Understanding the implementation of New Zealand's immunisation health target for two year olds

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Abstract

Health targets have been used internationally to stimulate change and improve performance within specific areas of a health system. While some countries have a long history of using health targets, their use within the New Zealand health system is relatively recent. Previous research on health targets has shown that they can be an effective policy mechanism for improving accountability and focusing attention on priority areas. However, critics of health targets have argued that they can create dysfunctional consequences within a health system that can have a negative impact on performance. This research used case study methodology to explore the implementation of New Zealand's immunisation health target for two years olds within four case study District Health Boards. Understanding the implementation process allowed the researcher to consider how effective the health target was as a policy mechanism for improving immunisation coverage and addressing immunisation inequities between Māori and non-Māori children within the context of the New Zealand health system. The research findings demonstrated that the immunisation health target created strong accountability mechanisms across each level of the New Zealand health system. This vertical dimension of accountability focused attention on immunisation and elevated it as a priority on local policy agendas. However, the immunisation health target was actually implemented at the local level along a horizontal dimension through network coordination. Network coordination allowed the case study District Health Boards to take a universal systems approach towards improving immunisation coverage in their region. This increased immunisation coverage for all children, including Māori children, in a way that previous policy attempts had failed to achieve.

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Abbreviations

CHIS	Child Health Information Systems
DHB	District Health Board
GP	General Practitioner
IMAC	Immunisation Advisory Centre
LMC	Lead Maternity Carer
MeNZB™	New Zealand vaccine against a specific strain of group B meningococcus
MMR	Measles/Mumps/Rubella vaccine
MOH	Ministry of Health
NGO	Non-Government Organisation
NHB	National Health Board
NHI	National Health Index
NHS	National Health Service
NIR	National Immunisation Register
OIS	Outreach Immunisation Service
PHO	Primary Health Organisation
Ro	Basic reproduction number
UNICEF	United National Children's Fund

Chapter One: Introduction

1.1 Introduction

Health targets have been used internationally to stimulate change and improve performance within specific areas of a health system (Bevan & Hood, 2006a; van Herten & Gunning-Schepers, 2000a). However, there has been ongoing debate around their effectiveness as a policy mechanism as critics of health targets have argued that they can create dysfunctional consequences within a health system that can have a negative impact on performance (Bevan & Hood, 2006b; Kelman & Friedman, 2009; Radin, 2006; Smith & Busse, 2010).

In 2007, New Zealand's Ministry of Health introduced a health target for immunisation as part of a set of health targets that would 'provide a greater focus for action and lift health system performance in priority health and disability areas' (Ministry of Health, 2008, p. 5). Improving immunisation coverage to 95 per cent had been a policy objective within the New Zealand health system since 1995. But more than a decade later, New Zealand continued to experience inadequate levels of immunisation coverage, persistent immunisation inequities for Māori and Pacific children and variation in immunisation coverage between different regions (Ministry of Health, 2007b; Turner, Baker, Carr, & Mansoor, 2000).

The immunisation health target stated that **95 per cent of two year olds would be fully immunised by July 2012.** The Ministry of Health identified the District Health Boards (DHBs) as the organisations within the health system who were responsible for achieving the immunisation health target. The New Zealand health system is organised around 20 DHBs who are responsible for providing or funding the provision of health services within their region. Although the Ministry of Health clearly set out *what* they expected DHBs to achieve, they gave very little direction on *how* they should achieve the immunisation health target.

This research explores how the immunisation health target was implemented at the local level within four case DHBs. It examines how these DHBs improved immunisation coverage at two years of age and how they addressed immunisation inequities within their regions. The researcher was then able to consider how effective the health target was as

a policy mechanism for improving immunisation coverage within the context of the New Zealand health system.

1.2 Rationale for this thesis

Research on immunisation in New Zealand has tended to focus on the role of health professionals and the systems and processes for immunisation at a primary care provider level of the health system (Goodyear-Smith, Grant, Petousis-Harris, & Turner, 2009; Goodyear-Smith, Petousis-Harris, & Turner, 2005; Grant, Petousis-Harris, & Turner, 2011; Petousis-Harris, Goodyear-Smith, Turner, & Soe, 2005). Very little research has examined the roles and functions of other organisations within the health system in improving immunisation coverage and addressing immunisation inequities. The Ministry of Health clearly identified DHBs as the organisations within the health system who were responsible for achieving the health target. This research set out to explore how DHBs implemented the immunisation health target and what they did to improve immunisation coverage at the local level.

Previous policy attempts had failed to improve immunisation coverage and address immunisation inequities in New Zealand (Ministry of Health, 2003; Turner et al., 2000). The introduction of a health target for immunisation coverage was a new policy approach by the Ministry of Health (Mays, 2006; Ministry of Health, 2008). Understanding the implementation process within the four case study sites allowed the researcher to consider how effective the immunisation health target was as a policy mechanism for improving immunisation coverage within the New Zealand health system. The effectiveness of health targets has been widely debated within the literature and this research contributes to our understanding of health targets by highlighting a number of lessons from the immunisation health target experience.

Exploring how the immunisation health target was implemented at the local level within four case study DHBs also allowed the researcher to examine how these DHBs improved immunisation coverage for Māori children within their region. Māori are the indigenous people of New Zealand and make up around 15 per cent of the New Zealand population (about 598,600 people) (Statistics New Zealand, 2013). When compared to the rest of the New Zealand population, Māori experience significant health inequalities (Robson & Harris, 2007). Persistent immunisation inequities between Māori and non-Māori children were highlighted as a challenge for immunisation policy in New Zealand for almost twenty

years (Grant, Turner, York, Goodyear-Smith, & Petousis-Harris, 2010). Even when rates of immunisation coverage increased in New Zealand the level of inequity between Māori and non-Māori children remained the same (Ministry of Health, 2007b).

This research uses the term *inequity*, rather than the term inequality or disparity, to describe the difference in immunisation coverage between Māori children and non-Māori children within the New Zealand population. The term inequity comes from a social justice perspective (Braveman & Gruskin, 2003; Whitehead, 1991) and can be defined as inequalities in health between population groups that are unnecessary, preventable and amenable to policy intervention (Mills, Reid, & Vaithianathan, 2012).

Case study methodology allowed the researcher to examine how the case study DHBs addressed, or did not address, immunisation inequities between Māori and non-Māori children. Although much of the previous research on immunisation in New Zealand has highlighted immunisation inequity as a significant challenge for the health system (Bramley, Hebert, Tuzzio, & Chassin, 2005; Grant et al., 2010; Turner et al., 2000), very little research has shown how these inequities could be reduced and eliminated. No previous research has demonstrated how immunisation inequities in New Zealand can be reduced through strong policy direction by the government.

1.3 Research questions

The central research questions for this study were:

- How effective is a health target as a policy mechanism for improving immunisation coverage?
- How was the immunisation health target implemented at the local level in New Zealand?
- How did DHBs address immunisation inequities between Māori and non-Māori children?

1.4 Reflecting on my role as the researcher

My role as the researcher in this study has been shaped by my background and my research interests in the areas of policy implementation, health services research and addressing health inequities for Māori communities.

My whakapapa (genealogy) connects me to Ngati Toarangatira, Ngati Koata and Nga Ruahine. I feel a strong responsibility as a Māori New Zealander to ensure that my research contributes to the improvement of Māori health outcomes within the New Zealand health system. I have completed a Bachelor of Health Science and Masters in Public Health through the University of Auckland and chose to return to this University to undertake my PhD as it would allow me to develop skills as a health policy researcher within the New Zealand context.

My interest in the immunisation health target developed from my interest in health inequities for Māori children, as there were persistent immunisation inequities between Māori and non-Māori children in New Zealand when the health target was introduced in 2007. I wanted my PhD to explore how a health policy could address inequities for Māori and the immunisation health target had the potential to do this.

I also wanted this research to have practical implications for health services research in New Zealand. The immunisation health target was a policy that was introduced at a national level by the Ministry of Health, but it relied on organisations at the local level for implementation. I was interested in how this implementation process happened (or did not happen) across the different levels of the New Zealand health system.

1.5 Research funding

This research was made possible by the University of Auckland Doctoral Scholarship, which I received over a period of three and half years. This scholarship allowed me to make a full time commitment to this research and the writing of this thesis. Additional research costs were covered by the University of Auckland PRESS account. This research had the support of the Ministry of Health and the Immunisation Advisory Centre (IMAC), but did not receive any funding from these organisations.

1.6 Structure of this thesis

This thesis is organised into seven chapters.

Chapter one provides an introduction to the thesis and outlines the rationale and research questions for this study. It also gives an overview of the structure of this thesis.

Chapter two presents part of the literature review for this research. It focuses on literature within the areas of performance measurement and management, the use of health targets to improve health system performance, policy implementation and network coordination.

Chapter three presents information on the policy context for immunisation in New Zealand. It also examines the international literature on policy mechanisms for improving immunisation coverage and addressing immunisation inequities for indigenous children. It presents an overview of research on immunisation and best practice for immunisation services within the context of the New Zealand health system.

Chapter four discusses the research process for this study. It begins with a discussion on the ontological and epistemological assumptions underpinning this research and describes how case study methodology was used as a research process. It also outlines the research methods that were used to collect, analyse and interpret data

Chapter five presents quantitative data on progress towards the immunisation health target over time at both a national and local level. It uses this existing data to establish a contextual baseline for the four case study sites from which to explore the implementation of the immunisation health target.

Chapter six presents the research findings from this research.

Chapter seven provides a discussion of the research findings in relation to the literature and the research questions for this study. It looks at the policy implications of these research findings and includes the conclusion for this thesis.

Chapter Two: Performance Management, Health Targets and Policy Implementation

2.1 Overview of this chapter

A literature review was conducted to establish a foundation of existing knowledge for this research. This involved examining previous research on performance measurement and management including the use of health targets to improve health system performance. It also required the research to explore the literature on policy implementation. However, due to the amorphous nature of policy implementation research, a wider search was needed to consider relevant research on policy implementation within the areas of public administration, organisational management and evaluation. This chapter presents this review of the relevant literature.

2.1.1 Search strategy for the literature review

The search for literature on performance management, health targets and policy implementation was undertaken using Google Scholar, Medline and SCOPUS. Key terms that were used during this search were: health target, performance measurement, performance management, policy implementation, local implementation, networks, organisational change, health systems, immunisation, immunisation coverage, immunisation policy, immunisation services, indigenous children, Māori, immunisation inequalities, health inequalities, immunisation services and New Zealand.

To understand the policy context for this research (which is the focus of the next chapter in this thesis) the literature review also needed to consider existing research in a number of other areas including: international policy approaches for improving immunisation coverage, addressing immunisation inequities for indigenous children and research on immunisation services within the New Zealand context. Key terms that were used to search for literature in these areas included: immunisation, immunisation coverage, immunisation policy, surveillance, financial incentives, health target, United Kingdom, Australia, United States, Canada, immunisation inequalities, indigenous children, New Zealand, immunisation services and primary care.

2.2 Performance measurement and management within health systems

Internationally, performance measurement and management systems have been applied to many different areas in both the public and private sector (Radin, 2006). Their use within health systems has been particularly prominent as governments have sought to control public expenditure, produce greater efficiency and improve accountability (Carter, Klein, & Day, 1992). Although performance measurement can occur without a system for performance management, the two are often discussed within the literature as two sides of the same coin. Distinguishing between the measurement and the management aspects is useful as performance measurement refers to *what is measured* while performance management is concerned with *why it is being measured.*

2.2.1 Performance measurement

Performance measurement within a health system has been described as 'the quantitative measurement of the results of health care … and of processes that are so closely associated with the results of care, that they can be used as surrogates for the anticipated results' (Mannion & Goddard, 2002, p. 231). Identifying a *performance indicator* that can serve as an precise measure of the desired result of care can be challenging as many health outcomes are difficult to attribute to actions within the health system (Bevan & Hood, 2006b). Performance indicators within a health system therefore tend to focus on measuring the inputs, processes and outputs of health services. Carter, Day and Klein (1992, p. 36) provide a useful definition for each of these terms:

> *'Inputs* are the resources that are required to provide a service, including staff, buildings, equipment and consumables. *Processes* are the way in which a service is delivered and involves some measurement of quality … *Outputs* are the activities of an organisation, or the service it provides, such as the number of benefit claims processed or patients treated … finally, *outcome* is the impact of the service – healthier or more knowledgeable individuals, a safer society and so on'.

Performance indictors can be used in a number of different ways depending on where and how they are applied. Within a health system, performance indicators have been used to monitor the strategic or operational performance of an organisation, as a tool for hands-off control over the lower levels of the health system or as a way of managing the day to day processes within an organisation (Carter et al., 1992). Performance indicators can be developed voluntarily from the 'bottom-up' through professional networks or they can be

used as a hierarchical tool to 'control at a distance' through a top-down approach (Pollitt & Bouchaert, 2000).

Carter, Day and Klein (1992) use the metaphor of performance indicators as dials or tin-openers to distinguish between the different effects that measurement of performance indicators can have within an organisation. In terms of controlling service delivery, an ideal performance indicator would operate as a dial, 'providing a precise measurement of inputs, outputs and outcome based on a clear understanding of what good and bad performance entails' (Carter et al., 1992, p. 49). However, there are very few precise measures within public sector organisations and performance indicators are often used as 'tin-openers rather than dials: by opening up a can of worms they do not give answers but prompt investigation and inquiry, and by themselves provide an incomplete and inaccurate picture' (Carter et al., 1992, p. 49).

2.2.3 Performance management

Performance management within a health system refers to a system of performance indicators that are monitored by government in order to manage the performance of organisations within the health system. Hood (2007) states that there are three major forms of performance management, which he refers to as 'public management by numbers'. The first is the use of targets which measure performance towards an identified policy objective. The second is the use of ranking systems or league tables which measure current or past performance of organisations against one another. And the third involves the use of intelligence systems that collect and measure performance. These are often combined into hybrid approaches which can compensate for the weaknesses of each other.

Targets use a performance indicator to set a minimum threshold for performance (Hood, 2012). The use of targets as a policy mechanism to improve health system performance will be examined within the next section of this chapter.

Ranking systems, such as league tables, use performance indictors to compare the performance of different organisations against each other. This places pressure on the organisations to improve their performance in comparison to the other organisations they are competing against. Like targets, ranking systems have been criticised for producing output distortions as managers learn to move their organisations up the league table in

ways that do not reflect the intentions of policy makers. Ranking systems may also divert attention away from other important activities as organisations focus their efforts on what is measured, a practice that has given rise to the oft-stated phrase 'what gets measured gets managed' (Drucker, 1954). Carter, Day and Klein (1992, p. 48) state that 'there is also a danger that average performance will be equated with good performance'. Ranking systems can focus attention on the organisations at the top and the bottom of a league table, allowing organisations located in the middle to 'hide in the pack' (Carter et al., 1992, p. 48).

Hood (2007) uses the term intelligence to refer to the collection of information for quantitative performance indicators that managers and policy makers can review but that do not necessarily need to link to a target or ranking system. This information is used to improve background knowledge and develop expertise about how a system works without creating the pressure that targets and ranking systems exert. Intelligence can be useful if gaming is an issue, as it can be used in unpredictable ways. As managers do not know which indicators will be used to monitor performance their incentive to game the numbers is reduced. However, there are some challenges due to this unpredictability, including multiple interpretations of the same data, a lack of transparency and no clearly stated policy goals for organisations to work towards (Hood, 2007).

Recent research on performance management has focused on understanding what kinds of social conditions best fit different forms of management by numbers. Or as Hood so eloquently puts it 'what makes management by numbers a performance-enhancing drug in some times and places but not in others?' (Hood, 2012, p. S85). Hood proposes two answers to this question.

The first is that the way in which performance is enhanced or obstructed depends on what form management by numbers takes: targets, ranking systems or for intelligence. Each of these approaches has the potential to improve performance as well as the potential for dysfunctional consequences. These factors need to be taken into consideration when determining the most appropriate approach to use.

The second states that the effects on performance of targets, ranking systems or intelligence systems will depend on the culture of the organisation. Hood defines culture as 'the shared attitudes, beliefs and associated ways of thinking and acting in the group of actors who produce or co-produce the relevant public services' (Hood, 2012, p. S89). He states that the use of targets will be most effective within a hierarchical culture where

there is a clear source of authority and a shared sense of purpose. However, Hood also argues that performance within a target regime may be enhanced by a culture of egalitarianism where there is a sense of a shared purpose in addressing a common challenge.

The use of ranking systems may be more effective within a more individualistic culture where competition is likely seen as normal behaviour. However, again it is possible that performance may be enhanced if individualism is mixed with elements of a culture of hierarchy and egalitarianism. Hood states that this may be effective in improving performance as:

> 'an element of hierarchism can help fix the rules of the game in which competition takes place and check responses that do not boost overall performance, such as the sabotage of rivals. And an element of egalitarianism can help encourage team effort rather than purely individual competition, thus producing the collective action needed for successful competition between organisations and teams, when players have to cooperate within their groups to compete successfully against other groups' (Hood, 2012, p. S90).

The use of intelligence is most likely to improve performance within some form of an egalitarian social context. Interpreting complex information to improve performance requires a social context that has a culture of communication and cooperation. Sharing of information and exchange of ideas is unlikely to occur within a hierarchical rule-bound culture or within an individualistic culture where information may be hoarded for individual advantage.

2.2.4 Accountability for performance

All health systems have some form of accountability mechanisms between different organisations and levels within the system (Brinkerhoff, 2004). Carter, Day and Klein (1992) highlight a number of dimensions that need to be considered regarding accountability for performance. The first dimension focuses on the extent to which an organisation is politically accountable for their performance to central government. The second dimension is the extent to which the organisation is accountable to the public and their exposure within the media. Both of these dimensions focus on external accountability for performance, but internal accountability for performance within an organisation is

another essential dimension. Internal accountability requires organisations to take *ownership* of their performance by accepting responsibility for their performance. Governments may face challenges controlling the performance of sub-ordinate organisations which do not take ownership of their performance (Carter et al., 1992).

There may also be challenges when performance ownership is shared across multiple organisations as the degree of ownership of performance is constrained by the level of interdependence of the different organisations involved. Carter, Day and Klein (1992) draw attention to the example of the National Health Service (NHS) in England, which is characterised by a complex set of working relationships where the performance of one department in a hospital or one organisation in a community is dependent upon the actions of other departments or organisations. This interdependence is one of the reasons why it is difficult to assign accountability for performance within a health system.

It is also important to consider the extent to which performance may be affected by factors that are beyond the control of the organisations involved. Once again, this has relevance for performance within the health system as many of the factors that influence health outcomes are outside of the control of the organisations that deliver health services. In order for organisations to take ownership of their performance, it needs to be an area where they feel they are responsible for what is being measured (Carter et al., 1992).

2.3 Using targets to improve health system performance

Health targets are used to improve performance within a specific area of a health system (Smith & Busse, 2010). They are a classic hierarchical policy mechanism as they allow governments to use authority to direct the actions of organisations that deliver publically funded services (Le Grand, 2007). Although health targets have been used in a number of countries, their extensive use within the English NHS during the early 2000s intensified the debate within the literature around the value of health targets (Bevan & Hood, 2006a, 2006b; Hood, 2007; Kelman & Friedman, 2009; Smith & Busse, 2010).

Advocates for the use of health targets emphasised that health targets can concentrate policy attention and improve health system performance (Campbell & Gibson, 1997; Hood, 2012; Smith & Busse, 2010). However, critics of health targets have argued that these improvements come at a cost, as dysfunctional consequences of health targets can

have a negative effect within a health system (Bevan & Hood, 2006b; Kelman & Friedman, 2009; Smith & Busse, 2010).

This section of the literature review examines the use of health targets within the English NHS. It then goes on to look at the debate within the literature on using health targets to improve health system performance. The section ends with a discussion on some of the issues that need to be considered when designing effective health targets.

2.3.1 The use of health targets in the English NHS

England has a long history of using health targets within public health policy documents (Hunter, 2002). However, in the early 2000s a new system of governance was introduced within the English NHS that used health targets alongside a performance rating system for individual NHS organisations (Smith & Busse, 2010). This became known as the *star rating system* as providers such as hospitals and mental health providers, and funders such as Primary Care Trusts, were given overall ratings from zero to three stars based upon their performance towards a number of performance indicators. There were around 40 indicators that were measured along six dimensions of performance: population health improvement, fair access, effective delivery of appropriate care, efficiency, patient and carer experience and health outcomes after treatment. The intention of the star rating system was to:

> 'compress a range of performance data into a single rating in a deliberate attempt to summarise complex information in the form of rankings that the public and media could relate to, thereby promoting public interest, strengthening accountability, and encouraging managerial and clinical action' (Mays, 2006, p. 5).

However in practice, the star ratings system largely depended on performance towards a set of ten key indicators that were dominated by targets for patient waiting times (Smith & Busse, 2010). The star rating system was attached to an incentive programme that rewarded high performing organisations with financial incentives and more financial and managerial autonomy. However, poor performing organisations were at risk of being zero rated and publicly 'named and shamed' through the publication of league tables. Their Boards and Chief Executives were also at risk of being dismissed, leading to what some commentators have described as 'a regime of terror and targets' (Bevan & Hood, 2006a).

Political responsibility for the NHS had been devolved to Scotland and Wales in 1998 and neither country followed England's lead in the use of the star rating system to measure and monitor performance towards set health targets (Bevan & Hood, 2006a). This created a natural policy experiment into the effects of health targets within a health system (Mays, 2006). Overall, performance improved in the areas that were covered by health targets in the English NHS. The most dramatic improvements were in the reported reductions in waiting times, which did not occur in the other countries of the United Kingdom (Bevan & Hood, 2006a).

However, there were serious issues with the gaming of health targets, in particular the distortion of data for ambulance response time targets and hospital Accident and Emergency waiting time targets. Bevan and Hood describe gaming as a 'reactive subversion such as hitting the target and missing the point or reducing performance where targets do not apply' (Bevan & Hood, 2006b, p. 521). And targets for public health did not receive the same level of managerial attention as the targets for health service delivery (Marks & Hunter, 2005). Smith and Busse (2010) found this concerning as it indicated that managers concentrated on the more readily managed and short-term aspects of health care, such as waiting times, at the expense of less controllable and longer-term areas like public health.

2.3.2 Debate around the value of health targets

The English NHS experience intensified the debate within the literature around the value of health targets and their potential to have dysfunctional consequences within a health system (Bevan & Hood, 2006a, 2006b; Hood, 2007; Kelman & Friedman, 2009; Smith & Busse, 2010). Advocates for the use of health targets emphasised that governments can use health targets to clearly identify priority areas within the health system. This can improve accountability between local organisations and central government and focus attention within the health system on achieving government priorities. When used this way, health targets are a policy mechanism that governments can use to provide leadership and strategic direction within a health system (Campbell & Gibson, 1997).

However, health targets can be seen as political promises and this can have implications for the government or minister who has made a commitment to them. If the health target is not achieved this could place politicians in a vulnerable position. This happened in the Netherlands in the early 1990s, when the then Secretary of State for Health believed that

quantitative health targets would imply political accountability and politicians would be held responsible if the targets were not achieved (van Herten & Gunning-Schepers, 2000a).

One of the general criticisms of health targets is that they oversimplify health policy by focusing on areas that are easily measured. This can be at the expense of other important areas that need to be addressed, but are more difficult to quantify (Smith & Busse, 2010). Health targets have also been criticised for diverting attention away from other areas of work as organisations focus their effort on the target area (Kelman & Friedman, 2009). This was seen in the English NHS experience, as local managers concentrated on targeted and easily managed areas of health care at the expense of areas that were more difficult to control, such as mental health, and of less immediate concern, such as public health (Smith & Busse, 2010). However, advocates for health targets argue that there is no reason why a target should distort priorities as a target is, by definition, an indicator of priority (van Herten & Gunning-Schepers, 2000a).

Health targets can also create a structure for measuring and monitoring performance indicators and this can improve the collection of data and its use for intelligence purposes (Hood, 2012). Organisations can use data that is collected for measuring and monitoring performance towards a health target to stimulate organisational learning and improve performance. Monitoring a health target over time can also expose discrepancies or gaps in the data that is collected and the health target can act as an incentive for organisations to address under reporting or inaccurate data collection (Hood, 2012).

As mentioned earlier, a prominent criticism of the health target experience within the English NHS was that the health targets led to gaming (Bevan & Hood, 2006b; Mays, 2006; Smith & Busse, 2010). An example of this behaviour that is often cited within the literature was the emergency department waiting times target in the English NHS, where patients were kept in ambulances and parked outside of hospitals until the emergency department was ready to see them (Bevan & Hood, 2006a). Le Grand (2007) has highlighted the issue of gaming behaviour and argued that the use of targets can turn 'knights' into 'knaves' by rewarding those who achieve the target, even if it is at the expense of other priorities that are not part of the target regime.

2.3.3 Designing effective health targets

The effectiveness of a health target depends on the way in which information on performance towards the target is used by governments to hold local organisations accountable for performance (Radnor, 2008). In the past, health targets have been used by governments to articulate policy objectives that were aspirational, without linking them to accountability mechanisms for performance (Wismar & Busse, 2002).

In 2003, Sweden introduced a set of public health targets that focused on the determinants of health. The purpose of these health targets was to 'create social conditions that ensure good health on equal terms for the entire population' (Lager, Guldbrandsson, & Fossum, 2007, p. 413). Although the heath targets in the Swedish experience were innovative, in that they focused on changing social environments that influenced the determinants of health, they were criticised for not including time frames or having explicit criteria for achievement (Lager et al., 2007). They were symbolic in nature and this made it difficult to use them as a policy mechanism for improving performance in the Swedish health system or the health outcomes that they set out address.

In contrast to these aspirational targets, health targets that focus on specific areas of service delivery are more likely to have strong accountability mechanisms associated with achieving the health target as these are areas which health care organisations have a degree of control (Smith & Busse, 2010). The challenge that governments face in setting health targets to improve performance in a specific area of service delivery is ensuring that they are designed in a way that cultivates the advantages of targets while also limiting the potential for dysfunctional consequences.

Within the literature on health targets, and the wider literature on performance measurement and management, a number of recommendations have been made regarding the design of appropriate health targets (Bevan & Hood, 2006b; Carter et al., 1992; Hood, 2007, 2012; Smith & Busse, 2010). Although many of these issues have already been discussed within this section on health targets, they are summarised here to highlight issues that policy makers need to consider when designing health targets.

One of the key assumptions underlying the use of a health target is that the performance indicator that is being measured adequately represents the performance as a whole. Bevan and Hood (2006b) refer to this as *synecdoche*, that the part can be taken to stand for the whole. Effective health targets need to act as an accurate measure for the intended policy outcome. This is where the distinction between using health targets as a

'dial' or a 'tin-opener' is important, as synecdoche may be more difficult for health targets that act as a 'tin-opener' (Carter et al., 1992).

Health targets should also clearly identify who is accountable for achieving the target and this should be feasible and within the power of that organisation (Carter et al., 1992). Due to the complex and interdependent nature of health systems, achieving a heath target often requires a considerable amount of commitment across different levels of the health system. This requires communication between organisations and coordination of actions (van Herten & Gunning-Schepers, 2000a). To establish accountability for the health target, organisations who are involved in the implementation process need to make a commitment to the health target and accept responsibility that their actions will contribute towards achieving the health target (van Herten & Gunning-Schepers, 2000b).

Health targets require some form of surveillance system for collecting data that can be used to measure and monitor performance (Hood, 2007). This surveillance system should be independent of the organisations responsible for policy implementation of the health target to prevent gaming behaviour and ensure credibility of the data that is used to measure and monitor performance (Sequist & Bates, 2010)

Health targets should be realistic. If the target is set too high they can cause frustration and affect staff morale (Smith & Busse, 2010). If they are set too low they can create complacency as there is no incentive to improve (van Herten & Gunning-Schepers, 2000a). Although health targets can be used to set a minimum threshold for performance, it is important to consider the effect they will have on organisations with disadvantaged populations. Organisations may be performing poorly due to significant social and economic issues outside of their control and they could become disillusioned and alienated from the health target process (Smith & Busse, 2010).

There needs to be a limited number of health targets as having too many health targets can fragment attention. One of the criticisms of English NHS experience was that there were too many targets (Mays, 2006; Smith & Busse, 2010). And health targets work best when applied to a specific area over a relatively short period of time. As time passes, the likelihood of gaming and harm to staff morale is more likely to increase (Le Grand, 2007). They should therefore be seen as dynamic; once a health target has been achieved it should be replaced with an ongoing monitoring process.

2.3.4 Implementation of health targets

Health targets can act as a catalyst for change, but their effectiveness as a policy mechanism relies on organisations within the health system changing the way that they do things. Research on the use of health targets requires an understanding of policy implementation, as the implementation process determines whether a health target acts as an effective policy mechanism. The next section of this chapter examines the policy implementation literature and discusses a number of key issues that are relevant for this research on the implementation of the immunisation health target.

2.4 Policy implementation

Policy implementation refers to the actions that are taken to achieve policy objectives. Policy implementation is a complex process, even within a relatively small country such as New Zealand, as central government relies upon local organisations to translate national policy objectives into local policy action (Exworthy, Berney, & Powell, 2002). This implementation process often involves multiple organisations and many policy actors who must coordinate their efforts to achieve the intended policy outcome.

This section of the literature review examines the policy implementation literature in relation to the research questions for this thesis. It begins by looking at early research on policy implementation and discussing key concepts from this research that continue to have relevance today. It avoids the debate that followed this early research between proponents of top-down and bottom-up approaches to understanding policy implementation (Hill & Hupe, 2002) and instead focuses on a number of areas within the literature that are essential for understanding this research on the implementation of the immunisation health target. These include: tension between policy makers within central government and the local organisations responsible for implementation, policy implementation across difference local contexts and policy implementation through multiple organisations.

2.4.1 Understanding the implementation process

Early research on policy implementation set out to understand what happened between the formation of policy objectives within central government and the reality of policy

outcomes at the local level. This was the focus of Pressman and Wildavsky's (1973) seminal book titled *Implementation: How great expectations in Washington are dashed in Oakland*. Pressman and Wildavsky examined the local implementation of a federal policy in Oakland, California and found that that the policy intentions of policy makers in Washington did not resemble what was happening on the ground in Oakland. Their research showed that when policy action depends upon a number of policy actors and requires multiple clearance points for implementation, it is more likely to stall and therefore fail to achieve policy objectives.

Elmore (1979) proposed the concept of *backwards mapping* as a useful approach for understanding the implementation process. He stated that the conventional top-down approach towards policy implementation that Pressman and Wildavsky proposed was inherently flawed as it assumed that 'policy makers control the organisational, political and technological processes that affect implementation (Elmore, 1979, p. 603). Rather than beginning with policy makers setting policy objectives and directing specific steps for implementation at lower levels, Elmore suggested that policy makers should focus on the behaviour of policy actors at the lowest level of the implementation process. After establishing a precise target for change at the lowest level, policy makers could then work backwards through each level to ensure that the necessary resources were available to achieve its desired policy outcomes.

The complexity of local organisations and the interactions of multiple policy actors were viewed as potential barriers to successful implementation within a top-down approach. However, Elmore believed that:

> 'the closer one is to the source of the problem, the greater one's ability to influence it; and the problem solving ability of complex systems depends not upon hierarchical control but on maximising discretion at the point where the problem is most immediate' (Elmore, 1979, p. 605).

Elmore saw local organisations as effective problem solvers and claimed that policy makers within central government did not need to dictate how policy objectives should be achieved. Instead, they needed to give local organisations the autonomy to exercise their own judgement and problem solving abilities. This approach would allow local organisations to be more responsive to their local contexts and facilitate innovative courses of policy action.

Lipsky (1980) explored the behaviour of frontline staff who interacted with the public and how they were able to shape policy action according to their own intentions. He demonstrated that these *street-level bureaucrats* were able to exercise discretion in their interactions with the public which enabled them to evade the requirements of central government, even when working in controlled rule-bound environments. This research reconceptualised the policy process as dynamic, interactive and often out of the control of policy makers in central government. It also emphasised the interactions between policy actors within the same organisations as well as the relationships between different policy organisations involved in the implementation process (Hjern & Porter, 1981).

The work of Pressman and Wildavsky, Elmore and Lipsky continues to have relevance for understanding the implementation of health policy today. Health systems are complex, with many interdependent organisations and a vast number of policy actors involved in delivering health services to the public (Buse, Mays, & Walt, 2005). Early research on policy implementation showed that the process was not as simple as articulating policy goals from central government down to organisations at the local level (Exworthy et al., 2002). There was an inherent tension in this process, between the authority of central government and the autonomy of local organisations (Colebatch, 1998).

2.4.2 Tension between central government and local organisations

Tension between central government and local organisations can be viewed along two dimensions. The vertical dimension focuses on *authority* and has a hierarchal structure where central government delegates authority to lower levels of government over decision making and responsibility for performance (Radin, 2003). This line of authority also becomes the line of accountability, as each level within the chain of command is accountable to the level above it (Considine, 2002).

One approach that is useful for examining the vertical dimension of authority is agency theory. Agency theory focuses on the relationship between a designated *principal* who delegates decision making authority and responsibility to an *agent* (Eisenhhardt, 1989). It highlights the uncertainties and risks that are inherent within this relationship and the incentives and surveillance systems that are needed to control opportunism by the agent. This is particularly relevant in the implementation of health policy as many health professionals view their primary accountability as being to their patients and their peers, not to central government (Carter et al., 1992). As it is difficult for the principal to verify

what the agent is actually doing, these relationships usually involve some form of performance measurement and management to ensure that the principal is able to manage the actions of the agent (Eisenhhardt, 1989).

The horizontal dimension focuses on the *autonomy* of an organisation or policy actor. Autonomy occurs through collective negotiation between the multiple organisations and policy actors involved in the implementation process (Colebatch, 1998). Accountability is far more complex along this horizontal dimension due to the complexity of the relationships between the organisations involved and their interdependence (Considine, 2002). However, given that health professionals view their accountability to their peers along a horizontal dimension (Carter et al., 1992), and that policy implementation often relies upon multiple organisations and many policy actors coordinating their efforts at the local level, governments have had to develop alternative modes of accountability to the traditional hierarchical approach.

The term *governance* has become prominent within the literature as it recognises the importance of collaboration, negotiation and partnership in the policy process (Newman, 2001). This represents a significant shift in understanding the role of central government:

> 'from a view of state power based on formal authority to one of the role of the state in coordinating, steering and influencing; from an interest in the actions of the state to an interest in the interplay of plural actors in both the shaping of policy (through policy networks) and the delivery of services (through partnerships)' (Newman, 2001, p. 23).

During the 1990s, a series of reforms introduced market-type mechanisms for coordination into the New Zealand health system (Gauld, 2000). However, this period of reform also saw significant emphasis on hierarchical mechanisms for governance, as market mechanisms were applied selectively and subsequently abandoned (Laugesen, 2001). In 2001, the newly elected Labour Government conducted further reforms which established the DHBs and created the PHOs. Although some market mechanisms remained, governance within the New Zealand health system became a mix of hierarchy and collaboration. These health reforms are explored in greater detail in the next chapter of this thesis on the policy context.

2.4.3 Policy implementation across different local contexts

When central government sets policy objectives with little direction on how local organisations should approach implementation there is potential for variation in how these policies are interpreted and what policy action is taken (Coleman, Checkland, Harrison, & Hiroeh, 2010). This hands-off approach to policy implementation may give local organisations greater discretion over the implementation process, but it could also lead to variation in policy outcomes between different localities.

Coleman et al (2010) explored this process in relation to practice-based commissioning within the English NHS. They highlighted how organisational history, discourses and norms shaped local sense-making and understanding of this loosely specified and aspirational policy. This process of sense-making led to different policy actions within different organisations and contributed to variation in interpretations and therefore policy implementation. This variation resulted in differences in practice-based commissioning between the three Primary Care Trusts involved in the study (Coleman et al., 2010).

Exworthy and Frosini (2007) showed that the ability of local organisations to exercise autonomy and improve performance is highly contingent upon their local context.

> 'Explaining variation in local outcomes of national policies demands an understanding and explanation of local autonomy and its effects on performance which takes into account the role of the local 'health economy' – the local context within which organisations are embedded' (Exworthy & Frosini, 2007, p. 204).

Exworthy and Frosini went on to state that the autonomy that is given vertically by central government and that which is given horizontally by other local organisations shapes the context in which local organisations can make decisions and the local policy actions that can be taken to meet policy objectives (Exworthy & Frosini, 2007).

2.4.4 Policy implementation through multiple organisations

Due to the complex structure of health systems, policy implementation in this area often involves multiple organisations. Cooperation between these organisations and coordination of policy actions can be challenging as each 'organisation is somewhat bound by its own goals, worldviews and routines so that its ability to respond to a new

mandate may be limited' (O'Toole & Montjoy, 1984, p. 492). These relationships take time and energy to develop and they require some form of motivation for cooperation.

O'Toole and Montjoy (1984) identified three forms of motivation for cooperation between organisations: authority, common interest and exchanges. Cooperation under authority occurs out of a sense of duty and is based on notions of power, while a common interest can facilitate cooperation based on shared values. Exchanges of cooperation can also be given in return for something else, such as resources or information. Within a health system, all three forms of motivation may play a role as different organisations may experience elements of authority in terms of contractual obligations between different levels of the health system, common interest in terms of achieving health objectives and exchanges of cooperation in terms of resources, time and expertise between different health professionals.

2.5 Networks and policy implementation

Networks represent a significant shift away from traditional forms of governance as 'the mode of coordination is based on relationships, rather than command and control in hierarchies and price and competition in markets' (Lewis, Baeza, & Alexander, 2008, p. 280). Within the policy literature, the term *network* is used to describe both a *conceptual model* and *a type of coordination* (Thompson, 2003).

This thesis is concerned with networks as a type of coordination for policy implementation. However, it is still useful to consider the literature on networks as a conceptual model for policy formulation as this research on policy networks as a conceptual model formed a foundation for later research on network coordination.

2.5.1 Networks as a conceptual model for policy making

Much of the early research on networks focused on the formation of policy, as networks provided a conceptual model for understanding the political nature of policy making. Networks were viewed as a model for mediation and negotiation between central government and the interests of a variety of local organisations. Rhodes described policymaking within this model as:

'a game in which both central and local participants manoeuvre for advantage deploying their constitutional-legal, organisational, financial, political and informational resources to maximise their influence over outcomes' (Rhodes, 1990, p. 303).

There were a number of different types of *policy networks* within this model, however, the two that warrant mention here are *policy communities* and *issue networks*. Rhodes and Marsh described policy communities as networks that have a

'highly restrictive membership, vertical interdependence based upon shared service delivery responsibilities and insulation from other networks and invariably the general public … these policy communities are based on the major functional interests in and of government' (Rhodes & Marsh, 1992, p. 182).

In contrast to the closed nature of policy communities, issue networks have a large number of participants and limited vertical interdependence. They focus on a specific policy issue and involve the policy actors and local organisations who have an interest on that issue. Issue networks are characterised by a high level of competition between participants and an unequal distribution of power as many participants may have limited resources (Rhodes & Marsh, 1992).

2.5.2 Networks as a type of coordination

Health systems are complex and policy implementation within a health system often requires collective action from multiple organisations across different levels of the system (Provan & Kenis, 2007). Rather than being considered as an alternative to hierarchical governance, network coordination can provide a potential solution to the challenge of policy implementation across multiple organisations (Considine & Lewis, 2003).

Rhodes (2000) states that the central mechanism for coordination in networks is trust. Within the organisational science literature, trust has been described as 'the willingness to accept vulnerability based on positive expectations about another's intentions or behaviours' (McEvily, Perrone, & Zaheer, 2003, p. 92). In much the same way that commands are used within hierarchical approaches or price and competition within market approaches, networks require communication and negotiation between the different organisations and policy actors involved to improve cooperation and compliance to achieve policy goals (Rhodes, 2000).

In the context of delivering public services, such as health services, networks are often called *partnerships* within the literature (Currie, Grubnic, & Hodges, 2011; Lewis, 2005; Lewis et al., 2008). Partnerships are usually formalised networks that are established to manage the relationships between organisations (Kickert, Klijn, & Koppenjan, 1997). Within these networks:

> 'partners share responsibility for assessing the need for action, determining the action to be taken and agreeing the means of implementation … however, partnerships which are externally mandated and funded at least partially by competitive contracts, also rely upon and display hierarchical and market mechanisms and characteristics, in addition to their network attributes. They are very different from networks which emerge on the basis of mutual benefit, trust and reciprocity' (Lewis et al., 2008, p. 281).

This distinction between networks that emerge from the bottom-up and those that are mandated by central government and implemented from the top-down is significant. Although networks or partnerships that are established by central government have some autonomy in determining their own local priorities and pathways of policy action, these decisions must align with the priorities of central government (Powell & Exworthy, 2002). This can create tension between the needs of central government and the needs of local organisations and limit the potential of using a network approach in the first place (Lewis et al., 2008).

Klijn (2007) stresses that networks are established and developed due to mutual dependencies. Mutual dependencies emerge when policy actors do not possess the resources to achieve policy objectives on their own; therefore they have to interact with other organisations in order to exchange resources. Networks develop from these resource exchanges and interactions over time and are often tied to the core interests of the policy actors involved.

O'Toole (1988, p. 424) emphasises that 'an individual or organisation strategically situated in the network – with a real interest in mobilising and maintaining achievement – can be exceedingly influential'. They can drive innovation within the network and implement changes across multiple organisations involved in the network.

2.5.3 Advantages and challenges in using network coordination

One of the key advantages of networks is that they can 'give professionals the freedom to use their expertise' (Rhodes, 2000, p. 355). This flexibility can allow the implementation process to be shaped by local contexts in a way that traditional hierarchical approaches to policy implementation may not allow for. This has particular relevance for health professionals as they have highly specialised expertise and often need to work within a team environment.

Networks can also enhance organisational learning through using resources more efficiently and providing better service to the public (Provan & Kenis, 2007). Networks have an increased capacity to plan for and address complex problems and this ability makes them particularly useful as a form of coordination for policy implementation within a health system.

However, interactions within a network are complex and knowledge is spread among different policy actors (Klijn, 2007). This can create challenges in terms of sharing information and organisational learning across different organisations. Communication is a key feature of successful networks as the exchange of information within the network is an essential element in the implementation process.

The structure of the network can either facilitate or constrain a network's ability to respond to challenges in the implementation process. O'Toole (1988) stated that 'different network structures suggest a trade-off between coordination and speed of action' (O'Toole, 1988, p. 431). Networks that involve a large number of policy actors or organisations may be restricted in their ability to respond to local challenges in a timely manner. While networks that do not involve all of the key policy actors or organisations involved in the implementation process can face challenges in coordinating necessary policy action.

One of the key challenges that networks face is uncertainty due to changes in priorities in the political environment. Rhodes states that 'network negotiation and coordination can be confounded by the political context in which they are embedded' (Rhodes, 2000, p. 355). Rapid changes within the political environment and short-term political interests undermine trust within a network and this can have an impact on the network's ability to take policy action.

Another challenge when using networks for policy implementation is that it can be difficult to identify lines of accountability (Rhodes, 2000; Rhodes & Marsh, 1992). This raises a number of concerns for governments where accountability has traditionally followed a

vertical line of authority where each organisation and policy actor is linked within a hierarchical chain of command (Considine & Lewis, 2003). Networks form across a horizontal dimension and this can create tension between vertical and horizontal forms of accountability as performance management structures usually require accountability to be concentrated rather than dispersed across different organisations (Currie et al., 2011).

2.6 Chapter summary

This chapter has reviewed a number of areas within the literature to provide a foundation of existing knowledge and research for this thesis. Health targets are a prominent form of performance measurement and management and their use internationally has generated much discussion about their ability to improve health system performance. However, critics of health targets argue that they can have unintended dysfunctional consequences within a health system and can actually reduce health system performance.

Research on policy implementation occurs across a number of different disciplines. This literature review has focused on examining a number of key areas within the policy implementation literature to inform this research on the implementation of the immunisation health target within the New Zealand health system. This included examining the tension between central government and local organisations responsible for policy implementation and policy implementation across different localities and through multiple organisations. It also included an overview of network coordination as a potential mode of coordinating the policy implementation process.

The next chapter of this thesis (Chapter Three: Immunisation as a Policy Issue) provides information on the policy context for this thesis. This also includes an overview of literature on international policy approaches for improving immunisation coverage and addressing immunisation inequities between indigenous children and non-indigenous children within Australia and the United States. It also examines previous research on immunisation within the context of the New Zealand health system.

Chapter Three: Immunisation as a Policy Issue

3.1 Overview of this chapter

This chapter focuses on the policy context for this thesis. It provides an overview of the New Zealand health system and describes the general roles and functions of the organisations that are involved in providing and supporting immunisation services in New Zealand. This is followed by a discussion on previous approaches to immunisation policy in New Zealand. It then looks at the introduction of the immunisation health target, which is the focus of this thesis.

The chapter then goes on to examine three areas of literature that are essential for this thesis. The first area describes a number of policy approaches that other countries have implemented in order to improve immunisation coverage within their populations. The second area explores the issue of immunisation inequities between Māori and non-Māori children in New Zealand and describes how immunisation inequities for indigenous children were addressed through policy actions in Australia and the United States. Finally, the third area reviews previous research on immunisation and best practice for immunisation services within the context of the New Zealand health system.

3.2 Immunisation

Immunisation uses the body's natural immune response to build resistance to specific diseases through the administration of a *vaccine* (IMAC, 2011). This provides individual protection against a disease (or a number of diseases) with some vaccines also providing protection at a population level. As the number of individuals who are immunised increases, the potential for a disease to spread from one individual to another within that population decreases. If a small percentage of the population is not immunised they still receive indirect protection from the disease due to the reduced transmission within the population. This protective effect is known as *herd immunity* (Anderson & May, 1990). It is important to note that vaccines are variable in that some do not offer any herd immunity, such as tetanus, while others have weak herd immunity, such as pertussis. Other vaccines work most powerfully through herd immunity, for example conjugate meningococcal vaccines (Anderson & May, 1990; Fine, 1993).

The level of immunisation coverage that is needed to prevent and control the spread of a disease depends upon the disease's expected number of secondary cases (the number of people that an infected individual may infect). This is known as the *basic reproduction number (Ro)* (Fine, 1993). The more contagious the disease, the higher the immunisation coverage level needs to be to prevent the spread of the disease within a community. For most vaccine-preventable diseases, the level of coverage required to prevent the transmission of that disease within a community is between 80 and 95 per cent of the population (refer to Appendix 1 for herd immunity thresholds for vaccine-preventable diseases).

3.3 New Zealand health system

Access to most health services in New Zealand is universal and funded by the government through taxation. Secondary care services are provided free of charge through public hospitals while primary care services are funded through capitation funding based on the number of people enrolled with the service. Most primary care providers also charge a co-payment for consultations that is paid out-of-pocket by the patient.

As a tax-funded health system, the majority of funding for health services (around 82 per cent) comes from the New Zealand Government (OECD, 2013). The remaining funding comes from private health insurance and out-of-pocket payments. For the financial year 2013/2014, the New Zealand Government committed $14,655 billion towards funding health services (Ministry of Health, 2014). Over three quarters of this funding was allocated to DHBs, who are responsible for planning, purchasing and providing health services for their populations. The remaining funding was given to the Ministry of Health where it was used to fund a range of national health and disability services (Ministry of Health, 2014).

3.3.1 New Zealand health reforms

There have been several changes to the structure of the New Zealand health system during the past thirty years as successive governments have reformed the way in which health services were organised and delivered according to their own political ideologies (Ashton, Mays, & Devlin, 2005). Before the 1980s, hospitals and some community-based health services were planned and delivered by hospital boards that were regionally based

and locally elected. These were restructured during the 1980s into Area Health Boards which were funded on a population basis and were also responsible for providing public health services (Laugesen, 2001).

During the early 1990s, the Area Health Boards were split into competing purchasers and providers in an attempt to create a market-based health system. Four Regional Health Boards were set up as purchasing agents and were funded by the government on a population basis. A separate Public Health Commission was established to purchase public health services. The personal health services that were previously provided by the Area Health Boards were reconfigured into 23 Crown Health Enterprises which were structured as for-profit organisations (Ashton et al., 2005).

In 1996, the four Regional Health Authorities were combined into a single national purchasing agency called the Health Funding Authority (Gauld, 2000). The Crown Health Enterprises were restructured as not-for-profit organisations and renamed Hospital and Health Services. Although the purchaser/provider split remained, the political rhetoric of markets and competition was replaced with a rhetoric of cooperation and public service (Ashton et al., 2005)

In 1999, the incoming Labour-led coalition government shifted the New Zealand health system away from a market ideology by abolishing the Health Funding Authority (which had only been operating for three years) and creating 21 DHBs who were responsible for both purchasing and providing health services for their populations (Ministry of Health, 2000a). The Labour Party was strongly opposed to market coordination within the health system arguing that it 'promoted (unhealthy) competitive rendering for contracts leading to fragmented services, lacked democratic community input and was neither accountable to central government nor to local communities' (Ashton et al., 2005, p. 255). The newly elected Government outlined their vision for the New Zealand health system in the *New Zealand Health Strategy* (Ministry of Health, 2000a) which signalled a shift in policy attention towards addressing health inequalities and improving population health.

The following year the Government also signalled changes to the way primary health care was funded and organised with the release of the *Primary Health Care Strategy* (Ministry of Health, 2000b). Primary health care services in New Zealand were traditionally provided by general practitioners (GPs) and practice nurses within a community setting. Many general practitioners worked as independent owner-operators and primary care providers were organised as for-profit businesses (Gauld & Mays, 2006). The *Primary*

Health Care Strategy placed greater emphasis on a multi-disciplinary approach towards primary health care and required general practitioners to come to come together under a PHO (Ministry of Health, 2011c). PHOs were funded on a capitation basis according to the number and characteristics of patients who were enrolled with them and were required to be community owned and governed (Gauld & Mays, 2006). These changes aimed to make access to primary health care in New Zealand more equitable by reducing financial barriers and shifting the focus of primary care away from individual health services towards a wider population health approach (Hefford, Crampton, & Foley, 2005).

The first PHOs were formed in the middle of 2003 and by late 2004 over 95 per cent of New Zealanders were enrolled with a PHO through their general practitioner. Many primary care providers continue to operate as private businesses but there was more diversity in the way in which primary care providers are organised, with a number of alternative models such as Māori PHOs and PHOs consisting of not-for-profit community providers (Ministry of Health, 2013a).

The structure of the health system has remained relatively unchanged since the creation of the DHBs and PHOs, bringing a period of stability to the New Zealand health system after a decade of constant upheaval. However, there have been a number of small but significant structural changes. In May 2010, Southland DHB and Otago DHB merged to become Southern DHB, reducing the number of DHBs to 20. And in November 2009, the newly elected National-led coalition government reduced the size and scope of the Ministry of Health and created the National Health Board (NHB). The NHB has been charged with the responsibility to improve quality, safety and sustainability within the New Zealand health system, functions that had previously been part of the Ministry of Health's mandate (National Health Board, 2011).

DHBs are accountable to both central government *and* local stakeholders and their communities (Tenbensel, Mays, & Cumming, 2011). Central government continues to direct policy attention and identify policy objectives within the health system, but DHBs have been left to work out the details of how these policy objectives should be achieved. This discretion over policy implementation at the local level requires DHBs to work with other health care organisations to achieve both national and local policy objectives.

3.3.2 Roles and functions of organisations within the health system

The current structure of the New Zealand health system comprises the Ministry of Health, DHBs, Regional Public Health Units, private non-government providers, PHOs, Māori and Pacific providers and independent GPs. The following section describes the roles and functions of the organisations that are involved in supporting and delivering immunisation services within the New Zealand health system.

3.3.2.1 Ministry of Health

The Ministry of Health provides leadership within the New Zealand health system and is responsible for the management and development of the health system. This involves providing advice to the Minister of Health, and the Government as a whole, on health issues and health services in New Zealand. The Ministry of Health is also responsible for directly purchasing national level health and disability services, such as disability support services, public health services, mental health services, screening programmes, maternity services and ambulance services (Ministry of Health, 2013b).

The Ministry of Health is required to address Government priorities and ensure that the health system is managed and functioning well from a financial perspective. This involves funding and monitoring performance within the health system and supporting the planning and accountability functions of the DHBs (Ministry of Health, 2013b).

3.3.2.2 District Health Boards

DHBs are geographically defined and vary in size, demographics and local health needs. A map of New Zealand with the DHB boundaries can be found in Appendix 3. Each DHB has a chief executive and is governed by a board with seven elected members and up to four members that are appointed by the Minister of Health (Gauld, 2006). DHBs are funded by the government based on their population characteristics and are responsible for planning, purchasing and providing health services for their populations (Ministry of Health, 2000a). This covers the full range of health services, from primary health care and disability services through to secondary health care within hospitals.

DHBs are required to respond to local health priorities while also addressing national health priorities that were identified in the *New Zealand Health Strategy* (Ministry of

Health, 2000a). This dual accountability to both the government and their local population can create tension for the DHBs as they are required to prioritise and address both national and local health priorities.

Each DHB has a Planning and Funding team who are responsible for planning and funding health services within the region and managing relationships between the DHB and the organisations that they contract to deliver health services. This includes the PHOs, who are contracted to deliver primary health care services to their enrolled populations. DHBs also provide funding for outreach immunisation services within their region and local immunisation initiatives. In terms of delivering immunisation services within primary care, DHBs pay an immunisation benefit directly to primary care providers for the administration of all childhood vaccination events on the National Immunisation Schedule (Ministry of Health, 2011b).

3.3.2.3 Regional Public Health Services

The Ministry of Health contracts public health services through 12 DHB-owned Public Health Units and a range of non-government organisations. Some of the Public Health Units cover a number of DHBs, for example Auckland Regional Public Health Service covers the three DHBs of the wider Auckland area (Auckland DHB, Waitemata DHB and Counties Manukau DHB). Other Public Health Units cover a single DHB and may be located within the DHB organisation itself. Public Health Units are responsible for environmental health, tobacco control, health promotion programmes and communicable disease control. This includes preventing and managing outbreaks of infectious diseases and supporting immunisation services (Ministry of Health, 2011a).

3.3.2.4 Primary Health Organisations

PHOs are non-government organisations and are funded by the DHBs 'to support the provision of essential primary health care services through general practices to those people who are enrolled with the PHO' (Ministry of Health, 2013a). PHOs are contracted to provide services either directly to their populations or through their primary care provider members. They are responsible for improving and maintaining the health of their entire enrolled population and providing health services when they are unwell (Ministry of Health, 2013a).

PHOs vary in size and structure, with the largest PHO representing over 200 primary care providers and over 500,000 enrolled patients while smaller PHOs may only cover several primary care providers and less than 50,000 patients.

3.3.2.5 Primary care providers

Primary care providers receive capitation funding through their PHO based on the number of patients who are enrolled with them. They are able to set their own consultation fee, which often requires patients to make a co-payment when they visit their general practitioner. Children under the age of six usually receive free or mostly subsidised care and immunisations on the National Immunisation Schedule are provided free of charge.

Practice nurses perform most of the immunisation services within primary care providers. They are usually responsible for delivering immunisations and providing immunisation information to parents. They also contact parents when a child is overdue for an immunisation event and refer children to outreach immunisation services when they are unable to reach the parents. Developing positive relationships with children and their families is a critical aspect of delivering immunisation services, but this takes time and consistency of staff within a stable primary care provider (Grant et al., 2011). Primary care providers in New Zealand are vulnerable to staff shortages and a high level of staff turnover and this has both financial implications for the provider as well as practical implications in their ability to deliver immunisation services (Grant et al., 2010).

Research on immunisation in New Zealand has shown that when general practitioners and practice nurses were knowledgeable about immunisation and confident in their knowledge this translated to higher rates of immunisation coverage and more timely immunisation (Goodyear-Smith et al., 2009).

3.3.2.6 Immunisation Advisory Centre

IMAC is a national level organisation located within the University of Auckland. IMAC provides independent information and advice on immunisation based on international and New Zealand research. This includes information on 'vaccine-preventable diseases and the benefits and risks of immunisation, information and training for health professionals, national immunisation coordination and policy advice and research into many aspects of vaccines and vaccine-preventable diseases' (IMAC, 2014). IMAC provides vaccinator

training for primary care nurses and midwives as well as a telephone hotline for primary care nurses that have queries about immunisation and vaccines.

3.4 The New Zealand National Immunisation Schedule

The New Zealand National Immunisation Schedule is a series of publicly funded vaccines that are provided free of charge to all children in New Zealand, regardless of their immigration or citizenship status (Ministry of Health, 2011b). The current Immunisation Schedule covers a total of twelve vaccinations that provide immunity for ten diseases (Ministry of Health, 2011b). The following diagram of the Immunisation Schedule shows the vaccines that are included, the diseases that they protect against and the ages that they should be given.

Figure 1 New Zealand National Immunisation Schedule (2011)

National Immunisation Schedule

Age given	Diseases covered and vaccines
6 weeks	Diphtheria/Tetanus/Whooping cough/Polio/Hepatitis B/ *Haemophilus influenzae* type b 1 injection (INFANRIX®-*hexa*) Pneumococcal 1 injection (Synflorix®)
3 months	Diphtheria/Tetanus/Whooping cough/Polio/Hepatitis B/ *Haemophilus influenzae* type b 1 injection (INFANRIX®-*hexa*) Pneumococcal 1 injection (Synflorix®)
5 months	Diphtheria/Tetanus/Whooping cough/Polio/Hepatitis B/ *Haemophilus influenzae* type b 1 injection (INFANRIX®-*hexa*) Pneumococcal 1 injection (Synflorix®)
15 months	*Haemophilus influenzae* type b 1 injection (Act-HIB®) Measles/Mumps/Rubella 1 injection (MMR®II) Pneumococcal 1 injection (Synflorix®)
4 years	Diphtheria/Tetanus/Whooping cough/Polio 1 injection (INFANRIX-IPV™) Measles/Mumps/Rubella 1 injection (MMR®II)
11 years	Diphtheria/Tetanus/Whooping cough 1 injection (Boostrix™)
12 years girls only	Human papillomavirus 3 doses given over 6 months (GARDASIL™)
45 years	Diphtheria/Tetanus 1 injection (ADT™ Booster)
65 years	Diphtheria/Tetanus 1 injection (ADT™ Booster) Influenza 1 injection (annually)

The Immunisation Schedule is designed to provide individual and population immunity against the most common childhood diseases in order to prevent morbidity and mortality from these diseases. All vaccines on the Immunisation Schedule are voluntary and parents may choose not to vaccinate their child. However, the Ministry of Health and the Immunisation Advisory Centre recommend and actively encourage parents to vaccinate their children (Ministry of Health, 2011b).

The Immunisation Schedule for children is linked to specific ages to account for epidemiology, effectiveness of the vaccine and the age at which a child is able to produce an immune response. The first immunisation event is at six weeks of age and the majority of vaccinations are administered before the child reaches two years of age, with additional booster events given later in childhood. Full immunity to a disease may not be established with the primary course of the vaccine, so additional booster shots are given to accommodate for immune non-response and to refresh vaccines where immunity may

decrease over time (Ministry of Health, 2011b). In New Zealand, the term *immunisation coverage* refers to the percentage of children who have received all of the immunisations on the New Zealand National Immunisation Schedule for their age across the population (Ministry of Health, 2011b).

Immunisations are usually administered by practice nurses through primary care providers with a small proportion of immunisations delivered through outreach immunisation services. Antenatal and birth immunisation events are administered by Lead Maternity Carers (LMCs) while Emergency Departments offer tetanus vaccines. Immunisation events at 11 and 12 years of age are usually delivered in schools by public health nurses.

3.5 History of immunisation policy in New Zealand

Over the past century, immunisation policy in New Zealand has undergone a number of changes as perceptions and attitudes towards immunisation have also changed (Day, 2008). Understanding this history of immunisation policy is useful as it provides a foundation for exploring immunisation policy in New Zealand today. It also highlights how attitudes towards immunisation have changed over time and how these changes may shape current rates of immunisation coverage.

3.5.1 Immunisation policy from 1920 - 1990

The first immunisation programme in New Zealand was introduced in the early 1920s, when the government launched a limited diphtheria immunisation programme within schools. Although the government at the time supported immunisation, it took a cautious and careful approach towards immunisation policy. It wasn't until after World War Two that the diphtheria immunisation programme was implemented nationwide and other introduced vaccines for pertussis, polio, tetanus and tuberculosis began to provide individual protection from these diseases and in some cases, such as polio, to prevent the spread of disease within communities.   Parental attitudes towards immunisation during this time were characterised by a high level of faith in the power of medicine and positive responses to immunisation after the discovery of the polio vaccine (Day, 2008).

In the early 1960s the first Immunisation Schedule was issued outlining a timetable for childhood vaccinations. Immunisation policy was implemented by the Department of

Health (the government department that would later become the Ministry of Health) through school-based campaigns or through general practitioners. Although school-based programmes were considered successful, immunisation coverage for infants and pre-schoolers was limited by the cost to parents in visiting a general practitioner. By the 1970's, the Department of Health had made vaccinations free which led to improving immunisation coverage but other factors such as challenges with access to services still prevented some children from being immunised. As the rate of infectious diseases declined within New Zealand, parents became more concerned with the risks of immunisation rather than the benefits of the protection that they provided (Day, 2008)

During the 1980s, a small but vocal group of conscientious objectors focused on adverse risks from immunisation and the rights of parents to refuse immunisations for their child. Although this movement had a limited impact on the decisions of other parents to immunise their children, parents became more assertive about informed consent during this period and the Department of Health and health professionals increased the focus on providing public education on the benefits of immunisation (Day, 2008).

There was a lack of data on immunisation coverage, at both a regional and national level, throughout this period. Information on a child's immunisation status was recorded by their primary care provider, but there was no system in place to collect this information in order to monitor levels of immunisation coverage.

3.5.2 Immunisation policy from 1990 - 2000

By the early 1990s, the Immunisation Schedule had been expanded to include vaccines for measles, rubella, hepatitis B, haemophilus influenza type b and a combined vaccine for measles, mumps and rubella. Vaccines for meningococcal meningitis A were also available temporarily during times of epidemic.

In 1991/1992, the first *National Immunisation Survey* was conducted to establish a reliable rate of immunisation coverage in New Zealand. The survey found that less than 60 per cent of children were fully immunised at two years of age. For Māori and Pacific children, immunisation coverage was much lower, at 42 per cent for Māori and 45 per cent for Pacific children (Department of Health, 1992).

In response to the low coverage rates revealed in the Immunisation Survey, the Public Health Commission established an expert group on immunisation to provide advice to the Minister of Health and recommend strategies for improving immunisation (Turner et al., 2000). The recommendations from this expert group lead to the development and release of the *National Immunisation Strategy* in 1995. The strategy set a policy goal of 95 per cent immunisation coverage for children and contained five elements: a simplified Immunisation Schedule, immunisation certificates for entry into early childhood centers and schools, standards for immunisation providers, local immunisation coordination and improved immunisation surveillance (Turner et al., 2000).

By the time the strategy was implemented, the simplified Immunisation Schedule had been introduced and some local immunisation coordinator positions had been created. The immunisation standards had been developed and the *Health (Immunisation) Regulations (1995)* required immunisation checks for children entering early childhood centres and schools. These checks were used to establish a record of those children who had, and had not, been immunised in case of a disease outbreak. They did not legally require children to be fully immunised before being enrolling in early childhood centres and schools (Turner et al., 2000). It is important to note that no resources were made available for auditing the immunisation standards for providers or for the implementation of the *Health (Immunisation) Regulations (1995)* and a national surveillance system had not been established. Without a national surveillance system to monitor immunisation coverage it was difficult to ensure a reliable reminder and recall system for timely vaccinations, to coordinate an effective outreach program, monitor performance or evaluate the effectiveness of the strategy (Turner et al., 2000).

In 1996, a follow-up survey of immunisation coverage in the Northern region (which covered what is now Northland, Waitemata, Auckland and Counties Manukau DHBs) found only a small improvement in immunisation coverage, with an overall coverage rate of 63 per cent and coverage rates of 45 per cent for Māori children and 53 per cent for Pacific children (Turner et al., 2000). With such low levels of immunisation coverage and alarming immunisation inequities, New Zealand continued to experience outbreaks of vaccine-preventable diseases such as pertussis (Blakely, Manoor, & Baker, 1999; Grant, 2000), measles (Jones, Bloomfield, Rainger, & Taylor, 1998), mumps and rubella (Turner et al., 2000).

3.5.3 Immunisation policy from 2000 - 2005

New Zealand had been experiencing an epidemic of group B Meningococcal disease since the early 1990's. Between 1991 and 2005, over 5550 cases and 22 deaths had occurred within a population of four million people (O'Hallahan et al., 2005). In 2004, the MeNZB™ vaccine was introduced to specifically target the epidemic as part of the Meningococcal B immunisation programme. The MeNZB™ programme would have a lasting impact on the systems and processes for immunisation in New Zealand as it was a key driver in the speeding up of the development of a national surveillance system to collect immunisation information (IMAC, 2010). This commitment to a national immunisation surveillance system, as well as the policy goal of 95 per cent immunisation coverage, was reaffirmed in the *New Zealand Immunisation Strategy* released by the Ministry of Health in 2003 (Ministry of Health, 2003).

A second *National Immunisation Survey* was conducted in 2005 and this indicated an improvement in immunisation coverage from the previous national survey over a decade earlier (Ministry of Health, 2007b). However, immunisation at two years of age had only improved to 77 per cent, well below the policy goal of 95 per cent coverage. While rates of immunisation coverage for Pacific children had improved and were comparable to the overall population, significant immunisation inequities continued to persist between Māori and non-Māori children with coverage rates for Māori children at 69 per cent (Ministry of Health, 2007b).

Global health statistics on immunisation further highlighted New Zealand's poor performance in relation to immunisation coverage. In 2005, the World Health Organisation ranked New Zealand's performance for immunisation coverage as relatively poor compared to other countries (ranked 121 out of 192 countries) (World Health Organisation, 2005). A new policy approach was needed to improve immunisation coverage, address immunisation inequities and reduce variation in immunisation coverage between different regions (Turner et al., 2000).

3.6 New approaches to immunisation policy in New Zealand

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In 2005, the Ministry of Health introduced a national immunisation surveillance system called the National Immunisation Register (NIR) to measure and monitor immunisation

coverage. This was followed by a PHO performance programme in 2006 that included a financial incentive for primary care providers that achieved a high rate of immunisation coverage. And in 2007, a health target for immunisation was introduced as part of a set of health targets to improve health system performance. The immunisation health target stated that **95 per cent of two year olds would be fully immunised by July 2012.** This section of the policy context chapter will consider each of these policy approaches in turn.

3.6.1 National Immunisation Register

The NIR is an electronic information system that holds the immunisation records for all New Zealand children. The NIR became fully operational in 2005 and for the first time provided a measure of immunisation coverage at both a regional and national level in New Zealand. It also allowed health professionals to access accurate information on a child's immunisation record, even when their family had moved from another area or changed their primary care provider (Ministry of Health, 2010)

This immunisation record contains the following information: the child's name, their date of birth, their unique National Health Index (NHI) number, their ethnicity, their parents or guardians details, secondary contact details, the date of the immunisation, the vaccine type and series number. Ethnicity data is based on data that is collected by their primary care provider. Most primary care providers use the New Zealand Census question on ethnicity which asks: which ethnic group do you belong to? Ethnicity is self-identified and parents may select more than one ethnicity. This has implications for research using ethnicity data as individuals may identify with more than one ethnicity and are therefore included in more than one ethnic group.

Every immunisation event that a child has is recorded on the NIR via a direct download from the electronic practice management system of the primary care provider. Parents or guardians can choose not to have any of their child's health information collected on the NIR. However the child's NHI number, their date of birth, the District Health Board they reside in and the date that their parents opted to take them off the NIR are all retained to provide an accurate denominator for the regional and national calculations of immunisation coverage (Ministry of Health, 2011b).

The NIR is overseen by the Ministry of Health who coordinates the collection of data and uses this information to measure and monitor immunisation coverage rates at a number of

milestone ages (refer to Table 1 below). The NIR also measures the rate of immunisation coverage at these milestone ages for the following ethnic groups: New Zealand European, New Zealand Māori, Pacific Islander and Asian. Children of all other ethnicities are grouped together under the category 'other ethnicity'.

Table 1 Milestone ages for measuring immunisation coverage

Milestone age	Immunisations included in the measurement
6 months	6 weeks, 3 months and 5 months
12 months	6 weeks, 3 months and 5 months
18 months	6 weeks, 3 months, 5 months and 15 months
24 months	6 weeks, 3 months, 5 months and 15 months

Adapted from Table 3 in Ministry of Health. (2011b). *Immunisation handbook 2011*. Wellington: Ministry of Health.

There are no immunisations scheduled between six and twelve months of age, or between 18 months and 24 months of age, so immunisation coverage increases between these milestone ages as children have time to catch-up on any immunisations that they have missed (Ministry of Health, 2011b).

3.6.2 Financial incentive for primary care providers

In 2006, the *PHO Performance Management Programme* (pay for performance programme) introduced a small financial incentive to support primary care providers and reward improvement against a number of national indicators, including immunisation coverage (DHBNZ, 2011). It was hoped that the pay for performance programme would strengthen the role of the newly established PHOs and focus their attention on population health and health inequality priorities.

When the pay for performance programme was introduced the incentive was up to $6.00 per enrolled patient if all of the targets were achieved. Each target was assessed

independently as a fraction of the total $6.00 payment and over achievement for one target could not be used to compensate for underachievement in another area (Buetow, 2008). The financial incentive was increased to $9.27 in 2008 and then reduced to $6.13 in 2011(Cashin, 2011). It is important to note that this financial incentive is relatively small when compared to a PHO's total income. And while the PHO has discretion over how it will spend this money, the Ministry of Health expected them to use this additional funding to support work towards key objectives in the Primary Health Care Strategy, rather than supplementing the incomes of health professionals within their primary care providers (Buetow, 2008).

3.6.3 Health target for immunisation

In 2006, the New Zealand Treasury commissioned Nicholas Mays to develop a working paper on the use of targets within the English NHS (Mays, 2006). Nicholas Mays was a Principle Advisor on health and social policy to the Treasury at the time as well as Professor of Health Policy at the London School of Hygiene and Tropical Medicine, University of London. The working paper stated that there was 'scope to use targets and related incentives sparingly to improve performance in New Zealand in areas of high importance to government and the public' (Mays, 2006, p. i). However, it made a number of recommendations regarding the potential use of health targets within the New Zealand health system.

It suggested that there should be a limited number of number of health targets and that they should focus on areas of health system performance that were considered important and where there was consensus that change was needed. It also recommended that the health targets should be attached to an incentive programme, but that these incentives should be awarded for improvements in performance rather than the achievement of a specific health target. The working paper stated that this would incentivise poor performing organisations as well as high performing organisations that may need only small improvements in performance to achieve a health target. The working paper did highlight that there may be situations where a health target is considered an absolute standard and performance below this level should be regarded as unacceptable. In these situations, the focus should be on improving the performance of those organisations who were well below the standard (Mays, 2006).

In August 2007, the Ministry of Health introduced an immunisation health target that **95 per cent of two year olds would be fully immunised by July 2012.** The immunisation health target was part of a set of ten health targets that the Ministry of Health hoped would 'provide a greater focus for action and lift health system performance in priority health and disability areas' (Ministry of Health, 2008, p. 5).

A change of government after the first year of the health targets saw the incoming Minister of Health revise the original set of health targets to emphasise a new direction for government policy that reduced the focus on population health (Tenbensel, 2009). The remaining six health targets had a stronger emphasis on accountability, to both the government and the public, with quarterly progress reports ranking DHBs on their performance towards each of the health targets in a league table. These league tables were published every three months in local and national newspapers and on the Ministry of Health website.

Improving immunisation coverage at two years of age remained as a health target, with incremental targets set each year to encourage progress and allow DHBs time to improve their own systems and practices for immunisation. The immunisation health target was set at 80 per cent of two year olds to be fully immunised by July 2009, 85 per cent by July 2010, 90 per cent by July 2011 and finally 95 per cent by July 2012 (Ministry of Health, 2009).

DHBs were expected to meet the incremental health target each year and they were expected to achieve the immunisation health target of 95 per cent immunisation coverage at two years of age by June 2012. However, unlike the health target experience in the English NHS, the New Zealand health targets were not linked to financial incentives or penalties. The financial incentive for immunisation under the pay for performance programme remained, but this was not initially linked to the immunisation health target.

The immunisation health target clearly identified *what* DHB had to achieve but it provided very little direction on *how* they should achieve it. DHBs needed to develop their own implementation strategies for the immunisation health target as they had very little direction from the Ministry of Health. Understanding *how* the immunisation health target was implemented at the local level was the focus of this research and will be explored in this thesis.

3.7 International policy approaches for improving immunisation coverage

This literature review provides an overview of international policy approaches for improving immunisation coverage. Examining how other countries have approached immunisation as a policy issue is useful as it can highlight policy mechanisms, and potential advantages and challenges in using these policy mechanisms, which may have informed policy decisions within the New Zealand health system.

This literature review focuses on the countries of Australia, the United Kingdom and the United States of America. These countries were selected because they shared similar health system characteristics with New Zealand (in the case of the United Kingdom) or because they shared similar population characteristics with the New Zealand population, particularly around the health needs of their indigenous populations and their shared histories of colonisation by the British (in the cases of Australia and the United States).

The following table compares policy approaches towards immunisation across Australia, the United States, the United Kingdom and New Zealand (see Table 2 on the following page). It also compares rates of immunisation coverage across these countries for six specific vaccines. Estimates on coverage rates for these vaccines are collected each year by the World Health Organisation and UNICEF to monitor the status of immunisation in each country (ChildInfo: Monitoring the situation of women and children, 2014). These estimates use two sources of data: reports of immunisations delivered by service providers and household surveys containing questions on a child's immunisation history. For the administrative data collected from service providers, estimates of immunisation coverage are derived from the total number of vaccines given divided by the number of children in the target population (ChildInfo: Monitoring the situation of women and children, 2014).

Table 2 Immunisation policy approaches in Australia, the United States, the United Kingdom and New Zealand

	Australia	United States	United Kingdom	New Zealand
National/regional immunisation registers	Introduced in 1996	-	Multiple regional Child Heath Information Systems (CHIS)	Introduced in 2005
Immunisation surveillance surveys	-	Ongoing national immunisation survey	-	National surveys conducted in 1995 and 2005
Financial incentives for immunisation	Provided for parents and health providers	-	Provided for health providers and linked to the health target	-
Immunisation requirements for school entrance	Voluntary requirements	Compulsory requirements but parents can apply for an exemption	-	Voluntary requirements established in 1995
Immunisation coverage for specific vaccines in 2007*				
DTP1	97%	99%	97%	91%
DTP3	92%	95%	92%	88%
POL3	92%	93%	92%	88%
MCV	94%	92%	86%	79%
HepB3	94%	94%	N/A	88%
Hib3	94%	93%	92%	78%

Source of data: ChildInfo: Monitoring the situation of women and children. (2014). *Immunisation: country reports*. Retrieved March 2014 from http://www.childinfo.org/immunization_countryreports.html

3.7.1 National/regional immunisation registers

National immunisation registers are 'confidential, population-based, computerised information systems containing identified data sent directly by providers of immunisation' (Hull, Deeks, & McIntyre, 2009, p. 5054). At an individual level, an immunisation register contains an accurate immunisation record for each child which assists in timely immunisation recalls and reminders to their parents (Hull et al., 2009). At a national or regional level, they provide governments and health care organisations with an accurate surveillance system for planning and delivering immunisation services and can be used to identify populations with low immunisation coverage (Ministry of Health, 2010).

In 1996, the Australian government was the first country to implement a national immunisation register and demonstrate how a reliable surveillance system could contribute to a significant improvement in immunisation coverage rates. During the three year period from March 1997 to March 2000, immunisation coverage rates in Australia increased from 75 per cent to over 90 per cent. Since 2000, immunisation coverage rates have been maintained at a relatively high level between 90 and 95 percent (Hull et al., 2009). However, part of this increase has been attributed to better reporting of immunisation coverage as under-reporting of immunisation events had been an issue before the national immunisation register was introduced. The ability to accurately measure and monitor immunisation coverage encouraged health providers to record immunisation information more accurately as they were closely monitored using this data (Hull et al., 2009).

In the United Kingdom, information on immunisation coverage is recorded on population based Child Health Information Systems (CHIS). There are a number of different operators of CHIS across the United Kingdom and the combination of data from these CHISs enables the production of estimates for immunisation coverage across the United Kingdom (Amirthalingam, White, & Ramsay, 2012). However, there have been calls for a single national immunisation register to reduce the complexities of maintaining multiple CHISs and improve the accuracy of immunisation records within the population (Amirthalingam et al., 2012).

3.7.2 Immunisation surveillance surveys

Immunisation surveillance surveys are used to estimate immunisation coverage levels by surveying a representative sample of the population. The United States Federal Government uses an ongoing National Immunisation Survey to establish immunisation coverage rates within their population. This surveillance survey involves a random digit dialled telephone survey to find households with children aged 19 to 35 months. From this conversation the survey gathers

demographic and socioeconomic information and asks for permission to contact the child's immunisation provider. The provider is then contacted by mail to verify the child's immunisation record (Centres for Disease Control and Prevention, 2012).

One of the challenges of using immunisation surveys is that they provide an estimate of immunisation coverage for a population rather than an accurate measure of immunisation coverage like a national immunisation register. There may also be an element of selection bias involved in an immunisation survey that is avoided when using a national immunisation register that covers all children within the population.

3.7.3 Financial incentives for immunisation

A number of countries use financial incentives for immunisation to achieve and maintain high rates of immunisation coverage (Hartman, 1995; Lawrence, MacIntyre, Hull, & McIntyre, 2004; Schmitt et al., 2003). Financial incentives can be an effective policy mechanism for encouraging health care providers and parents to ensure that children are immunised on time (Achat, McIntyre, & Burgess, 1999).

The Australian government provides financial incentives for both health care providers and parents who have their child immunised on time. Health care providers receive a financial incentive for achieving 90 per cent immunisation coverage for their enrolled children (Hull et al., 2009). The financial incentive for parents is known as the *Maternity Immunisation Allowance* and provides two instalments of $122.75. The first instalment is paid for children who meet the immunisation requirements between 18 and 24 months of age. The second instalment is paid for children who meet the immunisation requirements between four and five years of age (Centrelink, 2009)

The combination of financial incentives for both health providers and parents has contributed to high rates of immunisation coverage at two years of age (92 per cent in 2010) with minimal geographic variation between states (89.2 per cent in Western Australia and 93 per cent in Tasmania) (Medicare Australia, 2010). However, it is important to note that the national level of immunisation coverage dropped slightly in 2013 to 90 per cent (Department of Health, 2014) and this could suggest that financial incentives may only be useful over a limited time frame.

In the United Kingdom, financial incentives were offered to primary care providers who achieved immunisation health targets. In the late 1990s, general practitioners received £600 a year for achieving 70 per cent immunisation coverage among the two year olds enrolled with them and £2,400 if they reached 90 per cent immunisation coverage (Fairbrother, Hanson, Friedman, &

Butts, 1999). The use of financial incentives significantly increased immunisation coverage, however there was evidence that this was due to better documentation of immunisation events rather than real improvements in immunisation coverage (Fairbrother et al., 1999). This evidence suggests that some part of low immunisation coverage rates may be due to poor documentation of immunisation events and under-reporting of immunisation coverage. There was also evidence that the use of these financial incentives created ethical tensions for some general practitioners who did not want to be perceived as acting for financial gain rather than in the best interests of children and their parents (Brownlie & Howson, 2006).

3.7.4 Immunisation requirements for school entrance

The United States requires all children to be fully immunised before enrolling in early childhood centres and primary schools (BMA Board of Science and Education, 2003; Salmon, Teret, Salisbury, Burgess, & Halsey, 2006). This is an indirect form of compulsory immunisation as children who are not fully immunised are prevented from enrolling in early childhood centres and schools until they are. However, parents are able to claim an immunisation exemption for their child due to philosophical or religious reasons, although the type of exemption and ease of access to it varies from state to state (Fine-Goulden, 2010). This compulsory immunisation requirement ensured high rates of immunisation coverage at five years of age, but not timely delivery of immunisations, as immunisation coverage among pre-schoolers has remained a challenge (Hartman, 1995).

In Australia, school entry requirements require parents to submit details of their child's immunisation history when they enrol. However, unlike the school entrance requirements in the United States, an incomplete immunisation record does not prevent enrolment (Immunise Australia Programme, 2010).

3.8 Addressing immunisation inequities for indigenous children

This section of the policy context chapter takes a deeper look at immunisation inequities between Māori and non-Māori children in New Zealand. It describes how the process of colonisation in New Zealand has contributed to the poor health outcomes that many Māori experience today. It then goes on to examine how immunisation inequities have been reduced, and in some cases eliminated, for indigenous children within Australia and the United States. Understanding how these immunisation inequities were addressed may highlight important

policy lessons for addressing immunisation inequities for Māori children within the New Zealand context.

The section ends with a discussion on why it is necessary for governments to address health inequalities. It applies Woodward and Kawachi's (2000) arguments for reducing health inequalities to the issue of immunisation inequities between Māori and non-Māori children. These arguments highlight the need to address immunisation inequities even when taking a population approach towards improving immunisation coverage.

3.8.1 Colonisation and health inequities in New Zealand

Māori are the indigenous people of New Zealand. Māori traditionally identified themselves through their *iwi* (tribe), *hāpu* (family groups) and *whanau* (extended family) and view themselves as the *tangata whenua* (people of the land) of *Aotearoa* (New Zealand). Although they are collectively called Māori today, many Māori continue to describe their identity through their genealogy to their iwi, hapu and whanau.

Māori people make up around 15 per cent of the New Zealand population (about 598,600 people) (Statistics New Zealand, 2013) and like indigenous people in other developed countries Māori experience significant health inequalities when compared to the rest of the New Zealand population (Robson & Harris, 2007). In order to understand why Māori experience such persistent health inequalities compared to non-Māori living in New Zealand, we must recognise the impact that colonisation has had in shaping contemporary Māori realities.

The signing of the Treaty of Waitangi in 1840 between Māori and the representatives of the British Crown provided the constitutional foundation for the development of the New Zealand Government. The Treaty also guaranteed to protect Māori lands and resources and granted Māori all the rights and privileges of British citizens (Orange, 1987). However, the terms of the Treaty of Waitangi were not upheld by the British, or subsequent New Zealand Government's, and Māori experienced land loss, cultural subjugation and the erosion of their social, political and economic bases (Durie, 2004).

This history of colonisation has led to the intergenerational poverty, poor education opportunities and high rates of unemployment that many Māori families experience today (Durie, 2004; Robson & Harris, 2007). Compared to the rest of the New Zealand population, Māori experience higher rates of morbidity and mortality for asthma, diabetes, stroke and ischaemic heart disease (Ministry of Health, 2012a; Robson & Harris, 2007). And Māori children have higher rates of rheumatic fever, asthma, skin infections and tooth decay (Ministry

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of Health, 2012b). Immunisation inequities between Māori and non-Māori children need to be considered within the context of these broader health inequalities as collectively they show that the New Zealand health system has failed to meet the needs of Māori children and their families.

Indigenous people in other developed countries, such as Australia and the United States, share a similar history of colonisation with Māori in New Zealand. However, indigenous children in Australia and the United States have not experienced the same level of immunisation inequities in comparison to Māori children in New Zealand during recent times (Bramley et al., 2005; McIntyre & Menzies, 2005; Menzies & McIntyre, 2006). The following sections discuss how immunisation policies in Australia and the United States have affected rates of immunisation coverage for their indigenous children.

3.8.2 Immunisation coverage for Aboriginal and Torres Strait Islander children in Australia

Immunisation coverage among Aboriginal and Torres Strait Islander children in Australia is comparable with the wider population at the milestone ages of one and two years of age, generally exceeding 85 to 90 per cent (O'Grady, Krause, & Andrews, 2009). This has been attributed to the introduction of the national register for immunisation status and the financial incentives for both health care providers and parents (Lawrence et al., 2004).

However, research has shown that high rates of immunisation coverage at these milestone ages masked inequities in the timeliness of vaccinations designed to protect infants from diseases. O'Grady, Krause and Andrews (2009) found that Aboriginal children in the Northern Territory experienced low rates of coverage at seven months of age (45.2 per cent) with immunisation coverage increasing at 13 months (49.5 per cent) and again at 18 months (81.2 per cent). Coverage improved as children aged which suggested that the low rates of immunisation coverage at younger ages were due to timeliness of immunisation events rather than the parents or guardians being unwilling to immunise their child.

Low rates of immunisation coverage at these ages has implications for the control of vaccine preventable diseases that have a high incidence in infancy, such as pertussis and pneumonia (McIntyre & Menzies, 2005; O'Grady et al., 2009). Reasons for these delays included barriers to accessing primary health care within an urban environment and missed opportunities to immunise during other visits to their primary health provider (McIntyre & Menzies, 2005; O'Grady et al., 2009).

3.8.3 Immunisation coverage for American Indian and Native Alaskan children in the United States of America

Bramley, Hebert, Tuzzio and Chassin (2005) compared the health status of the indigenous populations of New Zealand and the United States with that of the majority populations of these countries. One of the health status indicators that they assessed was childhood immunisation. Their research utilised data from the *National Immunisation Survey 2001* in the United States and the *North Health Immunisation Survey 1996* in New Zealand, which were the most recent immunisation surveys available at the time (refer to Table 3 below).

These datasets indicated that the highest level of immunisation coverage was among White American children. However, in the case of the MMR vaccine for measles, mumps and rubella, American Indians/Alaska Natives had the highest immunisation coverage rate. The authors suggested that this may have been due to White American parents declining the MMR vaccine due to fears around vaccine safety. New Zealand European children experienced lower rates of immunisation coverage than both populations of children in the United States and Māori children experienced the lowest rates of immunisation coverage of all the population groups (Bramley et al., 2005).

Table 3 Immunisation inequities for indigenous children in New Zealand and the United States

Immunisation	New Zealand		United States	
	Māori	European	American Indian/Alaska Native	White
3 or more DTP	77.6	90.6	92.7	94.6
3 or more polio	49.7	79.7	87.5	90.1
3 or more hepatitis B	62.8	85.3	85.7	89.6
1 or more MMR	63.7	87.5	94.2	91.7

Adapted from Table 3 in Bramley, D., Hebert, P., Tuzzio, L., & Chassin, M. (2005). Disparities in indigenous health: a cross-country comparison between New Zealand and the United States. *American Journal of Public Health, 95*(5), 844 - 850.

In the United States, immunisation inequities for American Indian/Alaskan Native children had been largely eliminated through comprehensive health services provided through the Indian

Health Service, integrated primary health care services provided in collaboration with tribes, tracking of immunisation status for individual children, community based immunisation clinics and the provision of vaccines for free (Strine et al., 2003). Bramley et al (2005) stated that policy makers in New Zealand could benefit from studying this approach towards immunisation. They also highlighted that the low levels of immunisation coverage in New Zealand were compounded by the lack of a national surveillance system.

Singleton and Santosham (2009) examined the impact of immunisations on the disease burden of American Indian and Alaska Native children in the United States. This research highlighted that despite high rates of immunisation coverage, American Indian and Alaska Native children continued to suffer disproportionately from infectious diseases compared to the rest of the population. While highly effective vaccines, such as those for measles and hepatitis A, had eliminated or significantly reduced rates of infection for these diseases, other diseases such as pneumonia and pertussis, still occurred at rates significantly higher than those for other children in the United States. The researchers stated that 'adverse living conditions such as household overcrowding, lack of indoor plumbing and poor indoor air quality' (Singleton et al., 2009, p. 451) increased transmission of these diseases. These findings are significant for addressing the transmission of certain infectious diseases among indigenous populations when environmental and household characteristics need to be considered alongside high rates of immunisation coverage.

3.8.4 Addressing immunisation inequities for Māori children

When the immunisation health target was introduced in 2007, there were significant immunisation inequities at two years of age between Māori and non-Māori children in New Zealand. Immunisation coverage for Māori children was measured at 59 per cent while the level of immunisation coverage for non-Māori children was 70 per cent (an inequity of 11 per cent) (NIR data on immunisation coverage and immunisation inequities will be presented in chapter five of this thesis).

DHBs were expected to improve immunisation coverage to 95 per cent and this would require them to improve immunisation coverage for all children. However, achieving this high rate of immunisation coverage would be a challenge if immunisation coverage among Māori children did not improve, particularly within those DHBs that had a high proportion of Māori children living within their region. The health target also had the potential to hide immunisation inequities for Māori children within those DHBs that had a small proportion of Māori children, as

they may achieve the health target of 95 per cent immunisation coverage while still having significantly lower rates of immunisation coverage for Māori children.

Woodward and Kawachi (2000) provide four arguments as to why governments should reduce and eliminate health inequalities. They argue that health inequalities are unfair, that they affect everyone, that they are avoidable and that it is cost effective to reduce health inequalities. Each of these arguments is relevant to this discussion on addressing immunisation inequities between Māori and non-Māori children in New Zealand.

The first argument states that health inequalities are unfair. Immunisation inequities are unfair and unjust as immunisation protects a child against a number of specific diseases that can cause illness, lifelong disability and even death (Bramley et al., 2005; Turner et al., 2000). It is unfair to expose Māori children to these diseases when they could be protected through immunisation.

The second argument that Woodward and Kawachi make is that inequalities affect everyone within society. High rates of immunisation coverage prevent the spread of disease within a community and therefore provide protection at a population level as well as at an individual level (Anderson & May, 1990; Fine, 1993). Outbreaks of vaccine-preventable diseases can be dangerous for the children and adults within that community who are not immunised or cannot be immunised due to medical contradictions. Addressing immunisation inequities for Māori children would improve herd immunity for the whole population and reduce the transmission of these diseases within communities.

The third argument is that inequalities are avoidable. Immunisation inequities for indigenous children in Australia and the United States have been reduced, and in some cases eliminated, through a number of policy actions by their federal governments. These international policy experiences show that immunisation inequities for indigenous children are avoidable and can be addressed through policy intervention and appropriate health services. However, in order to effectively address inequities you must be able to measure them (Robson & Harris, 2007). Addressing immunisation inequities within these countries relied upon accurate surveillance data on immunisation coverage and the ability to access and track the immunisation records of individual children (Bramley et al., 2005; Hull et al., 2009). These surveillance tools were used alongside culturally appropriate health services for indigenous families, community based immunisation clinics and in the case of Australia, financial incentives for both parents and health providers (Lawrence et al., 2004; McIntyre & Menzies, 2005; Strine et al., 2003). .

The fourth argument is that addressing inequalities is cost effective. Childhood immunisation is one of the most cost effective activities within health care as the cost of vaccination is

significantly lower than the cost of treating vaccine-preventable diseases (McDonnell & Askari, 1997). Although there is no data on the cost effectiveness of immunisation within the New Zealand health system, an economic evaluation of the routine immunisation schedule in the United States has demonstrated that from the perspective of both direct costs and societal costs, immunisation results in substantial cost savings (Zhou et al., 2014). The analysis showed that immunisation within the 2009 birth cohort of the United States would have prevented 42,000 early deaths and 20 million cases of disease. This had a net savings of US$13.5 billion in direct costs and US$68.8 billion in total societal costs (Zhou et al., 2014).

3.9 Immunisation research within the New Zealand context

This section of the policy context chapter discusses a number of key factors that have been identified for immunisation uptake and the delivery of immunisation services within the context of the New Zealand health system. It examines the known risk factors for low immunisation uptake and looks at the issues of timeliness and parents declining immunisation on behalf of their child. It then goes on to look at the system and processes that have been identified as best practice for providing immunisation services within the New Zealand health system.

3.9.1 Risk factors for low immunisation uptake

Research on immunisation in New Zealand has consistently identified the socioeconomic environment of the child and their ethnicity as two significant risk factors for poor access to immunisation services (Grant et al., 2010; Mueller, 2010; Turner et al., 2000).

3.9.2.1 Socioeconomic deprivation

Research on factors associated within immunisation coverage and timeliness in New Zealand found that immunisation coverage was lower within primary care providers where the enrolled population had a higher level of socioeconomic deprivation (Grant et al., 2010). Variation in social deprivation between different DHBs has also been shown to contribute to variation in immunisation coverage between DHBs (Mueller, 2010). These findings were consistent with international research that identified the socioeconomic environment of a child as the strongest predictor of low immunisation uptake (Lynch, 1995; Wooten, Luman, & Barker, 2007).

Paradoxically, high socioeconomic status may also be a risk factor for lower immunisation uptake in some parts of New Zealand. A submission made by IMAC to the Health Select Committee Inquiry into immunisation suggested that areas of high socioeconomic status may be where anti-immunisation activities in New Zealand have had the most impact, contributing to higher rates of parents declining immunisation (IMAC, 2010). The issue of parents declining immunisations on behalf of their child is explored in greater depth in the next section of this chapter (refer to section 3.9.2.2)

3.9.2.2 Ethnicity

Ethnicity is also a significant risk factor for low immunisation uptake in New Zealand (Turner et al., 2000). Persistent immunisation inequities for Māori and Pacific children were an ongoing challenge within the New Zealand health system before the introduction of the immunisation health target. These immunisation inequities were most obvious at six months and 18 months of age, indicating that there were important differences in the timeliness of receiving immunisations for Māori and Pacific children (IMAC, 2010).

It is important to note that Māori and Pacific families are more likely to experience high levels of socioeconomic deprivation than non-Māori/non-Pacific families in New Zealand (Goodyear-Smith et al., 2005). However, research has shown that even when socioeconomic deprivation is taken into account, inequities in immunisation coverage for Māori children can still be seen (Mueller, 2010). This is consistent with many other health inequalities that exist between Māori and non-Māori in New Zealand in both accessing health services and inequities in health outcomes (Grant et al., 2011; Robson & Harris, 2007). Lower rates of immunisation coverage and timeliness of delivery are considered the main cause of the excess burden of vaccine-preventable diseases within Māori communities (Grant et al., 2010).

3.9.2 Issues for immunisation coverage in New Zealand

The immunisation health target stated that 95 per cent of two year olds would be fully immunised by July 2012. There are a number of issues that affect immunisation coverage that need to be examined here. These include the timeliness of immunisation events and ensuring that children receive all of the scheduled immunisations for their age as well as the issue of parents declining immunisation on behalf of their child.

3.9.2.1 Timeliness of immunisation events

Timeliness of immunisation events has been identified as a significant issue in New Zealand, particularly for pertussis in young infants and the first does of the measles vaccine (Ministry of Health, 2011b). The capacity for the immune system to respond to a vaccine can be reduced for some vaccines in young infants and maternal antibody transferrin utero can also affect response to some vaccines. The timing of immunisation events has been designed to protect infants and children at as young an age as possible (Grant, 2004). Until these immunisations have been administered infants and young children remain at risk to severe disease or death (Grant et al., 2003).

Timeliness of immunisation events in New Zealand has historically been poor. In 2010, only 41 per cent of infants had received their first immunisation on time (IMAC, 2010). Research has shown that delays in receiving the first immunisation on the National Immunisation Schedule is one of the strongest predictors of subsequent incomplete immunisation (Grant et al., 2010; McDonnell & Askari, 1997). When a child's immunisation record is incomplete, they are not considered fully immunised. Incomplete immunisations therefore affect the level of immunisation coverage as immunisation coverage measures the percentage of children who are fully immunised for their age according to the National Immunisation Schedule.

3.9.2.2 Parents declining immunisation

Immunisation in New Zealand is voluntary and parents can choose to decline immunisations on behalf of their child. Research in New Zealand and internationally has shown that parents who decline immunisation are more likely to be highly educated and have high socioeconomic status (Andre, 2001; Whitehead, 1991). Their reasons for declining immunisation usually stem from concerns around vaccine safety and what they perceive as negative effects on their child's immune system (Andre, 2001). Many of the concerns around vaccine safety can be traced back to the work of British doctor Andrew Wakefield, who published research in 1998 linking the MMR vaccine (for measles, mumps and rubella) with an increased risk of autism. Although this research was eventually discredited and Wakefield was struck off by the British General Medical Council in 2010, the impact of this statement on parental concerns around vaccine safety is still felt today (World Health Organisation, 1998).

Anti-immunisation sentiment has been actively presented within the New Zealand media and more recently through social media networks (Mills et al., 2012). This activity may have had greater impact in areas of high socioeconomic status and could affect levels of immunisation coverage within primary care providers in these areas. This is significant in terms of the

immunisation health target as primary care providers who have a significant proportion of parents who decline immunisation will need to ensure that all other children turning two during that quarter have been immunised for them to reach a high level of immunisation coverage at 95 per cent.

3.9.3 Systems and process for immunisation

Research on immunisation in New Zealand has highlighted a number of systems and processes for improving immunisation coverage and the timeliness of immunisation events.   This research has tended to focus on the primary care provider level and has identified the systems and processes that form best practice for providing immunisation services in New Zealand. An overview of these systems and processes and their role in improving immunisation coverage is provided in Table 4 on the following page.

Table 4 Systems and processes for immunisation services in New Zealand identified within the literature

Systems and processes	Role in improving immunisation coverage
Practice management systems	Linked to the NIR and essential for ensuring that data is recorded correctly on the NIR
Early enrolment	Ensures that an infant is registered with a provider before the first immunisation event at six weeks of age. Associated with a higher rate of immunisation coverage and timeliness
Recall processes	Provider contacts parents when their child has not received their immunisation on time
Precall processes	Provider contacts parents before their child is due for their immunisation events and improves timeliness
Opportunistic immunisation	Uses any visit to the provider as an opportunity to check a child's immunisation status and offer the opportunity to catch up on missed immunisations
Outreach immunisation services	Finds and contacts children who are not engaged with a primary care provider or are overdue for their immunisation event and offers to immunise in the home

3.9.3.1 Practice management systems

A key factor associated with immunisation coverage and timeliness in New Zealand is the type of practice management system that is used by a primary care provider. Practice management systems play an important role in delivering immunisation services but the quality of data and the way that this information has been used for immunisation processes has been shown to vary considerably between primary care providers (Goodyear-Smith et al., 2008; Grant et al., 2010). Variation in staff confidence and competence with their practice management system and their ability to access technical support when they required it were key issues for data quality. The quality of data on practice management systems is important as this determines the quality of data that is transferred to the NIR (Grant et al., 2010, p. 119). This has implications for the accuracy of the data that is then used to measure and monitor the immunisation health target.

3.9.3.2 Early enrolment with a primary care provider

Early enrolment with a primary care provider has been associated with a higher rate of immunisation coverage and timeliness (Grant et al., 2010). International research has shown that the early establishment of a relationship between a primary care provider and the infant's parents or guardians reduces delays of the first immunisation event (Braveman & Gruskin, 2003). Furthermore, receiving the first immunisation event on time has been a strong and consistent indicator that subsequent immunisation events will also be on time (Braveman & Gruskin, 2003; Menzies & McIntyre, 2006; Woodward & Kawachi, 2000).

Recent research in New Zealand found that immunisation coverage was significantly lower among infants with no nominated primary care provider on their NIR record. The researchers suggested that 'targeting both the systems and services that can identify and track infants who are not engaged with primary care at birth has the greatest potential to improve immunisation coverage rates' (Goodyear-Smith et al., 2012, p. 191).

3.9.3.3 Recall processes

Recall processes involve contacting the parents when a child is overdue on their immunisations and making an appointment for them to come to the practice. Primary care providers in New Zealand usually have recall processes set up on their electronic practice management systems to alert them to children who are overdue for an immunisation event. The NIR also sends a reminder message to the primary care provider if information about an immunisation event has

not been entered on the child's record. The overdue times for the NIR are set after the overdue times for the practice management system to give providers time to follow up the child before they start receiving overdue messages from the NIR (Goodyear-Smith et al., 2012).

3.9.3.4 Precall processes

Precall processes require the primary care provider to contact parents before the child is due for their immunisation event to make an appointment for them to come into the provider. This process does not assume that parents will know when to bring their child in for an immunisation event and ensures that children are immunised on time.

A precall system for immunisation events was tested within primary care providers in the Auckland DHB area between November 2008 and April 2009 (Goodyear-Smith et al., 2012). A welcome letter was sent parents when an infant was four weeks old, providing them with some information about immunisation and inviting them to bring their child in for the first immunisation event at six weeks of age. A follow-up phone call was made at five weeks old if the parents had not made an appointment and again if they did not come to their appointment. A further phone call was made at seven weeks of age in an attempt to contact the parents. The study found that primary care providers who implemented the precall system improved the timeliness of the first immunisations event, however as immunisation coverage rates improved across all of the primary care providers in the DHB during this period the change was not statistically significant (Goodyear-Smith et al., 2012).

3.9.3.5 Opportunistic immunisation

Opportunistic immunisations require a systematic approach and a practice management system that can flag children who are due or overdue for an immunisation event when they visit for other health reasons (Turner, Grant, Goodyear-Smith, & Petousis-Harris, 2009). Addressing missed opportunities to immunise is one area that has been identified within primary care providers that could improve immunisation coverage (Turner, 2007; Turner et al., 2009). Missed opportunities are defined as 'health care visits where children do not receive an immunisation when they are age eligible for the vaccine with no contradiction present' (Turner et al., 2009, p. 275). Missed opportunities to immunise are common in New Zealand, occurring in around one third of visiting children (Turner et al., 2009).

3.9.3.6 Outreach immunisation services

Outreach immunisation services find and follow up children who have missed some or all of their scheduled childhood immunisation events. DHBs contract these services through a wide range of health providers such as PHOs, primary care providers, Māori and Pacific providers and Wellchild/Plunket providers (Ministry of Health, 2007a). Although all DHBs have some form of outreach immunisation service, there are differences in how these services are contracted and provided. There are also differences between DHBs in the number of children that are immunised through outreach services, although there is no published data on these numbers.

Outreach immunisation services are recognised by health professionals as being an essential service for improving immunisation coverage rates for Māori and Pacific children and other priority groups with low rates of immunisation coverage and high rates of vaccine-preventable disease (Turner et al., 2000). However, even though they are viewed as an integral competent of immunisation services at the local level, very little research has explored the role of outreach immunisation services in improving and maintaining immunisation coverage within New Zealand.

3.10 Chapter summary

This chapter has provided background information on the policy context for this research on the implementation of the immunisation health target. It has provided an overview of previous policy approaches to immunisation in New Zealand and explored a number of policy mechanisms that have been used internationally to improve immunisation coverage and address immunisation inequities for indigenous children. It has also reviewed existing research on immunisation and best practice for immunisation services within the context of the New Zealand health system. This existing research has tended to focus on the role of health professionals in improving immunisation coverage and systems and processes at a primary care provider level.

However, this research takes a wider systems perspective and explores how the immunisation health target was implemented at the local level. While this included primary care providers it also considered the roles and functions of PHOs and DHBs in providing immunisation services and addressing the immunisation health target. The next chapter in this thesis (Chapter Four: Research Process) provides an overview of how this research was conducted.

Chapter Four: Research Process

4.1 Overview of this chapter

This chapter provides an overview of each stage of the research process. It begins with a discussion on the ontological and epistemological assumptions that underpinned this research. It then describes case study methodology and why this research methodology was adopted. It outlines the research methods that were used to collect and analyse data and the chapter ends with a discussion on research quality.

4.2 Ontological and epistemological assumptions

The way in which we conduct research is shaped by the way in which we perceive and understand the world around us. These ontological and epistemological assumptions form the foundation of the research process and determine how we collect, analyse and interpret data to develop new knowledge. However, making these philosophical assumptions explicit can be challenging as theoretical perspectives or paradigms often incorporate ontological, epistemological and methodological issues within the same concept.

As a research paradigm, the concept of realism is often used to describe different levels of philosophical assumptions within research inquiry. Realism makes an ontological claim as it assumes that there is a 'real world' outside of our own mind (Crotty, 1998). As an ontological assumption, realism has dominated western thought and the belief that the world exists, whether we are conscious of it or not, is compatible with many different theoretical perspectives, from positivism through to constructionism.

Positivist researchers 'view reality as being independent of our experiences of it, and being accessible through careful thinking, and observing and recording of our experiences' (Liamputtong, 2010, p. 12). However, even if we accept the concept of a 'world always already there' (Merleau-Ponty, 1962) it only gains meaning through our consciousness of it. This meaning may be perceived as objective but it could also be perceived as a socially constructed view of what we know as individuals and how we know it. Research within a constructionism paradigm views 'all knowledge, and therefore all meaningful reality as such, as contingent upon human practices, being constructed in and out of interaction between human beings and their world, and developed and transmitted within an essentially social context' (Crotty, 1998, p. 42).

As an epistemological perspective, realism positions itself between the poles of positivism and constructionism. Realism assumes that we can make observations about phenomena, but that

we may not be able to observe all of the structures that influence this phenomenon (Sayer, 2000). What we can do is develop a causal explanation that offers a plausible case for a phenomenon (Pawson & Tilley, 1997). This focus on causation is a distinctive feature of realism within both the natural and social sciences. However, unlike many phenomena that are observed within the natural sciences, social phenomena occur within open systems that are constantly changing (Sayer, 2000). Individuals and organisations within the social world are connected through relationships that are dynamic and interdependent and social phenomena are sensitive to the contexts in which they occur (Pawson & Tilley, 1997).

This study locates itself within the realism paradigm. The researcher holds the view that while we can observe policy implementation within the health system, we cannot observe all of the structures and mechanisms that influence this process. What policy research can do is develop causal explanations that uncover these mechanisms of social change to suggest how a policy may have created change within the health system (Pawson & Tilley, 1997).

4.3 Research methodology

Case study methodology was used to explore how the immunisation health target was implemented at the local level in New Zealand. Investigating this implementation process enabled the researcher to consider how effective the immunisation health target was as a policy mechanism for improving immunisation coverage and addressing immunisation inequities within the New Zealand health system.

Within the literature, there are many different ways of defining what case study methodology is and what it is not (Baxter & Jack, 2008; Stake, 1995; Swanborn, 2010; Yin, 2009). This research adopted Swanborn's definition of case study methodology. Swanborn describes case study research as:

> 'the study of a social phenomenon carried out within the boundaries of on social system (the case), or within the boundaries of a few social systems (the cases), such as people, organisations, groups, individuals, local communities or nation-states in the case's natural context' (Swanborn, 2010, p. 13).

Case study methodology allows the researcher to make a rich and detailed study of a phenomenon through the use of a single case or multiple cases (Yin, 2009). The researcher is able to monitor a phenomenon over a defined period of time using a range of data sources such as interviews, observations, datasets, surveys and documentary analysis (Swanborn, 2010; Yin,

2009). The flexibility to use both quantitative and qualitative sources of data is one of the strengths of case study methodology. Quantitative data can be used to identify and measure change while qualitative research methods can explore a phenomenon in much more depth to explain how or why this change occurred (Liamputtong, 2010; Yin, 2009).

Yin (2009) states that case studies can take three approaches, they can be descriptive, exploratory or explanatory. However, Stake (1995) extends beyond these approaches to also consider using case studies in an instrumental way. Within this instrumental approach, researchers can deliberatively select cases with certain characteristics to investigate a specific phenomenon (Stake, 1995). This is particularly useful for research on policy implementation as case study sites can be identified and selected due to similarities or differences in their local contexts, creating a natural experiment for examining policy implementation (Stewart, 2012). This gives the researcher the ability to investigate the role of local contexts, particularly the relationships between individuals and organisations, within the policy implementation process (Stewart, 2012).

4.3.1 Selection of case study sites

This research selected four DHBs as case study sites. Four case study sites were sufficient to allow the researcher to explore how the immunisation health target was implemented at the local level within the New Zealand health system. A greater number of cases may have increased the reliability of the research findings as being representative of the immunisation health target experience New Zealand, but this was outside of the resource capacity available for this study. By selecting four case study sites the researcher was able to gather rich data to develop a detailed story for each case site while still being able to make comparison between sites to explore the role of local contexts on the implementation process.

The case study sites were selected along two dimensions of performance to ensure that this research could address the research objectives. The first dimension was performance towards the immunisation health target from September 2007 to June 2010 (as this was the time period that the case study sites were selected). This data came from the Ministry of Health quarterly reports on progress towards the immunisation health target.

The DHBs that were selected as case study sites included one high performing DHB, one low performing DHB and two DHBs that had started the target experience with average rates of immunisation coverage and had markedly increased immunisation coverage within their region over the three year period under examination. This allowed the researcher to explore potential

differences within the local contexts of these DHBs that may have influenced their progress towards the health target.

The second dimension of performance was the level of immunisation inequity between Māori and non-Māori children. Identifying how the DHBs addressed immunisation inequities for Māori children within their region was a key research question for this research. To ensure that this research was able to explore this aspect of the implementation process the case study sites needed to have relatively large Māori populations. This limited the selection of case study sites to the DHBs located in the North Island of New Zealand as the DHBs in the South Island have much smaller Māori populations.

The North Island DHBs were evaluated on their level of inequity in immunisation coverage between Māori and non-Māori children. This process facilitated the selection of two DHBs with a relatively low level of immunisation inequity and two DHBs with a high level of immunisation inequity between Māori and non-Māori children.

The four DHBs that were selected as case study sites were Hawke's Bay DHB, Auckland DHB, Waikato DHB and Bay of Plenty DHB (refer to Table 5 below).

Table 5 Case study sites along two dimensions of performance

	Low level of immunisation inequity between Māori and non-Māori children	High level of immunisation inequity between Māori and non-Māori children
High performance towards the health target	Hawke's Bay DHB	
Improving performance towards the health target	Waikato DHB	Auckland DHB
Low performance toward the health target		Bay of Plenty DHB

A third dimension that was considered when selecting these four DHBs as case study sites was the urban and rural mix of the DHBs. Large urban DHBs may have encountered different challenges to smaller rural DHBs during the implementation process. The researcher wanted to

ensure that the case study sites captured these differences in local context. The four DHBs that were identified through the two performance dimensions included one large urban DHB (Auckland DHB), one large predominately rural DHB (Waikato DHB) and two small predominately rural DHBs (Hawke's Bay DHB and Bay of Plenty DHB).

Each case study site was bounded by the geographical and organisational boundaries of the DHB. This includes the DHB as a planning and funding organisation as well as the local hospitals, Public Health Service, PHOs, NGOs and primary health care providers located within the region of that DHB.

4.3.2 Ethical approval for this research

Ethical approval for this research was obtained from the Multi-region Ethics Committee on the 4th of July 2011 (MEC/11/EXP/019). A copy of the letter for this ethics approval is provided in Appendix 4. As part of this ethics approval process, approval from each of the four DHBs involved in this study was obtained through their own research approval processes. A copy of the letter sent to DHB to request their participation in this research can be found at Appendix 5.

4.4 Research methods

This study used qualitative research methods to collect and analyse data on the implementation of the immunisation health target within the four case study sites. Qualitative research methods are well suited to health policy research as they can capture and describe the dynamic processes and contextual settings that shape the policy implementation process (Pope & Mays, 2000).

The main source of qualitative data in this study came from semi-structured interviews with key informants involved in the implementation of the health target within each of the four case study DHBs. As a research method, interviews enable the researcher to collect empirical data about the social world through conversations with individuals (Liamputtong, 2010; Minichiello, Aroni, Timewell, & Alexander, 1995). Semi-structured interviews allowed the researcher to steer the conversation with individuals while still allowing space for unanticipated themes and concepts to be discussed (Pope & Mays, 2000). They are particularly useful as a research method within health policy research as they can draw out information on the complex organisational and contextual characteristics that influence policy implementation (Murphy & Dingwall, 2003).

A documentary analysis was also conducted for each case study DHB. This included strategic policy documents such as long term strategic plans, annual plans and their annual reports. Although these documents identified the immunisation health target as a priority within each DHB, very little information was given on how the DHB would achieve the health target. This operational information came from the interviews with key informants involved in the implementation process. Additional immunisation policy documents were made available to the researcher during the interview process at the request of the researcher. A list of the documents that were included in the documentary analysis is provided in Appendix 6.

This study also utilised quantitative data on DHB performance to monitor the performance of the case study DHBs towards the health target as well as the level of immunisation inequities for Māori children. This quantitative data was published by the Ministry of Health every three months and made available to the public via the Ministry of Health website. The data was pulled from the National Immunisation Register to measure and monitor the level of immunisation coverage for children who had turned two years of age during that quarterly period. The level of immunisation coverage for Māori children within each DHB was also published each quarter.

This quantitative data measured and monitored each DHBs progress towards the immunisation health target, but quantitative data alone could not explain how DHBs were improving immunisation coverage in their region. This is why qualitative research methods were used to produce the rich information that was needed to develop a detailed story of the immunisation health target experience.

4.4.1 Data collection

Two phases of semi-structured interviews were conducted to allow the researcher to capture the experiences of key informants during the implementation of the health target as well as their reflections on the implementation process after the immunisation health target for two year olds had ended.

4.4.1.1 Phase one interviews

The first phase of interviews focused on collecting information on the implementation process for the immunisation health target from multiple perspectives within each case study site. Thirty

three interviews were conducted across the four case study sites over a five month period between August and December 2011.

Sampling for phase one interviews was purposive to ensure that key informants were able to provide information based on their experiences with the immunisation health target. This also allowed the researcher to examine each of the case study sites in depth from the different perspectives of individuals involved within the local implementation process. Initially key informants were identified through the IMAC regional coordinators who worked closely with the immunisation champions within each of the DHBs in their region. Potential key informants were then contacted directly by the researcher by email and asked if they were interested in participating in the study. A copy of this email is provided in Appendix 7. Additional key informants were identified by the DHB immunisation champion and through a snowballing approach with interview participants until data saturation occurred with little or no new data being generated (Liamputtong, 2010).

This gave a sample size of between seven and nine key informants within each case study site. The first case study site (Hawke's Bay DHB) had nine interviews and included interviews with three primary care nurses involved in delivering immunisations to children within general practice. While providing valuable insight into the role of practice nurses, these interviews did not contribute any new information on the systems and processes involved in the implementation of the immunisation health target. Data saturation for the research questions had been reached after interviewing health professionals involved at the DHB level, the PHO level and within the DHB's immunisation team. This experience guided the selection of key informants for subsequent DHB sites and focused the attention of the researcher on interviews with individuals at a DHB and PHO level within the local health system.

Interview participants included individuals from the Planning and Funding team within the DHBs as well as other DHB employees such as NIR Managers, Medical Officers of Health within the local Public Health Service and Midwifery Leaders. A number of key informants worked as Immunisation Coordinators at the interface between the local PHOs and their primary care providers. Representatives from PHOs, including Māori PHOs, were interviewed to gain an understanding of their role in the implementation of the immunisation health target and how they worked with their primary care provider.

Interviews were conducted at a location convenient for each participant and were usually between 30 and 60 minutes long. They were digitally recorded with the permission of the key informants and participants were given the opportunity to review the written transcript for the interview. All of the key informants were given a participant information sheet before the

interview and a consent form which they completed before the interview took place. A copy of the participant information sheet and consent form can be found in Appendix 8 and 9.

An interview protocol was developed by the researcher to guide the interview process and ensure that information that was shared by key informants would address the research questions under investigation. The interview protocol for phase one interviews can be found in Appendix 10. The interview protocol was flexible and the researcher adapted the interview process and the order of the questions to suit the flow of the conversation. However, having the interview protocol ensured that the same questions were addressed in each interview. This allowed the researcher to compare data across different interviews within a case study site as well as between different case study sites.

4.4.1.2 Phase two interviews

The second phase of interviews revisited a number of key informants within each case study DHB. These key informants were selected by the researcher based on the rich information that they had provided during the phase one interviews. There was only one new key informant who had been unable to participate in phase one of the interviews due to personal circumstances. All of the key informants involved in the phase two interviews were located at a DHB or PHO level within their region. They included DHB Planning and Funding Managers, Medical Officers of Health, PHO Managers and Immunisation Coordinators. Sixteen interviews were conducted across the four case study sites during a two month period from September to October 2012.

The phase two interviews took place three months after the end date of the health target and allowed the key informants to reflect back on the implementation process of the health target. This perspective was useful because they were in a position to discuss what they thought had worked, or had not worked, during the implementation process. The researcher was also able to validate themes that had been identified during the analysis of the interviews from phase one with the key informants. A copy of the interview protocol for phase two of the interviews can be found in Appendix 11.

4.4.1.3 Interview with the key informants at the Ministry of Health

In November 2011, the researcher met with and interviewed two key informants at the Ministry of Health who were closely involved in the implementation of the immunisation health target at a national level. The interview was conducted at the offices of the Ministry of Health in Wellington,

following an informal update on this research. The interview was one hour long and it was digitally recorded to allow the researcher to focus on the conversation and to ensure that all of the information would be available for analysis. A copy of the interview protocol for this interview can be found at Appendix 12.

Although this study focused on how the immunisation health target was implemented at the local level within New Zealand, the researcher gained valuable contextual information from the interview with these key informants. They were able to provide a national level perspective on the implementation of the immunisation health target and discuss how they thought DHBs across the country were progressing towards the target.

4.4.2 Data analysis

The analysis of qualitative data is a dynamic and reflective process that occurs throughout each stage of research (Liamputtong, 2010). Braun and Clarke (2006, p. 86) state that it 'involves a constant moving back and forward between the entire data set, the coded extracts of data that you are analysing, and the analysis of the data that you are producing'. The researcher approached each phase of the data analysis process as integral to the overall analysis process. This process included the transcription of the interviews, the coding of interview data and the analysis of data using a thematic analysis approach.

4.4.2.1 Transcription of interviews

The digitally recorded sound files from the interviews were downloaded and saved on a computer that was password-protected. These sound files were then transcribed verbatim by the researcher into Microsoft Word 2010 and saved as individual documents. The transcription of the interviews was undertaken by the researcher to enable immersion in the data and allow the researcher both a familiarity with the perspectives and experiences of key informants and an overarching understanding of each case study site (Denzin & Lincoln, 2005). The transcribed interviews were then stored and managed using a qualitative analysis software package called MaxQda to allow the researcher to systematically code and analyse the interview data.

4.4.2.2 Coding

A coding matrix was created based upon the research questions and objectives that were being investigated and the researchers experience from transcribing the interviews. The use of a coding matrix allowed the researcher to be consistent in coding data both within a case study site and between the four case study sites. The initial matrix of keywords or codes was developed by testing the matrix on one interview from each case study DHB. Four interviews with key informants in similar positions within the DHB planning and funding team were chosen to ensure consistency in coding across the case study sites. The interviews with these key informants also contained a large amount of information pertaining to the implementation of the immunisation health target and therefore covered almost all of the themes that would need to be coded across all of the interviews.

Testing and developing the coding matrix involved a reflective process of expanding the coding matrix through the addition of new codes and then refining these codes by collapsing multiple codes together and renaming them. Many changes were made to the coding matrix during the first two test interviews that were coded, but by the time the fourth interview was coded there were very few changes that needed to be made. This final coding matrix was then used to code all of the interviews, including the four test interviews, which were recoded to ensure consistency. A copy of the final coding matrix is provided in Appendix 13.

The researcher coded all of the interviews within a case before moving on to the next case study site. This enabled the researcher to develop a detailed understanding of each case and the contextual factors that influenced and shaped the implementation process within that DHB. Throughout the coding process a small number of unexpected themes were identified and these were added to the coding matrix. However, these codes were usually only relevant to that particular key informant or their DHB.

4.4.2.3 Thematic analysis

Interview data was analysed using a deductive thematic analysis approach that drew upon the literature and researchers understanding of the topic. Thematic analysis aligns well with a realism paradigm as it is a research method that allows the researcher to explore the 'experiences, meanings and the reality of participants' (Braun & Clarke, 2006, p. 81). Thematic analysis can capture aspects of the local context or local experience across different interviews within a case study site and can also be used to compare and contrast the experiences between different case study sites.

Braun and Clarke (2006, p. 79) describe thematic analysis as 'a method for identifying, analysing and reporting patterns (themes) within data'. This process of identifying themes began during the transcription phase as the researcher transcribed all of the interviews to develop a familiarity with the interview data. Each of the interview transcripts were then actively read to search for patterns and themes within the data that related to the research question and objectives. During the coding phase the researcher was able to compare and contrast these developing themes across interviews within each case study site. After coding all of the interviews in each of the four case study sties, the researcher had developed an understanding of the themes that were universal across all of the case study sites and those themes that applied to a specific interview, organisation or case study site.

Analysis of the interviews began with these universal themes which allowed the researcher to combine data within related codes into themes that applied across all of the case study sites. Additional themes or sub-themes that applied to a specific interview or case study site were also identified as these contributed to the researchers understanding of the local context and local experience of the immunisation health target. The researcher then re-read the interviews to ascertain whether the themes that had been identified accurately reflected the meanings that were evident in the interview data and dataset as a whole (Braun & Clarke, 2006). This refined a number of themes that overlapped and emphasised the relationships between different themes for the researcher. These themes were refined further during the writing of the key findings as the researcher endeavoured to tell the policy process of the immunisation health target experience both within and across the four case study sites.

Within the realism paradigm it is essential for researchers to be value aware. Knowledge is viewed as subjective and therefore cannot be value free as our values shape the way we perceive and interpret the world around us (Healy & Perry, 2000). By recognising my own background and how these factors shaped this research on the immunisation health target, I was able to explore the philosophical assumptions and the decisions that underpinned the research design for this study. I was also able to challenge my own interpretations of the data by recognising that I viewed this data through a number of social, cultural and theoretical frames. These frames included my previous knowledge and experience of the New Zealand health system, a systems approach to understanding health services, an inequities perspective to Māori health outcomes and my existing knowledge of the policy literature.

4.5 Research quality

Healy and Perry (2000, p. 121) state that 'because a paradigm is a worldview, spanning ontology, epistemology and methodology, the quality of scientific research done within a paradigm has to be judged by its own paradigm's terms'. The quality of this research should therefore be determined against criteria that has been developed and recognised within the literature on research case study research within a realism paradigm.

Table 6 on the following page summarises the key criteria for research quality within the literature that were applied throughout the research process of this study and have been discussed throughout this chapter.

It is important to note that Stewart's (2012) discussion on convincingness for multiple case study research in relation to governance studies was particularly useful when considering research quality for this study. Much of the research discussed within this paper overlaps with the areas of public administration and policy implementation research and she argues that the ability of multiple-case study research to convince us of their findings rests on the *reliability* of these studies. Stewart uses the term *convincingness,* rather than validity, and states that 'convincingness derives from two sources: the research design and the reliability of the instruments that are used in gathering data' (Stewart, 2012, p. 74).

This chapter has outlined the research design for this study and explained how and why the research methods were used to collect and analyse data. Copies of the interview protocols and coding matrix have been provided in the appendices to give the reader a sense methodological trustworthiness. By being as transparent about the research process as possible, the researcher has endeavoured to strengthen the convincingness of the research findings.

Table 6 Criteria for research quality that informed this research process

	Brief description of criteria for realism research	Case study methodology techniques within the realism paradigm (Healy & Perry, 2000)	Criteria for convincingness (Stewart, 2012)
Ontology			
Ontological appropriateness	Research deals with complex social phenomena	Selection of research question that explores the how or why of a problem	
Contingent validity	Phenomenon occurs within open systems and are context dependent	Use of in-depth questions exploring why a phenomenon has occurred. Detailed description of the context of cases	Description of the context in which policy implementation occurs
Epistemology			
Multiple perceptions of participants	Value aware researcher and recognition of multiple perspectives of phenomenon	Self-description and awareness of own values. Multiple interviews to ensure multiple perspectives of a phenomenon are captured	Multiple case study sites to improve generalisability of research findings
Methodology			
Methodological trustworthiness	Research can be audited	Case study database, use in the report of relevant quotations and matrices that summarise data and of descriptions of procedures like case selection and interview procedures	Reliability that key findings could be replicated
Analytic generalisation	Theory building rather than theory testing	Identify research issues before collecting data to develop an interview protocol that will provide data that addresses the research question	
Construct validity		Use of prior theory, case study database, triangulation	Utilises the relevant literature as a starting point for exploring processes of policy implementation

Table adapted from: Table II Quality criteria for case study research within the realism paradigm in Healy & Perry (2000, p. 122)

4.6 Chapter summary

This research locates itself within the paradigm of realism and this position shaped the decision to use case study methodology to explore how the immunisation health target was implemented at the local level. Four DHBs were selected as case study sites and semi-structured interviews were used to collect data on the experiences of key informants involved in the implementation process within these case study sites. Data was analysed using a thematic analysis approach that drew upon the researcher's previous knowledge and the policy implementation literature.

The next chapter of this thesis (Chapter Five: Performance for the Immunisation Health Target) presents quantitative data from the NIR on performance for the immunisation health target at both a national and local level.

Chapter Five: Performance for the Immunisation Health Target

5.1 Overview of this chapter

This chapter presents quantitative data on performance towards the immunisation health target at both a national and local level. At a national level, this chapter examines the rates of immunisation coverage at two years of age over time. It also looks at immunisation coverage by ethnicity to highlight immunisation inequities in New Zealand and focuses on the level of immunisation inequity between Māori and non-Māori children.

At a local level this chapter provides a short case report on each of the four case study sites. This includes information on the region and their population demographics as well as a description of the organisations that make up the local health system within that DHB. The case reports also examine each DHBs performance for the immunisation health target, immunisation coverage by ethnicity and the level of immunisation inequity between Māori and non-Māori children. These case reports establish a contextual baseline for each case study site from which to explore the implementation of the immunisation health target at the local level, which is the focus of the next chapter in this thesis.

5.2 Improving immunisation coverage at two years of age

The Ministry of Health measured and monitored DHB performance towards the immunisation health target every three months using data from the NIR. The level of immunisation coverage within each DHB included all children who had turned two years of age during that quarter and were fully immunised according to the National Immunisation Schedule. This data was then used to determine the national level of immunisation coverage at two years of age for that quarter.

The data on immunisation coverage that is presented in this chapter covers the period from September 2007 (when the health target was introduced) to June 2013 (one year after the health target ended). It is important to note that during the first couple of quarters of the health target experience there were some data issues for a number of DHBs. These data inconsistencies made it difficult to establish accurate levels of immunisation coverage within these DHBs.

5.2.1 Immunisation coverage at a national level

When the immunisation health target was introduced in August 2007, the national level of immunisation coverage at two years of age was measured at 67 per cent for the twelve month period ending September 2007 (refer to Figure 2 below). By June 2008, immunisation coverage had increased to 78 per cent but improvements in performance towards the health target stagnated for the next three quarters.

In May 2009, the incoming Minister of Health for the newly elected National-led government revised the set of health targets. The immunisation health target remained the same, but greater emphasis was placed on accountability to both the Government and the public. Over the next three years, immunisation coverage continued to increase and when the health target ended in June 2012, the national level of immunisation coverage was 93 per cent. Although the national level of immunisation coverage fell short of the health target by two per cent, immunisation coverage at two years of age had improved by 26 per cent over the course of the health target experience (from September 2007 to June 2012).

The level of immunisation coverage dropped to 90 per cent during the quarter after the health target ended and one year on from the health target the national level of immunisation coverage at two years of age was measured at 92 per cent in June 2013.

Figure 2 National level of immunisation coverage at two years of age
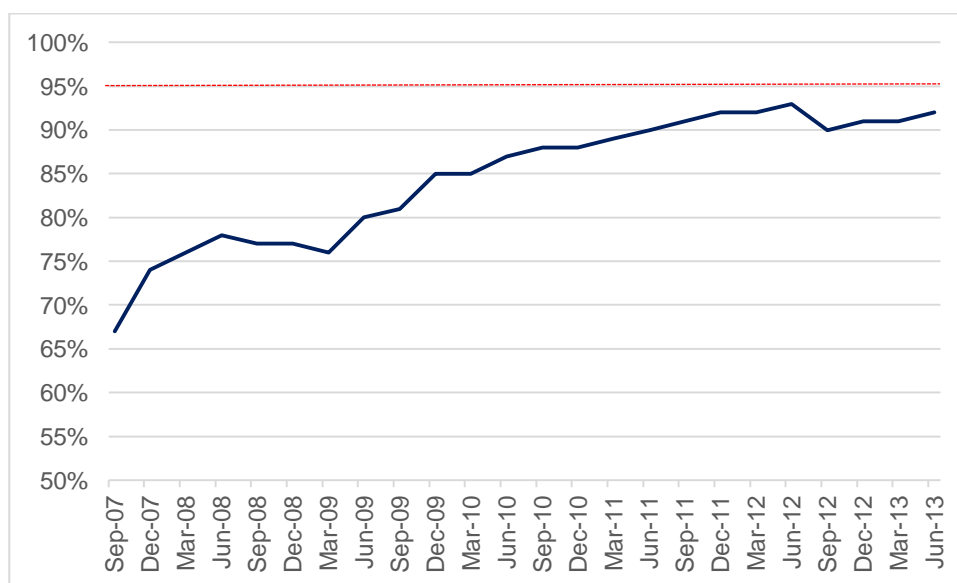
5.2.2 Immunisation coverage by ethnicity

In September 2007, rates of immunisation coverage among New Zealand European children and Asian children were comparable at 74 per cent and 73 per cent respectively. However, Māori children, Pacific children and children of other ethnicities experienced significant immunisation inequities when compared to New Zealand European and Asian children (refer to Figure 3 on the following page).

Immunisation coverage for Māori children was measured at 59 per cent, 15 per cent lower than the rate of immunisation coverage for New Zealand European children. Although rates of immunisation coverage were higher among Pacific children than Māori children, with a level of immunisation coverage of 63 per cent, this was still 11 per cent lower than the coverage rate for New Zealand European children. There were also immunisation inequities for children within the 'other ethnicity' category, which included all children enrolled on the NIR of any ethnicity other than New Zealand European, Māori, Pacific or Asian.

Over the course of the health target experience, rates of immunisation coverage increased for all ethnic groups. Levels of immunisation inequity reduced for Māori children and children within the 'other ethnicity' category and immunisation inequities for Pacific children were eliminated.

When the health target ended in June 2013, Asian and Pacific children had the highest rates of immunisation coverage at 98 per cent and 97 per cent. The rate of immunisation coverage for New Zealand European children was 93 per cent and immunisation coverage for Māori children was 92 per cent. Children within the 'other ethnicity' category had the lowest rate of immunisation coverage at 87 per cent.

Figure 3 National level of immunisation coverage at two years of age by ethnicity
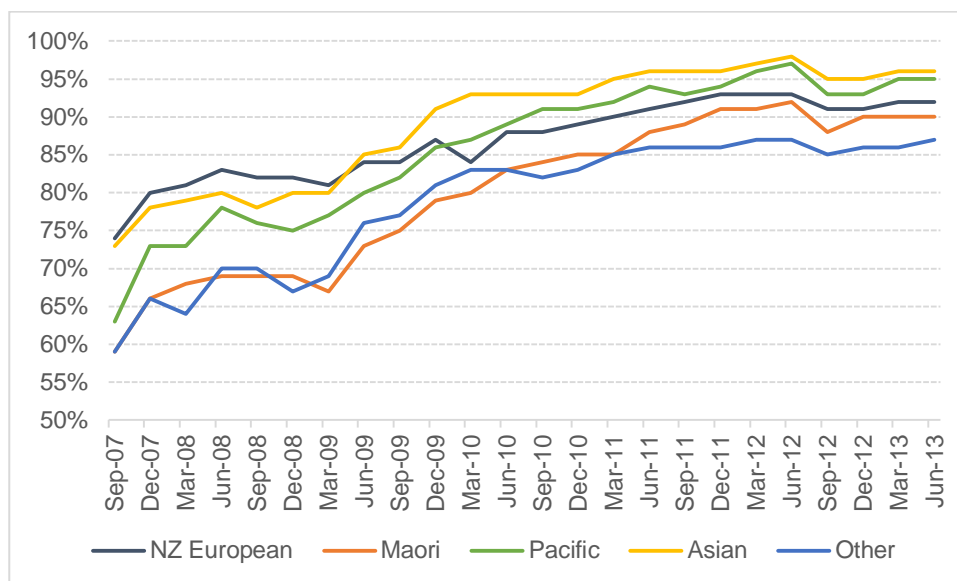
5.2.3 Immunisation inequities between Māori and non-Māori children

Immunisation inequities between Māori and non-Māori children has been an ongoing challenge within the New Zealand health system (Bramley et al., 2005; Turner et al., 2000). When the immunisation health target was introduced in 2007, immunisation coverage among Māori children was measured at 59 per cent. This was 11 per cent lower than the level of immunisation coverage for non-Māori children at 70 per cent (refer to Figure 4 on the following page).

Although the rates of immunisation coverage for both Māori and non-Māori children improved during the first eighteen months of the health target experience, the level of inequity remained the same. In the quarter ending June 2009, this immunisation inequity began to reduce as the level of immunisation coverage for Māori children steadily increased. By December 2011, the difference in immunisation coverage between Māori and non-Māori children had reduced to one per cent. And when the health target ended in June 2012, immunisation coverage for Māori children at two years of age was measured at 92 per cent, one per cent lower than the rate of immunisation coverage for non-Māori children.

Figure 4 Level of immunisation inequity between Māori and non-Māori children at two years of age
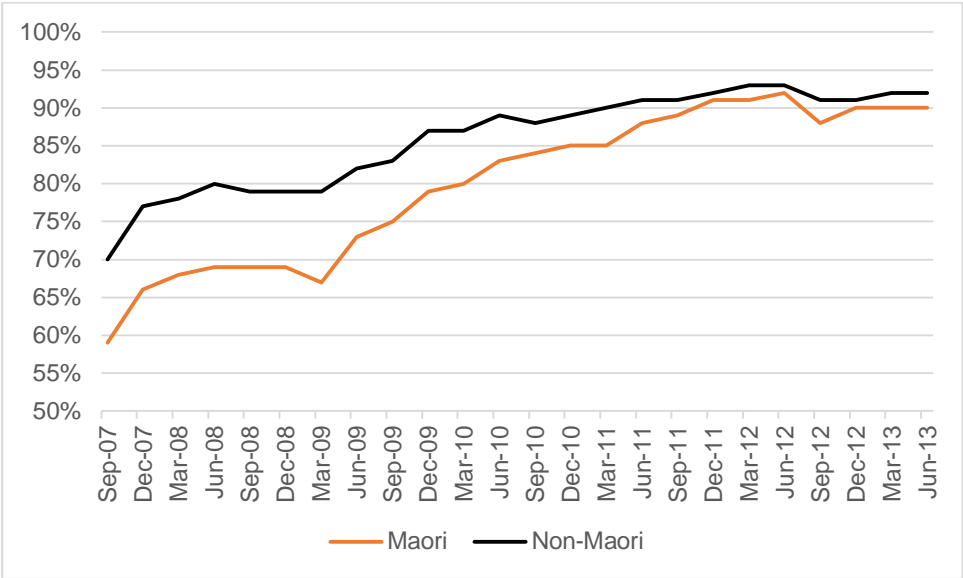
5.3 Exploring the implementation process through four case study sites

Immunisation coverage at two years of age increased during the health target experience and immunisation inequities were significantly reduced. Why did the health target improve immunisation coverage when previous policy attempts had failed? What did DHBs do to improve immunisation coverage within their region? And how did DHBs address immunisation inequities for Māori children? This research set out to answer these questions by exploring the implementation process of the immunisation health target within four case study DHBs: Hawke's Bay DHB, Auckland DHB, Waikato DHB and Bay of Plenty DHB.

These DHBs were selected as the case study sites as they were representative of low, middle and high performing DHBs along two dimensions of performance. The first dimension was performance towards the immunisation health target from September 2007 to June 2010. The second dimension was the level of inequity between Māori children and non-Māori children over the same time period of September 2007 to June 2010. The selection process for these case study sites was explored in more detail in chapter four of this thesis.

5.3.1 Immunisation coverage across the four case study sites

At the start of the health target experience, there was significant variation in immunisation coverage between the four case study DHBs (refer to Figure 5 on the following page). This variation reduced over time as all of the case study DHBs improved their performance towards

the immunisation health target. When the health target ended in June 2012, the variation between the highest performing DHB (Hawke's Bay DHB) and the lowest performing DHB (Bay of Plenty DHB) had reduced from 20 per cent to 5 per cent.

Figure 5 Immunisation coverage at two years of age across the four case study sites
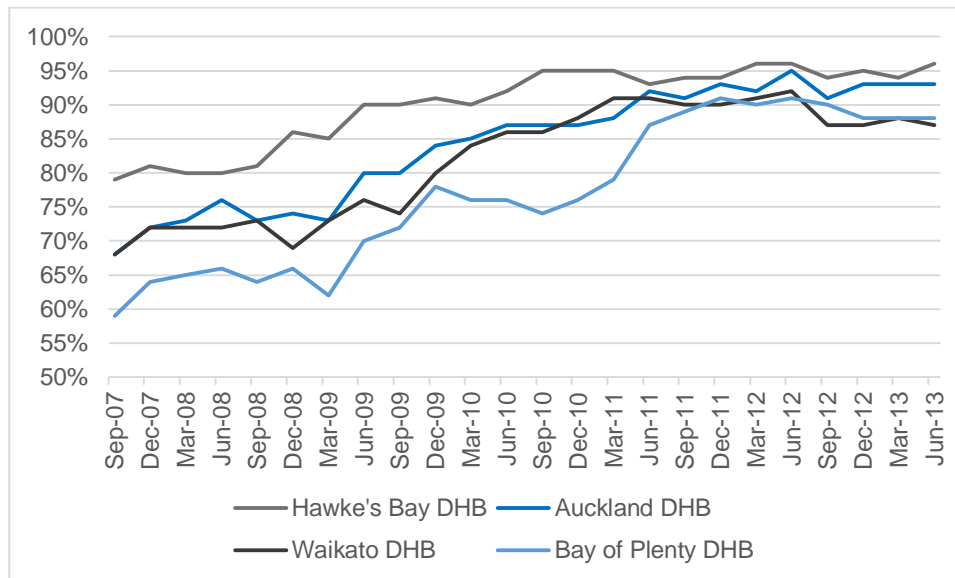
5.3.2 Immunisation inequity between Māori and non-Māori children across the four case study sites

When the immunisation health target was introduced in 2007, immunisation coverage for Māori children varied across the four case study sites (refer to Figure 6 on the following page). The case study sites were selected in the middle of 2010 and at this time two of the case study sites were performing well in terms of immunisation coverage for Māori children (Hawke's Bay DHB and Waikato DHB) and two of the case study sites were performing poorly in this area (Auckland DHB and Bay of Plenty DHB). There were also significant immunisation inequities between Māori and non-Māori children within Auckland DHB and Bay of Plenty DHB (refer to Figures 12 and 18 in the case reports for these DHBs presented later in this chapter).

Over time, the level of immunisation coverage for Māori children increased and when the health target ended in 2012, all of the case study DHBs had improved immunisation coverage for Māori children to a level above 90 per cent. Variation in immunisation coverage for Māori children between the highest performing DHB (Hawke's Bay DHB) and the lowest performing DHB (Bay of Plenty DHB) had reduced from 21 per cent to 7 per cent.

Figure 6 Immunisation coverage for Māori children across the four case study sites
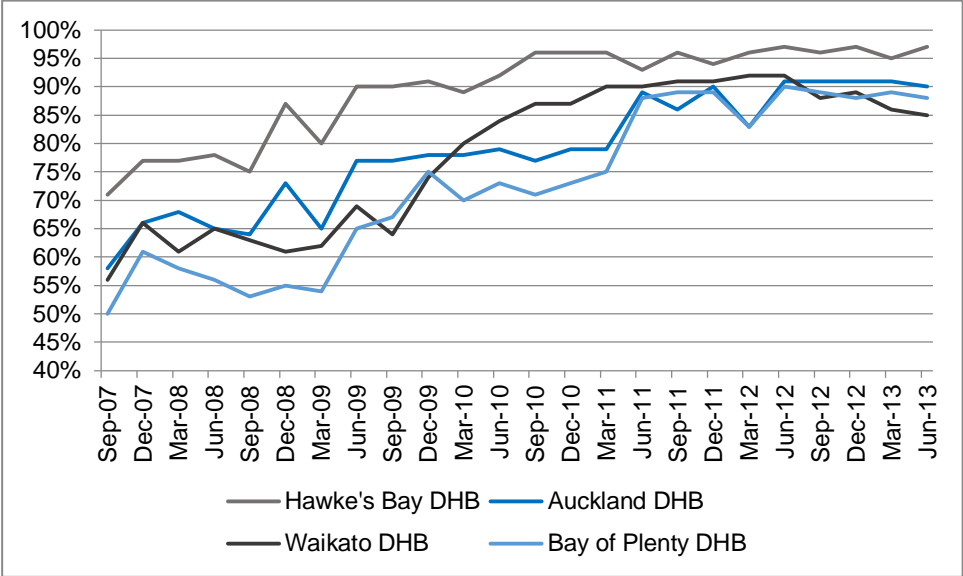
5.4 District Health Board case reports

In the section that follows, each of the case study sites will be described to highlight features of the local context that shaped the implementation process. These case reports provide information on the region and population demographics as well as a table of key organisations within the local health system for that region. Quantitative data from the NIR is presented on each case study DHBs performance towards the immunisation health target over time, rates of immunisation coverage by ethnicity and the level of immunisation inequity between Māori and non-Māori children.

5.4.1 Case study site one: Hawke's Bay District Health Board

Hawke's Bay DHB is a relatively small DHB on the east coast of New Zealand's North Island. The DHB covers the cities of Napier and Hastings as well as the rural districts of Central Hawke's Bay, Wairoa and the Chatham Islands (a map of New Zealand showing DHB boundaries can be found in Appendix 3).

Hawke's Bay DHB serves a population of around 156,490 people. Socioeconomic deprivation is a key issue within the region as the population has a lower median income than the national average, higher rates of unemployment and lower rates of education. The two predominant ethnic groups living within the region are New Zealand European and Māori and the proportion of Māori within the population is higher than the national average.

The following table provides a break-down of ethnicity for children turning two during the three month reporting period ending June 2012 (the last quarter of the health target experience). This is provided to give an indication of how many children were included in the measurement of the health target for this quarter and the number of children within each category of ethnicity. The majority of children within Hawke's Bay DHB were of Māori or New Zealand European ethnicity, with much smaller numbers of children from other ethnic groups.

Table 7 Hawke's Bay DHB: Children turning two during the quarter ending June 2012

Ethnicity	Number of children	Proportion of sample
Māori	270	48.1%
New Zealand European	202	36.0%
Pacific	39	7.0%
Asian	18	3.2%
Other ethnic group	32	5.7%
Total	**561**	**100%**

Source of data: NIR immunisation coverage at milestone age (24 months of age) for the reporting period ending June 2012.

The structure of the local health system within Hawke's Bay DHB is relatively straight forward as public health services are provided through the Population Health team that is located within the DHB and one PHO covers the entire region.

Table 8 Hawke's Bay DHB: Structure of the local health system

District Health Board	Hawke's Bay DHB
Public health services	Public health services are provided through the *Population Health* team which is located within the District Health Board
Secondary care	*Hawke's Bay Hospital* is located in Hastings and there are four health centres located in Napier, Wairoa, Waipukurau and the

services	Chatham Islands
Primary Health Organisations	A single PHO covers the entire DHB region. *Health Hawke's Bay PHO* was established in April 2011, when three local PHOs merged to allow for a district wide approach to primary care services in the region. The PHO currently covers 31 general practices or medical centres, including a number of Māori health providers

Source of data: http://www.hawkesbay.health.nz/ and http://www.healthhb.co.nz/.

5.4.1.1 Immunisation coverage within Hawke's Bay DHB

In September 2007, immunisation coverage at two years of age was 79 per cent within Hawke's Bay DHB. This was 12 per cent higher than the national average of 67 per cent for the twelve month period ending September 2007 (refer to Figure 7 on the following page). After the first year of the health target, Hawke's Bay DHB steadily improved immunisation coverage at two years of age and the DHB was often ranked as the highest performing DHB in the country. When the health target ended in June 2012, immunisation coverage at two years of age was 96 per cent.

There was a small drop in immunisation coverage during the quarter that followed the end of the health target, however Hawke's Bay DHB had consistently maintained high rates of immunisation coverage at two years of age since 2010.

Figure 7 Hawke's Bay DHB immunisation coverage at two years of age
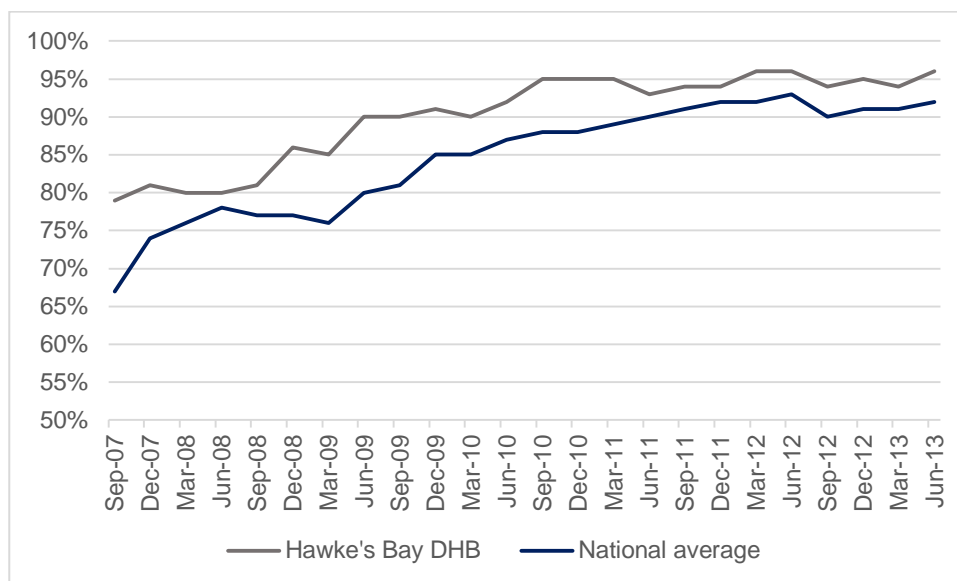
5.4.1.2 Immunisation coverage by ethnicity within Hawke's Bay DHB

The level of immunisation coverage for Pacific children, Asian children and children of other ethnicities fluctuated dramatically within Hawke's Bay DHB from quarter to quarter due to the relatively small numbers of children in each of these ethnic groups. Despite these fluctuations, the levels of immunisation coverage improved for each ethnic group over the course of the health target experience (refer to Figure 8 on the following page).

When the health target was introduced in 2007, there were significant immunisation inequities for Māori and Pacific children and children of other ethnicities compared to Asian and New Zealand European children within Hawke's Bay DHB. Over the course of the health target experience these inequities reduced as immunisation coverage increased for Māori and Pacific children and children of other ethnicities.

When the health target ended in June 2012, Asian children continued to have the highest rate of immunisation coverage at 100 per cent, but the level of immunisation coverage for Māori children and children of other ethnicities had also increased to 97 per cent. Immunisation coverage for Pacific children had increased to 95 per cent and this was closely followed by New Zealand European children at 94 per cent.

Figure 8 Hawke's Bay DHB immunisation coverage at two years of age by ethnicity
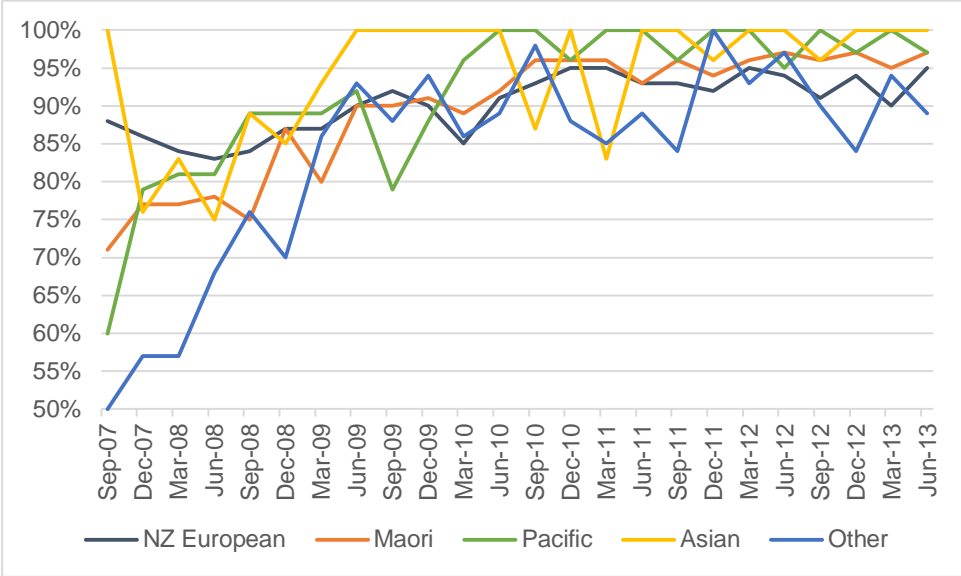
5.4.1.3 Immunisation inequities between Māori and non-Māori children within Hawke's Bay DHB

When the health target was introduced in 2007, the level of immunisation coverage for Māori children within Hawke's Bay DHB was relatively high (at 71 per cent) compared to the national level of immunisation coverage for Māori children (at 59 per cent) (refer to Figure 9 on the following page). Considering the high proportion of Māori children within Hawke's Bay DHB (around half of the children turning two each quarter were Māori) this was a significant achievement. However, there were still immunisation inequities between Māori and non-Māori children within the DHB (an inequity of 13 per cent in September 2007).

This immunisation inequity reduced during the first two years of the health target experience and in December 2009 the inequity was eliminated. From this quarter onwards, Māori children regularly had higher rates of immunisation coverage than non-Māori children within Hawke's Bay DHB. At the end of the health target experience, immunisation coverage for Māori children was measured at 97 per cent while the level of immunisation coverage for non-Māori children was measured at 95 per cent.

Figure 9 Hawke's Bay DHB Level of immunisation inequity between Māori and non-Māori children at two years of age
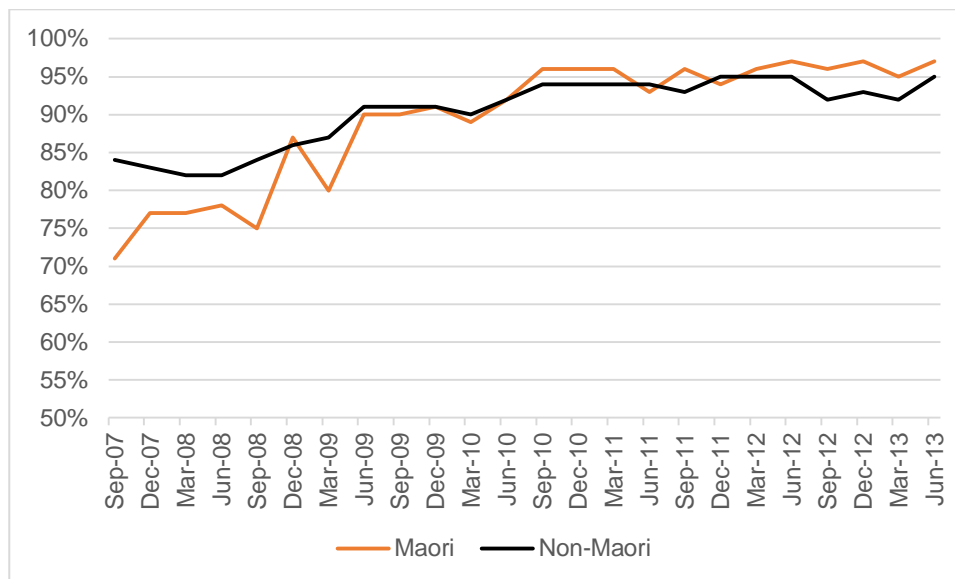
5.4.1.4 Summary of Hawke's Bay DHB

- Achieved the immunisation health target
- Increased immunisation coverage at two years of age by 17 per cent (from 79 per cent to 96 per cent)
- Eliminated immunisation inequities for Māori and Pacific children and reduced inequities for children of other ethnicities
- Eliminated immunisation inequities between Māori and non-Māori children

5.4.2 Case study site two: Auckland District Health Board

Auckland DHB serves a population of 468,000 people and is one of the largest DHBs in the country. It has a predominately urban population and covers five wards within Auckland City: Orakei, Maungakiekie-Tamaki, Puketapapa, Albert-Eden and Waitemata (which includes Waiheke Island and Great Barrier Island) (a map of New Zealand showing DHB boundaries can be found in Appendix 3).

Auckland DHBs population is younger than the national average and people are more transient than in other parts of the country, with more people moving into and out of the region and within the region itself. The level of deprivation is similar to the national average, but issues such as poor housing, overcrowding and low income are a reality for many families living within Auckland DHB.

The population within Auckland DHB is more diverse than within other DHBs. There are a higher proportion of Asian and Pacific people living within the region than in other parts of New Zealand. There is also a lower proportion of Māori living within Auckland DHB than the national average. The following table provides a break-down of ethnicity for children turning two within Auckland DHB during the last quarter of the health target experience.

Table 9 Auckland DHB: Children turning two during the quarter ending June 2012

Ethnicity	Number of children	Proportion of sample
New Zealand European	398	26.3%
Māori	188	12.4%
Pacific	321	21.2%
Asian	376	24.8%
Other ethnic group	232	15.3%
Total	1,515	100%

Source of data: NIR immunisation coverage at milestone age (24 months of age) for the reporting period ending June 2012.

As one of the largest DHBs in the country, Auckland DHB has a complex local health system with a number of organisations providing health services to the population within Auckland DHB as well as to other patients from around the country.

Table 10 Auckland DHB: Structure of the local health system

District Health Board	Auckland DHB
Public health services	Public health services are provided by the *Auckland Regional Public Health Service* which also covers the neighbouring regions of Waitemata DHB and Counties Manukau DHB
Secondary care	*Auckland City Hospital* is New Zealand's largest public hospital and provides secondary care services to patients within Auckland

services	DHB as well as patients from other parts of the country. It is linked to *Starship Hospital*, the national children's hospital. *Greenlane Clinical Centre* provides outpatient services and day stay surgery.
Primary Heath Organisations	*Procare* was founded in 1995 as one of the first Independent Practitioner Associations in New Zealand. As a PHO, Procare has over 800,000 enrolled patients and represents 200 general practices across the greater Auckland region. Many of these general practices are located within Auckland DHB but the PHO also covers the neighbouring regions of Waitemata DHB and Counties Manukau DHB
	Alliance Health Plus is a Pacific led PHO that covers a population of 75,000 enrolled patients. The PHO focuses on providing primary health care services to communities of Pacific people as well as high need populations within the Auckland DHB and Counties Manukau DHB regions
	Te Hononga o Tamaki me Hoturoa is a Māori PHO that is part of the National Hauora Coalition of Māori health providers. The National Hauora Coalition formed in July 2011 when 11 Māori led PHOs across New Zealand came together to create a national network of Māori health providers. The PHO serves a population of 80,000 patients across the Auckland DHB and Counties Manukau regions. Within the Auckland DHB region, it has 16 general practices and medical centres
	Auckland PHO has an enrolled population of 54,000 patients and covers 22 general practices throughout Auckland City and Waiheke Island.

Source of data: http://www.adhb.govt.nz/, http://www.arphs.govt.nz/, http://www.procare.co.nz/, http://alliancehealth.org.nz/, http://www.tehononga.org.nz/ and http://www.aucklandpho.co.nz/.

5.4.2.1 Immunisation coverage within Auckland DHB

When the health target was introduced in 2007, the rate of immunisation coverage within Auckland DHB was comparable to the national average (68 per cent in September 2007 compared to the national average of 67 per cent) (refer to Figure 10 below). Immunisation coverage at two years of age steadily improved within Auckland DHB over the course of the health target experience. When the health target ended in June 2012, Auckland DHB had achieved the health target of 95 per cent immunisation coverage.

Immunisation coverage at two years of age dropped during the quarter after the health target ended (to 91 per cent) but Auckland DHB had maintained a high level of immunisation coverage at 93 per cent one year after the health target ended.

Figure 10 Auckland DHB immunisation coverage at two years of age
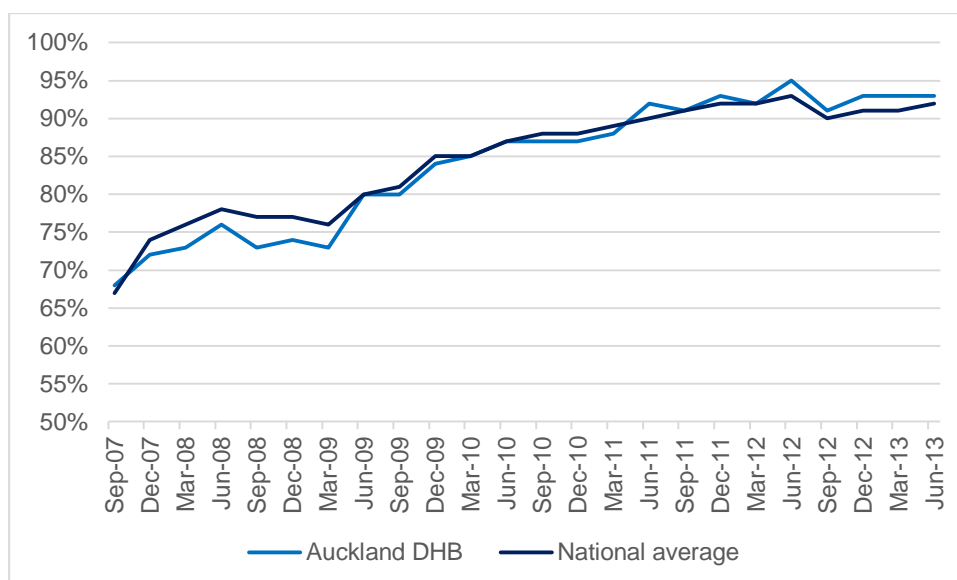
5.4.2.2 Immunisation coverage by ethnicity within Auckland DHB

At the start of the health target experience, rates of immunisation coverage for New Zealand European children (at 76 per cent in September 2007) were higher than coverage rates for Asian children (69 per cent), Pacific children (64 per cent) and children of other ethnicities (61 per cent). Immunisation coverage among Māori children (at 58 per cent) was much lower than other ethnicities within Auckland DHB and the level of inequity between New Zealand European children and Māori children was 18 per cent (refer to Figure 11 on the following page).

When the health target ended in June 2012, Pacific children had the highest rate of immunisation coverage within Auckland DHB (at 98 per cent), closely followed by Asian children

and New Zealand European children (at 97 per cent and 96 per cent respectively). Immunisation inequities for Māori children and children of other ethnicities remained (91 per cent and 92 per cent respectively), however these inequities were significantly smaller than they had been when the health target was introduced.

Figure 11 Auckland DHB immunisation coverage at two years of age by ethnicity
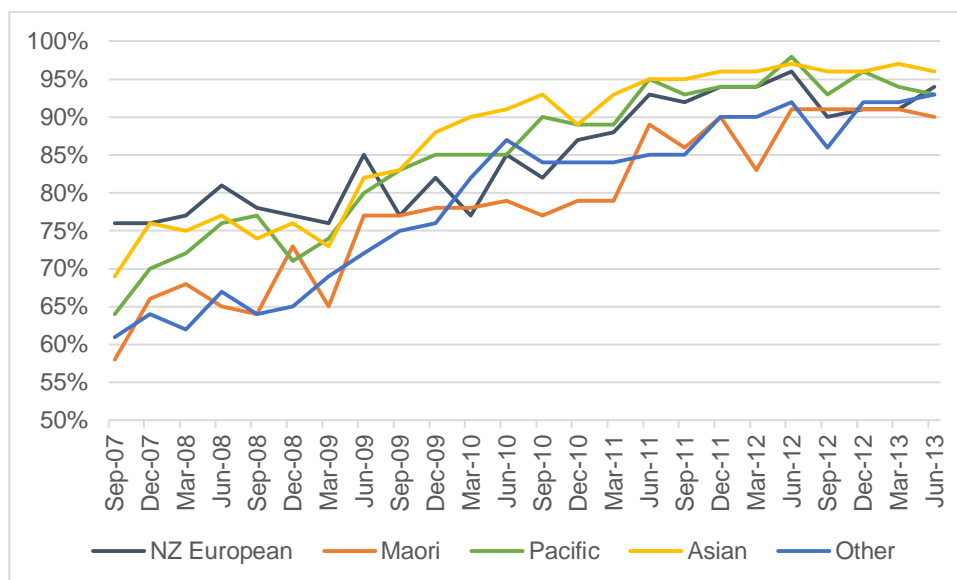
5.4.2.3 Immunisation inequities between Māori and non-Māori children within Auckland DHB

In September 2007, the level of immunisation inequity between Māori and non-Māori children within Auckland DHB was 9 per cent (with levels of immunisation coverage at 58 per cent for Māori and 67 per cent for non-Māori) (refer to Figure 12 on the following page). While immunisation coverage for Māori children increased over time, the level of immunisation coverage for non-Māori children also increased and the level of inequity did not reduce until June 2011. When the health target ended in June 2012, the level of immunisation inequity had reduced to 5 per cent (at 91 per cent for Māori children and 96 per cent for non-Māori children).

Figure 12 Auckland DHB Level of immunisation inequity between Māori and non-Māori children at two years of age
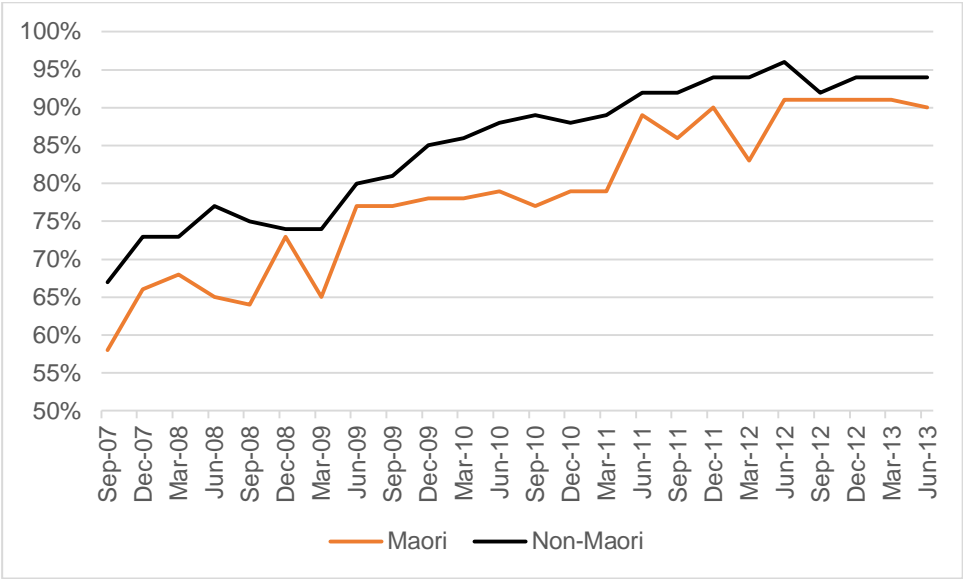
5.4.2.4 Summary of Auckland DHB

- Achieved the immunisation health target
- Increased immunisation coverage at two years of age by 27 per cent (from 68 per cent to 95 per cent)
- Eliminated immunisation inequities for Pacific and Asian children and reduced inequities for Māori children and children of other ethnicities
- Reduced immunisation inequities between Māori and non-Māori children

5.4.3 Case study three: Waikato District Health Board

Waikato DHB is a large DHB located in the North Island of New Zealand. The DHB serves a population of around 371,540 people and covers a widespread geographical area that includes the city of Hamilton, the towns of Thames, Huntly, Cambridge, Te Awamutu, Matamata, Morrinsville, Ngaruawahia, Te Kuiti, Tokoroa and Taumaranui and many small rural communities (a map of New Zealand showing DHB boundaries can be found in Appendix 3).

Although the level of deprivation across the population in Waikato DHB is lower than the national average, this regional average hides variation in deprivation within the population. There are significant deprivation issues for many families and communities within the region in regards to low income, unemployment and poor housing. The following table provides a break-

down of ethnicity for children turning two within Waikato DHB during the last quarter of the health target experience.

Table 11 Waikato DHB: Children turning two during the quarter ending June 2012

Ethnicity	Number of children	Proportion
New Zealand European	603	44.2%
Māori	488	35.8%
Pacific	51	3.7%
Asian	97	7.1%
Other ethnic group	124	9.1%
Total	1,363	99.9%

Source of data: NIR immunisation coverage at milestone age (24 months of age) for the reporting period ending June 2012

The local health system within Waikato DHB has a number of secondary and primary care providers spread over a wide geographical area.

Table 12 Waikato DHB: Structure of the local health system

District Health Board	Waikato DHB
Public health services	Public health services are provided through a Population Health team that is part of *Health Waikato*, the provider arm of the DHB
Secondary care services	*Waikato Hospital* in Hamilton is the main regional hospital. There is a secondary hospital located in Thames and smaller rural community hospitals in Te Kuiti, Tokoroa and Taumaranui
Primary Health	*Midlands Health Network* has a population of around 500,000 patients enrolled with 97 general practices across Tairawhiti DHB,

Organisations	Lakes DHB, Taranaki DHB and Waikato DHB regions. Fifty-five of these general practices are located within the boundaries of Waikato DHB making it the largest PHO in the region
	Te Korowai Hauora o Hauraki is a Māori PHO based in Thames on the northern border of Waikato DHB. The PHO provides a range of health and social services to their enrolled population of 76,000 people and comprises 10 primary health care centres operating 15 general practices across a large geographic area of small rural communities
	Toi te Ora and *Raukura Hauora o Tainui* were two Māori PHOs within the Waikato DHB region that merged with the National Hauora Coalition in 2011. Within the Waikato DHB region, there are 11 general practices and medical centres that provide Māori led primary health care services as part of the National Hauora Coalition

Source of data: http://www.waikatodhb.govt.nz/, https://www.pinnacle.co.nz/, http://www.haurakipho.org.nz and http://www.hauoracoalition.maori.nz/.

5.4.3.1 Immunisation coverage within Waikato DHB

Immunisation coverage within Waikato DHB was comparable to the national average when the health target was introduced (68 per cent compared to 67 per cent in September 2007) (refer to Figure 13 on the following page). In the first two years of the health target experience, Waikato DHB had made small improvements to immunisation coverage at two years of age. However, the DHB steadily improved rates of immunisation coverage from December 2009 to March 2011, increasing the rate of coverage to 91 per cent. After this period, progress towards the health target stagnated and Waikato DHB ended the health target experience on 92 per cent coverage in June 2012.

There was a drop in performance after the health target ended, with immunisation coverage at two years of age decreasing to 87 per cent. This was the biggest drop in immunisation coverage after the health target ended across the four case study sites.

Figure 13 Waikato DHB immunisation coverage at two years of age
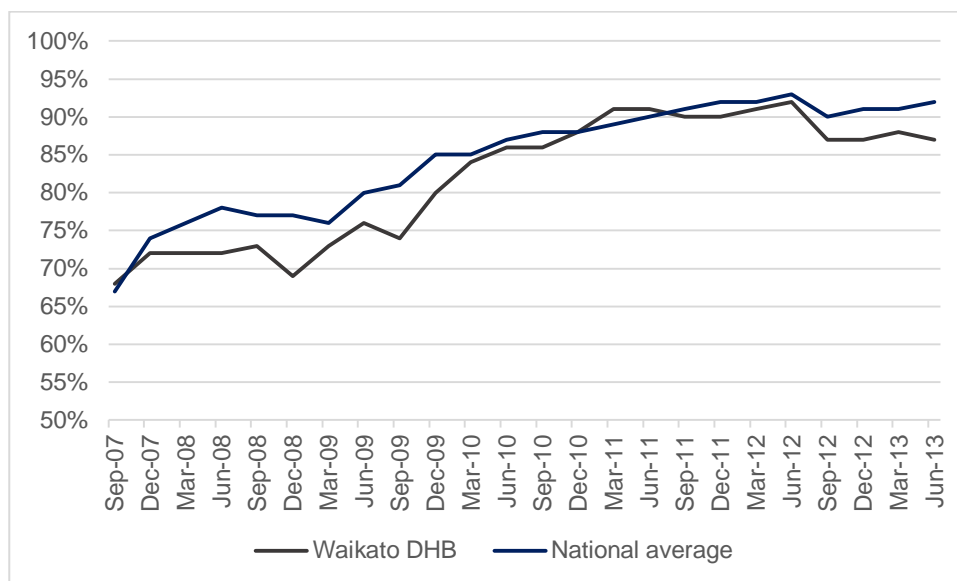
5.4.3.2 Immunisation coverage by ethnicity within Waikato DHB

When the health target was introduced in 2007, there were significant immunisation inequities within Waikato DHB (refer to Figure 14 on the following page). New Zealand European children and Asian had the highest level of immunisation coverage (at 75 per cent), almost 20 per cent higher than the rates of immunisation coverage for Pacific children (at 58 per cent) and Māori children (who had the lowest rates of coverage at 56 per cent).

Although rates of immunisation coverage for Pacific children, and children within the other ethnicity category, started to rise after December 2008, it took another year before rates of immunisation coverage for Māori children began to improve. In September 2012, three years into the health target experience, immunisation coverage for Māori children (at 87 per cent) exceeded the level of coverage for New Zealand European children (which was 85 per cent during this quarter). From this quarter onwards, rates of immunisation coverage for Māori children were comparable to those for New Zealand European children and in June 2012 the rate of immunisation coverage for Māori children was 92 per cent while the rate of immunisation coverage for New Zealand European children was measured at 91 per cent. Asian children and Pacific children consistently had the highest rates of immunisation coverage within the region and were measured at 97 per cent and 96 per cent respectively when the heath target ended in June 2012.

Figure 14 Waikato DHB immunisation coverage at two years of age by ethnicity
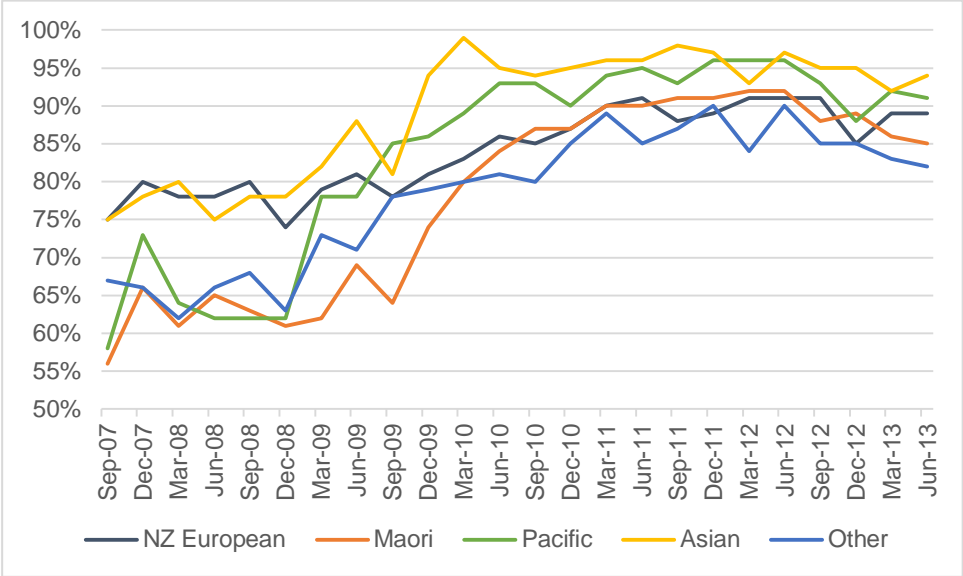
5.4.3.3 Immunisation inequities between Māori and non-Māori children within Waikato DHB

Waikato DHB had significant immunisation inequities between Māori and non-Māori children before the immunisation health target (refer to Figure 15 on the following page). In September 2007, there was a 17 per cent difference in immunisation coverage between Māori children (at 56 per cent) and non-Māori children (at 73 per cent). Although rates of immunisation coverage for Māori children improved during the first two years of the health target experience, rates of immunisation coverage for non-Māori children also improved, maintaining the level of immunisation inequity.

However, in the third year of the health target (from December 2009 to December 2010) there was a huge increase in immunisation coverage for Māori children (from 74 per cent to 87 per cent). This improvement raised the rate of immunisation coverage for Māori children to a level that was comparable with non-Māori children in Waikato DHB, effectively eliminating the immunisation inequity between them. And in 2011, the rate of immunisation coverage for Māori children exceeded the rate of immunisation coverage for non-Māori children.

When the health target ended in June 2011, immunisation coverage for Māori children and non-Māori children was the same at 92 per cent. However, the rate of immunisation coverage for Māori children decreased after the health target ended and in June 2013 was measured at 85 per cent, 4 per cent lower than the rate of immunisation coverage for non-Māori children at 89 per cent.

Figure 15 Waikato DHB Level of immunisation inequity between Māori and non-Māori children at two years of age
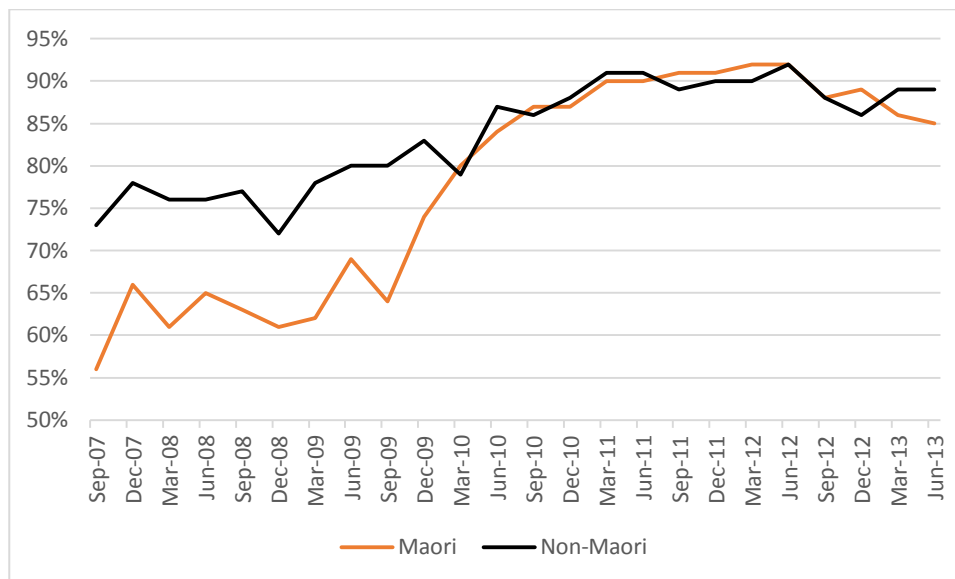
5.4.3.4 Summary of Waikato DHB

- Did not achieve the immunisation health target
- Increased immunisation coverage at two years of age by 24 per cent (from 68 per cent to 92 per cent)
- Eliminated immunisation inequities for Pacific children and reduced inequities for Māori children and children of other ethnicities
- Eliminated immunisation inequities between Māori and non-Māori children by the end of the health target but did not maintain this after the health target ended

5.4.4 Case study site four: Bay of Plenty District Health Board

Bay of Plenty DHB is a medium sized DHB located in the North Island of New Zealand. The DHB serves a population of 214,910 people and covers a diverse range of urban and rural communities including the city of Tauranga and urban centres of Katikati, Te Puke, Whakatane, Kawerau and Opotiki (a map of New Zealand showing DHB boundaries can be found in Appendix 3).

Three quarters of the population live in the Western Bay of Plenty with nearly half of this population living in the main urban city of Tauranga. One quarter of the population live in the Eastern Bay of Plenty which consists of smaller rural communities. The region can be divided into two distinct areas, each with their own local contextual issues.

The Western Bay of Plenty is characterised by a larger, more urban population, with a higher level of socioeconomic status when compared with the Eastern Bay of Plenty. The Eastern Bay of Plenty communities are smaller and much more widely dispersed. The population is also significantly younger than the national average and there are significant challenges with poverty, unemployment and access to services.

Bay of Plenty DHB has a large Māori population of around 50,000 people with half living in the Western Bay of Plenty and the other half living in the Eastern Bay of Plenty. There are significant social and economic challenges for Māori communities in the region. Compared to Māori living elsewhere in New Zealand, Māori families living in the Bay of Plenty have lower incomes, higher rates of unemployment and experience greater levels of household crowding.

The following table provides a breakdown of ethnicity for children turning two within Bay of Plenty DHB during the final quarter of the health target experience.

Table 13 Bay of Plenty DHB: Children turning two during the quarter ending June 2012

Ethnicity	Number of children	Proportion
New Zealand European	280	39.6%
Māori	300	42.4%
Pacific	18	2.5%
Asian	36	5.1%
Other ethnic group	73	10.3%
Total	707	99.9%

Source of data: NIR immunisation coverage at milestone age (24 months of age) for the reporting period ending June 2012.

The local health system within Bay of Plenty DHB is divided into two distinct areas, with one PHO covering the Western Bay of Plenty and one PHO covering the Eastern Bay of Plenty.

Table 14 Bay of Plenty DHB: Structure of the local health system

District Health Board	Bay of Plenty DHB
Public health services	*Toi te Ora* is located in Tauranga and provides public health services for both the Bay of Plenty DHB and Lakes DHB regions
Secondary care services	The main hospital within the region is *Tauranga Hospital*. There are also smaller hospitals located in Whakatane and Opotiki
Primary Health Organisations	*Western Bay of Plenty PHO* was formed in October 2003 through the merging of a number of smaller PHOs in the area. It has a population of 143,700 people enrolled with 27 general practices. It covers a number of rural communities, towns and the city of Tauranga
	Eastern Bay Primary Health Alliance was formed in August 2010 through the merging of the three PHOs that previously existed in the Eastern Bay of Plenty area. The PHO has 46,500 people enrolled across 11 general practices that cover a large geographic area. This includes the towns of Whakatane, Kawerau, Opotiki and Ohope and many smaller rural communities. Around 60 per cent of their enrolled population identify as Māori
	Nga Mataapuna Oranga is a small Māori PHO with four general practices in Tauranga and additional health and social service providers across the Bay of Plenty region

Source of data: http://www.bopdhb.govt.nz, http://www.ttophs.govt.nz/, http://www.wboppho.org.nz/, http://www.ebpha.org.nz/ and http://www.nmopho.org.nz/.

5.4.4.1 Immunisation coverage within Bay of Plenty DHB

Due to data issues with the NIR, there was inconsistent data on immunisation coverage at two years of age for the first quarter of the health target experience. However, for the second

quarter ending in December 2007, immunisation coverage at two years of age was measured at 64 per cent within Bay of Plenty DHB (refer to Figure 16 below). This was 10 per cent lower than the national average of 74 per cent coverage for that period.

Immunisation coverage at two years of age did not improve during the first year of the health target experience and although the rate of immunisation coverage did increase during the second and third year of the health target experience, performance towards the health target was well below the national average.

This changed after September 2010, as immunisation coverage increased dramatically from 74 per cent to 89 per cent for the quarter ending at September 2011. When the health target ended in June 2012, immunisation coverage at two years of age was measured at 91 per cent within Bay of Plenty DHB. This was 2 per cent lower than the national average of 93 per cent and 4 per cent lower than the health target.

There was a decrease in the level of immunisation coverage within Bay of Plenty DHB after the health target ended, dropping to 88 per cent in December 2012 and remaining at this level for the following two quarters.

**Figure 16 Bay of Plenty DHB immunisation coverage at two years of age**
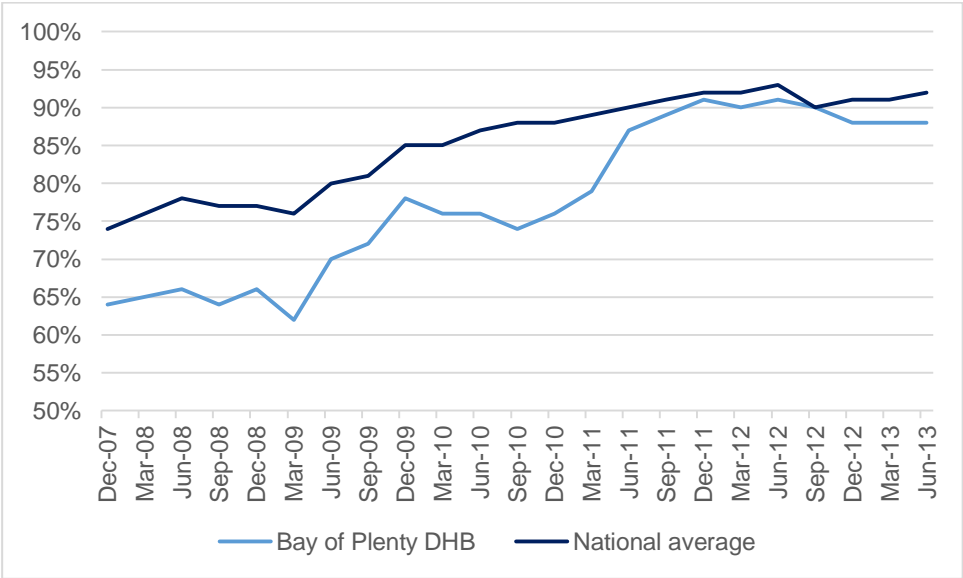
5.4.4.2 Immunisation coverage by ethnicity within Bay of Plenty DHB

When the health target was introduced in September 2007, there were significant immunisation inequities for different ethnic groups within Bay of Plenty DHB (refer to Figure 17 on the following page). Asian children had the highest rates of immunisation coverage at 78 per cent.

This was higher than the rates of immunisation coverage for Pacific children (at 67 per cent) and New Zealand European children (at 64 per cent) and much higher than immunisation coverage rates for Māori children (at 50 per cent) and children of other ethnicities (at 49 per cent).

Levels of immunisation coverage for all ethnic groups remained low during the first year of the health target experience. However, immunisation coverage improved for all ethnicities, except Asian children, for the period ending June 2009 and from this quarter onwards rates of immunisation coverage continued to improve.

The level of inequity between different ethnic groups in the region reduced and when the health target ended in June 2012, Asian children had the highest rate of immunisation coverage (at 100 per cent), followed by Pacific children (at 94 per cent). Immunisation coverage for New Zealand European children and Māori children were comparable at 90 per cent. Immunisation coverage for children of other ethnicities was measured at 88 per cent.

Figure 17 Bay of Plenty DHB immunisation coverage at two years of age by ethnicity
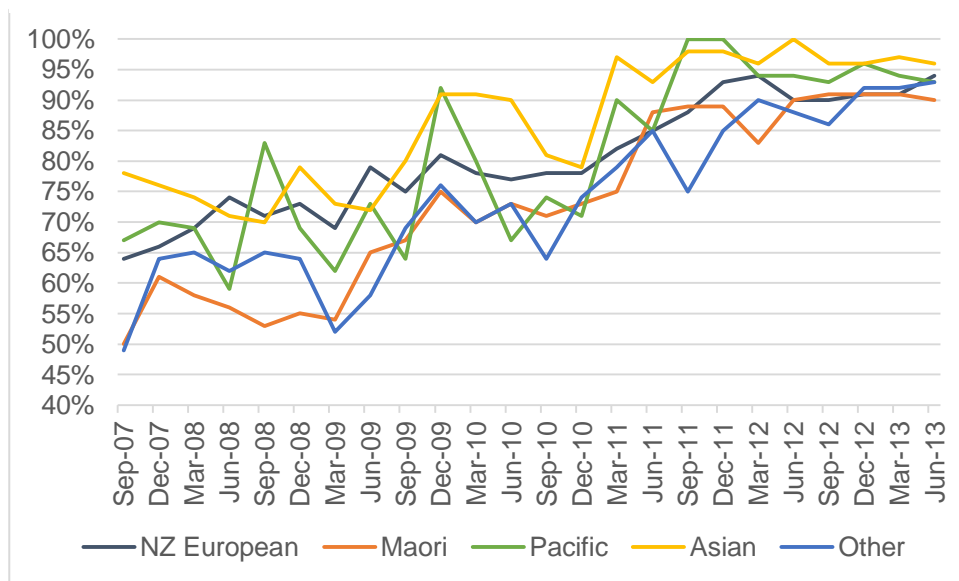
There were relatively small numbers of Asian children and children of other ethnicities turning two each quarter, and even smaller numbers of Pacific children, and this contributed to the variation in levels of immunisation coverage for these ethnic groups from quarter to quarter (refer to Table 13 for a breakdown of ethnicity for children turning two within Bay of Plenty DHB).

5.4.4.3 Immunisation inequities between Māori and non-Māori children within Bay of Plenty DHB

Before the introduction of the immunisation health target, Māori children within Bay of Plenty DHB had one of the lowest rates of immunisation coverage in New Zealand at 50 per cent (refer to Figure 18 below). This was 14 per cent lower than the rate of immunisation coverage for non-Māori children within the region (at 64 per cent). This level of immunisation inequity between Māori and non-Māori children persisted until the period ending at June 2009 when the level of inequity reduced to 10 per cent (65 per cent for Māori children compared to 75 per cent for non-Māori children).

Between June 2009 and June 2011, the level of immunisation inequity continued to reduce and in September 2011 the rate for immunisation coverage for Māori children increased to 89 per cent, surpassing the rate of immunisation coverage for non-Māori children. Although there was a drop in immunisation coverage during the quarter ending in March 2012, when the health target ended in June 2012, the difference in immunisation coverage between Māori children and non-Māori children was only one per cent (90 per cent immunisation coverage for Māori children compared to 91 per cent for non-Māori children). Comparable rates of immunisation coverage for Māori and non-Māori children were maintained during the year after the health target ended.

Figure 18 Bay of Plenty DHB Level of immunisation inequity between Māori and non-Māori children at two years of age
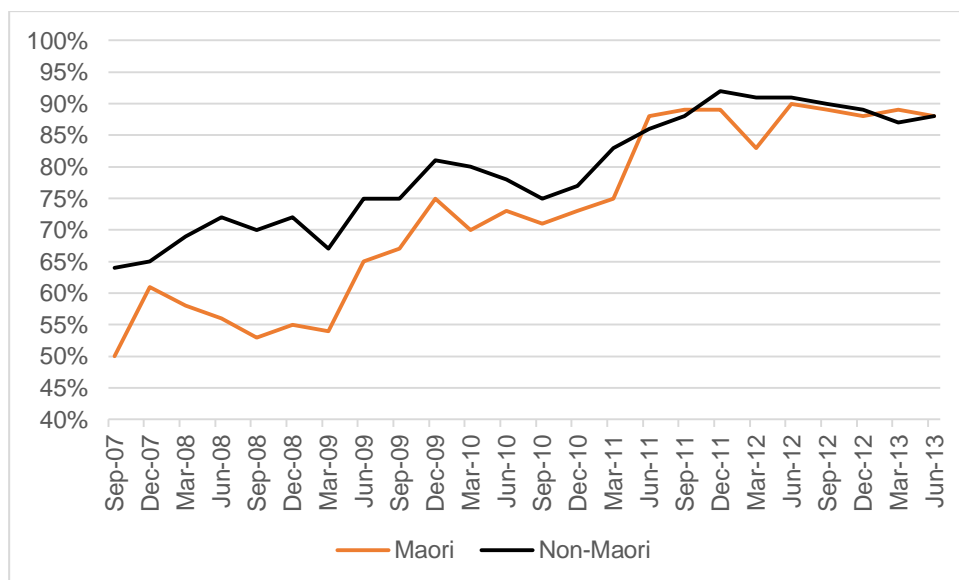
5.4.4.4 Summary of Bay of Plenty DHB

- Did not achieve the immunsiation health target
- Increased immunsiation coverage at two years of age by 27 per cent (from 64 per cent to 91 per cent)
- Reduced immunisation inequities between different ethnicities
- Eliminated immunsiation inequities between Māori and non-Māori children

5.5 Chapter summary

This chapter has presented quantitative performance data that was used by the Ministry of Health to measure and monitor progress towards the immunisation health target. At a national level, it has shown that immunisation coverage at two years of age increased over the course of the health target experience. It also showed that the level of immunisation coverage increased within all ethnic groups and immunisation inequities between these ethnic groups reduced. The level of inequity in immunisation coverage between Māori and non-Māori children in New Zealand reduced significantly and when the health target ended this immunisation inequity had reduced to one per cent.

At a local level, this chapter provided a case report on each of the four DHBs that were selected as case study sites for this research. These case reports included information on the local context of the DHB and performance data on the DHBs progress towards the immunisation health target. This performance data showed that immunisation coverage at two years of age increased within all of the case study DHBs and that variation between the DHBs reduced over time. Levels of inequity between different ethnic groups also reduced over time and in some cases these immunisation inequities were eliminated. Immunisation inequities between Māori and non-Māori children were eliminated in Hawke's Bay DHB and Bay of Plenty and they were significantly reduced within Auckland DHB and Waikato DHB.

The next chapter of this thesis (Chapter Six: Research Findings) presents the research findings of this study and examines what happened within the four case study sites. What did they do to improve immunisation coverage and address immunisation inequities at the local level?

Chapter Six: Research Findings

6.1 Overview of this chapter

This chapter presents the research findings for this study. It explores how the immunisation health target was implemented within the four case study DHBs. The research findings are organised into seven sections:

- The immunisation health target as a policy objective
- Accountability mechanisms for the health target
- Focused attention on immunisation
- Development of immunisation networks
- Improving systems and processes for immunisation
- After the health target ended
- Dysfunctional consequences of the health target

6.2 The immunisation health target as a policy objective

Understanding how the immunisation health target was implemented at the local level required the researcher to understand how key informants perceived the health target as a policy objective. There were two aspects to this perception: the first aspect focused on the legitimacy of the immunisation health target and the second aspect focused on organisational ownership for performance towards the health target.

6.2.1 Legitimacy of the immunisation health target

Key informants talked about the health target as being more than a performance indicator. For many of the key informants, progress towards the health target increased the number of children who were fully immunised and therefore protected from preventable diseases. This framed the health target as a child health issue and strengthened its legitimacy as a policy objective. It aligned the health target with strong underlying values that many health professionals hold about improving child health outcomes.

> *While that's a number and a target for the Ministry, for us it represents kids that are fully*
> *protected. So we constantly strive to remind ourselves that it's not just a challenge about*

numbers, it's a challenge about kids, and I think that's what drives us all, we've all got that common goal to keep our kids out of hospital (Immunisation Coordinator, Waikato DHB).

The health target was also framed as a population health issue by key informants. High levels of immunisation coverage provide protection for communities from the transmission of diseases and therefore improves population health outcomes. Key informants stated that the goal of the health target was to improve immunisation coverage to a level that would prevent the spread of these diseases within their communities.

Everybody actually thinks that the ultimate goal of this is to stop these diseases from spreading in our community (Medical Officer of Health, Waikato DHB).

I don't think it's important just because [the Minister of Health] is interested in it, I think it's important so we don't get measles outbreaks and pertussis outbreaks and we've seen those coming and going, because our rates weren't that good (Immunisation Coordinator A, Auckland DHB).

It is also important to note that one of the reasons that the health target was viewed as a legitimate policy objective was that rates of childhood immunisation coverage are often used as a proxy measure of engagement with primary health care. The National Immunisation Schedule requires a child to have regular contact with their primary care provider and these visits can be used as an opportunity to engage with parents about their child's health and development. If a child is fully immunised at two years of age, this indicates that they have had regular contact with their primary care provider.

Actually at the beginning I was sceptical but I think it was a very clever target not only because immunisation is a good end in itself because it is protective for the population but it also required that families had regular and ongoing contact with primary health care (Planning and Funding, Auckland DHB).

When the health target was introduced many of the key informants viewed it as an aspirational goal. They considered it a legitimate policy objective but they believed that it would be impossible to actually achieve it.

I don't know if 95 per cent is ever achievable, but I don't think they should abolish it because it should still be there because that's what we are aspiring towards, so I think it's appropriate to have it (Immunisation Coordinator A, Auckland DHB).

As some of the case study DHBs began to improve their immunisation coverage and achieve the incremental targets set for each year, this perception of the health target as an aspirational goal shifted to the health target being seen as an achievable policy objective.

> *Well I suppose I thought it was so bloody high, so unattainable, that I wasn't bothered with it, you know if we got a few more vaccinated it would be good. And suddenly we realised we were pretty good at it and suddenly when our rates got to 90 per cent we had a celebration and then we got to 95 per cent and we were over the moon (Immunisation Promoter, Hawke's Bay DHB).*

6.2.2 Organisational ownership of the health target

The first challenge that the case study DHBs faced in the implementation process was ensuring that their local PHOs, immunisation outreach providers and primary care providers recognised and accepted their roles in improving immunisation coverage within their region. These local organisations needed to take ownership of the health target before they were willing to make the necessary changes to their systems and processes for immunisation.

In Hawke's Bay DHB, all of the key organisations involved in immunisation had already identified immunisation as a local priority and this facilitated taking ownership of the health target. Auckland DHB and Waikato DHB responded to the introduction of the heath target relatively quickly and mobilised the key organisations that needed to be involved in the implementation process. In contrast, Bay of Plenty DHB was unable to get their local PHOs and primary care providers to take ownership of the health target. This lack of ownership was reflected in their poor performance towards the health target as the DHB struggled to match the progress of other DHBs around the country. However, Bay of Plenty was able to overcome a lack of ownership within their local PHOs and primary care providers. This experience will be explored, alongside the experience of the other case study DHBs, to highlight the importance of taking ownership of the health target.

Hawke's Bay DHB had already identified immunisation as a local priority before the health target was introduced. They had an immunisation strategy in place before the health target and a dedicated immunisation coordinator for the region. This gave them an advantage over other DHBs during the first couple of years of the health target experience as there was a strong sense of ownership of the health target at a DHB level, PHO level and within the primary care providers in their region.

I think the practices have really bought into the whole coverage target … when you get that focus and intensity and emphasis on delivery you get the change happening, you get the priority, so I do think that within the PHO and practices it's been more of a serious issue (Medical Officer of Health, Hawke's Bay DHB).

In contrast, Bay of Plenty DHB struggled to get their PHOs and primary care providers to recognise and accept their roles in achieving the health target.

In the beginning, the PHOs, everyone really, viewed the target as the DHBs target. So there was no ownership, they had no ownership over the target at that point, particularly general practice, they were just like 'who cares' (Planning and Funding, Bay of Plenty DHB).

This was a significant challenge for the Bay of Plenty DHB Planning and Funding team as it limited their ability to make the necessary changes to their local systems and process for immunisation to improve immunisation coverage in their region. By June 2010, almost three years into the health target experience, Bay of Plenty DHB continued to experience low rates of coverage (76 per cent compared to the national average of 87 per cent).

To overcome this challenge the Bay of Plenty DHB Planning and Funding team organised a number of workshops in the middle of 2010. These workshops drew together all of the local organisations involved in immunisation. A local immunisation strategy was developed at these workshops and this collaborative process enabled the organisations involved to recognise their role in improving immunisation coverage in the region. They could then take organisation ownership for their performance towards the health target.

I think the workshops helped because everyone was putting in their ideas and they all brought into the structure … they started to take ownership of what we were trying to achieve (Planning and Funding, Bay of Plenty DHB).

Although Hawke's Bay DHB and Bay of Plenty DHB started the health target experience from very different positions of ownership, their experiences highlight how taking ownership of the health target was an essential first step in improving immunisation coverage within their districts.

6.3 Accountability mechanisms for the health target

Improving immunisation coverage had been an ongoing policy objective within the New Zealand health system. However, there had been very little accountability for implementing this policy objective at any level within the health system. Childhood immunisations were viewed as the responsibility of primary care providers and low rates of immunisation coverage and persistent immunisation inequities were accepted as inevitable by many health professionals involved in providing immunisation services.

The introduction of the immunisation health target shifted responsibility for improving immunisation coverage from the individual level of primary care providers to the regional level of the DHBs. This shift in accountability was an essential factor that contributed to the success of the health target. It required the DHBs to take a leading role in improving local systems and processes for immunisation. It also made the DHB responsible for holding the PHOs and primary care providers in their region accountable for achieving the immunisation health target. Unlike previous policy attempts to improve immunisation coverage and address inequities, the immunisation health target established a hierarchy of accountability mechanisms for immunisation coverage at two years of age. This hierarchy of accountability extended from the national level down to the local level through the DHBs, PHOs and then the primary care providers.

6.3.1 Measuring and monitoring performance towards the health target

The Ministry of Health measured and monitored DHB performance towards the immunisation health targets on a quarterly basis (every three months) using data from the NIR. The NIR holds the immunisation records for every child in New Zealand and the Ministry of Health utilised this data to measure the percentage of children turning two during that quarter who were fully immunised according to the New Zealand Immunisation Schedule. This measurement was calculated at a national level and at a DHB level and was monitored each quarter to track each DHBs performance towards the immunisation health target.

Each quarter, the Ministry of Health publically published all of the DHBs performance towards each of the health targets on the Ministry of Health website and within national and local newspapers. DHBs were ranked in league tables that compared their performance towards each health target relative to one another. The Minister of Health stated that this would increase electoral accountability for the health targets as the public could assess how their DHB was performing compared to other DHBs around the country. This public 'naming and shaming' was a strong motivator for each of the case study DHBs to improve immunisation coverage in

their region. They were highly aware of their DHBs ranking in comparison to other DHBs around the country.

> *And I think having the health targets and the way the Minister publishes them now, that's really focused the DHB too (PHO Manager B, Bay of Plenty DHB).*

CEOs of DHBs that were performing poorly received a phone call from the Minister of Health regarding their performance and were required to show the Ministry of Health how they would improve their performance during the next quarter.

> *I think that having the Minister sitting behind it is really critical, because if you know that there isn't anything particular happening around a particular issue, he will actually go straight to the Chief Executive and have a conversation (DHB Relationships Manager, Ministry of Health).*

All of the key informants stated that they knew the health target was being closely monitored within the Ministry of Health, and by the Minister of Health, and that this focused their attention on improving immunisation coverage for two year olds. This accountability for the health target put pressure on the DHBs to ensure that they were meeting the health target each quarter, or at the very least, continuously improving their rate of immunisation coverage.

> *The target is everything. We know that there is someone at the Ministry setting the target and watching it closely …. So we're all very conscious that it's about achieving the target (Immunisation coordinator, Bay of Plenty DHB).*

Key informants who were located at a DHB level also stated that the health target was a core focus of their work within the Planning and Funding team. As long as the Ministry of Health continued to hold them accountable for the health target, they would continue to focus on addressing it. This highlights how important the monitoring process for the health target was in focusing attention on immunisation.

> *The Ministry has said they are looking at it, and ultimately that is what it comes back to, if somebody is looking over my shoulder, I'll keep the focus on what I have to keep it on (Planning and funding, Auckland DHB).*

6.3.2 The use of incremental targets

The immunisation health target used incremental targets each year to steadily improve the expected level of performance to 95 per cent by July 2012. These incremental targets were set at:

- 80 per cent of two year olds to be fully immunised by July 2009
- 85 per cent of two year olds to be fully immunised by July 2010
- 90 per cent of two year olds to be fully immunised by July 2011
- 95 per cent of two year olds to be fully immunised by July 2012

Local incremental targets were utilised within Bay of Plenty DHB until the final year of the health target in order to give them an achievable goal to work towards. Bay of Plenty DHB negotiated these local immunisation health targets with the Ministry of Health in order to set a health target for their district that was viewed as an achievable increase in immunisation coverage. Although they were not meeting the national health target, they continued to improve immunisation coverage each quarter and remained motivated rather than discouraged that the health target was unattainable.

> *So that target of 85 per cent last year was our own DHB target …. we exceeded our local target, missed the national target, but at least made a good contribution to achieving the national target, instead of dragging around at 75 or 70 per cent like we did for a long time, instead we were up at 87 per cent (Planning and Funding, Bay of Plenty DHB).*

6.3.3 Hierarchy of accountability for the health target

When the immunisation health target was introduced in 2007, an Immunisation Target Champion was appointed within the Ministry of Health. The Target Champion was responsible for the immunisation health target at a national level, provided national leadership on the immunisation health target and supported DHBs throughout the implementation process. The Target Champion within the Ministry of Health required each DHB to identify their own immunisation champion who was accountable for the health target within their DHB.

The immunisation champions within the case study DHBs were based within the DHB Planning and Funding or Population Health teams. Hawke's Bay DHB and Waikato DHB each had a Medical Officer of Health who had already been acting as an informal immunisation champion within their respective DHBs. These individuals had identified immunisation as a local priority and developed local immunisation strategies that outlined how their DHB could improve

immunisation coverage before the health target was introduced. The health target focused attention on immunisation and gave them organisational support within the DHB to implement these immunisation strategies.

> *I think there's been a lot of talk about immunisation over the years in New Zealand. It's been really good that the rates are now genuinely coming up and if the health target has been the kick start for that, then that's been good. I think we've known for some time what we needed to do to improve rates, so having that focus has helped (Medical Officer of Health, Hawke's Bay DHB).*

Auckland DHB and Bay of Plenty DHB needed to identify an immunisation champion within their respective organisations. This took time and required commitment from individuals who may not have been directly involved in the operational side of immunisation within their region. Individuals within the Planning and Funding teams at these DHBs took on this responsibility. They recognised that the health target needed to be pushed from within the DHB as they would be held accountable for not achieving the health target.

> *While my role is, theoretically I'm not supposed to get into the operational detail, but I have. So the operations meeting, because we don't have an identified person within the DHB, I've just taken it on because it's needed to be pushed, because otherwise I know we would get beaten up with a stick for not making the progress we should (Planning and Funding, Auckland DHB).*

The immunisation champions became the driving force behind the implementation of the immunisation health target within each of the case study DHBs. They identified key individuals across each level of the local health system who needed to be involved in improving local systems and processes for immunisation. This created a local hierarchy of immunisation champions who were accountable for the health target within their respective organisations. It also improved communication between the various organisations involved in immunisation at the local level as there was an individual in each organisation who was responsible for the health target.

> *Identifying the target champion was a real core feature that had to happen, even though it was a scary thing initially. And actually ensuring that there is an equivalent person in each DHB and hopefully within each PHO as well, so giving a sort of hierarchy of champions nationally, district level and locally, and that actually bred success (Immunisation target champion, Ministry of Health).*

6.3.4 Accountability mechanisms at a DHB level

To achieve the health target, DHBs needed to hold their local PHOs and primary care providers accountable for improving immunisation coverage for their enrolled populations. Before the introduction of the health target, there was very little accountability for immunisation coverage at a PHO level.

> *It's also about accountability. The PHOs up until then didn't have an awful lot of accountability, there was a lot of looseness around that, oh yeah we're not achieving it but kei te pae [it's okay]. There is a lot more focus now (PHO Manager B, Bay of Plenty DHB).*

DHBs placed a stronger emphasis on the existing contracts that they had with their PHOs. PHOs were expected to deliver on their contractual obligations for immunisation services and to improve immunisation coverage within their populations. This managerial pressure from the DHBs as funders of health services demanded stronger accountability for immunisation within the PHOs.

> *We've always had relationships with other providers. I think probably we've been stronger about saying you have to deliver, if you have a contract with us this is what we expect you to deliver and being really much more focused (Planning and funding, Waikato DHB).*

The previous lack of accountability at a PHO level meant that primary care providers had not been held accountable for their role in improving immunisation coverage and addressing inequities within their enrolled populations. This changed during the health target experience, as PHOs took ownership of the health target and began to exert managerial pressure to hold their primary care providers accountable for immunisation coverage.

> *To be honest the core of your immunisation has to be done in your general practice, which is what we've made the focus, and they didn't care. They didn't, it was like something else they had to do in terms of their role, so it wasn't like a focus … what we needed to do is instead of it being the DHBs target, it became the PHOs target to get that message out. So we had to make it clear that while we could put certain things in place, the actual achievement of it was out in primary care (Planning and Funding, Bay of Plenty DHB).*

6.3.5 Accountability mechanisms at a PHO level

A number of PHOs from the case study DHBs used NIR data reports to generate league tables for their practices each month. This ranked and compared their practices against one another in

terms of their performance towards the health target. In the same way that publically published league tables were used at a national level to hold DHBs accountable for the health target, PHOs who did this were able to hold their practices accountable for the health target. These league tables recognised the work of high performing practices and were used as a tool to motivate poor performing practices to lift their performance. They also introduced an element of competition between primary care providers within these PHOs as they competed to have the highest level of immunisation coverage at two years of age within their PHO.

> *Also with the way we publish on a monthly basis each of the practices and their achievement compared to each other, they can see where they sit against the others, that really focused them (PHO Manager B, Bay of Plenty DHB).*

6.4 Focused attention on immunisation

The health target elevated immunisation as a local priority and required DHBs to ensure that immunisation was considered a priority within their local PHOs and primary care providers. This was very different to previous policy attempts to improve immunisation coverage which had only identified immunisation as one of many priorities. The health target focused attention on immunisation in a way that raised it above other local health issues to become a high priority on the local policy agenda.

> *It became a priority and we had competing priorities … but we were able to elevate immunisation as one of the key priorities, one of the top priorities, and I think that helped (Planning and Funding, Bay of Plenty DHB).*

All of the key informants stated that the health target had focused attention on immunisation as both a local priority and as a priority within their organisations. Throughout the interviews, key informants returned to this theme of focused attention to highlight how the health target had stimulated change to improve immunisation coverage in their region.

> *The fact that there was a target in itself was a really important thing, because without that, without that single minded focus here we wouldn't be able to get that traction behind it and I guess that was at a DHB level, but also at a PHO and practice level (Planning and Funding, Auckland DHB).*

6.4.1 Focused attention of DHBs

Within the case study DHBs, the health target focused attention at a senior management level within the organisation. Many of the key informants at a DHB level talked about how the wider set of health targets were closely monitored by the DHB management team. For the case study DHBs who were high performers during the health target experience, this focused attention by the DHB management team involved increased attention on immunisation and the DHBs progress towards the health target during Planning and Funding team meetings. It also involved a higher level of interest from the DHB management team around what was happening to improve immunisation coverage in their region.

> *What it's done is focus the attention of the rest of the organisation on immunisation. We had already identified that our low immunisation rates were an issue, we had identified some plans, we had a steering group, we were doing a lot of that but it wasn't really getting a lot of focus from the rest of the organisation, so when it became a target suddenly that meant that the organisation was interested to see what we were doing especially once we started to get some good results coming through (Medical Officer of Health, Hawke's Bay DHB).*

For Bay of Plenty DHB, the health target focused attention on immunisation as the DHB management team expected them to not only meet the health target, but to be a high performer when compared to other DHBs around the country.

> *It was such a huge focus and the board, our board, were very strong that we needed to meet the target or be in the top five DHBs. We're nowhere near the top five, but we exceeded the target, so that was good (Planning and Funding, Bay of Plenty DHB).*

This expectation of success at a DHB level required focused attention on immunisation within the local PHOs and primary care providers. Individuals responsible for the immunisation health target within the DHB Planning and Funding teams played a significant role in focusing attention on the health target within their local PHOs.

> *We made everyone else focus as well. So the board was focusing on it, the exec team was focusing on it, us focusing on it and all the providers who have anything to do with immunisation. We got them together, all the stakeholders and we used the immunisation advisory group and the health target meetings to do that. So we said this is how important it is, this is how we're tracking, what we are going to do to increase it? (Planning and Funding, Bay of Plenty DHB).*

6.4.2 Focused attention of PHOs

DHBs contract PHOs to provide health services to their enrolled populations, including immunisation services within their primary care providers and in some cases outreach immunisation services as well. The case study DHBs became more focused on holding their PHOs accountable for delivering on these contracts and this focused attention on improving immunisation coverage as it was a contractual obligation that was being closely monitored.

> *I think probably we've been stronger about saying you have to deliver, if you have a contract with us this is what we expect you to deliver and being really much more focused, particularly on the outreach providers, that two or three kids is not going to make a difference to Māori health. We wanted more energy put in seeing those kids … we're much more focused on the contractual requirements (Planning and Funding, Waikato DHB).*

In their monthly meetings with PHOs, DHB Planning and Funding teams made the immunisation health target a consistent agenda item and took time to discuss how the PHO was working towards the health target and supporting their primary care providers. This improved communication between the DHB and the PHO regarding immunisation and also emphasised regular reporting on immunisation and what organisations were doing to improve immunisation coverage.

> *We do the contracts with the providers, we have to be able to listen to say what's going to work for them, plus the top down stuff from the Ministry, to make sure everybody is delivering what's required. We monitor that … I guess we're like the centre of it all and pretty much everything goes through us (Planning and Funding, Bay of Plenty DHB).*

6.4.3 Focused attention of primary care providers

The pressure that DHBs were putting on their PHOs translated into pressure on primary care providers to improve immunisation coverage for children enrolled with their general practice or medical centre. This focused attention on immunisation at a primary care provider level, particularly for the practice nurses who were responsible for providing immunisation services, and required them to recognise their role in improving immunisation coverage within their region. PHOs closely monitored their providers to ensure that they were meeting the health target and to provide support for those practices who were struggling. The ways in which they supported and motivated primary care providers will be explored later in this chapter within the section on improving systems and processes for immunisation.

This required ongoing activities for practice nurses such as ensuring that children were recalled when their immunisations were due and following up those who had missed appointments. It also required changes to the immunisation processes within many primary care providers such as when children were referred to immunisation outreach services and how immunisation information was entered on the NIR. These changes to the systems and processes within primary care providers will be explored later in this chapter.

6.5 Development of immunisation networks

This section explores how individuals with different roles and from different organisations involved in the implementation of immunisation health target came together to form immunisation networks. It introduces the different types of immunisation networks that evolved within the case study DHBs over the course of the health target experience and discusses the features of these networks that enabled them to create change at the local level to address the immunisation health target.

Table 15 Types of immunisation networks within the four case study sites

	Hawke's Bay DHB	Auckland DHB	Waikato DHB	Bay of Plenty DHB
Regional networks for immunisation	*	*	*	*
Immunisation advisory group	*	*	*	*
Immunisation team at DHB level	*			
Health target network		*	*	*

6.5.1 Regional networks for immunisation

The Ministry of Health established regional networks for immunisation across the country. The regional networks consisted of a number of DHBs that were located in the same area of New Zealand. Each quarter, DHBs involved in each regional network would meet or teleconferences with each other and the target champion within the Ministry of Health. These meetings provided a forum for individuals from different DHBs to talk about immunisation and share information with their regional counterparts. The regional networks encouraged the transfer of policy learnings as DHBs that were improving immunisation coverage and performing well in terms of

the health target were able to share their experiences with those DHBs that were struggling to meet the health target.

6.5.2. Immunisation advisory groups

When the health target was introduced the Ministry of Health required each DHB to set up an Immunisation Advisory Group. These acted as formal networks for individuals involved in immunisation services to come together on a regular basis to discuss local immunisation issues. The Immunisation Advisory Groups had a wider focus than the health target, looking at immunisation issues across all age groups.

> *I'm also on the IAG, I think I'm the deputy chair, which is a good group, all different immunisation people sitting around the table making decisions or providing advice on the health target but also wider than the health target (Planning and funding, Bay of Plenty DHB).*

The Immunisation Advisory Groups included a diverse range of health professionals such as Medical Officers of Health, Paediatricians, DHB representatives from Planning and Funding, PHO representatives, Immunisation Coordinators, NIR coordinators, outreach immunisation providers, Māori health providers, midwives, Plunket representatives and practice nurses from primary care providers. As a strategic forum, the Immunisation Advisory Group improved communication between individuals and organisations involved in immunisation at the local level.

> *The role there has been to ensure there has been continuity and uniformity across the region and transparency. So I think that's been a big help because there are providers from all sorts represented on that (PHO programme manager, Waikato DHB).*

The Immunisation Advisory Groups would meet either every two months or on a quarterly basis and this limited their ability to respond to local challenges in a timely manner. The large number of people involved in the groups and the wide strategic focus on all immunisation issues also limited the Immunisation Advisory Group's ability to focus attention on addressing the health target.

> *The Immunisation Advisory Group have been in place … but attention wasn't focused, it was fairly broad, didn't sort of go anywhere in particular, talked around things a lot, different people would turn up to different meetings so you would start again, that sort of thing. So you didn't really focus (Planning and Funding, Bay of Plenty DHB).*

Hawke's Bay DHB already had a dedicated Immunisation Team for their region that was located at the DHB level. This enabled them to focus attention on immunisation and the health target in a way that the other case study DHBs were unable to do. To address this challenge, the other three case study DHBs developed immunisation health target networks that were directly responsible for addressing the health target in their regions.

> *We had the forum group [Immunisation Advisory Group] and probably one of the first things that came out of the two year old target was having a two year old sub-group, a much smaller group, and that became the key working group in terms of they are the ones that get stuff done. (Immunisation coordinator, Waikato DHB).*

6.5.3 Immunisation team within Hawke's Bay DHB

Hawke's Bay DHB was the only case study DHB to have a dedicated immunisation team at a DHB level. Improving immunisation coverage and addressing inequities between Māori and non-Māori children had already been identified as a local priority within the DHB before the introduction of the health target.

> *When the target was first formally established we were already doing quite well … we could show a history of already having set internal targets and having an action plan so when the senior management wanted to see what our approach to immunisation was, they were reassured really that what we were doing was what we needed to do and that we were ahead of the game in many senses (Medical Officer of Health, Hawke's Bay DHB).*

Hawke's Bay DHB also had a number of individuals who were passionate about immunisation that had been in their positions for over a decade. These included a Medical Officer of Health who was a strong advocate for immunisations within the Population Health team at the DHB and an Immunisation Coordinator for the region. When the Immunisation Coordinator was first appointed, the role was located at a DHB level as there were three local PHOs at the time and this enabled her to take a district wide approach when working with primary care providers.

The NIR was introduced in 2005 and it made sense to locate it alongside the Immunisation Coordinator at the DHB level. Over time the Immunisation Team expanded to include an NIR coordinator, three NIR staff, and three registered nurses who were involved in immunisation activities such as vaccinator training, support for primary care nurses, opportunistic immunisations and outreach services.

Having the team and fantastic staff, that to me is the top priority. In a lot of areas NIR will sit with the PHO, immunisation coordinators will sit with the DHB or something and they are not linked, but all together, everyone works differently, have different thoughts and different strengths and sometimes we clash, but apart from that it is fantastic (Immunisation coordinator, Hawke's Bay DHB).

When the health target was introduced, Hawke's Bay DHB was at an advantage compared to other DHBs. They already had a local strategy for improving immunisation coverage and addressing inequities for Māori children. And this local strategy was driven by an Immunisation Champion within the DHB and an experienced Immunisation Coordinator and Immunisation Team who had already developed relationships with primary care providers and other stakeholders in their region. The health target focused attention on immunisation within their DHB and in a way this validated and recognised the work they were already doing.

We in the Hawke's Bay sort of say 'well we were doing it before the health target' and one of the reasons we are performing well is that we just had longer to get systems in place, but I fully expect everyone else to catch us up (Medical Officer of Health, Hawke's Bay DHB).

As one of the early success stories for the health target, Hawke's Bay DHB shared their experience with other DHBs around the country. All of the other case study sites involved in this study talked about Hawke's Bay DHB and how they had taken ideas that had worked in Hawke's Bay DHB and adapted them to suit their own local contexts. For example, all three of the other case study DHBs followed the lead of Hawke's Bay DHB and created Immunisation Coordinator roles, either at a DHB level or within a number of their local PHOs. However, these DHBs needed to overcome the challenge of having key individuals, who were responsible for immunisation and addressing the health target, located within different organisations.

6.5.4 Immunisation health target networks

The immunisation health target networks that developed within the other three case study DHBs were not mandated by the Ministry of Health. They formed in response to the need for a dedicated network of individuals who were directly responsible for immunisation at a DHB and PHO level. They would meet every couple of weeks, much more regularly than the wider Immunisation Advisory Group, allowing them to respond to local challenges more effectively.

These health target networks were described as working groups or as having an operational focus. They discussed solutions to local challenges and worked together to improve their local

systems and process for immunisation. This coordinated effort was a powerful catalyst for change and innovation within the local organisations involved in these health target networks.

> *We have an operations group that's internal and external and this is the stuff we talk about around immunisation. We meet fortnightly, we meet for one hour a fortnight, it's a meeting that I started this year because the challenge of course for immunisation is that by and large it happens in primary care. For us in our role it's really our responsibility to ensure that the systems are aligned to allow for providers to actually deliver against that (Planning and Funding, Auckland DHB).*

Although each of the health target networks in the case study DHBs developed in different ways, they shared a number of features that enabled them to successfully operate within their regions. The following section looks at how these health target networks developed in Auckland DHB, Waikato DHB and Bay of Plenty DHB.

6.5.4.1 Health target network within Auckland DHB

The health target network within Auckland DHB developed out of a conversation between the NIR coordinator and one of the Immunisation Coordinators after an Immunisation Advisory Group meeting. They talked about how difficult it was to communicate and collaborate on immunisation initiatives within their DHB due to the many different organisations involved. They realised that they needed a more focused operational group to effectively address the health target.

The DHB Immunisation Champion, who was based within the Planning and Funding team, organised regular meetings every two weeks for the key individuals who were directly involved in immunisation. This health target network included the DHB Immunisation Champion, NIR coordinator and both of the Immunisation Coordinators, who were located at a PHO level.

> *I call us the tight five, two immunisation coordinators, the manager of the OIS [Outreach Immunisation Service], the manager of the NIR, the immunisation project manager … we were a tight group who worked closely together, we were all close and we were all driven, there were no secrets, we all helped each other (Immunisation coordinator A, Auckland DHB).*

It is important to note that representatives from the other two DHBs in the Auckland region, Waitemata DHB and Counties Manukau DHB, were often present at these health network meetings as the three DHBs began to work more closely with each other over time.

The health target network focused on the local challenges that they were facing in improving immunisation coverage within their organisations and within the primary care providers that the Immunisation Coordinators were working with. The health target network allowed them work together to address these challenges and to take a universal systems approach to achieving the health target.

> *I kept on using the metaphor for people that there are lots of people doing really good things but they're doing them individually and what we really need to do is think of them as cogs all working together so everyone is interlinking and collectively we need to look at our cogs turning and see what we need to adjust together. And it might be that one of the cogs is not close enough or one of the cogs has a wee bend in it, we need to identify that and then decide how to fix that and again that was just a really good thing to do (Planning and Funding, Auckland DHB).*

Over time individuals within the health target network were able to develop strong working relationships with each other and this created a team approach to addressing the health target.

> *We've all developed a very close relationship, it's taken three years. Some work more closer than others, some are more team players than others. But in the main, each one respects the other and we're working well together (Immunisation coordinator B, Auckland DHB).*

6.5.4.2 Health target network in Waikato DHB

A health target network was established within Waikato DHB to focus on immunisation coverage for children under two years of age and directly address the health target. It developed as a sub-group within the wider Immunisation Advisory Group who recognised that a smaller working group was needed to focus specifically on addressing the health target. It involved key individuals within the DHB, such as the DHB Immunisation Champion and the Immunisation Coordinator, as well as representatives from each of the local PHOs. Key informants stated that having the PHOs involved with the network was essential as it provided an important communication link between the DHB and the PHOs, and consequently, with their primary care providers.

> *I think we've been very lucky having the three PHOs sitting on our working group, which has been very important, and the people we have had involved who have been enthusiastic, we have these meetings every month and for everybody to come into our office for these meetings every month, the fact that we get very good representation and*

*that the people involved have stuck with it, my hats always been off to the team involved
and their enthusiasm (Medical Officer of Health, Waikato DHB).*

The health target network used the NIR to generate local data reports that were then used to
identify local immunisation issues. Using this information, the network members developed
local solutions to address these issues and facilitated change within each of their own
organisations.

*Having a working group that can sit down and identify the issues, having a good data
analyst, looking at your data, and not just putting it in to the database, but actually pulling
it out of the database and seeing what its actually telling you and taking the time to
actually stop and say 'who are we missing and what are their issues' and identifying each
one of those issues and addressing them (Immunisation coordinator, Waikato DHB).*

6.5.4.3 Health target network in Bay of Plenty DHB

The health target network within Bay of Plenty DHB developed after the workshops that the
DHB Immunisation Champion and Planning and Funding team organised in 2010. It was
organised by the DHB Immunisation Champion every two months and involved representatives
from the three local PHOs, the NIR coordinator, the DHB Midwife Leader and the Planning and
Funding team within the DHB. This created a more focused network than the wider
Immunisation Advisory Group, which continued to meet every two months to take a more
strategic focus on immunisation within the region.

*We had bi-monthly meetings with the key stakeholders who are going to have a huge
impact on immunisation, so that was the PHOs, NIR, the provider arm and Planning and
Funding, so we kept that going and from those meetings we would do actions, they were
action focused meetings, so we would look at the data, where are the gaps, how can we
address those, and we would all sit around the table and try to come up with strategies
(Planning and Funding, Bay of Plenty DHB).*

The health target network improved relationships between the DHB and the local PHOs, as well
as between the PHOs themselves. It created a regular meeting that focused on addressing
local challenges and sharing best practice between the different organisations involved. It also
created a sense of one team working together to address the health target within the Bay of
Plenty region. This was a significant change in terms of the relationships between these
organisations and a key factor in the DHBs ability to create change within their local systems
and processes for immunisation.

I do have a sense with relationships in general with the PHOs that there is a much better relationship PHO to PHO and also PHO to DHB, because it was very strained, it was, so I think that has bought some cohesiveness through our bi-monthly meetings (Planning and Funding, Bay of Plenty DHB).

6.5.5 Key characteristics of the health target networks

Although each of the case study DHBs approached the development of health target networks for immunisation in different ways, over time these networks developed a number of shared features. These features enhanced their ability to respond to the health target and improve immunisation coverage within their respective regions.

6.5.5.1 Team approach

The first of these features was the sense of a team approach. Many of the key informants talked about the way in which the immunisation health target required them to come together and work as a team. They needed to develop relationships with other individuals and organisations working in the area of immunisation and create a shared vision of how they could improve immunisation coverage within their region. This sense of one team working together to address the immunisation health target was a strong theme across all of the interviews with key informants from all four case study DHBs.

It's about team work, about having a strategy and acknowledging that (Medical Officer of Health, Hawke's Bay DHB).

It was really a whole team approach, the DHB, the PHOs, the practice nurses, the practice managers, all really got together and approached it (Māori PHO Clinical Director of Nursing, Bay of Plenty DHB).

Key informants valued the health target networks and recognised that these regular meetings had facilitated the development of relationships and a better understanding of their respective roles in delivering immunisation services within the region.

At our operations meeting people were commenting yesterday just saying how much they value that meeting, better networking, better understanding of the systems (Planning and Funding, Auckland DHB).

6.5.5.2 Improved communication

The development of a team approach required individuals to meet with each other on a regular basis to discuss their progress towards the immunisation health target and how they could address local challenges that they encountered during the implementation process.

> *We meet fortnightly, we meet for one hour a fortnight, it's a meeting that I started this year because the challenge of course for immunisation is that by and large it happens in primary care. For us in our role, it's really our responsibility to ensure that the systems are aligned to allow for providers to actually deliver against that (Planning and Funding, Auckland DHB).*

Communication between individuals improved over time and this had positive outcomes for their working relationships with one another. They knew what skills and support other members of the health target network could provide and this allowed them to address challenges within their own organisations more effectively.

> *The communication is better and with the communication and the information you have the power to, you know, work more effectively. Just having the contact, if I go into a practice and there is a question there that I'm not quite sure about, I can call on IMAC or I can call on the NIR and then we can get the answer and feed it back to everybody. So it's not just a person asking a one-off questing, cause it could be valuable going out to all of the practices. So again, it's linking up, creating really good relationships then being able to communicate through those networks and getting information and being more effective (Māori PHO Quality Coordinator, Waikato DHB).*

6.5.5.3 Coordinated activity

Regular meetings also allowed the immunisation health target networks to develop a coordinated response to local challenges that they faced. It created a forum for different organisations to come together and discuss how they could address local challenges and improve the implementation process.

> *It wasn't organised as a system within our DHB, it was contracting out, contracting out, so bringing that all together ultimately and that didn't have to be the colocation one business*

model, so the operations meeting was a way of fixing that with a number of different players (Planning and Funding, Auckland DHB).

This made improving systems and processes for immunisation across the region easier as each individual could then return to their organisation and ensure that the necessary changes were made. The health target was able to act as a catalyst for organisational change across multiple local organisations.

It was quite fragmented before we had done those workshops and everyone was doing their own thing and nobody knew what the other one was doing and you didn't really know how good anyone was doing and they were also quite closed, they didn't want to share information, I don't know why, maybe they thought they were going to lose something, so everyone was quite guarded in terms of information, everything. And then with this workshop, we actually put the pot of money on the table and said 'this is up for grabs, how are we going to do it'. So that was a huge step towards it and now they come to these meetings and they're so collaborative, all talking and sharing 'this is what worked for me, do you want me to help you with it', it just totally changed (Planning and Funding, Bay of Plenty DHB).

6.5.5.4 Shared learnings

The health target networks also improved the way that knowledge and information was shared between different organisations within the case study DHBs. Individuals were able to discuss what had worked within their organisation and learn from the experiences of other organisations in their region.

We need to work together. Not for me or you, but for the population we serve. There is now more sharing of knowledge and information (Māori PHO Director of Nursing, Bay of Plenty DHB).

There was also an improvement in the way that knowledge and information was shared between DHBs. The health target created an element of competition between the different DHBs but they recognised that they were essentially working together to improve the level of immunisation coverage at a national level.

I think there's always been a willingness to share across the country, that's never been an issue, even though we were sort of competing with each other, we always liked to look at

our rankings, but there's never been a problem with people sharing whatever has worked for them (Planning and Funding, Bay of Plenty DHB).

DHBs that were performing well shared what had worked for them with other DHBs and this contributed to policy transfer between the DHBs. Hawke's Bay and Waikato DHB were both mentioned by key informants from other DHBs as two of the DHBs that had shared the systems and processes that they had put in place to address the immunisation health target.

We were learning from each other in the early stages and we wouldn't be pretending to tell others what to do at the time. We went to Waikato actually and asked them why they were doing so well. They were doing well at one point and they had an immunisation coordinator in their hospital so we picked that idea up (Planning and Funding, Bay of Plenty DHB).

6.5.5.5 Passion for immunisation

Finally, one of the key features of the immunisation networks that contributed to their success was the passion that the people involved had for immunisation. For Hawke's Bay DHB, the Immunisation Team had been well established before the introduction of the health target and they were passionate about improving immunisation coverage within their region. Their success during the early years of the health target experience was held up as an example to other DHBs across the country and they felt that this acknowledgement validated their hard work to improve immunisation coverage.

You've got people who are very passionate about the health of people in Hawke's Bay and I think that they go over and above you know, really their job descriptions, because they care … and actually there is a sense of pride that goes with it as well, you are held up as an example to the rest of the country (Public Health Nurse, Hawke's Bay DHB).

The other three case study DHBs were able to replicate this approach towards immunisation through the creation of the immunisation coordinator roles. The individuals who were appointed as Immunisation Coordinators were nurses who were passionate about immunisation and improving population health. They became champions for immunisation within their own organisations and provided support for primary care providers to improve their systems and processes for immunisation. These changes to the systems and processes for immunisation within the case study DHBs will be explored within the next section of this chapter.

6.6 Improving systems and processes for immunisation

All of the key informants stated that there had been a strong focus on improving the systems and processes for immunisation within their region.

> *I think what's happened is certainly a huge tightening up and focusing on the systems and so on to make sure we improve the immunisation coverage (Planning and Funding, Auckland DHB).*

Before the introduction of the health target, the different organisations involved in immunisation services were fragmented. There was very little communication or coordination between the different levels of the local health system and this limited their ability to improve local systems and processes for immunisation. The development of the health target networks created a structure that improved communication and coordinated local action towards addressing the health target. The health target focused attention on increasing immunisation coverage and acted as a catalyst for change within the case study DHBs.

> *It has been a real focus and it's made us look at different strategies and initiatives that we can do to actually increase that immunisation. It's not just put a focus on it, it's about coming up with new strategies and services to deliver that (Planning and Funding, Waikato DHB).*

This section of the research findings will discuss the changes that were made across each level of the local health system, from the DHB, through to the PHOs and primary care provider levels. It will also describe how the NIR was used as a tool to improve immunisation coverage within this implementation process. The following table provides an overview of this section.

Table 16 Overview of the systems and processes for immunisation

	Systems and processes for immunisation
DHB level	Contracting and funding immunisation services
	Immunisation Coordinators
	Outreach immunisation services
	Opportunistic immunisations within secondary care settings
	Vaccinator training
	Working with midwives
	Working with community based health organisations
NIR level	NIR Coordinators
	Enrolment on the NIR
	Data matching between the NIR and practice systems

	Identifying the correct denominator
	Tracking children before they turn two years old
PHO level	Pay for performance incentive
	Monitoring performance of primary care providers
	Support for practice nurses
	Following up parents who declined immunisations
	Lay advocates for immunisation
Primary care provider level	Understanding how the health target was measured
	Identifying an immunisation champion within primary care providers
	Enrolment with a primary care provider
	Contacting parents about immunisation events
	Referring children to outreach immunisation services
	Opportunistic immunisations within primary care providers

6.6.1 Improving immunisation systems and processes at a DHB level

The Planning and Funding teams and the Public Health or Population Health teams took a leadership role in the implementation of the health target within the case study DHBs. They actively participated in the immunisation networks and facilitated changes to the immunisation systems at a DHB level. As the funder of health services, the DHBs were able to change the way in which immunisation services were contracted and funded within their region. They were also able to develop new roles and services to improve immunisation coverage and address the health target.

6.6.1.1 Contracting and funding immunisation services

Each of the case study DHBs took a different approach to contracting and funding immunisation services within their region. Auckland DHB and Waikato DHB invested new funding to address the health target. Hawke's Bay DHB did not allocate new funding to address the health target while Bay of Plenty DHB took an innovative approach and reconfigured their contracts and existing funding for immunisation to use it more effectively.

Hawke's Bay DHB already had an Immunisation Team in place before the introduction of the health target and the DHB did not allocate any new funding to address the health target.

Well we had absolutely no new funding, so what we had is what we had (medical Officer of Health, Hawke's Bay DHB).

In 2009, Auckland DHB provided funding to create two Immunisation Coordinator roles at a PHO level. One of these Immunisation Coordinators was located in the largest PHO in the region while the second Immunisation Coordinator covered the three smaller PHOs. By having a direct contract with the Immunisation Coordinators, the DHB was able to support primary care providers in their region to improve their organisational processes for immunisation. The Immunisation Coordinators were also contractually accountable to the DHB in a way that primary care providers were not and this strengthened the hierarchy of accountability for the immunisation health target within the region.

I think that's one of the interesting things about immunisation. Because if I have a direct contract with a provider like I do with the OIS [Outreach Immunisation Service] provider, I can say 'you're doing well or you're not doing well, why are these numbers so low?' but with primary care it's much harder to keep that traction and hence why we've got the contracts for the Immunisation Coordinators who have a more direct relationship in there, so it's still not that direct contractual relationship, but it's much more relationship based stuff (Planning and Funding, Auckland DHB).

Auckland DHB also provided additional funding to support a number of NIR initiatives within their region and the development of resources for practice nurses on NIR processes and best practice processes for immunisation.

Waikato DHB invested a significant amount of new funding into immunisation services as part of their implementation of the health target.

I think it makes it very focused on wanting to achieve a target and getting that. It also means that the DHB does put the funding in to that area to try and achieve the target. So I do think it does make a difference (Planning and Funding, Waikato DHB).

They had already advertised for an Immunisation Coordinator role before the health target was introduced in 2007. The Immunisation Coordinator was responsible for implementing the opportunistic immunisations initiative within the Emergency Department (ED), Paediatrics ward and outpatient providers. After the health target was introduced the DHB allocated new funding to create a mobile immunisation service for the region. This service covered the areas that the other three outreach providers were unable to cover, due to the large geographic distances across the region.

We have had the mobile immunisation service in for probably three or four years, that is a resource of about $300,000. We have had outreach which is about the same amount and the hospital [opportunistic immunisations] is about $103,000 and that has been in for about the second year, so we've probably got about $600 or $650 thousand all up, outside of the performance programme to assist primary care around the target. And there are various estimates from $100 dollars to $250 dollars to inject a kid through one of those services per event that they get (Planning and Funding, Waikato DHB).

Bay of Plenty DHB did not allocate any new funding to address the immunisation health target. Instead, the Planning and Funding team held a number of workshops that involved all of the key stakeholders for immunisation services in the region. These workshops allowed the key stakeholders to develop a new approach to delivering immunisation services within their region. Existing funding was reallocated to the immunisation coordinator and lay advocate roles and rather than holding a competitive tendering process for these contracts, the key stakeholders at the workshops decided which organisations would be best placed to deliver these services effectively. This collaborative process facilitated the development of a team approach to implementing the health target within the Bay of Plenty region.

When we did the workshop, we did three workshops two years ago, and we said 'this is the amount of funding there is for immunisation and it's all going to OIS, the outreach service, and we're not moving', we were way down in terms of achievement 'what can we do?' So we had all of those same stakeholders around the table and more, probably more like the IAG stakeholders, and we just work shopped and brainstormed a new model and then that model, we contracted to the PHOs, and that was the system, that was the structure that was put in way back then about two years ago (Planning and Funding, Bay of Plenty DHB).

Funding for the Outreach Immunisation Services was reduced and the contracts for providing these services were given to the two largest PHOs in the region.

We didn't put any new resources in in terms of funding, but there were new roles. So instead of all the funding going to OIS, we implemented different roles such as lay advocates, immunisation coordinators, they work in the provider arm and the community, and we still had OIS and we had OIS administration, so those are the four new key roles that were created. Because we actually reduced significantly the amount of money going to OIS because we weren't getting anything out of it … So we were still funding OIS, considerably less, but a hell of a lot more targeted. (Planning and Funding, Bay of Plenty DHB).

The Planning and Funding team at Waikato DHB also focused on holding organisations in their region accountable for their contractual obligations. Their PHOs and outreach providers were expected to deliver the immunisation services that they were being paid to do.

> *I think we got focused on the contractual obligations, so if people have one FTE employed, they have to have one FTE employed and not half of one, or if someone is on leave for three months and they don't replace them. We're much more focused on the contractual requirements (Planning and Funding, Waikato DHB).*

6.6.1.2 Immunisation Coordinators

The Immunisation Coordinators played a significant role in the implementation of the health target within the case study DHBs. These positions functioned in different ways across the four case study sites, but they shared a number of features that contributed to their ability to improve local systems and processes for immunisation.

Hawke's Bay DHB already had an experienced Immunisation Coordinator in place when the health target was introduced. This position was located at a DHB level and was responsible for managing the Immunisation Team and working with primary care providers on immunisation.

> *I've been in this role for ten years and when I started I was the only person, I didn't have a team, I was the sole person and it's been really interesting because when I started I don't think the DHB had a big focus on immunisation … I just worked out in primary care, worked with different providers, then MeNZB came along and NIR and that made the DHBs much more focused on immunisation, which was really good, and of course when the health target came in well that changed things completely and now there's a strong focus on immunisation (Immunisation Coordinator, Hawke's Bay DHB).*

The Immunisation Coordinator within Waikato DHB was appointed soon after the introduction of the health target in 2007. This role had been developed and advertised before the health target and was responsible for implementing the opportunistic immunisations initiative within the Emergency Department (ED), Paediatrics ward and outpatient providers within Waikato Hospital and the smaller, rural hospitals in the region.

> *I started here two years ago specifically to set up opportunistic immunisation across Waikato hospital and the rural hospitals, across the Waikato region. Since then, it's kinda grown legs and we've set that up and it's been hugely successful. We're also making significant inroads with the health target, things like that, doing a lot of strategic stuff with*

the PHOs. It's become quite a comprehensive role (Immunisation Coordinator, Waikato DHB).

Over the course of the health target experience, the role expanded beyond the opportunistic immunisation initiative within the hospitals to also include holding education workshops for midwives and midwifery students in the region, developing forms for parents who declined immunisations and providing a link between secondary and primary care. The Immunisation Coordinator played an active role in the health target network within the DHB and it was the health target network who developed these immunisation initiatives.

The Immunisation Coordinator roles within Auckland DHB and Bay of Plenty DHB were created a couple of years into the health target experience. They performed similar functions as they were located at a PHO level, within the PHO organisations, and were responsible for supporting primary care providers to improve their systems and processes for immunisation.

Auckland DHB allocated funding for two Immunisation Coordinators in 2009 to provide support to primary care providers in the region. One of these Immunisation Coordinators was located within the largest PHO in the region while the second Immunisation Coordinator covered the three smaller PHOs within the DHB.

> *My role is Immunisation Coordinator and so I work through [the PHO] but my contract however comes through the Auckland District Health Board. So my concentration is on the ADHB region and we've got 84 practices just in Auckland. So my role is to facilitate practices, to support the practices and enable them to immunise the children, and when they don't immunise the children to seek outreach for the children (Immunisation Coordinator B, Auckland DHB).*

The Immunisation Coordinators within Auckland DHB provided an essential link between the DHB, the PHOs and the primary care providers in the region. Their work involved regular visits to their practices, providing NIR training and ongoing support for practice nurses and analysing NIR reports and sending them to their primary care providers. They acted as a liaison between the NIR team and the primary care providers but they were also able to help providers to identify and address challenges with their processes for immunisation.

> *In the past the NIR have been perceived as being the immunisation police, and it wasn't a good relationship between the NIR and the practices as they would send out these overdue reports and it wasn't a spirit of cooperation and so we were appointed to be the face of the NIR amongst other things, with the practices as the in between liaison people*

and we were seen as people who were prepared to help, not just telling them what to do (Immunisation Coordinator A, Auckland DHB).

The Immunisation Coordinator roles within Bay of Plenty DHB developed from the workshops that the DHB held with key stakeholders in 2010. An Immunisation Coordinator was appointed with each of the two mainstream PHOs in the region to work with primary care providers. One of the Immunisation Coordinators also worked with the Māori PHO that was located in the main urban centre.

So my job was basically born out of that change to devolve the outreach contracts to the PHOs and then support the practices in understanding what they have to do and getting organised to do (Immunisation Coordinator A, Bay of Plenty DHB).

This role involved supporting primary care providers to improve their systems and processes for immunisation, managing the outreach immunisation service, supporting initiatives such as opportunistic immunisations within the hospital, enrolling mothers with a primary care provider while they were in the maternity ward and monitoring the performance of primary care providers towards the health target.

6.6.1.3 Outreach immunisation services

All of the case study DHBs had outreach immunisation services in place before the health target was introduced. Over the course of the health target experience the way that DHBs contracted these services and how they were delivered changed as they tried to improve the efficiency of these services.

Hawke's Bay DHB had an existing contract with a local Māori health provider to deliver outreach immunisation services for their region. The NIR coordinator within the Immunisation Team processed the referrals from primary care providers and these were then passed on to the outreach service. There were a number of ongoing challenges with this process as the outreach service failed to immunise all of the children that were referred to them. The Immunisation Team did a significant amount of follow up work and in-home vaccinations to support the outreach service and ensure that children were being vaccinated before their second birthday.

At the end of the health target, the DHB moved the contract for outreach immunisation services to sit with the Immunisation Team and this brought all of the immunisation services in the region (other than primary care providers) into one team located at a DHB level.

We've been doing a lot of work with our outreach contract and our outreach contract had been struggling and through the imms team they provided a lot of hands on practical support for that outreach team and in essence had taken on some of that outreach work themselves and then formally since July of this year [July 2012], so after the target had been achieved but effectively it was mirroring what was happening, so we have now got the outreach contract as part of our imms team, but before that really that was how the team were operating, they were filling the gaps that the outreach provider had (Medical Officer of Health, Hawke's Bay DHB).

When the health target was introduced, Auckland DHB had several contracts with different heath providers in their region to provide outreach immunisation services. However, in 2008 the DHB contracted IMAC (the Immunisation Advisory Centre) which was based in Auckland, to provide all of the outreach immunisation services for the region. Many of the key informants within Auckland DHB stated that the outreach service had played an important role in improving immunisation coverage, particularly for Māori and Pacific children in the region.

Outreach has gone a long way to contributing to the two year old percentage targets. That's where we've seen the improvement in immunisation coverage rates (NIR Coordinator, Auckland DHB).

Waikato DHB had three contracts with their Māori PHOs and one with a Pacific health provider to provide outreach immunisation services to specific geographic areas within the region. A new service that was implemented during the health target experience was the introduction of a mobile immunisation service to cover the areas between the different outreach providers. The mobile immunisation unit was located at a DHB level alongside the NIR, which allowed them to work closely together to find children. All of the key informants from Waikato DHB stated that the outreach services, particularly the mobile immunisation unit, had been an important part of the implementation of process for the health target in their region as it improved access to immunisation services.

I think it was the outreach services, taking it to the family rather than having them access it through primary care when there might be various barriers to that, be it transport or be it that they have a big bill with the GP and they don't want to go that way or just that there's other things making that difficult, practical things, where it is easier for the service to come to them (Medical Officer of Health, Waikato DHB).

Bay of Plenty DHB reconfigured their contract for their outreach immunisation service as part of their new approach to address the health target. The funding for outreach services was

reduced and the contracts were given to the two mainstream PHOs as part of a package that also included the Immunisation Coordinators and Lay Advocates.

> *I mean we already had the outreach contract, but it was a national spec, which made it really difficult to manipulate it, it really doesn't suit our region and its really not working for us. So it enabled, the DHB was definitely wanting to improve the stats and we looked at what we were currently doing and how we could do it better and how we could present that to the DHB and the DHB tweaking the spec to enable that to happen, to working more with outreach than what we were doing before (PHO Manager A, Bay of Plenty DHB).*

The Immunisation Coordinators became the central point for immunisation within the PHOs and this allowed them to develop a coordinated approach to improve the systems and processes within the outreach services, alongside the improvements within primary care providers.

> *We continued with a smaller portion of OIS cause you still need OIS. But the services are a lot more connected up with the immunisation coordinator being the centre point for OIS, for the lay advocate, for the general practice provider arm, so it connects up a lot better because they were quite fragmented (Planning and Funding, Bay of Plenty DHB).*

All of the case study DHBs made changes to the referral processes between their primary care providers and outreach services. Children needed to be referred to the outreach services with enough time to ensure that they were fully immunised before their second birthday. This required an automatic referral process from the primary care providers to the outreach services for children who were not fully immunised by a set age.

> *We're enforcing the referral process from practices into outreach so it's timely because there is nothing more frustrating than the child is referred to them but its past it's due by date (PHO Manager A, Bay of Plenty DHB).*

Some of the children who were referred to the outreach service needed multiple immunisation events in order to be fully immunised and this took a number of visits from the outreach nurses. The processes around revisiting children were changed to allow the outreach nurses to deliver follow up vaccinations rather than waiting for them to be referred by their primary care provider.

> *Outreach is really important, even if it is only the last 8 to 5 per cent, those are hard to reach people and they deserve to have those services. I know there is a huge non-attendance, they try up to eight times in one go to get a baby, then they introduced the fact that you don't have to go through the whole referral process to get your second injection, they would just go to the same baby the second time. And so it makes the*

process faster. For about a year they automatically referred the 15 month old baby if they hadn't been up to date … but they did make sure that the patient knew who their primary home was and who their GP was and if for other reasons they couldn't get to the GP they would come back and do the others (Immunisation Coordinator B, Auckland DHB).

These changes were met with resistance from some of the primary care providers who did not want their patients to be referred to another health service. The PHOs and Immunisation Coordinators needed to work with these primary care providers to show them that it was in the best interests of the child to refer them to the outreach service and that immunisation was a population health issue that required different health services to work together.

It is population based and it's not just these are your patients, but some practices wouldn't let us refer them to OIS, they would say 'they are our patients' and we had to say 'actually, you don't own those patients, they have a right to be referred, because there is obviously a reason they are not coming in'. And when they looked at the people they said 'oh yes, that lady or that mother is notorious for not coming in'. So let OIS go see them at home. So there is a lack of understanding of what these services are (Immunisation Coordinator B, Auckland DHB).

One of the challenges that the outreach services across all of the case study DHBs faced was finding the children who were referred to them. The families of these children were often highly mobile, which made contacting them more difficult as their address on the NIR was not up-to-date, and they were not accessing primary health care.

Basically because of access issues, families who had debts with the GP and didn't want to access even a free service because they didn't want to have that confrontation. People who were itinerant, moving around a lot, people with lots of children, children moving around different families and households, people with other priorities who perhaps weren't taking it [immunisation] up like we were hoping (Medical Officer of Health, Waikato DHB).

The outreach services used many different strategies for finding a child, including visiting the last known address of the child, talking to neighbours or family members about where they might have moved to and talking to Plunket and other child health providers in the region. Once a child was referred to the outreach service they became the responsibility of the outreach nurses, who worked hard to find them and immunise them.

The outreach service, who had staff like bloodhounds and fox terriers, they just dig them out using their bloodhound tendencies and then they hang onto them with their fox terrier

tendencies until they are vaccinated. We're efficient, they just don't let kids slip through the gaps. There's a team, there is four of us, there are two vaccinators, an administrator and me, and I do most of the practice liaison. So chasing the kids up at a practice level who have refused outreach or who have not yet been referred to outreach, once they are in the outreach programme I tend to leave them to the Outreach Coordinator and her administrator and her vaccinators. And the vaccinators are, they don't just vaccinate, they have a folder full of kids and its their responsibility to get them (Immunisation Coordinator A, Bay of Plenty DHB).

Many of the key informants stated that the outreach immunisation services had contributed to addressing inequities for Māori children in their region.

There was an assumption too that Māori didn't want to immunise and we know that's rubbish. They just don't want to immunise in general practice. We take it to them and we make it way more appropriate for them. You know, they're no different to anyone else, they want the best for their children too (PHO Manager B, Bay of Plenty DHB).

Although the outreach services did not specifically target Māori children, some Māori families were more comfortable with an outreach nurse visiting their home than they were with taking their child in to a primary care provider.

We don't target Māori children, we just target everyone we can get hold of. The fact of the matter is there is a lot of work done finding Māori families and often we have a lot more success with Māori families accepting our service because we've got the right staff for them to feel comfortable with us coming into their home. So when I have looked at the data in the past I think 80% of the Māori and Pacific families we have contact with will have us into their homes to immunise. So to me that's a sign of the acceptability of our service to them (Outreach Provider, Auckland DHB).

By providing an alternative pathway for immunisation, the outreach services were able to engage with families who were not accessing primary health care services. The outreach nurses continued to stress the importance of having a primary care provider to the parents that they visited, but they also continued to visit the family and immunise their children if that is what they wanted.

It's about providing alternative venues and creating opportunities for children to be immunised, reaching our hard to reach families by being flexible to their needs, transport, childcare, and alternative venues. Ensuring that they are educated about the facts and know what their children are getting (PHO Manager B, Bay of Plenty DHB).

6.6.1.4 Opportunistic immunisations within secondary care settings

One of the new immunisation processes that was introduced during the health target experience involved checking the immunisation status of children when they presented at secondary care settings. If they were missing immunisations, they were given the opportunity to be immunised before going home.

Waikato DHB was a leader in this area and the Immunisation Coordinator was appointed by the DHB to develop an opportunistic immunisation initiative within the inpatient, outpatient and emergency department (ED) child health services. The initiative was originally limited to the paediatric medical and surgical inpatient wards and the outpatient facility at Waikato hospital. Over time, it was extended to include the ED, other wards at Waikato hospital as well as outpatient clinics were children were seen.

> *There is a huge population of kids who go through every day and we know from auditing the records that many of them were overdue immunisations and we were just missing those opportunities. So as a supporting factor towards the health target and for improving the general health across the whole region was for secondary care to come and take their role in helping out primary care and taking our role as health professionals and doing some prevention work and helping promote the health of our kids (Immunisation Coordinator, Waikato DHB).*

Each child had their immunisation status checked on the NIR at first point of contact. For acute admissions this usually occurred in the ED where a status query was printed and included in the patient notes. New admissions to the paediatric wards and the outpatient clinics were screened each day by the NIR coordinator or the Immunisation Coordinator. If a child was not fully immunised, this was verified by talking with their parent, checking their patient held record or by direct contact with their primary care provider. They would then be offered the necessary vaccinations and these would be delivered before they were discharged. Their updated immunisation status was sent to their primary care provider through the NIR and as part of their discharge letter.

While some families chose to defer immunisation, secondary care staff were able to have a conversation with parents about their concerns and facilitate further engagement with their primary care provider once their child was discharged.

> *What's been quite interesting is while parents haven't necessarily immunised while their children are here, we've been following up how many of them have got their kid*

immunised in the following month or two and there has been quite a high uptake there. So even just having the conversation with the parents, in ED in particular, has had a positive influence (Planning and Funding, Waikato DHB).

The NIR provided the immunisation history for each child and allowed staff to identify children who were not fully immunised from their first contact with secondary care. Staff received NIR training and on-going support from the Immunisation Coordinator as well as vaccinator training around immunisation and administering vaccines.

Some of the paediatric staff initially perceived immunisation as being outside the scope of their role and outside of the focus of hospital care. However, many staff members saw opportunistic immunisation as their clinical duty of care to patients as well as a way to support their primary care colleagues. It could reconnect families with primary care services and prevent children from being admitted to hospital for vaccine preventable diseases.

I think the really good thing about providing immunisation in a secondary care environment is for us we see these kids come in with things that we could have prevented by vaccine. So we are in a really good position to be able to say to parents 'we've got a baby in the ward at the moment who has got pneumococcal disease and this is a really dreadful disease for a family to go through'. And I think that is really powerful stuff to be able to share with families. And I think it's helping our primary care colleagues out, you now, I think they greatly appreciate the support from us and certainly the support from the paediatricians (Immunisation Coordinator, Waikato DHB).

The Immunisation Coordinator viewed opportunistic immunisations within secondary care settings as an effective way to reach children and their families who were not engaged with primary care.

A lot of our children are not well engaged with primary care, they spend a lot of time in ED. They know where ED is, and it's free and there are no issues there about being given a bill or any of those sorts of things. So if there are any issues with not having a GP or not having a GP that they can take them when they want to, they come to ED (Immunisation Coordinator, Waikato DHB).

Key informants stated that providing immunisations within secondary care settings also contributed to the reduction in immunisation inequities within Waikato DHB as many of the children who came through the hospital were Māori or Pacific or came from low socioeconomic families.

Also the opportunistic [immunisation] in the hospital, you know we had a lot of children presenting, you know, over representing in the emergency department and on the paediatric ward who are Māori, Pacific or low socioeconomic so it was another avenue to provide the service to the families rather than having the families have to make the trip to get it (Medical Officer of Health, Waikato DHB).

Hawke's Bay DHB and Bay of Plenty DHB followed the lead of Waikato DHB and implemented their own opportunistic immunisation initiatives. However, they did not commit the same level of resources and staff support as Waikato DHB had to establish the necessary processes for opportunistic immunisations within their secondary care settings.

I went to see [the Immunisation Coordinator] in Waikato, she's very inspirational and she's implemented it up there in a huge way, but she's still there to support it, we really won't have anybody here to support it so it's about trying to make it sustainable (Public Health Nurse, Hawke's Bay DHB).

Opportunistic immunisations within secondary care settings had strong support from the DHB Management team within both DHBs, but there was a lack of support from staff within the ED and hospitals.

It's been really supported by management … it has management support but once you get down a little bit, lower down the structure or the hierarchy … we're professionals here, but yeah not everybody sees it the way we do (Public Health Nurse, Hawke's Bay DHB).

This was a challenge, especially as opportunistic immunisations rely on the staff within these secondary care settings to view immunisations as their responsibility and follow up on the immunisation history for each child that presents to them. This was particularly challenging during the winter when a high workload from seasonal illnesses placed even more pressure on ED staff, who had their own health target that they needed to meet.

And in the hospital now we're trying to get the nurses to vaccinate and that's going quite well for children admitted into the children's ward and also in outpatients. We're working on it in ED, but that's much harder for them, the ED nurses are so busy, everybody is busy in the hospital but the ED nurses are so busy that they really can't focus on that (Immunisation coordinator, Hawke's Bay DHB).

It was met with enthusiasm and its, its hit a bit of a barrier around ED, I don't blame them, the Minister has a different target around ED, and people need to recognise that. That's an emergency department. That is not a place where you should be catching upon your

immunisation, with the amount of people going through there. Everybody can see that it's an ideal place to catch the kids … however I have to support the people who are running ED, and the Nurse Leader for ED, I have to support him, because they are getting hammered so hard on the six hour target, that they've got to keep their priorities around that (Midwife Leader, Bay of Plenty DHB).

6.6.1.5 Vaccinator training

Vaccinator training in New Zealand is provided through the Immunisation Advisory Centre (IMAC) and in Auckland and Northland vaccinator training run by Well Womens Nursing Services (WONS). Practice nurses need to complete this training to receive authorisation from their DHB. All of the case study DHBs viewed this training as an essential part of best practice for immunisation.

We have this system in New Zealand of non-medical vaccinators, where there is a training, or an approval process where the local Medical Officer of Health approves and we had, we had quite a lot of interest in Hawke's Bay from the practice nurses to really engage in that and we as a team within the, what was the public health unit back then, as a team we were quite keen to engage with those nurses because we saw it as a quality initiative, that if nurses felt confident and skilled then they would really want to do they best that they could do (Medical Officer of Health, Hawke's Bay DHB).

The vaccinator training was also an important component of the opportunistic immunisations initiatives as secondary care staff who completed the training were then able to become authorised vaccinators and immunise children when they presented at ED or to the paediatric ward. Even if the family chose not to immunise their child while they were there, hospital staff were in a position to have an informed discussion on immunisation with the parents.

6.6.1.6 Working with midwives

In New Zealand, midwives play an important role in supporting a mother and her baby before, during and after birth. In regards to immunisation, when a baby is born they are enrolled on the NIR by administration staff on the maternity ward. However, if it is a home birth, it is the midwife's responsibility to ensure that the child is enrolled on the NIR. After four weeks, the baby moves from the care of the midwife to a Wellchild provider and at any time from birth to six

weeks to a primary care provider. This transfer of responsibility for the care of the child is a crucial period for ensuring that a child receives their first immunisations at six weeks of age.

Bay of Plenty DHB made a number of changes to their systems and processes to ensure that this transition from the care of the midwife to a primary care provider was a smooth process. The health target network within Bay of Plenty DHB included the Midwife Leader for the DHB and she played a central role in implementing these change to ensure that mothers and their babies were enrolled with a primary care provider before they left the maternity ward.

> *In this role I've been able to implement a lot of changes and probably the first big one was, what we're doing is getting women to enrol with their PHOs or GPs before they leave the maternity unit (Midwife Leader, Bay of Plenty DHB).*

Bay of Plenty DHB also introduced two new Immunisation Lay Advocate roles, one in the Western Bay of Plenty PHO and one in the Eastern Bay of Plenty PHO. One of the roles of the Lay Advocates was to visit the maternity ward and talk to mothers about immunisation and make sure that they were enrolled with a primary care provider before they went home.

> *So those two people actually work in the maternity unit and educate the parents that are in there at the time, assist them to enrol their child in a general practice, because that was another issue, we weren't having enough early enrolments. So yeah, there were two parts to it, early enrolment and giving them the information to assist them in making that decision to immunise, and that's been really successful (Planning and Funding, Bay of Plenty DHB).*

Midwives are also legally required to provide information on immunisation to the mother during the first and third trimester. This means that they are usually the first health professional to talk to the parents about immunisation and address any concerns that they might have before the baby is born.

> *There is a perception that, midwives can be a bit anti-immunisation. And I don't know if that's true or not really, but at the end of the day they are undoubtedly in a very influential position with especially first time mums (Medical Officer of Health, Hawke's Bay DHB).*

Two of the case study DHBs talked about the ways in which they supported midwives in their region so they were confident about providing parents with accurate information on immunisation. Hawke's Bay DHB provided training for midwives on immunisation, which was similar to the vaccinator training days, but tailored to the needs of midwives. These training days were developed by a member of the Immunisation Team who was also a registered

midwife. This gave the Immunisation Team a connection with the midwives in their region and they were able to have these training sessions accredited by the Midwifery Council.

I also run study days for midwives, which have been really popular and we've put a lot of midwives through our study day, we were able to get ten points from the Midwifery Council, that was gold, fabulous, an easy easy ten points for them (Immunisation Promoter, Hawke's Bay DHB).

Waikato DHB also held immunisation training sessions with the midwives and midwifery students in their region. The Medical Officer of Health and Immunisation Coordinator worked closely with the midwifery education provider to develop these sessions and have them accredited by the Midwifery Council.

We're trying to work well with the midwifery sector, because we know from that Growing up in New Zealand study that's when people get their ideas, where they get their information from and that midwives are really important and so we've been working closely with them, because again the majority of midwives understand the role of immunisation but a few of them have meant that a lot of people have coloured the whole group as anti-immunisation, and I know that's not true, and it means that when we try to have a conversation with midwives they get defensive because they think you're going to attack them. So we've been working very closely with the midwifery teachers to try and work with the college to reinforce the importance of their role with immunisation (Medical Officer of Health, Waikato DHB).

6.6.1.7 Working with community based health providers

Many of the key informants talked about the work that they did with other health providers and community groups within their region. The Immunisation Team at Hawke's Bay DHB worked with some of the small rural health providers in their region to support them in running their own immunisation clinics so parents would not have to travel long distances. They also worked closely with Plunket to provide immunisation services for mothers coming in to visit the Plunket nurses.

There is a little provider down there, it's a nurses clinic, we got them up and running a few years ago now, but they do little clinics, but it's quite a few visits you have to go and help them get up and running, but now they're focusing on their area. In Waipuk there is a Māori provider down there who we have been working closely with to do some vaccinations. [Our Immunisation Promoters] run two clinics with Plunket each month, they

do these clinics, they're there for about three or four hours, they usually get about seven kids to vaccinate at those, that's working really well (Immunisation Coordinator, Hawke's Bay DHB).

Waikato DHB supported some of their public health nurses who were located in an isolated rural town to run immunisation clinics within their own community.

Use the people in that area because your local people are your gold really, they've got the trust, they've got the links, they've got the connections and you can't just come in and do it to people, you have to do it with them, and that takes time, it takes a lot of time and I think you can reinvent the wheel as many times as you like, but if you've got those people already there then it's much better use of resources and much better for them, those people working in those areas, to know that they are providing those services and not having other people coming in and doing stuff on their patch. And I think it's much more acceptable for a community that's not use to people just coming in (Immunisation Coordinator, Waikato DHB).

6.6.2 Improving systems and processes for the NIR

The NIR was established in 2005 as a tool to support the delivery, reporting and monitoring of immunisation activity within the New Zealand health system. When the health target was introduced in 2007, there were a number of issues with the accuracy of data recorded on the NIR that needed to be addressed. Despite these challenges, the NIR played an essential role in the implementation of the immunisation health target as it was now possible to monitor progress towards the health target from the DHB level, down to the PHOs and individual primary care providers.

If it weren't for the NIR, we couldn't have done this health target, and NIR has improved over the years so much (Immunisation Coordinator B, Auckland DHB).

6.6.2.1 NIR Coordinators

The NIR was located at a DHB level within all of the case study DHBs. In the smaller case study DHBs, there was one NIR Coordinator. In Hawke's Bay DHB, the NIR Coordinator was part of the Immunisation Team and worked alongside the Immunisation Coordinator and the Immunisation Promoters. In Bay of Plenty DHB, the NIR Coordinator was part of the Population

Health team. She worked closely with the Immunisation Coordinators who were located within two of the PHOs in the region.

The larger case study DHBs had small NIR teams that were managed by an NIR Coordinator. The NIR team at Auckland DHB was also responsible for cervical screening within the DHB, while the NIR team at Waikato DHB was located within Population Health alongside the mobile immunisation team.

The NIR Coordinators and NIR teams played a pivotal role in the implementation of the health target. They provided data on immunisation coverage at a DHB level, PHO level and primary care provider level to enable local monitoring towards the health target. They also began to use the NIR in a more sophisticated manner, to track children who were not fully immunised before their second birthday and to identify areas for improvement in the implementation process for the heath target.

> With the NIR, basically the way that the information on the national immunisation register is being used has been more sophisticated. It's hard to know whether it's to do with the target, I guess the target would have contributed to it, but we also had an incumbent in the role who was keen to develop it that way (Planning and Funding, Waikato DHB).

6.6.2.2 Enrolment on the NIR

When a child is born, the administration staff at the maternity ward or birthing centre are required to complete an NIR enrolment form. Enrolment with the NIR is an essential step in the immunisation process as it is the NIR that alerts the primary care provider when a child is due to have immunisations. The first immunisation event is scheduled at six weeks, which does not allow for much time to contact new parents, develop relationships and address any concerns that they might have about immunisation. If a child is not enrolled with the NIR, they may miss out on this early engagement with their primary care provider and they may also miss out on receiving their immunisations on time.

> We know from comparing NHI [National Health Index] lists to the NIR that there are 20 kids a week that aren't registered on the NIR, that have been born and given an NHI, but because they are not on the NIR, they're not getting those early recalls and early engagement with the clinics (Immunisation Coordinator, Auckland DHB).

One of the challenges that Auckland DHB and Waikato DHB faced in improving the systems and processes for enrolment on the NIR is that there were multiple locations where a mother

could give birth in their region. Each of these locations had different systems around enrolment on the NIR and aligning these systems and addressing issues around enrolment took time and resources.

> We've got a project manager looking at those things because the difficulty with the Waikato region, is that there are 11 or 12 different places that you can have your baby. And each of those places have got different systems set up around enrolment and who does that and often it's not the midwife who does that, it's the administrator or somebody else (Immunisation Coordinator, Waikato DHB).

Although there were fewer locations for mothers to give birth within Bay of Plenty DHB and Hawke's Bay DHB, mothers in these provincial DHBs were more likely to choose a home birth rather than travel in to the hospitals in the main urban centres. This created issues for their baby's enrolment on the NIR, as it became the responsibility of their midwife to complete the NIR enrolment paperwork. However, some of the midwives were not aware that this was their responsibility.

> I then went to each of the midwives that I knew because they said that they had a really low number of home births and I thought, this is strange, what is going on here? So once again, my relationship with the midwives, knowing them and knowing what they would do. I would pick up the phone and go 'midwife A, I noticed that you only recorded two home births in twelve months through the NIR' and they would say 'that's not my responsibility' and I would say 'yes it is'. They had no idea, some of them had no idea, some of them thought the computer links that they had with the providers linked straight in, passed the information on. So then it was an exercise with some motivated midwives and myself it was like 'no, the information isn't going through' and they were able to go back and say 'this information is not going through'. So now we've seen immediately a big increase in the home birth numbers (Midwife Leader, Bay of Plenty DHB).

6.6.2.3 Data matching between the NIR and practice systems

One of the key issues for the NIR that needed to be addressed was ensuring that the data recorded on the NIR matched the data that was recorded on the practice systems within primary care providers. Primary care providers used different practice systems to record patient information and these did not automatically share information with the NIR. This information needed to be updated manually by the practice nurses, many of whom had not received any training or support on how to use the NIR.

Well they are different systems, so the practice management system is what the nurses are using so they're not actually directly entering onto NIR, they can look up NIR, but they're using their practice management system to enter the details and then that messages back to NIR and where there's been some issues is where messages come back into the practices, someone has to go through those messages and update the information, and that is the sort of thing [our Immunisation Team] have had sessions with the practice nurses so they understand it because otherwise that is how your practice management system might not be up-to-date with the NIR (Medical Officer of Health, Hawke's Bay DHB).

All of the case study DHBs found that there were significant differences between what was being recorded on their primary care providers' internal practice systems and what was recorded on the NIR. Immunisations that had been delivered were not being counted as they were under-reported on the NIR and it was the data from the NIR that was used by the Ministry of Health to monitor performance towards the health target.

So much of it was they hadn't entered the data correctly, they had done all of the work and when they could actually see the benefit of entering the data correctly, 'look this is your target and you've achieved this much now because we've just corrected your data'. So now selling them the idea that their work was being recognised now, that was a key challenge and we worked our way through that (PHO Quality Manager, Waikato DHB).

To address this issue, all of the case study DHBs conducted data matching exercises between the NIR and the practice systems of each primary care provider in their regions. Immunisation data was extracted from the practice systems and this data was then matched against the data recorded on the NIR. This work was conducted by the NIR team or at a PHO level and it took a considerable amount of time and additional DHB and PHO resources to complete.

The biggest single project we've done was a data and primary care quality programme which involved us auditing every single primary care practice to extract their data and compare their data with the NIR (Planning and Funding, Auckland DHB).

The Immunisation Coordinators and PHOs played an important role in this process as they provided ongoing NIR training and support for practice nurses. The ways in which they supported practice nurses to improve the way that they entered information on the NIR will be explored later in this chapter. They also provided a link between the primary care providers and the NIR Coordinator, who was located at a DHB level, and this allowed them to improve the systems for immunisation information at a primary care level, PHO level and DHB level.

Our immunisation coordinator so she's out there basically working with the systems between NIR, PMS [Practice Management System] and the nursing staff, because that's where we find that there's a huge gap of it being really untidy and nothing there to actually fix the problem. Because NIR actually sits outside the PHO, so it's a matter of fixing them in general practice and fixing them on NIR, so you need that in between person (PHO Manager A, Bay of Plenty DHB).

One of the challenges with the data matching process is that it required regular follow up to make sure that new information that was being recorded on the practice management systems was also being recorded on the NIR. Some of the DHBs implemented a process of regular auditing processes to cross check this information.

I think with every DHB, initially there was a measure of our records weren't quite up to scratch and I think that was a reflection of the early days of the NIR and the measurement difficulties between primary care and the NIR. So that was an early situation, now maintaining that flow of information and making sure that we do have good messaging and being able to cross check that and making sure our data is accurate with what the practices have got (Immunisation Coordinator, Waikato DHB).

6.6.2.4 Identifying the correct denominator

The data matching exercises between the NIR and the practice systems identified large numbers of children who did not have a primary care provider recorded on their NIR record. This identified another challenge for the case study DHBs as they needed to develop processes to find these children and make sure that they had a primary care provider and PHO to follow up on their immunisations. Sometimes they would find that the child had moved to another region or overseas and their address and primary care provider needed to be updated on the NIR.

We get reports on kids with unknown GP, we don't know where they are ... sometimes you'll find them in another PHO and that's really important too because we find that out and we can transfer them and they come off our stats, so for us that's important (PHO Manager B, Bay of Plenty DHB).

Updating this information was important as the data on the NIR was used to measure and monitor performance towards the health target. The PHOs and DHBs involved in this research recognised the importance of this information in determining the correct denominator for their performance towards the health target. It also saved time and resources in trying to follow up

children that were no longer living in the region. Their information was updated on the NIR and this effectively transferred them into another PHO or DHB.

> *Being able to identify the correct population, so you know who you're dealing with, that you're not trying to waste a lot of resources trying to find someone not there, that's really frustrating for the PHO and the practice (PHO Manager A, Bay of Plenty DHB).*

However, this process of transferring children from one DHB region into another created challenges for the receiving DHB if they were not given enough time to ensure that the child was fully vaccinated before turning two.

> *One of the things that I found slightly disappointing to learn was shunting of children to other DHBs, so shifting them out of your denominator and quite frankly that made me very angry that that was something people thought was okay to do, that is still a child, it's not just a number so I guess, that's about each DHB having its counting system and remembering that there is always a child at the end of that data. Initially at the end of the quarter, they would push that child off, not in our resident area, shove them off to wherever and then we got tacit agreement that that was not okay, it was okay to put someone in their area of residence but you needed to inform the other DHB and have agreement that that is their latest residential address and not to do it at the end of the quarter, to bump your own numbers (Planning and Funding, Auckland DHB).*

6.6.2.5 Tracking children before they turn two years old

One of the new processes that developed during the health target experience was the use of the NIR as a tool for identifying and tracking children who were not fully immunised before they turned two years old. All of the case study DHBs adopted this process of identifying individual children as they approached their second birthday and flagging them as a high priority.

> *Another one is working with NIR, they would identify all of the children about to turn two, because it is the two years being counted, so identifying all the children about to turn two and we'd take them out to the practices and say, hey concentrate on these ones because they are the ones who will affect our figures. And while that's a reasonable thing to do, I still think that if your systems and processes are excellent, then those figures will take care of themselves (Immunisation coordinator A, Auckland DHB).*

This process was refined over time and during the final year of the health target the NIR Coordinators were able to provide PHOs and the Immunisation Coordinators with a report outlining each of the children that needed to be followed up during the next quarter.

> *The other thing is I provide the practices with their overdue reports, we've now brought it so that I do reporting on the health target, the milestone age for this quarter. So I run a report on all the children who will be turning two in October/November/December and then I can ascertain what our figure is now, what our percentage coverage is. I can highlight all the ones who haven't been immunised, fully immunised. So therefore, I'm letting each PHO know their ones that are not fully immunised so they can help their practices to target these children, find out where they are and why they are not being immunised (NIR Coordinator, Bay of Plenty DHB).*

Once these children were identified they were closely monitored by the Immunisation Coordinators to make sure that the primary care providers or outreach services were following them up well before their second birthday. This required a lot of time and attention but it was seen as essential as it was this small percentage of children each quarter who made the difference for whether the PHO or DHB achieved the health target.

> *I got [our Immunisation Coordinator] to go through and get the status for every single one of those children, send them back to the practice, and then she is to check every single day who is coming up to their birthday to check their funded status of where they're up to so there should be no catch ups after the child's birthday because they've got heaps of notice. It's a lot of drilling down to that individual level, but you really have to do that for the last 5 to 10 per cent, because the first 85 per cent is easy and that last 10 per cent, most of the work goes into that little group (PHO Manager A, Bay of Plenty DHB).*

6.6.3 Improving systems and processes at a PHO level

The PHOs played an important role in the implementation of the immunisation health target. Their relationship with their primary care providers allowed them to go into the providers and support them to make changes to their systems and processes for immunisation. They also held their providers accountable for immunisation and required them to meet the health target. Many of the new systems and processes for immunisation were implemented at a PHO level within the case study DHBs.

> *But talking about systems, the PHOs went back and had a really good look at their internal systems. Whilst they had a contract to do all of these big picture things they also*

had to look at their own internal systems and there were a lot of issues to do with data capture and they found a lot of areas they could work on, so they did change a lot of their systems (Planning and Funding, Bay of Plenty DHB).

6.6.3.1 Pay for performance incentive

Although the New Zealand health targets did not have financial incentives attached to their achievement, there was an existing financial incentive for childhood immunisation as part of the PHO performance programme.

The PHOs are incentivised through the performance programme … so that's probably another piece of the puzzle in terms of improving that performance, because they are incentivised financially to hit and improve on the target (Planning and Funding, Waikato DHB).

However, when the immunisation health target was introduced, the pay for performance incentive for PHOs was set at three years of age. This inconsistency between the age for the health target and age for the financial incentive caused confusion for many primary care providers who thought that they were achieving the immunisation health target because they were immunising children before their third birthday.

We found that practices didn't really know that, they didn't understand how the targets were measured. It used to be, under the performance programme, as long as they were done before they turned three, they were counted in the performance programme, now it's before they turn two and the practices are still just learning this (Immunisation Coordinator A, Bay of Plenty DHB).

It took three years for the Immunisation Champion and DHB Relationships Manager at the Ministry of Health to negotiate the shift in the age that the financial incentive was given. This process required discussions with the Primary Care Team at the Ministry and DHBNZ (District Health Board New Zealand) to change the age at which the pay for performance incentive was given and how it was measured. The NIR became the measure for the performance incentive and this aligned the incentive with the data that was used to measure the immunisation health target.

The PPP helps, once you get the PPP more closely aligned to the target, early on there was a bit of a gap between them, once you've got PPP more closely aligned then they

could see there were benefits for them as well (Planning and Funding, Bay of Plenty DHB).

6.6.3.2 Monitoring performance of primary care providers

PHOs began to use the NIR in a more sophisticated manner to monitor coverage rates within each of their general practices and identify those practices who were struggling to meet the health target. This focused attention on immunisation within primary care providers as they knew that they were being closely monitored by their PHO and held accountable for the health target.

Some of the PHOs within the case study DHBs used this information to compare performance across their practices by publishing their own PHO league tables for the health target.

> *They publish all of the practices results, so they do a graph and you can see if you are the slack practice for the month. And it's created huge competition and the results have skyrocketed and they believe that it is due to that. Because they send it out to all the general practices and they name them, they send it out monthly for all targets … they swear that is the key, having that level of competition (Planning and Funding, Bay of Plenty DHB).*

Key informants saw this as a powerful tool to motivate primary care providers to improve their rates of immunisation coverage. It was effective because each provider could monitor their own performance and compare themselves against the other providers within their PHO. Providers who were performing poorly recognised that they needed to improve their immunisation coverage rates. The PHO or Immunisation Coordinators were also able to provide additional support to identify how these provider could improve their rates of immunisation coverage.

> *And each practice can see how they're going in relation to their little population, so they know and they know what their peers are doing as well, so they can see if they are falling behind, it's quite powerful (Planning and Funding, Waikato DHB).*

Some of the providers initially resisted this process of comparing performance towards the immunisation health target. However, the PHOs made it clear that the health target was a priority and they were being monitored on their performance towards it on a monthly basis.

> *We've also found with the practices, because we publish their results on a monthly basis, they all get it, they hated it because we publish exactly how many they've got and what*

percentage they've got for the month and it caused a lot of consternation and initially we
said oh well, suck it up, get better (PHO Manager B, Bay of Plenty DHB).

6.6.3.3 Support for practice nurses

One of the key roles of the PHOs in the implementation of the health target was to provide support to the practice nurses within their providers. This support involved regular visits from the Immunisation Team (Hawke's Bay DHB), the Immunisation Coordinators (Auckland DHB and Bay of Plenty DHB) or staff from the PHO (Waikato DHB). These individuals worked closely with the practice nurses to ensure that they were aware of the immunisation health target, and how it was measured, and to improve the systems and processes for immunisation within each of the primary care providers.

They provided NIR training for their practice nurses so they were able to use the NIR to request immunisation records, set up alerts when children where due to be recalled for an immunisation, and to enter a child's information correctly to make sure that they would be counted towards the providers performance for the health target.

> *If I see an issue I will go out to the practices and go through it with them, have a training*
> *session. We also run regular training sessions that the PHO funds. We bought six days of*
> *training for every two months a year, we do a clinical one and an admin one … plus there*
> *is tips and tricks, I send out an email to all the managers saying 'I noticed your*
> *immunisation rates are a bit low, these are some things you can check' and I might print*
> *them some query bills that they can run through the system to help them check, sort of*
> *practice liaison stuff. It's really interesting and rewarding when you find a problem*
> *because it makes it much nicer for the nurses, they are doing so much work and if you*
> *find that it's just a data entry issue it's quite easy to fix (PHO Quality Advisor, Waikato*
> *DHB).*

They also provided ongoing telephone support for the practice nurses on processes for the NIR as well as any questions or concerns about immunisation that they needed to address for parents.

> *Another one of my roles that's quite big is answering telephone calls from practice*
> *nurses, 'oh I've got a little four year old come in born in South Africa had this and this*
> *and this, what do I do next?' So I say 'right, let's turn to the handbook, page such and*
> *such, you reading it and I'm reading it, have we got the same page?' … I don't get*

members of the public ringing me about questions, usually they will ring the surgeries and then the practice nurses will ring us (Immunisation Promoter, Hawke's Bay DHB).

One of the Immunisation Coordinators at Auckland DHB also developed a manual for practice nurses that covered step-by-step instructions on immunisation processes such as entering information on the NIR, generating NIR data requests, recalling children for immunisations and referring to outreach immunisation services. This manual was funded by the DHB and given to all of the primary care providers across the region.

ADHB decided that they would fund that so that manual was produced and then disseminated to practices. Now I'm sure that in a lot of practices it sits on the shelf, but having said that, any time there is a new practice nurse coming in, I would go visit them and go through the manual because up to that time, people learnt Medtech by Chinese whispers. So new people might pick up the bad habits or the no habits of the people who taught them and there was stuff they didn't know (Immunisation Coordinator A, Auckland DHB).

All of the case study DHBs had newsletters to share information on immunisation with the practice nurses in their providers. This included reporting coverage rates across the different providers in the PHO, information on best practice for immunisation, updates of disease outbreaks in the region as well as tips and suggestions on ways that practice nurses could improve immunisation coverage.

But I did a feature on the top ten tips to get good results and I put one on each week for ten weeks because the common problems are query builders, keeping your inbox clear of messages, checking that the NIR messages are going well, being vigilant about precalling your babies and recalling and if you've recalled three times, do it weekly, even two or three daily, they use to in the old days do it monthly, so it was a big shift to get them to do it weekly and so even two or three days, if the child has not responded, do another phone call or send another text, so you can quickly send them off to OIS (Immunisation Coordinator B, Auckland DHB).

A number of key informants stated that they made sure that they had a good working relationship with the practice nurses in Māori health providers in their region. This involved going out to visit the providers on a regular basis as well as providing ongoing support around using the NIR and support around delivering immunisations.

Our relationship with the Māori providers still helped, I think that got closer and closer, continuously improving. I still go out there at least once a month and I talk to them on the

phone and make sure everything is alright. I still identify the ones that transfer into their practice, that is still all going, still the same processes. We didn't let anything slip, especially with our Māori providers we did not let anything slip, if they needed us we were there, technical support, clinical support, we're always there for them and they could rely on us (NIR Coordinator, Hawke's Bay DHB).

6.6.3.4 Following up parents who declined immunisations

Following up parents who declined immunisations for their child was a new process that all of the case study DHBs implemented to address the health target. Some of these parents were true decliners, they were ethically against immunisation and did not want their child immunised. However, many of these parents were only delayers, they had not wanted to immunise their child at the time they were asked, but wanted more information or more time before immunising their child.

We've worked with so called decliners, anyone who is a definite decliner we leave them alone, but sometimes we look at one person and they've got some of their imms and some they have declined and if you ring them up they haven't sort of declined immunisation but they didn't want them that day or something. And the practice nurse put them down as declined and normally that would have gone through as a decliner but often, yeah you can get them off the decliner lists, so that has helped a lot too (Immunisation coordinator, Hawke's Bay DHB).

Following up decliners ensured that the information that had been entered on the NIR was correct and that children did not miss out on being immunised. Although it only reduced the decline rates by a small amount, this became more significant as the case study DHBs moved closer to the final health target of 95 per cent immunisation coverage.

What the system had done was that as soon as you decline it ignores you then and that was because they didn't want people to be bothered but it did mean that some of those people who then chose to vaccinate and [Immunisation Promoter] was then able to either vaccinate them herself or put them in touch with their GP practice and get vaccinated. So in that way that work at the decliner level then allowed us really to get up over the 95% because we reduced the decline rate, but we hadn't reduced the decline rate by changing people's minds, it's about the systems (Medical Officer of Health, Hawke's Bay DHB).

This process also allowed the DHBs to develop protocols for parents who genuinely did want to decline immunisations and ensured that they were aware of the implications of this decisions and were making an informed decision on behalf of their child.

> *What we're also looking at is a declination form, it's done as an invitation for people to reconsider and an invitation for people to talk it over with their GP or some other numbers they can go with. We've asked them if they would like to discuss it further, if they still feel that way then this is a form they can sign. And it's seen as a way for them to confirm their thoughts, so that it's well documented. It's actually protecting their wishes so to speak, but it's also protecting the health professionals if something happens then they can prove that they tried to have this conversation and gave people information, but they've decided that despite the known risk to their child, they've decided to decline (Medical Officer of Health, Waikato DHB).*

One of the challenges that all of the DHBs faced was the impact that these decliners had on their ability to achieve and maintain the immunisation health target. PHOs or DHBs who had a rate of true decliners over 5 per cent would never be able to achieve immunisation coverage rates of 95 per cent. A number of key informants, particularly at a PHO level, stated that there needed to be flexibility around achieving the health target when a community had a high rate of decliners.

> *I think it is achievable the only issue is the declines, because you can't make people have immunisations, we are a country of free choice, so there is nothing we can do about that so I think what's important, and I don't think a PHO or practice should be penalised if they only achieved 92% but they have definitely got 8% declined and they've got that documented that those parents did decline, so you might not be able to achieve the target, but you should be held accountable for 100% of your population (PHO Information Advisor, Waikato DHB).*

One of the PHOs within Bay of Plenty DHB implemented a training session on telephone technique for some of their practice nurses. By developing the way in which practice nurses talked to parents over the telephone, and giving them more confidence to have these difficult conversations, the PHO hoped that they might be able to reduce the number of parents who declined immunisation.

> *But with seven or eight per cent declines, so if you add them up, it's never going to happen, getting to 95 per cent. We started talking about it a while back and we implemented some training with the nurses on how to have the difficult conversation with parents, we've done a rough evaluation of that with parents and I'm not convinced. For*

those that did the training and liked it and use it, they say it works and helps them a lot but there were two practices that really adopted it well, one practice reduced their declines the other one increased … but anecdotally the nurses who did it said it was useful, the problem was that not enough did it (PHO Manager A, Bay of Plenty DHB).

6.6.3.5 Lay advocates for immunisation

Bay of Plenty DHB introduced two new Lay Advocate roles, who were located within each of the two large PHOs in the district, to support the implementation of the immunisation health target. The Lay Advocates were both young Māori women who had connections with the local Māori communities in their respective regions. One of the roles of the Lay Advocates was to visit mothers on the maternity ward and ensure that both the mother and the baby were enrolled with a primary care provider before they went home.

[The Lay Advocate] was going up to the annex to speak with new mothers and one of the problems when they are getting that six week [immunisation] started, is around enrolment. And because the mother is under a midwife, they don't present to general practice until after six weeks. So getting that timing, or getting them in before or at six weeks was difficult … So what we've done is look at early enrolment and getting the practice engaged with the mother and child straight after birth (PHO Manager A, Bay of Plenty DHB).

Another role of the Lay Advocates was to visit community groups for mothers, such as antenatal classes, mother's groups, early childhood centres and local marae, to discuss the importance of immunisation. They were able to talk about immunisation in a way that may have been more accessible for mothers than a discussion with a health professional.

I think that we're still developing the Lay Advocacy role, even though we're in to it a little bit, I think there is a lot that could be done with it. I think having someone who is not clinically focused, with that clinical background, the language that they use and their rapport with the families is going to be different even though clinicians are very mindful about the language that they use. We're coming from a different paradigm really, when we're talking with the families, so I think there are a lot of advantages to having a lay person (Immunisation Coordinator B, Bay of Plenty DHB).

The Lay Advocates were also responsible for the administration work for the outreach immunisation services at each PHO. This involved a significant amount of time spent finding children who were not engaged with their primary care provider and working with the outreach nurses.

There's a little bit of cold calling sometimes, and sometimes they will turn up and the family is not there, but she is really good at tracking people down, you know, she'll go and knock on the neighbours door and say 'where are they, do you know where they are?' And they'll say 'yeah, they're down at so and so'. She's really good with that and also I think they are well known in the area now so people are quite relaxed with them (PHO Manager B, Bay of Plenty DHB).

6.6.4 Improving systems and processes at a primary health care level

The majority of immunisations are delivered within primary care settings and it was the responsibility of the PHOs and DHBs to support change at the primary health care level. There were a number of organisational processes for immunisation within primary care providers that needed to be improved in order to improve immunisation coverage at the primary care level. Some of these processes were already part of the core business for primary care providers. While other processes needed to be developed and embedded within the day to day work of the provider and these changes took time and commitment from the practice nurses and the individuals at a DHB or PHO level who were supporting them.

Well I think a lot of it is what's been happening in the practice, that's probably been the biggest change. The practices are as I said taking more, doing more opportunistic imms, they're probably got different ways of recalling, perhaps they're recalling by text rather than calling or by letter. They perhaps manage their, they've got different systems like DoctorInfo which can manage their overdue list. There is probably more pressure coming from the PHO themselves to focus them, there's more reviewing of declines and looking at whether declines are actual declines or they shouldn't really be put as declines. So it's all about how practice management systems are recording what the practice nurse does around immunisations (Outreach Provider, Auckland DHB).

6.6.4.1 Primary care knowledge about how the health target was measured

One of the challenges the PHOs and Immunisation Coordinators faced was making sure that the staff within their primary care providers understood what the health target was measuring and how the health target was calculated. The performance incentive for immunisation had been measured at three years of age and the discrepancy between this incentive and the health target created confusion about what the health target was measuring.

We found that practices didn't really know that, they didn't understand how the targets were measured. It used to be, under the performance programme, as long as they were done before they turned three, they were counted in the performance programme, now it's before they turn two and the practices are still just learning this (Immunisation Coordinator A, Bay of Plenty DHB).

There was also confusion around how the health target was calculated and how long primary care providers had to achieve the incremental targets set each year. The health target was calculated on a quarterly basis using data from the NIR. However, some of the primary care providers were under the impression that they had the full year to reach the health target. This created problems when the PHOs and DHBs were held accountable for not meeting the health target during the first and second quarter of the year.

Nurses didn't understand how the target was calculated, so we needed to make them understand that. The one turning two years in this quarter are the ones the target will be based on whether their immunised or not (NIR coordinator, Auckland DHB).

The PHOs and Immunisation Coordinators needed to work with their primary care providers to address these misunderstandings to ensure that they were working towards the correct age and time frames for the health target. When the health professionals within the providers understood that the health target measured immunisation at two years of age and that this was calculated on a quarterly basis, not across the whole year, significant improvements were made in their performance towards the health target.

When we actually reached the national target and actually exceeded, we looked back and reviewed some of the things and one of the things was that the practices were actually were doing the magi [the work], the work was being done, there was no doubt about that. And that there was still room for improvement, but they weren't capturing the data and they didn't understand how the performance programme worked. So it wasn't a priority for them to get that data, the correct data into where it was going to be pulled out and from where we were going to measure them. So I think our first part of the plan was to actually bring everyone on track around what it actually meant, what the performance target meant and tried to get them to understand why they had to reach these targets. And once they had a goal, once they understood that and we said okay this is where you want to go, they actually had something to improve on and go for (Māori PHO Quality Coordinator, Waikato DHB).

In Auckland DHB, there was initially some resistance from the doctors and practice nurses around their responsibility to meet the health target. The Immunisation Coordinator was able to address this resistance with the support of the PHO.

> *I had a meeting with each practice, with the practice manager and the doctor and said 'this is what we need to do'. There was some resistance, like 'why should we bother doing this? What has the PHO ever done for us?' We did use a doctor from our clinical committee with one practice who were, not entrenched, intransigent in their approach, 'we're good doctors and nurses, we don't have to worry about targets, and we don't have to do anything'. And this doctor was able to say to them 'that's what you're saying, these are your results, with those results you don't get the performance payment, do you see a problem with that?' (Immunisation Coordinator A, Bay of Plenty DHB).*

6.6.4.2 Identifying an immunisation champion within primary care providers

The Immunisation Coordinators within Auckland DHB and Bay of Plenty DHB required each primary care provider to identify their own champion for immunisation.

> *In almost every practice now we have got an immunisation champion. So I've gone around and said 'okay, I need one nurse that I can liaise with'. Hopefully one doctor that will support her. So we've got that set up, so they do all of the recalls, they are kind of conscious of which kids need to be done, they're setting up alerts on their practice management system so all of their staff know that these kids are overdue. Where it's working really well, that's what they're doing (Immunisation Coordinator A, Bay of Plenty DHB).*

This gave the Immunisation Coordinator a contact within the provider that they could work with around improving processes for immunisation. It also improved accountability for immunisation and the health target within the providers as there was an individual responsible for the organisations performance towards the health target.

> *I focused on the ones that had poor performance and there were about five practices down in the 60 per cent range and they are all now in the 80 per cent range and that's because they all came up with a nurse who would be dedicated to immunisation (Immunisation Coordinator A, Bay of Plenty DHB).*

In primary care practices which did not identify an immunisation champion, the Immunisation Coordinators needed to be flexible and ensure that all of the practice nurses received information about changes to the immunisation processes.

We've got a couple of practices where a nurse is with a doctor and she only does that doctor's work, so you might have to talk to five nurses but there is still a lead nurse. So you just talk to the lead nurse and say 'can you talk to all of your nurses and get them to fill in their overdue reports and send them in'. So that is a bit trickier and cumbersome but that is the way they want to work so we just work along with that (Immunisation Coordinator B, Auckland DHB).

6.6.4.3 Enrolment with a primary care provider

One of the challenges that primary care providers required support with was making sure that children were enrolled with a provider once they were born. This ensured that they have a primary care provider who can contact their parents about their first immunisation event at six weeks of age.

To link up the children to primary care was very important, we identified, children are born, we get the notification from the hospital system or midwife but unfortunately either the mother doesn't give the midwife the GP she will take her child to or she doesn't know. So the result is that we have the child registered with the NIR but with no GP. So we call this status unknown provider, because we don't know about the provider. We know that the earlier the child is linked, or the earlier they have a healthcare provider the better the immunisation outcome will be (NIR Coordinator, Auckland DHB).

Bay of Plenty DHB addressed this issue by making sure that mothers had enrolled their babies with a primary care provider before they left the maternity ward at the hospital. The Midwife Leader at the DHB had taken a leadership role in this area to ensure that midwives were aware of their responsibility to identify a primary care provider and enrol children on the NIR. And the lay advocates that were appointed half way through the health target experience also talked to new mothers while they were on the maternity ward and helped them to enrol their child with a primary care provider before they went home.

Auckland DHB developed a new baby welcome letter that was sent to all new mothers in their region when their chid was registered on the NIR. This letter provided an alternative pathway to ask for the primary care provider of a child if this information was missing from the NIR. If the

mother did not provide this information, the child was automatically referred to the outreach immunisation service to receive their six week immunisations.

> *The NIR after registering a child, automatically sends a letter saying we have received notification that a child has been born, if the GP is unknown, we would write there is no GP named for that child and we put in a form saying please provide GP name, things like that. And mothers will happily ring up and say my GP is, and they give us the name (NIR Coordinator, Auckland DHB).*

The NIR Coordinator at Hawke's Bay DHB realised that many of the children who were not registered with a primary care provider were Māori and that their families were also not registered with a provider. To address this issue the NIR Coordinator worked with the PHO to make sure that all of these children and their families were enrolled with a primary care provider.

> *I've just started working with the PHO, which will start next week, to make sure we've got that all Māori births are registered with a GP. This has only come up for next week, there is a notice that the majority of the Māori children, they don't have GPs, but I've noticed that the whole family don't have a GP, so when they're not registered anywhere, they don't get recalls, they don't get reminders, they don't get any help. So from next week, hopefully, we should be able to link all those one's up, that have no GP to a GP in the PHO yeah. So hopefully that's one that should work (NIR Coordinator, Hawke's Bay DHB).*

6.6.4.4 Contacting parents about immunisation events

Primary care providers already had processes in place to precall children when they were approaching a scheduled immunisation event and to recall them for a follow up event. This usually involved sending out letters to parents and following these letters up with a phone call to make an appointment for them to bring their child into the practice for their immunisations. If they were unable to contact the parents, or the parents did not show for their appointments, they were usually referred on to the outreach immunisation services for follow up.

However, these processes of reminding parents that their child was due for an immunisation event and referring children on to the outreach immunisation service varied between different primary care providers. Aligning these processes across primary care providers and ensuring best practice was one of the areas where the PHOs and the Immunisation Coordinators were able to make significant changes at the primary care level.

It was mainly recalling and phoning and then they come in. If they don't, each practice was different then, some would send two letters and if they don't respond they phone and then that was it. That was before the outreach came in, that was what we usually, that was normal. We recall by letters or phone but when the outreach came in that's when, if they're unresponsive for three times then they are referred to outreach (PHO Nurse Leader, Auckland DHB).

Improving the processes for precalling and recalling children required practice nurses to regularly set aside time to contact parents every couple of days, or once a week, rather than monthly. Alerts were set up on the practice management systems to remind them when a child was due for an immunisation event. All of the DHBs developed processes where the NIR provided practices with more relevant and up-to-date information on children who were overdue on their immunisations. This gave the practices more time to find children, or refer them on to outreach services if they were unable to immunise them.

We put a lot of systems in place for immunisations, capturing those hard to reach children, keeping on top of the practice staff with reminders and prompts, trying to reduce the number of catch ups because they go past the measurement date if they've started too late (PHO Manager A, Bay of Plenty DHB).

A number of primary care providers within the case study DHBs, particularly the kaupapa Māori providers, also introduced a text reminder system to recall children for the immunisation events. They found this a highly effective way of contacting parents who may not have a landline phone or permanent address.

I think what's been successful particularly for the kaupapa Māori PHO is text to remind. So they implemented a text to remind system and it reduced their DNAs [Did Not Attends] largely, I can't remember exactly but it was amazing and it also increased their immunisation as well. So that was a big success factor for them and now other PHOs are looking at implementing it too, some of them have already and some of the general practices (Planning and Funding, Bay of Plenty DHB).

If the parents did not respond to a set number of reminders the child would then be referred to the immunisation outreach service who would then follow up with the parents and offer to immunise them at home.

6.6.4.5 Referring children to outreach immunisation services

All of the DHBs developed processes that automatically referred children to their outreach immunisation service at a set age to ensure that they would have enough time to catch up on the vaccinations they had missed before they turned two. Some of the primary care providers resisted this process initially, but the PHOs and Immunisation Coordinators emphasised that it was necessary for them to work together to make sure that the child was immunised.

> *One of the systems changes we've made, we've sort of specified a time which the child is considered overdue, just going to be referred to the outreach team … and that might sound like an easy thing to do, but we need to go back to general practice and say 'this is what we're doing' and some of them get upset when you say we're referring the kids in their practice. But we say 'look we did this other process with you where we emphasised precall and recall, we know that you're doing all those things, this is to help you, because this child you are struggling to connect with, this is a home visiting team'(Planning and Funding, Auckland DHB).*

6.6.4.6 Opportunistic immunisations within primary care providers

The PHOs and Immunisation Coordinators encouraged their primary care providers to conduct opportunistic immunisations when children came to medical appointments or were accompanying a parent or sibling who was there for an appointment. This involved checking the immunisation records of each child who visited the primary care provider and if they were not fully immunised, offering their parents or caregivers the opportunity for them to have the immunisation then.

> *At the practice there has been a lot of focus on missed opportunities at the practice. So if a child comes in for stitches or whatever they come in for, if the practice you know, is also aware that they need immunisations they give them and also siblings too. So I think that's made a big difference (Outreach Provider, Auckland DHB).*

This was an area that the Immunisation Coordinators were able to encourage practice nurses to change the way that they approached immunisation in their day to day work. However, it continued to be an area where they saw room for improvement.

> *This child was overdue, he came in and saw you for a minor illness, there was no infection, you took his temperature and it was okay, so why did you not immunise? Getting*

the nurses to understand about the missed opportunities in general practice, there is still a
lot of that (Immunisation Coordinator A, Bay of Plenty DHB).

6.7 What happened after the health target ended?

When the health target ended in July 2012, immunisation coverage had increased within all of the case study DHBs. Hawke's Bay DHB had exceeded the immunisation health target by improving immunisation coverage at two years of age to 96 per cent and Auckland DHB achieved the health target of 95 per cent. Waikato DHB and Bay of Plenty DHB did not achieve the immunisation health target but they had significantly improved immunisation coverage at two years of age to 92 per cent and 91 per cent respectively. So what happened after the health target ended? Did the DHBs maintain a high level of immunisation coverage at two years of age? And how sustainable were the changes that were made to address the immunisation health target once it had ended?

6.7.1 Recognising success for progress towards the health target

The Ministry of Health provided funding when the immunisation health target ended to recognise success and acknowledge the hard work of individuals and organisations at the local level. DHBs that had achieved the immunisation health target or had increased their performance towards the health target by 3 per cent during the last quarter received this funding and were able to use it to hold a celebration around the immunisation health target. Key informants within all of the case study DHBs stated that they appreciate this gesture from the Ministry of Health as it recognised their hard work and effort towards the immunisation health target.

The Ministry put out funding to show their appreciation to the PHOs who got 95% and
Auckland used it for the celebration night, it was fantastic, everyone loved it, first time ever
that I know nurses have been pampered or treated and we had prizes. For the nurses who
were there it was fantastic (Immunisation Coordinator B, Auckland DHB).

6.7.2 New health target for immunisation

When the immunisation health target for two year olds ended in July 2012, a new health target for immunisation was introduced to replace it. The new health target stated that 95 per cent of

babies will be fully immunised by eight months of age by December 2014. This gave DHBs three months to follow up on the immunisation event that is scheduled for five months of age. It was a shorter timeframe than the health target for two year olds, which had given the DHBs twelve months to follow up on the immunisation event scheduled for one year of age.

During the first phase of interviews for this research, many of the key informants had anticipated that there may be a shift in age after the health target for two year olds ended. Although immunisation coverage had significantly improved at two years of age, coverage and timeliness for other immunisation events were poor.

> *So we're already thinking now, that's probably where the Minister is going to go, because if you ensure that your six month is on time then it's going to flow through anyway. So we're thinking about strategies if we're going to shift our focus to the six month, what would that look like. So we're already planning ahead for that now. And we've been talking to practices about that for a few months, because they are really dismal. Our six month rates are very low. So you know, we've got a lot of work to do there, but if that's where the focus swings then we're ready to do it (Planning and Funding, Bay of Plenty DHB).*

The second phase of interviews for this research took place a couple of months after the health target for two year olds had ended. Many of the key informants stated that the new eight month health target would be achieved as the improved systems and processes for immunisation were already in place.

> *I guess what was valuable was that, with the change of target, because of the system we had set up, when the new target came in it just fell into place, we didn't actually have to change the system. We didn't actually have to change anything (Planning and Funding, Bay of Plenty DHB).*

Key informants highlighted the connection between focusing attention on children being fully immunised at eight months of age and maintaining high rates of immunisation coverage at two years of age.

> *I see the eight month target as supporting what we are doing for the two year old coverage. So it will actually be a lot easier because once we start bringing our eight month coverage up it means that it's just one more event. Because what we were finding certainly at the beginning of the contract for the two year old target was that by 20 months we would have someone referred to us that needed three events, so that's not doable. So we put systems in place to try and have an earlier referral (Immunisation Coordinator B, Bay of Plenty DHB).*

However, some of the key informants were concerned that immunisation coverage at two years of age would decrease after the end date of July 2012.

> *If we get things going well at eight months then ultimately they'll eventually become our two year olds, so things should be improving. But I wouldn't be surprised if there is going to be some deterioration in the two year old target, but we're still looking at them, we're still trying to get them up to date just before they turn two. There's still activities going on there but it is a challenge for the primary care and outreach and mobile services (Medical Officer of Health, Waikato DHB).*

> *I think the two year is going to drop off because the concentration will be on the eight month, so I think there is going to be a period where it falls back because there is only the same number of nurses and resources available, however in the longer term that will improve because eventually those eight month olds will be two (PHO Information Advisor, Waikato DHB).*

Some of the challenges that were addressed during the health target for two year olds experience, such as access to immunisation services, would present a greater challenge at eight months of age due to the shorter time frame to find children who were not accessing primary health care and follow up on the immunisation events that they had missed.

> *We really are going to be struggling with this new target because a lot, because a fair proportion of our, if you look at the disparities early on, what we had with the two year target, we had significant disparities based on ethnicity and socioeconomic status, with the way things so dramatically, those disparities were gone, but when you go back and look at the six month figures then those disparities were all back there again. So we know that access is a major issue (Medical Officer of Health, Waikato DHB).*

6.7.3 Maintaining rates of immunisation coverage at two years of age

When the health target ended in the middle of 2012, there was a drop in the national level of immunisation coverage at two years of age during the following quarter. One year on from the end of the health target, immunisation coverage at two years of age was measured at 92 per cent. Key informants talked about the increased effort that was needed during the last quarters of the health target experience and that once the health target ended in July 2012 this level of effort dropped off.

We initially dropped a percentage or two in July, but that came back up in December, but that often happened anyway and like every part of the country and often each year there is a drop in July because often there is a big push before the end of the year and after that I think a little bit goes off the pedal and its winter (Planning and Funding, Bay of Plenty DHB).

A number of key informants also spoke about the inclusion of the PCV vaccine for a child to be considered fully immunised after the health target ended. The PCV vaccine had been on the National Immunisation Schedule since June 2008, but it was not included in the measurement of immunisation coverage until after the health target ended.

The coverage has reduced at two years, it's gone from 95 per cent to 93 per cent and probably 92 per cent and about 1 per cent of that is that now the reports include PCV, which they didn't before, and there are a number of children that decline PCV for some reason. I really haven't focused on the fact that that's not been there, for the last, for the years that I've used those reports. Because I hadn't perceived that it made a difference, but it seems that 1per cent or 2 per cent has made a difference (Immunisation Coordinator A, Auckland DHB).

6.7.4 Sustainability of systems and process

Maintaining high rates of immunisation coverage into the future will depend upon the sustainability of the systems and processes that were implemented during the health target experience. All of the key informants talked about the importance of sustainable systems and processes for immunisation.

I think the targets are very useful at focusing attention as long as you can then get your systems and processes correct for that particular target and ensuring that they're sustainable, and that's the key, that they're sustainable, once you have that sustainability you can move on to other things, you can do the same processes (Immunisation Coordinator B, Bay of Plenty DHB).

A number of key informants also felt that they had reached a level of sustainability as the systems and processes they had implemented during the health target experience became embedded in the organisations at the local level. Hawke's Bay DHB in particular maintained high rates of immunisation coverage during the last two years of the health target experience.

I think our data is showing that we've reached that sort of sustainability, where we've been tracking at 95% since the middle of last year, a good twelve months of being around the 95% mark, so it think those systems are established, it doesn't mean we can walk away and let it all, deal with it, we continue to put a lot of effort in training vaccinators, maintaining vaccinators, the core of this is about primary care but it's also about the role and contribution others can make (Medical Officer of Health, Hawke's Bay DHB).

And key informants at a DHB level also highlighted that they were still required to report on their performance for immunisation coverage at two years of age to the Ministry of Health, alongside their performance towards the new health target of eight months. They felt that this ongoing monitoring would continue to focus attention on immunisation coverage at two years of age and would support the sustainability of the systems and processes that had been put in place. This ongoing monitoring also continued at a PHO level and PHOs were still receiving a financial incentive for immunisation at two years of age as well as a new financial incentive for meeting the new eight month immunisation health target.

It's still part of our health target focus as well and its still, we developed an eight month milestone plan, but we still made it clear that 24 months was still, because we still have to report on it every quarter to the Ministry, so it's still something they keep their eye on and they are happy with that. We are hoping it's going to be sustainable; it looks like it has been over the first three months (Planning and Funding, Bay of Plenty DHB).

However, a number of key informants stated that sustainability could become an issue in the future if priorities changed and funding shifted to meet new policy objectives. This was a particular concern for Waikato DHB, which had invested substantial new funding to address the immunisation health target for two year olds.

I think when the target stops there is a risk that some of the funding will go because normally when one health target stops another one comes on board. They are health targets at the moment, they have been other objectives in the past, they have been given different names but effectively one thing stops and another thing comes on board and with a finite sum of money that could shift wherever the new health target is. So there is a risk if you don't have it, funding will go elsewhere. Although I don't think we would slip back down to the levels of immunisation that have been in the past, but certainly we wouldn't have the same level of investment going in as previously (Planning and Funding, Waikato DHB).

One of the significant challenges to sustainability of the systems and processes for immunisation will be changing workforces, particularly within primary care providers. Many of

the systems and processes for immunisation at a primary care level require practice nurses to be confident and competent in providing immunisation services and also working with the practice management system and NIR. Providing ongoing support and training for practice nurses may be one way to ensure that these systems and processes are maintained and sustainable, even when there are staffing changes.

> *And of course, health being as it is its always changing. And that goes for the workforce. I mean, I firmly believe that if you can put in place best practice immunisation systems and processes and if the service can champion those systems and processes that even though your workforce may change, as long as it's rich within that service or a way that they practice, that hopefully even though your staff is turning over, those processes will just be part of the orientation, part of the environment of the delivery (NIR Coordinator, Auckland DHB).*

Another area of concern for key informants was the sustainability of outreach immunisation services after the health target for two year olds ended. The role of the outreach immunisation services was to support primary care providers by providing immunisation services to the small proportion of children who were not engaged with primary care. However, immunising children through an outreach service is much more expensive and time consuming than immunising them through a primary care provider.

> *As long as we keep the percentage of referrals to 5 or 10 per cent of our children then it will be sustainable, if it pushed up to 30 per cent of children then it wouldn't. And what I notice is of those children that are referred to outreach, the first component of outreach is that they have to phone the mother and give them the option to go back to the practice to get vaccinated or outreach comes to them, of all of the referrals that come to outreach 50 per cent of them will go back to general practice to get vaccinated so we're only really going out to do 50 per cent of those referrals, so that is our biggest push, to get them back to the practice, because certainly it's a lot cheaper doing that (PHO Manager A, Bay of Plenty DHB).*

6.8 Dysfunctional consequences of using a health target

The health target improved immunisation coverage and reduced immunisation inequities at two years of age within all of the case study DHBs. However, some of the key informants expressed concern that focused attention on the health target may have narrowed the scope of immunisation at the local level. Timeliness of immunisation events continued to be an issue at

other ages that are measured by the NIR. And the sustained pressure to achieve the health target each quarter increased the level of stress that these health professionals were working under on a day to day basis. By the end of the health target, many of the key informants, particularly the Immunisation Coordinators, were experiencing target fatigue.

6.8.1 Narrow focus on the health target

The health target focused attention on improving immunisation coverage at two years of age and elevated this policy objective on the local policy agenda. However, one of the criticism of health targets within the policy literature is that they divert attention away from other issues.

> *Well the whole point of a target is to focus effort and inevitably by focusing effort you have to reprioritise as there is only so many hours in the day (Planning and Funding, Auckland DHB).*

It is possible that the immunisation health target shifted attention away from other child health issues at the local level. One of the key informants expressed concern that the focus on the immunisation health target may have given the DHB management team the impression that that they had good health outcomes for children within their region.

> *We didn't get resources pumped into immunisation so you can't really say 'that's where our resources for child health went'. But certainly that was what the conversation was, what was being reported through to Board level, it may have given some of our senior managers an unreal belief that everything is fine in child health in Hawke's Bay because our immunisation rates have been so good and in actual fact there are a lot of other issues that haven't reached them that they might be surprised about when they see because the immunisation rates are so good (Medical Officer of Health, Hawke's Bay DHB).*

And a number of key informants stated that although they had improved immunisation coverage, improving the systems and processes for other health services that are delivered at a primary care level remained a challenge.

> *Yes we really did well on immunisation … but you wouldn't want to look at our cervical screening or breast screening rates. And in general practice if you really, and they did put a lot of effort into it, then inevitably unless you put in extra resource, something has got to drop (Planning and Funding, Bay of Plenty DHB).*

Determining what other child health or primary health care issues were disadvantaged by the focus on immunisation is difficult. Immunisation is just one part of the day to day work of primary care providers and they continued to provide many other health services to their enrolled populations.

> *I don't think anything else particularly suffered … we had already been doing a lot of work on immunisation, it just gave us more focus, but we still have to do our general business anyway (Medical Officer of Health, Waikato DHB).*

6.8.2 Timeliness of other immunisation events

The health target focused attention on ensuring that children were fully immunised by two years of age. However many of the key informants expressed concern that this focused attention may have overshadowed immunisation coverage rates across all of the other ages that were measured.

> *The other flip side of this, because we've focused on the health target, all the work that's gone into improving immunisation rates at two years and we haven't had the same effort going into improving immunisation rates at six months, and twelve months, and eighteen months and five years. So yes you might have good figures for two years, but our figures for the other rates are still a lot lower than they should be. And that's the flip side to it, yes you focus attention on the health target, but you're not capturing the whole spectrum of immunisation work (Planning and Funding, Bay of Plenty DHB).*

Timeliness in starting immunisations and receiving immunisation events was a significant issue for Māori children and therefore immunisation inequities between Māori and non-Māori. Although immunisation coverage at two years of age increased for Māori children during the health target experience, there continued to be significant immunisation inequities between Māori and non-Maori children at younger milestone ages.

> *Because we're still seeing a disparity between Māori and non-Māori at the eight month and I think that's picking up some of those issues we do have with later enrolment of the babies, some younger mums, some of those mums being late into the ante-natal process, so that whole decision making and knowledge is just you know, you've got the first six months of the babies life, it's all quite challenging … but I think we can do it because it's about systems and support and about really having that focus, so I still don't hold to the fact that we should accept any disparity at eight months, I haven't been convinced that*

there is a genuine reason why there is a difference really (Medical Officer of Health, Hawke's Bay DHB).

6.8.3 Prioritising children to receive outreach immunisation services

All of the case study DHBs implemented to outreach services for children who were close to turning two years of age. These children were flagged as a priority and outreach services were expected to focus on immunising them ahead of other children that had been referred to them.

I also have ethical concerns around it when some services are only available to children under two because of the target. Whereas I think that's unethical and I think access to services, it's not a child's fault that they might be three and moving into a new area and are not perhaps focused on the same. It's just their bad luck that they happen to be in a family where they can be taken to their GP. So to me, yes the target's good, but I don't like to see it used to just direct service to under two's (Outreach Provider, Auckland DHB).

6.8.4 Pressure to achieve the health target

All of the key informants talked about the intense pressure that they were under to achieve the health target. They were acutely aware that progress towards the health target was being closely monitored by the Minister of Health and their DHB Management Teams.

The health targets are followed very closely by our DHB … I remember saying to my manager and the manager of planning and funding about two months ago, we've dropped from 95 per cent and it looks as though for this next quarter we're going to be 94 per cent and he said 'oh I know that'. So it's been looked at a lot closer than I realised (Immunisation Coordinator, Hawke's Bay DHB).

During the final year of the heath target, everyone involved in immunisation within the case study DHBs worked very hard to ensure that their DHB would achieve the health target of 95 per cent.

We kind of got really intense on that last quarter, everything got more intensified, because we ended up at 91 per cent for total, and 90 per cent of Māori at the last quarter, so prior to that everything was like 'we've got one more quarter to go, let's ramp it up' (Planning and Funding, Bay of Plenty DHB).

This level of focus and effort was not sustainable and when the health target ended many of the key individuals driving the implementation of the health target within the case study DHBs said that they needed to take a step back and rest.

With the improved systems in place, I suppose, for me, I feel less driven and I feel a bit like I've lost momentum too. I feel like well is it because I need a holiday? (Immunisation Coordinator A, Auckland DHB).

6.9 Chapter summary

The immunisation health target used strong accountability mechanisms across each level of the health system to focus attention on immunisation coverage at two years of age. Once organisations within the case study DHBs took ownership for improving immunisation coverage in their region, the health target acted as a catalyst for change. These changes occurred through the health target networks that developed within the case study sites as individuals from different organisations came together to address local challenges and coordinate local action. Despite having local discretion over the implementation process, all of the case study DHBs implemented a similar set of systems and processes improving immunisation coverage and meeting the immunisation health target.

The next chapter of this thesis (Chapter Seven: Discussion) discusses the research findings in relation to the research questions and the literature. It also highlights the contribution that this research makes to the literature.

Chapter Seven: Discussion

7.1 Overview of this research

Increasing immunisation coverage to 95 per cent at two years of age had been a policy objective within the New Zealand health system since the release of the *National Immunisation Strategy* in 1995. A decade later, the *National Immunisation Survey* reported that immunisation coverage at two years of age remained well below the policy objective of 95 per cent, there continued to be significant immunisation inequities between Māori and non-Māori children and variation in immunisation coverage between different regions (Ministry of Health, 2007b; Turner et al., 2000).

In response to these challenges, the Ministry of Health introduced a health target for immunisation in 2007. The immunisation health target stated that **95 per cent of all two year olds would be fully immunised by July 2012**. Over the course of the immunisation health target experience, immunisation coverage at two years of age increased from 67 per cent to 93 per cent. While the rate of immunisation coverage at the national level failed to achieve the health target of 95 per cent, immunisation coverage at two years of age had improved significantly. Immunisation coverage rates for Māori children had increased to 92 per cent, reducing the level of immunisation inequity between Māori and non-Māori children from eleven per cent to one per cent.

This research set out to understand how the immunisation health target for two year olds improved immunisation coverage so dramatically. It explored how the health target was implemented at the local level within four case study DHBs. By understanding the implementation process at the local level, this research was able to consider how effective the health target was as a policy mechanism for improving immunisation coverage within the New Zealand health system. It also allowed the researcher to examine how the case study DHBs addressed immunisation inequities between Māori and non-Māori children within their regions.

This research was located within a realism paradigm and this approach is used to present and analyse the research findings in this chapter. It explores the mechanisms for change and contextual factors that enabled the success of the immunisation health target within the New Zealand health system. It also looks at the issue of dysfunctional consequences of the health target on health system performance and discusses a number of strengths and limitations of this research. The chapter ends by presenting the contribution that this research makes to the existing literature and examining the policy implications of the research findings.

7.2 Policy implementation research within a realism paradigm

As a research paradigm, realism assumes that we can make observations about a phenomenon, but that we may not be able to observe all of the structures that influence or shape this phenomenon (Sayer, 2000). What we can do is develop plausible casual explanations for a phenomenon based on the observations we are able to make. This research paradigm is well suited to policy research as policy implementation occurs within complex and dynamic social structures which make it difficult to identify how specific actions may contribute to the outcomes that are observed (Pawson & Tilley, 1997).

Pawson and Tilley's (1997) approach to realistic evaluation provides a useful framework for policy implementation research within a realism paradigm. It focuses on identifying the contextual factors and mechanisms for change that contribute to the policy outcomes. This chapter uses their framework of *context + mechanism = outcome* to present and analyse the research findings.

7.3 Outcomes of the immunisation health target

The immunisation health target was a very effective policy mechanism for improving immunisation coverage in New Zealand. The national level of immunisation coverage at two years of age had improved to 93 per cent when the health target ended in July 2012. Although the level of immunisation coverage did not achieve the health target of 95 per cent, this was a significant achievement considering the inability of previous policy attempts to increase immunisation coverage within the New Zealand health system.

The health target also reduced the level of immunisation inequity between Māori and non-Māori children, which had been an ongoing challenge within the New Zealand health system (Turner et al., 2000). In September 2007, the level of immunisation inequity between Māori and non-Māori children at two years of age was 11 per cent (59 per cent for Māori and 70 per cent for non-Māori). When the health target ended in June 2012, this immunisation inequity had reduced to one per cent (92 per cent for Māori and 93 per cent for non-Māori). And in some DHBs, immunisation inequities between Māori and non-Māori children were eliminated.

The following sections explore how the immunisation health target improved immunisation coverage and reduced inequities between Māori and non-Māori children. The first section examines the mechanisms for change that were introduced to improve immunisation coverage. The second section explores the contextual factors that facilitated the implementation process.

7.4 Mechanisms for change in the implementation process

Health targets are a classic hierarchical policy mechanism as they allow governments to use authority to direct the actions of organisations at the local level who are responsible for delivering publically funded services (Le Grand, 2007). This research identified a number of mechanisms for change that were part of the immunisation health target experience. Some of these mechanisms, such as the mechanisms for accountability and the immunisation surveillance system, were introduced by the Ministry of Health at a national level. While others were implemented by organisations at the local level in response to the immunisation health target.

7.4.1 Health target identified immunisation as a government priority

Governments can use health targets to provide leadership and strategic direction within a health system (Campbell & Gibson, 1997). In the New Zealand experience, the Ministry of Health introduced the immunisation health target in August 2007 as part of a set of health targets that would 'provide a greater focus for action and lift health system performance in priority health and disability areas' (Ministry of Health, 2008, p. 5). Almost two years later, a change of government saw the incoming Minister of Health revise the original set of health targets and place stronger emphasis on accountability for the health targets to both government and the public (Tenbensel, 2009).

The immunisation health target remained in the revised set of health targets and stated that 95 per cent of all two year olds would be fully immunised by July 2012. It clearly identified DHBs as the organisations responsible for achieving the health target and set a time frame in which the health target would be achieved. This combination of accountability for the health target and a defined period in which to achieve it focused attention on improving immunisation coverage at two years of age. It also elevated immunisation as a priority on the local policy agenda as it identified immunisation coverage at two years of age as a key priority for the Ministry of Health and the New Zealand government.

Carter, Day and Klein (1992) use the metaphor of dials or tin-openers to distinguish between the different effects that measurement of performance indicators can have within an organisation. Health targets that act as a dial steadily increase the level of expected performance while health targets that act as tin-openers open a can of worms that can then prompt further investigation and inquiry. The immunisation health target acted as a dial, as the

Ministry of Health used incremental health targets each year to encourage DHBs to steadily increase immunisation coverage at two years of age. The incremental health targets increased by 5 per cent each year until the final year of the health target when all DHBs were expected to achieve 95 per cent immunisation coverage at two years of age. Many of the DHBs achieved the incremental health target each year, but the use of incremental health targets encouraged poor performing DHBs to continue to focus on improving their systems and processes for immunisation services rather than becoming discouraged that they would never achieve the final health target of 95 per cent immunisation coverage.

7.4.2 Strong accountability mechanisms for the health target

The immunisation health target had strong elements of hierarchical accountability. This vertical dimension of authority was established and reinforced through a number of accountability mechanisms including: measuring and monitoring performance towards the health target, public ranking of DHBs according to their performance towards the health target, involvement by the Minister of Health when DHBs did not meet the health target and establishing a hierarchy of accountability for the health target across each level of the New Zealand health system. These accountability mechanisms created a culture of collegial competition between DHBs and organisations at the local level that facilitated innovation and transfer of policy learnings.

7.4.2.1 Measuring and monitoring performance towards the health target

Performance measurement within a health system has been described as 'the quantitative measurement of the results of health care … and of processes that are so closely associated with the results of care, that they can be used as surrogates for the anticipated results' (Mannion & Goddard, 2002, p. 231). Governments can use these measurements to monitor performance within the health system in a number of ways, but Hood (2007) identifies two forms of performance management that are relevant for this research. The first is the use of targets which measure performance towards an identified policy objective and the second is the use of ranking systems or league tables which measure current or past performance of organisations against one another.

The Ministry of Health measured and monitored DHB performance towards all of the health targets each quarter (every three months). The immunisation health target was measured using data from the NIR. The NIR holds the immunisation records for every child in New Zealand and the Ministry of Health utilised this data to measure the percentage of children turning two during

that quarter who were fully immunised according to the New Zealand Immunisation Schedule. This measurement was calculated at a national level and at a DHB level and was monitored each quarter to track each DHBs performance towards the immunisation health target.

7.4.2.2 League tables to compare performance across DHBs

League tables use performance indicators to compare the performance of organisations against each other. This ranking system places pressure on organisations to improve their performance relative to one another (Hood, 2007). The Ministry of Health created league tables for the immunisation health target each quarter. These league tables were published on the Ministry of Health website and in both national and local newspapers. The media attention that followed the publication of these league tables played an important role in motivating DHBs to improve their performance towards the health target. For DHBs that were performing poorly, the league tables held an element of 'naming and shaming' (Bevan & Hood, 2006b) as key informants talked about the pressure from DHB management to improve their ranking. For DHBs that were high performers, the league tables gave key informants a sense of validation and encouraged them to improve on and maintain high rates of immunisation coverage in their region.

One of the challenges in using ranking systems such as league tables is that they can focus attention on the organisations at the top and the bottom of a league table, allowing organisations in the middle to 'hide in the pack' (Carter et al., 1992, p. 48). However, in the immunisation health target experience DHBs were still expected to achieve the health target each quarter and the incremental health targets required an increase in performance each year until the final year of the health target. DHBs could not hide in the middle of the league table and fail to meet the health target.

7.4.2.3 Pressure from the Minister of Health

Measuring and monitoring performance towards the health target was strengthened as an accountability mechanism by the involvement of the Minister of Health when DHBs failed to meet the target set for that quarter. The Minister of Health would contact the CEOs of these DHBs to discuss how the DHB would improve their performance during the next quarter. This pressure from the Minister of Health on senior management within the DHB ensured that the immunisation health target was elevated as a priority within all of the case study DHBs.

7.4.2.4 Hierarchy of immunisation champions across each level of the health system

All health systems have some form of accountability between different organisations and between levels within the system (Brinkerhoff, 2004). Before the introduction of the immunisation health target, there was very little accountability for immunisation coverage within the New Zealand health system. The immunisation health target clearly identified DHBs as the organisations within the health system that were responsible for achieving the health target. DHBs were well placed to oversee the implementation of the immunisation health target as they were responsible for contracting immunisation services for their populations and could take a regional perspective on improving local systems and processes for immunisation.

This emphasis on accountability for the health target was reinforced by the Immunisation Champion at the Ministry of Health, who required each DHB to identify their own immunisation health target champion who would be responsible for the health target within their region. Early on in the health target experience, the case study DHBs either recognised an existing informal immunisation champion or identified an individual within the DHB itself to take on the immunisation champion role.

The concept of an immunisation champion was developed further and individuals at a PHO level and a primary care level were also identified as immunisation champions within their organisations. Within some of the case study DHBs, this required the DHB to create and fund immunisation coordinator roles that were located at a PHO level. By the final year of the health target experience (July 2011 to June 2012), this hierarchy of immunisation champions had become well established and reinforced the vertical dimension of accountability for the health target from a national level down to the DHBs, PHOs and primary care providers at the local level.

7.4.2.5 Collegial competition between organisations

One of the consequences of strong accountability mechanisms for the immunisation health target was the development of collegial competition between organisations across each level of the New Zealand health system. Health professionals work within a collegial environment where individuals from different professions need to cooperate to provide health services. An element of competition can motivate health professionals to improve organisational performance within a specific area while still maintaining an egalitarian culture of cooperation (Hood, 2012).

The use of league tables each quarter to compare DHB performance introduced an element of competition into the health target experience. Key informants within the case study DHBs were acutely aware of their DHBs ranking in comparison to other DHBs and improving their ranking motivated them to improve their performance towards the health target. However, this element of competition did not prevent DHBs from sharing what had worked for them with other DHBs around the country. The underlying values of protecting children from vaccine-preventable diseases and improving population health ensured that competition did not stifle communication and collaboration between DHBs. Instead it created a culture of collegial competition between DHBs, where they were competing against one another but also supporting and encouraging one another to improve their performance.

Within the case study DHBs, there was an element of competition between PHOs as each PHO knew how well they were performing towards the health target relative to other PHOs in their region. However, the PHOs also recognised that the health target was measured and monitored at a DHB level and this required them to work together to improve immunisation coverage across all of the PHOs in their region.

A number of PHOs replicated this culture of collegial competition by publishing their own league tables on a monthly or quarterly basis that compared the performance of their primary care providers against one another. One PHO openly named their primary care providers, while the others anonymised the league table so their providers could review their own performance relative to other providers in the PHO, but could not identify the other primary care providers. Primary care providers who were performing poorly were forced to recognise their performance was not at the same level as other providers in their PHO and that they needed to improve their systems and processes for immunisation. These PHOs were able to take what had worked within high performing providers and share these experiences with the providers that were performing poorly.

7.4.3 Accurate surveillance system for immunisation

Health targets require some form of surveillance system to measure and monitor performance over time (Smith & Busse, 2010). The immunisation health target was introduced two years after the NIR was established as a surveillance system for immunisation within the New Zealand health system. The Ministry of Health used data from the NIR to measure and monitor immunisation coverage at two years of age at both a national and DHB level. Measurements were also taken for Māori children at a national level and a DHB level as well as for Pacific children within DHBs that had a high proportion of Pacific children.

Measuring and monitoring a health target over time can expose discrepancies or gaps in the data that is collected and the need to improve performance towards the health target can motivate organisations to address these data quality issues (Carter et al., 1992; Sequist & Bates, 2010). During the first couple of years after the NIR became operational there were a number of challenges with data quality, particularly around under reporting on the NIR.

All of the case study DHBs ran data matching audits between the practice management systems within their primary care providers and the NIR. Key informants stated that these audits had exposed gaps in the data on the NIR and that between two and four percent of their true immunisation coverage had been missing. Children were being immunised but this information was not transferring from the practice management systems to the NIR. Under-reporting on the NIR had implications for these children, as their immunisation records on the NIR were incomplete and there was the potential that they could be given the same vaccines at a later date. It also had implications for the measuring and monitoring of the immunisation health target, as the health target used data from the NIR and in some of the case study DHBs this data did not reflect their true level of immunisation coverage. The immunisation health target motivated DHBs to address under-reporting on the NIR and establish regular audits to ensure that data on practice management systems matched the data on the NIR.

Surveillance systems can also be used to enhance organisational learning (Hood, 2007). The NIR allowed health professionals to access accurate information on a child's immunisation status, which enabled the development of processes for opportunistic immunisations within primary and secondary care settings and timely precalling and recalling of children when they were due to have an immunisation event. Over the course of the health target experience, the way in which the NIR was used became more sophisticated. DHBs and PHOs developed processes to ensure that children were enrolled with a primary care provider, to identify and track children who were not fully immunised and automatically refer children to outreach immunisation services before they turned two years of age.

Children who moved out of the region had their addresses updated on the NIR and were effectively transferred to the DHB they had shifted to. This ensured that the denominator within both DHBs was more accurate, but it also caused problems for the DHB that received the child if they did not have enough time to fully immunise them before their second birthday. Over time, all of the case study DHBs developed processes to identify and transfer these children with enough time for their new DHB to contact the parents and provide the necessary immunisation events before they turned two years of age.

7.4.4 Improved systems and processes for immunisation

The health target acted as a catalyst for change for the systems and processes for immunisation at the local level. Many of these systems and processes for immunisation were already in place before the health target was introduced but they became more efficient over the course of the health target experience. The immunisation coordinators played an important role in these changes as they supported primary care providers to address challenges they were facing and establish best practice for providing immunisation services.

All of the case study DHBs implemented a common set of systems and processes for immunisation that were consistent with New Zealand research on best practice for immunisation services (Grant et al., 2011). These systems and processes included early enrolment with the primary care provider (Grant et al., 2010), establishing effective precall and recall processes for contacting parents when children were due to have an immunisation event (Goodyear-Smith et al., 2012), having processes to check and provide opportunistic immunisations (Turner et al., 2009) and ensuring that practice nurses and general practitioners were confident about discussing immunisation with parents (Grant et al., 2010).

All of the case study DHBs and their PHOs worked with primary care providers to establish these processes at a local level. They also used the NIR to track children who were not fully immunised and developed referral process to outreach immunisation services when a child reached a set age to ensure that they were fully immunised before they turned two years of age. They conducted data matching exercises between practice management systems and the NIR to ensure that under reporting on the NIR was addressed and the immunisation coordinators provided ongoing training and support to practice nurses on entering and accessing data on the NIR.

Two of the case study DHBs introduced opportunistic immunisation services within secondary care settings such as the emergency department, paediatric ward and outpatient clinics. However, this focus on immunisation at a secondary care level may have been less effective than focusing on the systems and processes for immunisation within primary care providers. Waikato DHB invested additional resources into opportunistic immunisations within secondary care and had an immunisation coordinator located at the main regional hospital. Waikato DHB also experienced the largest decrease in immunisation coverage at two years of age during the quarters that followed the end of the health target. This may suggest that systems and processes within secondary care settings may have been more difficult to maintain after the health target has ended.

7.4.5 Addressed barriers to accessing immunisation service

Research in New Zealand had identified a number of barriers in accessing primary health care services which disproportionately affect Māori children and their families including cost, discrimination and racism (Robson & Harris, 2007). All of the case study DHBs focused on addressing barriers to accessing immunisation services and stated that this had contributed to increased rates of immunisation coverage for Māori children in their regions. Each DHB had some form of outreach immunisation service in place before the immunisation health target was introduced. However, over the course of the health target experience, all of the case study DHBs improved the efficiency and effectiveness of these outreach services as part of the wider focus on improving the systems and processes for immunisation.

Processes for referring children to outreach services improved due to better linking between practice management systems and the NIR and clear guidelines around when a child should be referred to outreach services. All of the case study DHBs used the NIR to track the immunisation status of children who were turning two in the following quarter. This allowed them to establish processes to automatically refer a child to outreach services when they reached a certain age. Within some of the case study DHBs, outreach services were able to return to immunise a child for follow-up immunisation events, rather than waiting for them to be referred back to them again. This ensured that children who were not engaged with a primary care provider did not miss out on being immunised.

Outreach immunisation services have been viewed as an essential service in rural areas where transport and long distances may be an barrier to access for families (McIntyre & Menzies, 2005). However, outreach services may be just as necessary within urban settings where families may face additional challenges in accessing primary care services. Research on immunisation coverage and timeliness of immunisation events for indigenous children in Australia found that there were delays in immunisation events within urban settings due to financial barriers in accessing primary health care services and missed opportunities to immunise during other visits to their health care provider (McIntyre & Menzies, 2005).

In the case study DHBs, outreach immunisation services provided an alternative pathway to immunisations services for families that were not engaged with primary care provider, or who preferred to have their child immunised in their own home. This had greater impact on immunisation coverage for Māori children as they were a higher proportion of this group. This finding is significant as outreach immunisation services are more expensive than immunising within primary care provider settings, but may be an essential service for addressing immunisation inequities between Māori and non-Māori children as they provide immunisation services for children who are not engaged with the health services.

7.5 Contextual factors in the implementation process

The effectiveness of mechanisms for change relies upon contextual settings that are conducive to change (Pawson & Tilley, 1997). Each of the case study DHBs started the health target experience with different levels of immunisation coverage and what seemed like different contextual features and local challenges. However, these contextual differences became less apparent over time as all of the case study DHBs implemented a very similar set of systems and processes to improve immunisation coverage at two years of age.

7.5.1 Organisational ownership for performance towards the health target

Health systems are complex and policy implementation often requires considerable commitment across more than one organisation at the local level (Buse et al., 2005). Carter, Day and Klein (1992) describe this commitment as a form of internal accountability where organisations take ownership of their performance. Internal accountability for organisational performance is essential, as governments may struggle to influence the performance of organisations that do not take ownership of their performance.

This research found that the case study DHBs were only able to improve their systems and processes for immunisation **after** they had taken ownership of their performance towards the immunisation health target. Hawke's Bay DHB had an advantage over other DHBs as it had already identified immunisation coverage as an organisational priority before the health target was introduced. This case study site did not need to take organisational ownership of the health target; they had already selected and pursued improving immunisation coverage as a local priority. The other case study DHBs needed time to establish organisational ownership for immunisation coverage and progress towards the immunisation health target within their region.

When multiple organisations are involved in achieving a health target, each organisation involved in the implementation process needs to recognise and accept their role in improving performance in this area (van Herten & Gunning-Schepers, 2000b). However, there can be challenges when performance ownership is shared across multiple organisations as the degree of ownership for performance is constrained by the level of interdependence of the organisations involved (Carter et al., 1992). These challenges were highlighted within Bay of Plenty DHB, which struggled to improve immunisation coverage at two years of age until each organisation involved in immunisation services within the region had accepted that they were responsible for achieving the health target. The DHB facilitated this process of accepting

ownership of the health target by holding a number of workshops for local organisations to come together and discuss how they would improve immunisation coverage and address the immunisation health target in their region.

7.5.2 Implementation through network coordination

Network coordination is a mode of coordination that 'is based on relationships, rather than command and control in hierarchies and price and competition in markets' (Lewis et al., 2008). This focus on relationships provides a potential solution to the challenge of policy implementation across multiple organisations (Considine & Lewis, 2003). It can also 'give professionals the freedom to use their expertise' (Rhodes, 2000, p. 355). This feature of networks is particularly relevant within a health system where health professionals have a high degree of expertise and professional autonomy within their work.

The immunisation health target had a strong emphasis on hierarchical accountability, however implementation of the health target at the local level actually occurred through network coordination. These horizontal networks developed in different ways within the case study DHBs, but they shared a number of key features.

The Ministry of Health required each DHB to establish an Immunisation Advisory Group (IAG) that consisted of individuals from a wide variety of organisations with an interest in immunisation services at the local level. However, the large number of people involved, the wide focus on all immunisation issues and the length of time between meetings limited the ability of the IAGs to respond to local challenges in the implementation of the health target. A smaller, more responsive network was needed to address the immunisation health target and these networks developed internally, rather than being mandated by the Ministry of Health.

Hawke's Bay DHB already had an immunisation team in place at a DHB level and with only one PHO in the region, communication between individuals and coordination of local action to address the immunisation health target was relatively easy. The other case study DHBs needed to replicate this environment and they did this by developing dedicated health target networks. These health target networks were relatively small (between six and ten people), consisted of key individuals involved in immunisation at the local level and met on a regular basis (either fortnightly or monthly). Unlike the IAGs that were mandated by the Ministry of Health, the health target networks developed from the bottom-up. Networks that develop from the bottom-up do so based on 'mutual benefit, trust and reciprocity' (Lewis et al., 2008, p. 281).

Relationships within a network require trust to facilitate communication and negotiation between the individuals and their organisations who are involved in the implementation process (Rhodes, 2000). The health target networks met on a regular basis and this improved communication between the organisations involved as individuals were able to discuss local challenges to the implementation process and negotiate how these challenges would be addressed. Regular meetings also nurtured the sense of a team approach towards the immunisation health target, as the individuals involved felt that they were one team working together despite being from different organisations.

Policy implementation within a health system often requires collective action (Provan & Kenis, 2007) and the health target networks facilitated change across multiple organisations. Individuals within the health target network were able to go back to their respective organisations and ensure that the necessary changes were made to improve systems and processes for immunisation within and between their organisations.

7.5.3 Clarifying the roles and functions of each level of the health system

The immunisation heath target clearly identified DHBs as the organisation responsible for achieving the health target, but the majority of immunisation events are delivered by primary care providers. This raises the question, what role did DHBs and PHOs play in improving immunisation coverage and addressing the immunisation health target at the local level?

DHBs were well placed to coordinate the implementation process as they were able to take a systems perspective on immunisation services within their regions. Within the case study DHBs, the DHB Immunisation Champions acted as network facilitators. They organised the health target network meetings and were a driving force in the implementation process. This is consistent with previous research on DHBs which described DHBs as 'relationship brokers rather than directors' (Tenbensel et al., 2011). This role as a network facilitator or relationship broker emphasises how DHBs have used network coordination for policy implementation at the local level rather than hierarchical 'command and control' strategies (Le Grand, 2007). DHBs needed to build relationships with local organisations that provide health services to their populations and this approach towards policy implementation required negotiation.

The PHOs played an important role in the implementation process as they worked with the DHBs to coordinate local actions in the implementation process and address local challenges. They were then able to introduce these changes across all of their primary care providers and provide ongoing support to their providers to improve their systems and process for

immunisation. These changes contributed to the increase in rates of immunisation coverage at the primary care provider level, where the majority of immunisation events were delivered.

Perhaps the most essential role in the implementation process for the immunisation health target was the role of the immunisation coordinators. Before the immunisation health target was introduced, immunisation services were fragmented and there was very little communication or coordination between different organisations involved in immunisation services. The immunisation coordinators played an important role in connecting these different organisations and coordinating local action across each level of the local health system. This was helped in part by the development of the health target networks, but the immunisation coordinators ensured that the ideas developed within these networks were actually implemented within primary care providers.

Hawke's Bay DHB already had an immunisation coordinator in place before the immunisation health target was introduced. This gave the DHB an advantage over other DHBs as Hawke's Bay DHB was able to coordinate local action to address the health target. The other case study DHBs needed to create immunisation coordinator roles that could work across each level of the local health system and facilitate the implementation process. Within Auckland DHB and Bay of Plenty DHB, the immunisation coordinators acted as a liaison between different organisations at the local level providing an essential link between each level of the local health system. These immunisation coordinators were contracted by the DHB but were physically located within a local PHO. This allowed them to liaise between the PHO and their primary care providers and the outreach immunisation service. They worked with practice nurses and supported change within primary care providers to improve the systems and processes for immunisation.

7.6 Dysfunctional consequences of the health target

Within the literature on health targets there has been much debate about the dysfunctional consequences that health targets can have within a health system (Bevan & Hood, 2006b; Hood, 2007; Smith & Busse, 2010). Critics of health targets have argued that the potential for dysfunctional consequences such as gaming and effort substitution can have a negative effect on the overall health system performance, despite improving performance within a specific area identified by a health target (Radin, 2006).

Perhaps the most prominent dysfunctional consequence of health targets within the literature is gaming behaviour (Bevan & Hood, 2006b; Smith & Busse, 2010). Gaming has been described as subversive behaviour that 'hits the target, but misses the point' (Bevan & Hood, 2006b). It is

behaviour that focuses on achieving the target, but at the expense of other important factors within a health service, such as quality, appropriateness and health outcomes. There was no evidence of overt gaming in the use of data to measure and monitor the immunisation health target. This was due in part to the way that information was recorded on the NIR, as monitoring the immunisation health target used data drawn directly from the individual immunisation records of New Zealand children. One way to avoid the gaming of data could be to centralise the collection of data while still allowing that data to be accessed and used by organisations at a local level.   This is what happened in the immunisation health target experience as immunisation records were updated at a primary care level and entering inaccurate information had strong ethical implications in terms of privacy laws in New Zealand.

Another prominent criticism of health targets within the literature is that health targets can cause effort substitution (Bevan & Hood, 2006b; Smith & Busse, 2010). Effort substitution occurs when focused attention on the target area diverts attention away from other important areas that need to addressed, but are perhaps more difficult to measure (Smith & Busse, 2010). Le Grand (2007) argues that the use of targets can turn 'knights' into 'knaves' by rewarding those who achieve the target, even if it is at the expense of other priorities that are not part of the target regime. Determining whether effort substitution occurred due to the immunisation health target was difficult as immunisation was already a core service within the New Zealand health system and the purpose of the health target was to focus attention on improving immunisation coverage. This research had no way of tracking what was not done due to the focus on the immunisation health target.

Addressing the immunisation health target required sustained organisational effort and this led to target fatigue during the final quarters of the health target experience. The immunisation coordinators in particular stated that they were exhausted when the health target for two year olds ended. This target fatigue was reflected in the drop in immunisation coverage at two years of age during the quarter that followed the end of the health target. Part of this decrease in performance was described by key informants as being due to the inclusion of the PCV vaccine, which had been on the National Immunisation Schedule since June 2008, but had not been included in the measurement of immunisation coverage until after the health target ended. However, this drop in immunisation coverage may also highlight that the enormous push towards the health target of 95 per cent during the final quarters was not sustainable.

7.8 Strengths and limitations of this research

The following section considers a number of strengths and limitations of this research, specifically around the use of case study methodology, the selection of case study sites and interviews with key informants.

7.8.1 Case study methodology

A common critique of case study methodology is that the research findings are context specific and that they lack generalisability of their findings (Stewart, 2012). While generalisability is desired in large, quantitative research projects, case study methodology offers researchers the ability to investigate a social phenomenon in much greater depth and understand the social context in which it took place (Swanborn, 2010). Rather than being held accountable to criteria for research quality within quantitative research, case study research should be evaluated against criteria for quality that is relevant to the research paradigm and methodology in which it occurs (Healy & Perry, 2000).

Convincingness of the research findings was the key criteria for quality that was used in this research (Healy & Perry, 2000; Stewart, 2012). Stewart uses the term *convincingness,* rather than validity, and states that 'convincingness derives from two sources: the research design and the reliability of the instruments that are used in gathering data' (Stewart, 2012, p. 74). This thesis has outlined the research design for this study and explained how and why the research methods were used to collect and analyse data. Copies of the interview protocols and coding matrix have been provided in the appendices to give the reader a sense methodological trustworthiness. By being as transparent about the research process as possible, the researcher has endeavoured to strengthen the convincingness of the research findings.

One of the strengths of case study methodology is that it provides the flexibility to use both quantitative and qualitative sources of data (Liamputtong, 2010; Yin, 2009). This research used data from the NIR to measure progress towards the immunisation health target over time. It then applied qualitative research methods to explore the policy implementation process to explain how or why changes in immunisation coverage occurred at the local level. The use of qualitative research methods enabled the researcher to explore the role of local context within the case study DHBs and the mechanisms for change that were used to improve immunisation coverage at two years of age.

7.8.2 Selection of case study sites for this research

Stake (1995) states that researchers can deliberatively select cases with certain characteristics to investigate a specific phenomenon. This is particularly useful for research on policy implementation as case study sites can be identified and selected due to similarities or differences in their local contexts, creating a natural experiment for examining policy implementation (Stewart, 2012).

This research purposively selected the four case study DHBs based on two dimensions of performance: their progress towards the immunisation health target and the level of immunisation inequity between Māori and non-Māori children. By selecting case study sites using these dimensions, the researcher was able to investigate how the immunisation health target was implemented at the local level while also addressing the other research questions in this study. Selecting case study sites with different levels of performance towards the health target allowed the researcher to explore how effective the health target was as a policy mechanism within a high performing DHB, two middle performing DHBs and a low performing DHB. And the researcher was able to ensure that the four case study sites had relatively large proportions of Māori children within their population so that the researcher could explore how the case study DHBs addressed immunisation inequities for Māori children.

These considerations in selecting case study sites gave the research a high degree of generalisability. Although the experiences of the four case study sites may not be representative of all DHBs in New Zealand, they do provide an understanding of the immunisation health target within the context of the New Zealand health system.

7.8.3 Interviews with key informants

An interview protocol was used to guide all of the semi-structured interviews with key informants. While these set questions may have influenced the way in which the key informants talked about the immunisation health target experience, it was necessary to ensure that the researcher obtained relevant information to address the research questions in this study. The interview protocol also provided consistency across interviews and across case study sites.

The researcher focused on interviewing key informants at a DHB and PHO level, although other key informants such as NIR coordinators and Medical Officers of Health within public health services were also included. Research on immunisation services in New Zealand has tended to focus on the role of general practitioners and practice nurses at a primary care provider level. No other research has taken a systems approach to exploring immunisation services and this

research contributes to the existing literature by highlighting the role of DHBs and PHOs in delivering immunisation services and improving immunisation coverage at the local level.

7.9 Contribution to existing knowledge

This research demonstrates how a health target with strong vertical accountability mechanisms may be implemented at the local level through the use of horizontal network coordination. It has also shown that intractable health inequities may be addressed by taking a whole systems perspective. This section explores these research findings in greater detail and discusses how they contribute to existing knowledge on the use of performance measurement and management within a health system.

7.9.1 Integration of vertical accountability and horizontal network coordination

The literature on health targets has concentrated on hierarchical accountability mechanisms and the way in which governments can use performance measurement to manage the actions of local organisations from a distance (Bevan & Hood, 2006a, 2006b; Smith & Busse, 2010). And the wider policy literature on combining hierarchy and network coordination has tended to focus on their incompatibility and the inherent tension that is created between the vertical and horizontal dimensions of coordination (Hill & Hupe, 2002; Le Grand, 2007; Rhodes, 1990).

However, there has been a shift within the recent literature on combining hierarchical and network coordination that examines how the integration of these two dimensions may enhance policy implementation by addressing inherent weaknesses within each approach to coordiantion (Klijn & Skelcher, 2007; Peck & 6, 2006). For example, Hood (2012) has stated that the use of targets will be most effective within a hierarchical culture where there is a clear source of authority, but he has also argued that performance towards a target may be enhanced by a culture of egalitarianism where there is a sense of a shared purpose in addressing a common challenge.

Despite this shift in focus, there is still a gap in the literature around how network coordination could be used to successfully improve health system performance while operating within a hierarchical structure of accountability. Health systems often require professionals to work together within a team environment and the use of network coordination can foster a culture of egalitarianism amongst health professionals who have a high degree of professional autonomy (Rhodes, 2000).

This research makes a valuable contribution to the literature as the immunisation health target had a strong emphasis on hierarchical accountability but implementation of the health target actually occurred through network coordination. This hybrid of hierarchical accountability and network coordination allowed the government to tell DHBs **what to do** while also giving them local discretion to determine **how they would do it**. This is a significant research finding as it highlights how governments can use health targets to provide leadership and strategic direction within a health system while also allowing space for local organisations to shape the implementation process.

One of the challenges when using networks for policy implementation is that it can be difficult to identify lines of accountability (Rhodes, 2000; Rhodes & Marsh, 1992). Networks tend to disperse accountability across the organisations involved and this can create tension between vertical and horizontal dimensions of performance management (Currie et al., 2011). This has been a concern for governments who have traditionally relied on a vertical line of accountability where each organisation, and each policy actor within those organisations, has operated within a hierarchical chain of command (Considine & Lewis, 2003).

This research has shown how the Ministry of Health used a number of accountability mechanisms to measure and monitor performance towards the immunisation health target. These accountability mechanisms were reinforced by a hierarchy of health target champions across each level of the health system, which provided a structure of vertical accountability while still allowing for network coordination at the local level. This approach may be useful to improve performance in other priority areas within a health system as it allows for the flexibility and responsiveness of implementation through network coordination as well as a vertical line of accountability to central government.

7.9.2 Addressing health inequities by taking a systems approach

This research sought to understand how the case study DHBs addressed immunisation inequities between Māori and non-Māori children. It was the intention of the researcher to identify innovative local initiatives that improved immunisation coverage for Māori children and transfer these policy learnings to other DHBs and the Ministry of Health.

The immunisation health target required DHBs to increase immunisation coverage to 95 per cent at two years of age. This high level of immunisation coverage could not be achieved without addressing immunisation inequities for Māori children, particularly within regions that had a high proportion of Māori children. However, the case study DHBs did not develop specific

immunisation initiatives for improving immunisation coverage for Māori children during the health target experience. Instead they took a broader systems perspective and focused on improving the systems and processes for immunisation. This improved immunisation coverage for all children, but it had the biggest impact on rates of immunisation coverage for Māori children as they had the lowest rates of immunisation coverage when the health target was introduced. These findings are consistent with research in Australia and the United States, where immunisation inequities for indigenous children were addressed through policy action at a national level that focused on improving the systems and processes for immunisation services (Bramley et al., 2005; McIntyre & Menzies, 2005; Strine et al., 2003).

The immunisation health target experience demonstrates that health targets can be used to improve performance within the health system **and** address health inequities, even when they do not specifically focus on health inequities. This is a significant contribution to the literature and could have important policy implications within the New Zealand health system. It highlights how health targets could be used to address persistent health inequities that are in part created and maintained by the health system itself.

7.10 Policy implications of this research

The research findings outlined in this chapter have important policy implications both within New Zealand and internationally. Within New Zealand, health targets have become a prominent feature of government policy. The research findings from this study highlight a number of issues that need to be considered when designing effective health targets within the context of the New Zealand health system. And the immunisation health target experience demonstrates that health targets can be used to address health inequities between Māori and non-Māori.

Internationally, there is increasing interest around how governments can improve health system performance without investing additional funding. Auckland DHB and Waikato DHB did invest additional funding into immunisation services during the health target experience, but Hawke's Bay DHB and Bay of Plenty DHB improved immunisation coverage within the boundaries of existing funding for immunisation services. The immunisation health target experience demonstrates that a health target can improve performance without, or with very little, additional funding. However, this research cannot rule out the impact of effort substitution in diverting resources away from other areas in order to address the immunisation health target. What it can show is that resources for immunisation services were used more effectively to improve immunisation coverage and achieve the immunisation health target.

7.10.1 Using health targets to improve performance within the New Zealand health system

When the immunisation health target for two year olds ended in July 2012, it was immediately replaced with another health target which stated that 95 per cent of eight month olds will have their primary course of immunisations (six weeks, three months and five months immunisation events) by December 2014. Although this new health target should theoretically contribute to higher rates of immunisation at two years of age as it requires earlier immunisation events to be delivered in a timely manner, it also shifts the focus for immunisation services to an earlier milestone age. Maintaining high rates of immunisation coverage at two years of age will require ongoing monitoring by the Ministry of Health.

The immunisation health target was an effective policy mechanism for improving immunisation coverage within the context of the New Zealand health system. Its success as a policy mechanism raises questions about other areas within the New Zealand health system where the use of a health target could improve performance and address health inequities. Public health services where the performance indicator that is being measured closely aligns with the desired health outcome could benefit from the use of a health target in a similar way that immunisation services have through the immunisation health target.

7.10.2 Addressing health inequities through policy action

Māori experience significant health inequities compared to the rest of the New Zealand population (Robson & Harris, 2007), but there is often public resistance in New Zealand to policy decisions that focus on addressing health inequities between Māori and non-Māori. The immunisation health target effectively addressed immunisation inequities between Māori and non-Māori children at two years of age and yet as a policy objective the health target did not mention addressing inequities or targeting Māori children.

This is a significant finding as it demonstrates that some health inequities in New Zealand could be addressed through strong policy action by requiring a high level of universal performance that does not allow space for the inequity to be maintained. To achieve the immunisation health target of 95 per cent, DHBs needed to improve immunisation coverage for Māori children, particularly within those DHBs that had a high proportion of Māori children in their region. Case study DHBs found that once they addressed barriers to accessing immunisation services for all children, immunisation coverage for Māori children increased and their progress towards the

health target accelerated. Although the immunisation health target did not specifically target Māori children, it did measure and monitor immunisation coverage for Māori children at a national and DHB level each quarter. This highlights the need to measure inequities in order to address them (Robson & Harris, 2007).

7.10.3 Implications for designing effective health targets

One of the challenges that governments encounter when using health targets is ensuring that the output that is measured and monitored is an accurate representation of the desired outcome. Bevan and Hood (2006b) refer to this as synecdoche, where the part that is measured represents the whole. This is significant when considering the process of designing health targets, as targets that do not accurately represent the area where change is needed will be ineffective or could have dysfunctional consequences on performance within the health system.

New Zealand's immunisation health target stated that 95 per cent of all two year olds will be fully immunised by July 2012. This clearly identified the output being measured as the percentage of children turning two who were fully immunised according to the New Zealand National Immunisation Schedule. This output closely corresponded to the intended outcome that the Ministry of Health desired, which was to protect children from vaccine preventable diseases and improve population health. If a high level of immunisation coverage is maintained, not only are individual children protected from vaccine preventable diseases, but the level of herd immunity reduces the transmission of these diseases within the population (Anderson & May, 1990).

Effective health targets also need to identify who is accountable for performance and these organisations need to take organisational ownership for performance towards the health target (Carter et al., 1992; van Herten & Gunning-Schepers, 2000b). The immunisation health target had strong mechanisms for accountability and these were reinforced by a hierarchy of immunisation champions across each level of the health system. The emphasis on accountability mechanisms also elevated immunisation as a priority on the local agenda.

Governments need an accurate surveillance system for measuring and monitoring performance towards health targets if they are to avoid gaming of health target data (Bevan & Hood, 2006b). The immunisation health target used data from the NIR to measure and monitor progress each quarter. It would be difficult for DHBs to game data on the NIR as the data is entered at a

primary care level and the NIR is managed by the Ministry of Health. There would also be serious ethical implications in terms of the immunisation records of individual children.

Health targets need to be realistic. Health targets that are set too high can cause frustration and affect staff morale while targets that are set too low can create complacency as there is no drive to improve (van Herten & Gunning-Schepers, 2000a). If the intent of the health target is to use it as a dial for improving performance then incremental targets may be useful. Incremental targets over time can steadily increase the level of performance that is expected without overwhelming organisations or discouraging poor performing organisations.

Finally, health targets should be used within a defined time frame and once they have ended they should be replaced with regular monitoring (Le Grand, 2007). There were concerns around maintaining high levels of immunisation coverage at two years of age once the immunisation health target ended. Maintaining a high level of immunisation coverage requires systems and processes for immunisation to be sustainable. Policymakers need to consider the long-term consequences of using a health target and whether short-term solutions will be used to address it rather than the health target acting as a catalyst for change to improve systems and processes that can be embedded within the health system.

7.11 Conclusions

The immunisation health target was an effective policy mechanism for improving immunisation coverage in New Zealand. It acted as a catalyst for change within the New Zealand health system and improved immunisation coverage to 93 per cent in June 2012. Previous policy attempts to increase immunisation coverage and address immunisation inequities had failed due to poor accountability for policy objectives. Immunisation was seen as a primary health care issue and this perspective restricted the development of a wider systems approach towards improving immunisation services. The immunisation health target shifted accountability for immunisation coverage to the DHBs, creating a clear line of accountability from the Ministry of Health at the national level, down to the DHBs, PHOs and primary care providers at the local level.

Strong accountability mechanisms ensured that DHBs focused attention on immunisation. However, the majority of immunisation services are delivered within primary care providers and this meant that DHBs needed to work with their PHOs and primary care providers to change the systems and processes for immunisation within their region. This led to the development of immunisation networks that were responsible for the implementation of the health target. These

networks improved communication between local organisations, coordinated local action and developed innovative solutions to address local challenges. They created a sense of a team approach towards the immunisation health target and were instrumental in coordinating change to the systems and processes for immunisation across multiple organisations.

When the health target ended, the national level of immunisation coverage had increased from 67 per cent in September 2007 to 93 per cent in June 2012. Immunisation inequities had been eliminated for Māori children within some DHBs and dramatically reduced within other DHBs. These immunisation inequities were reduced by taking a universal systems approach towards improving immunisation services and addressing barriers to access that had disproportionately impacted Māori children in the past.

Research on immunisation services within the New Zealand health system has tended to focus on the role of health professionals and best practice for delivering immunisation services within primary care providers. This thesis contributes to the literature in this area by highlighting the role of DHBs and PHOs in improving the systems and processes for immunisation within New Zealand health system. It demonstrates that improving immunisation coverage required a systems approach that went beyond the primary care providers who delivered immunisation services.

From an academic perspective, this research has shown how a hierarchical policy mechanism can be implemented using network coordination at the local level. This mix of vertical accountability and horizontal coordination allows governments to set out what needs to be achieved while giving the organisations responsible for policy implementation the autonomy to determine how it should be achieved. Policy implementation within a health system often relies on multiple organisations and network coordination can improve relationships between these organisations and coordinate change across multiple organisations.

Appendices

Appendix 1: Herd immunity thresholds for vaccine-preventable diseases

Disease	Basic Reproduction Number (*Ro*)	Herd Immunity
Smallpox	5 – 7	80 – 85%
Diphtheria	6 - 7	85 %
Mumps	4 – 7	75 – 86%
Polio	5 – 7	80 – 86%
Rubella	6 - 7	83 – 94%
Measles	12 - 18	83 – 94%
Pertussis	12 – 17	92 – 94%

Adapted from Fine, P. (1993). Herd immunity: history, theory and practice. *Epidemiologic Review, 15*(2), 265 - 302.

Appendix 2: The New Zealand population

The New Zealand population has around 4.2 million people (Statistics New Zealand, 2013). The largest ethnic groups within New Zealand are New Zealand European (at 74 per cent of the population), Māori (around 15 per cent), Asian (almost 12 per cent) and Pacific (at 7 per cent). People from other ethnicities comprise around 3 per cent of the population. This ethnic group includes people of Middle Eastern, Latin America and African ethnicity.

Ethnic group *	Number	Percent
European	2,969,391	74.0%
Māori	598,605	14.9%
Pacific peoples	295,944	7.4%
Asian	471,711	11.8%
Other ethnicity	114,705	2.9%
* People are able to identify with more than one ethnic group and therefore percentages do not add up to 100.		

Source: Statistics New Zealand. (2013). 2013 Census Quickstats about national highlights.

Appendix 3: Map of New Zealand with DHB boundaries

Source: Ministry of Health (2014) Location boundaries for DHBs. Retrieved April 2014 from
http://www.health.govt.nz/new-zealand-health-system/key-health-sector-organisations-and-people/district-health-boards/location-boundaries-map

Appendix 4: Ethics consent for research

**Health
and
Disability
Ethics
Committees**

Multi-region Ethics Committee
c/- Ministry of Health
PO Box 5013
1 the Terrace
Wellington
Phone: (04) 816 2655
Fax: (04) 496 2343
Email: multiregion_ethicscommittee@moh.govt.nz

4 July 2011

Professor Esther Willing
University of Auckland
Health Systems- School of Population Health
Faculty of Medical and Health Sciences
Private Bag 92019
Auckland

Dear Professor Willing

| Ethics ref: | **MEC/11/EXP/019** (please quote in all correspondence) |
| Study title: | Implementation of the New Zealand health policy target of immunising 95% of 2 year olds by July 2012 - the role of District Health Boards |

This expedited study was given ethical approval by the Chairperson of the Multi-region Ethics Committee on the 4th of July 2011.

This approval is valid until **30th of April 2013**, provided that Annual Progress Reports are submitted (see below).

Amendments and Protocol Deviations
All significant amendments to this proposal must receive prior approval from the Committee. Significant amendments include (but are not limited to) changes to:

— the researcher responsible for the conduct of the study at a study site
— the addition of an extra study site
— the design or duration of the study
— the method of recruitment
— information sheets and informed consent procedures.

Significant deviations from the approved protocol must be reported to the Committee as soon as possible.

Annual Progress Reports and Final Reports
The first Annual Progress Report for this study is due to the Committee by **04 July 2012**. The Annual Report Form that should be used is available at www.ethicscommittees.health.govt.nz. Please note that if you do not provide a progress report by this date, ethical approval may be withdrawn.

A Final Report is also required at the conclusion of the study. The Final Report Form is also available at www.ethicscommittees.health.govt.nz.

We wish you all the best with your study.

Yours sincerely

AWHINA RANGIWAI
ADMINISTRATOR
Multi Regional Ethics Committee

Appendix 5: Letter requesting DHB participation

THE UNIVERSITY
OF AUCKLAND
NEW ZEALAND

Kia Ora,

My name is Esther Willing and I am a PhD candidate from the School of Population Health at the University of Auckland. I would like to invite your DHB to participate in a study that will explore how the immunisation health target has been implemented within District Health Boards (DHBs).

The aim of this study is to understand how effective the health target is as a policy tool to increase immunisation coverage and reduce inequalities. It will look at the process of policy implementation within DHBs and why there is variation between DHBs towards achieving the health target and reducing inequalities. The study consists of two phases, with the first phase of interviews occurring in the middle of 2011 and the second phase of follow-up interviews with some of the participants taking place in the second half of 2012.

Approximately 8 to 10 participants will be selected from within your DHB and other health providers in your region to participate in phase one of the study and share their knowledge and experience on the implementation of the immunisation health target. Some of these participants will be followed-up with a second interview in 2012 as part of phase two of the study. These interviews will each take between 45 and 60 minutes. Their participation is voluntary (their choice) and they are free to withdraw from the study at any time, without having to give a reason. The interviews will be audio recorded and then transcribed and participants may request a copy of their transcribed interview to ensure their views have been recorded accurately.

Participants will have the opportunity to share their knowledge and experiences from implementing the immunisation health target. This enables them as health professionals to contribute to policy knowledge and influence policy change for immunisation. No material that could personally identify them will be used in any reports on this study. Audio recordings and transcribed interview data will be anonymised and given a code to ensure confidentiality and data will be stored in a secure location at the School of Population Health for a period of ten years, after which they will be destroyed. The only people with access to this data will be the PhD candidate and her supervisors.

At the end of the study, the findings will be shared with participating DHBs and the Ministry of Health to improve understanding on how the immunisation health target was implemented and successful systems and practices that could be introduced to improve immunisation and reduce inequalities. The results of this study will also be published within peer-reviewed academic journals. This study has received ethical approval from the Multi-region Ethics Committee, which reviews national and multi regional studies, ethics reference number (MEC/11/EXP/019). Please feel free to contact the researcher if you have any questions about this study. Thank you for your time.

Contact Details
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Tim Tenbensel, PhD Supervisor
University of Auckland
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Appendix 6: DHB documents included in the documentary analysis

Hawke's Bay District Health Board	Auckland District Health Board
Annual Plan 2009/2010	Annual Plan 2009/2010
Annual Report 2010	Annual Report 2010
Annual Plan 2010/2011	Annual Plan 2010/2011
Annual Report 2011	Annual Report 2011
Annual Plan 2011/2012	Annual Plan 2011/2012
Annual Report 2012	Annual Report 2012
Moving Immunisation Coverage Forward in Hawke's Bay (2010)	Immunisation Strategy 2010 – 2015 (2010)
Healthy People, Healthy Places : HBDHB Health Status Review (2010)	
Waikato District Health Board	**Bay of Plenty District Health Board**
Annual Plan 2009/2010	Annual Plan 2009/2010
Annual Report 2010	Annual Report 2010
Annual Plan 2010/2011	Annual Plan 2010/2011
Annual Report 2011	Annual Report 2011
Annual Plan 2011/2012	Annual Plan 2011/2012
Annual Report 2012	Annual Report 2012
Waikato DHB Policy: Immunisation (2006)	Analysis of Eastern Bay of Plenty Health Needs (2012)
Immunisation (2010)	Health Status of Children and Young People in the Bay of Plenty (2008)

Appendix 7: Email to potential participants

Kia ora,

My name is Esther Willing and I am a PhD student at the University of Auckland. My PhD is examining the implementation of the immunisation health target within DHBs. Essentially I want to understand how effective the health target had been as a policy tool in increasing immunisation coverage and reducing inequalities, particularly for Māori children. I am focusing on four DHBs as case studies and I would like to include [name of DHB].

[Name of IMAC Regional Coordiantor] gave me your contact details as the ideal people to get in touch with within [name of DHB]. I am hoping to interview between 8 to 10 people within your DHB and some of the PHOs within your region to understand how the health target has been implemented.

I've attached a participant information sheet and please do not hesitate to contact me if you would like more information on this project.

I would really appreciate any help or advice that you might have on people that I should talk to about immunisation and the process for conducting research within your DHB.

Thanks for your time,

Esther Willing

PhD Candidate

University of Auckland

Appendix 8: Participant Information Sheet

Implementation of the immunisation health target

You are invited to participate in a study that explores the implementation of the immunisation health target within District Health Boards (DHBs). The aim of this study is to understand how effective the health target is as a policy tool to increase immunisation coverage and reduce inequalities. It looks at the process of policy implementation within DHBs and why there is variation between DHBs towards achieving the health target and reducing inequalities. The study is based in the School of Population Health, University of Auckland and has a time span of three years. The study consists of two phases, with the first phase of interviews occurring in the middle of 2011 and the second phase of follow-up interviews with some of the participants taking place in the second half of 2012.

Participants have been selected due to their knowledge and experience with the implementation of the policy within their DHB. Approximately 8 to 10 participants from each participating DHB will be interviewed in phase one and some of these participant will be followed-up with a second interview in 2012. These interviews will each take between 45 and 60 minutes.

Your participation in this study is voluntary (your choice) and you may take two weeks to decide whether you will participate. If you do agree to take part in this study you are free to withdraw from it at any time, without having to give a reason. You do not have to answer all the questions and you may stop the interview at any time. The interviews will be audio recorded and then transcribed and you may request a copy of your transcribed interview to ensure that your views have been recorded accurately.

Participants will have the opportunity to share their knowledge and experiences from implementing the immunisation health target. This enables you as a health professional to contribute to policy knowledge and influence policy change for immunisation. If you have any queries or concerns regarding your rights as a participant in this study, you may wish to contact your employer. No material that could personally identify you will be used in any reports on this study. Audio recordings and transcribed interview data will be anonymised and given a code to ensure confidentiality and data will be stored in a secure location at the School of Population Health for a period of ten years, after which they will be destroyed. The only people with access to this data will be the PhD candidate and her supervisors.

At the end of the study, the findings will be shared with participating DHBs and the Ministry of Health to improve understanding on how the immunisation health target was implemented and successful systems and practices that could be introduced to improve immunisation and reduce inequalities. The results of this study will also be published within peer-reviewed academic journals. This study has received ethical approval from the Multi-region Ethics Committee, which reviews national and multi regional studies, ethics reference number (MEC/11/EXP/019). Please feel free to contact the researcher if you have any questions about this study.

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Appendix 9: Consent form

Project title: Implementation of the immunisation health target

English	I wish to have an interpreter	Yes	No
Deaf	I wish to have a NZ sign language interpreter	Yes	No
Māori	E hiahia ana ahau ki tetahi kaiwhaka Māori/kaiwhaka pakeha korero	Ae	Kao
Cook Island Māori	Ka inangaro au i tetai tangata uri reo	Ae	Kare
Fijian	Au gadreva me dua e vakadewa vosa vei au	Io	Sega
Niuean	Fia manako au ke fakaaoga e taha tagata fakahokohoko kupu	E	Nakai
Sāmoan	Ou te mana'o ia i ai se fa'amatala upu	Ioe	Leai
Tokelaun	Ko au e fofou ki he tino ke fakaliliu te gagana Peletania ki na gagana o na motu o te Pahefika	Ioe	Leai
Tongan	Oku ou fiema'u ha fakatonulea	Io	Ikai

I have read and I understand the information sheet for volunteers taking part in the study designed to explore the implementation of the immunisation health target within District Health Boards. I have had the opportunity to discuss this study and I am happy with the answers I have been given. I have had the opportunity to use whanau support or a friend to help me ask questions and understand the study.

I understand that taking part is voluntary (my choice), and that I may withdraw from the study at any time, and this will in no way affect my employment.

I understand that my participation in this study is confidential and no material that could personally identify me will be used in reports on this study.

I have had time to consider whether to take part in the study.

I know who to contact if I have any questions about the study in general.

- I consent to my interview being audiotaped   Yes [ ]   No [ ]
- I would like to view a copy of the interview transcript   Yes [ ]   No [ ]

- I understand that the interview transcript will be stored at a secure location within the School of Population Health   Yes [ ]   No [ ]

- I wish to receive a copy of the results   Yes [ ]   No [ ]
  Participants should be advised that a significant delay may occur between data collection and publication of the results. Alternatively, I would like the researcher to discuss the outcomes of the study with me

Please turn over page to complete consent form

I _____ hereby consent to take part in this study.

Date: _____

Signature: _____

Full name of researcher: Esther Willing

Project explained by: Esther Willing

Project role: Lead Investigator

Signature: _____

Date: _____

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Appendix 10: Interview protocol for phase one interviews

Implementation of the Immunisation Health Target

1. What is your current role?
2. How long have you been in this role?
3. Has the target had a significant impact on the work that you do?
4. What systems and processes were in place for improving immunisation coverage before the introduction of the target?
   a. *Before 2007?*
5. How has your organisation responded to the immunisation health target?
   a. *Any changes after the revised targets in 2009?*
6. What systems and processes were in place for improving immunisation coverage for Māori children before the target?
   a. *How have these changed over time?*
7. How have you worked with other organisations and/or health professionals to improve immunisation?
   a. *What has been the role of the DHB?*
   b. *What has been the role of PHO's?*
   c. *Have any other organisations had a role in implementing this health target?*
8. How have relationships or partnerships between the DHB and other health providers changed since the introduction of the health target?
9. Why do you think immunisation rates are the way they are in this DHB?
10. In your opinion, is a target an appropriate approach to child immunisation services?
    a. *Is this the right target?*
11. Is getting feedback on performance towards the target important?
    a. *How do you use data on your organisations performance towards the target?*
    b. *Is there pressure to meet the target?*

Appendix 11: Interview protocol for phase two interviews

Implementation of the immunisation health target

1. What has happened over the last year since I talked to you about the immunisation target?
   a. *Systems and processes?*
   b. *Relationships with other organisations?*
2. What were the key challenges in the overall implementation process and how did you address these?
   a. *Changes over time?*
3. What do you think were the key factors for success in this process?
   a. *Addressing inequalities?*
   b. *Changes over time?*
4. Were any new resources or positions created to meet this target?
   a. *Details of what these were?*
5. How sustainable are the systems and processes that were put in place to meet the 2 year old target now that the target has shifted to 8 months?
6. Do you think that the target diverted attention from other health issues?
7. What are the key lessons from this experience that might help other DHBs improve coverage and address inequalities?
8. Is there anything else you think I should know about?

Appendix 12: Interview protocol for key informants at the Ministry of Health

Implementation of the immunisation health target

1. What is your current role and how you are involved in the immunisation health target?
2. How long have you been in this role?
3. What role has the Ministry played in the implementation of the target?
    a. What work has the Ministry done on improving coverage for Māori children?
4. What have been some of the successes in this process?
5. Have there been any challenges in this process?
6. Is a health target an appropriate mechanism for improving coverage?
7. Has the target diverted attention or activity away from of issues in child health?
8. This target has been around since 2007 and was continued as part of the refined set of targets in 2009, what has been the difference in the way the Ministry has approached it?

Appendix 13: Coding matrix

Local contexts	
Miscellaneous	
	Measles outbreak
Outcomes	
	Sustainability
	Changes over time
	Challenges
	Success
Maori	
	Whanau ora
	Initiatives to improve coverage for Maori
	Coverage for Maori
	Maori families
Immunisation	
	Barriers to access
	MMR
	Decliners
	Five month imms
	Immunisation and child health
	Immunisation coverage
	Inequalities for Maori
	Six week imms
	Timeliness
	Vaccination
Networks	
	Passion for immunisation
	Shared learnings
	Champions
	Team approach
	Communication
	Collaboration
	Operations group
	Steering group
Systems and processes	
	After hours clinics
	Recalls/reminders
	Following up declines
	Vaccinator training
	Social marketing
	Comparing performance across practices
	Supporting practices
	Information for parents
	Enrolment with GP
	Resources for primary care
	Opportunistic immunisations
	System improvement
	Competition
	P4P incentive
	Funding
	Reporting
	Contracts
Organisations	
	CYFS
	Maori PHO/Providers
	Maori Women's Welfare League
	Plunket/Wellchild
	Practice nurses
	Midwives
	Lay advocate
	Immunisation coordinator
	ED

	Hospital	
	Primary care providers	
	Population health/Public health service	
	Outreach	
	NIR	
	PHOs	
	Other DHBs	
	DHB management	
	DHB	
	IMAC	
	Ministry of Health	
NIR		
	Tracking children	
	Data reports	
	Data quality	
Health target		
	Diverting attention	
	Performance towards target	
	Accountability for target	
	Focused attention	
	Target as policy mechanism	
	Impact of target	
	Since target	
	Before target	
Key Informant		
	Time in position	
	Position	

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