A REALIST CASE STUDY OF ALICE SPRINGS HOSPITAL'S RESPONSE TO IMPROVE EMERGENCY DEPARTMENT ACCESS IN THE CONTEXT OF NATIONAL HEALTHCARE REFORMS

(Why and How Alice Springs Hospital improved their emergency department access)

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SUMMARY

Introduction

In the past few years, Australia has embarked on major health care reforms extending across all states and territories. While reform implementation has slowed, increased funding and targets have had some impact on the public hospital sector. However, evidence linking national reforms to improved performance in public hospitals is meager. This absence is even more pronounced in the case of regional hospital performance. This study evaluates whether national reforms have led to an improvement in emergency department (ED) access (an important hospital performance measure) in a regional hospital in Central Australia, Alice Springs Hospital.

Methods

Assessing a complex scenario such as national reforms and the challenges faced by the regional hospital to implement the reform requires an in-depth analysis. This is offered by a realist evaluation approach. Within the realist framework, a case study design was adopted to define the case and set boundaries around it. The study commenced with interviews of key stakeholders and a literature review to outline a program theory. The theory was articulated in the form of sets of preliminary 'Context-Intervention-Mechanism-Outcome (CIMO) Configuration' patterns. The CIMO configuration outlines a link between the context, intervention, the cognitive reasoning of key actors in the program and the program outcomes, presenting a map of how the program objectives were achieved or not. As

both realist evaluation and case study allow flexibility in the choice of methods for data collection, a mixture of methods was used. The methods include quantitative analysis of hospital datasets, document analysis, and semi-structured interviews. Thematic analysis of documents and interviews was used to review and refine the program theory.

Ethics and dissemination

The Central Australian Human Research Ethics Committee, the body governing ethics approval in the Central Australian region, granted ethics approval for the study. Results from the study have been disseminated in phases, in the form of briefings and a comprehensive report to aid hospital quality improvement processes.

Results

The study identified moderate improvement in ED access as a result of investment in infrastructure and workforce, and the introduction of ED targets. Clinical leadership and support from the hospital management and the federal government have been critical to the improvement. However, infrastructure and workforce funding must be accompanied by clinical redesign activities for improvement to be sustained. The study also identified that reform funding has to be equitable within a hospital, and be provided on a long-term basis in order to be effective.

Discussion

In the context of a paucity of research on the impact of national healthcare reforms on regional and remote hospital performance, this study sheds some light on pathways that are critical for improvement in ED access. This information will assist policy makers and managers in the development and implementation of programs to improve ED performance in regional hospitals. However, further research is required to test the findings from this study and assess the impact of other components of national healthcare reforms on hospital performance improvement, such as hospital governance and payment systems.

DECLARATION

I, Sandeep Reddy, am the author of the thesis titled *A Realist Case Study of Alice Springs Hospital's response to improve Emergency Department Access in the context of National HealthCare Reforms*, submitted for the degree of Doctor of Philosophy. I declare that the material is original, and to the best of my knowledge and belief, contains no material previously published or written by another person, except where due acknowledgement is made in the text of the thesis, nor does the thesis contain any material that infringes copyright. The thesis contains no material, which has been accepted, for a degree or diploma by the University or any other institution.

Sandeep Reddy **31-03-2016**

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Firstly, I would like to dedicate this thesis to the Central Australian region and its people, the land being awe-inspiring and the people being remarkable for their tenacity, authenticity and adaptability. Secondly, I would like to dedicate this thesis to my eight-year-old son, Samuel, whose wisdom and insight, beyond his years, continues to inspire me to do better in life and career. Thirdly, I would like to acknowledge the trinity of my supervisors Professors Tim Carey, John Wakerman and Judith Dwyer, who have with their supervision and feedback shaped this research and thesis, which aims to fill in the gaps in an important health policy area: *impact of national healthcare reforms on regional hospital performance.*

LIST OF ACRONYMS

Acronym	Expansion
ASH	Alice Springs Hospital
CAHS	Central Australia Health Service
CAHN	Central Australia Hospital Network
CMO	Context-Mechanism-Outcome
ED	Emergency Department
HHF	Health and Hospital Fund
NHHRC	National Health and Hospital Reform Commission
NPA-HHWR	National Partnership Agreement on Health and Hospital Workforce Reform
NPA-IPHS	National Partnership Agreement on Improving Public Hospital Service
NT	Northern Territory
SDA	Service Delivery Agreement
UK	United Kingdom
WA	Western Australia

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DEFINITIONS[1]

National Healthcare Reforms:

The Oxford English Dictionary(1) defines **Healthcare** as '*the organised provision of medical care to individuals or a community*' and **Reform** as '*making changes in (something, especially an institution or practice) in order to improve it*'.

There are varying interpretations of healthcare reform across the world.(2–5) The scale and scope of reform differs depending on the context, but there are three main areas that are common to most reforms: financial sustainability, access to services, and quality of services.(2,6,7) Roberts et al. discuss six stages of health-sector reform: problem definition, diagnosis, policy development, political decision, implementation, and evaluation. (4)

In Australia in the past decade growth in health spending has exceeded state and local governments' tax revenues, leading to the possibility that government budgets would become overwhelmed by health spending obligations (8,9). This coupled with increasing demands on health services because of increased costs for delivery of essential health services, rise in prevalence of chronic diseases and an ageing population motivated the Commonwealth and state and territory governments to agree to major

[1] This section covers definitions not described in the main body of the thesis

reform of the health system in the form of a National Health Reform Agreement and subsequent partnership agreements.(9)

While the National Health Reform Agreement (10) does not offer a definition for national healthcare reforms, it outlines arrangements that intend to achieve a nationally unified and locally controlled health system. These arrangements are described later in this thesis. However, based on the principles outlined in the National Healthcare Reform Agreement, one can define healthcare reforms as being ***a framework, through which policies and arrangements intending to change healthcare delivery in a given place and time, are introduced***.

Hospital:

The Australian Institute of Health and Welfare (11–13) defines a Hospital in Australia as '***A health care facility established under Commonwealth, state or territory legislation as a hospital or a free-standing day procedure unit, and authorised to provide treatment and/or care to patients***'. The hospital services cover *admitted patient care, admitted patient palliative care, admitted patient mental health care, and public hospital establishment.*

Hospital Performance:

Improvement in hospital performance can be defined as '***achievement of***

definitive hospital targets that could be either clinical or administrative targets '.(14) These targets may cover traditional hospital functions (such as diagnosis, treatment, care, and rehabilitation) but as definitions and functions of hospitals change, targets may also.

Emergency Department:

Some Australian resources (15,16) suggest an Emergency Department can be defined as `***a discrete unit within a hospital providing emergency medical, nursing and allied care to relevant patients'***.

PUBLICATIONS[2]

1. Reddy S. Remote hospital reform in the context of national healthcare reforms. *Rural and Remote Health Journal.* 2016. **Undergoing peer review.**

2. Reddy S. Realist Evaluation of a remote hospital programme in the context of Australian health care reforms. *International Journal of Healthcare Management*. 2015. **Published online:** http://dx.doi.org/10.1179/2047971915Y.0000000013

3. Reddy S, Carey TA, Wakerman J. A realist case study of a regional hospital's program to increase emergency department access in the context of national health care reforms. *Health Services Research and Managerial Epidemiology*. 2016**.** doi: 10.1177/2333392816631101. **Accepted for publication.**

4. Reddy S, Jones P, Shanthanna H, Wakerman J, Damarell R. Do national health reforms improve access to emergency department and elective surgery? A systematic review of national healthcare reform in Australia, Canada, New Zealand and the UK: 1994-2014. **In progress.**

PRESENTATIONS

1. Reddy S. Evaluating complex phenomenon-do regular evaluation methodologies suffice? *SHAPE Symposium* 2015. Sydney. Jul 2015.

2. Reddy S. Patient demand, hospital occupancy and emergency department performance. In 'Coming together to explore health management research' at Griffith University. *Health Management Research Association Third Mini Conference*. Gold Coast. May 2014.

3. Reddy S. The influence of national health reforms on hospital performance. in what's new in health and health reforms. *51st CARPA Conference*. Alice Springs. Nov 2013.

AWARDS[3]

1. 2016 Research Higher Degree Student Publication Award, Faculty of Medicine, Nursing and Health Sciences. Flinders University.

2. 2015 Research Higher Degree Student Publication Award, Faculty of Medicine, Nursing and Health Sciences. Flinders University.

[2] See Appendices for the publications in full.
[3] For publications 2 and 3

CHAPTER ONE: INTRODUCTION

INTRODUCTION

Governments worldwide are engaged in reform of their health services.(4) The main intention of these reforms is to improve the performance of health services and render them more sustainable. Reducing costs, improving access to health services, and increasing efficiency are central tenets of health reforms. Healthcare costs are gradually increasing worldwide with tangible benefits of spending hard to gauge.(4,17) Health spending data from the Organisation of Economic Co-operation and Development (OECD) indicates total health expenditure as a percentage of Gross Domestic Product has increased from 6.9 percent in 1990 to 9.7 percent in 2010 as an average amongst OECD countries.(18)

Likewise, in Australia, health costs are estimated to increase from 15% of all Commonwealth Government spending in 2010 to 26% by 2050.(19) Key drivers of the increase in health costs include longer life expectancy leading to increase in the prevalence of chronic diseases, rising costs of health care goods and an ageing population.(4,17)

Public Hospitals comprise the largest single component of the Medicare, federal and state and territory health budgets in Australia.(20) From 2007-08 onwards, public hospital costs grew at an average of approximately 10%, considerably more than state government revenue growth.(19) Because of the increasing costs, concerns have arisen about the continued viability of

the public hospital system.(20) Aside from funding issues, the Australian public hospital system is under increasing pressure from changing population health needs, leading to increased demand for healthcare services and unacceptable inequities in access to services. With increased demand, the public hospital system is also finding it challenging to provide timely services to patients.(19) Increasingly, patients have been reported to be waiting longer than the clinically recommended time for elective surgery and emergency department services.(19) Concerns have also been raised about the safety and quality of healthcare services in the Australian public hospital system.(8) With the challenges confronting the system, there have been increasing calls for the redesign of public hospital services in Australia, so they are better positioned to meet emerging increases in demand.

In August 2011, the Council of Australian Governments (COAG)[4], reached a National Health Reform Agreement with the aim of delivering better health care to all Australians, and improved system sustainability.(21) The ensuing health reforms led to new funding arrangements for public hospitals in Australia, with the federal government becoming more responsible for significant funding of public hospital services.(8)

Due to these changing funding arrangements and the widespread restructuring of hospital funding and governance arrangements, many

[4] COAG is the peak intergovernmental forum in Australia with membership including the Prime Minister of Australia and the heads of the states and territories.(215)

stakeholders held high expectations for public hospital performance in the changed administrative environment.(22) The reforms intended to make public hospitals accountable, and to measure their performance against rigorous national standards.(8,9,19,23)

Of the many parameters through which public hospital service delivery and performance is measured, access to emergency services is one of the more important.(24–27) The same factors that have led to increased pressure on the public hospital system (growing complexity of cases, increase in hospital presentations, rising older population), have contributed to a mounting burden on hospital Emergency Departments (EDs) and a subsequent impact on services.(28,29) Specifically, EDs have struggled to provide timely access to their patient population.(8,25,27,29,30) This situation is aggravated in regional (rural and remote) hospitals, where workforce and isolation issues contribute significantly to health service accessibility.(31–33)

SIGNIFICANCE OF STUDY

There are gaps in knowledge about the impact of national health reforms on regional hospital performance, specifically ED performance, in Australia.(22,34–37) Where improvements in performance have been reported, questions have been raised about the drivers of these improvements and their sustainability.(38–41) Research linking improvements in ED performance to national health reforms is thought by

some to be inconclusive due to methodological issues.(42,43) Evidence of the impact of national reforms on public hospital performance is even more limited in the regional (rural and remote) hospital context.(9,31,33)

Against a background of gaps in existing evidence, this study was designed to contribute to an understanding of the impact of national health reforms on hospital performance in remote locations in Australia. This study examines a key component of the Australian health reform that has been implemented throughout Australian public hospitals: improved access to EDs. This research selected a regional[5] hospital in a remote location as its research site, and explored the hospital program to meet ED targets and improve ED access, in the context of national health reforms.

To ensure its objectives are achieved, this research utilises a rigorous methodological approach to evaluating the impact: a combination of theory based realist evaluation and case study design. This combination ensures not only a rigorous approach to the collection of data, but allows an in-depth analysis of the impact of national reforms on ED performance. The robust methodology is expected to add to the credibility of the findings.

[5] Alice Springs, where this study will be based, has been classified as a remote location both by the Accessibility/Remoteness Index of Australia (ARIA) and the Australian Institute of Health and Welfare. However, the only hospital in Alice Springs is also a major regional 186-bed hospital servicing a population of 60,000 spread across Central Australia.(108)

This study sheds light on pathways that are essential for improvement in ED access, an under-researched area with few answers currently available. This information is expected to assist policy makers and managers in the development and implementation of programs designed to improve ED access in regional and remote hospitals.

RESEARCH OBJECTIVE

This research assumes the regional hospital's program to improve ED access, like other social programs, consists of sophisticated and complex interactions within a composite reality.(43-45) Because of its philosophical stance (scientific realism) and methodology (theory-oriented evaluation framework) the research also assumes that embedded within the hospital program is a program theory (an explanation of how the program's objectives were achieved), even if those involved are not aware of this, and it is up to the researcher to elucidate this embedded theory and make it explicit.

Thus, the main study objective, structured by a theory-oriented evaluation framework, is *to assess the impact of national healthcare reforms on ED access in a regional hospital.*

The sub objectives of this research are:

to develop and apply an understanding of the program theory in use in the regional hospital's program to improve emergency department access over

the period since introduction of the recent national healthcare reforms (2008-2014).[6]

and

to test the initially developed program theory through a range of data collection and analysis methods.

Findings from the data collection and analysis have been used to refine and/or revise the preliminary program theory.

OUTLINE OF THE THESIS

The thesis is organised in chapters and sections. In addition to the introductory chapter, seven further chapters outline the research context, ED reform in the hospital case study, the study methodology, theoretical approach, findings, discussion, and conclusion.

The next chapter (Chapter 2) sets the scene for this research by describing the context in which this study operates. It commences with a review of international healthcare reform literature and the general principles behind it. This is followed by a review of recent healthcare reforms in Australia, including key drivers (like the macro-economic context, rising chronic disease burden, ageing population, and improving access to hospital services) behind the recent reforms. General Australian healthcare reforms are also covered.

[6] The relevance of the 2008-2014 period is explained in more detail in the following chapters

Chapter 3 and 4 hone the narrative down to literature related to the key focus of the research: national and local hospital reforms and ED reforms. Chapter 3 also discusses hospital performance and reporting of performance. Chapter 4 commences with discussion of relevant processes that underlie ED operations. The chapter then describes experiences of ED reforms in the United Kingdom (UK) and Western Australia (WA) prior to the introduction of the National Health Reform Agreement and National Emergency Access Targets (NEAT) in Australia. This chapter also profiles the hospital under study, and its ED, including developments in the recent past.

Chapter 5 describes the methodology employed to achieve study objectives. The study design, a realist case study, not only combines two highly regarded methodologies but also utilises the well validated mixed methods approach to enhance the study rigor. This multilayered methodological framework means a substantial part of the chapter has been devoted to describing the rationale for selection of the study design, the advantages achieved, and the philosophy underpinning the chosen framework. This chapter also briefly touches on the ethics dimensions of the study.

Chapter 6 discusses program theory and what it means in theory-oriented and realist evaluation. It also presents a preliminary program theory, tested in later phases of the study through data collection and analysis. As per the methodology and objectives, the program theory forms the cornerstone of

this study.

Chapter 7 presents findings obtained through the range of data collection methods including quantitative, document content, and interview data collection. This chapter synthesises the data to test the preliminary program theory. As this study is a combined study design with a mixed methods approach, multiple formats are employed to present the findings including tables, figures, flow charts, and matrices. The analysis is then used to revise the preliminary program theory and arrive at a final program theory describing improvement in Alice Springs Hospital ED performance in the context of national healthcare reforms.

Chapter 8 discusses the results in relation to the theoretical, realist evaluation approach. The chapter also discusses how the findings are supported by literature and reform experiences in other settings. Limitations of the study are reviewed, as are the relevance of the findings to other regional and remote hospitals. Implications of the study for both policy makers and researchers are raised. Finally, recommendations are provided to the hospital case study to assist in sustaining the improvement in ED access.

The final chapter (Chapter 9) summarises key concepts from each chapter, drawing the narrative together. A reference section and appendices follow, incorporating supporting content. This includes permissions and approvals

from relevant bodies, participant information sheets, interview questionnaires, published and submitted for publication study-related manuscripts, and analyses not included in the main text.

CHAPTER TWO: HEALTHCARE REFORMS

INTRODUCTION

There are healthcare reforms occurring across the globe.(23,46–49) Despite the different contexts in which these reforms are operating, there are common principles and themes.(49) Within healthcare reforms, hospital reform is frequently considered important because of the status hospitals are accorded in healthcare delivery and costs involved in running hospitals.(9,35,48) This study focuses on recent Australian healthcare reforms and examines the impact of national healthcare reforms on a regional hospital in a remote location in Australia.

While there is some measure of accounting of reforms as they apply to metropolitan hospitals, there is minimal research on how national healthcare reforms impact remote Australian health services.(33) In the quest to identify evidence, this chapter identifies and reviews relevant literature on *national healthcare reforms and healthcare reform in Australia.* While the recent national healthcare reforms in Australia had a whole-of-system approach, the literature in this section focuses on public hospital reform, particularly as it relates to remote hospital ED performance.

HEALTHCARE REFORMS

The 2000 World Health Report developed by the World Health Organisation (WHO) identifies three primary goals for all healthcare systems:

1) improve the health of the population;

2) assure health services are responsive to the public; and

3) ensure equitable payment systems.(51)

Health care reform, in its essence, seeks to change existing heath service arrangements to accommodate these goals.(23,47,49,50,53) However, approaches to health reform differ from country to country, and sometimes even within a region.(4) While some health reforms focus on specific aspects within a health system, others seek to significantly restructure the entire system. Yet, at a fundamental level, all healthcare reform seeks to transform current healthcare arrangements by rearranging distribution of costs, benefits, and prized resources.(49)

Nearly all developed countries have structural and ongoing difficulties with financing healthcare as well as the delivery and performance of their healthcare systems, despite the repetitive introduction and implementation of new health policies.(53) Contributing to these difficulties are the increasing opportunity costs of health spending, rising burden of economic and demographic changes on welfare systems, and the need to maintain international competitiveness of national economies in an increasingly globalised economy. While several years of reform experience indicate it isn't always effective, healthcare reform seems inevitable as long as healthcare issues abound.(49)

According to the OECD, six objectives should guide health policy (53) and consequently, healthcare reforms. These objectives are:

- *Macro-economic efficiency*: Health expenditure must claim an appropriate portion of the GDP.
- *Micro-economic efficiency*: In consideration of the GDP portion spent on health services, a mixture of services that maximises a combination of health outcomes and consumer satisfaction needs to be achieved.
- *Adequacy and equity in access to healthcare*: A minimum level of health care needs to be available to the population, with treatment being accorded, as far as possible, in terms of need.
- *Income protection*: Where payments are required for accessing healthcare, patients should be protected from costs that threaten their income adequacy and ability to pay.
- *Freedom of choice*: Arrangements have to be made such that patients are free to choose between various healthcare providers.
- *Autonomy for providers*: Conditions have to be created such that different health care providers are free to engage in medical and organisational innovation to achieve the above objectives.(53)

Aside from these policy factors, other dynamics influence the reform of health systems.(7) These include external or macro-level factors beyond the control of governments, such as global economic and population trends. It has been suggested that forces beyond the control of individual nation-states

drive healthcare reforms because of international trends in organisation and production of health services.(7) Such forces may be mediated to some extent at the meso-level by national and state policies, and at the micro-level by organisational reform strategies. Consequently a supranational process of reform convergence is said to be taking place.(7)

While healthcare reform has many potential drivers, Roberts et al (4) propose that health reform generally goes through a cycle of six stages as outlined below (and in Figure 1):

Definition of the problem: This step involves identifying the problematic area/s ripe for reform.(4) Though a critical component of healthcare reform, this step is often inadequately addressed. In defining the problem, Roberts et al (4) recommend asking the following questions:

- What leads to one area of poor performance being accorded more priority than the other?
- What social process modifies how problems are perceived?
- What factors determine the definition of the problem?

While defining the problems is essential, the authors caution reformers that reforms are means to an end and not the end itself.

Diagnosis for identified problems: Not dissimilar to a medical doctor working backwards to identify the causes for a patient's symptoms, reformers need to undertake a diagnostic journey to explore the cause of health sector

problems once they are identified.(4) This journey involves conducting a deep exploration and developing a comprehensive understanding of why the relevant healthcare system behaves as it does.

Planning and policy development: This phase involves consideration and development of the right policy or therapy to address the problems identified in the previous steps.(4) This is more complicated than it may seem. New policies are difficult to develop, and not necessarily innovative. Roberts et al. suggest a forward thinking process in policy development, anticipating political decisions and the implementation process. (4)They also recommend, as far as possible, engaging in wide consultation and involving stakeholders in policy design.

Political decision-making: This step occurs when the reform proposal, covering the problem, solution, and relevant policies, goes through a process of review and approval by the executive and legislative branches of the government.(4) This phase is as much about political skill (effective political strategy and coalition building) as it is about political will (political commitment and risk-taking). Key throughout this phase is the development of a strong support coalition.

Implementation: Many good health policies fail either because they are not properly implemented, or are not implemented at all.(4) As reform involves change, there is commonly resistance from many stakeholders. Roberts et al

(4) suggest overcoming resistance requires strong leadership, while progressing reform requires effective monitoring and reporting mechanisms.

Post-reform evaluation: Reformers need not necessarily await the end of reforms to commence evaluation. Astute and experienced reformers are aware that successful evaluation begins even before the reforms are implemented. Key to evaluation is data collection, specifically pre- and post data. However data acquisition in this context is not straightforward, with a need for the design of administrative systems to collect the relevant data. The importance of evaluation cannot be emphasised enough, as it not only assesses the success of the reform or not, but also identifies unintended consequences or new problems post reform.

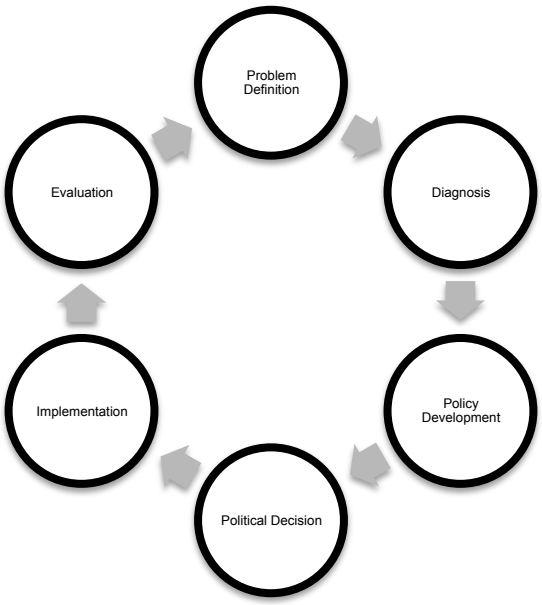


Figure 1. Health reform cycle (Adapted from Roberts et al.)

It has to be stated that the cycle described above represents how reforms will occur in an idealised form.(4) Realistically, it is uncommon for healthcare

reforms to occur in such a straightforward fashion: it often takes varied routes.

In addition to the six stages of the reform cycle, Roberts et al. (4) describe five "control knobs" that reformers can adjust to improve health services. One of these is financing. Roberts et al. (4) maintain financing has an enormous influence on the performance of a health system. Among the many things financing establishes is the amount of funding available to the system and its various service providers, and the extent to which healthcare costs can be limited. With national healthcare systems funded by taxation, as in the United Kingdom (UK), an essential feature is the balance of health expenditure against competing public expenditure areas.(55) With health systems funded more through private insurance, as in the United States (US), costs are largely borne by individuals and employers, but inefficiencies and inconsistencies in quality of care and health outcomes abound.(5,46)

In light of financial inefficiencies also present in public sector health service delivery, a popular concept in reform is 'new public management'.(56,57) The concept suggests organisational performance and health care service provision can be improved through the introduction of market mechanisms into the public sector. This has led to a rethink of how public health services should be delivered and funded, with measures such as financial devolution, explicit standards of performance measurement, clear specifications of relationships between inputs and outputs, and the introduction of

competition through competitive tendering and virtual markets.(56,57) There is said to be a gain in efficiencies from the introduction of such competitive forces through increased transparency in management processes. In the 1990s, this concept led to the establishment of an internal market in the UK, separating the functions of health authorities into purchaser and provider functions.(7) In implementing this 'new public management' strategy, purchasing authorities would seek lowest cost providers for patient care, and providers would compete with one another to gain contracts.

While the economic component of health service reform is important, organisational change is also an important component.(4,49) Organisational reform is driven by a range of issues, including a need to reduce centralised and perceived bureaucratic control.(57) Reform can be about changing governance structures, so management and organisations can be held accountable for the expenditure of public funds.(58) Health reform can also be used to provide overall strategic direction. Ideally, the intention of the changing governance arrangements in Australia is to improve the accountability and effectiveness of management. (65-67,69)

From a theoretical perspective, many different models of organisational change have been proposed.(59) However, a widely cited and comprehensive model proposed by Van de Ven and Poole (60) presents four categories of change: life cycle, evolutionary, dialectical, and teleological. Life cycle relates to the natural progression of change, evolutionary denotes slow

adaption to change, teleological marks rational and linear change, and dialectical captures change brought through negotiation and power. These categories of change can be applied to the way reforms have developed internationally over the past half-century.(49) During the 1950s and 1960s, the focus of reforms was on individual organisations: Institution Building. During this period, an emphasis on state-based delivery of essential services resulted in the establishment of many public sector institutions. By the 1970s, the focus on 'Institution Building' had shifted to 'Institution Strengthening' where tools were sought to improve the performance of existing institutions rather than embarking on wholesale change. During this period, processes were initiated to reach vulnerable population groups with targets being structured to monitor progress. As the focus was on people rather than institutions, these processes have been termed 'Development Management'. Later in the 80s, a trend of 'Structural Adjustment' emerged, where countries benefiting from donor funds were required to adopt economic and social changes as a condition of funding. The 1990s were characterised by capacity development, reassessment of technical cooperation, and emergence of local ownership in the development process. In the 21st century, international goals such as the Millennium Development Goals, information technology developments, knowledge-based networks, decentralisation, and human resource management drive healthcare reforms.(49)

Another key factor behind organisational reform in the public sector in recent years has been concern regarding efficiency and quality of services.(57) A number of approaches have been trialled to address these concerns. Disaggregation of the public sector into discrete management units is thought to improve efficiency and quality of service provision. Allowance of autonomy or semi-autonomy is thought to reduce bureaucratic control and set up an environment for innovation and improved productivity. Insufficient autonomy may stifle management processes within a health service, and in turn impact on overall efficiency. The theory supporting increased organisational autonomy purports that it enables management to develop structures and systems congruent to their devolved functions and responsive to their local situation.(57)

Rapidly changing healthcare environments such as increases in consumer demand and competition for finite resources have led to more attention being paid to exploring the use of appropriate models of health governance.(58) Three broad models of governance have been defined: bureaucratic/political, community/philanthropic, and corporate. Barnett et al (58) describe the bureaucratic model as relating to direct government ownership and responsibility, while philanthropic governance is based mostly on a volunteer model. The corporate model has an emphasis on strategy and market share. However healthcare reforms in different countries have introduced variants of these models and many of these models have an

emphasis on local autonomy and participation.(49)

Another key driver of health reforms is access to health services. Whatever the type of health system, a fundamental concern of national governments is to ensure access to a minimum level of healthcare for its citizens.(4,7,22,23,46,47,49,51,53,56) This has led to governments considering various mixes of providers, payment systems, and modes of healthcare delivery in order to maximise access.(49,54) Some healthcare reforms are focused on achieving equity in consumer access to quality health services combined with achieving a reduction in health disparities. These reforms usually include improvements to community health cover as this is broadly recognised as important in reducing disparities.(5) Other reforms have considered expansion of either public health care services or the private market.(49,54) In conjunction with these approaches, policy makers have also considered strengthening or introducing public-private partnerships, not only to attain efficiencies in health service delivery but also to ensure sustainability of the services.(49)

Examining healthcare reforms across different countries, healthcare systems, and different periods, it is clear that health reform is not necessarily the solution for all healthcare system issues.(49,54,61) On occasion, healthcare reforms are initiated because of non-healthcare concerns such as macro-economic issues and/or budgetary concerns.(4,49) In other instances, reforms are rolled out to address public sector inefficiencies in healthcare

delivery. However, neither the private sector nor a market model is the answer to inefficient healthcare delivery, as the US health system infamously demonstrates.(46,49,52) In fact, evidence demonstrates public healthcare systems are more equitable and efficient than their market oriented health care counterparts.(49) Ultimately, what is required is the development and implementation of effective public policies, and creation of national standard accountability measures attached to funding.(49,61)

While some question the effectiveness of incremental reforms and current reform models (63,64), most healthcare systems do not have the healthcare resource surplus required to undergo short and sharp reforms. With healthcare reforms being inevitable in the future, governments need to carefully consider the appropriate underlying model, value, transaction costs, evidence base, and impact of national healthcare reforms before embarking on the reform journey.

This section outlined the drivers behind national healthcare reforms and the different forms healthcare reforms can adopt. This narration relates to the background/context in which this study operates. The next section reviews how national healthcare reforms as applicable to the Australian healthcare system and what set off the current healthcare reforms.

HEALTHCARE REFORMS IN AUSTRALIA

Healthcare systems can be generally categorised into three types: national healthcare systems, social insurance systems, and private insurance systems.(55) Australia has a mixed health system, largely publicly funded. Public funding enables access to all public hospital and some medical and allied health services for Australian citizens and permanent residents.(20) Health Care agreements between the federal government and states and territories set the terms under which states and territories handle the provision of public hospital services. These services are funded both by state and territories and by grants from the Australian Government. Medicare funds access to medical consultations through the Medical Benefits Schedule and subsidises the costs of many prescribed medications through the Pharmaceutical Benefits Scheme (PBS) for most Australians.(20,48)

Despite the healthcare system being largely publicly funded, the private sector has a significant role both in funding and delivery of health services in Australia.(20,48) Private health insurance remains an important component of funding health care, while providing choice in healthcare for its subscribers.(65) The majority of doctors in Australia are self-employed, or engaged in private practice in addition to their public role. Therefore, private doctors have a major voice in health policies and, consequently, are key stakeholders in healthcare reform arrangements. Further, private hospitals are important entities in the Australian healthcare system: in 2014, 612

private hospitals saw more than 3 million patients in Australia.(12)

The Australian healthcare system remained largely the same from the introduction of the current form of Medicare in 1984 until 2007.(2) While there were low-scale reforms across the nation during this period, there had been no attempts at serious, comprehensive, national healthcare reforms. However, it was argued then there were unacceptable inequities both in terms of health provision, and health outcomes for many Australians.(8) It was suggested that this was due to inherent faults in the system that failed to address the inequities adequately. According to this perspective, the main structural flaw was the split of funding responsibility and performance accountability across different levels of government. State and territory governments were facing voter backlash because of perceived inefficiencies in public hospital management, while the treasuries of these governments were increasingly burdened by the costs of running them.(2) A 'blame game' erupted between the federal and state governments over management of public hospitals and other healthcare services. These issues provided a compelling case for structural and systemic reform in the late 2000s.(8,22)

With support from a public in the mood for healthcare reform, the Australian Labor Government established the National Health and Hospital Reform Commission in 2007. The aim was to develop a long term reform plan, with an objective to enable sustainable healthcare delivery and improvement in

health service performance.(2,49) One key purpose for initiating reforms was to honour a pre-election commitment by the Labor Party to address hospital funding and performance issues.(66) In the prevailing arrangement, the state and territory governments were responsible for running public hospitals, but the federal government managed Medicare funding.(2,8,9,48) The state and territory budgets were being strained by the increasing costs of running public hospital services, while concurrently, morale of the hospital workforce was low due to systemic issues.(8)

In 2009, the National Health and Hospital Reform Commission (NHHRC) report identified that the public hospital system, in practice, was fragmented, poorly responsive, underfunded, and in dire need of reform.(8) The NHHRC report provided a 'blue print for health reform' in this context.(67) With the establishment of the NHHRC and other national health reform initiatives, the states and territories agreed to a series of National Agreements under the auspices of the Council of Australian Governments (COAG).(67) Through the reforms outlined under the NHHRC, additional funding for public hospitals was committed by the federal government to increase access to essential hospital services like ED and elective surgery services.(8) Public hospitals with major EDs would be funded to ensure there were sufficient numbers of available beds to enable timely access for patients being admitted through the ED.

The NHHRC report also recommended the federal government fund 60 percent of the forward costs of all public hospitals through an Activity Based Funding (ABF) and national efficient pricing mechanism.(8) The ABF mechanism, with the support of data and other resources, was to enable sustainable funding of public hospital and financial efficiencies. Moving to a largely single public funder model would reduce fragmentation, provide a whole-of-system view, and increase opportunities to be financially innovative.(67) However, disagreement from states and territories about the funding source for ABF led to the federal government revising their share of ABF from 60 to 45 percent for the 2014-2015 financial year, and 50 per cent from 2017-2018.

One of the most important initiatives of the national healthcare reforms was the establishment of Local Hospital Networks (LHNs).(48) The main intention of establishing the LHNs was to decentralise public hospital management, to increase accountability at the local level, and to drive improvements in hospital performance.(48) The LHNs are intended to engage in system-wide public hospital service planning, purchasing of public hospital services, development of infrastructure, and planning for teaching and research.(20) The LHNs are also accountable for service delivery access and outcomes, and are required to ensure robust and transparent reporting.(48) As of 2016, there are over 140 LHNs in Australia.(68)

In 2013, Christine Bennett, the Chair of the NHHRC, reviewed the 2007 national healthcare reforms.(67) Of the 123 NHHRC recommendations, only 44 recommendations were fully actioned as proposed in the NHHRC report. However, 61 recommendations had either been partially implemented, or implemented in an amended form. In terms of hospital reform, the development of the MyHospitals website to enable public reporting of hospital performance, the continuation of ABF and efficient pricing mechanisms, and the flourishing of LHNs were deemed as welcome outcomes of the national reform program.

However, as of 2016, many national hospital targets (discussed later in this section) and specific funding payments arising from the national healthcare reforms have expired or are in the expiry stage.(70–72) While there has been criticism about the disproportionate focus of the national healthcare reforms on public hospitals (34), the continuation (even with a change in the government) of a large number of reform components (69) intended to improve public hospital efficiency and performance signifies the continuing importance of public hospitals for stakeholders.

This section explored the national healthcare reform context specifically in relation to Australia. This section provides valuable information about the motivation behind the current national healthcare reforms in Australia and how there was an imperative for governments to demonstrate tangible

changes in the way health services were managed and delivered. This requirement was an important driver for setting up reporting systems about reform changes and organisational performance.(19,69) This process is reviewed in the subsequent chapters.

CHAPTER THREE: HOSPITAL REFORMS

INTRODUCTION

This chapter progresses the reform discussion but focuses on hospital reforms, hospital performance and reforms in remote hospitals; these components being immediately relevant to the study context and objectives.

HOSPITAL REFORMS

Public hospitals play an important role in achieving system-wide health reform goals. This is because hospitals account for a significant proportion of health spending.(64,73) Secondly, because of the positioning of hospitals at the apex of health care delivery, access to their services has an overall impact on the healthcare system. Thirdly, hospitals are central to the quality of secondary and tertiary level health care services delivered to communities and contribute significantly to population health.(50) However, managing hospitals is expensive and pressures like population changes, disease patterns, increasing costs of technology and workforce, and public expectations have a significant effect on hospital management.(73,74) These challenges have had an impact not only on the efficiency and effectiveness of hospital-based services, but also on clinical outcomes. Variations in clinical practice, issues with efficacy in treatment regimens, and concerns about clinicians' responsiveness to consumer needs have all impacted further on hospital outputs.(75) With these expectations, challenges, and impacts,

improving hospital efficiency is an important concern.

Hospital reforms, like health reforms, can take different forms. However, achieving change in hospitals can be difficult because of structural inflexibility and lengthy implementation time frames.(73) This, coupled with an intrinsic workforce culture that can be resistant to change or inter-professional collaboration, can create active barriers to reform. Nonetheless, the costs of not undertaking reform can be huge in terms of both financial and clinical outcomes.(74) Healthcare reform over the past decades has demonstrated that despite these challenges, changes can be achieved in hospitals by increasing autonomy, efficient use of resources, and through the introduction of performance measures.(74)

In engaging with hospitals, general systems theory offers important lessons. Hospitals are complex organisations operating in an open system (a system which exchanges feedback with its external environment regularly) , not unlike complex biological organisms interacting with their environment for survival and growth.(73) Therefore the environment in which the hospital operates is key: the way a hospital responds to changes depends on its role and function in the environment, and the beliefs and experiences of its stakeholders, among other factors. While the hospital is an open system interacting with its environment, it is also an assemblage of several subsystems, with each department a different subsystem contributing to the

whole. Therefore, when one brings about change it has to be contextualised, and enacted at an appropriate level and area of the system.

Some countries have sought to enhance hospital service delivery through increased community governance and improved management practices.(50) This focus on governance includes moves to establish hospital boards that are flexible, accountable, and with a greater focus on business and service goals.(58) Other public hospital reforms have led to decentralisation of program management and separation of purchaser-provider functions.(76) Conversely, in other countries, reforms have been associated with a 'recentralisation' of hospital services; that is, hospital management processes which were once decentralised have been centralised again.(64) In some instances, recentralisation has been associated with improvements in both cost efficiency and technical efficiency. However, this process has also been associated with an increase in the reform costs.(64)

Rather than system restructure, hospital reforms can also focus exclusively on clinical operations, such as patient care and pathways.(77,184) In 2005, the National Health Service (NHS) Modernisation Agency in the UK outlined ten changes that would have a high impact on hospital service delivery.(184) The changes included:

- Treating day surgery as the norm for elective surgery;
- Improving access to key diagnostic tests;

- Managing variation in hospital discharges, and thus reducing the length of stay in hospitals;
- Managing variation in the patient admission process and thus reducing cancellations of procedures for non-clinical reasons;
- Managing follow-ups appropriately;
- Organising therapeutic interventions in the form of Care Bundles, thus reducing the length of stay in hospitals;
- Undertaking a systematic approach to managing chronic disease patients, and thus reducing emergency admissions to hospitals;
- Improving patient access to elective surgeries by reducing the number of queues;
- Using process templates to reduce patient flow bottle-necks; and
- Optimising workforce functions to align with efficient patient pathways.

Other foci of hospital reform can be the quality of clinical services and patient safety. Following poor care and high mortality rates at the Stafford Hospital in the UK in the late 2000s, a series of inquiries were initiated to review the quality and safety of NHS services.(77) Recommendations from the inquiries led to considerable reflection on, and changes to how hospitals addressed quality of care issues. The recommendations arising from the inquiries included but were not limited to:

- Recognising transparency as essential, and insisting upon it;

- Enabling NHS workforce to learn modern methods for quality control, quality improvement, and quality planning;
- Allowing patients and their carer's involvement at all levels of their care;
- Reporting data on quality and safety in a timely fashion; and
- Establishing simple and clear supervisory and regulatory systems.

HOSPITAL REFORMS IN AUSTRALIA

In Australia, it is not surprising that hospital reforms spearheaded recent healthcare reforms as Australians are relatively high users of hospital services, hospital service delivery is expensive, and failings or closure of hospitals make front page news regularly.(22) The national healthcare reforms led to the provision of additional funding of up to $1 billion to increase access to hospital services.(78) Additional funding has been largely provided through national partnership agreements and dedicated hospital infrastructure funds, such as the Health and Hospital Fund.(19,21) National partnership payments are a mechanism through which the Australian Government can support specified projects/outputs and enable reform and efficiency.(21,79) Two of these agreements have focused largely on public hospitals, namely the National Partnership Agreement on Hospital and Health Workforce Reform 2008 (NPA-HHWR) and the National Partnership Agreement on Improving Public Hospital Services 2012 (NPA-IPHS).(71,72)

The NPA-HHWR, signed in 2008, had the broad intention to improve efficiency and capacity in public hospitals, while specifically aiming to reduce pressure on them by increasing ED capacity.(71) The Australian Government provided a total of $1,383 million to states and territories through this agreement. The NPA-IPHS, established in 2011, invested $3.4 billion to increase hospital access and support previous work under the NPA-HHWR.(21,72) Although the Australian Government provided a large proportion of the funding, the states and territories were expected to continue their funding contribution and management of public hospital services, and report on targets and funded projects.

Another Australian Government initiative to significantly impact hospital services during the reform period was the *Health and Hospital Fund* (HHF), a federally funded infrastructure package.(80) The HHF was established in January 2009 through the *Nation Building Funds Act 2008*.(81,82) While not strictly a reform agreement, HHF sought to invest in health infrastructure that enabled the achievement of health reform targets.(81,82) The HHF was not meant to replace state or territory efforts, and required their co-contribution for projects. There were four HFF funding rounds with $5 billion disbursed by the Australian Government for various hospital and non-hospital infrastructure projects.(80)

HOSPITAL PERFORMANCE

Present day hospitals have to fulfil several objectives: achieve high clinical performance in a rapidly changing technological world, increase productivity within tight budget constraints and under close inspection, and increase patient access to services while confronted with shortages in health workforce.(83) Limited resources and changing structures have created challenges in delivering hospital services. Public hospitals have traditionally struggled to provide appropriate and timely services while maintaining control over expenditure and being clinically efficient.(49,50,73,76,84) Many governments believe there are significant efficiency gains to be achieved in the hospital sector.(85) These gains and consequent improvements in hospital performance are thought to be possible through the rationalisation of activity between hospitals and clinical levels of hospital care, and through the granting of greater autonomy to hospitals on a phased basis.(85)

Hospital performance is an important issue and can be assessed within the framework of organisational theory.(83) Hospital performance can be directly linked to the way services are delivered, that is, how can access to services be enabled? With performance improvement there is emphasis on how the organisation gears itself to run smoothly without undue internal strain. Some authors have considered performance improvement as equating to quality improvement, with the ownership of quality a system issue.(86) Describing performance at a hospital level rather than at a patient level allows for benchmarking and assessment for effective care. Both of these

approaches are necessary in order to achieve continuous quality improvement.

Recent years have seen the development of a variety of models for assessment of hospital performance.(83) However weaknesses have been identified with many of them, due to their focus on single variables. This has led to the assessment of hospital performance within the framework of organisation theory, but using multiple variables. Four models have been proposed within this framework (83):

- *The Rational Goal Model* is based on instrumental and rational conceptualisation. That is the model deems organisations as effective only if they achieve their stated objectives;
- *The Open System Model* frames the organisation as dependent on the environment within which it operates. Any flexibility and adaptability developed to acquire resources is seen as good performance;
- *The Internal Process Model* stresses the importance of internal production processes. The services provided by the hospital are then assessed according to the way they were produced; and
- *The Human Relations Model* maintains that an organisation performs well if its members are freed from external controls. Once freed, members can then fulfil their optimum potential and become committed to the goals and operational processes of the organisation.

Within these models, various performance measures with different foci can be developed and utilised to monitor hospital performance. In the US, improving hospital performance has focused on the quality of healthcare provision.(50) This approach concentrates on identifying inefficient aspects of hospital care, and utilises quality improvement techniques to redesign patient care provision. A quality focus has been seen to be effective in many cases.(50) In some of the hospital reforms introduced in New Zealand (75) there has been a focus on increasing accountability and financial performance. This has included establishment of thorough performance appraisal systems, appointment of staff with limited term contracts, instituting performance related salary systems, tighter spending limits, and initiatives to reduce waiting times to access hospital services. In other countries, improving hospital performance has meant increasing hospital autonomy and giving managers defined responsibility for performance, efficient use of resources by cutting down on wastage, use of lower cost generic products, and using appropriate staff mix to achieve objectives.(74)

In Australia, one of the key intentions of recent national healthcare reforms has been to drive improved performance across the whole healthcare system.(87) This led to the establishment of a National Health Performance Authority (NHPA) and development of a Performance and Accountability Framework (PAF).(79) The NHPA was established in 2012, and had the objective of providing transparent public reporting of every LHN and each hospital within the network.(19) The PAF covers performance across a wide

range of health services including hospital services. Indicators pertaining to hospital service delivery are outlined in Table 1.

Table 1. Hospital performance indicators framework (Adapted from the NHPA Performance and Accountability Framework, 2012)

<table>
<tr><th rowspan="2">Performance</th><th colspan="3">Objectives</th></tr>
<tr><th colspan="2">Outputs</th><th>Outcomes</th></tr>
<tr><td>Equity</td><td>Access</td><td colspan="2">Access to services by type of service compared to need</td><td rowspan="8">Hospital Standardised Mortality Ratio

Death in low mortality Diagnostic Related Groups

In hospital mortality rates for various conditions

Unplanned hospital readmission rates for various conditions</td></tr>
<tr><td rowspan="2">Effectiveness</td><td rowspan="2">Access</td><td colspan="2">ED waiting times by triage category</td></tr>
<tr><td colspan="2">Percentage of ED patients transferred to a ward/discharged within 4 hours by triage category</td></tr>
<tr><td rowspan="5">Effectiveness</td><td rowspan="2">Access</td><td colspan="2">Elective surgery patient waiting times by triage category</td></tr>
<tr><td colspan="2">Cancer Care Pathway - waiting times</td></tr>
<tr><td rowspan="3">Quality</td><td>Safety</td><td>Healthcare Associated Infection Rates</td></tr>
<tr><td>Responsiveness</td><td>Patient experience measures</td></tr>
<tr><td>Continuity</td><td>Rate of community follow-up after psychiatric discharges</td></tr>
<tr><td rowspan="2">Efficiency</td><td rowspan="2">Mixed Measures</td><td colspan="2">Relative Stay Index for multi-day stay patients</td></tr>
<tr><td colspan="2">Day of surgery admission rates for non-emergency multi-day stay patients</td></tr>
</table>

Performance	Objectives		
	Outputs		Outcomes
		Cost per weighted separation	
		Financial performance against budget	

As part of the national health reform agreements, states and territories agreed to report against performance indicators listed in the PAF, with funding increasingly linked to performance. The reportable measures included waiting times for elective surgeries and ED.(19) Figures for most Australian hospitals relating to these performance measures are now being published on the Commonwealth Government funded 'MyHospitals' website (13), and through NHPA reports.(21) Indicators relevant to ED access and their importance in the context of current Australian healthcare reforms are discussed in the following chapter.

REFORMS IN REMOTE HOSPITALS

A third of Australians live in regional, rural, or remote areas.(69) Populations residing in these areas are sicker than those residing in other parts of Australia. Universal entitlement to healthcare under Medicare does not translate to universal access to healthcare in these areas due to limited healthcare resources - both infrastructure and workforce.(8,31) Residents in remote areas face significant challenges in accessing relevant health and social services, while services experience issues with staff retention and resource constraints.(31,37) The geographical isolation and inadequate

investment in remote health services have been suggested as the main factors responsible for these issues.(66) Although rural health services face workforce and resource limitation issues, the isolation component has a greater impact within remote locations.(37,65) Therefore, researchers and professional bodies have increasingly made a distinction between rural and remote health services.(88)

Hospital services are an integral and vital component of health service provision in remote areas.(89) Opinions differ regarding how performance indicators associated with national reforms will or have impacted on patient access to hospital services. (26,42) In addition, there are questions as to whether these performance indicators and reforms in general are relevant to rural and remote areas.(33) The provision of hospital services in these areas requires a different approach to a metropolitan setting. Not only do rural and remote patients require access to local services, but also such access requires predictability, and planning access to specialised services not available in local hospitals. The common requirement for remote and rural patients to travel great distances to access services not only places a huge burden on patients and families, but also creates inequities in access.(33,89)

Hospitals in remote locations have unique challenges that impact on their viability and their capacity to deliver quality services to their populations. Hospitals in remote areas have either experienced repeated downgrading of

their services or a lack of upgrade in services to match their population growth.(66) This has led to clinicians leaving remote hospital employment, frustrated by inadequate professional or infrastructural support.(66) EDs in these hospitals are also challenged by an increasing burden from both complicated cases, and patients seeking 24-hour no-cost care for non-urgent medical conditions.(66,90,91)

The remote health scenario is complicated by social disadvantage, higher rates of psychosocial difficulties, and physical distances, which have a direct impact on hospital service delivery.(31,37,66) As mentioned earlier, there are significant health disparities between populations in remote areas and those in urban settings. These circumstances have led remote hospitals and health services to adopt unique and innovative models of care in order to optimise their limited resources.(31,32,37,66,88)

With the Australian Government intending the national reforms to be relevant to all public hospitals, including regional and remote services, it is important to understand the impact of the reforms from a remote hospital perspective. While some recommendations for reform packages for rural and remote areas have been made, including top-up funding on a per capita basis to match better-served populations, incentives to attract healthcare workforce, and increased funding for travel and accommodation (8,31), there is very limited research evidence to guide the development or

implementation of reforms in remote hospitals. In the context of gaps in the research literature, and uncertainty about existing evidence, this study has been designed to contribute to an understanding of the impact of national health reforms on hospital performance in remote locations in Australia. This study examines a key component of the Australian health reforms that has been implemented throughout Australian public hospitals in Australia, including those in remote areas: improved access to emergency care.

The researcher selected Alice Springs Hospital (ASH) to evaluate the hospital's program to meet ED targets in the context of national health reforms as he was based in Alice Springs and had easy access to ASH. ASH is a regional hospital in a remote location[7] (see Figure 2), and is the only tertiary hospital in Central Australia. These factors made it an appropriate site to base this study. More details about this iconic hospital are provided in the following chapter.

Figure 2. Location of Alice Springs (dot) within the Northern Territory of Australia and catchment area of ASH (marked by a red circle).

[7] The Accessibility/Remoteness Index of Australia (ARIA) describes a remote area as having "very restricted accessibility of goods, services and opportunities for social interaction".(p. 212)

CHAPTER FOUR: EMERGENCY DEPARTMENT REFORM

INTRODUCTION

The previous two chapters have discussed how healthcare reforms occur continually and the emergence of current healthcare reforms in Australia since 2008. Within most Australian public hospitals, EDs are the entry point for many patients and the public considers timely access to EDs as very important. (94,98) Access to ED is generally an indicator of access to the wider hospital system. (94) Thus access to ED is a key component of the current healthcare reforms in Australia. This chapter discusses issues affecting ED access and how the Australian healthcare reforms proposed to address this issue. The chapter also discusses how ED reforms were implemented in ASH.

ED CONCERNS

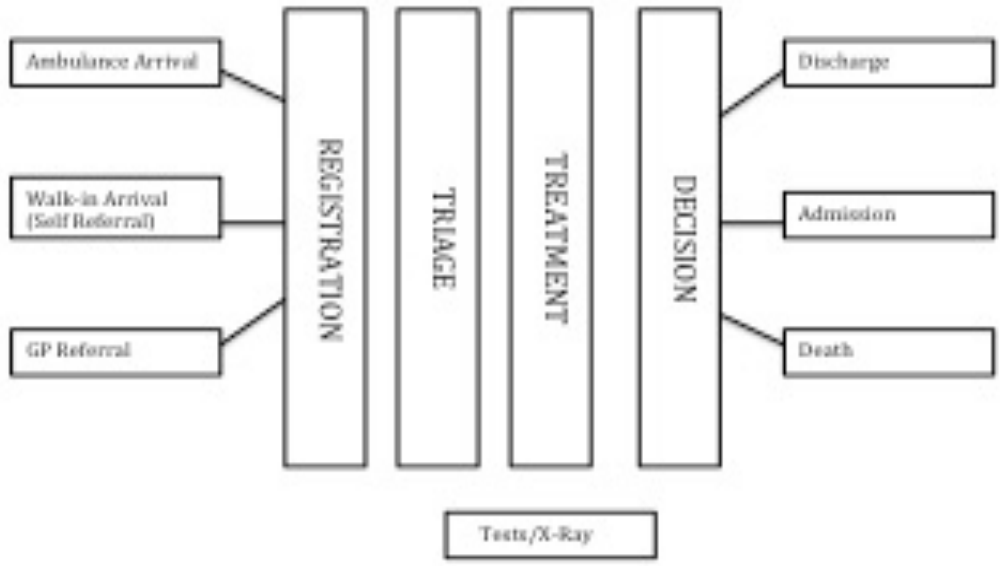


Figure 3. Usual Emergency Department patient flow pathway (Adapted from Gunal & Pidd,)

EDs form an essential part of the public hospital system and act as the public face of many public hospitals.(42) Timeliness and efficiency are fundamental characteristics of well-functioning EDs.(92) However, public hospital EDs are experiencing an ongoing tension between the need to receive sick patients on demand, and the need to keep discharging patients either to their home, to available beds within the hospital, or to some other appropriate healthcare facility.(42) EDs can be easily overwhelmed due to heavy patient demand for services, resulting in access block[8] to hospital beds.(93)

A frequent and major issue within EDs is 'crowding'.(93,94) Crowding occurs when the need for ED services exceeds resources available for patient care within ED or the hospital.(93) Multiple studies have documented the negative outcomes of ED crowding including adverse patient outcomes, and the adverse impact on the morale of ED staff and its efficient performance.(30,94,95) Factors leading to ED crowding can be grouped under three main headings (28,94,96,97):

- *Input Factors*: sources and aspects of patient flow such as attendance of non-urgent patients and heavy use by repeat or frequent visitors;
- *Throughput factors*: issues such as 'bottlenecks' where patients may be required to wait for a long time to be seen within an ED due to organisational problems such as understaffing; and

[8] Access block is the term that describes the delay patients who need hospital admission experience in ED when their inpatient bed is unavailable.(213)

- *Output factors*: 'hindrances' to the discharge of patients from an ED due to other parts of the healthcare system being unable to accept new patients. Hospital bed shortages are a frequent cause.

Output factors have become increasingly important in ED crowding, with a strong relationship between ED treatment time and hospital occupancy.(93) Congestion of hospital services leads to access block, which in turn leads to ED beds being held by patients ready for inpatient admission.(98) This has flow on effects like prolonged ED waiting times, ambulance ramping, and hospital bypass.

Some authors have speculated that the increasing incidence of access block is because of progressive reduction in accessible hospital beds over many years.(98) While the average length of stay in hospital has reduced, this has been offset by increasing numbers of patients requiring complex hospital care in the context of limited hospital beds. The net effect of increasing hospital bed occupancy is increased waiting times for ED patients to be admitted into the hospital.

Several recommendations have been made to address access block. These include the need to look beyond creating new beds, as they will only provide temporary relief if systemic inefficiencies continue.(92,98) For access block to be effectively addressed, the whole health system must be engaged in the

development of system wide solutions.(42,98) Greater infrastructure for the growing and ageing population is required, and clinical redesign principles applied to patient flow processes. This rethink of patient processes and pathways would include appropriate management of bed capacity, increase in the provision of community care services, provision of relevant diagnostic tests over stretched periods, and creation of emergency networks comprising hospitals, ambulances, primary and community care services.(99)

ED Reform in the UK

As widely reported the ED reform program in the UK inspired the introduction of ED reforms in Australia.(25,42,99) This section reviews recent ED reforms in the UK and the 4-hour program.

In the late 1990s in the UK, EDs were receiving negative attention due to access blocks, reports of long waiting times, poor morale of ED staff, and poor patient access to diagnostic and other support services.(99) It was not uncommon for patients to be waiting on trolleys for more than 12 hours to obtain inpatient admission.(99)The government at the time took action in the form of a series of hospital reforms including the introduction of an ED time-based target.

As a consequence of the reforms, a 4-hour ED target for discharge was introduced in England in 2002, and subsequently in Wales and Scotland in

2004.(99,100) The target aimed to ensure patients would spend 4 hours or less in ED. While initially the 4-hour target was set at 100%, it was agreed in 2003 that there were clinical exceptions where four hours was not an appropriate cut-off. The target was therefore reduced to 98%. While there was initial criticism regarding the time-based target, with clinicians concerned that pressure to achieve it could lead to unnecessary admissions and premature discharges, subsequent reports indicated that clinicians felt the target provided a focus, and was beneficial to EDs in general.(99,100) Before the introduction of the target there was no system driver for change – its introduction provided incentive for whole-of-system thinking. However, the target was also reported to have led to gaming (manipulation of data to inaccurately reflect achievement of targets), bullying of junior staff, and inadequate consideration of quality of care.

With a change of government in 2010, the 4-hour target was abolished.(99) The reasons cited were that the target provided incentive to move patients out of ED, but nothing to ensure they were receiving quality care. The target was therefore replaced by a suite of outcome measures emphasising quality of care.(101) The 4-hour rule continued as one aspect of the suite of measures, and the performance threshold was reduced to 95%. (100) Reflecting on the UK experience, many commentators agree that the introduction of the 4-hour program did lead to a decrease in overall ED length of stay.(27,99,100)

ED Reform in Australia

Australian EDs have seen an increasing number of presentations over the past many years.(102) Two different patient cohorts: individuals under 24 years and 65 years and over are mainly behind the demand for ED care.(29) The under 24s significantly contribute to the growth in non-urgent presentations like injuries and poisoning, while the 65s and over contribute to urgent medical presentations such as chronic disease complications. Other drivers for increasing ED presentations include change in patient demographics, patient morbidity profile, patient expectations, and referral patterns. A general practitioner (GP) shortage, more acute in rural and remote areas, has further contributed to a transfer of demand to EDs.(29)

This increase in demand on Australian EDs is in the context of a population that is living longer and experiencing more chronic and complex conditions.(28) With the resultant growth in ED presentations, access block has increasingly become a significant issue.(27) Access block[9] is stated to be the principal reason for ED overcrowding in Australia. However, access block is not just an ED problem - it reflects systemic issues such as a relative lack of inpatient bed capacity or efficient mechanisms to admit inpatients from ED. Therefore, health departments and hospitals have increasingly sought multi-factorial, evidence-based solutions that improved capacity and processes throughout the hospital to address the access block issue.(27,28)

[9] Access block in Australia is measured as an ED length of stay of greater than eight hours for patients requiring hospital admission.(28)

While many hospitals across Australia engaged in programs to address access block, Western Australia (WA) was the first state in Australia to implement a state wide ED reform program.(25) Prior to 2008, WA hospitals were experiencing significant rates of access block.(26) In response to this, and together with lessons from UK ED reform, the WA Government introduced the 'Four Hour Rule (FHR)' program in 2010, aiming to decrease access blocks and increase ED access. The program had a clear focus on patient safety and quality outcomes, and had no financial incentives or sanctions for hospitals. Further, the FHR program employed a clinical services redesign framework based on 'Six Sigma' and 'Lean Thinking' principles[10].(26) Recent studies and reports have shown a very considerable reduction in access block in WA following the introduction of the FHR program.(26,103) Studies have also noted decreases in mortality in public hospitals following its introduction.(30) Emphasis on monitoring performance across the whole hospital, and the lack of financial incentives have been noted as key factors in the decrease of access block and adverse outcomes with the FHR program.(26)

With ED congestion and access block increasingly becoming politically sensitive issues for both federal and state governments, reforming EDs became a key focus of the national healthcare reforms when they

[10] Six Sigma is a tool that helps providers achieve their level of expectation by reaching entitlement through different factorial combinations of quality.(214) Lean thinking emphasises end-to-end processes, the creation of flow, the importance of patient time, and staff expertise and minimisation of wasteful processes.(97)

commenced.(24,27,42) The national healthcare reforms injected a large amount of funding into the improvement of access to emergency services, and consequently benchmarks or 'targets' were set to monitor emergency service performance.(42) Two National Partnership Agreements (NPAs) had specific components dedicated to relieving pressure on EDs and increasing ED access: the *National Partnership Agreement on Hospital and Health Workforce 2008 (NPA-HHWR)* and *National Partnership Agreement on Improving Public Hospital Services 2011 (NPA-IPHS).* (21,79,102,104) These agreements, signed under the auspices of the Council of Australian Governments (COAG) set two nationally applicable performance indicators for ED access. These indicators are:

1. *ED Waiting Times (NPA-HHWR)*: This performance indicator monitors the proportion of patients seen within the recommended time for their triage category.(102) Patients who present to an ED are assessed according to how urgently they should receive care using a triage category system. The most urgent cases are assigned to the *Resuscitation* triage category (should be treated immediately), and the least urgent are assigned as *Non-urgent* (should be seen within two hours). Waiting times are a good indicator of how accessible hospital emergency services are to patients.(28,102)

   At this stage, there are no national targets set for public hospitals through the NPA-HHWR as the agreement expired in 2013.(71,104) However, until 2013 the target was '*By 2012-2013, 80 percent of*

emergency department presentations are seen within clinically recommended triage times as recommended by the Australian College of Emergency Medicine'.(71)

2. The second ED performance indicator *(NPA-IPHS)* has been termed the '*National Emergency Access Target' (NEAT).* The NEAT has been defined as '*where 90 percent of all patients presenting to a public hospital ED will either physically leave the ED for admission to hospital, be referred to another hospital for treatment, or be discharged within four hours*'.(72) The NPA sets phased targets for each calendar year from 2012 to 2016, with the final target being 90 percent of patients presenting to ED leaving within four hours[11]. This target borrows inspiration from the experience of hospitals in the UK and WA.(26,38)

Publication of the 2013-2014 NEAT results demonstrated that only five of the eight Australian states and territories achieved an increase in the proportion of patients leaving ED in four hours or less compared to their baseline results in 2011-12.(102) Another report from NHPA showed that metropolitan hospitals recorded lower NEAT performance scores than regional hospitals.(105) Patients who presented to an ED and were subsequently

11 Reward funding had been associated with achievement of NEAT targets for each state and territory in Australia.(72) However, in its 2014 Budget the Australian Government ceased reward funding for NPA-IPHS targets from 2015-16.(216)

admitted to the same hospital, waited longer in the ED than those patients who left the ED without being admitted.

However, some commentators have questioned the validity of the NEAT target, echoing the criticism of the four-hour program in the UK that the target made no changes to ED waiting times and hospital mortality.(42,106) Where targets were met, it was inferred that patients had been redesignated into alternate categories rather than there being an authentic improvement in the process. It has also been noted that the NEAT rule could lead to early discharge of patients and a higher turnover of staff due to increased stress and workload.(42) Because of these criticisms of the NEAT, a different approach to structural and process change to improve ED performance and hospital access has been suggested.(42) The proposed measures include separation of emergency and elective surgery streams to free up limited hospital beds, and addressing chronic disease management in the community to help reduce the number of these patients presenting to hospital EDs.

With mixed assessments of the 4-hour program in the UK and WA (25,26,30,42,99,107), uncertainty about the value of time-based ED targets, (24,27,108) and the large investment into ED reform, it is important for both policy makers and researchers in Australia to monitor and evaluate ED reforms and targets. This evaluation will determine if improvement in ED access has indeed occurred. While there have been fairly recent studies that

have positively assessed the ED reforms, NEAT and other time-based ED targets (109,110), these studies have either focused purely on metropolitan hospitals, or have not interrogated the often significant contextual factors. One recent study has cautioned against taking ED performance results in Australia at face value, and recommends consideration of contextual factors such as location and size of hospitals.(111) With minimal evidence of the impact of national healthcare reforms on regional/remote health services and a need to understand ED reform beyond metropolitan hospitals, this study selected a regional hospital in a remote location (Alice Springs Hospital) to evaluate the hospital's program to improve ED access in the context of national healthcare reforms.

ED Reform in Alice Springs Hospital

Figure 4. Alice Springs Hospital

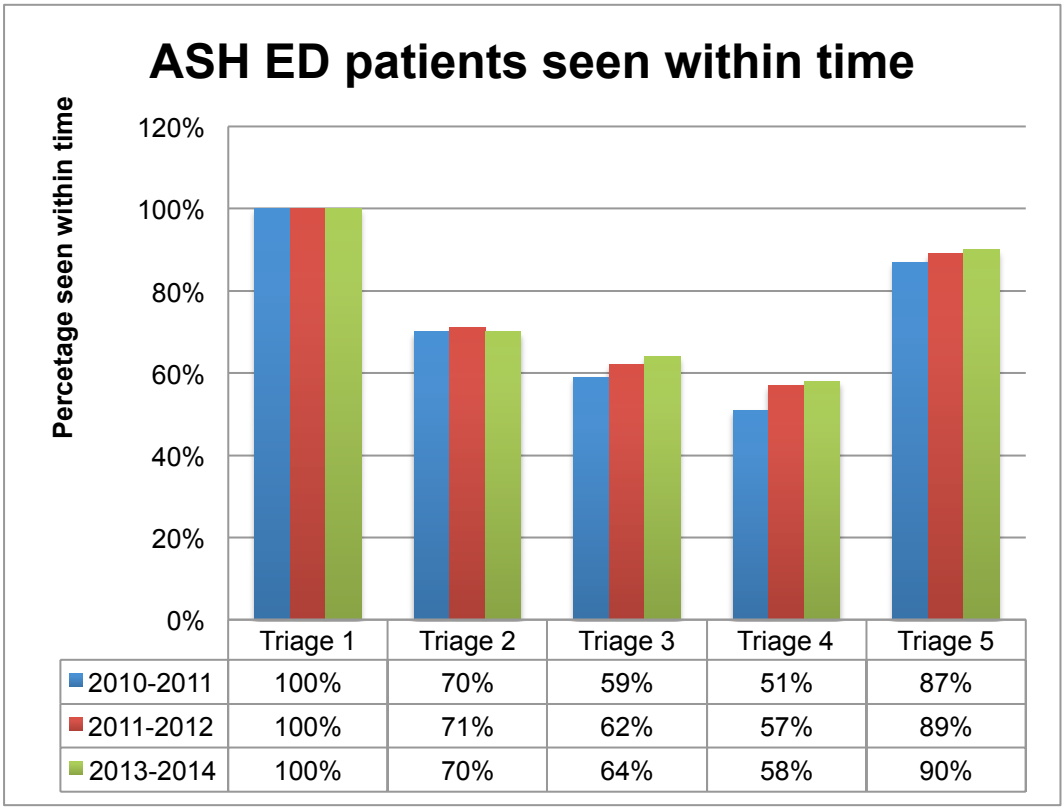
Alice Springs Hospital (ASH: Figure 4) is a 186-bed major regional hospital servicing a population of up to 60,000 people including visitors.(112) The hospital is a key institution in the Central Australia Health Service, a LHN established post national healthcare reforms to service the Central Australian region.(113) ASH was established in 1977 but has been undergoing continuous renovations and redevelopments since.(114–116)

Located in a remote area, the hospital faces significant challenges in delivering quality and comprehensive specialist services to its patients. (117–122) A majority of ASH's inpatients are Aboriginal people.(117,118) The Aboriginal population experiences significant health disparities, and a higher mortality burden than the non-Indigenous population.(117,118) Alice Springs, where the hospital is located, has also in the recent past been associated with significant social issues, including alcohol-fuelled violence and crime. (119–121) Efforts to address these issues are being made by all levels of Government(121,122) with mixed results.

Currently, there are over 41,000 presentations per annum to the ED at ASH.(123) The ED has in the past been known to experience significant challenges including access block, patients with chronic disease complications, alcohol-related admissions, and inadequate infrastructure.(90,120) ASH ED performance did not compare favourably with the other major regional hospital (Royal Darwin Hospital, RDH) in the NT.(91) However, following the introduction of national reforms and recent

major redevelopments, local and national reporting has indicated improvement in ED performance.(103,105,124) This improvement has been significant and visible enough for different political parties to claim responsibility.(114,115)

The Australian Government publishes individual hospital details and their performance, including ED performance, on the 'MyHospitals' website.(125) The following ED performance data for ASH is obtained from this website. (Figure 5). ASH is included in the 'Major Regional Hospitals' group and ASH is the only remote hospital included in the major regional hospitals group.



	Triage 1	Triage 2	Triage 3	Triage 4	Triage 5
2010-2011	100%	70%	59%	51%	87%
2011-2012	100%	71%	62%	57%	89%
2013-2014	100%	70%	64%	58%	90%

Figure 5. ASH ED patients seen within clinically recommended times 2010-2013 (Adapted from NHPA, 2015)

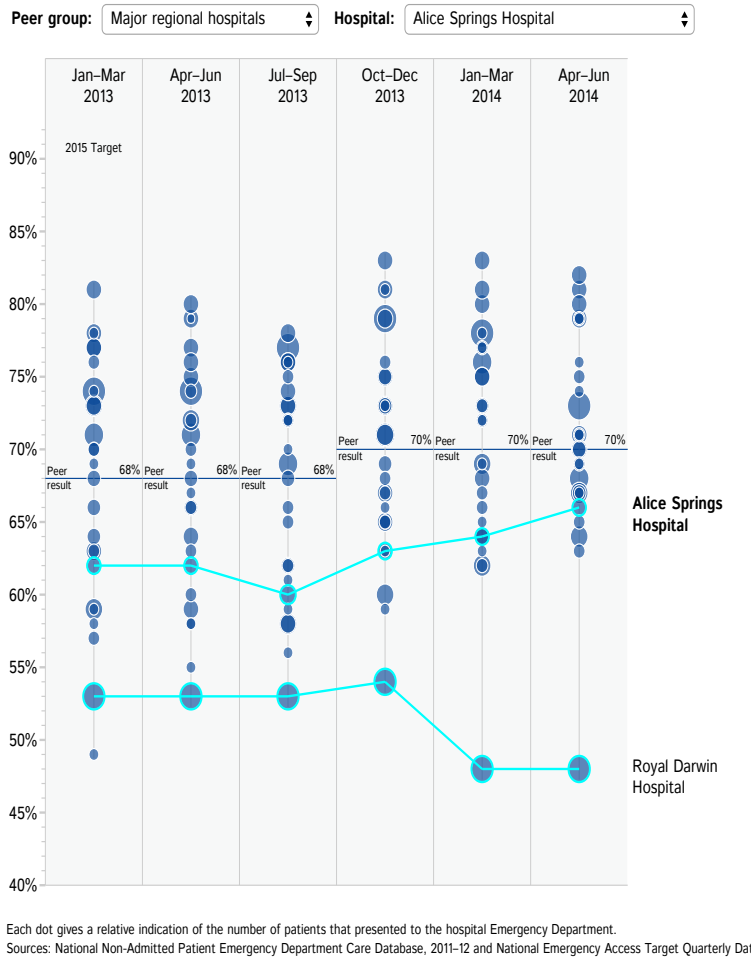


Figure 6. Time patients spent in ASH ED compared to other major regional hospitals (Source: NHPA 2015)

Figure 5 outlines the improvement for 'seen within clinically recommended time' for ED patients presenting at ASH over the 2010-2013 period. In Figure 6, a comparison of ASH NEAT performance with RDH performance reveals that ASH outperforms RDH, which is a much larger hospital.(126)

This recent improvement in ASH ED performance may be traced to reform funding and projects commencing with the NPA-HHWR in 2008, followed by HHF funding in 2010 and NPA-IPHS funding in 2011. The NPA-HHWR, through its '*Taking Pressure off Public Hospitals*' schedule, allocated $2.1

million for ASH ED to address access block and clinically unacceptable ED waiting times.(71,127) The projects that were implemented in ASH ED included establishment of an interim Short Stay Unit to enhance the existing ED patient stay until a new ED was opened, and provision of IT software that would enhance access to patient results and support efficient clinical decision-making.(127)

In 2010, the Australian Government allocated, through the HHF, $13.6 million for a new ED in ASH.(82,114,128) The NT Government co-contributed $11.3 million for this infrastructure project. The new ED opened in 2013, increasing ED capacity through six acute treatment bays, eight non-acute treatment bays, four paediatric treatment bays, two secure assessment rooms, and three resuscitation bays.(114) The modular design of the new ED provided staff with more room, facilities, and equipment than the previous ED that was regarded as space-constrained and overcrowded.(124)

Further, in 2011 the Australian Government allocated approximately $2.8 million, through the NPA-IPHS, for various ED related projects at ASH.(72,129) The allocated funding covered continuation of ED software implemented through the NPA-HHWR, equipment and fit-out for the new ED and extension of a radiology service to support ED overnight. Separate funding was also allocated for a clinical redesign program throughout NT public hospitals. A further description of ASH and its ED is provided in

Chapter 6.

Considering the literature on national healthcare reforms, healthcare reform in Australia, and hospital performance, it is likely that a combination of reform packages and the introduction of ED targets have led to improvement in ED performance/access at ASH. For this possibility to be evaluated effectively, the improvement must be examined further and considered in the context of the hospital's remote location, surrounding social context, and increasing disease burden. This research therefore explores whether the ASH ED access improved, and if so, how hospital managers and clinicians generated this change within the context of national healthcare reforms, and in the face of known and emerging challenges.

CHAPTER FIVE: METHODOLOGY

INTRODUCTION

A case study strategy was chosen as a suitable study design to analyse the complex phenomenon of the impact of national healthcare reforms on ED access in a regional hospital located in remote area. Case studies, a type of qualitative descriptive research strategy, were developed specifically to describe complex phenomena.(130–132) A case study can contain the phenomenon in focus as a case, demarcate units of analysis, and then enable in-depth analysis. However, although the method can provide a valuable descriptive analysis, it is not inherently an evaluation framework.

The study's objective was to provide more than a description of the phenomenon: it also involved program evaluation i.e. evaluation of the hospital's process in improving their ED access. Furthermore, research that would usefully inform subsequent policy and future reform would be required to answers not only about if the improvement occurred, but also why and how it did so. This assessment therefore had to consider the multifactorial and information rich context. A purely method-oriented evaluation would not sufficiently account for context; a more robust design was necessary. Theory-oriented evaluation can much more comprehensively incorporate these complexities, and provide the opportunity for deeper analysis of the impact of national reforms on this regional hospital.

A combination of a case study and a theory-oriented evaluation framework were therefore adopted. Both strategies emphasise the inclusion of context in their assessment, but a theory-oriented evaluation framework has the capacity to answer the why and how queries. Retaining a case study approach within the theory-oriented evaluation framework allowed boundaries of the case to be established and rationalised the number of questions to be asked. Case study strategy also meshes well with a theory-oriented evaluation approach through its ability to build and test theories.(133,134)

PROGRAM EVALUATION

The concept of program evaluation was first developed in the US, where it was used to assess if poverty alleviation (War on Poverty) programs were having the desired effect.(135) Such programs are set up to achieve specified outcomes through the adoption of rational actions. The path to achieving outcomes unfolds along a chain of elements including inputs, outputs, and objectives. The most common form of evaluation, termed 'method-oriented approaches', uses a logic model to base it's evaluation.(136) The logic model presents a causal chain linking inputs to outcomes and impacts of the program.(137) This evaluation approach can incorporate various data sources, collection models, and forms of analysis.(136) Results from a method-oriented approach determine whether the program worked or did not work. (135) The method-oriented framework emerged from reasoning that programs had 'absolute rationality (chose

optimal strategies to reach their goals and are unbiased)' and bounded rationality and incrementalism were the accepted paradigms. (135)

However, the method-oriented approach has been criticised for not taking into account the values and context (especially in politically motivated programs), which may influence program outcomes.(135,136) Stakeholders do not necessarily formulate programs and intended outcomes based on empirically tested theories. Their values, including assumptions and biases, play a significant role in the development of programs. The lack of consideration of these values in method-oriented evaluation is a serious shortcoming.(135–137) Further, the attribution of outcomes solely to inputs (successionist theory of causality) is seen by many as erroneous.(137) Finally, method-oriented evaluations present an information deficit i.e. whether information learnt at a local/program level can inform analysis at higher/global policy levels.

To address this information deficit, evaluators have focussed on understanding not just whether a program worked but why and how it worked, and in what circumstances.(135,136) It is not enough to develop sophisticated tools to gauge the link between objectives and results; it is also necessary to address the 'value' and 'context' issues. Complex issues require a different form of evaluation approach. Theory-oriented approaches that consider a 'generative theory (interventions lead to intended and unintended

outcomes)' of causality are better suited to probe the 'black box' gap between the actual input and expected program outputs. (135,136)

THEORY-ORIENTED EVALUATION

Method-driven evaluation, as its name indicates, focuses almost exclusively on methods and performance measures (135,137), shying away from probing the values, context, and complexities associated with programs. Chen and Rossi first developed the concept of theory-oriented evaluation as a response to this limitation.(138) A theory-oriented evaluation is designed to formulate a program theory, an explanation of why, when, how and for whom the program works or does not work.(138)

Theory-oriented evaluations consider programs designed to address social issues as products of human imagination.(137,139) Programs are set to address social problems through a charted process. By this view, evaluation has the task of explaining the underlying program theory i.e. elucidating the why, when, how and for whom? Program theories in theory-oriented evaluations identify key program elements and explain how these elements are set-up to be connected to one another. Use of program theory presents opportunities to explain the problem and solution in detail, and demonstrate substitute actions to achieve intended outcomes.(135,137) Further description of the concept of program theory is provided in the following chapter.

During their formative period, theory-oriented evaluations were used for evaluating 'simple' programs.(135) However, they are now increasingly used to evaluate 'complex' programs. Some of those commissioning evaluations are now aware that method-driven approaches do not allow deep examination of the multilayered context in which multifaceted programs operate. Theory-oriented evaluations allow for robust conceptual construction, and provide flexibility with the theoretical direction and methods used.(137) As program theories play a central role in theory-driven evaluations, any method that can examine assumptions can be incorporated into the framework.

Depending on how proponents wish to probe the 'black-box' of program activity - the space between inputs and outcomes - there are three popular models of theory-oriented evaluations.(136) These are:

- *Theory-driven evaluation,* which was the first to lay out the concept of program theory;
- *Theory-based evaluation,* which uses 'result chains' to enunciate why the order of results is expected to occur; and finally
- *Realist evaluation*, the most recent of the major theory-oriented models.(136)

This study employs the latter framework and explores the approach further later in this chapter.

There are different opinions about the role of theory-oriented evaluation.(138) While some consider it is best used to provide useful information to stakeholders, for others theory-oriented evaluation is able to determine which of the program aspects are effective and under what conditions. (138) In reality, evaluators face significant challenges - political, financial, and social - to conduct an evaluation by following a specific theory. It has been observed that it is not possible to replicate a theory-oriented evaluation in a different context. (138,141) However, being flexible in applying the program theory and pragmatic about the amount of information one can derive through one evaluation makes findings from theory-oriented evaluation more transferable.(138,141)

SCIENTIFIC REALISM

While realist evaluation is a form of theory-oriented evaluation, it is set apart from the other forms by its philosophical basis, scientific realism.(133) Scientific realism commences with theories of how processes work, taking the position that theories are developed to provide a literal view of reality, that is, what the world is like.(141) Scientific realism is the view that theoretical entities of science exist, (141,142) including entities that can't be observed, but are confirmable on the basis of evidence.(143) Scientific realism adopts the position that a world exists external to and independent of the mind. This position involves three claims:

1) Reality is knowable;

2) Resulting knowledge is flawed i.e. incomplete; and

3) Although flawed, our knowledge can be enhanced.(142-145)

According to scientific realists, science helps in describing knowledge - the world beyond the reach of ordinary perception. Unlike critical realism, scientific realism asserts that the scientific method can present a true picture of the world, no matter how incomplete it is, and promotes scientific inquiry as the best mode of investigation.(140) Scientific realists are not concerned about consequences of reality. Scientific realism posits that causal powers reside in organisational structures and social relations that individuals form.(142) This suggests individuals' positions in social relations influence their views and tendency to act in certain ways.

Another tenet of scientific realism is that observational evidence by itself cannot be attributable for outcomes.(140,147) Instead, the theory posits that causal laws, or 'mechanisms' generate program outcomes.(140,147) The task of a realist is to probe these mechanisms and explain why relationships came about, and what connects the inputs and outputs in a program. (140) Mechanisms are processes that can explain discovered regularities, and are a key concept of realist evaluation.

REALIST EVALUATION

Realist evaluation is a theory-oriented evaluation.(140,141) As discussed previously, a theory-based evaluation approach was developed in the 1980s

to address gaps in the evaluation designs of policies and programs that remained confined to before-after/input-output designs.(138) Realist evaluation is one of the by-products of this theory-based approach. When evaluating organisations, realist evaluation offers distinct advantages over non-theoretical evaluation approaches by analysing why changes occur and under which conditions. (140,141)

Realist evaluation provides a unique approach to evaluating change in complex settings and attempts to capture the various, contingent outcomes of the intercessions of all variables.(140) It does not concentrate exclusively on the interventions to explain the outcomes (141), rather it takes a realist stance and posits that events are rarely the result of a single causal pathway. Both the contexts in which the interventions have been introduced, and the potential mechanisms are considered and incorporated in the evaluation process.

The context can assist in the development of alternative explanations of the observed outcomes.(141) The context in which a program operates can trigger a particular response from participants, and thus influence eventual program outcomes. Based on scientific realism, realist evaluation recognises that the underlying reasoning of participants can explain observed outcomes. Realist evaluation separates the institutional and structural features from the

actors in a given context, and explores the causal mechanisms that reside within that context. (140,141)

As mentioned earlier, mechanisms are a key component of the realist approach. The concept that inquiry works by uncovering underlying processes that lead to specific outcomes has become increasingly accepted in the social and natural sciences. (142-145) 'Mechanisms' is the term used by realist evaluators to describe these underlying processes, and explain causal laws.(141) Realists distinguish between natural and social mechanisms. While they accept natural mechanisms are not changed by human action, they believe social mechanisms to be effects of human interplay amidst social relations and resources. Embracing the concept of mechanisms means acknowledging there are latent powers and their effects can be contextually contingent. Less abstractly, realist mechanisms refer to underlying social or psychological drivers that lead to particular responses from program participants.(141,153) Mechanisms can lead to different outcomes based on participant's perception of norms, roles, and responsibilities – all of which underlie their 'reasoning'.

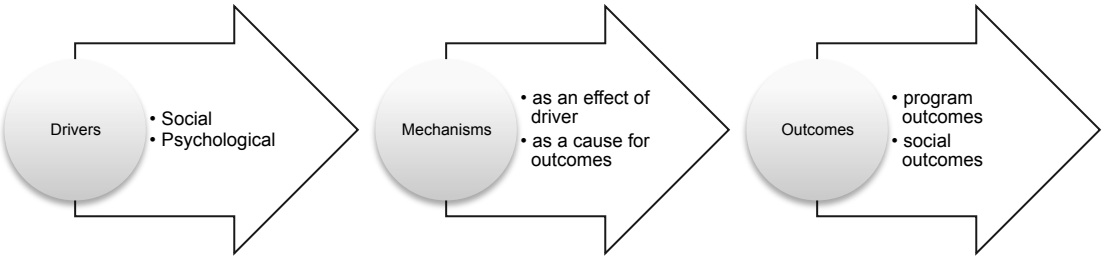


Figure 7. Mechanisms, in realist evaluation, are both an effect and a cause

In realist evaluation, as with other theory-oriented evaluations, program theories are central.(140) Program theories explicate the underlying assumption of how the program (or its components) has worked. In realist approaches, an initial program theory is developed, and then used as an outline to focus the research question and select relevant data collection methods. A range of data is then collected to heuristically test the initial program theory. (140,141)

A realist evaluation design generally involves the following steps (141,151):

- Development of a preliminary program theory;
- Collection of data to test the program theory;
- Analysis of data;
- Synthesis of data to identify context-mechanism-outcome patterns; and
- Reviewing and refining the program theory.

The construction, exploration, and refining of program theories is undertaken in the form of Context-Mechanism-Outcome (CMO) configuration patterns. CMO patterns are models of how programs activate mechanisms in different contexts, and in whom, to lead to changes in behavioural or event or state regularities.(140,141) The CMO configurations express relevant combinations of program context and mechanisms to explain variations in program outcomes. The final research product of a realist evaluation is not a

determination of the effect size, but a refinement of the initial program theory such that it addresses the why, when, how and for whom questions in as accurate a reflection of the program reality as possible.(141) Program theory, as it applies to theory-oriented evaluations and realist evaluation, is further described in the next chapter.

A central tenet of realist methodology is that programs work differently in different contexts, and participants' responses to resources offered determine program outcomes.(153) Realist evaluation, which distinctively explores the nature of programs, and attempts to explain the workings and outcomes of the program by studying mechanisms, provides an appropriate framework to analyse and explain the aforementioned elements (why, when, how and for whom?).(140,141)

Due to the complexity of the phenomenon and the flexibility offered, this study sought to evaluate, within a realist framework, the program undertaken by the Alice Springs Hospital to improve ED performance. By using a realist approach, the evaluation explains the why and how. The advantage of a good evaluation is that it can explain complex patterns of outcomes.(153,140) Realist evaluation allows consideration of the relevant context, interventions, and mechanisms generated as a result of the intervention as well as the outcome patterns. In other words, it can interrogate a program as to the how and why. Further exploration of these points and how they relate to the current evaluation occurs later in the

thesis, as the relevant areas arise.

REALIST CASE STUDY DESIGN

Study design is the string of logic that connects the study questions, data, and study outcomes.(131) Usually, study design allows for identification of study questions, data relevant to the study, data collection methods, and analytical parameters. In other words, study design is the travel guide to get you from the beginning to the end of the study. At the beginning of the chapter, the merits of combining a case study with realist evaluation to form a realist case study design were discussed. As much as realist evaluation adds value to the case study in the form of generalisability, a case study approach can also strengthen realist evaluation by delineating a case so that the initial program theory can be tested in all its dimensions within that case.(133) The ability of a case study to test hypotheses has long been advocated by case study proponents.(132,134)

Many theory-driven evaluations in health care use a case study design.(134,155,164) Case studies are typically used to examine individuals or a group of research participants or an organisation.(131, 132, 155) A case study design suits the context of this study where an emerging complex phenomenon, such as national health reforms, represents an opportunity to develop, extend, or test a theory relating to an individual organisation, following the collection, analysis, and interpretation of data from multiple

sources.

Yin (132, p.18) defines a case study as an "*empirical inquiry that investigates a contemporary phenomenon within its real life context, especially when the boundaries between phenomenon and context are not clearly evident*". Case studies generally examine the interaction between variables to obtain an understanding of the phenomenon under study.(132,156) The understanding is arrived at through in-depth description of the phenomenon. This approach ensures a case study strategy can adequately provide data for building a theory that can contribute to existing knowledge.(156) Through such an in-depth description, a rich understanding of the context of the research can be gained, rather than just the processes being enacted. Case studies can also be useful when examining a planned change occurring in a complex setting, and/or when it is important to understand why change or interventions succeed or fail.(130)

Selecting and bounding the 'case' are fundamental processes in case study research.(156) The case may range from a person to an entire organisation: in this instance, the case under study is ASH in the NT of Australia. Issues relating to accessibility, resources, and time availability, and the critical nature of the case with its iconic stature in Central Australia/Remote Australia have determined the selection of ASH as a single case. However, a single case does not imply a reduction in complexity or credibility. In this

instance, the case study research is evaluating a complex phenomenon (implementation of national healthcare (ED-focused) reforms) in a complicated situation (remote hospital in a context filled with social and health intricacies). Thus the situation presents enough complexity to justify consideration of a single case.

In such a complex situation, it may be difficult to set boundaries on the case.(130,132,156) To address this issue, clear parameters such as the period of study (2008-2014), the hospital involved, and the variables being assessed are defined at the outset of the study. The study will be using ASH as a *single case* or a *critical instance case*. Critical cases are used to examine and test a widely held assertion.(132) There is a notion that the national health reforms and introduced targets are relevant to all public hospitals in Australia.(8,19,21) However, some have questioned if these reforms are applicable to rural and remote hospitals.(9,33) With little evidence of the effect of reforms on regional hospital ED access, Alice Springs Hospital represents a critical case in which a phenomenon that few people have considered in this setting can be studied.

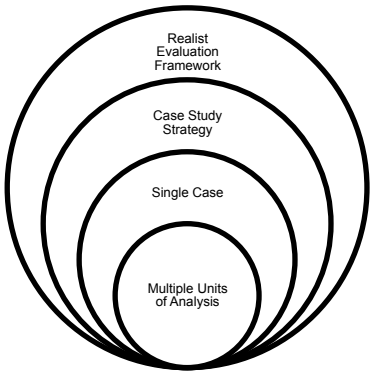


Figure 8. Design for this study

A single case design has sometimes been compared to a single experiment.(132) This design is particularly applicable to this research as the national health reforms and the introduction of national ED performance indicators applying to all public hospitals are unprecedented in Australia, and are considered individual phenomena. Therefore, the case is considered unique and has something important to reveal. Within the single case, multiple units of analysis will be examined. These units will consist of different professional groups and how they have understood or enacted the program theory, including the executive, senior clinicians, junior clinicians, and managers.

While case studies can help with analysing the intervening processes or documenting evolution/changes, they have limits in establishing a causal link between intervention and outcome.(134,155) Coupling the case study design with a realist evaluation approach not only enhances the usefulness of a case study, but also assists in addressing its limitations in terms of external validity. By making use of the CMO pattern configuration, a critical case study can sustain theory building.(134,155)

Realist evaluation structures the analysis by linking context, mechanism, and outcome.(140,141) This structure increases both the explanatory power and usefulness of the case study. Realist evaluation enables an in-depth understanding of the mechanisms contained within the hospital reform program and how they behave under different contexts within the selected

case. This process enables transferable recommendations about the likely impact of reform in other regional hospitals, because it will be known what mechanisms operate in certain contexts and why. Equally, a case study design complements and strengthens realist evaluation through its capacity for purposive case selection, theory building, and testing of program theory in all its dimensions.(132,134) Both case study and realist methodology allows for triangulation - corroboration of the same fact or finding using evidence from different sources.(132,140,156) Based on these methodological advantages, a **realist case study design** has been employed in this study.

METHODS

A mixed methods approach refers to the use of two or more methods in a study to derive both quantitative and qualitative data.(158) Realist evaluation and case study research are method neutral and, as such, can be based on a mix of qualitative and quantitative approaches.(132,140,141,156) The choice of data collection and analysis methods within these approaches is largely guided by the research objectives and the need to test the program theory.(132,141) In realist evaluation, quantitative methods are generally used to analyse the context and outcomes, while qualitative data focuses on generated mechanisms.(141) A case study strategy can accommodate numerous data collection techniques such as interviews, documentary analysis, and questionnaires.(131)

Consequently, this study is an evaluation examining the mechanisms that underlie the change management process to improve ED access, and exploring how the research participants' choices and use of resources led to the program outcome. The evaluation utilised qualitative methods to collect and analyse data, but also incorporate quantitative data and analysis to support the study's objectives and enhance the study's credibility. To this end, quantitative analysis used to test the improvement in ED access, and provide material to construct questions in the qualitative phase.

The six phases of this study adopt a combination of methods to yield both quantitative and qualitative data. The six phases of data collection and analysis are outlined in Table 2.

Table 2. Outline of methods, analysis, and expected outcomes

Phase	Step	Methods	Analysis and expected outcome
Phase 1	**Construction of a preliminary program theory**	Literature review, interview with the main hospital clinicians and managers, review of theories concerned with organisational change and performance	Initial program theory and a preliminary CMO configuration pattern - the hypothetical pathway linking intervention strategies to outcomes
Phase 2	**Data collection: Quantitative**	Trend and regression analysis of selected ED access indicators	Quantification and confirmation of an improvement trend in ED access over time
Phase 3	**Data collection:**	Review of hospital and government documents pertaining to study	Themes identified and coded using computer-assisted qualitative data analysis

Phase	Step	Methods	Analysis and expected outcome
	Qualitative	questions and context	software. The themes were used to refine the program theory and preliminary CMO configuration pattern
Phase 4	**Data collection-Qualitative**	Purposive sampling of hospital staff and semi-structured interviews with selected participants	Themes were identified from interview data and coded using computer-assisted qualitative data analysis software
Phase 5	**Data collection-Qualitative**	A second round of interviews with selected participants	The interviews were used to explore or confirm themes that emerged from the previous round
Phase 6	**Validation and refinement of the theory**	Analysis of findings from Phases 3, 4, and 5 to outline the relationship between various components of the CMO configuration pattern and the role of the context in the study	The analysis assisted with further refinement of the program theory in order to provide a credible and dependable explanation of what components of the reform initiated interventions worked for whom, and under what conditions

Phase 1: Construction of a preliminary program theory

The first phase involved an initial discussion with the hospital executive and some directors of clinical departments to help with development of a preliminary program theory (this process is explained in detail in the next chapter). Following this a literature review was undertaken to provide the context for the study and also contribute to the preliminary program theory. This process involved an extensive literature review of national healthcare reforms, healthcare reforms in Australia, reform in remote areas, hospital reform and ED reform. An online search using 'Google Search and Google

Scholar' was initially undertaken to obtain a general idea of available information. This was followed by a search of peer reviewed literature and grey literature (such as government technical reports) over the past 30 years using the databases *Web of Science*, *Scopus,* and *Medline* to identify appropriate articles. The keywords used in the search are outlined in Table 3.

Table 3. Keywords used in the literature search

Topic category	Key words
1. **Healthcare Reform**	Healthcare Reform Health Restructure Health Service Change National Healthcare Reform
2. **Healthcare Reform in Australia**	Australian Healthcare Reforms Australian Healthcare System National Healthcare reform in Australia
3. **Hospital Reform**	Hospital Reform Hospital Restructure Hospital Change Management
4. **Reform in Remote Hospitals**	Remote Health Services Remote Hospital Healthcare Reform in Remote Areas
5. ED Reform	ED performance, ED targets, ED Reform, ED Operation

Following an extensive search of the databases, more than 100 articles were identified as appropriate for consideration. Specific criteria were utilised for inclusion and exclusion of articles:

- *Inclusion*: relevant, aligned to the identified five topic categories, theme of 'reform' and/or 'change' and/or 'restructure' and/or 'performance' and/or 'target' covered in their text

- *Exclusion*: did not align with the five categories under consideration, were excluded.

This process identified 80 articles. These were further scrutinised for their quality using the McMaster critical review form. The assessment includes review of study purpose, literature, study design, sampling, data collection and analysis, overall rigor and conclusion. This narrowed down suitable articles or texts to 44. These 44 articles/texts were then grouped into the five aforementioned categories with *Mendeley* software, and retained for the literature review. The collected literature was then critically reviewed (the details of which are presented in Chapters 2 and 3) and used to further develop the program theory.

Phase 2: Quantitative data collection and analysis — ED access

Initial discussion with the hospital executive and senior clinicians and review of grey literature (including national performance reports and media reports) indicated the hospital was performing well in term of its ED performance (ED access in specific). However, as the information was examined further it was identified there hadn't been a careful examination of the ED access trend over the study period (2008-2014). This study is not only formulating a program theory it is also testing the program theory (and its components). A quantitative data collection and analysis phase was needed to verify the outcome component. Also, the quantitative analysis would provide information that could be used in the interviews to probe the context or elicit

mechanisms.

To test the accepted notion of increase in ED access, ED performance indicator data for seven years was obtained from the ASH electronic patient care information system (CareSys). The period under study was 2008-2014, commencing the year the first national ED target was introduced. The 7 year period would account for seasonal variations and test whether it was a natural progression or because of interventions. Initially, an annual trend of ED waiting times was obtained for the 2008-2014 calendar years. Data was then disaggregated according to monthly results and examined using trend analysis and bivariate regression analysis. The quantitative analysis identified there was a lot of complexity inherent within the context, program implementation and outcomes. Further description of the quantitative data analysis is provided in the Findings chapter.

Phase 3: Qualitative data collection and analysis — Document analysis

This quantitative analysis was followed by a document analysis phase. Document analysis has been described as a type of qualitative research where documents are interpreted to provide meaning and voice to the phenomenon under study.(159) Document analysis can provide information about the program being evaluated that may not be collected during field data collection.(159) This analysis involved coding documents into themes. .

The thematic analyses of the extracted data were undertaken through NVivo for Mac with free line-by-line coding of the data. This was followed by organisation of coded data into related themes, which in this study is expressed as CMOs. Consequently, this phase involved reviewing hospital and government documents including annual reports, policy papers, clinical redesign reports, and other publications. A detailed list of documents that were considered is provided in the Findings section. The emergent analytical themes were then crosschecked with individual documents to ensure alignment with their findings. The collected data and review assisted with framing the context, and contributing to what was already known about the outcomes; thus contributing to refinement of the preliminary program theory. Further, this analysis, coupled with the program theory, was used to construct interview questions for later qualitative data collection.

Phase 4: Qualitative data collection and analysis — Interview data analysis

The next phase involved the first round of interviews. The interviews enabled augmentation of the preliminary program theory, and explained participants' views of the hospital's program to improve ED access. Following consultation with the hospital executive and some clinical department heads, purposive sampling was used to identify interview participants[12]. Purposive sampling is

[12] The identities of the final interview participants remained confidential to the researcher and were not discussed either with the hospital management or clinical heads of departments.

very useful in case study strategies as judgment can be used to select information-rich cases.

The two main categories of staff interviewed were operational and management staff. Within the categories, four units of analysis were delineated: Executive, Other Managers, Senior Clinicians (including medical and nursing staff), and Junior Clinicians (including medical, nursing and allied health staff). Recruitment was restricted to hospital staff who had been involved in planning and implementing health/hospital reform activities, including hospital redesign and patient flow activities and infrastructure improvements. A total of 30 participants were approached by phone or email and provided copies of the letter of introduction from the head of the hospital, letter of introduction from the head of the research department, summary information about the study, and consent form. Interview questions are presented in the Findings chapter, and study documents in the Appendices.

Following provision of informed consent, an appropriate date and time to conduct the interview was discussed. This sampling led to recruitment of a total of 21 participants. Further recruitment was not undertaken, as either theoretical saturation was achieved or participants involved in reform activities were not available. Theoretical saturation is considered here as no new data appearing and satisfactory data were obtained to test and refine the program theory. It is not possible to definitely confirm the impact of not

accessing those who were unavailable on the research analysis and findings but based on theoretical saturation being achieved and involvement of several and diverse participants who had long association with ASH it can be surmised sufficient data were obtained to review the program theory. It has to be noted here that qualitative methodology literature recommends that small number of participants be considered for initial interviews, as greater participant numbers dilute the possibility of open and frank exchanges, and affect the researcher's ability to maintain a relationship with participants.(161,162)

An initial round of 31 semi-structured interviews[13] of individuals and work groups was conducted. Interviews were recorded and transcribed verbatim. After each interview contact, summary sheets were completed and field notes written. Following the initial round of interviews, categories and themes were developed. Thematic analysis was used to make meaning of the data and to identify relationships and linkages. This analysis involved coding documents into themes. . The thematic analysis of the extracted data was undertaken through NVivo with free line-by-line coding of the data. This was followed by organisation of coded data into related themes, which in this study is expressed as CMOs. The emerging themes were used to review and refine the program theory and inform a second series of interviews (phase 5).

[13] Interviews were conducted twice with 10 participants, to obtain more information, further probe mechanisms, or refine the program theory.

Phase 5: Qualitative data collection and analysis— Second round of interviews

The phase of interviews and discussions, informed by phase 4, involved key hospital executives, managers, and senior clinicians derived from the original 21 participants. This phase yielded an additional five in-depth interviews. The two phases of interviews were necessary to develop a more detailed understanding of the mechanisms generated by the intervention and explain their links to the outcomes.

Phase 6: Theory validation and refinement

Data obtained in the previous phases, including the refined set of themes, categories, and codes (from both interview and other sources) were used to develop CMO configuration patterns. The emerging patterns helped outline how the intervention led to particular outcomes and by what mechanisms. An internal validity exercise was undertaken to check if the patterns corresponded to the raw interview data. The retained and refined CMO configuration patterns were then examined to determine if they supported or refuted the earlier established program theory. Depending on the outcome, a new program theory was developed and discussed with the principal participants to validate it.

NVivo 11, computer-assisted qualitative data analysis software was used for data management and analysis. Coding was employed to categorise

recurrent themes, topics, or relationships. This categorisation was analysed further to identify relevant mechanisms and causal chains. The preliminary codes that were used in NVIVO were based on the previously discussed literature review, the initial program theory, and the interview questions.

ETHICS

Maintaining ethical standards was of paramount importance throughout the study. Ethics approval for the study was obtained from the Central Australian Human Research Ethics Committee (CAHREC). CAHREC is an ethics committee of the Northern Territory Government, and governs research approval for studies conducted in the Central Australia region where ASH is located.

The *National Statement on Ethical Conduct in Human Research* notes that human research can involve a range of studies that will have different risks and benefits.(163) This study, while involving human subjects, presented minimal or 'negligible risk' as there was no experimentation, risk of harm, or discomfort risk to study participants. Based on this scenario and the risk framework utilised by CAHREC as per the *National Statement*, a 'negligible risk' application was made and approved.

Although of negligible risk to participants, there were other relevant and important ethical issues considered in the research. These included individual

and institutional risks, the involvement of Aboriginal peoples in the research, participant rights and responsibilities, privacy and confidentiality, handling of information, and generalisability of findings as per the *National Statement*. These issues as they relate to the study are briefly covered below.

Research Merit and Integrity

There is justification for this study of national health reforms in a regional hospital in a remote location. Evidence surrounding this area is weak at best and, as a principle, the Australian Government has intended that reforms and improvement in access apply to all hospitals regardless of location. This study aimed to fill gaps in the literature regarding the impact of reforms on regional and remote health services' ED access. It adopted best research practices, including an extensive literature review, risk management, and adoption of privacy and confidentiality measures in order to establish and maintain the integrity of the process and findings.

Justice

All participation was voluntary, with consent obtained only after full information about the study was provided. As far as possible, all potential participants were approached, and provided with an opportunity to participate. Both potential benefits and risks associated with the study were explained. Extensive measures were taken to minimise risks to participants and the hospital, including de-identification of participant data. Following completion of the study, efforts continue to be made to ensure study findings

are accessible to the participants, other ASH staff, and the community.

Beneficence

Results from the study will contribute to the understanding of the implementation of hospital reform and redesign activities, especially in regional and remote hospitals. Issues identified by the research will be used to inform future ED access improvement activities and patient care models in regional and remote hospitals.

The study also aims to minimise the risks to the participants by:

- Not identifying the participants by name or position;
- Providing an opportunity for participants to review the data and transcripts before publishing; and
- Couching issues in a non-judgemental manner in all discussions.

Respect

In a demonstration of respect for participants and the research process, the study has taken into account important ethical issues including individual and institutional risks, the involvement of Aboriginal peoples, participant rights and responsibilities, privacy and confidentiality, handling of information, and generalisability of findings.

Indigenous Involvement

The study recognises that a significant proportion of Alice Springs Hospital

patients, and within the Central Australian catchment area are Aboriginal, and the significance of obtaining input from Aboriginal peoples in order to obtain a comprehensive understanding of the impact of reform. Aboriginal staff involved in implementing hospital reform were recruited to understand their perspectives and describe their experiences in implementing health reform/patient support activities. This contribution was appropriately acknowledged and respected, and minimal risk to individual participants was ensured. The study also recognises that the Aboriginal patient population would have had an influence on models of care at ASH, and subsequently impacted on the hospital's program to improve ED access. However the study did not recruit Aboriginal patients or access individual patient records, as it was beyond the scope of this study.

GENERALISABILITY

The study employs a realist case study design. This prioritises the unique experiences from an information rich phenomenon over the wide applicability of findings. However there are gaps in the literature and questions on how health reforms have impacted on regional hospitals and remote health services, which may benefit from this individual experience. This study therefore aims to address these gaps in knowledge by documenting the experiences of a regional hospital, in a remote location, in its aim to meet ED performance indicators in the context of national health reforms.

CHAPTER SIX: PROGRAM THEORY

INTRODUCTION

Program theory is an essential component of all theory-oriented evaluations. As previously discussed, a program theory summarises the sequential chain of program events. Basically program theory is an explanation of how the outcomes were achieved or not and is central to the methodology of the current study. Realist evaluation begins with a preliminary program theory (outlined in this chapter) and ends with a revised program theory after testing (discussed in Chapter's 7, 8 and 9). Because of its central role in this study, both discussion about the concept of program theory, as it applies to theory-oriented evaluation, and the preliminary program theory for this study are presented here in advance of the findings (next chapter). The preliminary theory is revisited, in light of quantitative and qualitative findings, in the next chapter.

PROGRAM THEORY

The development of a program theory is increasingly becoming a mark of a quality evaluation. (138) A theory-oriented evaluation is designed to develop a program theory, which in turns guides the program evaluation. Program theories outline the focus and role of the evaluation, help in formulating the evaluation questions, design, and implementation, and inform the use of evaluation findings. There are different definitions of program theories, but a widely accepted one is "*a process through which program components are*

presumed to affect outcomes and the conditions under which these processes are believed to operate".(160, pp.376-377)

While stakeholder consultation has an important role in the construction of program theories, it is recommended in many circumstances that the evaluator use a social science theory or framework as the main basis for formulating the program theory.(138,165) Prior evaluations and similar programs have also been proposed as sources for the development of program theories.(164) The program theory is created to outline program components (inputs, mediating processes, and outputs) and contextual factors, thus explaining what must be done to achieve the program's goals. Following this, the evaluator tests components of the program theory using various methods of data collection and analysis.(137) Some authors have suggested replacing 'program theory' with the term 'intervention theory', as they believe the main focus of theory-oriented evaluations to be the intervention. They argue that an intervention occurs at levels other than the program level i.e. at policy, treatment, administration levels, etc.(164) However, for the purposes of this particular research study, and considering its focus on the hospital program, the term 'program theory' is appropriate.

As with other theory-oriented evaluations, realist evaluation typically begins by eliciting and formalising a program theory.(141,166) Pawson and Tilley borrow Merton's concept of Middle Range Theory (MRT) to explain the level

at which program theories are presented in realist research.(150) Merton (167) defines MRT as "*a theory that lies between the minor but necessary working hypothesis and the all-inclusive systematic efforts to develop a unified theory that will explain the observed uniformities of social behaviour, social organisation and social change*". MRT can be formulated on the basis of an existing theory and experience to identify implicit models used to make sense of the intervention.(135,149,154,155)

In this realist evaluation context, a preliminary program theory was formulated. Recent ED performance results of ASH published in national reports, key stakeholders inputs (see Table 4), media reports, and literature review were used to formulate this preliminary program theory. The theory is that:

National Healthcare reforms were introduced to improve ED access for patients across public hospitals in Australia over the 2008-2014 period. These reforms contributed to gradual improvement in Alice Springs Hospital ED access because of the introduction of national ED targets, resources provided through reforms, and the willingness of management and clinicians to support the implementation of hospital reform.

The program theory states the recent national healthcare reforms have brought about a change in ED and hospital practices in ASH through the introduction of previously non-existent ED targets, funding for infrastructure

and workforce, and an impetus for the rest of the hospital to support ED and inpatient flow. The combination of these resources and interventions is posited to have led to improvement in ED access.

Table 4. Consultation list of key stakeholders

Hierarchy	Professional Group	Position
Strategic	Governance	Chair, Central Australia Health Service
	Executive	Chief Operating Officer, Central Australia Health Service
Operational	Clinical Leaders	Director, Emergency Department
		Director, Medicine
		Director, Surgery
		Director, Intensive Care Unit

Consistent with the realist evaluation framework, the program theory was organised into CMO configurations (see below). To emphasise and make the intervention component – the introduction of ED performance targets-clearer, an intervention (I) item was added to the configuration. The CMO configurations comprising the preliminary program theory are:

1. **Context:** National Healthcare Reforms (NPA)
   + Intervention: Introduction of ED performance targets
   +Mechanisms: Management want to satisfy hospital board and government + management are keen to implement targets
   = Outcome: Improved ED access

2. **Context:** National Healthcare Reform (NPA, HHF)
   +Intervention: Local investment in hospital infrastructure and workforce

+ Mechanisms: Management wants to support clinicians + clinicians feel supported by management and government + clinicians feel encouraged to develop new protocols and pathways to improve patient flow

= Outcome: Improved ED access

3. **Context:** National and Local Healthcare Reforms (NPA, SDA)

   + Intervention: Introduction of ED performance targets

   + Mechanisms: Management want to meet targets + management feel compelled to communicate with clinicians more regularly and effectively+ inpatient clinicians are keen to support and collaborate with ED clinicians + clinicians feel encouraged to develop new protocols and pathways to improve patient flow + clinical leaders want to implement targets and staff are keen to follow leaders

   =Outcome: Improved ED access

The program theory is also represented as a diagram in Figure 9, with C representing context, I: intervention, M: mechanism, and O: Outcome.

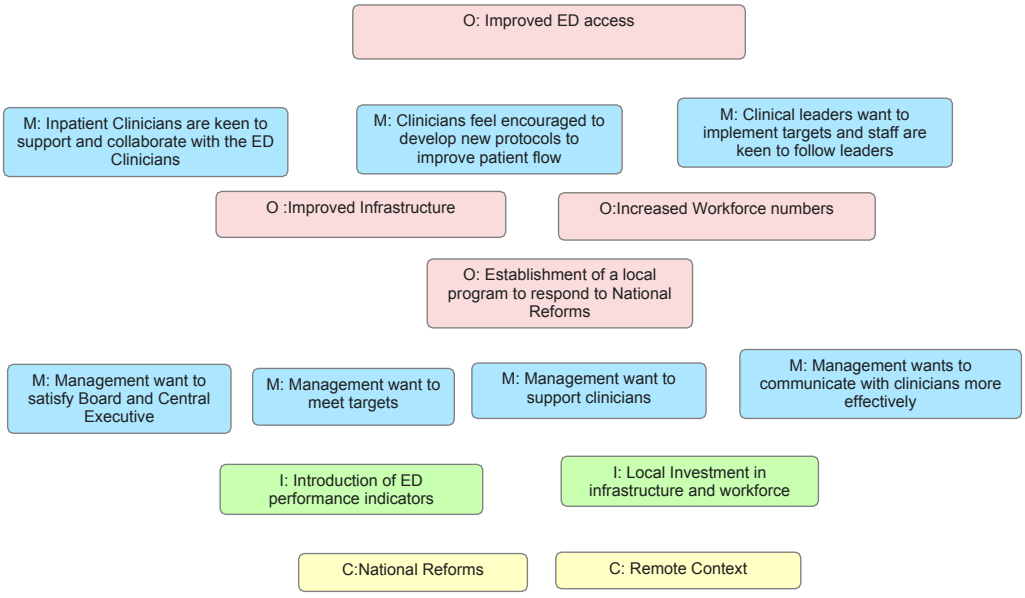


Figure 9. Preliminary program theory

The program theory was then tested through different methods of data collection and analysis (as discussed in the previous chapter). The expectation was that the ensuing findings would lead to confirmation, revision, or refutation of the preliminary program theory. Results from the data collection and analysis are outlined in the following chapter.

CHAPTER SEVEN: FINDINGS

INTRODUCTION

The analysis in this study, utilising both qualitative and quantitative data, is underpinned by principles of realist data and case study analysis. Fortunately, realist analysis and case study analysis share many common features. These include employment of different methods to identify issues, in-depth description of the process of analysis and reporting the findings as clearly as possible.(141,156) Both realist and case study analysis aim to set the findings in their context. These commonalities have assisted in the presentation of the findings of this realist case study.

Realist evaluation expects some key criteria to be followed in the analysis and reporting phases.(141) These include:

- Reporting the 'for whom, in what context' questions, key mechanisms, and outcomes, both in the refined program theory and in the analysis;
- Describing the program theory and CMO configuration patterns;
- Explaining what data and analytical techniques were used and for what purpose;
- Aligning evidence and the theoretical approach to the program theory, so a credible assessment of the program can be made; and
- Presenting the revised program theory and its implications for policy and programs.

For academic reporting of case studies, the 'linear-analytic structure' is widely accepted.(131,156) This structure involves presenting the problem, literature review, methods, analysis, and conclusions, a strategy that does not contradict the realist evaluation result presentation approach.

All elements required for realist evaluation and case study reporting of results and analyses are incorporated in the current study, to ensure credible and realistic reporting of study findings.

QUANTITATIVE ANALYSIS

One of the objectives of the current study was to test the preliminary program theory. The preliminary program theory proposed that reform funding and introduction of targets contributed to the increase in ED access at ASH. It assumes, based on national and local reporting, there has been improvement in ED performance. However, there was a need to assess this improvement further and identify variability over years. This required longitudinal assessment of the improvement. Three ED performance indicators, widely accepted as measures of ED access (16,27,94), were used to track improvement. These indicators were:

- Proportion of ED patients seen within clinically recommended times (see Table 5);
- Access block; and
- The NEAT measure.

Table 5. Australasian Triage Scale (Adapted from these sources: Curtin University, 2011 & NSW Government, 2016)

Triage Scale Category	Acuity (maximum waiting time)	Description
ATS 1	**Immediate**	People who have immediately life threatening conditions
ATS 2	**10 minutes**	People who have imminently life threatening conditions
ATS 3	**30 minutes**	People who have potentially life threatening conditions
ATS 4	**60 minutes**	People who have potentially serious conditions
ATS 5	**120 minutes**	People who have less urgent conditions

Access block and the NEAT measure were defined in Chapter 3 but are defined here again:

1. Access block is the term that describes the delay patients who need hospital admission experience in ED when their inpatient bed is unavailable.(27,94)
2. The NEAT has been defined as "*where 90 percent of all patients presenting to a public hospital ED will either physically leave the ED for admission to hospital, be referred to another hospital for treatment, or be discharged within four hours*".(72)

Alongside these performance indicators, growth in ED presentations was also tracked.

The first step in confirming the access increase, was to analyse ASH annual ED performance indicator data for the seven-year study period, commencing in 2008, the year the first national ED target was introduced, and ending in

2014. ED performance indicator data[14] were obtained from a reporting tool (BusinessObjects) that sourced data from the ASH patient care information system. An annual summary of the ASH ED performance indicators for 2008-2014 is presented in Table 6.

Table 6. ASH ED performance 2008-2014 (Source Data: Alice Springs Hospital)

ED Performance Indicators	2008	2009	2010	2011	2012	2013	2014
Number of ED presentations	33,528	37,273	39,210	41,931	39,818	42,107	42,873
ED presentations seen within clinically recommended triage times	17,265	21,876	19,252	22,362	22,793	23,803	26,387
ED percentage of patients seen within clinically recommended triage times	51%	59%	49%	53%	57%	57%	62%
Access block (percentage of ED patients experiencing access block)	46%	45%	44%	44%	39%	42%	42%
NEAT (percentage of ED patients who were discharged within 4 hrs)	60%	65%	60%	62%	63%	61%	63%

[14] Performance figures were adjusted for self-discharge

ED presentations 2008-2014

Table 6 indicates there has been a gradual increase in the number of ED presentations at ASH during this period, with approximately a 26 percent increase in 2014 compared to 2008. While the analysis did not delve into the profile of ED patients (primary care type or non-primary care type, age group) because of lack of access to these type of data, the majority of the presentations were identified as being in the less serious Australian Triage Scale (ATS) categories 4 and 5 (See numbers marked in blue in Table 7). There was also significant growth identified in numbers of patients presenting with less urgent conditions.

Table 7. ASH ED presentations by ATS category 2008-2014 (Source data: Alice Springs Hospital)

Year	ATS 1	ATS 2	ATS 3	ATS 4	ATS 5	Total
2008	177	2865	13638	16112	736	**33528**
2009	137	3050	14560	17970	1556	**37273**
2010	138	2724	14762	19710	1876	**39210**
2011	132	2922	15116	21520	2241	**41931**
2012	129	2822	14046	20575	2246	**39818**
2013	184	3344	14823	21270	2486	**42107**
2014	182	3495	14061	22879	2256	**42873**

To further analyse the increase in presentations, the annual data were disaggregated into monthly data and a trend analysis of the ED presentations constructed for the 2008-2014 period (see Figure 10). The index (x axis) in Figure 9 is the month of the year: 0 for January 2008, 1 for February 2008 and so on.

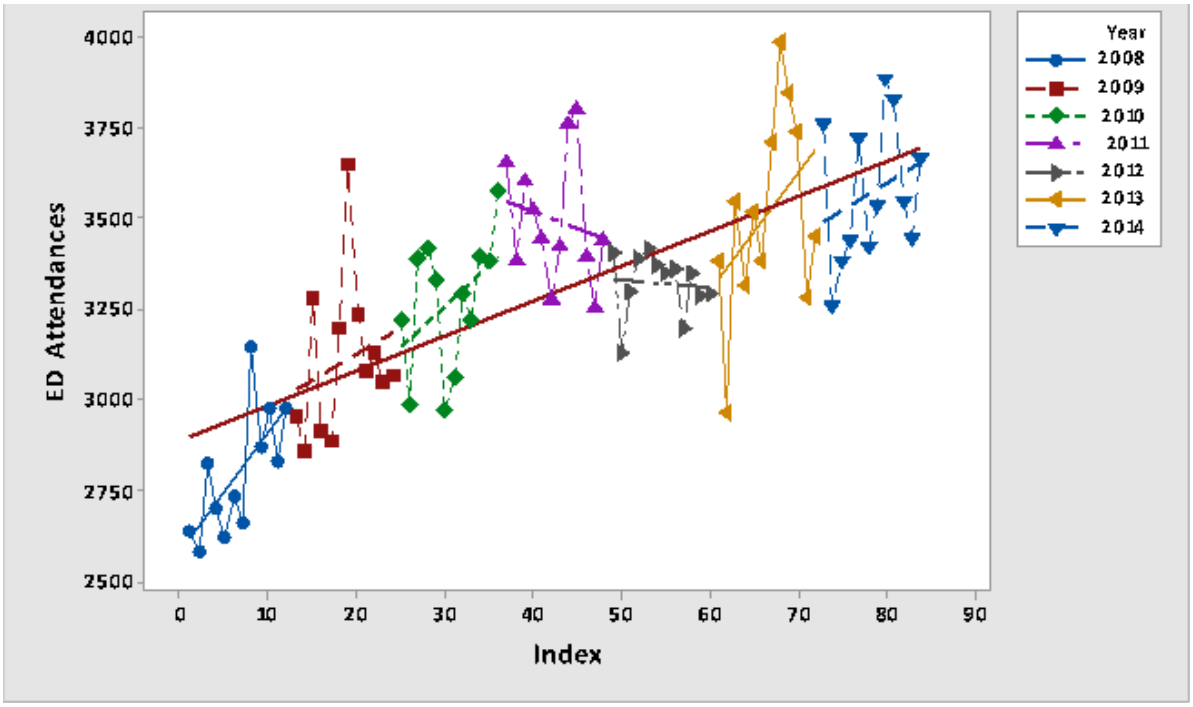


Figure 10. Trend graph for ASH ED presentations 2008-2014

The trend analysis illustrates that there has been an upward trend in presentations over the past seven years. Years 2008 and year 2013 show a strong upward trend in presentations, and years 2009, 2010 and 2014 show a moderate upward trend. However, there was a downward trend in year 2011 and 2012 with recovery in the following years.

Analysis of the ED presentations for the period 2008-2014 confirmed an upward trend in the numbers. This is not dissimilar to EDs in other regional

hospitals in Australia.(16) However, in relation to this study it indicates a growing pressure on the ASH ED to serve an increasing number of patients with limited resources. The next section examines how the ED fared, within this context, in seeing patients within clinically recommended triage time frames.

ED presentations seen with clinically recommended triage times 2008-2014

Both Table 6 and Figure 11 outline the increasing number of ED patients being seen within clinically recommended triage times.

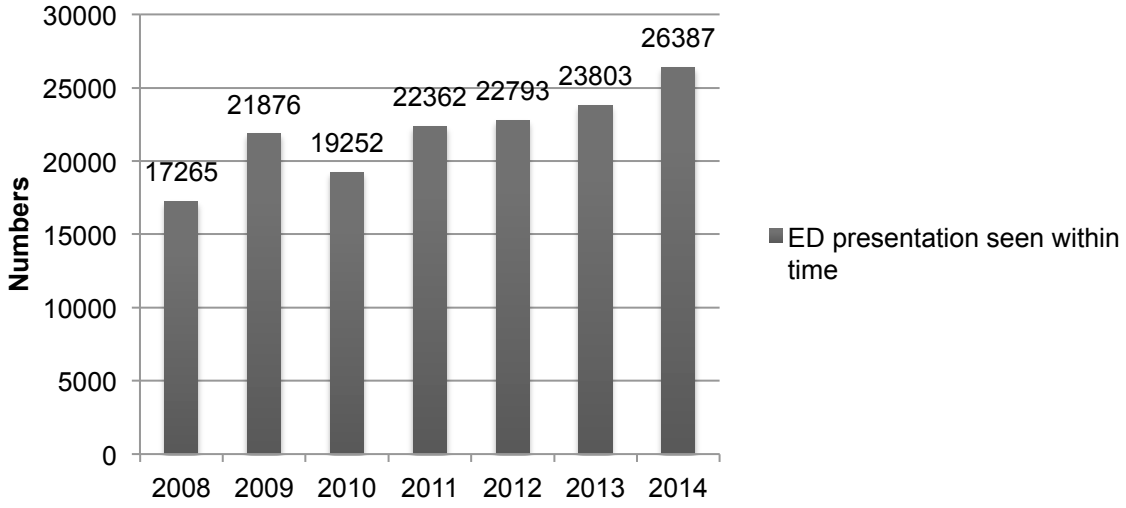


Figure 11. ASH ED presentations seen within clinically recommended time 2008-2014

These data were diaggregated, and a trend graph constructed (see Figure 12). The trend graph confirms that ED 'seen on time' numbers have been growing over the study period. The graph in Figure 12 identifies a steep increase in 'seen within time' in year 2009. Notwithstanding this increase, there was a downward trend in years 2012 and 2014 shown in Figure 12.

Analysis of the residuals of the percentage 'seen on time' showed normality in the distribution of the data.

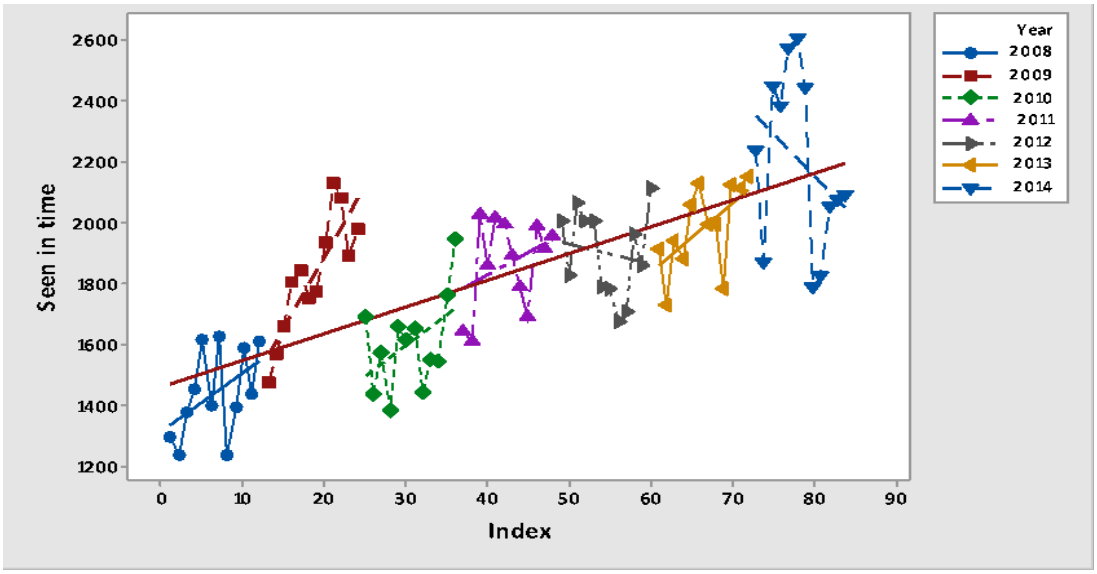


Figure 12. Trend graph for ASH ED presentations 'seen within clinically recommended time' 2008-2014

The above figures represented 'seen within time' in raw numbers, so a separate analysis was undertaken to chart the trend in terms of percentages (see below figure).

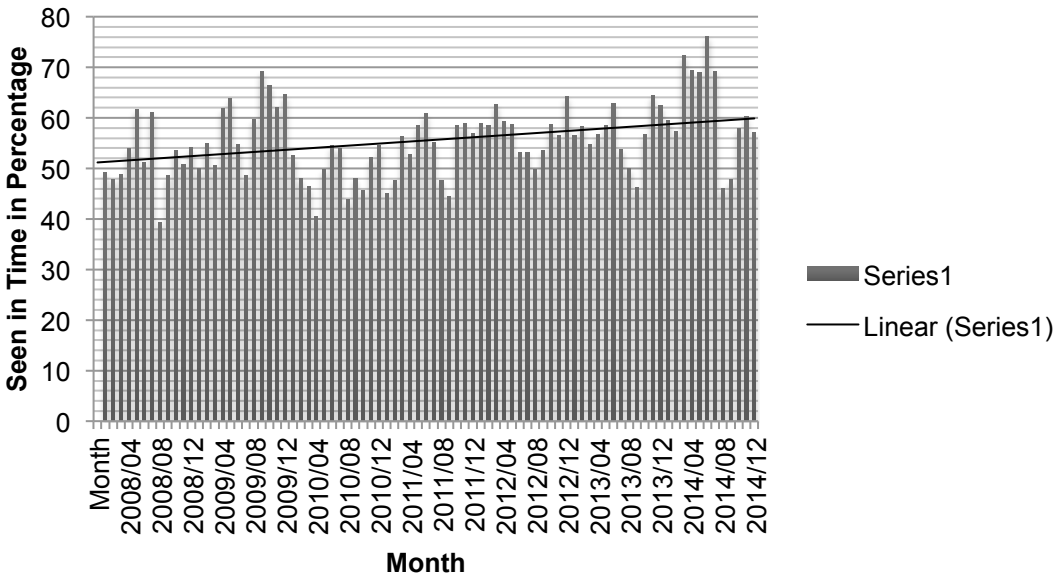


Figure 13. ASH percentage of ED patients seen in clinically recommended time performance 2008-2014

Figure 13, like Figures 11 and 12 outlines an upward trend (average increase of 3% over the 2008-2014 period) with percentage of ED patients being 'seen within time'. To obtain a more in-depth picture of the trend, a linear regression analysis was undertaken to study the linear, additive relationship between time (independent variable) and ED 'seen within time' performance measure (dependent variable). The linear regression analysis predicts scores on one variable (dependent variable) from the scores on a second variable (independent variable). A linear graph, with a linear equation (y-mx+c), was used to indicate the gradient and R^2 value was used to indicate if the line fit the data. The graph is presented below in Figure 14.

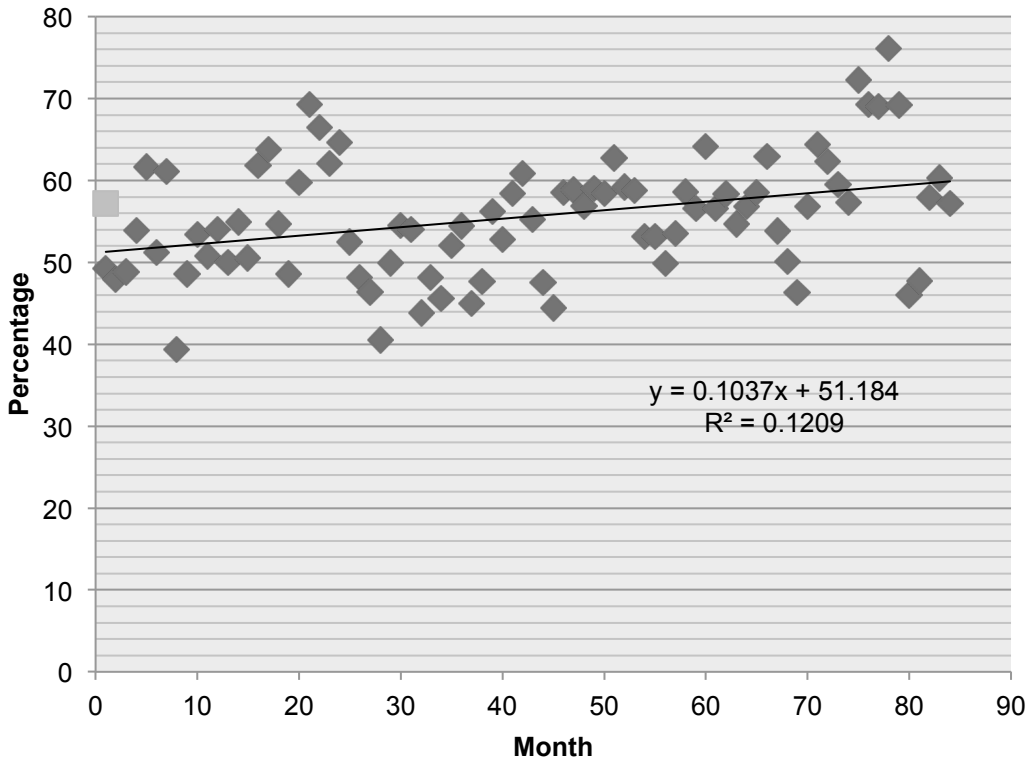


Figure 14. Linear regression graph for ASH percentage ED patients seen within clinically recommended time 2008-2014

Here the linear equation is represented in the form of y=mx+c, where m is the gradient (slope) and c is the y intercept. The equation in Figure 14 indicated a positive and upward gradient (0.1037).

The graph presents a R^2 value. Closer the R^2 value is to 1; the closer the line fits the data. R^2 is the percentage of the response variable variation that is explained by a linear model. In this graph, the R^2 presents a weak fit of the line to the data. What this means there is limited ability to predict future trends from the ED data that has been obtained so far (because of the limited accounting of variability in the linear regression results) and thus it cannot be concluded if there is a long term improvement trend with ED seen in clinically recommended times.

Access Block 2008-2014

Access block was previously discussed as the single most critical issue affecting EDs across Australia, whether it be metropolitan hospitals or regional hospitals.(25,27,28, 91,124,169) This measure, while not being a national reform target, is a widely accepted indicator amongst EDs of not just ED performance, but performance of the hospital as a whole. As discussed in chapter 3, increasing access block is not just a reflection of problems within the ED, but a symptom of wider systemic problems such as lack of hospital beds, increased inpatient length of stay, inefficient discharge process and so on.(91) As the access block measure pre-dated the national ED targets, was officially endorsed by the Australasian College of Emergency Medicine

(ACEM) (the professional college of emergency physicians in Australasia)(28), reflects ED overcrowding, requires multi-factorial and whole-of-system solutions to be addressed(96), and continues to be used in ASH and national reports (11) as an ED performance measure, it was utilised as the peak indicator of ED access (the 'Outcome' in the program theory).

The access block measure used within this research study reflects the measure as defined by the ACEM:

> *An admitted patient who spends longer than 8 hours in the ED from their time of arrival*.

This time frame differs from that used by the Australian Institute of Health and Welfare (AIHW) to define access block (177) and how they report the measure (11,99). AIHW defines access block as:

> *All patients presenting to a public hospital emergency department (including publicly funded privately operated hospitals) who are subsequently admitted to the same hospital, including the:*
>
> *(a) Percentage of presentations where the time from presentation to physical departure (i.e. ED stay length) is ≤4 hours (i.e. ≤240 minutes); and*
>
> *(b) ED stay length at the 90th percentile.*

The AIHW definition is derived from the NEAT measure (also used as an ED performance indicator in the current research study) but the ACEM definition is more widely accepted. The ACEM definition has therefore been adopted for use in the study's analysis.

In Table 6, a gradual decrease in access block from 2008-2014 was quantified. This decrease is also evident in Figure 15.

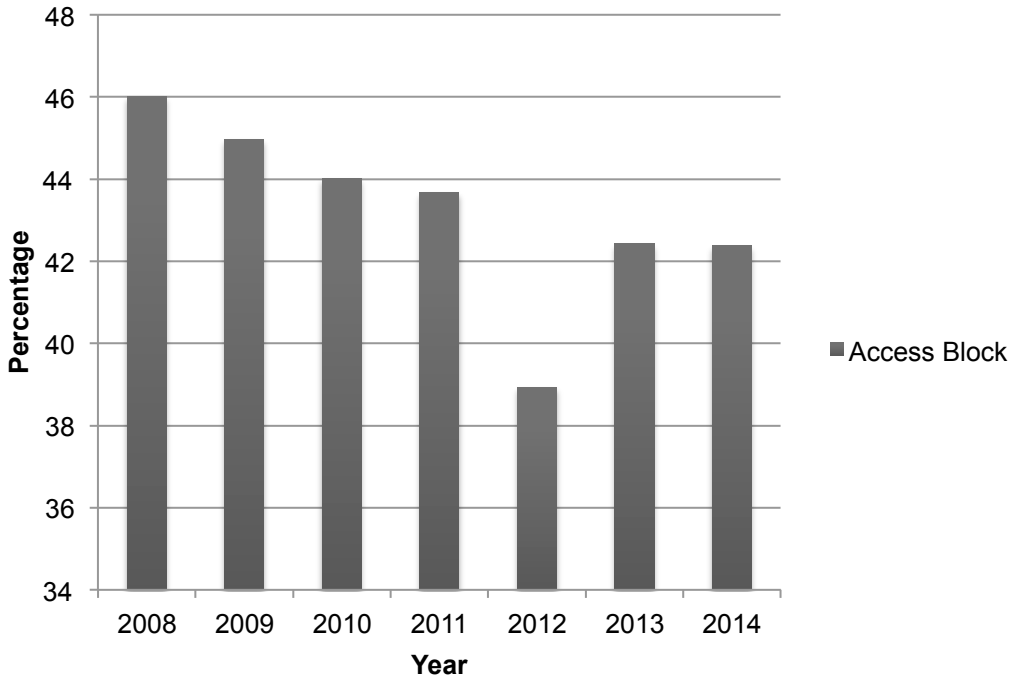


Figure 15. ASH access block performance 2008-2014

The annual access block data were then disaggregated to a monthly level and a trend analysis was conducted

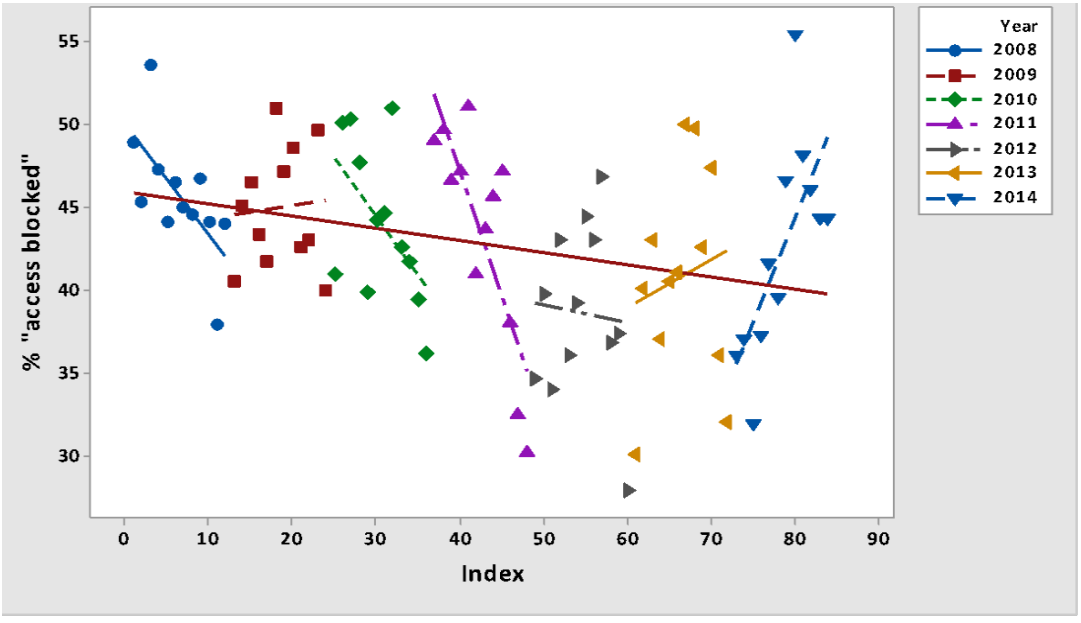


Figure 16. Trend graph for ASH access block performance 2008-2014

The graph in Figure 17 outlined a downward trend (average decrease of 1% over the 2008-2014 period) in access block over the past seven years. Over the years 2011 and 2012, there was a substantial decrease in access block. However, 2013 and 2014 are showing the beginning of an upward trend in the measure. To further test the measure, a scatter plot and correlation analysis was undertaken.

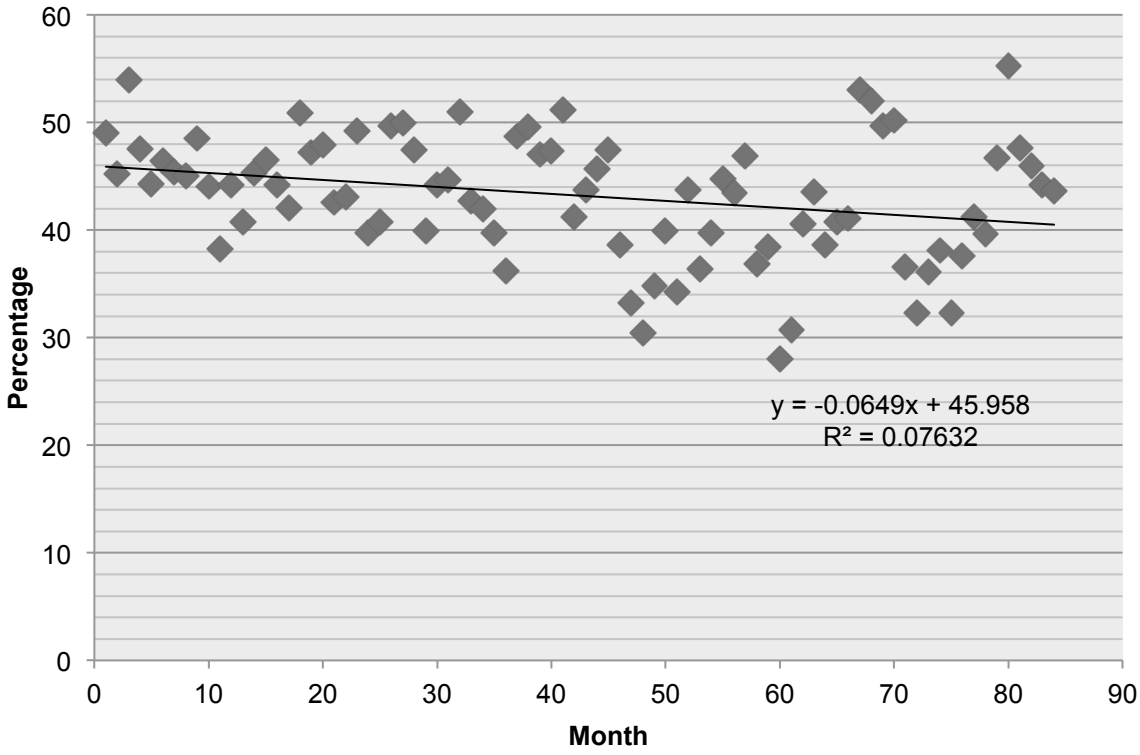


Figure 17. Linear regression graph for ASH access block performance 2008-2014

The linear equation in Figure 17 confirmed a downward gradient (-0.0649). However, in this graph, the R^2 presents a weak fit of the line to the data. This means there is limited ability to predict future trends from the ED data that has been obtained so far (because of the limited accounting of variability in the linear regression results).

NEAT 2008-2014

The NEAT has been defined as '*where 90 percent of all patients presenting to a public hospital ED will either physically leave the ED for admission to hospital, be referred to another hospital for treatment, or be discharged within four hours'.* (72) The measure was introduced as a national target by the National Partnership Agreement on Improving Public Hospital Services (NPA-IPHS) in 2011, but has a longer history as a target in the UK and WA.(25,72,100) While the NEAT was only introduced in 2011, the analysis has used the measure across the study period 2008-2014 to enable comparision with other ED indicators utilised.

Unlike the ED 'seen within time' and access block performance, NEAT performance doesn't present a clear trend because of significant variation across years (see Figures 18 and 19).

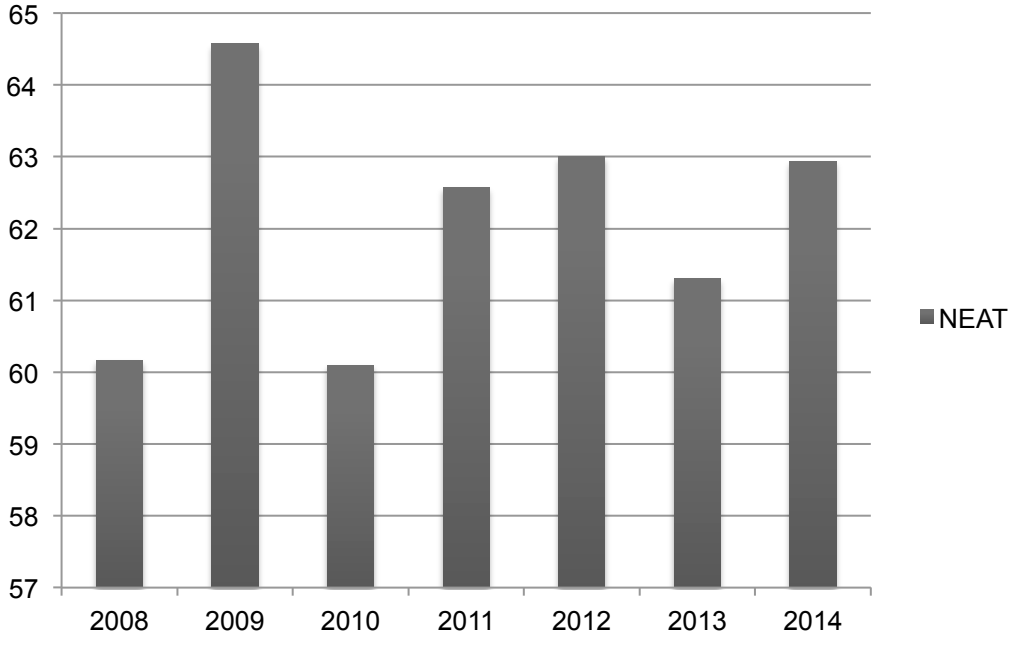


Figure 18. ASH NEAT performance in percentage 2008-2014

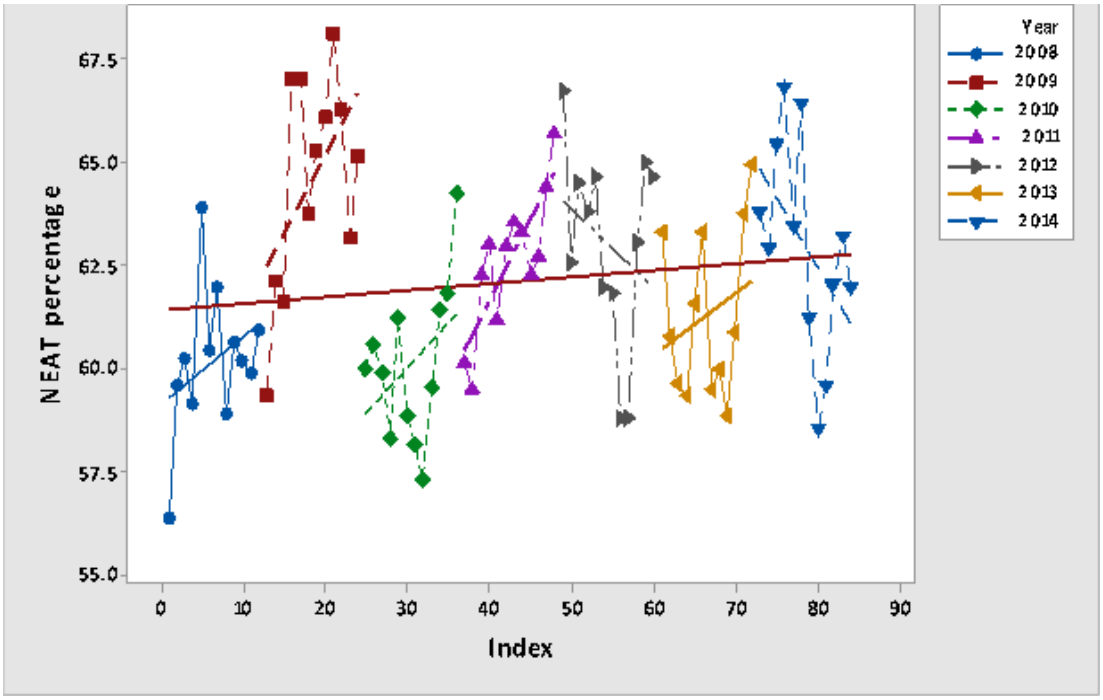


Figure 19. Trend graph for ASH NEAT performance 2008-2014

Unlike access block or the ED 'seen within time' measure, the NEAT measure was a fairly recent indicator for ASH and most hospitals in Australia. Additionally, the NEAT cut-off period for ED wait time is 4 hours (based on the UK and WA programs), compared to the access block 8 hour cut-off. While the NPA IPHS allowed for clinical exceptions (72), it still considers all ED presentations. The access block measure covers only admitted patients. Even with new resources as a result of national healthcare reforms and associated funding, ASH still fared poorly compared to its peers (major regional hospitals) in NEAT performance (see Table 11).

Table 11. ASH NEAT performance compared to peer group average in financial years 2011-2014 (Source: NHPA, 2016)

Year	Patients who departed ED within 4 hours of arrival	Peer group average
2011-2012	65%	63%
2012-2013	62%	67%
2013-2014	63%	70%

The performance indicator analysis identifies some improvement in ASH's ED access in relation to 'seen within time' (11 % increase in 2014 compared to 2008 and an upward trend) and 'access block' (4% decrease in 2014 compared to 2008 and a downward trend). Because of the variations within years, it is unlikely the improvement was a random or coincidental improvement in access.

2008 was the year the National Partnership Agreement on Hospital and Health Workforce Reforms (NPA-HHWR) introduced the first nationally applicable time-based ED target along with ED specific funding. (71) This was followed by the release of infrastructure funding for construction of a new ED, through the *Health and Hospital Fund* in 2010. In the following year, NPA-IPHS brought in the NEAT target, while contributing to ASH's ED development through release of ED specific funding. The staggered reforms across the 2008-2014 period and the gradual improvement in some ED parameters suggest an association between reforms and the moderate improvement in ED access. For example, Figures 20 and Figure 21

demonstrate that ED performance has improved (largely remained above median) in terms of ED 'seen within clinically recommended time' percentage and access block reductions after the various reform interventions were introduced.

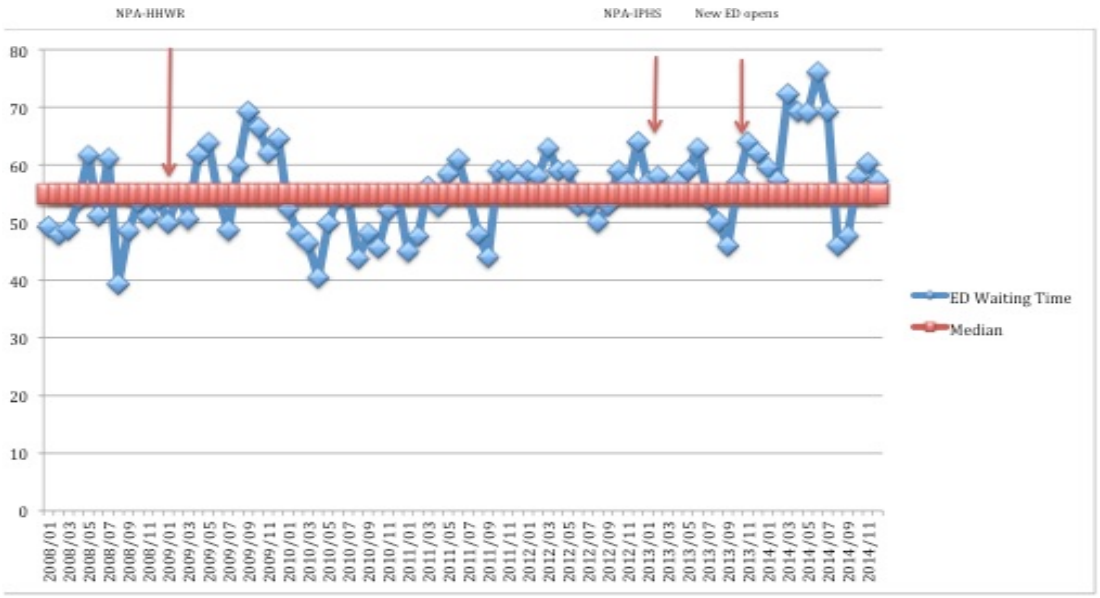


Figure 20. Reform intervention points and ED seen within clinically recommended time run chart 2008-2014

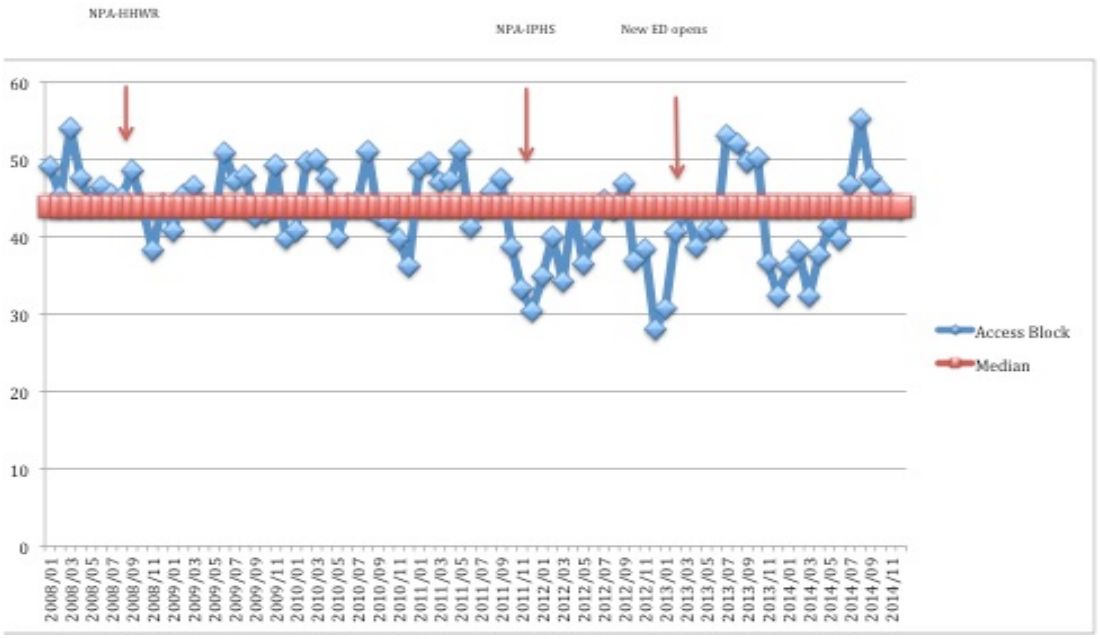


Figure 21. Reform intervention points and access block run chart 2008-2014

While the trend analysis in this section identified improvement in ED access (increase in 'seen in time' numbers and decrease in access block) it also identified variations between years in the reform period. These variations suggest other factors, beyond the reform interventions covered in this study, are in play. For example Figure 22 and Figure 23 indicate that the 'seen within time' and access block improvement is reversing in the latter years of this study, after the new ED opened.

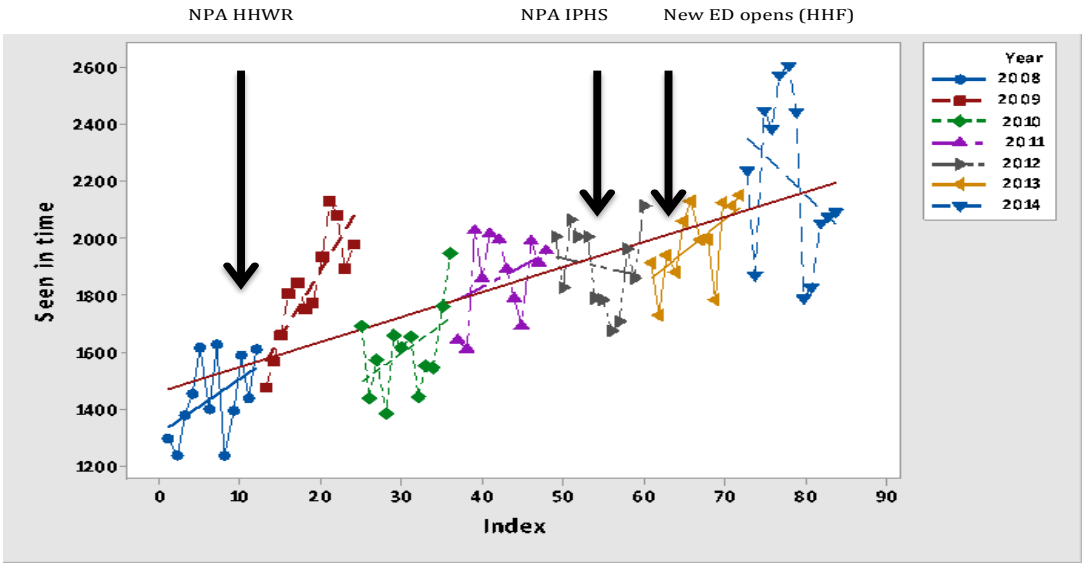


Figure 22. Reform intervention points and ED patients 'seen within time' trend 2008-2014

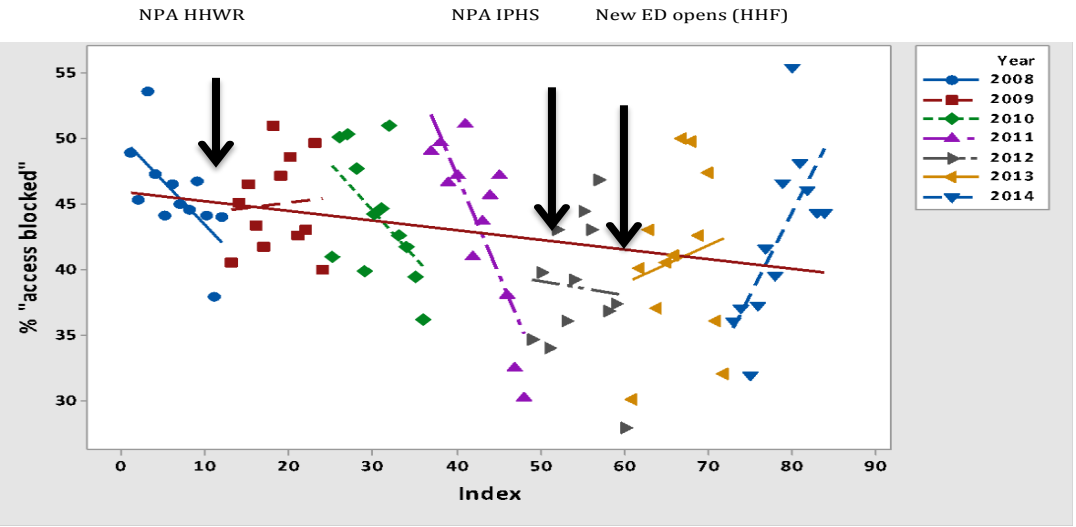


Figure 23. Reform intervention points and access block trend 2008-2014

The analysis also identified weak NEAT performance throughout. These findings indicate the improvement in ED access is not a long-term trend. The factors potentially impeding the sustainability of improvements are explored in the qualitative analysis and in Chapter 8, the study discussion.

The preliminary program theory assumed the national healthcare reforms led to improvement in ASH ED access. While the quantitative analysis confirms this; the analysis also suggests this may not be a long-term improvement. This aspect is examined in the qualitative phases of the study. Further, the lag in NEAT performance as opposed to access block performance raises the issue of relevance of some targets over the others and the need to contextualise targets. This outcome presents a case for revising the preliminary program theory. This aspect is discussed at the end of this chapter.

DOCUMENT ANALYSIS

In Chapter 5, document analysis was defined as a type of qualitative research where documents are interpreted to provide meaning and voice to the phenomenon under study.(159) The purpose of the document analysis in this study was to identify contextual information that would not be identified in the quantitative and interview phase of the study. The analysis involved coding of document content into themes. Only official documents (federal, territory, and hospital) documents were considered for the analysis.

Ultimately, 20 official documents were considered for analysis and initially divided into 4 groups (context, implementation, performance, and policy groups) based on the main purpose of the reports (see Table 12). The grouping helped with the pre-coding analysis.

Non-official documents were not included in the document analysis, due to their lack of reliability. Both peer reviewed and grey literature documents were incorporated in the literature review discussed earlier.

Table 12. Document list

Group	Document name	Source
Context	1. Emergency and Retrieval Registrars, 2012 Recruitment Document	Alice Springs Hospital
Implementation	2. Strong Care Journey clinical redesign project 2014	Alice Springs Hospital
	3. Evaluating the Health and Hospitals Fund 2014	Australian Government Department of Health
	4. Northern Territory Implementation Plan for NPA-IPHS 2011	Council of Australian Governments
	5. Northern Territory Implementation Plan for NPA-HHWR 2008	Council of Australian Governments
Performance	6. Northern Territory Department of Health Annual Report 2007-2008	Northern Territory Government
	7. Northern Territory Department of Health Annual Report 2008-2009	Northern Territory Government
	8. Northern Territory Department of Health Annual Report 2009-2010	Northern Territory Government
	9. Northern Territory Department of Health Annual Report 2010-2011	Northern Territory Government
	10. Northern Territory Department of Health Annual Report 2011-2012	Northern Territory Government

Group	Document name	Source
	11. Northern Territory Department of Health Annual Report 2012-2013	Northern Territory Government
	12. Northern Territory Department of Health Annual Report 2013-2014	Northern Territory Government
	13. Time in Emergency Departments 2013-2014	National Health Performance Authority
Policy	14. Central Australian Health Service, Service Delivery Agreement 2014-2015	Northern Territory Government
	15. Change Management in the Northern Territory Public Service 2012	Northern Territory Government
	16. Health and Hospitals Fund-principles and evaluation criteria 2012	Australian Government
	17. Nation Building Funds Act 2008	Australian Government
	18. National Healthcare Agreement 2012	Council of Australian Governments
	19. NPA-IPHS	
	20. NPA-HHWR	

The documents from each group were coded for themes through NVivo. This being a realist evaluation, the content was coded either to **context** (C) or **intervention** (I) or **outcome** (O) themes. As mechanisms (M) generally require verbal interactions with research participants for them to be uncovered, they were not considered as a theme in the document analysis phase. To figure out what content went into C or I or O, the program theory and its CIMO configuration patterns were referred to. For example, all content referring to national healthcare reforms, the social background and hospital issues were coded to C, as these reflected conditions in which the intervention (I) was introduced. For interventions, content referring to introduction of resources and targets was coded to I. The intervention would

lead to triggering of relevant mechanisms (not covered in the document analysis), which in turn would lead to Outcomes (O). For the purpose of this document analysis, as with the rest of the thesis, the O refers to impact on ED access.

Coded content from the document analysis is now presented in the C, I, and O categories, with the most frequently occurring words (indicating which topics/terms participants emphasised) shown in Figure 24.

Figure 24. The most frequently occurring words in the document analysis

Context (C)

The document analysis yielded rich contextual information including a

detailed profile of the hospital and evolution of its services over recent years. Specific information relating to ASH ED and its patient profile was also uncovered through the document analysis. The combination of these data helped identify, report, and analyse contextual factors that may trigger mechanisms relevant to the hospital's program to improve ED access.

In the 2007-2008 period, the ASH profile indicates it had 177 beds and served a catchment area that covered the southern half of the NT and the border regions of South Australia, Western Australia, and Queensland. Although in 2016 the catchment remains the same, bed numbers had increased to 186 beds.(172) The closest referral centres are Darwin and Adelaide each 1500 kilometres away. Of the many specialised services ASH provides, one of the most important is its renal service. This is due to the high prevalence of chronic kidney disease in Central Australia.(173) In addition to inpatient renal services at ASH, the hospital provided satellite renal services in other parts of Central Australia.(172)

The profile of the hospital did not change substantially in the 2008-2009 period, but saw an increase in the number of renal patients receiving haemodialysis services (treatment for advanced kidney failure), and the opening of a twenty bed continuing care ward to cater to longer term patients.(174) The following years (2009-2010 and 2010-2011) saw expansion in renal services to serve an increasing number of patients with

advanced kidney disease (175,176), and the opening of a 12 bed rapid assessment and discharge unit, designed to assist in easing the pressure on bed availability and reducing the average length of stay in the hospital.(176) However, the hospital ED was the busiest per capita ED in Australia, with annual presentations exceeding thirty five thousand during this period.(176) The existing ED was not fit for purpose nor had the technological or clinical facilities to deal with this growth.(80) Understandably, planning for expansion of ED treatment facilities, including new treatment bays and a paediatric treatment room, began during this time frame.(176)

The following years (2011-2014) showed high growth rates in the number of haemodialysis patients in the hospital, with haemodialysis separations (discharges) increasing from 22,723 in 2009-10 to 32,778 in 2013-2014.(177,178) This reflected the increasing chronic renal disease burden in Central Australia.

During this period, an interesting profile of patients presenting at the ASH ED was circulated.(177) In 2012, 38 % of the ED presentations were marked for admission. The average age of ED patients presenting at the ASH ED was 35 years, with 28 percent of the ED patients being paediatric. Seventy six percent of the ED patients were Aboriginal patients. Chronic diseases like rheumatic heart disease, chronic liver disease, chronic kidney disease, and diabetes constituted a significant proportion of the presentations. However,

acute presentations such as ischaemic heart conditions and sepsis were also common. Trauma was a frequent presentation, including motor vehicle, stabbings, and blunt traumas. This profile reflects the complexity of treating and managing ED patients at ASH.

Some documents also identified the resource constraints and difficulties experienced in admitting ED patients to inpatient beds. Along with a small ED and lack of ambulance bypass capacity (due to no nearby hospitals), there were delays in acceptance of ED patients for admission, and an inefficient bed management policy contributing to ED crowding.(80,174)

The contextual analysis presents a bleak picture of growing disease burden in Central Australia and increasing ED presentations, with consequent increasing pressure on the ED and ASH to manage and treat its patients. The analysis does not note any increase in hospital capacity in proportion to the growth in admissions largely requiring complex care and longer stays in the hospital. Taken together, these factors presented a ripe setting for the introduction of hospital reforms.

Intervention (I)

The first ED specific intervention came through the 2008 NPA-HHWR, in the form of a national target that specified by 2012-2013, 80 percent of total ED presentations were to be seen within clinically recommended triage times as

specified by ACEM.(71) The NPA-HHWR did not just come with a target, it provided funding to hospitals intended to relieve pressure on their EDs. For ASH, the funding enabled establishment of an interim Short Stay Unit (SSU).(127) The SSU was to accommodate patients who, with proper assessment and treatment, were likely to be discharged within 24 hours. The NPA-HHWR also provided funding for an enhanced Hospital-in-the-Home (HITH) program in Alice Springs. The HITH program would enable early discharge of some rehabilitation-type patients, to undergo continuing treatment in their home, near their homes, or in a temporary non-hospital accommodation. This early discharge would free up beds and allow for faster ED admissions.(127)

The 2011-2012 period had major hospital reforms introduced, through the National Health and Hospital Network (NHHN) agreement and NPA-IPHS, including working to establish a Central Australian Hospital Network (CAHN) that would be responsible for the operations of ASH and Tennant Creek Hospital.(178) Governing councils for the networks would replace existing hospital boards and would report to the Northern Territory Minister of Health. CAHN officially commenced network operations in April 2012 and as a government business division in July 2012.

The 2011-2012 period also saw the introduction of NEAT targets for NT public hospitals (Table 13) and progression of construction work on the new

ED and 24/7 medical imaging services, having commenced in 2010. The new ED would have 31 treatment bays, a five bed fast track area, an eight bed SSU, and a procedure and consultation area.(177,178) During this period, the NPA-IPHS introduced the NEAT target (69) and provided funding for equipment for the new ED, staffing of the 24 hour medical imaging service, and continuation of previously installed ED software (127,129,178). The combination of the target and resources was intended to enable increased access to the ASH ED.(127,129)

Table 13. NEAT target for NT public hospitals (Source: NPA-IPHS and NT Government)

Baseline (2010)	**2012**	**2013**	**2014**	**2015**
66.2%	69%	75%	83%	90%

ASH's new ED, which opened fully in 2013, was the result of combined Australian Government and Territory Government funding of $24.9 million.(80) The new ED, as was the old ED, is the largest ED and acute facility within 1500 kilometres. A two-storied facility, it was a welcome improvement from the previous out-dated and space constrained ED.

In 2013-2014, ASH became involved with the 'Strong Care Journey' clinical redesign project. (177) The aim of the project was to improve patient access, patient flow, and the patient experience. It also aimed to reduce delays and

increase access to hospital services by streamlining processes and efficiently using resources. These aims were intended to be accomplished through use of best practices for bed management and effective discharge processes.(177,178) Also in 2013-2014, a palliative care/day care respite house was opened in Alice Springs to provide respite for patients and their carers, also consequently reducing pressure on the ASH ED.(177)

In 2014, CAHN became the Central Australia Health Service (CAHS) when it absorbed other operational health services.(177,181) CAHS, as per its Service Delivery Agreement (SDA) with Northern Territory Government, was obliged to capture all data necessary for clinical care, service delivery, and management, and report them regularly. These reporting measures included ED presentations departing within 4 hours (NEAT) and ED presentations seen within time as outlined in Table 14.

Table 14. CAHS Service Delivery Agreement ED performance indicators 2014-2015

Performance Indicator	**Target**
ED presentations departing within 4 hours	67%
ED presentations seen in time	**ATS 1:** 100% **ATS 2:** 70.5% **ATS 3**: 66% **ATS 4:** 65.5% **ATS 5:** 92%

In summary, the past seven years have seen increasing attention to the

functioning of ED services in ASH, and initiatives to ensure its patient population receives optimal access to its services. A combination of targets and infrastructure and workforce funding has led to change in terms of how ED services are delivered in Central Australia. Whether the reform funding and introduction of targets has been adequate to sustain optimal ED access remains to be seen. However, it is interesting to note that the NT decreased the performance threshold for ED presentations departing within 4 hours in its SDA, as compared to the NEAT target set for that period. A combination of the expiry of NPA-IPHS and associated reward funding for achievement of NEAT targets, along with the futility of pursuing high performance thresholds for a regional hospital beset with complex contextual issues may have led to this modification.

Outcome (O)

Prior to this study, there has not been a comprehensive assessment of the impact of the national health reforms on ASH or its ED. However, some of the documents considered in this analysis have assessed certain aspects of the hospital reform and its outcomes. One of the assessed factors was the impact of the new ED. In an assessment conducted by an independent agency (80), it was identified that the new ED had significantly improved ED access. The new ED was also assessed as having reduced overall waiting times by six percent, while providing more culturally appropriate and acceptable services. The layout of the new ED was better equipped to accommodate the growth in ED presentations along with new technological

and clinical developments. Further, the redevelopment had attracted an increased number of health professionals to work in the new ED.(77)

Alongside these impact assessments, national bodies have tracked both the ED 'seen in time' and NEAT measures for ASH. ASH's NEAT performance compared to its peer hospitals has already been noted in Table 11 but Table 15 compares ASH ED 'seen in time' to its peers in 2013-2014.(182)

Table 15. ASH ED 'seen in time' performance compared to peer group average in financial years 2013-2014 (Source: NHPA, 2016)

ATS category	ASH	Peer group average
ATS 1	100%	100%
ATS 2	72%	83%
ATS 3	67%	71%
ATS 4	63%	72%
ATS 5	91%	90%

This table indicates that while there has been definite improvement in ED performance at ASH (see Tables 6, 8, and 9), its performance lags behind its peer hospitals. However, none of these peer, major regional hospitals (102) are located in a remote setting such as Alice Springs or have the complexity of patient profile such as ASH.

Summary

Key questions of the document analysis include was the document analysis beneficial, and if so, how do the findings relate to the realist evaluation framework? Firstly, the document analysis uncovered significant new information that was not identified through initial stakeholder consultations, the literature review, or the quantitative analysis. The document analysis, while being framed with the study's themes, presented a compelling narrative as to why ED reforms were required. The analysis also supported the preliminary program theory's assumption that national healthcare reforms made a difference in ASH ED service delivery. Finally, the analysis identified key emerging themes, including:

- Contextual need for ED reforms;
- Growing burden on ED services;
- Targets brought a focus on ED performance;
- ED targets had to be contextualised;
- Reforms brought an increase in resources; and
- Redesign activities have to accompany resources.

These themes were matched against the interview findings, and in conjunction, used to construct a revised program theory.

INTERVIEW ANALYSIS

As discussed in Chapter 4, purposive sampling was used to identify interview participants. Purposive sampling is very useful in case study strategies, as judgment can be used to select information-rich participants.(128) Four

categories of staff were interviewed (see Table 16).

Table 16. Interview participant groups

Participant Group (units of analysis)	Number
Senior Clinicians	11
Executive	5
Other Managers	2
Junior Clinicians	3
Total	**21**

The sampling and categorisation were strongly influenced by the methodological framework discussed in Chapter 6. The program theory emphasises the importance of hospital leadership in the course of reform and change management. Consequently, emphasis was placed on recruiting hospital executive and senior clinicians. Other levels of staff were also recruited in order to obtain their perspective and identify or confirm generated mechanisms.

This method of sampling recruited a total of 21 information-rich participants. Further recruitment was not progressed as further participants would not add to the information already acquired (information saturation) or did not have

involvement with the national healthcare reforms at a level required to provide adequate information.

Participants were allocated codes to anonymise their collected data. Codes are presented in Table 17. These codes are henceforth used to refer to the participants. The red font indicates participants who were interviewed twice.

Table 17. Interview participant codes

Hierarchy	Professional Group	Code
Strategic	**Executive**	P-E-1
		P-E-2
		P-E-3
		P-E-4
		P-E-5
Operational	**Management**	P-M-1
		P-M-2
	Senior Clinicians	P-SC-1
		P-SC-2
		P-SC-3
		P-SC-4
		P-SC-5
		P-SC-6
		P-SC-7
		P-SC-8
		P-SC-9

Hierarchy	Professional Group	Code
		P-SC-10
		P-SC-11
	Junior Clinicians	P-JC-1
		P-JC-2
		P-JC-3

Following recruitment and informed consent, semi-structured interviews were organised with the interview participants (see Table 18 for interview questions). The main aim of the interviews was to help in refining the program theory through participants' discussions of highs and lows of the hospital program - what works for whom, in what circumstances, and in what respect? The questions reflected the realist case study methodology and the desire to understand the 'what, why, and how' of the hospital's program to improve ED access.

While a semi-structured framework (sections and related questions) was used to support the interviews, in reality many interviews became open ended. Opportunity was provided to participants to freely articulate their views, and opportunities taken to probe emerging mechanisms.

Table 18. Interview questions

Theme	Questions
Context	What was the context in which changes/reform in the ED/Hospital were initiated? Why were the changes/reform introduced in the ED/Hospital?
Planning	What strategies were planned by the hospital to introduce the changes? What performance indicators were considered to track changes and improvements in ED access? What was your involvement in the planning?
Implementation	Which initiatives were eventually implemented by the hospital to introduce the targets? What was your involvement in the initiatives? Which initiatives were the most successful and how did they achieve their objectives? Why? What have been the challenges to meet targets? Why? What have been the opportunities presented when meeting targets? How?
Impact	How has the introduction of the targets affected ED access? Why?

Theme	Questions
Future Process	What has been the main learning from the reform process undertaken in ED and Hospital? Why? What hurdles remain to improve ED access? Why? What other parameters may be useful to track improvement in ED access? How?

The initial interview phase yielded 31 interviews in total. Interviews were recorded and transcribed verbatim. After each interview, contact summary sheets were completed, and field notes written. Following this, interview transcripts were coded for Context (C), Intervention (I), Mechanisms (M) and Outcome (O) themes using NVivo 10. An initial list of codes was constructed to help with the thematic analysis (see Table 19). These codes were based on a deductive process using the stakeholder consultation, literature review, quantitative, and document analysis. To ensure credibility of the codes, the initial codes were discussed with an external realist evaluation expert to check if they aligned with realist evaluation methodology and they were considered appropriate. Similar to the document coding, interview content was coded to relevant themes by referring the content back to the program theory. So any description of national and local healthcare reforms was

coded to the context, discussion of ED targets and reform funding was coded to intervention; any reasoning and behavioural patterns identified through their statements were coded to mechanisms, and views about ED access improvement and patient flow was coded to outcomes.

Table 19. Preliminary CIMO codes

Context	
Alice Springs and Hospital	
C1	Hospital issues
C2	Regional Hospital
C3	Remote Location
Local Reform and Funding	
C4	SDA
National Reform and Funding	
C5	HHF
C6	NPA HHWR
C7	NPA IPHS
Intervention	
I1	Creation and implementation of hospital wide processes
I2	Hospital wide targets
I3	Introduction of ED performance targets
Mechanism	
M1	Clinical leaders want to implement targets and staff keen to follow
M2	Clinicians understand the bigger picture
M3	Clinicians feel encouraged to develop new protocols

M4	Clinicians feel patient safety is a priority
M5	Clinicians feel supported by management
M6	Clinicians feel supported by management and government
M7	Clinicians want to collaborate because of the context
M8	Inpatient clinicians keen to support ED clinicians
M9	Management keen to implement targets
M10	Management want to satisfy board and government
M11	Management want to support clinicians
Outcome	
O1	A long standing program
O2	Improved ED access
O3	Improved patient flow

The first stage of interview analysis produced the findings outlined below.

Key results are presented as four themes derived from the codes listed in

Table 19:

- Hospital issues (covering C1, C2 and C3)
- Introduction of ED reforms (covering C4, C5, C6, C7, I1, I2 and I3)
- Clinicians and patients have benefited from the reforms (covering M3, M4, M5, M6, and M7)
- Clinicians feel the need for contextual targets (covering M8, M9, M10, M11, O2 and O3)

Hospital issues

> *"I would say one of the biggest drivers here at Alice Springs Hospital was in fact the old Emergency Department. So the fact that we had an old Emergency Department that was so well and truly overcrowded, not functional, not actually supporting the community that it was serving was the particular driver to make change in the Emergency Department."* – **P-E-1**

The above quote neatly identifies the main trigger for ASH to re-examine their ED practices, performance, and service delivery, and reflects the unanimous opinion of all interviewed participants. There were other drivers identified: participants outlined numerous ED issues pre-reforms (and to an extent post reform). They are summarised in the following paragraphs.

ASH ED is the only ED in Alice Springs. There is no private hospital in the area, leaving ASH ED responsible for all emergency care. The majority of GP clinics provide only Monday to Friday health care. There has been some recent change around the availability of evening and weekend General Practice care, but largely emergency services are provided only through the ED. The substantial geographic isolation and the vast area covered by the hospital render ASH ED a very significant hospital department.

The other complexity identified is clearly apparent: the location of ASH's patients. A large proportion of ASH patients reside in very remote communities. The complexity of transporting patients back to their communities was identified as a challenge, with patients often having to stay longer in hospital beds while waiting for transport back, delaying discharge.

The hospital frequently utilises hostel accommodation for patients who are well enough to be discharged. However, hostel accommodation in Alice Springs is limited, particularly with the recent closure of a major hostel, further complicating discharge of well patients.

Another identified ED issue was the process for admitting ED patients to ASH. Accessing hospital teams to come to ED to accept and admit patients was noted as an ongoing challenge. On the other hand, increased workload in the wards and/or theatres reportedly made it difficult for inpatient clinicians to come down to ED. While being a small hospital (less than 200 beds) meant an opportunity to be more efficient, a comparatively sicker population meant this opportunity couldn't be realised.

One of the biggest challenges for ASH continues to be its workforce. The main difficulty is in obtaining skilled staff. Recruitment was reportedly a significant issue for ASH, with difficulties not only in attracting nurses and doctors but also allied health staff. Further, due to the relative isolation of Alice Springs and a relatively high turnover of staff, the hospital has employed considerable numbers of transient staff. This limits the ability to set up long-term systems or mechanisms of working. Alongside staffing issues, support services such as 24-hour pathology and imaging required for a 24/7 ED/hospital were not available.

The lack of alcohol and other drug (AOD) services at ASH was also raised as

an issue. Alcohol abuse and dependence is a significant issue in Alice Springs (189), but prior to 2009, ASH did not have an AOD physician or department. This resulted in many patients not receiving treatment until late in the progression of their alcohol-related illness. Lack of AOD consultation liaison services meant lack of recognition of these issues; patients taking leave from the hospital, and on their return, requiring intensive care for severe withdrawal.

Central Australia has a high prevalence of chronic kidney disease.(179) Patients missing their haemodialysis appointments have created issues for both the ED and inpatient service. Some clinician's term Alice Springs 'the missed dialysis capital of the world' as a large proportion of patients, for a variety of reasons, did not attend their scheduled dialysis appointments on their scheduled days. As a result of missed dialysis, a substantial number of patients deteriorated, experiencing acute care needs and subsequently impacting on ED services. Renal patients attending the ED in the evening would have to be kept there overnight, and dialyzed at the earliest available opportunity within the hospital's capacity.

" *We were regularly during my first years working here … quite often being in bed block (access block). Patients were being bumped in corridors and spaces*." – **P-JC-1**

"*When you're jammed in like literally sardines in the old ED, there's very little capacity to have innovative ways of working*"- **P-E-1**

The above quotes echo those of many participants, detailing a perception of a very poor ED environment around 2008. The previous ED was physically a very small place, not conducive to care, with an inherent level of chaos. Within this chaos, increased risk of poor medical outcomes and inadequate identification of issues were entrenched, as patients were not able to be seen on time, or adequately assessed in the small built environment.

Access block was a huge issue, with patients reportedly lined up in the hallways, staying in the waiting room for long periods, receiving antibiotics in the waiting room, or being admitted but remaining in the waiting room overnight. This had an impact on patients and on the morale of the nursing and medical staff in their efforts to appropriately and safely care for those patients.

ASH ED at that time was also under-staffed and under resourced. This resource deficit included an inadequate number of computers, computer screens, x-rays, sinks, showers, and toilets. One shower and one toilet serviced 38-40 patients. The ED failed to meet privacy standards. According to clinicians who worked in the ED at that time, the ED failed to meet any hygiene targets. It failed to meet any infection control targets.

A significant barrier to ED patient flow was a lack of expedient access for clinical staff to patient diagnostic (pathology and radiology) results. Information technology (IT) solutions such as a purpose-specific system that

would provide clinicians with prompt access to patient results were not available, despite the fact it would have supported optimal and efficient clinical decision-making, reduced risks associated with delays and omissions, and thus improved flow and saving on costs.

The hospital made efforts to respond to these significant issues. Essentially the move from the existing ED to the new ED needed to occur before the old ED gave in. The transition to the new department had to occur before the former, fundamentally unsafe, ED stopped working due to increasing dysfunction.

Introduction of ED reforms

"*From government perspective I guess it is largely imperative to be seen to do something about these long waits in emergency department and the terrible service that the customers are getting.*"
- P-SC-3

"I guess my understanding is that there's been a lot of pressure politically to get emergency departments to improve their performance and one of the biggest things is really that concept of waiting time and people getting stuck in the emergency department in beds and so, we see introduction of the concept of NEAT targets and trying to get rid of access block."
–P-SC-4

"I think the context of why the ED reforms were brought in is to do with other hospitals in other states and not really our hospital, but they've obviously made it a blanket thing for all ED departments to fit with these reforms, so the whole guidelines about 4 hours or 6 hours and things like that." – **P-SC-10**

While the ASH ED did not individually trigger the national ED reforms, it formed an important part of the larger narrative regarding poor access to ED

services - ED overcrowding, access block, and increased ED waiting times - across Australian public hospitals. There was strong support for change within the hospital, and the national healthcare reforms and resources it brought provided a reason to trigger these changes. Along with funding for increased infrastructure and workforce resources, the reforms brought ED targets.

The first in the series of national ED reforms was the NPA-HHWR. This was recognised by some participants as the genesis of ED reform in ASH. The national agreement introduced the concept of a national ED target, the first time in Australia. Funding in 2010 to construct a new ED at ASH followed this. The old department was due to be replaced in May 1990 as the final part of the previous ASH rebuild, but this never occurred. Inefficient organisation of the upgrade of the rest of the hospital resulted in upgrades needing to be redone, and the resources meant for the new ED were diverted into error rectification. Over two decades later, in June 2013 the old ED closed and staff moved to the new ED.

It has now been more than two years since the new ASH ED opened. All participants agree the new ED is the most significant change in ASH to date. The move allowed the ED to expand the number of bays and to develop protocols for the short stay unit (SSU). Most importantly, with the move came the capacity to recruit more nursing staff in order to attain a more appropriate staff-patient ratio of one nurse per four patients.

ED volume represents a significant component of the overall work at ASH. So, as ED presentations increased, the opportunities of a new development arose and clinicians began considering different ways of working. This thinking led to the development of a Fast Track service, and the creation of patient flow teams within the hospital. These teams included a patient flow manager, bed managers, and a person in charge of discharge planning. Guidance from the Australasian College of Emergency Medicine (ACEM) and emergency nurses and doctors from other hospitals led to innovative approaches. Further, accreditation requirements prompted increasing attention to ways of addressing access block issues.

With the introduction of NEAT in 2011 there was pressure on the executive and clinical leadership to meet pre-determined national targets. Meeting the NEAT necessitated whole-of-hospital-thinking. The target put pressure on the entire hospital, ensuring it was not solely an ED target. When ED and inpatient teams were struggling with admissions from a capacity perspective, they were able get the attention of the coordinators, the executive, and the Board due to the NEAT. However, the small size of ASH meant there was already, to some extent, a cohesive whole-of-hospital team approach to patient management. So the gains had to be through the scrutiny of inefficient patient treatment protocols and management pathways and provision of resources to support implementation of efficient patient pathways.

The ED targets - both ED seen within clinically recommended times and NEAT - gave inpatient teams, including physicians and surgeons, part of the responsibility in ED performance. This led to greater inpatient engagement with ED, with inpatient teams more frequently visiting ED to admit patients, considering admitting patients even without comprehensive investigation, pathology, or diagnosis.

The ED reforms also led to increased focus on clinical redesign, incorporating Lean Thinking and Six-Sigma quality approaches. Due to the transient nature of Alice Springs, and consequently, ASH staff, it was often difficult to develop and implement long-term systems or mechanisms of working. Following the introduction of ED targets, and from 2012 onwards, a number of structural changes were initiated. One pertinent example is the move from the use of multiple nursing forms required for a transfer from ED to a ward, to a single form. Another is the increased focus on discharge processes, with enhanced Hospital-in-the-Home programs and collaboration with other sectors to enable early discharge.

In direct attempts to address access block, increased monitoring of length of stay was initiated within the ED. The hospital information system was modified to flag patients waiting for more than four hours. The access block measure was introduced to monitor ED performance and the hospital admission process. In ASH, the access block is split into two components 'regi-block' and 'bed block'. Regi-block is the time between ED referral of a

patient to an inpatient team and completion of the inpatient team patient review. Bed block is the time from the decision to admit until the time a bed becomes available.

In addressing both forms of access block, ED nursing staff ensured senior clinicians were aware of immediate and urgent category patients, to facilitate them being seen within clinically recommended time frames. ED leadership also ensured staff were proactive in recording patient 'seen times' data accurately and in time. The ASH ED also conducted audits, exploring which patients received what triage category, and which were appropriate. Education on ED targets and relevant protocols was provided to nursing and other ED staff. This increased focus on senior clinicians meeting time targets meant target awareness was filtered down to the junior clinicians. Senior clinicians led by example through enabling fast track processes for particular categories of patients, demonstrating proactivity in meeting targets and improving ED access.

ED reforms also prompted hospital management and clinicians to engage and collaborate with non-hospital partners, such as primary care providers and community and social services. The focus of these collaborations was on preventing ambulatory-sensitive admissions and supporting discharge and ongoing care of patients in the communities. ASH predominantly functions at 90 percent occupancy, so a focus on easing bed pressure through planning for hospice, nursing home, or outpatient setting and ambulatory care models was highly pertinent.

ED reforms also led to changes at ASH from a governance perspective. In 2012, the CAHN became responsible for governing the hospital. In July 2014, the hospital became part of the CAHS, with a new board and Chief Operating Officer. As CAHS also governed and managed primary and community health services, some saw being part of CAHS an opportunity to collaborate with non-hospital health services and focus on the whole of the patient care continuum. However, staff were pragmatic that the reform process had still a long way to go. Even though the national healthcare reforms were tapering down, the local reform journey had just commenced.

Clinicians and patients have benefited from the reforms

"*I think there's been an improvement because there are more experienced doctors working in the emergency department. There's more supervision. There are better support services*." – **P-SC-1**

"*There's more senior doctors going around going, "Who's going to pick up this patient or why haven't you decided what to do with this patient?" "You need to refer this patient to the medical registrar now. Don't wait for their results of the thyroid function tests which are not going to come back for two days." I think that within the ED, that's something that we found we've done over the last, definitely the last five to six years that would have impacted on our KPIs for the better*."-**P-SC-3**

"*The hospital and the staff, the primary care divisions, the government has been so renally focused because of the burden of kidney disease*"- **P-SC-11**

Many clinicians recognised that reforms not only enabled new infrastructure but also led to an increase in medical and nursing workforce. Within ED, this change had a considerable effect on performance and patient care. Fewer ED

consultants were employed in the pre-reform period, and in recent years there was improvement both in the number and quality of ED consultants. Over the last two years, there had been a stable group of local consultant physicians. The number of ED consultants increased from only three prior to 2008, to 6.5 at the end of 2014. Because of this increase, ED was able to raise the level of senior clinician cover from two to three consultants during a 24-hour shift period. For a significant part of the day there were concurrent consultants on the ED floor and at least two were present between 8pm and 10am. The availability of senior clinician decision-making in ED has been recognised as a key factor in the improvement in ED care at ASH.

Within the study period (2008-2014), the number and quality of ED registrars had also improved. Nearly all ED registrars that came to ASH training had chosen the hospital, as opposed to being seconded to the ED from other hospitals, and reportedly demonstrated a true interest in emergency medicine practice in a remote and Indigenous health context. There were 11 registrars, 4 senior Resident Medical Officers (RMOs), and 18 junior Remote Medical Officers (RMOs) and interns. Coupled with this increase in medical workforce was an increase in total nursing numbers.

Other areas of the hospital also experienced increases in specialist workforce, as well as satellite services, funded by the NT Government rather than the national reform program. The national reform context and its focus on increasing access to hospital services had placed pressure on the NT

Government to increase investment in its hospitals. Other contextual issues such as an increase in the renal burden and alcohol dependence in Alice Springs also prompted investment in relevant specialist services.

The focus on waiting times and investment in a new ED was largely welcomed by the Alice Springs public and local media, as indicated in public feedback to the hospital, and media reports on ASH ED performance in the 2013-2014 period. While the hospital leadership welcomes the improvement in ED in the context of reforms, there is acute awareness that many challenges (including increasing numbers of ED presentations and increasing sickness of patients) persist. This means complacency is a risk, and ED performance must be continuously monitored.

Clinicians feel the need for contextual targets

"*But certainly, there are some differences that might create problems in imposing a national context on an area in which 70% of patients are Indigenous and most likely to have chronic diseases. In terms of patient flow, that can create problems…*"- **P-SC-9**

"…. *Whatever reforms that are contemplated on a national scenario it has to be attuned to the needs of a particular centre*." **–P-SC-11**

While there was overwhelming support for the resources that the reform framework brought to ASH, there was a mixed response in relation to the corresponding ED targets. Many clinicians commented on the need for targets and what the hospital does as a consequence of the targets, to be reflective of the surrounding circumstances of ASH's patient population. Any

action taken out of this framework was not considered helpful in the long term.

The challenges of the Central Australian context were clear. The patient profile, particularly the high burden of chronic disease and other health risks in the Aboriginal population meant a longer length of stay for many ASH patients. Greater illness severity and a larger number of co-morbid conditions contribute significantly to this issue. There is also recognition that ASH patients tend to deteriorate more quickly, resulting in increased complexity of care required. Things that might be seen as fairly simple in other organisations were clearly more complex at ASH.

Other contributing contextual issues include self-discharge, which occurs at extraordinary rates across the hospital, and a smaller workforce. ASH has a high proportion of self-discharges for a regional hospital; and ASH patients are often not prepared to wait in the ED. Patients are therefore not completing their treatment, and are re-admitted more unwell. Workforce, or rather limited numbers of skilled workers, is also an ongoing issue for ASH. In an isolated location, the relatively high turnover of staff made ensuring a culture of safety in ASH a challenge. It is well accepted that it takes years to gain a proper understanding of the complex cultural, political, and health context in Central Australia: nursing staff in particular were said to have a stay period of three to six months.

There was a large body of opinion that national ED targets had not considered the contextual challenges faced by ASH, as described above. A final factor that impacts on the applicability of national targets is the availability of support services: where patients may be discharged to a step-down facility or to their home with community supports in other settings, these services are either non-existent or very limited in the Alice Springs context. This clearly impacts upon length of stay, bed availability, and consequently, ED access.

ASH's limited bed capacity (which did not increase in the reform period) is a major issue. There is a strong opinion that the ED is never going to function at its peak efficiency until bed capacity is increased. A further challenge in trying to reach NEAT or other ED targets in the context of limited beds is timely access to laboratory and radiology services. Over the weekend period there could be a 16-hour wait for a pathology result. While there was a provision to call in out-of-hours pathology and radiological services, consultants were reluctant to do so for a non-ICU patient. There can therefore be a significant delay in accessing results that may change outcomes and patient admission status.

A number of patients re-presenting to ED were doing so not because of inappropriate discharge, but because the social circumstances into which they had been discharged. These circumstances, including drug or alcohol dependency, or other social factors, precluded staying out of the hospital for

a prolonged period of time. It is not uncommon for a homeless patient to present to ED for boarding and lodging needs. To prevent skewing, these possibilities must be considered carefully when extracting or analysing hospital data.

While there was acceptance of a cut-off time point for patients to be seen and discharged for the majority of people attending the ED, having cut-off points that are inappropriate for the population impaired the level of care provided. The focus of cut-offs is time - not ensuring the patient has been taken from their state of disease or discomfort and moved into a state of ease, or is being treated and receiving the care that they require. Inpatient teams reported pressure from ED clinicians to admit patients in order to meet targets.

Interview themes indicated ED targets were useful as a driver for change in ASH, and because funds were allocated to implement the targets. However, unlike the ED seen within clinically recommended time and access block performance measures, many considered ED targets unrealistic and impacting on delivery of safe and quality care. Despite political pressure to do *something*, targets cannot be the endpoint.

Second stage of interview data analysis

Figure 25. The most frequently occurring words in the interview transcripts

The first stage of interview analysis identified previously unrecognised themes and mechanisms. This included identification of a strong theme emerging from clinicians about the need to contextualise targets, and in some instances, a resistance and lack of buy-in to the targets. The analysis also noted minor tensions between the inpatient teams and ED teams in terms of the admission process. The literature review and document analysis had previously identified that the national reforms brought focus and investment into EDs but other hospital services (with the exception of elective surgery and subacute care services) did not receive the same level of focus or investment. This sentiment was echoed in ASH. Also, there appeared to be a pattern in the interviews of some clinicians perceiving the targets as not relevant to the context, and some inpatient clinicians voicing

concerns about inequitable investment and focus in the national reforms. These emergent findings required consideration of new codes (developed using an inductive process) and listing of new mechanisms, which are presented in Table 20.

Table 20. New CIMO codes emerging from second stage of analysis

Context	
Alice Springs and Hospital	
C8	Social Issues
Local Reform and Funding	
C9	NT Funding
Intervention	
I4	Investment in specific areas only
I5	Local investment in infrastructure and workforce
I6	No Intervention
Mechanism	
M13	Clinicians feel targets not useful
M14	Clinicians feel the need for contextual targets
M15	Clinicians resist targets
M16	Inpatient clinicians not motivated to support ED clinicians
M17	Management and clinicians feel frustrated with inadequate community services
M18	Management and clinicians feel powerless to address external factors
M19	Management do not feel target useful

M20	Management does not want to meet targets at a cost
M21	Management feel compelled to communicate effectively
M22	Some clinicians feel unsupported
Outcome	
O4	Increase in access block
O5	No impact on performance
O6	Recent establishment of a program
O7	Steady performance

Based on emergence of these new codes (themes and mechanisms), the interview transcripts were reviewed again to code content to these new themes. The findings are presented as two key themes, which in turn are based on the codes listed in Table 20.

Clinicians feel targets are not useful

> *"I think that from my impression our ED care has not changed because of NEAT, because we have always tried to promote quality patient care more than NEAT targets."* **–P-SC-5**

Some senior clinicians felt the NEAT target was largely political, rather than arising from clinical evidence. Several clinicians with experience with the UK 4-hour target expressed reservations about its applicability in ASH. Some clinicians pointed to the New Zealand 6-hour program and its success, believing six hours was a more reasonable cut-off period. They were also sceptical that the NEAT measure adequately reflected hospital performance.

While the NEAT may lead to increased ED throughput, limited bed capacity in the hospital would still result in poor performance. Additionally, the NEAT was perceived to have led to pressure on decision making, thus affecting clinical outcomes. For example, it was speculated that NEAT and the drive to meet targets had led to increased antibiotic prescribing because of hurried diagnosis.

> *"My opinion was that in order to actually meet these targets or to significantly improve workflow through the emergency department, then we needed to have 24 hour pathology, 24 hour radiology, rapid turnaround of pathology and radiology reporting to make timely clinical decisions and both, with respect to clinical management discharge of patients and disposition of patients within the national targets*.
> *."* **–P-SC-2**

Further challenges in meeting NEAT were the limited laboratory and imaging services during the night and weekends - this deficit resulted in keeping patients in ED longer, until they were adequately tested and diagnosed. In the Central Australian context, where patients are brought in from remote locations at great cost, it does not make sense for them to be discharged and brought in after the weekend as an outpatient for pending tests.

Measuring re-presentations, an emerging ED performance measure, was also viewed cynically. If an asthma patient had been released following treatment, there was nothing to stop them having a relapse of their asthma within the next 12, 24, or 48 hours. Similarly with alcohol dependence - patients are not

discharged intoxicated, they are discharged sober. The fact that they may re-present within 12, 24, or 48 hours is not because the patient was discharged inappropriately. Instead, it was viewed as a failure of the system to arrange suitable resources such that the patient did not become intoxicated again.

ED targets and reforms were also viewed to have increased the bureaucracy of the department. There were more forms and considerably more processes for medical staff to deal with. However, there did not seem to be a concomitant improvement in health outcomes or care for patients.

Following the introduction of ED reforms, the hospital leadership initiated clinical redesign activities. While evidence has clearly shown such activities are essential to reduce wastage, increase reliability of services, and improve quality (97), there was a view that the initial consultation and planning, conducted by an external agency, was hurried and incomplete. Selective and easy-to-achieve projects were chosen but harder and systemic issues were perceived as ignored. One of these more difficult issues was 'regi-block' – the time between an ED referral to inpatient teams and when the inpatient team patient review is completed. Several ED clinicians suggested that inpatient teams had yet to adopt new or revised protocols to address access block, particularly during weekends or periods of peak activity. Admission processes were perceived by the clinicians to have not been properly addressed through the recent reforms. Both ED clinicians and inpatient clinicians indicated that inpatient 'length of stay' is an appropriate hospital wide target.

Due to patient preference to reduce time in the hospital and return to their community, the hospital system had to be geared to reduce length of stay and enable earlier discharges where clinically safe.

Some inpatient staff not motivated in supporting the ED

> *"I think the biggest holdups in Alice Springs emergency department are access to inpatient beds. Generally, the emergency department medical staff are efficient and timely, but it's the wait from a referral to a medical registrar or referral to a surgical registrar or referral to an orthopaedic registrar, that is where the bulk of the time to admission takes place."*
> -**P-SC-4**

While management and senior clinicians cited the cohesive and collaborative culture in the hospital as one of the main reasons for improvement in ED and hospital throughput, in-depth probing revealed underlying tensions. The view of ED clinicians was that the main reason for many ED hold-ups was lack of access to inpatient beds. This process involved getting ED patients assessed, admitted, and allocated an inpatient bed, but there were many impediments in the process. One primary cause was delays in inpatient registrars attending ED to admit their patients. The ED clinicians also had a view that medical and surgical staff were not as available in the hospital over weekends as ED clinicians. The ED clinicians were also of the opinion that the bed managers were not proactive enough, with avoidable delays occurring throughout the process. Finally, ED clinicians feared that the availability of a SSU could mean further delays in the inpatient admission

process, as inpatient clinicians would incorrectly assume the ED's capacity to hold the patients longer.

However, there was recognition amongst most ED clinicians that inpatient medical teams are coming on board to ED targets through having dedicated medical registrars for ED. There is also recognition that the medical teams are stretched and have to work with limited resources.

"*One of the issues there though is that ED performance isn't necessarily reflected in the medical performance in terms of bed flow, because the faster ED churns them out, the faster they get up to the ward and it makes absolutely no difference to the medical teams*."- **P-E-1**

"*There is an increase in admissions, but there hasn't been a corresponding increase in Allied Health, particularly for ED. We do struggle with trying to meet their needs."* –**P-JC-3**

"*I think one of, one of the barriers has been around medical engagement, and part of that is too, they just don't have the time,*" –**P-M-1**

"Look, I think we're going to always have access block until they increase bed capacity in the hospital." –**P-SC-4**

"*As far as supporting ED goes, medical registrars feel pressured because of the need to admit and bed shortages."*-**P-SC-8**

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Inpatient clinicians and allied health staff expressed a perception of increased pressure to admit patients faster due to the reforms, in spite of having limited resources both in terms of beds and workforce. The reforms were perceived to have not provided them the necessary resources to match

the increased ED throughput (arising as a result of increase in ED capacity) or any resources at the level ED had gained.

There was also pressure on senior inpatient clinicians to engage in clinical redesign activities while not being provided with a replacement or dedicated time to devote to the clinical redesign program. Some inpatient clinicians travelled to WA to study their 4-hour program implementation and had observed the appointment of medical champions and provision of resources for inpatient teams to address hospital bottlenecks. Unlike the WA program, the national healthcare reforms appeared not to have an inpatient focus in ASH (with the exception of elective surgery and sub-acute services), nor did it bring the resources required for a whole–of–hospital approach. This limitation was more acutely felt at ASH because of the contextual challenges.

Even if funding was available for an increase in workforce, recruitment and retention of a skilled workforce remained a challenge. There were also the contextual challenges of alcohol dependence, increasing prevalence of chronic kidney disease and diabetes, and limited social and community services. The inability to change this context and the ensuing frustration was reflected in participant interviews across the hospital. There is a strong view that the hospital would, on its own, be incapable of sustaining improvement in access. Collaboration with other primary health care and social services was imperative to progress the reforms.

REVISED PROGRAM THEORY:

Following the two stages of analysis, a revised program theory was formulated. The revised program theory was then discussed with 5 participants drawn from three of the professional groups (2 executives, 2 senior clinicians and one manager) that had been organised for the initial interviews. The participants confirmed the revised program theory, and provided some updates about recent increases in workforce, progression of the clinical redesign program, and continuing social challenges. These factors were incorporated into the final program theory. The revised and final program theory is articulated below:

National Healthcare reforms were introduced to improve ED access for patients across public hospitals in Australia over the 2008-2014 period. The introduction of *contextually relevant reform programs* ***have contributed to improvement in Alice Springs Hospital ED access over the 2008-2014 through*** *involvement of both management and clinicians****. The changes have been aided by infrastructure and workforce investment acquired through national and local funding. The funding has provided*** *resources/motivation* ***for clinicians to implement reforms. However, unequal investment across different areas of the hospital and continuing social challenges has an impact on the*** *motivation* ***of the hospital staff to sustain improvement.***

The revised program theory reflects findings from the interview, document, and quantitative analysis. These analyses identified that the national ED

reform program had to be contextualised to the Central Australian and ASH context through:

- modification of ED targets in the service delivery agreement (SDA);
- emphasis on quality and patient safety over meeting targets;
- provision of resource funding highly relevant to the ASH context both in the form of HHF funding and NPA funding; and
- continuation of measuring ED performance through the pre-existing access block measure.

It was also identified that leadership from ED senior clinicians, adoption of new clinical protocols (fast track, SSU), and support from management had a positive impact on ED access. This was confirmed through the quantitative analysis. However, interview data also identified underlying tensions and a negative perception of certain ED performance indicators. These negative mechanisms coupled with continuing contextual challenges would certainly affect the sustainability of gains.

As per realist evaluation standards, the program theory was broken down into CMO configurations to reflect the causal pathways. To emphasise the development and refinement of the program theory, the configurations are presented as refined and revised components. The refined configurations largely match the preliminary program theory and present a positive outcome. The minor change (hence 'refined') is that only 'some' inpatient clinicians are keen to support and collaborate with ED clinicians as was

identified in the interviews. The revised configurations reflect the new mechanisms that were identified post interview, which had a negative impact on the program to improve ED access. Both the refined and revised configuration patterns are presented below. Similar to the preliminary configuration pattern, the intervention component is clarified by the addition of an intervention (I) item to the configuration.

Refined CIMO Configuration Pattern (post interview analysis)

1. **Context:** National Healthcare Reform (NPA, HHF)
   + Intervention: Local investment in hospital infrastructure and workforce
   + Mechanisms: Management want to support clinicians + clinicians feel supported by management + clinicians feel encouraged to develop new protocols and pathways to improve patient flow
   =Outcome: Improved ED access

2. **Context:** National and Local Healthcare Reform (NPA, SDA)
   + Intervention: Introduction of ED performance indicators
   + Mechanisms: Management want to focus on specific factors such as access block + management feel compelled to communicate with clinicians more regularly and effectively + Some inpatient clinicians are keen to support and collaborate with ED clinicians + clinicians feel encouraged to develop new protocols and pathways to improve patient flow
   =Outcome: Improved ED access

Revised CIMO Configuration Pattern (post interview analysis)

1. **Context:** National and local healthcare reforms (NPA, SDA)
   + Intervention: Introduction of ED performance targets
   + Mechanisms: Management does not want to meet targets at the cost of patient safety and relationship with clinicians.
   = Outcome: Risk of decrease in ED access

2. **Context:** National Healthcare Reform (NPA, HHF)
   + Intervention: Investment in specific areas of hospital infrastructure and workforce only
   + Mechanisms: Inpatient clinicians are not particularly motivated to support ED or meet targets + Some clinicians feel unsupported
   = Outcome: Risk of decrease in ED access

3. **Context:** Alice Springs Context (Remote + Patient Profile)
   +Intervention: Introduction of ED performance indicators
   + Mechanisms: Management does not want to meet targets at the cost of patient safety and relationship with clinicians + management and clinicians frustrated with inadequate community services + management and clinicians feel powerless to address patient flow issues + ED and inpatient clinicians feel patient safety comes before patient flow or targets
   =Outcome: Risk of decrease in ED access

The refined and revised components of the program theory are also represented as a diagram in Figure 25 and 26, with C representing context, I, intervention, M, mechanism and O, Outcomes in both charts.

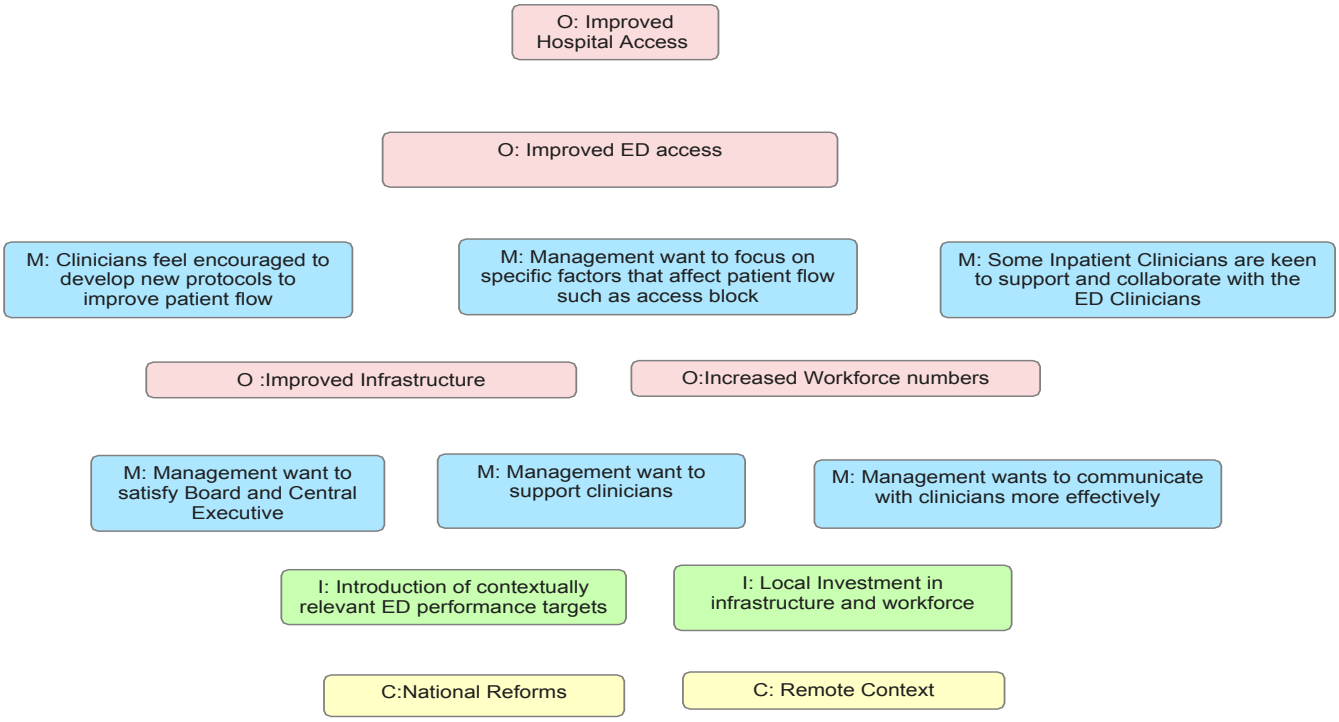

Figure 26. Refined program theory

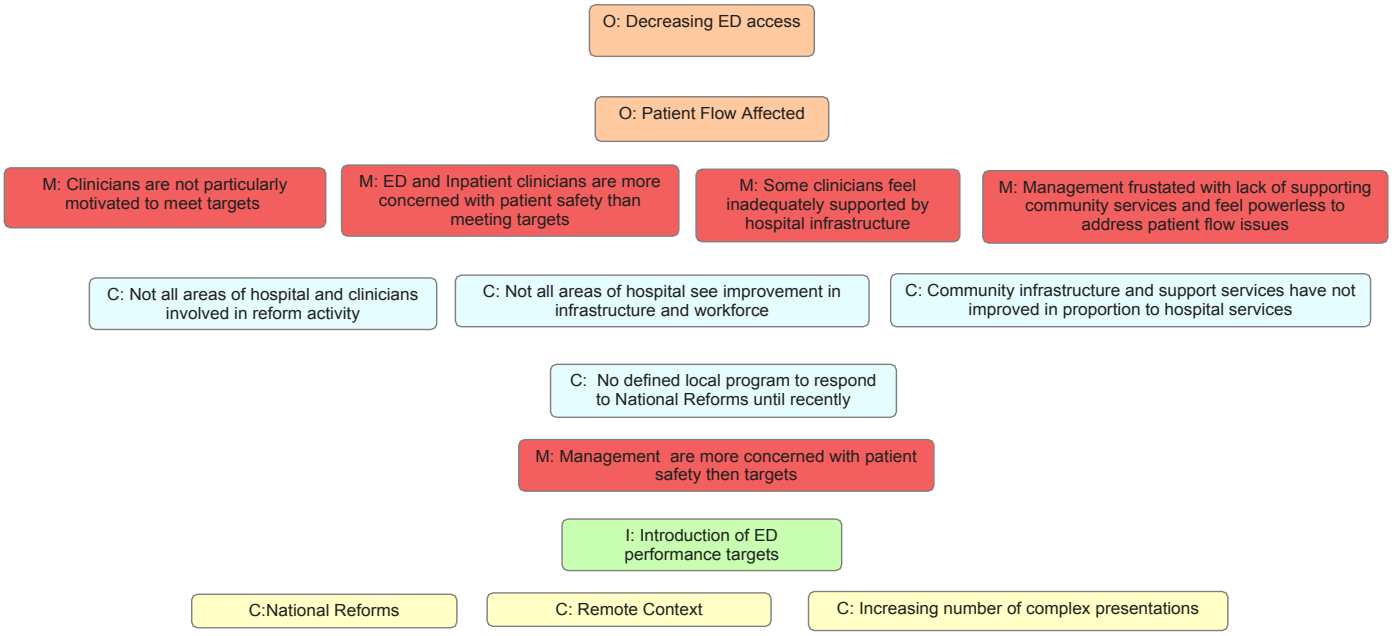

Figure 27. Revised program theory

CONCLUSION:

One of the key objectives of all realist evaluations is to test the program theory that is developed pre-data collection. Based on initial discussions with stakeholders and reading of national performance and media reports, it was easy to presume an association between national healthcare reforms and improvements in ED access. However, findings from hospital performance data and staff interviews challenged these pre-held notions. They also presented a riveting narrative of how ASH and its clinicians are striving to provide the best possible care for its patient population, a significant proportion of which is Aboriginal, and experiencing more severe illness, in spite of growing challenges.

The ASH ED is to an extent unique because of its remote location, geographical catchment, and importance to the area it serves. It has consistently risen to the task of providing timely and efficient emergency care for increasing patient presentations. The result has been a moderate increase in access post introduction of reforms. The reform period brought unprecedented investment to the ED but a concurrent need to meet national ED standards. Further, for the first time, a whole-of-hospital approach was considered because of the introduction of NEAT. Obligations to meet NEAT standards meant ED waiting times were no longer just an ED issue: other hospital departments also held some responsibility. While the targets brought a change to the status quo, both the management and ED clinical leadership were determined to not compromise on patient safety and quality.

The combination of quantitative, document, and interview analysis indicates an association between reforms and the improvement in ED access. However, the analysis also reveals factors that cast doubt on the sustainability of this improvement. These factors include limited bed capacity, inequitable reform investment, workforce challenges, rising chronic disease burden, and pressure on community and social services. The presence of these factors means continued monitoring of ED and hospital performance is necessary, and wherever they arise, issues must be addressed in a timely manner. The analysis also identifies tensions (negative mechanisms) that could hinder progress in ED access improvement. While recent developments indicate these tensions are being alleviated, ongoing monitoring of such negative mechanisms is required.

Realist evaluators believe it is not the program that leads to results, but the participants in the program who make the difference.(140,141) While resources are important to a program, so is the reasoning of the actors. It is therefore as important to highlight key mechanisms that have emerged as a result of the analysis, as it is the context or outcome. The key mechanisms are categorised as 'positive' or 'negative' based on their impact on ED performance.

Key Positive Mechanisms are ED clinicians and hospital management wanting to make improvements in ED access because of resources provided through reforms and introduction of time based ED targets.

Key Negative Mechanisms are clinicians and management feeling powerless to address contextual issues, and some inpatient clinicians feeling unsupported because of the lack of investment of reform funding in certain inpatient areas.

These mechanisms are not just relevant to ASH, but potentially to other regional hospitals undertaking ED or hospital reforms in the midst of contextual challenges. The revised and final program theory is highly relevant to policy makers who are contemplating the introduction of ED/hospital related reforms. The implication of the program theory for other hospitals and its basis in evidence is discussed in the following chapter.

CHAPTER EIGHT: DISCUSSION

INTRODUCTION

Hospitals, like other health care organisations, are complex adaptive systems.(184) A hospital is considered a system because it contains coordinated action for a purpose. It is complex due to the variable relationships between its components, making it hard to predict its behaviour or outcomes. The hospital is adaptive because employees can change and evolve in response to interventions and fluctuations in the environment. Understanding hospital systems to this level of depth is essential in order to meet the aims of the current study. However, examining issues at a granular level is just as important for comprehension of the impact of such complex phenomena as that under investigation. Fortunately, the realist case study methodology employed in this study and the subsequent analysis allowed for this level of introspection.

The use of a robust methodology and mixed-method data collection ensure that study findings can inform an audience beyond ASH and CAHS. It is anticipated that other regional hospital managers and clinicians, policy makers, and healthcare service researchers can benefit from this research. However, proponents of both realist evaluation and case study research caution about how much can be understood of a complex evaluation from a single study, no matter how rigorous it is. This is because as one examines systems closer, the more complex and invariant arrangements can be.(184)

Both case study and realist evaluations expect repeat evaluations, with further examination both at the original site and in other locations.(132,141,151,185) This study is a first step to filling a clear gap in the literature regarding the impact of national healthcare reforms on regional hospitals. It presents key mechanisms, identified as essential to consider when implementing ED or other hospital reforms in regional hospitals. This section outlines evidence from the literature that supports the findings, transferability, and credibility of the study, and presents recommendations for ASH to consider into the future.

Figure 29. The most frequently occurring words in the identified mechanisms

REALIST CASE STUDY

Most case studies are presented as stories with a plot, exploration of an idea, characters, and contextual description.(132,156) If we extrapolate the story metaphor to the current study, the national healthcare reforms provide the

setting with Central Australia as the backdrop, the hospital staff are the characters and commitment to improve patient outcomes is the key theme. This context is integral to this study, and to case study methodology. While the case study design provides flexibility in the methods and questions employed to draw out a narrative, it is crucial that the researcher understand the context as much as possible.(132,134) Hence, this study explored the context (including the hospital and reform context) at several stages, in as much depth as possible. This contextualisation not only enabled collection of multilayered data but also, to revisit the story metaphor, a plot. Employing a case study design ensured separation of the case (ASH) from the context (national healthcare reforms and the Central Australian context), maintaining these important boundaries, and streamlining data collection.

Realist evaluation also uses story telling as a frame to present its findings –it focuses both on programs and its characters, and the plot is presented as a program theory. Realist evaluators consider programs as complex and open social systems (140,152), composed of sequential interventions introduced over time in settings in transition. This is a pragmatic approach, rooted in scientific realism which suggests our understanding of reality will always be partial and provisional.(143,151) This does not mean being blind to the consequences of intervention, but being modest about the outcomes of a program evaluation.

Realist evaluators are also cautious with regard to the issue of attribution.(141) Unlike epidemiological studies, which use the classic Bradford Hill criteria (strength, consistency, specificity, temporality, biological gradient, plausibility, coherence etc.) to examine causal inference (186), realist evaluators explore the operation of mechanisms (141). Mechanisms act within a specific context to bring about change. The question is how can an evaluator be sure that these specific mechanisms are responsible for the change in that context. Realist evaluators avoid making universal claims about what works.(140,141) They utilise the principles of mid-range theory (MRT). They focus on the interaction of particulars such as a specific context, specific period, and specific participants in the creation of an outcome. Realists use a program theory and mechanisms to describe how program resources influence participants' reasoning, thus leading to particular outcomes. This is their perspective on attribution – a much more targeted approach. By operating at a mid-range rather than grand level, realist evaluation findings have a greater opportunity to be realistic and transferrable.(151)

As discussed earlier, realist evaluation begins with and ends with a program theory.(141) The program theory aims to discover what it is about programs that works, for whom, in what circumstances and what respects, and why? This explanatory model is outlined as a CMO configuration pattern (in the case of this study, CIMO configuration). This ensures that the study design, data collection, and findings focus on particular contexts, mechanisms, and

outcomes, ensuring any causal attributions are contextual and pragmatic. Importantly, the focus on CMO or CIMO sub-sets enhances the transferability of the explanations. Policy makers often struggle to generalise statistical findings in a meaningful way, and may find it easier to interpret and utilise a realist evaluation explanation of how and why certain mechanisms work, and in which contexts.(141)

The above listed principles of story, context, mechanisms, and program theory apply directly to this study. The adoption of a realist case study design enabled in-depth exploration of the context and articulation of a program theory. Care has been taken to express a mid-range and pragmatic program theory, through clear specification of the case (ASH) and outcome (ED access). While providing a background about international and Australian healthcare reforms, the main focus of the current study is the subset of national health reforms applicable to EDs. In-depth but streamlined questions were employed to elicit collection of dense but focused data. Findings were presented as CMO configurations so subsets of association patterns could be understood. Finally, prior research or review associated with the context and outcomes of this research was examined in the context of the current findings to enhance the study's credibility. The following sections discuss how evidence from literature applies to the study findings

REMOTE CONTEXT

There have been differing views about how national reforms will impact hospital services (22,23, 26, 41). The literature review identified little or no information on the impact of national healthcare reforms on remote hospitals, or how current reforms will involve remote hospitals and address their unique needs. This lack of available information prompted questions of whether hospital reforms are relevant to rural and remote areas considering their different profile (33). This gap and subsequent questions justified the conduct of a study focusing on a remote hospital, aiming to examine the contextual issues such hospitals faced, and how reforms could be adapted to address their unique needs.

There was an assumption when the current Australian hospital reforms were implemented that they applied equally to all public hospitals, including remote hospitals, in Australia.(19,21) Some flexibility was provided in financial arrangements and target levels (67,69,72), but no contextualisation of targets or provision of dedicated funding was identified for remote hospitals. The current study identified that in the Central Australian context, the success and efficacy of national healthcare reforms will occur through flexibility in targets and funding. Innovations in workforce and collaboration amongst different health services were also identified as essential and should be supported. Considering the complexity of the remote hospital's situation, consideration should also be given to developing contextually relevant health

databases, and supporting local evaluations. These views are supported in published commentaries.(31,33,111)

While there has been recent progress in terms of access to hospital and primary care services in rural and remote areas due to improved infrastructure, the gap in funding for rural and remote health services continues.(32) Consideration has to be given to rectify this through increasing investment in preventative care, strengthening primary care, and supporting workforce models that will encourage recruitment and retention in remote locations. Unless these wider policy and system changes occur, it is difficult to see how remote hospitals such as ASH can maintain optimal access to its services. While this study has presented some insights into the impact of reforms on a remote hospital, further studies are required to provide a clearer picture of the relationship between national health reforms and access to hospital services in remote locations.

ED Access

The traditional ED patient flow model comprises a triage nurse and ED physician triaging patients to the relevant treatment or specialty with the support of investigations (187,188), as depicted in Figure 3. However, a considerable number of issues with this traditional model have been identified, including poor utilisation of resources, duplication of effort, and considerable delay in treatment.(187) A frequent manifestation of the

inefficiency of this model is critical bed status[15] or ED overcrowding.(187,188)

However, ED overcrowding is not merely because of inefficiencies or poor ED resources. Overcrowding can be a direct result of inadequate bed and staff resources in the wider hospital.(190) Some authors have stated that overcrowding represents a global hospital dysfunction and any resultant mortality is due to inappropriate processes within the hospital.(30,190,191) There is no simple solution to access block: sustainable improvements can be achieved only by a whole-of-hospital and whole-of-system approach.(28) These solutions include increasing hospital and alternative care capacity, system-wide clinical redesign solutions, implementing over-capacity protocols, improving bed management practices, reducing avoidable hospital admissions, establishing chronic disease outreach programs, and improved access to step-down care and residential care.(28) Essentially, these are solutions that extend the focus beyond ED and consider the whole of the patient journey.

Findings from this study indicate that a whole-of-system approach will be required to address the rising number of ED presentations and increasing chronic disease burden at ASH, particularly in the context of limited bed

[15] Critical bed status has been defined as '*an emergency department overwhelmed by triage level 1 and 2 (severe) patients, inadequate stretcher space for additional or stretcher patients, or reasonable anticipation of multiple injured patients'.*(189)

capacity and minimal supporting social and community services. Adopting this approach will require efforts beyond the hospital, and involve CAHS (which oversees all government delivered health services in Central Australia), along with both the NT and Federal Governments. The establishment of the more broadly focused CAHS as a replacement for the hospital-focused CAHN provides a good opportunity for this whole-of-system frame of mind to be institutionalised and sustained.

The federal government also employed a whole-of-system strategy in the introduction of the national healthcare reforms (8) and the NEAT target (27). However, by the time reforms were implemented, the whole-of-system approach was not translated to the reality on the ground (67). With continuing pressure on public hospitals, the silo approach to provision of care has continued to a certain extent in recent years (69,198). The NEAT is increasingly perceived as an ED target (27,40) rather than a whole-of-hospital target. This was perpetuated by the flagship hospital performance agreement, the NPA-IPHS, which categorised NEAT as an ED target, largely ignoring the general medicine discipline.(72) These views have percolated down to ASH as reflected in the findings of the study.

Even within ED, many clinicians in ASH and other public hospitals do not have a favourable impression of the NEAT target. This is partly because of an adverse perception of the UK 4-hour program, and the intentions of the

Australian Government with the introduction of the measure. These clinicians view the 4-hour program as a political strategy rather than a clinical program. They perceive the focus to be on time, rather than quality of patient care or clinical end points. The target is perceived to have made ED consultants' bed flow managers, rather than retaining the responsibility for the assessment and treatment of patients.

However, these views ignore other reports from the UK highlighting the introduction of innovative ED models (such as the 'see and treat' model and fast track process), novel models introduced to the wider hospital including efficient bed management practices and the provision of appropriate diagnostic tests over extended periods, and the establishment of emergency networks comprising ambulance, primary care, and community services.(96) These views also ignore the opportunity NEAT has brought: it reflects the government's commitment to reduce ED overcrowding, allows the introduction of innovative practice models, and brings increased focus to clinical redesign processes as a solution to inefficient practices.(27) Further, WA has experienced improvement in patient flows across the hospital as well as quality improvements and a reduction of mortality following the introduction of the 4-hour program.(26,38) A very recent study, which involved a systematic review of the benefits and limitations of implementing NEAT reported there were significant improvements in in-hospital mortality for emergency type admissions in a large number of public hospitals where

NEAT was implemented.(193) However, the report cautioned hospitals and policy makers about dependence on time-based ED targets and suggested use of patient outcome-oriented targets to complement time-based ED targets.

As noted in the quantitative findings, there was no statistically significant improvement over time for NEAT at ASH. However, the NEAT results were only a recent introduction to ASH, implemented in 2012. Change takes time, and there is much further to be achieved with the NEAT performance. The CAHS SDA has incorporated NEAT, albeit with a modified target, so ASH is to live with the measure for the near future. The question remains as to how the target can be effectively met.

Measures that have been suggested by experts elsewhere to improve ED access include the creation of Short Stay Units (SSUs) to accommodate patients for short stays without requiring inpatient admissions (187,194) are already implemented at ASH. Other suggested measures include relocation of medical and surgical admissions units to within ED (inpatient registrars currently attend ED to admit patients), triggering of occupancy management policies like over-census beds (flexibility in provision of beds beyond official count), and reducing length of stay for sub-acute care patients.(187,194) However, implementation of these solutions requires additional resources, including an increase in inpatient capacity, increase in community services,

strengthening of primary care services, extended diagnostic and imaging service hours, and the introduction of point of care testing (partly implemented at ASH).(27,191) These resources need to be committed by the government for meaningful progress to be made with ED access.

There is evidence from literature about the importance of access to public hospital services to the general population, and how EDs act as an important gateway to hospital services.(8,28,94,96) Also identified in the literature is the importance of efficient and effective functioning of EDs to the general public and the government.(25,28,93,94) The recent reforms presented an opportunity for the Australian and state and territory governments to address issues with access and efficiency of emergency services.(27)

Ultimately, regardless of the differing views on the reforms and/or introduction of ED targets, no one at ASH wants a return to the pre-reform ED. Many clinicians, some grudgingly, remark how the hospital capacity (workforce and other resources) and performance has improved from 2008, though not proportionate to the increasing demand and chronic disease burden in Central Australia. The management also report an appreciation of the opportunity to innovate and implement new models that would not ordinarily have occurred without the context of reforms.

RELIABILITY AND TRANSFERABILITY

Case study design, as with all other research methodologies, has certain limitations. One of the limitations is generalisability of findings. On the other hand, one of the greatest strengths of a case study research method is that it collects evidence from multiple sources to corroborate findings. This data triangulation approach (132,156) contributes to the credibility and dependability of the findings. Combining a case study design with a realist evaluation approach aids in increasing the transferability and attribution power by laying out findings in a CMO configuration. This improves the usefulness of the findings for decision makers in other settings.(134,155)

Case study researchers prioritise enhancing the reliability of their findings. Steps include balancing results from one mode of data collection with another, prolonging the process of data gathering, using a variety of data sources, collecting referential material, and engaging in peer consultation.(131,156) In this tradition, the research protocol for this study was reviewed by external academics from the UK and Australia, mixed methods of data collection were used, multiple data collection stages occurred over a two year period, a literature review was included, and complementary data collected from the hospital with other reports was incorporated into the analysis. These steps are expected to increase the reliability of the findings within its case study context.

The realist framework employed has strengthened the transferability or generalisability of the study findings. Because of its philosophical foundations, realist evaluation stresses that formulation of an explanatory theory provides scope for transferability through explanatory mechanisms.(140,141) As opposed to method-oriented evaluations, realist evaluation findings transcend conventional divisions by presenting results in the form of explanatory CMO configuration patterns.

For realist evaluators, explaining the contextual factors in which specific mechanisms are triggered is critical. This ensures findings are not misinterpreted and stakeholders can be sensitive to diversity and change in program development and delivery.(141) In other words, realist evaluation does not purport to offer a one size fits all solution, but, instead, provides contextually sensitive causal attributions that in similar conditions can be replicated.(151,166)

Approaches taken to strengthen the credibility and transferability of this study are summarised in Table 21.

Table 21. Steps taken to maintain research credibility, transferability, and dependability (Adapted from Yin, 1994).

Tests	Steps
Reliability	• Triangulation/use of multiple sources of evidence • Maintain a chain of evidence • Have key respondents review data • Facilitate peer assessment of protocol • Undertake pattern and explanation matching • Prolong data collection period • Check the fit of the revised program theory with evidence from other sources
Transferability	• Use of realist evaluation framework/CIMO configuration pattern

LIMITATIONS

One study, even with a rigorous methodology, cannot profess to provide all the answers to the research questions being asked.(132,141) Realist evaluators are content to present a rational approach by providing answers that lie somewhere between a comprehensive form and a so-small-its-meaningless form.(140) They are also pragmatic in the context of limited data sources or resources and try to explain program footprints utilising available data and data types.

One of the limitations of this study is that not all reform variables were considered in the analysis. Reform funding, workforce parameters and even leadership themes were not exhaustively covered. As realist standards suggest (141), further studies will be required to examine the association between reform and ED access improvement, and perhaps causative factors. While we cannot assume from the results of this study that national healthcare reform led to improvement in Alice Springs Hospital ED access in isolation, we can confidently note there has been moderate improvement in ED access following the introduction of reform components.

Another limitation of the current study is the use of a single evaluation site. However, the realist case study design doesn't discriminate against single site selection, and allows intra-program comparison and in-depth analysis within a single site. In fact, case study strategies highlight the value of

critical cases (single case) in examining and testing a widely held assertion, particularly relevant for this study due to the nature of the case and the phenomenon being studied.(156) The level of analysis undertaken in this study may not have been feasible to complete within practical time frames if multiple sites were involved.

While we cannot assume the program theory derived from this study applies to each and every regional hospital in Australia or elsewhere, we can safely assume the mechanisms (positive and negative) and reform components (infrastructure and workforce funding, introduction of targets and clinical redesign activity) identified through this study are vital considerations when implementing ED reforms in other regional hospitals.

RECOMMENDATIONS

Based on the research findings, recommendations in relation to ED access and hospital reform can be made. One set of recommendations is for policy makers and the other set is for ASH and CAHS to consider. Only key recommendations are presented as minor recommendations are interspersed across the thesis.

FOR POLICY MAKERS:

Both realist and case study approaches emphasise the need to present clear findings.(141,156) With realist evaluation, unlike method-oriented

evaluations which restrict themselves to assessing whether a program has worked or not, the findings discuss causal and contextual components i.e why, when, how and for whom?(141) The framework through which the findings are presented is the program theory.(151) The final program theory from this study can be broken down as follows:

Table 22. Program theory in the form of why, when, how and for whom?.

Evaluation component	Program Theory component	CIMO configuration component
Why?	*National Healthcare reforms to improve ED access*	**Context**
When?	*Over the 2008-2014 period*	
How?	*Introduction of contextually relevant reform programs at ASH* *Infrastructure and workforce investment acquired through national and local funding.*	**Intervention**
	Through involvement of both management and clinicians.	
	The reform funding has provided resources/motivation for clinicians to implement reforms.	**Mechanism**
How?	*Continuing social challenges*	**Context**
	Unequal investment across different areas of the hospital	**Intervention**
	Impact on the motivation of the hospital staff	**Mechanism**
For whom?	*ED access for ASH patients*	**Outcome**

Based on the program theory and the findings from this study, two key recommendations can be made for policy makers in regards to future hospital reforms:

1. **Contextualisation of targets**

The Australian Government, as stated unequivocally in the National Health

and Hospital Network agreement, intended through its healthcare reforms for public hospital service delivery to be shaped by local needs and for these hospitals to be more accountable and responsive to local communities.(79) Local governance bodies like CAHS, and its predecessor CAHN, emerged as a result of this reasoning.(177,178,181) Yet, in regards to ED targets, flexibility to shape the targets around local needs was hard fought.

When the first national ED target was introduced through NPA-HHWR, there was no option for individual states or territories to negotiate about the target.(71) However, with the NPA-IPHS the Northern Territory (where ASH is based) negotiated with the Australian Government to modify annual NEAT targets (see Table 13) to suit its context (remoteness and Aboriginal context).(72,177) Yet, ASH lagged behind its counterparts in NEAT performance (see Table 11).(103,105,125) The CAHS in its 2014-2015 SDA brought down the level that ASH had to achieve with the NEAT target (see Table 14).(181) Feedback from ASH executive and senior clinicians, acquired through the interviews in this study, is that the SDA NEAT target is more realistic and takes into account the contextual challenges in which ASH operates.

Evidence indicates targets have to be contextualised and take into account factors influencing local service delivery.(24,100,108,111) If not, targets either become unachievable or meaningless or at the worst, stressful for clinicians.(100,108,193) Regarding Central Australia and the larger context of

regional Australia, resource constraints and the isolation component impose far more burden on hospital service delivery in these locations.(84,118,197) While targets are important in terms of performance improvement, they have to be shaped by local feedback to make them acceptable and realistic.(108,193) Future healthcare reforms have to consider this factor when formulating hospital targets.

2. **Long-term support for reforms**

As observed in the study findings, the resources provided through national healthcare reforms led to improvement in ED access. The introduction of ED targets helped in tracking ED access against a national standard. Reform investment enabled opening of a new ED in ASH and brought additional resources for the ED. Because of the challenging context in which ED services are delivered in Central Australia, this flow of investment into the ED was welcomed by the hospital management and clinicians. However, as also identified in this study the improvement in ED access seems to be of short-term nature and unsustainable. This is because of the contextual challenges in Central Australia (rising chronic disease burden, limited social services, social problems and workforce limitations) and because of the one-off nature of some of the investment (HHF),and expiry of relevant national agreements and thus expiry of funding and targets. (71,72,79,81,82,197)

While there was an expectation from the Australian government ,when the

national healthcare reforms were introduced, for state and territory governments to pick up the responsibility for long-term reform (including funding of hospital infrastructure and management of targets), budgetary constraints has meant states and territories have been unable to sustain the level of investment that was provided through the national healthcare reforms framework.(198,199) While reform led to improvement in ED access in ASH, a single achievement is not enough to ensure lasting change.(163,176) As evidence indicates, sustaining improvement takes time and requires significant resources.(62) Thus sustaining the improvement in ED access at ASH requires continued support from the Australian and NT governments.

Findings from this study identify a number of obstacles to change in ASH ED, including issues with the admission process, limited bed capacity and workforce, limited pathology and imaging services, and limited community and social services available to absorb ready-to-be discharged patients. A concerted effort is required by the hospital and CAHS leadership to address these obstacles to ensure the continuation of the change process. These efforts required significant funding and thus support from the Australian Government. With the expiry of national reform agreements and winding down of national healthcare reforms, it remains to be seen if the Australian Government will provide support for continued improvement in ED access at ASH. As discussed earlier in this chapter, this gap in funding is not restricted to ASH, a recent review identified significant gaps in funding for

health services in regional locations.(32)

FOR ASH AND CAHS:

Recommendations to ASH and CAHS are made on the findings from the different phases of analysis in this study (including quantitative, document, and interview analysis). The recommendations are presented as themes. These recommendations also have a strong evidence base in the literature that has been reviewed for this study.

1. Consideration of the whole of patient journey

ED performance measures like 'seen in time', NEAT, and access block are a misnomer: they do not just measure ED performance but the whole-of-hospital performance.(202) Similarly, ED targets are not just for the ED: as acute care targets they relate to and reflect upon the broader hospital.(203) Therefore, to improve ED access, the onus is on a hospital's management to drive change throughout the hospital. While ASH's management are well aware and supportive of this view, there is still much to be achieved. Areas to target include an increase in bed capacity, better bed management policies, improved admission and discharge process, and enhanced collaboration with non-hospital health and social services.

However, ASH on its own will not be able to address the whole-of-system issues. CAHS, through its oversight of all government-led health services in Central Australia, has to plan for out-of-hospital demand strategies, and for

enhancing community support for these strategies.(27) Demand from aged care, mental health, and sub-acute care are priorities to be addressed, as these measures can alleviate the pressure on the already stretched hospital.

2. Long term clinical redesign program

As discussed earlier, change takes time and the change process can face resistance.(62) So it is with change in ASH, and specifically with change to ED access. However, clinical process redesign can ensure the change process is efficient and on track to achieve its objectives.(204,205) In hospitals across Australia, clinical redesign has been demonstrated to increase access to services.(205) Clinical redesign has been assessed as a key element for improvement in ED access.(38) At ASH, clinical redesign has only recently been introduced, and, at the time of data collection, a process mapping and operations review (diagnostic phase) had just been undertaken by an external agency. Some clinicians were critical of the earlier consultation phase, stating it lacked good clinical engagement, while systemic issues failed to be identified or considered for improvement. However, ASH management has continued with their support for the clinical redesign program, and established a project manager to progress redesign activities.

Clinical redesign challenges the status quo and identifies long standing processes that are inefficient - a degree of resistance for the program can be expected.(204) While some may be content with the infrastructure and workforce improvements brought through the reforms, efficiencies gained

from these resources maybe one off and temporary. (204,206)

Long-term improvement in ED access can only be achieved through establishing patient-centric, minimal wastage, quality improvement processes.(204,206) Clinical redesign provides the framework to plan for and implement these processes. It focuses on the whole-of-the-patient journey, cutting down on protocols, which do not add value and waste time, and provides the opportunity to develop innovative models of care. In a challenging environment such as Central Australia and with the pressure on resources, clinical redesign is all the more essential. Thus, clinical redesign has to be considered a long-term strategy within ASH.

3. Improve ED support services

A repeat theme in the ED clinician interviews was the absence of 24 hour diagnostic and imaging services in ASH. The closing of these services in the evenings and over the weekends had reportedly led to either holding up of patient discharges, or requiring patients to return to ED for testing post discharge. While these services were accessible on call, this facility was used only for urgent cases. While point of care testing is increasing at ASH, specialised tests still required support from the pathology and imaging services. In the UK during the 4-hour program implementation, it was identified that prolonged access to diagnostic services was important both for patient care and for reducing length of stay.(99) The resources from NPA-

IPHS were intended to enable 24 hour imaging service, but this has not occurred at ASH. With an inability to access diagnostic and imaging services out of regular hours acting as a major bottleneck, priority has to be given to addressing this issue.

4. Address unequal distribution of reform funding

While the NPA-HHWR, NPA-IPHS, and the 2010 HHF brought increased investment and resources into the ASH ED (and in some cases, to surgery and sub-acute care), many other areas of the hospital (such as medical and allied health areas) received little focus from the national healthcare reforms. The lack of focus on these departments, coupled with an expectation to support the ED in its performance was criticised by a number of participants. Stretched inpatient departments are finding it hard to support the ED in meeting the 4-hour target. The reforms increased ED throughput, which brought increased pressure on inpatient clinicians to admit ED patients. Recommendations in the literature suggest that dedicated registrars from the main clinical disciplines should be allocated to ED.(27,38,207) In reality this is impractical in ASH considering the limited workforce in some departments. However, long-term inpatient clinicians have remarked about the considerable increase in medical and surgical workforce over the past decade and there may be potential in the future to consider dedicated registrars for ED.

The NT Government has provided increasing support for specialised medical

areas like nephrology and cardiology in recent years because of the increasing chronic disease burden.(172-178) However, increasing ED presentations and consequently, increased demand for limited beds means continued investment into workforce is imperative. The gaps in national healthcare reform have to be addressed through joint investments from the Federal and Territory Governments.

CHAPTER NINE: CONCLUSION

The study aimed to determine if ASH ED access has improved in the context of national healthcare reforms, and if so, how improvement was achieved in the face of known and emerging challenges for regional and remote hospitals. Combining a case study design with a realist evaluation framework enabled rich exploration of this complex context and potential extrapolation of results to other hospitals experiencing reforms. Consistent with a realist approach, the study has highlighted the importance of contextual factors, program resources, and staff reasoning for the realisation of change. This chapter summarises the study and presents its conclusions.

The reform of healthcare systems employs different approaches depending on the ideology of those calling for reform, and the context in which the reforms are perceived to be needed.(7) Reasons for reforming health care systems range from financial considerations to governance issues.(4,49) In Australia, the public health system has been facing the quadruple challenges of an ageing population, demand for more health services, workforce shortages, and increasing costs to operate health services.(9,69) Within the public health system and the entire health sector in Australia, public hospitals are key organisations, accounting for the majority of total health expenditure.(208) Like the rest of the health system, public hospitals face the challenges of meeting the service needs of an ageing population, increases in the burden of chronic diseases, and increasing costs.(8) The Australian Government, in its attempt to address the challenges facing the

public hospital system has called for major health reforms.(8,19) The main thrust of current health reforms is to improve hospital efficiency and increase patient access to hospital services. (19,68,69,209)

EDs form an essential part of the public hospital system and generally act as a hospital's public face, receiving sick patients on demand.(27,28,42) EDs can be easily overwhelmed due to heavy patient demand for services, resulting in 'crowding' and 'access block' to hospital beds. The Australian health reforms injected significant funds into improving access to emergency services. Benchmarks or targets were set to monitor emergency service performance.(27,69,71,72) A critical monitoring tool of emergency service performance, set through a National Partnership, is the National Emergency Access Target (NEAT).(72) This target has been set not only to monitor ED performance, but also hospital performance with respect to patient flow. The target is to have attending patients leave ED within four hours.

The measure (4-hour rule) has been in operation in WA and UK public hospitals for some time, with some good outcomes being reported.(26,99) However, questions have arisen regarding whether time based ED targets and the NEAT target are good measures at all. (41,108) There is speculation that the NEAT target may lead to harm to patients with an emphasis on discharging patients within a certain timeframe. Because of the mixed views about the national healthcare reforms and ED targets, it is critical to assess

how the ED reforms have rolled out in hospitals. This research project pursued answers to this query within the boundaries of the scope of a PhD study.

This study took a regional hospital in a remote context as it's setting. The choice of a regional hospital in a remote context was important, as there is minimal evidence about the impact of national healthcare reforms on regional/rural/remote hospitals. This lack has even led to some questioning if national healthcare reforms and interventions are useful for rural and remote populations at all.(9,33) ASH, a major regional hospital in a remote location (112,210), and its ED, were selected for investigation. The impact of the national ED reforms (provision of resources and introduction of ED targets) on ASH over the 2008-2014 periods was explored.

As ASH faces considerable contextual challenges, including the remote context, growing chronic disease burden, and social problems (88, 117,118), it was evident early on that a complex phenomenon was being studied. This, coupled with the larger context of national healthcare reforms, meant a rigorous study design was required for an impact evaluation. The study therefore employed a combination of a case study strategy and a realist evaluation framework. Both strategies have strengths in the study of complex phenomena, while the methodologies complement each other and

work well together.(132,134,149,155)

Realist evaluation requires formulation of a program theory before commencing data collection (141). Accordingly, on the basis of literature review, social theories, and stakeholder consultation, the following program theory was developed:

National Healthcare reforms were introduced to improve ED access for patients across public hospitals in Australia over the 2008-2014 period. These reforms contributed to gradual improvement in Alice Springs Hospital ED access because of the introduction of national ED targets, resources provided through reforms, and the willingness of management and clinicians to support the implementation of hospital reform.

To test the program theory, data were collected from multiple sources (hospital data sets, documents, and interviews) and through multiple methods (quantitative and qualitative). The quantitative component of this study charted ED performance indicator results over time. Analyses identified moderate improvement in some ED access indicators (increase in ED presentations seen within time and decrease in access block) over the reform period of 2008-2014. While these indicators capture only a single dimension of ED performance, they are still an important representation of the outcome of targeted ED reform.(28,30,94)

The qualitative phase of this study examined 'how' these outcomes were achieved. Analysis indicated that strong clinical leadership enabled improvement in ED access despite contextual challenges. Reform investment into infrastructure and workforce were also key drivers for improvement. While reform targets were important and contributed to improvement in ED access, patient safety was paramount for both management and clinicians. Sustainability of performance improvement will be difficult without changes in other hospital departments, including infrastructure and workforce, improvement in support services, and a long-term clinical redesign program. This led to revision of the preliminary program theory as follows:

National Healthcare reforms were introduced to improve ED access for patients across public hospitals in Australia over the 2008-2014 period. Introduction of *contextually relevant reform programs* ***contributed to improvement in Alice Springs Hospital ED access over the 2008-2014 period through*** *involvement of both management and clinicians.* ***The changes have been aided by infrastructure and workforce investment acquired through national and local funding. The funding has provided*** *resources/motivation* ***for clinicians to implement reforms. However, unequal investment across different areas of the hospital and continuing social challenges have an impact on the*** *motivation* ***of the hospital staff to sustain improvement.***

The thesis, backed by the research findings and evidence from existing literature, includes recommendations for policy makers to consider in future hospital and ED reforms in regional and remote hospitals. The main recommendation is for contextualisation of hospital reforms to achieve

reform objectives in regional locations. The other recommendation is to commit to long-term support to ensure sustainability of changes. The thesis has also recommendation for ASH and its governing body CAHS to progress its program to improve ED access. Recommendations include considering a whole-of-hospital and whole-of-system approach, a long-term clinical redesign program, expansion of ASH's inpatient workforce, and an increase in the capacity of diagnostic services at the hospital.

Finally, while the study presents useful findings in the context of minimal existing evidence about the impact of national healthcare/ED reforms in regional hospitals, it strongly recommends further evaluations be undertaken both at ASH and at other sites. This is essential to test the findings from this study, and collect further evidence regarding the impact of the national healthcare reforms on regional and remote public hospitals.

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APPENDICES

APPROVALS

CENTRAL AUSTRALIAN HUMAN RESEARCH ETHICS COMMITTEE
Centre for Remote Health
PO Box 4066 Alice Springs NT 0871
Ph: (08) 8951 4700 Fax: (08) 8951 4777
Email: cahrec@flinders.edu.au

Dr Sandeep Reddy
Centre for Remote Health
PO Box 4066
Alice Springs NT 0872

23rd September 2014

Our Ref: HREC-14-266

Dear Dr Reddy

RE: Ethics Application – Approval

The Central Australian Human Research Ethics Committee (CAHREC) considered your research project **'Alice Springs Hospital's program to meet Emergency Department Performance Indicators in the context of National Health Reforms-A Realistic Evaluation'** at their meeting on the **18th September 2014.**

The Ethics Committee agreed that this project meets the requirements of the National Statement on Ethical Conduct in Human Research.

However the Committee did request that the researcher proof read the Letter of Introduction to make it more reader friendly eg some parts of paragraph 4 are difficult to follow.

The Committee members decided to **grant approval** for your project to proceed.

The period for which approval has been given is from the date of this letter until the **31st December 2016**. If you do not complete the research within the projected time please request an extension from CAHREC.

Ethics approval is contingent upon the submission of an annual Progress report and a Final report upon completion of the project. It is the responsibility of researchers to make a note of the following dates and submit these reports in a timely manner, as reminders may not be sent out. Failure to submit reports will result in your ethics approval lapsing.

Your reports are due on:

23rd September 2015

23rd September 2016

31st December 2016

Copies of the report form can be downloaded from the CAHREC website.

Yours sincerely

Chris Schwarz
Secretariat Support
Central Australian Human Research Ethics Committee

Northern Territory Government

Central Australia Health Service
NORTHERN TERRITORY HEALTH

Central Australia Health Service Board
Postal Address: PO Box 721
ALICE SPRINGS NT 0871
Tel: (08)89517089
eMail: CAHSB.DOH@nt.gov.au
Our Ref:

Mr Sandeep Reddy
PhD Candidate
Flinders Northern Territory

Dear Sandeep,

REQUEST TO USE DATA FOR DEVELOPMENT OF PhD

I received your letter on 11 September 2015 and am able to grant permission for you to use the findings of your PhD research **(A realist case study of Alice Springs Hospital's response to improve emergency department performance in the context of National Healthcare Reforms)** to develop your thesis.

Yours sincerely

Damien Ryan
Chair
Central Australia Health Service Board

15 September 2015

Northern Territory Government

DEPARTMENT OF HEALTH

Dr Meredith Arcus
Director of Medical & Clinical Services
Alice Springs Hospital

Postal Address: PO Box 2234
Alice Springs, NT 0871
Tel: 08 895 17017
Fax: 08 895 17665
eMail: meredith.arcus@nt.gov.au

LETTER OF INTRODUCTION

Dear _____

This letter is to introduce Dr Sandeep Reddy who is a PhD candidate and staff member at the Centre for Remote Health, School of Medicine at Flinders University. He will produce his student and staff card, which carries a photograph, as proof of identity.

He is undertaking research leading to the production of a thesis or other publications on the topic of "Alice Springs Hospital's program to meet Emergency Department Performance Indicators in the context of National Health Reforms- A Realistic Evaluation".

Outcomes from the study will contribute to hospital performance improvement processes and improved patient care models apart from adding to the evidence surrounding impact of health reforms on regional hospitals in remote locations. He would like to invite you to assist with this study by agreeing to being observed at staff meetings and to be involved in an interview, which covers certain aspects of this topic.

Be assured that any information provided will be treated in the strictest confidence and none of the participants will be individually identifiable in the resulting thesis, report or other publications. You are, of course, entirely free to discontinue your participation at any time or to decline to answer particular questions.

Please do not hesitate to contact me if I can be of assistance.
Kind regards

Dr Meredith Arcus
Executive Director Medical & Clinical Services
Central Australian Hospital Service
Alice Springs Hospital

INTERVIEW DOCUMENTS

PARTICIPANT INFORMATION SHEET

Study Topic

Alice Springs Hospital's program to meet Emergency Department targets in the context of National Health Reforms- *A Realistic Evaluation*

Thank you for considering participating in this research study. Please read this information carefully before deciding whether or not to participate. If you prefer, we can go through this information sheet together. If you decide not to participate, there will be no disadvantage to you of any kind.

I am undertaking this project as a principal researcher and as a Ph.D. candidate at Flinders University. The project is being supervised by Professor Tim Carey (Centre for Remote Health) , Professor John Wakerman (Flinders NT) and Professor Judith Dwyer (Flinders SA). This study has been reviewed and approved by the Central Australian Human Research and Ethics Committee and the Flinders University Social and Behavioural Research Ethics Committee.

Background:

Because of the critical role that public hospitals play in the provision of essential health services in Australia, there has been increased scrutiny of their performance. A key issue is access to emergency services. The Australian Government has embarked on a major reform of the public hospital system including the establishment of various performance indicators to monitor and improve emergency department access. The national reforms and performance indicators are meant to apply to all regions and all public hospitals.

Regional Hospitals in remote locations face unique challenges because of the environment they are in and limited resources. There have been several questions if the national reforms have been useful for remote health services. This study examines the reform process, over the period 2008-2014, in Alice Springs Hospital (a regional hospital in a remote location), which has in recent reports demonstrated improved access to its emergency

services.

This study will describe the process how this improvement in performance was achieved and analyse the theory behind the process.

The Key Emergency Department Performance Indicators this study proposes to use are:

- *Emergency Department Waiting Times*: This performance indicator monitors the proportion of patients seen within the recommended time for their triage category. This measure is a good indicator of how accessible hospital emergency services are to patients.
  At this stage, there is no single set of national comparators for public hospitals to compare their performance. Hospitals can compare their performance to the average performance of a similar group (peer group) of hospitals. This comparator changes as individual hospital performance varies each year.

- *National Emergency Access Target (NEAT)*: The NEAT has been defined as "where 90 percent of all patients presenting to a public hospital ED will either physically leave the ED for admission to hospital, be referred to another hospital for treatment, or be discharged within four hours"

  However, NEAT is not just about improving the performance of emergency departments. Importantly, it has a broader objective of improving overall hospital performance. Obviously, patients are not able to leave an emergency department and be admitted for care if the hospital lacks available and appropriate inpatient beds. In fact, a lack of hospital beds is said to be the principal cause of ED overcrowding. So the objective of NEAT is to drive change 'across the hospital' through clinical service redesign, which requires both Executive and Clinician engagement.

Therefore the study will also use the following data to support analysis:

- *Emergency Department Presentations*: Emergency presentation refers to attendance for an actual or suspected condition, which is sufficiently serious to require acute, unscheduled care.
- *Emergency Department Access Block*: describes the delay patients who need hospital admission experience in the emergency department when their inpatient bed is unavailable. A wait period of more than 8 hour is considered Access Block
- *Emergency Department Did Not Wait*: includes Patients who presented to the emergency department and did not wait or left against medical advice

- *Hospital Admissions* including overnight and same-day admissions

Research Objective:

The primary objective of this Ph.D. research is to develop a theory to understand Alice Springs Hospital efforts to meet Emergency Department Performance Indicators (ED-PI).

The sub-objective will be to assess the usefulness of the theory's major elements and approaches.

What we are interested in:

Semi-structured interviews and observation of staff meetings will be utilised to collect information about key themes. The themes would include:

- The **context** in which the ED-PI have been established
- The **challenges** faced by clinicians and management to meet ED-PI
- The **opportunities** presented when meeting ED-PI
- What other **parameters** may be useful to track improvement in ED and hospital performance?

How the observation will be carried out:

- The observation will be carried out by the principal investigator [Sandeep Reddy]
- Permission will be sought from the head of the hospital and department head separately to engage in staff meetings
- Participants will be advised of the principal investigator's involvement in a particular staff meeting
- The discussion may be recorded on a tape recorder if you agree to this. If you do not wish to be audio taped then, there will be no disadvantage to you and what you say will be written on paper.
- You can request that the tape recorder be stopped at any time during the meeting.

How the interviews will be carried out:

- The interviews will be face to face with the interviewer [Sandeep Reddy]

- The interviews may be recorded on a tape recorder if you agree to this. If you do not wish to be audio taped then, there will be no disadvantage to you and what you say will be written on paper.

- You can request that the tape recorder be stopped at any time during the interview.

- The interview involves a number of questions and the exact questions will depend on the way in which the interview develops

- There will be likely two interviews with each participant. The initial interview will last no longer than 60 min with a follow up interview lasting approximately 30 min to test the emerging themes identified in the initial interview.

Right to withdraw:

- You have the right not to answer any particular question
- You can withdraw at any time without any disadvantage to you.

How the observation data and interviews will be used:

- Data from the observation and interviews will be written out and will be anonymised (i.e. your name or any other personal details will not be recorded with the interview transcript).

- Your identity will be confidential to the principal researcher.
- Some parts of the interviews may be used as quotes in the report. Any quotes used will be anonymised.

- The results may be published, but any quotes included will not be linked to any particular participant or organisation, and all quotes will be anonymised.

- The tapes will be destroyed at the end of the research study, or if you would prefer, we can return the tape to you.

- Should you wish, we would be very happy to send you the results of the research study.

Questions or queries:

If you have any questions about this project, either now or in the future, please feel free to contact the principal researcher [Sandeep]as per the contact details below:

Dr Sandeep Reddy
C/- Centre for Remote Health, Cnr Simpson and Skinner Street
Alice Springs, NT-0870
Phone: 0487194924

Email: sandeep.reddy@flinders.edu.au

Concerns or complaints:

If you have any concerns or complaints about this project, either now or in the future, please feel free to contact the following Ethics Committees as per contact details below:

1. Secretariat Support
   CAHREC
   Centre for Remote Health, cnr Simpson and Skinner Streets
   ALICE SPRINGS, NT 0870

2. Secretariat Support
   SBREC
   Research Services Office
   Flinders University, Adelaide

CONSENT FORM FOR PARTICIPATION IN RESEARCH
(BY INTERVIEW AND OBSERVATION)

Alice Springs Hospital's program to meet Emergency Department targets in the context of National Health Reforms-
A Realistic Evaluation

I

……

being over the age of 18 years hereby consent to participate as requested in the …… for the research project on. ……

1. I have read the information provided.
2. Details of procedures and any risks have been explained to my satisfaction.
3. I agree to audio/video recording of my information and participation.
4. I am aware that I should retain a copy of the Information Sheet and Consent Form for future reference.
5. I understand that:
   - I may not directly benefit from taking part in this research.
   - I am free to withdraw from the project at any time and am free to decline to answer particular questions.
   - While the information gained in this study will be published as explained, I will not be identified, and individual information will remain confidential.
   - Whether I participate or not, or withdraw after participating, will have no effect on any treatment or service that is being provided to me.
   - Whether I participate or not, or withdraw after participating, will have no effect on my progress in my course of study, or results gained.
   - I may ask that the recording/observation be stopped at any time, and that I may withdraw at any time from the session or the research without disadvantage.
6. I agree/do not agree* to the tape/transcript* being made available to other researchers who are not members of this research team, but

who are judged by the research team to be doing related research, on condition that my identity is not revealed. ** delete as appropriate*

7. I have had the opportunity to discuss taking part in this research with a family member or friend.

Participant's signature……Date……..

I certify that I have explained the study to the volunteer and consider that she/he understands what is involved and freely consents to participation.

Researcher name Dr Sandeep Reddy

Researcher's signature……Date……..

NB: Two signed copies should be obtained. The copy retained by the researcher may then be used for authorisation of Items 8 and 9, as appropriate

COMPLETE LIST OF IDENTIFIED CIMO'S

Context	Description
Alice Springs and Hospital	
C1	Hospital issues
C2	Regional Hospital
C3	Remote Location
C4	Social Issues
Local Reform and Funding	
C5	NT Funding
C6	SDA
National Reform and Funding	
C7	HHF
C8	NPA HHWR
C9	NPA IPHS
Intervention	**Description**
I1	Creation and implementation of hospital wide processes
I2	Hospital wide targets
I3	Introduction of ED performance targets
I4	Investment in specific areas only
I5	Local investment in infrastructure and workforce
I6	No Intervention
Mechanism	**Description**
M1	Clinical leaders want to implement targets and staff keen to follow
M2	Clinicians understand the bigger picture
M3	Clinicians feel encouraged to develop new protocols
M4	Clinicians feel patient safety is a priority
M5	Clinicians feel supported by Management
M6	Clinicians feel supported by Management and Government
M7	Clinicians feel targets not useful
M8	Clinicians feel the need for contextual targets
M9	Clinicians resist targets
M10	Clinicians want to collaborate because of the context
M11	Inpatient Clinicians keen to support ED clinicians
M12	Inpatient Clinicians not motivated to support ED clinicians
M13	Management and Clinicians feel frustrated with inadequate community services
M14	Management and Clinicians feel powerless to address external factors
M15	Management do not feel target useful
M16	Management does not want to meet targets at a cost
M17	Management feel compelled to communicate effectively
M18	Management keen to implement targets
M19	Management want to satisfy Board and Government
M20	Management want to support clinicians
M21	Some clinicians feel unsupported
Outcome	**Description**
O1	A long standing program
O2	Negative impact on ED access
O3	Outcome difficult to assess

O4	Improved ED performance
O5	Improved patient flow
O5	Increase in access block
O6	No impact on performance
O7	Recent establishment of a program
O8	Steady performance

CHANGE MANAGEMENT APPROACH (AS IT APPLIES TO THIS STUDY)

INTRODUCTION

A broader concept in a theory-oriented evaluation is it's theoretical approach, which explains the basis of changes and mechanisms discussed within the program theory. While program theory is an illustration of how the outcomes were achieved or not, the theoretical approach explains and substantiates the change mechanisms articulated in the program theory. The chapter discusses a theoretical concept relevant to organisations undergoing change: Change Management. Change management as a theoretical approach not only guides organisational changes (1,2) but, pertinent to this study and its realist framework, also explains the cognitive reasoning of the actors involved in changes.

One organisational approach has significantly influenced the construction of this study's program theory, and underpins the program theory – change management theory. Health care reform, in its essence, seeks to change existing heath service arrangements.(3,4,7) While health care reform has progressed from an exclusive focus on organisational change to include changes in economic aspects of health services, organisational change is still a major component of health care reform.(3,4) Many different theoretical models of organisational change have been proposed.(8)

However, change management theory is considered more appropriate for this study rather than organisational change theories because of the nature of Alice Spring Hospital 's (ASH) change program. ASH adopted low-intensive change management processes to move the hospital towards ED targets and address challenges, rather than wider organisational shifts/changes that occur elsewhere in the context of national healthcare reforms.

There are numerous change management theories.(1,9) In its quest to provide high quality, safe, effective and cost efficient care, the healthcare sector has borrowed various change management models from other sectors to enact changes within its services. (1,13) A focus on systemic changes has meant development of numerous strategies and tools on the basis of these models.(1,13) However, at a fundamental level, change management in health care, or more specifically in a hospital setting, is about managing and/or implementing change to improve clinical service delivery through

transformation of care practices and organisational or team culture.(12–14)

In the context of this study, change management relates to both improvement of practice and transformation of team and management culture. This results in improvement in ED access, that is, ED patients receiving care on time. As discussed previously, it is important not to get distracted by the numerous circulating change management theories/models, and instead ensure adoption of a model that directly relates to the change mechanisms articulated in the program theory. Two change management models have gained popularity in the healthcare sector due to their relevance to the rapid and complex changes that occur in the industry.(1) These are 'Kotter's change management model' and 'Bridges's transition model'. These two models are also highly applicable to the current study and its program theory.

Kotter's change model (14,16) incorporates both an emotional and situational component, and methods for managing each are expressed in an eight-step non-linear model:

1. Increase urgency
2. Build guiding teams
3. Get the vision right
4. Communicate for buy-in
5. Enable action
6. Create short-term wins
7. Don't let up, and
8. Make it stick.

Conversely, Bridges addresses change at a more individual and granular level.(17) His model suggests that individual's transition from one identity to another during change situations. These transitions occur in three steps:

1. Endings
2. The neutral zone, and
3. Beginnings.

The current study takes the view that changes occurred in ASH at both the hospital organisational and individual levels. Thus Kotter and Bridge's models are considered equally important in explaining the change mechanisms expressed in the program theory. The remainder of this chapter discusses these two models in the context of this research.

CHANGE MANAGEMENT: KOTTER'S MODEL

In 1996, John Kotter published *Leading Change*, now widely accepted as a foundation work in the field of change management.(1,16) In this work,

Kotter stated that organisational change can be managed using an active, non-linear eight-step process, as described above.(15,16) The eight-step process is grounded in well-accepted principles of organisational psychology (19), which considers four basic conditions must exist before employees change their behaviour:

1. Presenting a compelling story for changes so employees can see the point of change and consequently support it;
2. Creating role models, who employees can admire and model their behaviour;
3. Adapting existing systems and processes to be in line with the changes and reinforcing this at regular instances; and
4. Enabling employees to build their capabilities to implement the changes.

Based on these principles, Kotter's eight step approach can be structured into three distinct phases (1):

- *Creating a climate of change* (Steps 1, 2 and 3),
- *Engaging and enabling the whole organisation* (Steps 4, 5 and 6), and
- *Implementing and sustaining the change* (Steps 7 and 8).

Creating a climate of change, steps 1, 2 and 3, involves the process of facilitating employees to understand why change is required, and why there is an urgency about it.(1) As a sense of understanding and urgency develops, change managers establish guiding teams. These teams, comprising credible and respected staff, guide employees towards the changes required. Also important in this phase is the identification of key visions for the future i.e. what is the change process required to achieve, and what steps must be taken to achieve the objective? The guiding team has the responsibility of developing these visions and selling them to the employees of the organisation.(1)

Engaging and enabling the whole organisation, steps 4, 5 and 6, involves the guiding teams addressing negative feelings arising as a result of the change process. In order to do so, they must adopt robust communication methods that enable employees to think and act in line with the change plan.(1) Kotter states that an effective way to address negative feelings is to commence by selling the vision of the change plan, and enabling buy-in. For this to occur, an engaging story about the context and need for change has to be communicated. Also in this phase, the impact of the rollout of changes is monitored, with pockets of resistance addressed through question and

answer sessions. Finally, involving employees in change planning is a focus: this not only increases their commitment to change but enables faster action. It is important in this phase for the change managers and guiding teams to choose and complete assignments that can clearly show the change process is succeeding – the short-term wins. These wins create momentum for bigger and subsequent changes.(1)

Finally, implementing and sustaining the change, steps 7 and 8, emphasise the importance of not letting up with the change process.(1,15) Many change projects fail because of early declaration of success. This phase emphasises change managers avoiding the trap of complacency, arising as a result of increasing short-term wins. It is important to maintain the sense of urgency created in the first three steps and stick with the change processes that enabled the short-term win. Kotter suggests referring to external competition, and enabling a culture that fosters and supports the change visions as measures addressing change sustainability.(1)

Through the eight steps, across the three phases of change, Kotter's model expects change managers to appreciate and capitalise on employee's negative emotions (including feelings of anger, cynicism, panic, insecurity and complacency) that arise as a result of the changes/interventions, transforming them into positive and proactive feelings (such as passion, excitement, trust, and hope).(1,15) As described above, this transformation is achieved through the communication of a compelling vision for change, and the development and implementation of appropriate teams to guide employees in the process of change.

Another concept that Kotter's model builds upon is the 'see-feel-change' model. Traditionally, managers have used the 'analysis-think-change' model to initiate changes.(1) This concept proposes that providing employees with information about change in the form of reports will enable analysis, and consequently changes in employees' mindset and behaviour. This is premised on a trust in employees' ability to harness their rational thought to bring about change in their behaviour. Kotter observes weakness in this approach, stating large reports and analysis rarely drive the message of urgency and change required on their own. He presents the 'see-feel-change' model, where change managers have to create a 'compelling, eye-catching, dramatic situation'(1, p.31) to help employees identify the problem and devise a solution.(1,15) This form of presenting change creates feelings, which can be harnessed to action change. Behaviour fuelled by emotions is likely to last longer than behaviour arising as a result of intellectual analysis.(1)

The current study's preliminary program theory, deriving its position from Kotter's model, assumes the context of poor ED access and the opportunity (resources and targets) arising as a result of national healthcare reforms presented a compelling story for change in ASH. It also theorises that the hospital management and clinical leadership effectively communicated this vision for change. This led to hospital staff buying into the change vision, and actioning change to improve ED access. This assumption is tested here and analysed in relation to Kotter's model.

CHANGE MANAGEMENT: BRIDGES'S TRANSITION MODEL

While Kotter's model emphasises the change process itself, Bridges's model argues it is the transitions that determine the success or failure of a change project.(1,17) Changes are considered situational, and transitions psychological. The model focuses on the individual's adaption to change or more specifically, transition to the changed environment. The three stages through which an ideal transition will occur as described above are endings, the neutral zone, and beginnings. Bridges posits that successful change is more likely if employees transition through these stages (1,17), described in more detail below.

In the initial endings stage, Bridges recommends the change manager consider what the employees are losing as a result of the change process.(17) It is not the change process individuals resist, but the loss they may experience as a result of the change. People like predictability, and being in control. They also possess a specific set of beliefs that guide their actions.(1) However, changes can disrupt these beliefs. Therefore Bridges states it is important for change managers to document employee's beliefs, acknowledge the importance of these beliefs, and make decisions sensitive to these beliefs. Bridges also recommends change managers assist individuals to openly acknowledge their losses, and help them move on. Change managers should attempt to compensate individuals for those things they feel have been lost.(1,17)

The neutral zone marks the grey zone between endings and beginnings.(1,17) Bridges states that in this zone, individuals fluctuate between their desire for the pre-change past and the excitement for prospects that a new environment brings. Bridges cautions change managers not to ignore these feelings as the vacillation could polarise groups, and if

not properly managed, lead to failure of the change project. To address the negative feelings, Bridges suggests employees and change managers to consider the neutral zone as a journey, not a single step. The journey includes adaptation to the new environment, describing their feelings as metaphors (for example 'loss'), managing change as blocks, celebrating short-term wins, being pragmatic about what can be achieved, enabling a sense of connectedness amongst employees and creating transition monitoring teams.(1,17)

In the beginnings stage, Bridges posits individuals emerge with a new identity.(17) However, the new beginning can only occur if the individual's heart and mind is set in adopting this new identity and consequently ushering in the new beginning. Thus, a new beginning cannot be forced. To enable movement of individuals from the neutral zone to a new beginning, change managers need to provide a compelling vision. This includes providing the individual with a purpose, plan, and opportunity to be part of the change planning or implementation. The goal is for everyone impacted by the changes to feel part of the change team, and be supported through the transition process.(1)

In a broad sense, Kotter and Bridges's models may seem quite disparate, with separate foci on the situational and psychological aspects of the change process. On closer examination, there are overlapping elements, and one can view the models as interconnected. The change process can move from a situational context to psychological context, and vice-versa. Therefore, this study considers components or stages of both models equally relevant to the change management process, and the program theory of this study. In the preliminary program theory, consideration is given to how the hospital leadership enabled employees to move through the different transition phases. The program theory assumes staff had to let go of some existing practices to adapt to the changes – the introduction of ED targets and new resources - brought through the national healthcare reforms. It also assumes they were effectively guided to new beginnings by the hospital leadership, thus leading to a positive outcome - improvement in ED access. As with those based on Kotter's model, assumptions based on Bridges's model are tested in the following chapter and analysed in Chapter 7.

DISCUSSION

Change management theory can be used to explain the mechanisms of change articulated in the program theory in this thesis. Aligning the program theory, mechanisms and analysis to well-accepted theories is a very important principle of both realist evaluation and case study strategies.(20,21) Change management, particularly as applied to health services, is one such.

There is wide recognition in health services that to achieve improvement in service and performance, change has to occur.(1,2,13) This is the case as each system is designed to achieve the results it gets. This focus has led to the development of numerous strategies and tools to improve service and performance. However, change management theory suggests it is not enough to provide strategies and tools to people involved in change. It proposes there is also a need to educate and train staff in what to expect during change, how to engage with those affected by change, and how to make change sustainable.(1,16) In the change process, people are the most important component and essentially responsible for the success or not of the change process. Being aware of how people react to change and what is required to guide them towards the change objectives is critical. This is where consideration of the two change management approaches discussed in Chapter 5, is highly relevant. This section discusses how the findings from this study align with these approaches; explain the processes occurring within the study context, and make recommendations for change to progress.

In the study findings, the context in which changes were introduced in ASH and its ED were noted. Pre-reform, the old ED infrastructure was deteriorating rapidly and ED access was a significant issue. The question was not if change was required, but when. The reform interventions (introduction of time based ED targets and provision of resources) provided a trigger for changes to be enacted. Although it cannot be definitively stated that the changes introduced post reform independently led to improvement in ED access, there is a statistically significant association between the reforms and the moderate improvement in ASH ED access. However, it was also noted in both the quantitative and qualitative analysis that sustainability of the improvement was a concern.

This concern regarding sustainability has support from observations of previous change efforts and current issues. Recently the hospital and leadership were considering clinical redesign activities to address patient flow bottlenecks, but there was lack of widespread buy-in for the redesign program. There also appeared to be tension in the handover and admission process between the ED and the inpatient service. Further, reportedly non-

hospital contextual issues appeared to be overwhelming the hospital leadership. So how do change management theories explain these factors, and what does it suggest for change/improvement to progress?

Firstly, both Kotter and Bridges' theories emphasise that change is not a short term process and proceeds through stages.(1,17) The study therefore considered a 7-year period (2008-2014) in order to analyse the impact of the reform interventions. While there were varied forms of interventions aimed at improving ED access (targets, resources and clinical redesign activities), the recipients largely remained the same (ASH and its employees). It was therefore easy to track the change journey through the views of those who had been part of it (clinicians and managers). Incorporating participants from both management and clinician levels (ED and inpatient) helped present alternative views of the change process. What became clear over the 7-year period is that despite the contextual challenges and intra-hospital tensions; everyone in the hospital accepted change was necessary. Both Kotter and Bridges' change management models (1) describe this acceptance of change stage as a critical component in the change process. Kotter mentions that more than 50 percent of organisations aiming for change fail in this stage.(16)

While there was no definitive program to communicate the urgency around change or guide staff through the initial 'endings stage', awareness of the contextual challenges and poor patient access to ED and inpatient services enabled a smooth transition. Nothing in the interview content indicated any strong resistance to the introduction of reforms, albeit in stages and in different forms. While the 7-year period covered in this study is a substantial period, interview data indicates the hospital is only just emerging from the initial stage of the change process, the 'creating a climate of change' and 'endings' stage.

If this is the case, the next phase in the ASH ED change process, as per Kotter and Bridges' models, are 'engaging and enabling the whole organisation' and the 'neutral zone'. (1,17) While some hospital staff may have already transitioned through the neutral zone into 'new beginnings' it is clear that there is considerable work to be done in engaging and enabling the whole of hospital to this point. Both Kotter and Bridges discuss the significance of establishing powerful guiding coalitions. While advice was provided that the recent clinical redesign program has led to the formation of redesign working groups, it is not clear if they are powerful enough, or there is sufficient buy-in for the teams across the hospital. It appears there has not been enough communication of the change vision to engage hospital staff in the change process. Although the recent launch of clinical redesign activities involved staff consultation and workshops, this engagement does not seem to have been maintained.

Transformation requires involvement of a large number of people as change progresses.(15) This large-scale involvement enables staff to innovate and become change leaders. For this to occur, good communication of the vision and a strong guiding coalition is necessary. In some cases, even if there is buy-in of the change vision (which has occurred in some pockets in the hospital), renewal requires removal of obstacles.(1,9) These obstacles can either be unreal (existing only in the heads of employees) or real. In the case of the current study, interview and other data suggest a number of 'real' obstacles to change in ASH ED, including issues with the admission process, limited bed capacity and workforce, limited pathology and imaging services, and limited community and social services available to absorb ready-to-be discharged patients. Concerted effort is required by the hospital and CAHS leadership to address these obstacles to ensure continuation of the change process.

As mentioned earlier, transformation takes time. However, short-term goals can be created and may aid in the change process.(1,16) Achievement of short-term goals will ensure momentum by sustaining the buy-in and attention of staff engaged in change. The moderate improvement in ED access is a good example of short-term goal achievement, though it has not been classed as such in the hospital. Celebration of these achievements can not only dissuade people from abandoning the change process, but also bring people who have been resisting change on board. However, a single short-term goal or its achievement is not enough to ensure lasting change. Concerted efforts are required to establish goals across the change journey and create incentives for staff to achieve these goals.(1,15) While the SDA establishes a suite of short-term goals, it is not clear if there is a reward and recognition system in place to motivate staff to meet these goals.

Although potentially useful, there is a significant risk that staff will accept short-term goals as a victory and a mark of the end of the change process.(16) Bridges' model describes how people moving into the new beginnings stage have to be supported and guided towards the change vision (17), while Kotter discussed the importance of implementing and sustaining the change in the final phases.(15) The quantitative analysis revealed a reversal in the trend of improvement in ED access in the latter years of the study period. There also seems to be resistance emerging towards the ED targets, especially the NEAT. Kotter cautions that many organisations fail because of complacency (following short-term wins) and inability to embed the change process in the organisational culture.(15) For ASH, the clinical redesign program provides a suitable framework to embed and sustain change within the hospital culture. The program can provide an avenue to communicate the urgency vision, enable and sustain guiding coalitions and help in establishing change as a norm in the hospital culture.

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Remote Hospital Reform in the Context of National Healthcare Reforms

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ABSTRACT

Introduction: Public hospitals play an important role in the delivery of essential healthcare in Australia as in many countries. The Australian Government has in the recent years implemented national healthcare reform to improve the performance of and access to public hospital services. This reform extends to all public hospitals including remote hospitals. However, there is limited information on how reform should be implemented in relation to remote hospitals. With this background, this article presents literature about national healthcare reforms, reform in Australia, hospital reform and the context in which remote hospitals operate.

Methods: This review has utilised databases such as Web of Science, Scopus and Medline, and web search engines such as Google Scholar to identify relevant literature. Extracted information is presented in this review as four categories i.e. Healthcare Reform, Healthcare Reforms in Australia, Hospital Reform and Reform in Remote Hospitals.

Results:
The review reveals hospital access is an important factor for remote populations amongst other issues but there is little evidence on how national healthcare reforms can address this issue.

Conclusions:
Further studies are required to fill the gaps in evidence and to provide a clearer picture of the relationship between national health reforms and its impact on remote hospital service delivery.

Key words: Healthcare Reform, Hospital Reform, Australian Reform, and Remote Hospitals

[16] This article is linked to Chapter 2 of this thesis.

Introduction

Because of the important role that public hospitals play in the provision of essential health services in Australia, there has been increased scrutiny of their performance. A key issue is access to hospital services. The Australian Government has embarked on a major reform of the public hospital system including the establishment of national targets to monitor and improve hospital services access. With the Australian Government intending the reforms to be relevant to all public hospitals (including remote hospitals), it is important to understand the unique context in which remote hospitals operate and their requirements.

However, there is meagre evidence on how national health reforms should be adapted to remote locations in Australia (33). Therefore, this review aims to identify and evaluate relevant literature about '*national healthcare reforms, reform in Australia, hospital reform and the positioning of remote hospitals in this context'*.

Methods

A computerized search using 'Google Search and Google Scholar' was initially undertaken to get a general idea of available information. This was followed by a search of peer reviewed literature or grey literature (e.g. government technical reports) using University Databases such as '*Web of Science'*, '*Scopus*' and '*Medline*' to identify appropriate articles. The keywords used in the search are outlined in the below table:

Category	Key words
HEALTHCARE REFORM	HEALTHCARE REFORM, HEALTH RESTRUCTURE, HEALTH SERVICE CHANGE, NATIONAL HEALTHCARE REFORM
HEALTHCARE REFORM IN AUSTRALIA	AUSTRALIAN HEALTHCARE REFORMS, NATIONAL HEALTHCARE REFORM IN AUSTRALIA
HOSPITAL REFORM	HOSPITAL REFORM, HOSPITAL RESTRUCTURE, HOSPITAL CHANGE MANAGEMENT
REFORM IN REMOTE HOSPITALS	REMOTE HEALTH SERVICES, REMOTE HOSPITAL, HEALTHCARE REFORM IN REMOTE AREAS

Table 1. Keywords used in the literature search.

Following an extensive search of the databases, more than 100 articles were found to be appropriate for consideration. However, the author used certain

criteria for including or excluding articles. The main criteria for inclusion were the articles had to be relevant and aligned to the identified four categories but importantly had to have a theme of 'reform' or 'change' or 'restructure' covered in their text. Articles, which did not align with the four categories under consideration, were excluded. This narrowed identified articles to 80 articles or text.

The 80 articles or text were further scrutinized for their quality (peer reviewed or publishing organisations), immediate relevance to the research topic, the time frame in which the text was published and the context. This narrowed down suitable articles or texts to 39. These 39 articles or texts were then grouped into the four aforementioned categories by 'Mendeley' software and used in the literature review.

Healthcare Reform

Health care reform, in its essence, seeks to change existing heath service arrangement (49). Although health care reform has progressed from just focusing on organisational change to include changes in economic aspects of health services; organisational change remains a major component of health care reform (47). Approaches to health reform differ from country to country and sometimes even within a country (4). While some health reforms focus on certain aspects within a health system, others seek to restructure the entire system significantly.

Several factors are known to influence the reform of health systems.(7) These include external or macro-level factors beyond the control of governments such as global economic and population trends. Such forces may be mediated to some extent at the meso-level by national and state policies and at the micro-level by organisational reform strategies. Also, different philosophies and theories can drive health reforms. In particular, a very popular theory in reform is the concept of "new public management" (56). Basically, the concept is that organisational performance and health care service provision can be improved through the introduction of market mechanisms into the public sector.

This has led to a rethink of how public health services should be delivered and funded with measures such as financial devolution, explicit standards of measuring performance, clear specifications of relationships between inputs and outputs and the introduction of competition, such as competitive tendering and

virtual markets (56). There is said to be a gain in efficiencies from the introduction of competitive forces leading to increased transparency in management processes.

Reform can also be about changing governance structures so management and organisations can be held accountable for the expenditure of public funds (58). Health reform can be used to provide overall strategic direction. Ideally, the intention of the changing governance arrangements in Australia is to improve the accountability and effectiveness of management.

Some health reforms focused on achieving equity in consumer access to quality health services combined with achieving a reduction in health disparities. These reforms usually include improvements to community health insurance coverage because this is broadly recognised as important in reducing disparities (5).

A key driver behind organizational reform in the public sector has been because of concern about efficiency and quality of services (57). Disaggregation of the public sector into discrete management units is thought to improve efficiency and quality of service provision. Allowance of autonomy or semi-autonomy is supposed to help in reducing bureaucratic control and setting up an environment for innovativeness and improved productiveness. Insufficient autonomy may stifle the management processes within a hospital and in turn impact on overall efficiency. The theory supporting increased hospital autonomy purports that it enables management to develop structures and systems congruent to their devolved functions and responsive to their local situation.(57)

Healthcare Reform in Australia

Australia has a largely publically funded healthcare system called 'Medicare', which provides access to all public hospital and some medical and allied health services to Australian citizens and permanent residents (20). Medicare has been in existence, in different forms, since 1975. It was implemented throughout Australia through health care agreements between the Federal Government and States and Territories. Under Medicare, States and Territories handle the provision of public hospital services. These services are funded both by State and Territories and by grants from the Australian Government.

It has been argued that Australians have unacceptable inequities both concerning health provision and outcomes (8). It has been further argued this is because of the health system having inherent faults to address the inequities adequately. According to this perspective, the main structural flaw is the split of funding responsibility and performance accountability amongst different levels of government. This issue, coupled with varying capacities of governments to fund essential health services, has provided a compelling case for structural and systemic reform (8,22).

In 2009, a report by the National Health and Hospital Reform Commission (NHHRC), identified that the public hospital system, in practice, was fragmented, poorly responsive and underfunded and in dire need of reform (8). The report was developed following the election of the Labor Government under Kevin Rudd in 2007 to honour pre-election commitments (to address hospital funding amongst other health issues) (66).

The NHHRC report provided a 'blue print for health reform' (67). With the establishment of the NHHRC and other national health reform initiatives, the States and Territories agreed to a series of National Agreements under the auspices of the Council of Australian Governments (COAG) (66). Through the reforms outlined under the NHHRC, additional funding for public hospitals would be provided by the Federal Government to increase access to essential hospital services like emergency department (ED) and elective surgery services (8). Public hospitals with major EDs would be funded to ensure there were sufficient available beds to enable timely access for patients being admitted through the ED.

One of the important initiatives through these agreements is the establishment of Local Hospital Networks (LHNs) (48). By establishing the LHNs, the main intentions are to decentralise the management of public hospital management, to increase accountability at the local level, and to drive improvements in hospital performance (48). The LHNs will engage in system-wide public hospital service planning, purchasing of public hospital services, development of infrastructure, and planning for teaching and research (20). The LHNs are also accountable for service delivery access and outcomes and are required to ensure robust and transparent reporting (48).

Hospital Reform

Public hospitals play an important role in achieving system-wide health reform goals. These hospitals are central to the quality of secondary and tertiary level health care services delivered to communities (50). However, managing hospitals is an expensive business, with hospital costs accounting for a majority of healthcare expenditure (74). Therefore making hospitals more efficient is an important concern. Hospital reform, like health reform, can take different forms. Efficiency may be achieved by increasing hospital autonomy, efficient use of resources and through the introduction of performance measures (74).

Hospital performance has become an important issue in the eyes of stakeholders (83). Meagre resources and changing structures have led to challenges in delivering services. Present day hospitals have to fulfil several objectives: achieve high clinical performance in a rapidly changing technological world, increase productivity within tight budget constraints and under close inspection, and increase patient access to services while confronted with shortages in health workforce (83).
Many Governments believe that there are significant efficiency gains to be achieved in the hospital sector (85). These gains are thought to be possible through the rationalising of activity between hospitals and clinical levels of hospital care and through the granting of greater autonomy to hospitals on a phased basis.

Hospital performance can be assessed within the framework of organizational theory (83). Performance is directly linked to the way services are delivered, that is, how access to services is enabled. With performance improvement, there is an emphasis on how the organization gears itself to run smoothly without undue internal strain. Some authors have considered performance improvement as equating to quality improvement with the ownership for quality being a system issue (86). Describing performance at a hospital level rather than at a patient level allows for benchmarking and assessment for effective care. Both of these approaches are necessary to achieve continuous quality improvement.

In the United States of America, improving hospital performance has focused on the quality of healthcare provision (50). This approach concentrates on identifying inefficient aspects of hospital care and utilises quality improvement techniques to redesign patient care provision. Such an approach has been seen

to be effective in many cases (50).

The national health reforms in Australia have led to the development of a 'Performance and Accountability Framework' and the establishment of a 'National Health Performance Authority [NHPA]' (79). The NHPA was established in 2012 to provide transparent public reporting of every Local Hospital Network and each hospital within the network (19). The Performance and Accountability Framework covers performance across a wide range of health services.

As part of the national health reform agreements, States and Territories have agreed to report a comprehensive list of performance indicators. Specifically for hospitals, performance measures were instituted, for example waiting times for elective surgeries and ED were instituted (19). Figures relating to these performance measures for most Australian Hospitals are now being published on the Commonwealth Government's funded 'My Hospitals' website(13) and through NHPA reports (21).

The reforms have also led to the provision of additional funding of up to $1 billion to increase access to hospital services (78). The provision of additional funding has been largely through National Partnership Agreements and dedicated hospital infrastructure funds such as the Health and Hospital Fund (19,21).

National Partnership payments are a mechanism through which the Australian Government can support specified projects/outputs and encourage reform and efficiency (21,79). Two agreements have focused largely on public hospitals, namely *National Partnership Agreement on Hospital and Health Workforce 2008* (NPA-HHWR) and the *National Partnership Agreement on Improving Public Hospital Services 2012* (NPA-IPHS) (71,72).

The NPA-HHWR, agreed to in 2008, had the broad intention to improve efficiency and capacity in public hospitals, while specifically aiming to take the pressure off public hospitals by increasing ED capacity (71). The Australian Government provided a total of $1,383 million to states and territories through this agreement. The NPA-IPHS, agreed to in 2011, invested $3.4 billion to increase hospital access and support previous work under the NPA-HHWR.(21,72). Although this large quantum of funding was provided by the Australian Government, the states and territories were expected to continue regular funding

of public hospital services and report on targets and funded projects.

The *Health and Hospital Fund* (HHF) established in January 2009 through the *Nation Building Funds Act 2008*, sought to invest in health infrastructure that enabled the achievement of health reform targets (81,82). The HHF was not meant to replace State and Territory effort and required their co-contribution for projects. So far, four HFF funding rounds have taken place with $5 billion disbursed by the Australian Government for various hospital and non-hospital infrastructure projects (80).

REMOTE HOSPITALS

Remote residents face significant challenges in accessing relevant health services, which in turn have issues with staff retention and resource constraints (31,37). The geographical isolation of such locations and inadequate investment in remote health services have been described as the main factors responsible for these issues (66). Although rural health services face workforce and resource limitation issues, the isolation component in remote locations is stronger (37,66). Therefore, some researchers and professional bodies have made a distinction between rural and remote health services (88).

Hospital services are an integral and vital component of health service provision in rural and remote areas (89). The provision of hospital services in these areas requires a different tact to that of metropolitan situations. Not only do rural and remote patients require access to local services but they also need predictability and planning for specialised services not available in local hospitals. The frequent need to travel great distances not only places a huge burden on patients and families but also creates inequities in access (33,89).

Hospitals in remote locations have unique challenges that impact on their viability and need to deliver quality services to their populations. Hospitals in remote areas have either seen repeated downgrading of their services or their services not being upgraded to match their population growth (66). This has led to clinicians leaving hospitals because they have been frustrated by inadequate professional or infrastructural support. Emergency departments in these hospitals are also challenged by an increasing burden of a mixture of complicated cases and patients seeking 24-hour free care for non-urgent medical conditions

(66,90,91).

This scenario is complicated by social disadvantage, disharmony, and physical distances, which in remote locations have a direct impact on hospital service delivery (31,37,66). Populations in remote areas also have significant health disparities compared to urban populations. These set of circumstances have led to hospitals and health services to adopt unique and out-of –the-box models of care, which try to optimize the limited resources these services have (31,32,37,66,88).

There have been differing views about how reforms will impact hospital services (26,42). The review has identified little or no information on how national healthcare reforms will involve remote hospitals and address their unique needs. Some even question whether reforms are relevant to rural and remote areas because of their different profile (33). There is a need for studies focusing on remote hospitals to study the contextual issues these hospitals face and how reforms can be adapted to address their unique needs.

CONCLUSION

The review indicates that hospital access and performance is an important issue for governments and stakeholders both worldwide and in Australia. With the Australian Government intending the reforms to be relevant to all public hospitals (including regional and remote hospitals), it is important to understand the impact of the reforms from a remote hospital perspective. It is assumed by policy makers that reforms can improve hospital access, including remote sites. However, the literature reveals little evidence to support this understanding. Further studies are required to fill the gaps in evidence and to provide a clearer picture of the relationship between national health reforms and access to hospital services in remote locations.

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JOURNAL ARTICLE-2[17]

Realist Evaluation of a remote hospital programme in the context of Australian health care reforms

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Abstract

Background: Since 2008, Australia has embarked on major healthcare reforms extending across all states and territories. Only limited evidence linking national healthcare reforms to improvement in public hospital performance exists. This evidence gap is even more pronounced in the case of remote hospital performance. This article describes a protocol retrospectively assessing a remote hospital programme to implement emergency department performance indicators, in the context of national reforms, over a period of 7 years (2008–2014). Challenges to implementing these reforms are explored.

Method: Assessing the complex scenario of reform implementation requires an in-depth analysis, offered by a Realist Evaluation framework. Within this framework, a case study design is adopted to enable descriptive analysis. Interviews with key hospital stakeholders were followed by a literature review to identify a programme theory. The programme theory was articulated in the form of a preliminary context-mechanism-outcome configuration (CMOC). This theory will underlie further data collection, analysis, and interpretation. Both Realist Evaluation and case study allow flexibility in a choice of methods; both quantitative and qualitative methods will be incorporated. The thematic analysis will be employed to identify causal relationships and linkages in collected data.

Discussion: Assembled data will be used to develop final CMOC patterns. The final CMOC will help in understanding the theory and mechanisms in use in the hospital.

Keywords: Realist evaluation, Case study, Health reforms, Emergency department performance

Background

The Australian public hospital system is finding it challenging to meet both the growing patient demand and the need to provide timely service.[1] Increasingly, patients have reportedly been waiting longer than the clinically recommended time for elective surgery and emergency department (ED) services. With these and other challenges confronting the public hospital system, there have been increasing calls for the redesign of hospital services to be better positioned to meet emerging increases in demand.[2,3]

In August 2011, the Council of Australian Governments announced that a National Health Reform Agreement had been reached with the aim of delivering better healthcare to all Australians, and improved system sustainability.[4] A range of indicators was proposed to measure expected improvements in hospital performance following reform. As part of the National Health Reforms and Agreements, States and Territories have agreed to report on this comprehensive list of performance indicators.[1]

Access to health services is seen to be a key performance measure following health reforms: it is a critical issue[5] and has practical impact on consumer health and satisfaction. Waiting times for hospital services are useful indicators of access.[6,7]

Through the reforms, additional Federal funding for public hospitals was allocated to increase access to essential hospital services such as EDs and elective surgery services.[8]

Public hospitals with major EDs are funded to ensure there are sufficiently available bed numbers to enable timely access for patients being admitted through the ED. Performance indicators specific to ED access were set by the National Partnership

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[17] This article is linked to Chapters 4 and 5 of this thesis.

Agreements (NPAs): *National Partnership Agreement on Hospital and Health Workforce 2008 (NPA-HHWR)* and *National Partnership Agreement on Improving Public Hospital Services 2012 (NPA-IPHS)*, and signed under the auspices of the Council of Australian Governments (COAG).[9–11]

The two performance indicators are as follows:

1. *Emergency Department Waiting Times (NPA-HHWR)*: the proportion of patients seen within the recommended time for their triage category.[12]

Until 2013, the agreed target was set at 80% of patients seen, as recommended by the Australian College of Emergency Medicine.[10] As the agreement expired in 2013, there are no current agreed national targets. However, this measure is a useful indicator of how accessible hospital emergency services are to patients.[12,13]

2. *National Emergency Access Target (NEAT; NPA-IPHS):* 90% of all patients presenting to a public hospital ED will physically leave the ED for admission to hospital, be referred to another hospital for treatment, or be discharged within 4 hours.[11]

The NPA sets phased targets for each calendar year from 2012 to 2016 with the final target being 90% of patients presenting to the ED leaving within 4 hours. This target is informed by the experience of UK and Western Australian hospitals.[14,15]

Some researchers have questioned the validity of the NEAT target. A systematic review of the 4-hour rule in the UK indicated there were no changes in ED waiting times or hospital mortality with this target in place.[16] Targets were met only due to re-designation of patients' categories rather than an authentic improvement in the process. It has also been noted that the NEAT rule could lead to premature patient discharge and high staff turnover due to increased workload/stress.[16]

Remote hospitals

These dissenting views regarding the impact of reform associated performance indicators on ED performance and patient access to hospital services[14,16] raise queries applicable to all hospitals.

Additional queries exist about the applicability of these performance indicators and reforms to regional services.[17] Hospitals in remote locations have unique challenges that impact on their viability and capacity to deliver quality services to their populations. Many remote hospitals have experienced repeated downgrading of their services, or insufficient upgrades to match their catchment's population growth.[18] This has contributed to staff and speciality shortages, with clinicians leaving hospitals frustrated by inadequate professional or infrastructure support. Additional challenges to remote EDs include the increasing burden of complex cases, and patients seeking publicly funded, 24-hour care for non-urgent medical conditions.[18–20]

With the intent of the Australian Government reforms to be relevant to all public hospitals, including regional or remote services, it is important to understand the impact of the reforms from a remote hospital perspective. In the context of the limited available evidence, this study has been designed to contribute to the understanding of the impact of national health reforms on hospital performance in remote locations in Australia. Access to emergency care, an essential component of the nationwide Australian health reforms, has been selected as the focus of this study. Due to the complexity of the hospital and reform context, Realist Evaluation will be employed to allow for in-depth analysis using multiple methods.

Alice Springs Hospital (ASH) is the only tertiary hospital in Central Australia. It has been selected as the study site due to its remote location, its busy ED service, challenges to service provision and convenience of access. The study will evaluate the hospital's programme to meet ED performance indicator targets in the context of national health reforms, using a Realist Evaluation approach.

Alice Springs Hospital

ASH is a 189-bed major regional hospital servicing a population of 45 000 people spread across Central Australia.[21] The present hospital was established in 1977 but has been undergoing continuous renovations and redevelopments since.[22–24] Located in a remote area, the hospital faces significant challenges in delivering comprehensive and quality specialist services to patients. A substantial portion of AHS patients are Aboriginal Australian,[25] a population who experience significant health disparities, and a higher mortality burden than non-Indigenous Australians.[26]

The ASH ED has in the past experienced significant challenges including inadequate infrastructure and patient block and continues to receive a large proportion of patients with chronic disease complications and alcohol-related admissions. Previously, ASH's ED performance was behind the other major regional hospital in the Territory despite similar challenges. However, following the introduction of national reforms and major redevelopments, local, and national reports have indicated a

turnaround in ASH ED performance, despite increasing presentations.[23,27,28]

Method

Research objective

This study seeks retrospectively to evaluate the programme undertaken by the regional hospital to meet National ED Performance Indicators targets.

This study assumes that, entrenched within the hospital programme is a theory, even if those involved are not aware of this and it is up to the researcher to tease out this embedded theory and make it explicit. Thus, the research aims to develop and apply an understanding of the theory in use in a regional hospital programme to meet ED performance indicators. The sub-objective will be to assess the usefulness of the theory's major elements and approaches.

Research questions

Based on the national reform context described earlier and the absence of evidence linking reforms to improvement of hospital performance in remote locations, the central questions of this study are:

1. Have the changes and targets that were introduced as a result of the national reforms contributed to the improvement in ED performance in ASH?
2. How have ASH clinicians and managers addressed the need to meet ED performance indicator targets?

Study design

This research assumes the hospital programme, like other social programmes, consists of sophisticated and complex interactions within a composite reality. Therefore an evaluation framework, which analyses the complexity in depth, is most suited to study this phenomenon.

Realist evaluation

The evaluation needs to consider the context, interventions, and mechanisms generated as a result of the intervention, as well as the outcome patterns. In other words, the evaluation interrogates the programme as 'what works for whom in what circumstances and what respects, and how?' Realist Evaluation, which distinctively explores the nature of programmes, and attempts to explains the workings and outcomes of the programme by studying generative mechanisms, has been deemed by the authors as an appropriate framework to achieve the objectives of this study.[29,30]

Realist Evaluation provides a unique approach to evaluating change in complex settings. A Realist Evaluation design involves the following steps[30,31]:

- development of a preliminary programme theory;
- collection of data to test the programme theory;
- analysis of data;
- synthesis of data to identify context-mechanism-outcome configuration (CMOC) patterns; and
- review and refine the programme theory.

Realist Evaluation separates the institutional and structural features from the actors in a given context and explores the causal mechanisms that reside within that context. This analysis is used to explain the outcome of the intervention.[30,31]

Case study and Realist Evaluation

Most theory-driven evaluations in healthcare use a case study design.[31,32] A case study design suits the context of this study where an emerging complex phenomenon, the national health reforms, represent an opportunity to develop, extend, or test a theory following the collection, analysis, and interpretation of data from multiple sources.

While case studies can help with analysing the intervening processes or documenting evolution/changes, they have limits in establishing a causal link between intervention and outcome.[31]

Coupling the case study design with a Realist Evaluation framework not only enhances the usefulness of a case study, but also helps in addressing its limitations regarding external validity and generalisability. Realist Evaluation structures the analysis by linking context, mechanism, and outcome. This structure increases both the explanatory power and usefulness of the case study for decision makers in other settings.[31]

Case study research can utilise any combination of qualitative and quantitative approaches.[32] A case study allows data to be collected from multiple sources and allows for triangulation: corroboration of the same fact or finding using evidence from different sources.

A single case design has been compared to a single experiment.[32,33] This design has been chosen as it is considered that the national health reforms and the introduction of national ED performance indicators applying to all public hospitals are individual phenomena, and unprecedented in Australia. Therefore, each case is considered as unique and has something special to reveal.

Selecting and bounding the 'Case' are fundamental processes in the case study research.[32] The case may range from a single person to an entire organisation: it can, therefore, be difficult to set the boundaries of the case. To address this issue, clear parameters such as the hospital involved, the period of study, and variables being assessed will be stated upfront. Within the single case identified, multiple units of analysis will be examined: exploring how different hospital work groups have understood the reforms and enacted change management processes.

The selected case for this study-ASH represents a critical case, where a phenomenon few have considered in this setting, is being studied. Multiple variables will be analysed over the 2008–2014 period under study: including the ED, department of medicine and hospital executive.

Programme theory

Realist Evaluation typically begins by eliciting and formalising a programme theory.[29–31] Pawson and Tilley borrow Merton's concept of Middle Range Theory (MRT) to explain programme theory.[30,34] Merton[34] defines MRT as 'a theory that lies between the minor but necessary working hypothesis and the all-inclusive systematic efforts to develop a unified theory that will explain the observed uniformities of social behaviour, social organisation, and social change'. MRT can either be formulated on the basis of an existing theory and experience or through on-site research to identify implicit models used to make sense of the intervention.[30]

Table 1: Preliminary programme theory and context-mechanism-outcome configuration

Programme theory	
The national health reforms and emergency department (ED) performance targets have led to improvement in ED performance in Alice Springs Hospital through generated mechanisms such as improved clinical practice and increased productivity	
Context	
What conditions are needed for a measure to trigger mechanisms to produce particular outcome patterns?	• National Health Reform • Infrastructure funding • Clinical Redesign Programme
Mechanism	
What is it about a measure, which may lead it to have a particular outcome in a given context?	• Clinicians improving their performance • Emphasis on clinical leadership • Clinicians collaborating better • Management supporting clinicians better
Outcome pattern	
What are the practical effects produced by causal mechanisms being triggered in a given context?	Improvement in ED performance

The premise of this study is that change management mechanisms and infrastructure improvement are brought about by the introduction of targets and reform funding. A combination of literature and document review, and individual interactions with hospital staff led to the formulation of a preliminary programme theory for this research as follows:

> The changes initiated, and ED Targets introduced in the context of **national health reforms** have led to the improvement in **ED performance** in Alice Springs Hospital. The mechanisms enabling improvement include influence of external environment (reform activity), emphasis on clinical leadership, improvement in clinical practice and increased productivity with the improvement in performance assessed through Emergency Department Waiting Times and Length of Stay results.

This programme theory will be evaluated and amended as necessary throughout the study, as per Realist Evaluation principles.

Preliminary context-mechanism-outcome configuration

Realist Evaluation explains not only the intervention and the outcome but also the programme's enveloping context and the inherent mechanisms.[30] The realist approach elucidates and links these elements in a pattern termed CMOC. This linked pattern is outlined in Table 1.

While some researchers use the CMOC as merely a descriptive frame without feeling the need to establish a causal link between the intervention and outcome,[29] the objective of this study is to explore the relationship between reform initiated changes and hospital performance. This suggests the use of the CMOC as a tool in the analysis of this relationship.

Data collection methods

Realist Evaluation and case study design have no particular preference for either qualitative or quantitative methods.[30–32] In fact, these approaches see an advantage in adopting multiple methods so

different data sources can be used to explore the phenomenon and analyse the intervention. This study is an evaluation model examining the generative mechanisms that underlie the change management process, and how the research participant's choices and use of resources led to the outcome. This creates a rich opportunity for multiple data methods for data collection and analysis.
The study involves five main phases.

Phase 1 has been completed: interviews with key hospital stakeholders were conducted, and an extensive literature review performed to allow generation of a programme theory. The programme theory was articulated in the form of a preliminary CMOC as detailed above.
Phase 2: To provide some context/background for the qualitative data collection, published quantitative data covering ASH ED performance indicators will be collected NEAT data, ED waiting times and ED length of stay will form the basis of a summary report. Hospital-supplied data for the period 2008–2014 will be used to undertake a fundamental exploratory time series analysis.
Phase 3: Phase 2 data collection and analysis will be followed by the review of hospital and government documents including annual reports, policy papers, and other publications. Papers and videos pertaining to the hospital published in the public domain will also be examined. The following search strategy terms will be used to identify relevant documents:

- National Health Reform and Health Reform,
- Northern Territory,
- Alice Springs Hospital, and
- Emergency Department.

To identify relevant videos and other media in the public domain, a keyword search of 'Alice Springs Hospital' will be conducted in popular Internet search engines.

Phase 4: An observation phase will follow this analysis. A select number of meetings that discuss hospital clinical redesign activities will be observed. The observation is expected to provide a greater understanding of the activities undertaken to meet targets and the challenges involved. The review will then be used further to refine the theory and the CMOC pattern.
Phase 5: Interviews will be conducted with eight categories of staff. Purposive sampling will be used to identify interview participants. Purposive sampling is very useful in case study strategies as judgment can be used to select information-rich cases. A sampling frame was used to identify the ideal number of participants for this study: a possible total of 35 participants. Further recruitment of participants is not expected to yield additional information: as this study focuses on a single small hospital, additional participants are likely to provide the same information (information saturation).

An initial round of semi-structured interviews with individuals will be conducted. Interviews will be recorded and transcribed verbatim. Following each interview, contact summary sheets will be completed, and field notes written. Interviews will assist in refining the programme theory through participants' discussions of highs and lows of the hospital programme: illuminating' what works for whom and in what circumstances and in what respect.

Following an initial round of semi-structured interviews with research participants, themes and categories will be constructed from the data. The thematic analysis will be used to make meaning of the data and identify any relationships and linkages. Emerging themes and categories will be used to inform a second series of semi-structured interviews. The two rounds of interviews are necessary to move closer to illuminating the mechanisms generated by the intervention and explain their links to the outcomes.

Assembled data including the refined set of themes from both interview and other sources will be used to develop CMOC patterns. The emerging patterns will assist to outline how the intervention led to particular outcomes and by what mechanism. An internal validity exercise will be undertaken to check if the patterns fit the data. The retained and refined CMOC patterns will then be examined to determine whether they support or refute the earlier established programme theory. Depending on the outcome, a new programme theory will be developed and discussed with the principal participants to validate it.

NVivo, the computer-assisted qualitative data analysis software will be used for data management and analysis. Coding will be employed to categorise recurrent themes, topics, or relationships. The preliminary codes that will be used in NVivo will be based on a literature review, the initial programme theory, and the interview questions.

Ethics and dissemination

Ethics approval has been obtained from the Central Australian Human Research Ethics Committee, a

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Ethics and dissemination

Ethics approval has been obtained from the Central Australian Human Research Ethics Committee, a

committee of the Northern Territory Department of Health. Further to this, the authors have received in-principle support from ASH management and clinical leaders to progress the evaluation within the hospital.

Research findings will be presented to ASH management and governance committees at board meetings, the staff at ASH grand round presentations and Flinders University seminars. Further, there will be regular posting of project information and research findings on the Flinders University and Centre for Remote Health websites. Findings will be also disseminated through publications in a number of peer-reviewed journals and at various national conferences.

Discussion

Evidence supporting improvement in hospital performance as a result of government-initiated reforms is weak at best.[35] The reforms and subsequent performance indicators instituted by the Australian Government provide the opportunity for researchers to observe changes in hospital performance. A key factor driving current Australian healthcare reform is the need to improve hospital efficiency and access. Studying the progress of the reforms in a remote hospital becomes important as the reforms have the clear intention of improving patient access to emergency care in all public hospitals.[8,11,36]

Reform initiated ED targets have also generated interest among many researchers and policy makers.[14,16] While it is expected many more studies will be undertaken on these targets, it is likely that funding and population factors will ensure future research is focused primarily on metropolitan hospitals. This study documenting the implementation of ED targets in a regional hospital in a remote location is expected to be one of the very few studies of its kind.

As with all research methodologies, Realist Evaluation has its limitations.[29,31,37] When assessing complex situations, multi-causality, and inter-linked factors limit the researcher's ability to pin down exact mechanisms that improve organisational performance. Also adopting a preliminary hypothesis may limit one's horizons to a particular view. Finally, the researcher may struggle to separate the effect of the context from that of the intervention.[31]

However, Realist Evaluation allows the researcher to be pragmatic about the framework's limitations and does not purport to provide all answers through its evaluation of the intervention.[30] Evidence arising as a result of this evaluation can never be placed in the same category as those based on positivist models. The researcher will adopt a pragmatic position to refining the programme theory so the results can richly inform stakeholders of options for improvement, rather than provide a complete understanding of the existing complexity. Realist Evaluation enables a researcher to paint a detailed snapshot of a complex situation by charting select causal pathways. This feature of Realist Evaluation can aid policy and decision-making, and add to the understanding of a complex and important phenomenon.

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A Realist Case Study of a Regional Hospital's Response to Improve Emergency Department Access in the Context of Australian Health Care Reforms

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Abstract

Introduction: Major health-care reforms have extended across all Australian public hospitals in recent years. Improving emergency department (ED) access has been a focus of these reforms.

Objective: This study evaluates how the national reforms have led to improvement in ED access in a regional hospital in remote Australia.

Methods: Assessing a complex scenario such as national reforms and the challenges faced by the regional hospital to implement these reforms requires in-depth analysis. A realist evaluation theory-based approach was employed, allowing investigation of what, how, why, and for whom change occurred. A case study mixed methods design was adopted within the realist framework to answer these questions about change.

Results and Conclusion: The study identified moderate improvement in ED access as a result of the reforms (investment in infrastructure and workforce and the introduction of ED targets). Clinical leadership and support from management were essential for the improvement. Without ongoing investment and clinical redesign activities, however, sustainability of the improvement may prove difficult.

Keywords
national health-care reforms, emergency department access, realist evaluation, case study, regional hospital

Introduction

Australian Health-Care Reforms

Governments worldwide are engaged in health service reform.[1] The main intention of these reforms is to improve the performance and sustainability of health services. In 2009, a report by the National Health and Hospital Reform Commission identified that the Australian public hospital system was, in practice, "fragmented, poorly responsive, underfunded and in dire need of reform."[2] Following the report's release, Australia's States and Territories agreed to a series of National Agreements under the auspices of the Council of Australian Governments.[3,4] The agreements stipulated the Federal Government would provide additional funding for public hospitals to increase access to essential hospital services such as emergency department (ED) and elective surgery services.[2] Public hospitals with EDs would be funded to enable timely access for patients presenting to EDs. As part of the national health reform agreements, performance indicators and targets were established to increase ED access.[5] Also, clinical redesign activities to improve access were initiated along with major infrastructural redevelopments in ED's across the country.[6-9]

Emergency Department Reform

The principal reason for ED overcrowding in Australia is Access Block—the delay patients experience in ED when an

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[18] This article is linked to Chapters 6 and 7 of this thesis.

inpatient bed is unavailable.[5] Access Block is an indicator of ED performance, measured as an ED length of stay of greater than 8 hours for patients requiring hospital admission.[10] Access Block, however, is not just an ED problem. It reflects systemic issues: relative lack of inpatient bed capacity or efficient mechanisms to admit inpatients from ED. Therefore, multifactorial evidence-based solutions that improve capacity and processes throughout the hospital are required to improve performance.[10,11] The national agreements therefore encouraged hospital-wide solutions, allocating funding for non-ED areas. They also introduced additional ED targets:

- *Emergency department waiting times*: This performance indicator monitors the proportion of patients seen within the clinically recommended time for their triage category.[12] It is a reliable indicator of how accessible hospital emergency services are to patients.[10,12]

There are no current national ED waiting time targets for public hospitals.[13,14] Until it expired, the most recent target was "80 percent of emergency department presentations are seen within clinically recommended triage times as recommended by the Australian College of Emergency Medicine" by 2012 to 2013.[13]

- National Emergency Access Target (NEAT): This reflects ED attendance outcomes, where "90 percent of all patients presenting to a public hospital ED will either physically leave the ED for admission to hospital, be referred to another hospital for treatment, or be discharged within four hours."[15] The relevant agreement introduced phased targets for each calendar year from 2012 to 2016 with the final target being 90% (note 1). Reward funding associated with achievement of NEAT targets ceases in 2015 to 2016.

Emergency Department Reform in Regional Hospitals

The Australian Government reforms were intended to cover all Australian public hospitals, including the 569 hospitals in nonmetropolitan areas.[2,5,16] Many of these 569 hospitals are regional hospitals.[17,18] Regional hospitals refer to those hospitals located in government-defined regional areas (nonmetropolitan areas beyond major capital cities and their immediate areas).[18-20] Regional hospitals in Australia have different contextual challenges compared with metropolitan hospitals.[21,22] These challenges include workforce shortages, inadequate infrastructure, limited professional support, and services not aligned with population growth. Emergency departments in these locations face additional challenges, including an ever increasing load of complicated cases, and patients seeking nonurgent care because they cannot afford or access paid primary care services.[21,23,24]

Alice Springs Hospital (ASH) is the regional hospital for Central Australia.[25] ASH is a 186-bed hospital providing a range of services including general medicine, nephrology, surgery, psychiatry, pediatrics and obstetrics, and gynecology among other acute and subacute specialist services.[26] The present hospital was established in 1977 but has been undergoing continuous renovations and redevelopments since then.[27-29] Located in a remote area (note 2), the hospital faces significant challenges in delivering quality and comprehensive specialist services to its patients.[31,32]

The ASH ED currently sees over 42 000 presentations per annum and services a population of 60 000 spread over 830 000 km^2.[26,33-35] A significant proportion of ASH patients are Aboriginal, and Aboriginals form 30% of the Northern Territory population (note 3).[31,32,36] ASH ED has previously been known to experience significant challenges including large numbers of patients with chronic disease complications (such as *diabetes mellitus* complications and *chronic kidney disease* in adults, and *chronic suppurative otitis media,* and *chronic suppurative lung disease* in children),[31,32,37] alcohol-related admissions, and inadequate infrastructure. When compared to the other major regional hospitals, ASH ED performance has previously fared poorly in terms of access.[23] However, following the recent introduction of ED targets and clinical redesign activities and major infrastructural redevelopments such as a new ED and expanded workforce, local and national reporting has indicated recent improvement in ASH ED access (see Figure 1).[38-40] Explanations for these improvements have been attributed to the national health care reform funding, capital projects, and performance targets.[27,28,38,41]

Improvement in ASH ED access in the context of the national reforms and associated investment suggested an association. However, the complexity of the context and outcomes necessitates formal assessment prior to making any firm conclusions about association. Further, improvements must also be considered in the context of the hospital's remote location and heavy disease burden, which have an impact on hospital service delivery.[24,31,32] The current study aimed to verify ASH's ED access improvement and establish how improvement was achieved in the face of known and emerging challenges.

Methods

Study Framework

The reform context, remote location, and hospital patient profile present a contextually rich and complex research setting. A robust methodology allowing in-depth analysis was chosen to answer the research question. Realist evaluation, a theory-based evaluation, used to describe and analyze complex phenomena was chosen.[42,43] When evaluating organizations, realist evaluation offers distinct advantages over nontheoretical evaluation approaches by analyzing why changes occur, under which conditions, and in which situations.[43] An initial program theory is developed to explain how the program has worked in a particular setting, and this theory is then used to focus the research questions and select appropriate data collection methods. A range of data are then collected to heuristically test and

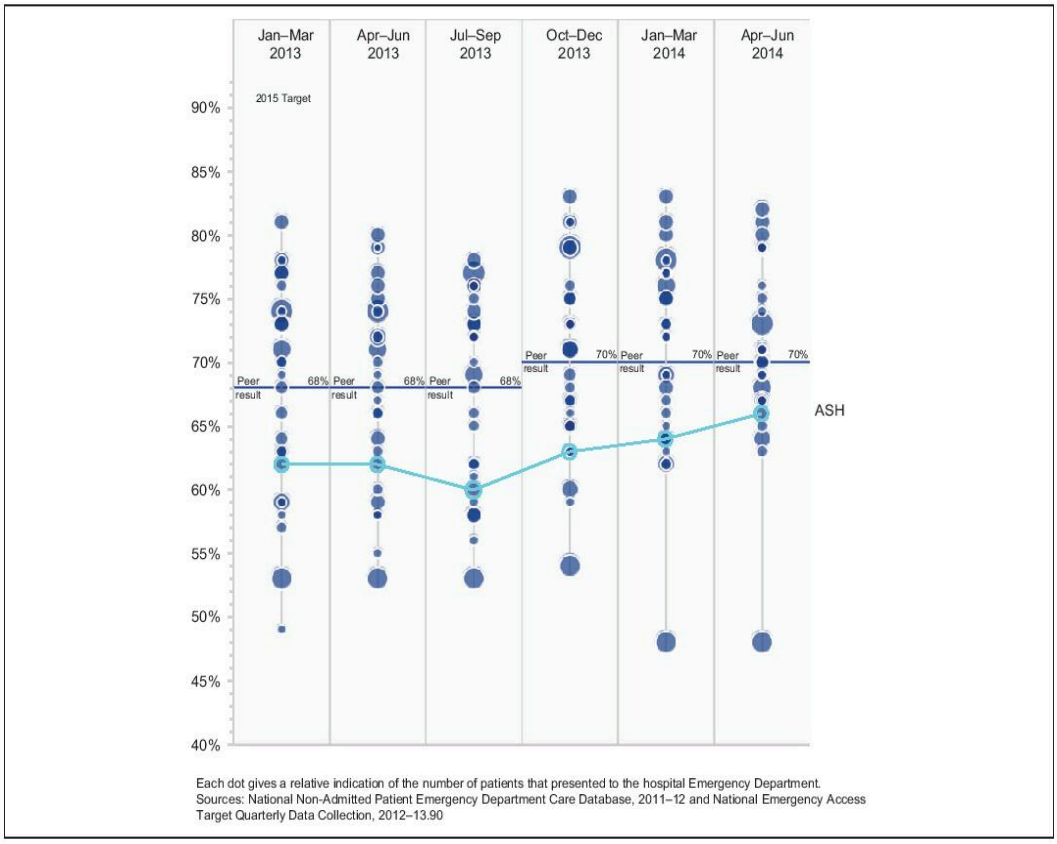

Figure 1. ASH emergency department (ED) patients departing within 4 hours (National Emergency Access Target [NEAT]) compared to other major regional hospitals, 2013 to 2014. Adapted from National Health Performance Authority, 2015.

refine the program theory as the evaluation progresses.[42,44] The construction, exploration, and refining of program theories is expressed in the form of Context-Mechanism-Outcome configurations (CMOCs). Different contexts and mechanisms triggering change are identified and hypothesized to explain variations in program outcomes. The final research product of realist evaluation is not a determination of the effect size but a refinement of the initial program theory to more accurately represent what, for whom, why, and how change has occurred.[44]

Case studies also allow a rich understanding of the context of the research and the processes being enacted. They are especially important where a planned change is occurring in a complex setting, and it is important to understand why a planned change or intervention succeeds or fails.[45,46] Case studies help in setting boundaries around the phenomenon under study while establishing units to be researched.[47,48] They are therefore widely used in theory-driven health research,[43,45] and a case study design has been adopted in the current study to complement the realist framework. ASH was selected as a single case because of the unique nature of the hospital (the only major regional hospital in remote Australia)[18] and the complex environment under study (national health care reforms being implemented in a remote regional hospital).

Study Design

This study employed a realist case study design, utilizing a mixed method approach, implemented across several phases (see Table 1). Ethics approval was received from the Central Australia Human Research Ethics Committee (HREC-14-266), and approval covered all phases of the study including interviews in the latter part of the study.

Data Collection and Analysis

Program Theory

Initial program theory and preliminary CMOCs were developed in phase 1 on the basis of a literature review incorporating academic, hospital, and media documents as well as pilot

Table 1. Data Collection and Analysis Phases.

	Step	Methods	Analysis and Expected Outcome
Phase 1	Construction of program theory	Literature review, interview with the main hospital clinicians and managers, and review of theories concerned with organizational change and performance.	Initial program theory and a preliminary CMO configuration—the hypothetical pathway linking intervention strategies to outcomes.
Phase 2	Data collection-quantitative	Correlation and regression analysis of select ED access indicators	Quantification and confirmation of an improvement trend in ED access over time.
Phase 3	Data collection-qualitative	Review of hospital and government documents pertaining to study questions and context.	Themes identified and coded using computer-assisted qualitative data analysis software. The themes were used to refine the program theory and preliminary CMO configuration
Phase 4	Data collection-qualitative	Purposive sampling of hospital staff and semistructured interviews with selected participants.	Themes were identified from interview data and coded using computer-assisted qualitative data analysis software.
Phase 5	Data collection-qualitative	A second round of interviews with select participants.	The interviews were used to explore or confirm themes that emerged from the previous round.
Phase 6	Validation and refining the theory	Analysis of findings from phases 3, 4, and 5 to outline the relationship between various components of the CMOC and the role of the context in the study.	The analysis assisted with further refinement of the program theory in order to provide a credible and dependable explanation of what components of the reform initiated interventions worked, for whom, and under what conditions.

Abbreviations: CMO, Context-Mechanism-Outcome; ED, emergency department.

interviews with senior hospital clinicians and managers. Interview participants provided verbal informed consent.

Quantitative Data

The preliminary program theory proposed that national health-care reforms (funding and introduction of targets) contributed to the increase in ED access. In phase 2, to test the increase over time, ED performance indicator data for 7 years commencing 2008 (the year the first national ED target was introduced) and ending 2014 were obtained from the hospital patient care information system. These data were split by monthly results and examined using bivariate scatter plot and correlation analysis.

Qualitative

Thematic analysis of 20 official documents (Federal and Territory Government documents, national agreements, and hospital reports) was undertaken in phase 3 to extract contextually relevant themes. Thirty interviews in phases 4 and 5 followed this with relevant hospital executives, hospital managers, medical heads of departments, senior clinicians, and junior clinicians. Interview participants provided written informed consent.

Participant groupings correspond to units of analysis as prescribed in case study design. Themes from the interview transcripts and document analysis were laid out in the form of CMOCs to analyze the hospital's program to improve ED access and to test and refine the program theory.

Results

Preliminary Program Theory

Based on the literature review and pilot interviews, a preliminary program theory was developed as follows:

National health-care reforms and introduction of ED access targets have led to improvement in ASH ED access because of the resources provided through reforms and the willingness of management and clinicians to support implementation.

Quantitative Findings

Initially, annual results for the 3 performance indicators considered in this study (ED waiting times, Access Block, and NEAT) were charted over 2008 to 2014 (see Table 2). The data indicate moderate improvement (increase in percentage of ED patients seen within clinically recommended time and decrease in Access Block). To analyze the results further, the performance indicator data were broken down by month and scatter plots constructed to explore the improvement over time (see results in Table 3). The scatter plots indicated a positive relation between time and ED seen within clinically recommended time and NEAT results, and a negative relation between time and Access Block results. To obtain strength and significance of these relationships, correlation analysis was performed. The correlation analysis (Table 3) indicates a strong association ($P < .001$) between the month of the year and ED presentations seen within time and a moderately strong inverse relationship between Access Block and the month of the year ($P < .05$). There was no statistically significant improvement over time for NEAT. The NEAT results should be interpreted in light of its recent introduction in 2012: the other 2 performance indicators have been in place for some time.[10,13,15,49]

Table 2. ASH ED Performance Indicators, 2008 to 2014.[a]

ED Performance Indicators	2008	2009	2010	2011	2012	2013	2014
Number of ED presentations	33 528	37 273	39 210	41 931	39 962	42 107	42 873
ED percentage of patients seen within clinically recommended triage times	51.5%	58.7%	49.1%	53.3%	57.0%	56.5%	61.5%
ED Access Block	46.0%	45.0%	44.0%	43.7%	38.9%	42.4%	42.4%
NEAT	60.2%	64.6%	60.2%	62.4%	63.0%	61.2%	62.9%

Abbreviations: ED, emergency department; NEAT, National Emergency Access Target.
[a]Source Data: Alice Springs Hospital.

Table 3. Scatterplot and Correlation Analysis Between Month of the Year and ED Performance Indicators, 2008 to 2014.[a]

ED Performance Indicators	Linear Equation ($y = mx + c$)	R^2 Value	Correlation With Month
ED presentations seen within time	$y = 0.1037x + 51.184$	0.1209	0.348[b]
Access Block	$y = -0.0649x + 45.96$	0.0763	−0.276[c]
NEAT	$y = 0.0159x + 61.42$	0.0223	0.149

Abbreviations: ED, emergency department; NEAT, National Emergency Access Target.
[a]$n = 84$.
[b]$P < .001$.
[c]$P < .05$.

Table 4. Context-Mechanisms-Outcome Configuration Patterns.

Context	Intervention	Mechanisms	Outcome
National health care reform	Local investment in hospital infrastructure and workforce	Management wants to support clinicians + clinicians feel supported by management + clinicians feel encouraged to develop new protocols and pathways to improve patient flow.	*Improved patient flow*
National and local health care reforms	Introduction of ED performance indicators	Management wants to focus on specific factors such as Access Block + management feel compelled to communicate with clinicians more regularly and effectively + some inpatient clinicians are keen to support and collaborate with ED clinicians + clinicians feel encouraged to develop new protocols and pathways to improve patient flow	*Improved ED performance*
		Management does not want to meet targets at the cost of patient safety and relationship with clinicians.	*Recent establishment of a local program to respond to national reforms*
National health care reform	Investment in specific areas of hospital infrastructure and workforce only	Inpatient clinicians are not particularly motivated to support ED or meet targets + some clinicians feel unsupported	*Potential increase in Access Block*
Alice Springs Context (remote + patient profile)	Introduction of ED performance indicators	Management does not want to meet targets at the cost of patient safety and relationship with clinicians + management and clinicians frustrated with inadequate community services + management and clinicians feel powerless to address patient flow issues + ED and inpatient clinicians feel patient safety comes before patient flow or targets	*Potential decrease in ED access*

Abbreviation: ED, emergency department.

Qualitative Findings

The key CMOC pathways that emerged from document and interview transcript analysis are outlined in Table 4. The CMOCs and quantitative results identified nuances that led to revision and refinement of the program theory as follows:

Introduction of contextually relevant reform programs have led to improvement in ASH ED access through involvement of both management and clinicians. The changes have been aided by infrastructure and workforce investment acquired through national and local funding. The funding has provided resources and motivation for clinicians to implement reforms. However,

unequal investment across different areas of the hospital and continuing social challenges will have an impact on the motivation of hospital staff to sustain improvement.

Discussion

The study aimed to determine whether ASH ED access has improved in the context of national reforms, and if so, how improvement was achieved in the face of known and emerging challenges for regional hospitals. Combining a case study design with a realist evaluation framework enabled rich exploration of this complex context and potential extrapolation of results to other hospitals experiencing reforms. Consistent with a realist approach, the study has highlighted the importance of contextual factors, program resources, and staff reasoning for the realization of change.

The quantitative component of this study charted ED performance indicator results over time. Analyses identified moderate improvement in some ED access indicators (increase in ED presentations seen within time and decrease in Access Block) over the reform period 2008 to 2014. While these indicators capture only a single dimension of ED performance, they are still an important representation of the outcome of targeted ED reform.[10,50,51]

The qualitative phase of this study probed how and why these outcomes were achieved. Analysis indicated that strong clinical leadership ensured improvement in ED access, despite contextual challenges. Reform investment into infrastructure and workforce were also key drivers to improvement. While reform targets were important and a driver for improvement in ED access, patient safety was paramount for both management and clinicians. Sustainability of performance improvement will be difficult without changes in other hospital departments (infrastructure and workforce), improvement in support services, and a long-term clinical redesign program.

One of the limitations of this study is that not all reform variables (such as reform funding and workforce parameters) were considered in the quantitative analysis to identify association with improvement in ED access. This is because this study is meant to be first of the studies that will explore the impact of national reforms on regional ED access. Further studies, as realist standards[52] suggest, will be required to probe the association and perhaps causative factors. While we cannot assume from the results of this study that national health care reform, in isolation, led to improvement in ASH ED access, we can confidently note there has been moderate improvement in ED access following the introduction of reform components.

Another limitation is that a single site was selected to undertake the evaluation. However, the realist case study design doesn't discriminate against single site selection and allows intraprogram comparison and in-depth analysis within a single site. This level of analysis may not have been feasible to complete (in reasonable time frames) if multiple sites were involved. While we cannot assume the program theory derived from this study applies to all regional hospitals, we can safely understand the mechanisms (positive and negative) and reform components (infrastructure and workforce funding, introduction of targets, and clinical redesign activity) identified through this study are vital considerations when implementing ED reforms in other regional hospitals.

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Notes

1. Reward funding had been associated with achievement of NEAT targets for each state and territory in Australia.[15] However, the Australian Government in its 2014 Budget announcement ceased reward funding from 2015–16.[53]
2. The Accessibility/Remoteness Index of Australia (ARIA) describes a remote area as having "very restricted accessibility of goods, services and opportunities for social interaction".[30]
3. Northern Territory includes Central Australia and Alice Springs.

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Author Biographies

Sandeep Reddy is a senior research fellow at the Centre for Remote Health and is actively engaged in research on various levels of health services. He has a background in medicine, international health, health service management and health policy.

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John Wakerman is the associate dean of Flinders Northern Territory and has a background in public health medicine, remote general practice and remote health research.

FINAL PHD SEMINAR

PhD Final Seminar

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A REALIST CASE STUDY OF ALICE SPRINGS HOSPITAL'S RESPONSE TO IMPROVE EMERGENCY DEPARTMENT ACCESS IN THE CONTEXT OF NATIONAL HEALTHCARE REFORMS

(Why and How Alice Springs Hospital improved their emergency department access)

Dr Sandeep Reddy
Centre for Remote Health
Supervisors: Prof Tim Carey, Prof John Wakerman & Prof Judith Dwyer

In the past few years, Australia has embarked on major health care reforms extending across all states and territories. While reform implementation has slowed, increased funding and targets have had some impact on the public hospital sector. However, evidence linking national reforms to improved performance in public hospitals is meager. This absence is even more pronounced in the case of regional hospital performance. This study evaluated whether national reforms have led to an improvement in emergency department (ED) access (an important hospital performance measure) in a regional hospital in Central Australia, Alice Springs Hospital. The study identified moderate improvement in ED access as a result of reform investment in infrastructure and workforce, and introduction of ED targets. Clinical leadership and support from the hospital management and the federal government has been critical for the improvement. However, infrastructure and workforce funding must be accompanied by clinical redesign activities for improvement to be sustained. The study also identified that reform funding has to be equitable within a hospital, and be provided on a long-term basis in order to be effective. In the context of a paucity of research on the impact of national healthcare reforms on regional and remote hospital performance, this study sheds some light on pathways that are critical for improvement in ED access.

Wednesday 16th March 2016, 9am to 11am (NT time)
Venue: CRH Main Meeting Room, Centre for Remote Health, Alice Springs
Video-conferencing is available by contacting sandeep.reddy@flinders.edu.au

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