Co–production in Health Management:

An Evaluation of Knowing the People Planning

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Abstract

Treating chronic health conditions consumes a significant portion of the health care resource. Two–thirds of UK hospital admissions consist of people with chronic conditions (Singh, 2005). To date, health management has tended to focus on service redesign, rather than focusing on the patients, as a way to facilitate improved outcomes and control costs. Typically, these management approaches are premised on the patient as a consumer/end user.

An alternative view to the patient being a consumer is that of the patient being a co–producer of the service. Co–production recognises the client (patient) as a resource, in that value cannot easily be created or delivered, unless the patient actively contributes to the service (Alford, 1998). Patients gain health value when they are well and are independent of the health care system and its costs. Health care organisations gain economic value, when chronic patients require less health care.

This thesis examines co–production, in the context of contemporary patient involvement and heath services management. 'Knowing the People Planning' (KPP), an innovative health management method, is evaluated for its patient management co–production potential. KPP is based on ten key features of service provision. Four of the key features relate to the patient, whilst the remaining six features relate to the organisation. It is the management of these patient and organisation features that better facilitates chronic long-term mental health patients as co–producers.

The empirical findings, from this evaluation of KPP provide evidence for the efficacy of co–productive health management theory and practice. Patient health value and health care organisation economic value are created, when both the organisation and the patient co–produce the health service.

KPP was initially implemented by eight of New Zealand's 21 District Health Boards. Socio-ecological action research methodology was used to evaluate KPP — by taking a 'people-in-environments' approach. The evaluation covers

fourteen action research cycles for 2,021 chronic long-term patients over four years. Measurements include the amount of time these long-term patients spent in hospital and employment rates. The integration of the action research cycles, using the socio-ecological method supported the generation of (what I have called) 'co–productive health management theory'.

Analyses of secondary data, across organisational and patient domains, supplement the action research findings, in order to assess for confounding factors. The organisation outcomes relate to costs and staff turnover. Patient outcomes relate to service utilisation measures, for approximately 60,000 adult patients per year, who access New Zealand's secondary mental health services.

A pivotal finding of this research was that, as the rate of patients with treatment plans increased from 50% to 90%, inpatient bed use decreased by 26%. However, increased funding for mental health services had only a minor impact on decreasing inpatient bed use. Patient employment rates increased, whilst the number of patients who required access to general practitioners and changes to their housing situation, decreased.

The patient management co–production view offers a significant opportunity for health care managers and researchers to significantly improve both patient and organisation value. Co–production views the patient as a resource, who contributes to her/his health outcome, rather than a person who simply consumes services. The better patients can co–produce their health outcome the better their health, and the lower their demand for health services.

Table of Contents

List of Figures

List of Tables

Chapter One

 Introduction

Creating health care value is the management challenge for the new millennium (Shortell & Kaluzny, 2006). Typically, management processes are premised on the patient as a consumer/end user and have taken scant account of the significant contribution that people can — and do — make to their own heath outcome.

1.1 Co–production: An alternative management approach

An alternative view, to the patient as a consumer, is that of the patient being a co–producer of the service. This thesis sets out to demonstrate how chronic patients can co–produce health care value and the empirical findings, from the evaluation of Knowing the People Planning (KPP), provide the evidence for co–production. Co–production recognises the patient as a resource, in that value cannot easily be created or delivered, unless the patient actively contributes to the service (Alford, 1998).

Management approaches to improving the effectiveness and efficiency of care for people with chronic long-term conditions have been premised on the patient as a consumer/end user. Management approaches have either focused on service redesign (a service centric approach), or focused on the patient (a patient/consumer centric approach). Service centric redesign approaches include; integrated care (Atun, de Jongh, Secci, Ohiri, & Adeyi (2010b), chronic care teams (Coleman, Austin, Brach, & Wagner 2009), reengineering (Ham, Kipping, & McLeod, 2003) and quality improvement (Walshe, 2009). The patient centric focus has been on self management (Lorig & Holman 2003) and patient centred care focusing on the patient/clinician relationship (Edwards & Elwyn, 2001). Dunston, Lee, Boud, Brodie, & Chiarella (2009) contend that the concept and practice of co–production rejects a binary either/or position – in this case provider centric and consumer centric practice. It argues that an exclusive focus on either the provider or the consumer

needs to be evolved into a range of well developed and well supported dialogic and co–productive partnerships developed between health systems/health professionals and citizens/health consumers. This thesis provides empirical evidence for the theory that co–productive management processes need to be in place to support effective co–production by long–term patients and when these management processes are in place both patient and organisational value is improved.

1.2 Long–term chronic conditions: The extent of the problem

People with long–term chronic conditions consume a considerable amount of health care resource and they offer a significant opportunity to create value for themselves and the health system. The National Advisory Committee on Health and Disability, (2007) definition of a chronic condition captures the essence of how chronic conditions are defined globally. They define chronic conditions as "any ongoing, long–term or recurring condition that has a significant impact on people's lives" (p. 7). Approximately two–thirds of people with chronic conditions are under the age of 65 years: 44% have co–morbid conditions and they account for two–thirds of UK hospital admissions (Singh, 2005). A patient with one chronic condition costs twice the amount of a patient with an acute condition and approximately six times more, if the patient has multiple chronic conditions (Institute of Medicine, 2001, p. 27).

The National Advisory Committee on Health and Disability (2007) claimed that the most common chronic conditions in New Zealand (by diagnosis) are:

- chronic neck or back problems (one in four adults)
- mental illness (one in five adults)
- asthma (one in five adults aged 15-44 yrs)
- arthritis (one in six adults)
- heart disease (one in 10 adults).

These patients gain value when they require less health services and they are more able to generate an income. The organisation gains value, when chronic patients place less demand on health care resources. Management processes that support

co–production offers a way to further enhance value for both patients and health care organisation value.

1.3 New Zealand mental health services: The research setting

This research is set in New Zealand's mental health services. The New Zealand Minister of Health has overall responsibility for the health system (New Zealand Government, 2001). The Ministry of Health (Ministry) acts as the Minister's agent and it enters into funding and accountability arrangements, via the Crown Funding Agreement (CFA), and by agreeing to District Annual Plans (DAPs), with the 21 District Health Boards (DHBs).

The Ministry of Health (1994) outlined the goals and strategic directions for mental health organisations, for the ensuing decade, in 'Looking Forward': Strategic Directions for Mental Health Services (Ministry of Health, 1994). 'Moving Forward' (Ministry of Health, 1997b), the national mental health plan, provided national objectives for up to ten years, in order to ensure the implementation of 'Looking Forward' (Ministry of Health, 1994). The over-arching approach to the quality and safety of health services in New Zealand was the 'Improving Quality Strategy' (Minister of Health, 2003a). These health strategies, however, did not differentiate long-term clients and they were premised on the patient as a consumer rather than a co-producer.

The Mental Health Commission (Commission) was tasked with overseeing the implementation of the National Mental Health Strategy (Minister of Health, 1996). The Commission's oversight involved monitoring and reporting on the performance of the key agencies involved in implementing the strategy — most significantly the Ministry of Health. 'The Blueprint' (Mental Health Commission, 1998) described the mental health services that were required, per 100,000 population to ensure suitable treatment and support, for those people affected by mental illness. 'The Blueprint' was still having a significant impact on service planning and delivery models in New Zealand, ten years after it was developed.

Successive governments agreed to fund the implementation of 'The Blueprint'. The Commission's eighth annual report (Mental Health Commission, 2005), was concerned with the implementation of the national mental health strategy and it showed that, between 1993/94 and 2003/04, funding for mental health services increased from $270 million (excluding the Goods and Services Tax) to $801.7 million per annum — an increase of 141.7%, after adjusting for inflation.

1.4 Knowing the People Planning: Applied co–production

David King (Research Fellow) and I were commissioned, in 1999 by the Health Funding Authority, to study high needs mental health patients in the South Island of New Zealand. The research was not directly related to the Mental Health Commission's role but rather occurred against a backdrop of a poor public impression of mental health services, three government reviews and a wide unexplained variation in DHB acute admission rates. We interpreted our study as having two questions:

1. What makes a good community mental health service?
2. How can the features of a good community mental health service be applied to all mental health services?

Anderson & Lyons (2001) identified that the differing goals, values, and philosophies of patients, families, clinicians and funders were often hard to reconcile. Knowing the People Planning was developed out of this study and was able to reconcile the values of stakeholders.

Knowing the People Planning (KPP) is a health management innovation that was designed for patients with long–term chronic mental illness and it demonstrates how their health can be improved. KPP describes ten key features of service delivery. Four of the ten key features relate to the patients and the remaining six features relate to the organisation. A KPP plan (key feature ten) is compiled annually, for management evaluation and action, based on key features, one to nine. It is the interaction of these ten patient and organisation key features that provide the platform for the co–production of services. KPP measures processes — whether or

not the services were delivered — and what needs are being met or unmet which may require a management response: KPP does not directly measure clinical outcomes.

KPP is entirely consistent with the concepts of recovery and empowerment. In 2002/03, a milestone was reached, when the Ministry of Health allowed DHBs to include KPP as part of their District Annual Plans (DAPs). This formalisation represented the Ministry's acknowledgement that KPP was a worthwhile tool that could assist with service planning.

1.5 The evaluation

KPP was implemented into DHBs without any underpinning theory or previous validation. . The purpose of this research was to both evaluate KPP and explain the findings which in turn contribute to the further development of co–production theory.. Ticehurst & Veal (2000) assert that evaluation research arises from the need to make judgements on the success or effectiveness of programs, strategies, policies or practices. Explanatory research seeks to explain the patterns or trends involved, in order to establish causality or the likelihood of causality. Establishing causality requires rigorous data collection, analysis, and interpretation of data within a theoretical framework. A quantitative approach was taken in this research in order to enable causality to be tested. A qualitative approach using observation, informal and in depth interviewing and participant observation would not have enabled me to test for causality. Further, a qualitative approach would have increased the cost of the research and presented significant ethical issues in relation to interviewing long–term clients.

In practice, data is rarely collected without some explanatory model in mind so there is some element of deduction, further it is not possible to develop hypotheses and theories without at least some initial information on the subject in hand, so there is also always an element of induction. This research has both inductive and deductive and retroductive aspects.

KPP was implemented in-situ, thus making true experiments impossible however a quasi–experimental analysis of secondary data was possible.

Management thinking and research has continued to develop in recent times building on the classical (scientific and administrative theories), behavioural, and human relations thinking and research. Modern management thinking and research approaches use both the quantitative approaches and systems theories. Quantitative research is also known as management science or operational research and grew out of statistical approaches first developed during the Second World War. This approach is used to improve the allocation of resources, work scheduling and management decision–making and relies heavily on computer–based applications. Systems theory considers an organisation as a system of interrelated parts. Closed systems are seen to operate independently of their environment and they reflect the frame of reference of the classical management school of thinking and research. Open systems are seen to interact with their external environment (Ticehurst & Veal, 2000). The long–term KPP mental health patients are external to the health organisation, so this research requires an open system theoretical dimension.

This programme evaluation of KPP is set in eight of New Zealand's 21 District Health Board mental health services. The programme evaluation required that the outcome evaluation is undertaken only after an assessment of KPP's implementation fidelity had been made. The evaluation had three stages: the first stage determined if it was possible to implement KPP into New Zealand District Health Board (DHB) mental health services; the second stage determined if the outcome of implementing KPP improved value for the chronic patients and the DHBs; and stage three led to the development of a co–productive health management theory.

Evaluating the outcome of KPP — and its co–productive potential — required a departure from contemporary health management research methods. The KPP outcome was determined, by the application of Gloster's (2000) socio-ecological action research method to the fourteen KPP plans produced by the eight DHBs. Socio-ecological action research is based on open systems ontology and it takes a

6

people-in-environments perspective. The open systems theory argues that people are continually influencing each other and that they transact and co-evolve with their physical and social environments (Emery, 2000).

1.6 The findings

The empirical findings, from this evaluation of KPP, provide an evidence base for co–productive health management. The key to co–production lies not in how to provide services, but in how to create value for the long–term chronic patient and, in the process, create economic value for the health care organisation. Patients gain value, when they are well and independent. Health care organisations gain economic value when less demand is placed on their services and this leads to lower costs. At the heart of marketing's customer relations theory is the co–creation of value. I have used customer relations theory, together with the KPP evaluation results, to develop co–productive health management theory. Engineering co–productive processes, into existing health management processes, has the potential to significantly improve value, for both patients and health care organisations.

This thesis is comprised of nine chapters, which includes this introduction. Chapter Two examines management processes, in relation to patients as co-producers of value. Customer relations theory is scrutinised for its applicability to support the development of co–productive health management theory.

Chapter Three — the research setting — describes New Zealand's health and mental health services and the development of the KPP concept and its purpose. Chapter Four presents the research strategy. Chapter Five describes, in detail, the research procedures. Chapter Six details the KPP implementation fidelity, whilst Chapter Seven details the KPP results.

Chapter Eight discusses the research findings. In this chapter, drawing on the KPP results and long–term customer relations theory, I set out the evidence base for co–productive health management theory. Chapter Nine draws the thesis to a conclusion. The reference and appendices sections follow on, sequentially, from Chapter Nine.

Chapter Two

Co-production in Healthcare: A Literature Review

Typically, health management approaches have been premised on the patient as a consumer/end user. An alternative viewpoint, to that of the patient being a consumer, is that of the patient being a 'co–producer' of the service. Co–production recognises the client (patient) as a resource, in that value cannot easily be created or delivered, unless the patient actively contributes to the service (Alford, 1998). In this chapter, I critically examine the theoretical construct of co–production and its potential to lift long–term, patient–centred care to a new level. Co–production is also examined in the context of health strategy; service design; information management; performance monitoring; and clinician manager relationships. Other possible theories that could explain the KPP findings are also discussed, prior to the concluding section of this chapter.

2.1 Co–production background

Bovaird (2007 p. 849-850) distinguished seven types of participation, all involving less or more co–production:

- *Rational professional service provision with user/community consultation on service planning and design issues* – here services are delivered by professionals but planning and/or design stage has closely involved users and community members
- *User co–delivery of professionally designed services* – here professionals dictate service design/planning but users and community members deliver the service.
- *Full user/professional* co–production – here users and professionals fully share the tasks of planning and designing the service, then delivering it. Client/patient co–production fits here.

- *User/community co–delivery of services with professionals, without formal planning or design process* – here, users and community groups take responsibility for undertaking activities but call upon professional service expertise when needed.
- *User/community sole delivery of co–planned and designed services* – here, users and other community members take responsibility for delivering services planned by professionals.
- *Traditional self–organised community provision* – finally where professional staff have no direct involvement of in services, we have traditionally self organised e.g. children's play groups, and local festivals.

Marks & Lawson (2005) have applied co-production principles to the delivery of the a community based child care welfare initiative, in the USA, for hard to serve families. They argue that social services co-production, is underpinned by four key values:

- Asset building; every human being can be a contributor to creating solutions
- Redefining the work: work must be defined in a way to include what ever it takes to solve the problem
- Reciprocity: one way acts of assistance are replaced by two way transactions, an exchange occurs. Staff no longer see themselves as givers and consumers as receivers. Recipients contribute to a shared vision that is mutually beneficial and involves both parties as collaborators working toward a desired end.
- Social capital: human service providers must do more than help individuals they need to enlist participants in and maintaining social networks.

Boyle & Harris (2009) described the commissioning of a day care mental health service in the London Borough of Camden, in 2006, where the co–production approach was a contractual expectation. The Camden's day care services have been able to leverage previously invisible or neglected resources – the capacities and knowledge of service users and the wider community it self, who provide support to each other, anything from advice, to gardening and lifts (p15).

Dunston, Lee, Boud, Brodie, & Chiarella (2009, p. 41) assert that while a focus on consumer or patient–led services has been, and remains important for challenging the predominantly provider and expert orientation of much health care practice, recent thinking about reform argues that an exclusive focus on either the provider or the consumer needs to be evolved into a range of well developed and well supported dialogic and co–productive partnerships, developed between health systems/health professionals and citizens/health consumers. Boyle & Harris (2009) contend that co–production represents fundamental reshaping of public services.

2.2 Co–production theory

Alford (1998) stated that public service organisations are conceived as being the producer and the client as being the recipient (consumer). The latter may be active in advocating levels or types of services but she/he is invariably passive in their delivery. Co–production means that a service is not simply undertaken by the organisation, in a one way transfer, but rather it is partly undertaken by the client (Alford, 1998).

The sociotechnical system theory developments of Trist (1981) facilitated significant developments in co–production theory (Ramirez, 1999, p. 50). Emery and Trist researchers at the Tavistock Institute of Human Relations in the 1950s used a research strategy that was grounded in the open systems paradigm (discussed in Chapter Four), which focuses on people's interface with their environments and technical systems.

Two schools of co–production thought provide important insights into co–production and its application to the management of health services. The first is value co–production, which is seen in the private sector and this is driven by opportunities to improve profitability (Ramirez, 1999). The second school of thought, seen in the public sector, is driven by the realisation that client co–production is necessary, for both the organisation to achieve its purpose and for the client to receive value

(Alford, 1998). The concepts of consumption and value are crucial to an understanding of the co–production paradigm.

Two historical contradictory definitions of consumption, dating back to the 15th century, have contributed to an understanding of co–production theory. In one sense, consumption means 'to use up' and in the other sense it means 'to accomplish or complete'. This apparent paradox is complementary within the co–production framework, in that the final use is not necessarily tied to finalising consumption (Ramirez, 1983).

In terms of value, Ramirez (1999) contended that the concepts of 'utility value' and 'exchange value' are some 900 years old and (by the 17th century) 'exchange value' had become commensurate with *price*. The proposition that utility value was subjective to the person began to emerge in the 18th century and it flourished during the 19th century. Ramirez (1999) defined value co-production as "value co–production by two or more actors, with and for each other, with and for yet other actors" (p. 49).

Bovaird (2007) argued that the Ramirez definition of co–production is trivial, now that partnership is such a normal occurrence. He defined co–production "as the provision of services through long–term relationships between professionalised services (in any sector) and service users or other members of the community where all parties make substantial resource contributions" (Bovaird, 2007, p. 847).

Co–production has attracted insignificant official interest since the early 1980's, mainly because as Alford (1998) asserted, it was perceived as being concerned with the use of volunteers and it was overly dependant on altruism. This emphasis on volunteers has, however, overshadowed co–production by clients. Whereas volunteers are analogous to suppliers of inputs to a firm, the clients are analogous to its buyers and yet this conception of co–production has been almost entirely overlooked (Alford, 1998, p. 129). Clients are defined as those people who deal with an agency at its 'business end' and who receive personal value from the service provided by the agency (Alford, 2002). Alford (1998) stated that the majority of public services do not require payment for the service and consequently there is

no economic exchange. Consumers in these cases are better described as 'beneficiaries' or 'patients' (in the health care setting), who receive a service or benefit but give no money directly in return. The organisation cannot be said to be seeking to generate demand, but rather it is concerned about rationing services. Public service clients however, provide important supplies that the organisation needs, such as information, compliance, cooperation and productive effort.

Client co–production has two key features, which are relevant to the management of long–term chronic conditions. The first feature is Ramirez's (1999) and Alford's (1998) conception of co–production that recognises the client/patient as a resource, in that value cannot be created or delivered, unless the client actively contributes to the service. The second feature, as Bovaird (2007) contended, is that the client relationship is long–term.

Alford (1998) asserted that an organisational/client interdependency exists at three levels. Firstly, the organisation may require inputs from the client, especially in the form of information. Frequently, effective health interventions rely heavily on the patient providing information about her/his problem. Secondly, the organisation may rely on the client performing processes (converting inputs to outputs) — most notably transforming themselves in some way. The organisation and its agents can encourage and facilitate change, but they cannot bring it about, without the client's contribution. Thirdly, the client must convert the organisational output into an outcome. In health care, a patient's positive health outcome is likely to be contingent on her/his understanding of the causes of the condition and the necessary actions needed to minimise its impact.

2.2.1 Co–production in healthcare

Parker & Heapy (2006, p.15) contend that experience and relationships are the recurring theme, co–production needs to happen at the point of delivery and through conversation and dialogue rather than through choice alone, learning to understand and map people's experience and the interface between the service and their lives, is essential for creating conditions for co–production. Dunston et al (2009) state

that "the site of the *relationship,* the interface between health consumers and health professionals, is identified as the location of 'production' — where services, outcomes and the experience of various participants are shaped" (p48).

Successfully negotiating a transition from a traditional expert–based professional practice to a co–productive professional practice will require an in–depth and co–productive engagement with issues and processes of profound cultural, identity and practice change, renegotiation and reformation (Dunston et al 2009, p. 50) . Co–production means that service users and professionals must develop mutual relationships in which both parties take risks. The service user has to trust the professional's advice and support, but the professional has to be prepared to trust the decisions of (and the behaviours of) the service user, rather than merely dictating to them (Bovaird, 2007). Inherent in co–production is a redistribution of power, which is an important concept, given that changing health professional practices and attitudes are a significant health system challenge. The shift from a traditional expert–based health system to a co–productive health system, will necessarily involve substantial socio–cultural and organisational change Dunston et al (2009, p. 42).

Stewart, Brown, Donner, McWhinney, Oates & Weston, (2000) found that doctors and patients can effectively manage health conditions, when an agreement is reached between doctor and patient, with respect to the nature of the health problem, the goals of treatment and their respective roles in managing the condition. Martin & Peterson (2008) the state that care planning/management, based on a partnership model can result in improved system organisation and self management of chronic conditions, even in the most difficult cases. A study of cardiac surgery patients by Trummer, Mueller, Nowak, Stidl, & Pelikan (2006), showed that, where health professionals aimed to empower patients to be more effective co–producers of their surgery recuperation (by the use of more effective communication strategies), improved clinical outcomes were demonstrated. Post–surgery tachyarrhythmia occurred less frequently (4% verses 18%): logistics regression Exp(B)=.220 at *p*=.027; and duration was 9.3 versus 8.1 days in the intervention group, for care level adjusted days (Exp(B) =.822 at *p*=.0004).

Forde & Raine (2008, p. 1695) stated that "the complexity of health, its multiple dimensions and determinants, makes it a markedly fertile area for fruitful co–production". Essentially, as Mills & Rorty (2002) contended, the effectiveness of care provision frequently depends on the co–operation of the patient. Co–production recognises the patient as a client, who co–creates value.

2.2.3 Co-production and customer relations theory

Customer relations theory has, at its heart, the co–production of value and it provides an excellent framework for an understanding of how long–term patient co–production can be enhanced.

Pitta & Laric (2004) linked the value concepts of customers, in customer relations theory, to the value of patients in the health care value chain. They argued that the participation of the patient, in the provision of health services, greatly affects the objective outcome of the value chain (better health) (p. 457). Customer relations theory offers a framework, which can be used to understand how long–term patient co–production could be facilitated, in health care management. Customer relations theory requires a horizontal process organisational view rather than a vertical functional view (Kumar, Lemon, & Parasuraman, 2006). Processes provide a convenient intermediate level of analysis, opening up the 'black box', by providing the needed integration of the realities of work practice that link explicitly to the firms overall functioning (Garvin, 1998). The horizontal mindset is essential in order that all of the processes and activities, which contribute to long–term customer value creation, are included (Shah, Rust, Parasuraman, Staelin, & Day, 2006).

Customer relations theory requires customers (patients) to be classified, based on an analysis of value (Day, 2003). Pauly (1978) contends that three important distinctions can be made between three types of medical care. The three types of care services are those services that:

1. are used relatively frequently by most households, such as paediatric care normal deliveries, prescription drugs for common conditions, and routine care for persons with chronic conditions

2. a typical provider produces frequently but that a typical consumer can consume relatively infrequently, perhaps once in a life time, such as gall bladder treatment

3. a typical providers produces and typical consumer consume relatively infrequently including most care undertaken in emergency procedures

Long–term customer relations theory was developed, in part, because of the realisation that customers could be co–producers, and that company profitability could be improved, by attracting and retaining customers, over the long–term (Gummesson, 1987). Health care organisations have chronic (long–term) patients who justify significant resources and consequently they represent significant value creating opportunities. Robinson (2001) contended that patients, with chronic (long-term) conditions, are the greatest users of healthcare resources and (as such) they are most reliant on the trust and professionalism of their clinicians.

The National Advisory Committee on Health and Disability (2007) captures the essence of how chronic conditions are defined globally. They define chronic conditions as "any ongoing, long–term or recurring condition that has a significant impact on people's lives" (p. 7) Chronic conditions affect all age groups with about two–thirds of those affected being people less than 65 years old, and 44% have co-morbid conditions (Singh, 2005). A patient with one chronic condition costs twice the amount of a patient with an acute condition and approximately six times more, if the patient has multiple chronic conditions (Institute of Medicine, 2001, p. 27). In the UK, two–thirds of those admitted to hospital are people with chronic conditions (Singh, 2005). Chronic conditions are the leading cause of illness in New Zealand and they account for more than 80% of deaths. They are the leading cause of preventable morbidity, mortality and unequal health outcomes (Ministry of Health, 1999).

The National Advisory Committee on Health and Disability (2007) claimed that the most common chronic conditions in New Zealand (by diagnosis) are:
- chronic neck or back problems (one in four adults)
- mental illness (one in five adults)

- asthma (one in five adults aged 15-44 yrs)
- arthritis (one in six adults)
- heart disease (one in 10 adults).

Chronic patients can also have multiple medical and social health needs, for example:
- asthma combined with mental illness (Scott, Von Korff, Ormel, Zhang, Bruffaerts, & Alonso, 2007).
- the frail elderly with mental illness (Bruce, Van Citters, & Bartels, 2005)
- psycho–social needs of minority groups with cancer (Moadel, Morgan, & Dutcher, 2007)
- housing impacts on health (Dunn, Hayes, Hulchanski, Hwang, & Potvin, 2006)
- psychiatric disability and employment (Salkever, Goldman, Purushothaman, & Shinogle, 2000)

Chronic disease has been inadequately treated and prevented, due to poorly organised health systems (Bodenheimer, 2000; Institute of Medicine, 2001). Sang (2007) believed that, based on interviews with chronic patients, they are not so much concerned about choice and waiting times, but about holism and self–management (co–production). Wilson (1994) contended, from a self management perspective that managers, who understand that chronic patients are actually co-producers, will be more likely to deliver efficient services.

At the heart of marketing's customer relations theory is the co–production of value. Payne & Frow (2005) developed a customer relationship management framework. Payne and Frow are well recognised authors in the marketing/customer relations literature, their 2005 article has been sited 49 times at the time of writing. The framework is comprised of five interactive generic processes:
1. The strategy-development process, which includes not only a business strategy but also a customer segmentation strategy (that includes long–term customers)
2. The dual value creation (co–production) process

3. The multi-channel/service integration process, which encompasses all the consumer touch points
4. The information/management process that includes all the data collection and data analysis functions
5. The performance/assessment function

The purpose of Payne and Frow's (2005) customer strategy is to know when and how customers want to interact with the organisation (Kumar et al., 2006; Prahalad & Ramaswamy, 2001; Woodcock, Stone, & Foss, 2003). Customer relations theory requires customers (patients) to be segmented, based on an analysis of value (Day, 2003). Long–term customer relations theory realises that customers can be co–producers (Gummesson, 1987). In health care, this would require a strategy that recognised people, with chronic long–term conditions, as co–producers.

Payne & Frow's (2005) value creation processes transform the outputs of the strategy into programmes, which can both extract and deliver three key elements:
- Value that the organisation can provide the customer
- Value that the organisation receives from its customers
- Successful management of this value exchange.

Kumar, Lemon, & Parasuraman (2006) contended that, from a customer relations perspective, values are the criteria by which a judgment is made, whilst value is the notion of preference: the result of an interaction and trade–off between the customer and the service. Health is a personal value: a vital human value (well-being, independence) and an economic value (the capability to generate income) (Zwetsloot & Pot, 2004). Furthermore, patient compliance with the clinicians' recommendations will be highly compromised, if the patient's values are not taken into account, during treatment decisions (Sloan, 2001). The organisation gains economic value when chronic patients require fewer health care resources. Co–production recognises the patient as a resource, in that value cannot be created or delivered, unless the client actively contributes to the service.

Customer relations, multi–service, integration processes take the outputs of the business strategy and turn the value creation processes into value–adding activities for the customer (Payne & Frow, 2005). In the health care context, this could equate with health care organisations either providing (or assisting with) the chronic patient's access to a range of medical and rehabilitation services, which would add value to the patient and the organisation.

Customer relations, information management, processes are concerned with the collection and use of customer data. Data is collected from all customer contact points, in order to generate customer (patient) insights and thus enable appropriate management responses (Payne & Frow, 2005). This requires information systems, which are capable of gathering and analysing information, from all parts of the organisation(s). Health care managers would require a single unified patient view, rather than just a service or episode view, in order to ensure that appropriate services were being provided.

Customer relations, performance assessment, processes involve the monitoring of both customer and staff results. "Customer productivity becomes as an important criterion as internal and supplier productivity" (Ramirez, 1999, p. 59) which means that, in the health management context, how well the patient is managing their health condition is as important as how well staff are performing. Performance processes provide direct feedback to staff on their customer (patient) performance (Payne & Frow, 2005). At a customer (patient) level, these results are collated and they provide information for management action. These feedback processes are consistent with increased coordination and accountability to individual customer (patient) requests.

Payne and Frow's (2005) five customer relations processes of — strategy, value creation, services, performance and monitoring — offer a broad framework for discussion on current health management approaches and how they relate to patient co–production.

2.3 Heath strategy and patient co–production

Marketing's long–term customer relations theory realises that customers can be co–producers (Gummesson, 1987). The customer relations management framework requires that organisations, together with a typical business strategy, have a strategy in place that recognises long–term customers. This section examines policy, patient centred care, and self management in relation to co–production. A strategic commitment by health care organisations, to patients as co–producers, will be required if the concept is to be imbedded into management practice.

2.3.1 Policy

Economic, political and social forces have required the health system to emphasise population based wellness (Minister of Health, 2000; Shortell & Kaluzny, 2006). Mills & Rorty (2002), however, pointed out that patients are not interested in the needs of a population and according to Kleinke (1998), there has been no clear visible reconciliation between prioritising the interests of the patient over the interest of the population and indeed this is a fatal structural defect, people are not populations.

 Hyde & Davies (2004) stated that recent policy efforts have been directed at a cultural change in the basic values, beliefs and assumptions of health care delivery. Scott, Mannion, Marshall, & Davies (2003) argued that considerations of organisational culture have typically conceived an organisation as being a closed system, thus giving insignificant or no weight at all to the role of patients. Menzies (1970) identified a culture of de–personalisation and the denial of the individual, e.g. 'the liver in bed ten' and 'the pneumonia in bed fifteen'. Glouberman & Mintzberg (2001a) noted that a liver transplant surgeon was happy to claim nine out of eleven successful liver transplants, even though there were only ten people. They argued that the 'pigeonholing' of patients into services meant that a category replaced the person. Hyde & Davies (2004) asserted that, without a fundamental change in service design, this culture will be perpetuated. Culture shifts could be driven by

processes that enable patient co–production and processes that value the patient as a resource, rather than a consumer/end user.

2.3.2 Patient Centred Care

The policy commitment, to involve patients in their care, is best reflected in governmental healthcare strategies, such as: Primary Health Care Now More Than Ever (WHO, 2008), New Zealand's Improving Quality Strategy (Minister of Health, 2003a), America's Crossing Quality Chasm (Adams, Greiner, & Corrigan, 2004) and the UK's Quest for Quality (Leatherman & Sutherland, 2005).   These quality strategies define the essential elements of the heath system as being:

- safe
- effective
- patient–centred
- timely
- equitable
- efficient

Internationally, health systems (in their Codes of Practice) also incorporate claims for the primacy of patient interests and this implies reciprocity within joint decision making with patients, for example, the New Zealand Mental Health Sector Standard (Standards New Zealand, 2001). The New Zealand Health and Disability Commissions (HDC) Code Patient of Rights (Health and Disability Commissioner, 1994) offers patients who have suffered an adverse event an alternative to litigation, which is common in many countries (e.g. USA and Canada). The HDC resolves complaints by advocacy, investigation or mediation. The HDC also acts as a gate keeper to disciplinary proceedings and disseminates findings so that lessons can be learnt. This is a process that many patients prefer (Bismark, Dauer, Paterson, & Studdert, 2006). Informed consent is also a legal requirement, in most countries: Physicians have an obligation to explain options to patients, in advance of care, in terms that the patient (or their power of attorney) can understand (Sloan, 2001). The health care system tends to rely on informed consent to ensure patient centeredness.

Edwards & Elwyn, (2001) contended that patient centredness is underpinned by ethical and psychological theoretical perspectives. Ethically, greater autonomy for the patient is regarded as a basic value. Psychologically, patient involvement is seen as leading to a stronger adherence to advice and treatment and thus more suitable outcomes.

Concepts of patient centredness, empowerment, patients as partners, shared decision making and informed choice, illustrate patient emancipation (Edwards & Elwyn, 2001). Patient centredness is similarly defined around the world. The Institute of Medicine (Adams, Greiner & Corrigan, 2004) defines patient centredness as providing care that is respectful of (and responsive to) individual patient preferences, needs and values, thus ensuring that this guides decisions. The United Kingdom's (UK) National Health Service (NHS) defines patient centredness as health care being based on a partnership between practitioners and patients and (when appropriate) their families (Leatherman & Sutherland, 2005). Feedback regarding patient evaluations of health care is expected to be a tool for quality improvement (Wensing, Vingerhoets, & Grol, 2003).

Empowerment refers to political processes, which affect individuals and organisations, which direct attention to processes that involve individuals in decisions about their heath options, including self management (Opie, 2000). Patient compliance with the physicians recommendations will be highly compromised if the patients values are not taken into account in the treatment decisions (Sloan, 2001). A clinician cannot be a good agent with out a substantial amount of help from the consumer. Involving patients and their carers in determining the process and outcomes of care provides a route to: better communication, patient and staff satisfaction, and the overall quality of care (Wilson, 1998). Ryan & Sysko, (2007) examined patient preferences regarding treatment decision making and physician's decision-making style in the U.S. The results revealed that patients prefer participatory medical decision making in their treatment, particularly educated patients. The researchers suggest observing prudence with medical decision making process, by including the patient in any decision making process.

2.3.3 Self Management

Lorig & Holman (2003) contend that self–management is underpinned by self efficacy theory, which states: "Perceived self efficacy refers to ones beliefs in one's capabilities to organise and execute the courses of actions required to produce given attainments" (p. 4). Self–management has become a popular term, for both behavioural interventions and healthful behaviours. Self–management's key feature is to increase patients' involvement and control in their disease and improve their wellbeing (Bourbeau, 2009, p. 700). For most people with a chronic illness, self management is a life time task as only they can be responsible for his or her day–to–day care over the length of the illness Lorig & Holman (2003).

Self-management education teaches problem-solving skills, whereas traditional patient education offers information and technical skills (Bodenheimer, Lorig, Holman, & Grumbach, 2002). Examples of self management include: post-discharge recovery management in Alcohol and Drug services (Dennis, Scott, & Funk, 2003); a diabetes passport for diabetes self management (Dijkstra, Braspenning, & Grol, 2002); and relapse prevention management advice for mental health clients (Frank, Kupfer, Thase, Mallinger, & Fagiolini, 2005; Leavey, King, Cole, Hoar, & JohnsonSabine, 1997; Wolf, 2000).

Russell & Browne, (2005) in a study of adults diagnosed with bipolar disorder who had no episode of acute illness for 2 years or more, found that 76% of the people were in employment and 36% were parents. The study concluded that staying well, involved clients being mindful of their illness and having intervention plans to prevent episodes of illness. Wolf (2000) undertook concept mapping with sixteen consumers, thirteen family members, and eighteen professionals found that relapse prevention and the development of good therapeutic relationships were more important than activities aimed at developing the client's integration into the community.

Bird, Kurowski, Dickman, & Kronborg, (2007) based on research in Australia identified 231 older patients (over 55 years old) who were at risk of making frequent ED admissions. Their risk was identified because, either they had made three or more presentations to a hospital emergency department (ED) in the previous year, or who were identified by community health agencies as being at risk of making frequent ED admissions. They were allocated a "care facilitator" who provided assistance in identifying and accessing health services required, as well as education in aspects of self management. 85 patients, who were eligible for the service but declined, became the comparator group. The recruited participants displayed a 20.8% reduction in ED presentations, a 27.9% reduction in hospital admissions and a 19.2% reduction in bed days. The comparator group however, had 5.2% increase in ED presentations, a 4.4% reduction in hospital admissions and a 15.3% increase in inpatient bed-days over a similar time-frame.

Jonker, Comijs, Knipscheer, & Deeg (2009) in a review of randomised control trails of the Chronic Disease Self–management Programme (CDSMP) found that CDSMP led to an increase in physical exercise, a decrease in heath distress, an improvement in self care and it had a beneficial effect on self–efficacy.

Lorig, Sobel, Stewart, Brown, Bandura, Ritter (1999) conducted a six month randomised control trial on the effectiveness of a self management (CDSMP) that involved 952 patients. While they found that there were no differences for pain, discomfort or for psychological well being, they found improvements in five variables of health status in the treatment group. Further, the treatment group had fewer hospitalisations ($p<0.05$) and spent, on average, 0.8 fewer nights in hospital ($p=0.01$).

Lorig & Holman (2003) contend that self–management is not supported by the system and as one physician claimed "this is not part of our dance". Jordan, Briggs, Brand, & Osborne (2008) and Harris, Williams, Dennis, Zwar, & Davies (2008) also contend that for self management to work there is a need to better understand the infrastructure, systems and training that is required.

Traditional health management practices are underpinned by the assumption that the patient is a consumer/end user, rather than the patient being a resource, who co–produces the health outcome. Co–production needs to happen at the point of delivery and through conversation and dialogue rather than through choice alone, learning to understand and map people's experience and the interface between the service and their lives, is essential for creating conditions for co–production (Dunston et al 2009). Patient–centred care and self management are central to co–production. This thesis argues that for long–term patient co–production to be effective, management processes must be in place to support it. Recognising co–production in strategy offers health management the opportunity to lift patient–centred care to a new level, by ensuring that the significant contribution patients can (and do make) to their heath outcomes, is capitalised upon.

2.4 Service designs and co–production

Integrated care, re-engineering, quality improvement, and chronic care services have been adopted by health care organisations, in order to meet and enhance the health of their patients and these have gone some way to improving patients' experiences and their co–productive potential. Each of these services centric approaches and their relationship to co–production is discussed in detail.

2.4.1 Integrated care

Atun, de Jongh, Secci, Ohiri, & Adeyi, (2010a) contend that the debate on integration effectiveness has been driven by narrow binary considerations, of integrated (horizontal) versus non-integrated (vertical) and is characterised by a polarisation of views for and against integration. They further contend that there is no commonly accepted definition of integration. Atun, de Jongh, Secci, Ohiri, & Adeyi (2010b) undertook a systematic review of the evidence for integration in health systems. They reviewed 8,274 potential articles, which yielded 55 papers from a range of countries for inclusion in the review. There analysis showed few instances of full integration (horizontal) of a health intervention or of completely non-

integrated (vertical) intervention. Instead there exists a rich mosaic of instances where health interventions are integrated into one or more health system functions producing a highly heterogeneous picture (p. 11). They found a paucity of evidence for integration and suggested in order to deliver an evidence based conclusion on effectiveness of integration there was a need for country case studies that used a common methodology and replication logic, informed by appropriate theoretical frameworks.

Van Wijngaarden, de Bont, & Huijsman (2006) asserted that co-ordinated care (horizontal integration) is widely acknowledged as providing more effective and efficient health care. Integrated care stresses processes and agreements, rather than structures and competition and thus it is designed to improve the functional integration of services. Designing an integrated system requires the designer to begin with the population and its health care needs, rather than beginning with existing facilities and programmes (Hirsch & Gregg, 1997).

Chandler et al (1996) stated that integration reduced the skewed distribution of resources and it assisted patients to become active participants in their own care. Their research demonstrated that, compared with the control groups, patients served by integrated service agencies: received less hospital care; greater workforce participation; fewer group and institutional housing arrangements; greater social support; more leisure activity; less family burden; and greater patient and family satisfaction. Mehrotra, Epstein, & Rosenthal (2006) concluded, from their cross sectional study of integrated care, that patients in integrated medical groups received higher quality care, than those patients cared for by independent practice associations. Furthermore, their findings were independent of practices, which had electronic patient medical records, and/or quality improvement strategies, further highlighting the significance of integrated care in improving the quality of patient care.

Whilst integrated care has demonstrated improved results for patients, it is premised on the needs assessment paradigm. The problem with the concept of assessing need is that it does not distinguish between the identification of a problem and its solution. The assessment can inhibit a consideration of the probabilities, as to how

effective various interventions may be, in any given case. They do not reflect the iterative process, which is the reality of health and most social services (Priebe, Huxley, & Burns, 1999). Needs assessments do not specify goals and they tend to over simplify the evaluation of outcome, because they do not take account of different degrees of change. This lack of goal specificity causes a risk of equating service use with service need and thereby entrenching the status quo. As Bell (1999) suggested, needs assessment alone is not a predictor of service demand. Demand is the willingness of participants to use available services. Co–production recognises that services are not undertaken in a one–way transfer, but that the patient contributes to the service.

2.4.2 Business process redesign

Hammer and Champy (1993) in 'Re-engineering the Corporation' argued that business process re-engineering changed from a fad to a flop, within a few years. However, business re-engineering is again being utilised by 61% of companies (Champy & Weger, 2005). Re-engineering in healthcare has been applied to particular conditions or services and it appears to underpin the development of clinical pathways, for example, depression clinical pathways.

The Institute of Medicine (2001) stated that the redesign of health care organisations is based on five generic re-engineering design principles. The first principle is the 80/20 rule — 'design for the usual, but recognise and plan for the unusual'. The second principle is 'mass customisation'. Customisation occurs where the treatment is predictable and it is based on appropriate information which relates to the needs of a particular stratum of past patients. Standardised treatment processes are developed for 80% of patients (with a particular condition) and contingency plans are developed for the other 20% of patients, where exceptions are likely to occur.

'Designing safe systems' is the third redesign principle. The clinician/patient relationship is important, but perhaps more important is how much clinicians can rely on the system not to allow patients to slip though the cracks (Institute of

Medicine, 2001). This design principle, however, appears to assume that well–informed patients are not in the best position to co–ordinate their own safe care.

The fourth design principle is 'continuous flow', which exactly matches demand with supply. If we assume patient demand is steady and predictable and not insatiable, thus requiring waiting times, the health system could run an open access scheduling system for its patients. An open scheduling system could be possible for long-term chronic patients, in a well designed health system. The fifth and final re–engineering process is 'production planning' which ensures the best staff, equipment and other resources are available, in order to meet the needs of patients, in addition to reducing costs.

Examples of successful business process reengineering approaches include:
- the national booking admission program in the NHS (Ham, Kipping, & McLeod, 2003)
- redesigning the intake process in a Netherlands mental health service (Jansen-Vullers & Reijers, 2005)
- surgical care in the National Hospital of Singapore (Kumar & Shim, 2005; Kumar & Ozdamar, 2004)
- reducing emergency department weight time (Kumar & Shim, 2007)
- improving access to 60 public hospitals across New South Wales and at the Flinders Medical centre in South Australia (Ben-Tovim, Dougherty, O'Connell, & McGrath, 2008).

Business process reengineering particularly the 80/20 rule, supports the engineering of co–production processes into contemporary health management where a small number of long-term chronic patients consume a disproportionate volume of the health care resource. A study conducted by Roos (2003) found that 1% of the Winnipeg population occupied 69% of hospital beds. In another study, Lavik (1983) measured total psychiatric inpatient and outpatient service consumption, and reported that 11% of psychiatric patients consumed 75% of all the total services used. The Institute of Medicine (2001) only briefly mentioned the possibility that a small number of patients (rather than diagnoses) consume the

greatest portion of health care resources. Crucially, as Edwards & Elwyn et al (2001) stated, we need to identify what approaches of involving patients, with what problems, at what moment in time are required to improve patient outcomes — co–production offers a way to do this for long-term chronic patients.

2.4.3 Chronic care

Chronic care management (CCM) is designed to improve efficiency, by improving service coordination, for patients with specific chronic illnesses (asthma, diabetes, depression, heart failure). Effective chronic care requires collaboration between the patient and the care team (Shortell et al., 2004) and it is designed to reduce costs.

CCM is based on project management methodology and it provides a scientific framework for organising and delivering care, at the level of small-practice setting or micro systems. The CCM teams have been developed according to five key design elements: clinical information systems; delivery design; decision support; community resources; and policies (Adams et al., 2004). The centrepiece of CCM is the facilitation of productive interactions between patients and CCM teams (Shortell & Kaluzny, 2006, p. 247). Schmittdiel et al (2006) also suggested that the best way to improve chronic illness care is by the redesigning of primary care services, which emphasise the comprehensive co-ordinated approach advocated by CCM. Whilst the CCM approach goes some way to addressing chronic illness, the management premise is still that the patient is a consumer.

Coleman, Austin, Brach, & Wagner (2009) examined the evidence for CCM they reviewed articles published since 2000 and retained 82 articles for the final study. Fourteen of the reviews were a meta analysis; twenty-one were studies of the relationship between organisational characteristics and quality improvement: eleven articles described nine randomised control trails; six studies related to cost or cost-effectiveness; and thirty were quasi-experimental or observational evaluations of the use of the CCM for quality improvement. Most of the articles reflected experience in the United States, although European, Canadian and Australian experience was well represented (p. 77). They found, although not definitive, published evidence

28

suggested that practices redesigned in accord with CCM generally improved the quality of care and the outcomes for patients with various chronic conditions.

New Zealand's Counties Manukau DHB introduced a chronic care management model, in order to reduce demand on acute hospital beds. This DHB's approach is similar to that of chronic care programmes internationally. Evidence based guidelines were the foundation of the programme (Wellingham et al., 2003). Patients with serious chronic conditions were enrolled in the programme and there was a generic care plan for the disease. In addition, education was also provided on the plan. Patient health outcome was seen as an output of negotiated decisions with patients in the context of their normal environment. However, my reading of the Counties Manukau approach is that it seems to be based on a generic, rather than a personal plan. Audit and evaluations were used, to ensure and monitor programme compliance. The project did show some evidence of success, through the reduction of respiratory acute bed days, by a mean 2.6 days (95% CI [0.5-4.7]) (Clarke, Howells, Wellingham, & Gribben, 2003). This DHB's model goes some way to improving patient co–production, at a clinical team level.

Managed care is defined as 'any care organised or assisted by heath care professionals'. Singh (2005) asserted that, in recent years, managed care has become associated with models developed by health management agencies in the United States (US), in order to promote cost effective use of health care resources. There are three main US managed care models (Singh, 2005). The Kaiser model focuses on all chronic patients, with the aim of improving integration between primary and secondary care. The Evercare model targets people, who are at highest risk, by using advanced primary nurses to focus on integrating social and heath care, to more suitably meet the individual's needs. The Pfizer approach also targets those people at the highest risk, by the use of telephone case management, to supplement existing services.

Managed care programmes including the CCM programmes, appear to be subject to standard monitoring and control processes, for example sample based audits. Chronic care programmes are often applied to those patients causing the highest costs — since they are not available to the entire population — not all patients can

29

benefit (Bodenheimer, 2000). Furthermore, as Hunter (2000) asserted, patients may not have 'any say' as to whether they are involved and (if primary care is not involved in designing the care) there is a potential for fragmentation. A co–production lens concerns itself with all long–term chronic patients not merely a sample of them. Co–production values the patient as a resource and it has, as its starting point the creation value for the patient (who may have multiple health and social concerns), and as a consequence it can create value for the organisation.

2.4.5 Quality Improvement (QI) methodologies

The goal of total quality management (TQM) and its associated technique continuous quality improvement (CQI) are designed to improve production processes to produce cheaper or better quality (Anderson, Rungtusanatham, & Schroeder, 1994). Achieving high-quality, low-cost performance was found to associated with improved profit margins (Jiang, Friedman, & Begun, 2006).

Walshe, (2009) drawing on bibliometric analysis of the quality improvement (QI) literature over the period 1998 to 2007, found an essentially similar set of QI methods under different names and methodologies. These programmes included: Clinical Governance, TQM (total quality management), CQI (continuous quality improvement), medical audit, clinical audit, Lean, Patient safety, Six sigma, Process redesign, and Accreditation. Walshe, (2009) labelled this pseudoinnovation and called for scientifically rigorous approach to QI where a combination of theoretical, empirical, and experiential evidence is used to guide and plan QI tools uptake.

Alexander, Weinew, & Griffith (2006) contend that quality improvement collaboratives are increasingly being used in many countries to achieve rapid improvements in health care. The health care industry has invested substantial resources to meet the demands for improved quality of care while at the same responding to demands for more efficiency. Hospitals that implement TQM initiatives effectively, by focusing control and learning, can reasonably expect to improve their financial and cost performance. Or at least not place the hospital at risk for investing in quality improvement. However, there is little independent

evidence that they are more cost effective than other methods, and there is little knowledge about how they could be made more effective (Ovretveit, Bate, Cleary, Cretin, Gustafson & McInnes, 2002). TQM requires both clinical and management staff to work extensively in teams, and at least in short run these efforts decrease efficiency (Alexander & D'Aunno in (Mick & Wyttenbach, 2003, pp. 56-57)). Alexander, Weinew, & Griffith (2006) contend QI has a measurable impact on global measures of health care organisational performance (cash flow and cost per case).

Wensing, Vingerhoets, & Grol (2003) contend that feedback regarding patient evaluations of health care is expected to be a tool for quality improvement In the traditional market though, the consumer is the final arbiter of quality. The theories of QI assume that the payer, the customer, and the consumer are identical: an important anomaly for health care services. Clearly, the patient is not the ultimate arbiter quality in the case of the health system. The use of QI techniques in health care can not prevent the shift of attention of other interests away from the patient, and may even contribute to it (Mills & Rorty, 2002). Co–production recognises the patient as a resource rather than a consumer/end user.

2.4 Information management and co–production

A seminal health economics article by Arrow (1963) identified that health information was imperfect and asymmetrically distributed. This imperfection and asymmetry of information has been seized upon to justify every inefficiency, idiosyncrasy and interest-serving institution in the health care industry (Robinson, 2001). Edwards & Elwyn (2001) assert that many patients are well informed, much more than in previous years, they often have experiences relevant to treatment, but unknown to professionals, and their needs and preferences can differ considerably to those of professionals. Essentially the effectiveness of care provision often depends on the co–operation of the patient. "A leap of faith will always be needed. Information does not and cannot, provide all the answers" (Lancet 1995, p1451). Information technology has improved consumers' access to information in order to make meaningful choices, however information asymmetry will never go away - no internet site will replace the doctor/patient relationship. Data crunching will never

eliminate the vast grey areas where the technology of medical treatment and patient preference intersect (Millenson, 2001).

Crucial to co–production, as stated by Payne & Frow (2005), is information. Shortell & Kaluzny (2006) argued that health care organisations frequently do not collect and store the correct information and their information systems are generally not automated or integrated and they lack sufficiently sophisticated computer hardware and software. These systems also frequently lack the necessary support in order to retrieve and analyse information. In the US, 40% of health care organisations planned to spend 1.5% or less of their total operating budgets on information technology. This compares with an 8.5% average in other industries (Shortell & Kaluzny, 2006)p. Jackson (2006) reported that New Zealand's Counties Manukau DHB had not spent any money on information infrastructure, since 2003. The majority of DHBs involved in this research had to manually extract all the necessary data, for their KPP patients in their first year, because their patient management systems could not provide the data.

Shortell & Kaluzny (2006) stated that there is a need for information systems, which can collect data about individuals in care. These information systems would need to:

- capture appropriate patient information
- analyse data, in order to identify trends
- integrate information across the service continuum
- track trend and utilisation information to ensure appropriateness of care delivered
- feedback information on protocols and clinical quality improvement
- provide data on demand, such as utilisation and patient tracking

The continuity of patient care depends on the availability of complete health care information so that future care can be planned and implemented (Mills, 2006). Health information in general and electronic health records in particular, are increasingly viewed as tools for improving both patient care and health system efficiency. Jha, Doolan, Grandt, Scott, & Bates, (2008) examined the use of

electronic health records (EHR) using a combination of literature reviews and interviewing country experts, in seven industrialised nations to determine the rate of electronic medical record use in both ambulatory care settings and hospital settings. Four nations (the UK, Netherlands, Austria and NZ) had greater than 90% of general practitioners using EHRs, while in Germany the range was from 40%-80% and Canada and the US ranged 10% to 30%. Less than 10% of hospitals in any of the countries had key components EHRs. Chen, Garrido, Chock, Okawa, & Liang, (2009) quoting two systematic reviews and three other studies, state that there is a growing body of literature confirming the value of EHRs in improving patient safety, improving co-ordination of care, enhancing documentation, and facilitating clinical decision making and adherence to evidence based guidelines. Wiljer, Urowitz, Apatu, DeLenardo, Eysenbach & Harth (2008) contend there is growing interest in, and demand for harnessing the power of the EHR beyond just the delivery of care; patient access to EHRs is a fundamental right and health care professionals and organisations must move in a responsive and responsible manner to provide access.

Simon, Evans, Benjamin, Delano, & Bates (2009) using focus groups that compromised of 62 community members, from a Massachusetts community, explored patients views regarding the sharing of electronic health information and their preferences for learning about and participating in this process. Patients realised the capacity electronic health information exchange had to improve the quality and safety of their care but were also concerned about potential breaches of privacy and the misuse of health data.

Jamal, McKenzie, & Clark (2009) systematically reviewed the published evidence of the impact of health information technology or health information systems had on quality health care focusing clinicians' adherence to evidence based guidelines and the corresponding impact this had on patient clinical outcomes. 23 studies were included in the study and showed (consistent with other reviews) that heath information technology has been shown to improve clinician's adherence to guidelines, however there was insufficient evidence of either clinically or statistically important improvements in patient outcomes.

Increasingly electronic tools are being developed to assist self management, for example the:

- use of personal health records in diabetes management (Hess, Bryce, Paone, McTigue, & Olshansky, 2007)
- electronic self-report assessment for cancer (Karras, Wolpin, Lober, Bush, Fann, & Berry, Karras, 2006)
- decision support tool for lipid management in primary care (Gill, Chen, Glutting, Diamond, & Lieberman, 2009).

Mettler & Kemper (2006), based in the Netherlands, describe information therapy as the timely prescription and availability of evidence–based health information to meet individual's specific needs and support sound decision making. They claim the information therapy tool provides cost–effective disease management support to a much larger portion of chronically ill patients than is currently reached. Flett, Curry, & Peat (2008) evaluated the chronic disease management of three general practices in Scotland (using a case study approach). One practice used the Dunlop Recall Management (DRM system) The DRM is an innovative information system, to manage patients with chronic disease from a holistic perspective, treating patients on the basis of their individual health status and associated conditions rather than managing them through a series of predefined clinics for individual conditions. Pharow, Hildebrand, & Blobel (2006) describe smart cards that serve as a storage media and portable application systems, which enable patient controlled exchange and use of personal health data for specific purposes, such as prescription and disease management.

The internet is becoming a key arena for self–management. Kennedy, Rogers, Sanders, Gately, & Lee, (2009) examined the role of patients as lay tutors using the internet. They undertook a quantitative analysis of discussion postings of 11 online classes. The study gave insights in to the roles tutors adopt – one being their ability to 'police' subjective management of long–term conditions and another being to attempt to enhance the psychological capabilities of participants.

Information will be a key to developing and operating a high quality, cost efficient health system. Information systems appear to be developing along two lines, a service centric approach, as exemplified by the electronic health record (HER), and a patient centric approach as exemplified by electronic tools that support self management. Co–production needs to happen at the point of delivery and through conversation and dialogue rather than through choice alone, learning to understand and map people's experience and the interface between the service and their lives, is essential for creating conditions for co–production (Dunston et al 2009). Appropriate information will be crucial to long–term patient co–production. Information systems to support co–production will need to be able to 'recognise' who the long–patients are, and the health record will need to be able to reflect a negotiated heath care plan that can also inform management decisions.

2.5 Service performance monitoring and control and co–production

Payne and Frow's (2005) customer relations framework suggests that co–production requires monitoring and control processes, which relate more directly to the client/patient. Health care organisations, across the world, are subject to strong regulatory frameworks. In New Zealand, the key regulations cover: consumer rights[1]; health information privacy[2] ; safe services[3] ; workforce competence[4]; and the New Zealand Public Health and Disability Act ("New Zealand Public Health and Disability Act," 2000)

Management generally relies on sample processes for routine audits, in order to measure compliance with the standards that rest within regulatory frameworks. The DHB mental health service profile (Welsh & Kokaua, 2005) shows that from the approximately 100,000 patients, seen by New Zealand DHB mental health services,

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[1] Consumer rights: ("Health and Disability Commissioner (Code of Health and Disability Services Consumer's Rights) Regulations," 1996)

[2] Health information privacy: ("Privacy Act: Health Information Privacy Code," 1994) ,

[3] Safe services: ("Health and Disability Services (Safety) Act," 2001)

[4] Workforce competence: ("Health Practitioners Competence Assurance Act," 2003)

35

approximately 15,000 were long-term chronic psychiatric patients[5]. Sample audits do not work effectively for long–term patients, because these patients represent approximately 15% of the sample of files that could be audited. Sloan (2001) contended that there is a lack of any sound empirical evidence that regulations have adequately protected patients. Ozcan, Shukla, & Tyler (1997) argued that regulations have tended to legitimise health care organisations, but they are independent of efficiency and they have failed to ensure organisational success.

Performance and improvement measures, particularly in secondary care, usually relate to episodes of care for a particular condition or speciality. The 'OECD's Health Care at a Glance' document provides excellent examples of indicators, which rely on episodes of care, e.g. average lengths of stay per hospital discharge, for respiratory, circulatory, and cancer treatments (OECD, 2005, pp. 55-56). Relying on performance measures by episode, does not give sufficient information, relating to the number or the needs of patients, who use services.

(Chuang & Inder, 2009) contend that the use of accreditation and quality measurement has been widespread across many countries but that the improvements of health care outcomes need to be based on an appreciation of the whole system that contributes to the outcome.

Health care organisations are subject to strong control processes that focus on services and episodes — not the individual patient's experience. These are measures that do not differentiate long-term chronic patients, nor acknowledge them as co–producers.

2.6 The roles of clinicians and managers in co–production

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[5] Chronic psychiatric patients are defined as those who attend a DHB mental health service at least once every quarter, for two years or more.

Effective clinician/management relationships are crucial to an effective health service delivery and it is important that they are considered, in light of a potential change in management practice, a co–production approach could bring.

Difficulties within clinician/manager relationships are well documented (Berwick, 1994; Cavana, Davies, Robson, & Wilson, 1999; Glouberman & Mintzberg, 2001b; Rundall, Davies, & Hodges, 2004; Edwards, 2005). Difficulties with modern medicine and management have been termed the "danse macabre" (Degeling, Maxwell, Kennedy, & Coyle, 2003). Edwards (2003) stated that these poor relationships may cause damage (decrease value) to patients.

Ramanujam & Rousseau, (2006) asserted that organisation and management practices, in hospitals, are shaped by four factors: conflicting missions; a distinctive and largely professional workforce; demanding external environments; and a complex day–to–day task environment. Cavana (1999) argued that, in order to minimise these often conflicting worldviews, management research is required to redesign care processes based on best practice.

Clinicians ought to be playing a central role in making the changes in the health care system that will allow the system to offer better outcomes, greater ease of use, lower cost, and more social justice in health status. Instead, Berwick, (1994) states most of the proposed changes that are today called "health care reform" are actually changes in the surroundings of care rather than changes in the care itself. Clinicians have an opportunity to exercise leadership for the improvement of care, but they must first agree to address the aims of reform and to adopt an agenda of specific changes in their own work that are likely to meet the social needs driving the reform movement. Health services research offers a sound scientific basis for identifying promising improvement aims for clinician-led reform. Berwick (1994) outlined eleven aims for clinical leadership of health system reform, these are:
1. reducing inappropriate surgery, hospital admissions, and diagnostic tests
2. reducing key underlying root causes of illness (especially smoking, handgun violence, preventable childhood injuries, and alcohol and cocaine abuse)
3. reducing cesarean section rates to pre-1980 levels

4. reducing the use of unwanted medical procedures at the end of life
5. simplifying pharmaceutical use, especially for antibiotics and medication of the elderly
6. increasing active patient participation in therapeutic decision making
7. decreasing waiting times in health care settings
8. reducing inventory levels in health care organizations
9. recording only useful information only once
10. consolidating and reducing the total supply of high-technology medical and surgical care
11. reducing the racial gap in infant mortality and low birth weight.

Health care professions and their professional organizations in concert should embrace these 11 aims, establish measurements of progress toward them, and commit to continuous and fundamental changes in their pursuit (Berwick 1994).

Lin, Marsteller, Shortell, Mendel, Pearson & Rosen (2005) examined the motivation of health care professionals to improve quality of chronic illness care using the Chronic Care Model and Plan-Do-Study-Act cycles. The findings suggest that organisational attempts to redesign care require support of activities initiated by practitioners and managers and an organisational commitment to quality improvement.

Garelick & Fagin (2005) described the different worlds of doctors and managers, and how they can conflict. Doctors, whether they work in the acute hospitals or the community, tend to be focused on the individual patient and they are not concerned about costs. Managers tend to focus on populations, government agendas and efficiency. They rarely have contact with patients or patients' families. Managers need to motivate and lead groups and respond to problems of personal commitment, turnover, apathy and conflict, amongst professionals, through negotiation. Managers have control over resources, budgets, beds and many staff (Garelick & Fagin, 2005). Hunter & Hudson (2000) contended that when managers prioritise they frequently rely more on values and judgement, rather than on a technical process.

Managers are faced with a number of questions when deciding what the organisation's strategic approach should be; what is the population need: what is the most efficient way to provide services: and should services be vertically integrated? They also need to position the organisation in response to problems in the environment, such as: uncertainty; complexity; technical and social change; competitive forces; and multiple performance demands (Garvin, 1998).

Robinson (2001) contends that the health care sector has unique features but so do other industries. Salient characteristics of health care such professionalism, licensures, third party payment, and heavy government regulation can be found in other sectors, albeit not in quite the same dysfunctional bundle. Environmental uncertainty has been used as a justification for the difficulties of managing health care organisations. Given the turbulence of the heath services environment the ability of health service organisation is of growing importance (Shortell & Kaluzny, 2006, p. 22). Bigelow & Arndt (2000) assert that even in the 1960's heath care was described as volatile and changing and they contend that it is time to question the pattern. Begun & Kaissi (2004) argue that there is a discrepancy between high perceived and actual uncertainty in health care environments especially when compared to other industries. The health care environment is a fairly certain one and change is predicable when compared with other industries. Patients continue to get sick and seek medical care with a high degree of regularity, governments continue to reimburse and change is predictable.

Managers also need to consider what processes could create cost shifting, from one budget to another. Cost shifting may occur for those service users who have high, complex and ongoing support needs and who present as high cost or high risk (Shortell & Kaluzny, 2006). Management processes, which recognise long–term chronic patients as co–producers, rather than consumers, offer a way to mitigate the risk of cost shifting, within this group of patients because patients not services are the unit of measure.

Evidence-based management involves the systematic application of the best available evidence for assessing options and making managerial decisions within the organisations missions and values. Evidence based management seems to

39

have made little progress in heath care so far and governments, policy makers and mangers themselves have shown a conspicuous lack of interest. Proper use of evidence based management is a long way from a reality (Walshe & Rundall, 2001).

Pfeffer & Sutton (2006) claimed that managers, from all types of organisations can learn from the practitioners of evidenced–based medicine, which is a movement they argue has taken the medical establishment by storm over the last decade. Similar to medicine, management is learned through practice and experience. Managers (similar to clinicians) can practice their craft more effectively, if they relentlessly seek new knowledge and insight, from both inside and outside their companies, in order that they can keep updating their assumptions, skills and knowledge (Pfeffer & Sutton, 2006, p. 62). Kirkpatrick, Jespersen, Dent, & Neogy (2009) contend that around the world there has been a trend for doctors to increase their participation in management.

Management's recognition of long-term patients, as co-producers, provides a long-term patient lens to both management and clinicians, which could assist with co–operative work practices. In a co–production environment, managers would be as concerned with long–term patient performance, as they are now with efficiency (Payne & Frow, 2005).

2.7 Consideration of other theories

Co–production provides the theoretical unpinning for this thesis. The close relationships between co–production and patient centred care and self management have been discussed. I also considered and ruled out four other theories that might help explain the Knowing the People Planning (KPP) findings. While aspects of the theories are consistent with some aspects of the KPP findings, they do not provide sufficient explanatory power. The theories and their limitations for this research are discussed in the following four sections.

2.7.1 Stakeholder theory

40

Freeman (1984) states, in relation to stakeholder theory, that managers need to "take into account all of those groups and individuals that can effect, or are effected by, the accomplishment of the business enterprise" (p. 25). Laplume, Sonpar, & Litz (2008) analysed 179 articles (mostly focused on large corporate firms written between 1984 and 2007) that directly addressed stakeholder theory and found five key themes:

- Stakeholder definition and salience, meaning any group or individual who can effect or is affected by the achievement of the organisation
- Stakeholder actions and responses, meaning managers must go beyond understanding stakeholder interests and attempt to predict which influence strategies stakeholders will likely employ
- Firms action and responses, meaning how do firms gain manage and balance stakeholder interests, ideally in win–win relationships
- Firm performance meaning how is the firms performance affected by stakeholder management
- Theory debates' meaning that an understanding is required regarding the normative foundations of stakeholder theory, what are its problems and what theories does it compete with.

Stakeholder theory is certainly relevant to co-production by chronic long–term patients, as patients can be viewed as stakeholders of the heath care organisation. New Zealand mental health organisations have employed consumer advisors (discussed in more detail in Chapter Three) in an attempt to manage consumer stakeholder expectations. Stakeholder theory certainly supports a strategic approach to developing management processes that can reduce the impact of long–term chronic patients on the healthcare organisation.

2.7.2 Social Capital Theory

Adler & Kwon (2002) synthesised the theoretical research undertaken on social capital theory. They define social capital as "the good will available to individuals or groups. Its source lies in the structure and content of the actor's social relations. Its affects the flow from the information, influence and solidarity it makes available to

the actor" (p23). One of the four KPP key features relates to patients social needs and therefore has an element of social capital theory, especially in relation to peer support. Richardson, Kennedy, Reeves, Bower, Lee, Middleton (2008) found using a pragmatic randomised controlled trial of the Expert Patients Programme (a lay–led self–care group involving sessions teaching self care skills) across a range of self–defined long–term conditions found that there was a 94% chance of the programme being cost effective, based on quality adjusted life years (QALYs). Jerant, Moore-Hill, & Franks (2009) randomised 415 people (40 years) and older into standard care and a peer led chronic illness self–management programme, they found improvements in illness management self efficacy showing an effect size of (0.17; 95% CI, 0.01-0.33) at six months but not after a year and also there was no effect on service utilisation, suggesting other factors are required to assist improving self management.

While social capital is a feature of KPP, the theory focuses on the patient/individual rather than the interaction of the patient with the service.

2.7.3 Process Theory

Process management is based on the view of an organisation as a system of interlinked processes, and involves coherent efforts to map, improve and adhere to organisational processes (Benner & Tushman, 2003). Process management is defined set of methodological and behavioural practises emphasising the management of process rather than results (Anderson, Rungtusanatham, & Schroeder, 1994, p. 489).

Garvin (1998) developed a unifying frame work for process theory. Garvin identified three key management processes; direction setting, negotiation, and monitoring and control processes. Management's direction setting processes (strategy) have several components, learning about the organisation and its problems through interactions, gathering information and choosing appropriate interventions. Critical direction setting process choices include; what information sources to tap into, and which communication and supporting systems should be

emphasised. Negotiating processes involve managers working vertically and horizontally to obtain the needed support and resources to get the task completed. Monitoring and controlling processes ensure the organisation performs as planned. The aim of monitoring and controlling is to sense, formulate problems, collect information and take any necessary action to ensure work is undertaken as agreed. These processes rely on variance reporting of critical work processes. The important decisions here are what information sources to tap into, what data to request, the questions to pose and the amount of time required to draw conclusions.

Processes provide a convenient intermediate level of analysis opening up the black box by providing the needed integration of the realities of work practice link explicitly to the firms over all functioning. Process views also provide useful insights into managerial behaviour through integrating activities into a coherent whole. This approach is provider centric and takes no account of the contribution patients can — and do — make to their heath outcome.

2.7.4 Rational Systems Theory

Rational system theorists asserts that "Organisations are collectives oriented to the pursuit of relatively specific goals and exhibit relatively highly formalised social structures" (Scott, 2003, p. 27). Specific goals result in clear task specifications that allow formalised social structures. Current management approaches are all attempts to close the system using rationale management (Thompson, 1967) with the aim of removing uncertainty from the technical core (clinical workers) and reducing the number of variables (Perrow, 1984). Organisations use standards, service provision frameworks, clinical pathways and quality improvement tools to provide technical and organisational rationality. These approaches are provider centric and take no account of the contribution patients can — and do — make to their heath outcome.

43

2.8 Conclusion

Typically, health management has been premised on the patient as a consumer/end user. This has led to two distinct approaches to improving care for patients. The first approach is service centric and has resulted in a focus on: integrating services, re-engineering, quality improvement and the development of chronic care teams. These approaches cannot account for the significant contribution patients can and could make to the health care. The second approach is patient centric and is exemplified by patient centred care and self management. Patient centred and self management approaches occur independently of direct management support. Information systems are also developing along the same binary lines, with electronic medical records being service centric and self management information systems being patient centric. Whilst all of these approaches have met with some success in improving patient care, they are based on the assumption that the patient is a consumer/end user and occur independently of direct management support. Managers have tended to focus on populations, government agendas and efficiency. They rarely have contact with patients or patients' families. Further, monitoring and control processes tend to based on an episodic or service and can take little account of patients with long–term conditions.

Co–production rejects the binary service centric and patient centric approaches. Co–production needs to happen at the point of delivery through conversation and dialogue rather than through choice alone, learning to understand and map people's experience and the interface between the service and their lives, is essential for creating conditions for co–production. Co–production theory views the patient as a resource, rather than a consumer/end user, who can create value for themselves and in the process create value for the organisation.

This thesis contends that management processes need to be in place to support the effective co–production by long–term patients which creates value for the organisation as well as the patient. Customer relations theory recognises lifetime customer value and it provides a framework for understanding how chronic patients

44

can more effectively co–produce healthcare value. This framework covers the following processes:

- customer strategy
- co–production
- service provision
- information-management
- monitoring and control (performance)

Such an approach also has the potential to improve the often tense doctor and management relations because the co–productive management process can support improved outcomes for patients.

Stakeholder Theory, Process Theory, Rational Systems Theory, and Social Capital Theory were considered in relation to the KPP and while KPP includes aspects of these theories focused on either patient (individual) or the service. Co–production provides another lens for researchers and practitioners to view and improve the functioning of health care organisations.

The setting for this research, including a description of KPP, is described in the following chapter.

Chapter Three

Research Setting, New Zealand Mental Health Services

Alford (1998) stated that public service organisations are conceived as being the producer and the client as being the recipient (consumer). Prior to the development of 'Knowing the People Planning' (KPP), mental health services in New Zealand did not tend to differentiate their long-term patients, nor conceive of them as co–producers. This chapter describes the New Zealand health and mental health system and the development of KPP, in order to provide the context for this research. The chapter is comprised of six sections. The first section discusses the historical context of the New Zealand public health system. The second section describes New Zealand's public health system, whilst the third describes the New Zealand mental health system. The fourth section places New Zealand's mental health services within an international context. The fifth section describes KPP and this description is followed by a section, which concludes the chapter.

3.1 Historical context of the New Zealand public health system

Gauld (2002) states that health restructuring has been in vogue, but in no country has engaged in as much health sector restructuring as New Zealand where, in a decade there have been four different public health sector structures (p436). The four structures include:

- an area health board system (AHB) (1983-1993), with planning and purchasing located at "home" in local areas and closely aligned with service provision
- a competitive internal quasi market (1993-1997) which separated planning and purchasing from service provision
- a centralised quasi market system with a "headquarters" controlling planning and purchasing (1997-2000)
- the current district heath board (DHB) system (2000 -)

Barnett & Newberry (2002) studied, over the period 1984 to 1997, the impact of the hollow state framework on New Zealand community mental health services. The hollow state unpinned public sector restructuring in New Zealand, and was characterised by privatization, decentralisation and flexibilisation. This quasi–market approach to mental health, suggested competition would be possible between interchangeable service components, and that service development would be better served by classical rather than relational contracts. The researchers used two data sources (documentary data and a survey of providers) and concluded that the quasi–market approach was detrimental to community mental health services in New Zealand.

Cumming & Mays (2002) clarify the differences and continuity between the earlier reforms and the current DHB structure. The AHBs (1983–1993) were criticised for poor financial management, it was argued that the model lacked incentives for efficiency (AHBs were both purchasers and providers of services) and further performance was not adequately monitored. The internal quasi–market (1993-1997) saw a sharp separation between four regional health authority (RHAs) purchasers and providers that included binding contracts between the two. Overall, the limited evidence available suggests that this quasi–market period of reform led to no obvious improvements. The quasi market (1997-2000) saw the four RHAs combined into one national purchaser, the Health Funding Authority (HFA), to give greater consistency in access to services. The rhetoric of competition was replaced with emphasis on co–operation the hospitals were renamed to Hospital and Health Services (HHSs) with the removal of their for–profit status (Cumming & Mays, 2002). The research that led to the development of KPP was, however, commissioned during this period of health reform.

The current DHB health structure (2000-) is discussed in detail in the next section

3.2 The New Zealand public health system

The New Zealand Health Strategy (Minister of Health, 2000, p. vii) sets out seven fundamental principles, for the New Zealand health system:

- The special relationship the Crown has with Māori (New Zealand's indigenous people)
- Good health for New Zealanders throughout their lives
- Improvements in health status for the disadvantaged
- Collaborative health promotion and disease and injury prevention by all sectors
- Timely and equitable access to a comprehensive range of health and disability services, regardless of an ability to pay
- A high performing system in which people have confidence
- Active involvement of consumers at all levels

The Minister of Health has overall responsibility for the health system (New Zealand Government, 2001). The Ministry of Health (Ministry) acts as the Minister's agent and it enters into funding and accountability arrangements, via the Crown Funding Agreement (CFA), and by agreeing to District Annual Plans (DAPs), with the 21 District Health Boards (DHBs).

The Minister also sets out health priority areas for all DHBs, as outlined in the New Zealand Health Strategy (Minister of Health, 2000). New Zealand's 21 District Health Boards (DHBs) are accountable (within their boundaries) for the promotion and maintenance of the population's wellness through an emphasis on a continuum of care and integrated service delivery (Minister of Health, 2000). DHB Boards are predominately compromised of community elected members who are accountable to the Minister. This composition causes a tension between the Government's expectations and the DHBs mandate to maintain the wellness of their population, because the elected members are accountable to the Government, not their local population (Adam, 2003).

DHBs are required to assess the health and disability support needs of the people in their regions and to appropriately manage health resources. A population based funding formula determines a DHB's funding allocation. DHBs contract with a range

of health and disability services, in order to meet the population's health needs. Figure 3.1 shows the structure of the New Zealand health and disability sector. The DHB provider arm services provide secondary and tertiary acute hospital services and some community services, such as community mental health teams. DHBs also contract with non-governmental organisations (NGOs) such as primary care organisations and Iwi (Māori) providers in order to deliver services.
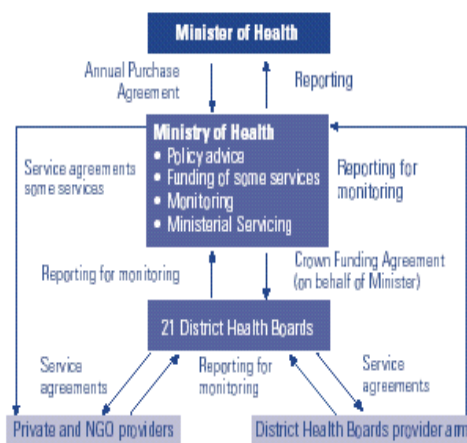
Figure 3.1 New Zealand Health Structure (New Zealand Government, 2001)

This structure is designed to emphasise the 'steering' role of central government by strengthening national direction, preventing the emergence of inequities between regions and improve 'rowing' performance by enhancing accountability and co–ordination at a local level (Barnett & Newberry, 2002, p. 205). The structure was a concerted effort to steer the publicly fund health sector towards population health objectives. Ashton, Tenbensel, Cumming, & Barnett (2008) undertook research to examine the extent to which the New Zealand government was able to steer the health system towards population health. The research was based on semi–structured interviews with key informants that included; DHB chief executives, DHB chairs and, DHB funding and planning managers. A questionnaire survey was sent to DHB board members and case studies were undertaken in five DHBs. The researchers concluded that there was the will to change, but by 2005 government agencies were some way off discovering effective ways to steer towards population health (p. 1151).

3.3 New Zealand mental health services

3.3.1 Historical Context

Psychiatric hospitals existed in New Zealand, until the late 1990's. The closures of large psychiatric hospitals began in the 1970's and they were replaced by community and acute hospital services. The number of residents in psychiatric hospitals dropped from 350/100,000 population, in the early 1970's, to approximately 50/100,000 population, in the late 1990s (Simpson, McKenna, Moskowitz, Skipworth, & Barry-Walsh, 2003).

Three significant reports in the late 1980s and 1990s, identified shortcomings in the mental health system. The two 'Mason' reports (Mason, Ryan, & Bennett, 1988; Minister of Health, 1996) were significant, since they identified the fact that services were under-funded and in disarray and that there was a need for specialist mental health forensic services. These reports also found that there was a lack of co-ordination across services; a lack of leadership in the sector; and poor services for Māori. The third significant report, the 'Acuity Review' (Ministry of Health, 1997a) identified that (on any given day) approximately 40% of acute unit inpatients did not need to remain in hospital, if there were alternative services available. This report also found that care was fragmented across levels of service and between service providers and there was not any one organisation that could be identified as being ultimately responsible for:

- the overall co-ordination of a comprehensive treatment plan
- ensuring appropriate planned services were provided for — in a timely manner
- evaluating the effectiveness and progress of patients' care

The Ministry of Health (1994) outlined the goals and strategic directions for mental health organisations, for the ensuing decade, in 'Looking Forward': Strategic Directions for Mental Health Services (Ministry of Health, 1994). 'Moving Forward' (Ministry of Health, 1997b), the national mental health plan, provided national objectives for up to ten years, in order to ensure the implementation of 'Looking Forward' (Ministry of Health, 1994). The over-arching approach, to the quality and safety of health services in New Zealand, was the 'Improving Quality Strategy'

(Minister of Health, 2003a). These health strategies, however, did not differentiate long-term clients and they were premised on the patient as a consumer rather than a co-producer. The Second New Zealand Mental Health and Addiction Plan (Te Tāhuhu) (Ministry of Health, 2005b) however, was developed around ten leading challenges and the second leading challenge: Building better mental health services, and stated that "this challenge also confirms that the Government remains committed to services for people who are severely affected by mental illness, especially those who have enduring severe conditions" (p. 9).

The Mental Health Commission (Commission) was tasked with overseeing the implementation of the National Mental Health Strategy (Minister of Health, 1996). The Commission's oversight involved monitoring and reporting on the performance of the key agencies involved in implementing the strategy — most significantly the Ministry of Health.

3.3.2 Funding

'The Blueprint' (Mental Health Commission, 1998) described the mental health services that were required, per 100,000 population to ensure suitable treatment and support, for those people affected by mental illness. 'The Blueprint' was developed by an expert committee; using a needs assessment approach, based epidemiological data from outside New Zealand, particularly the Australian Tolkien Report (Andrews, 1991). Blazer & Kaplan (2000) argue that there is conflict between community (epidemiological) and clinical "caseness" makes estimates of actual need difficult. 'The Blueprint's' development also involved public consultation. Blueprint planning is concerned with known fixed end states, and planning assumes the fixed end states will be relevant for the life of the plan (Lane, 2005). Clearly the end states, years after the development of 'The Blueprint', are less likely to be relevant as recovery focused services begin to have an impact.

'The Blueprint' was still having a significant impact on service planning and delivery models in New Zealand, ten years after it was developed.

Successive governments agreed to fund the implementation of 'The Blueprint'. The Commission's eighth annual report (Mental Health Commission, 2005), was concerned with the implementation of the national mental health strategy and it showed that, between 1993/94 and 2003/04, funding for mental health services increased from $270 million (excluding the Goods and Services Tax) to $801.7 million per annum — an increase of 141.7%, after adjusting for inflation.

Mental health service planning and delivery has largely been based on the funding and structures determined by 'The Blueprint'. DHB funding is allocated annually according to 'The Blueprint' expectations, in order that all DHBs will have 100% 'Blueprint' funding by 2010. 'The Blueprint' funding is "ring fenced" as an expectation of the Crown Funding Agreement (CFA) and therefore the funding cannot be spent on other health services.

In 2005, in addition to 'Blueprint' funding, there was also a re–negotiation of all nurses pay and conditions, which was known as the Multi Employer Collective Agreement (MECA). The MECA resulted in a substantial increase in nurses' pay of up to approximately 20%. Between March 2003 and March 2007, the overall growth in the nursing workforce was 19.7%, compared with an 11% increase, in all other occupations (Buchan & North, 2008).

Māori are New Zealand's indigenous people. Whanau ora, the ultimate aim of the New Zealand Māori Health Strategy (Minister and Associate Minister of Health, 2002), is described as 'Māori people being supported to have more control, so they can maximise their health and well being'. Te Rau Hinengaro: The New Zealand mental health survey (Oakley, Wells, & Scott, 2006) found that the 12 month prevalence rates for any disorder in Māori were 29.5% compared to 19.3% for other ethnicities. However, after adjusting for socio–demographic variables there was no significant difference in the prevalence of anxiety disorders or depression, but the prevalence for both substance abuse and bipolar disorder was higher in Māori than for other ethnicities. The report also found that Māori had lower access to services the other ethnicities. The fourth leading challenge of 'The Second New Zealand Mental Health and Addiction Plan' (Te Tāhuhu) (Ministry of Health, 2005b) is Māori

mental health (p13), and the challenge is designed to keep a strategic focus on Māori mental health issues.

3.3.3 Services

DHBs and their contracted NGO providers are funded to provide recovery focused services. "Recovery is happening when people can live well in the presence or absence of their mental illness" (Mental Health Commission, 1998, p. 42). A central tenet of the recovery concept is empowerment (Opie, 2000). Empowerment often refers to political processes, which affect individuals and organisations and it directs attention to processes that involve individuals in decisions about their health options, in addition to there being opportunities for them to influence and be engaged in planning (Opie, 2000, p. 227).

New Zealand has pursued the active involvement of consumers in the planning and management of mental health services (Minister of Health, 2000, 2001; Ministry of Health, 2005a, 2005b; Standards New Zealand, 2001). The most recently published data showed that there were approximately 130 consumer advisor positions involved in mental health services, in the 2002/03-year (Mental Health Commission, 2004). Studies of consumer participation have reported the following types of results: extending the hours of service delivery (Pilgrim & Waldron, 1998); funding advocacy (Gummer & Furney, 1998); and publishing information on service provision (Silva, 1990). Simpson & House (2002) conducted a systematic review of randomised control trials and other comparative studies, which involved service users, in the delivery and evaluation of services and they concluded that users can be involved as employees, trainers, or researchers, without detrimental effect to users and the service. Consumer advisers are active in advocating levels or types of services, but they are passive in their delivery: Only the patient themselves can co–produce their health outcome.

DHBs fund a mix of adult mental health services, some of which are provided directly by the DHB and others by NGOs. Typically, the DHB services are the acute hospital unit and the crisis and community mental health teams. In addition, there

may also be a day hospital; mobile intensive care team(s); assertive outreach team(s); and forensic team(s). The majority of these services work the usual office hours. However, acute units and crisis teams operate twenty–four hours/seven days a week. NGOs generally provide rehabilitation and social support services, in the form of staffed hostels; domiciliary support; employment; 'drop in'; and advocacy. Māori, Pacific Island, and Refugee Services may also be provided, either by the DHB provider arm or NGOs.

NGO residential rehabilitation services tend to provide four levels of rehabilitation programmes and housing. These levels range from level four — an intensive 24 hour, awake, nursing service — down to level one, where there is nursing and community support during the day. The focus on recovery-based services has resulted in the level one and two residential services being replaced by patients staying in their own accommodation and being supported by community support workers. The community support workers (CSWs) act as a social co-ordination service and they assist patients with community living tasks, such as returning to employment, education and community involvement.

3.3.4 Accountability

Since October 2004, hospital and residential services (with five or more beds) are required to be certified under the 'Health and Disability (Safety) Act, 2001' (New Zealand Government, 2001). Services can be certified for up to three years, based on an independent audit, before re–certification is required. Mental health services are required to meet the 'National Mental Health Sector Standard' (Standards New Zealand, 2001) plus three other standards, in order to be certified. New Zealand mental health services have also been contractually required to implement the Mental Health Standard, since December 2000.

The Ministry of Health (Ministry) requires DHBs to report on a number of accountability indicators. Indicators can change, but only after an exhaustive consultation process with the DHBs. DHBs routinely report accountability results to the Ministry. Continued under achievement on accountability measures, can result

in the application of significant political and financial pressure being applied to DHBs by the Ministry. The Minister of Health has the power to disestablish a DHB board if underperformance is extreme.

DHBs have tight financial accountability requirements for mental health because Blueprint funding is ring fenced. In terms of DHB service accountability the main measures were access rates and the implementation of the National Mental Health Sector Standard. For the 2006/07 year, as a result of the early findings of this research, DHBs were required to report the number of clients in contact with services for 2 years or more (the KPP group) along with their work status and relapse prevention plan status.

3.3.5 Monitoring

Information underpins the whole mental health system, however it was not until 2006 that the Ministry of Health developed the National Information Strategy: Implementation plan (Ministry of Health, 2006). New Zealand has a 'Mental Health Information National Collection' (MHINC) system that began in 2000 and this collects patient contact data, for both inpatient and outpatient/community services (New Zealand Health Information Service, 2002). New Zealanders have a unique national heath index number (NHI), which allows for a patient–centric view of health services use. MHINC captures data for each unique patient, using their NHI, for each contact with a particular mental health service type.   MHINC enables an understanding of patient utilisation of services and the development of key monitoring and accountability measures.

The DHB Mental Health Service Profile [Service Profile] (Welsh & Kokaua, 2005) is based on several key mental health service indicators, which have been drawn from the Ministry funding data, MHINC data and certification reports. The Service Profile indicators include funding; access rates; discharge rates; and acute admission data; and key certification results. The results are ranked for DHBs, in a range of minimum, medium, and maximum, for each criterion. This profile provides a basis for improved, objective and comparative understanding of DHB mental health

service performance. The Service Profile also includes key data on the KPP patient group (the number of patients and their acute bed use). This Service Profile has also been used as a secondary data source, for the outcome part of this research.

Outcome measures are those tools or instruments designed to measure the effects of an intervention on the health of an individual; typically achieved with a questionnaire. Significant developments have occurred within the mental health sector in recent years with the development, testing and implementation of clinical outcome measures. For example, "Hua Oranga" (Kingi, 2000) is a Māori mental health outcome measure that incorporates the views of the Tangata whia ora (Client), Whanua (Family) and the clinician, and measures the; spiritual, physical, family and mental well being dimensions of mental health. The development of COS (Carer Outcome Scale) and CORM (Clinical Outcome and Resource Monitoring) have also been trialled in New Zealand (Mellsop & O'Brien, 2001). HoNOS (Health of the Nation Outcome Scale) currently has more credibility than any other instrument; there is no single ideal measure of outcome. New Zealand is currently implementing the HoNOS outcome tool into secondary mental health services.

Outcome measures presume illness and do not enable any reflection on why a person's illness may have deteriorated. Little clinical and cost effectiveness evidence exists to support the routine use of outcome measures and needs assessments tools (Gilbody, 2003). Mann & Yett (1986) argue that the output of a hospital should not be specified in terms of its effect on the patient for the same reason that we do regard the output of a beauty salon as beauty.   Once process and substance become blurred, Illich (1976) argues, that a new logic is assumed: the more treatment there is the better the results. Process verses outcome can represent goal displacement – a problem when means and ends become disconnected.   Medical treatment is mistaken for healthcare, and the improvement in treatment is dependant on allocating more resources to health services and their management.

New Zealand has a national pharmaceutical purchasing agency, known as PHARMAC (PHARMAC, 2007), which manages the purchasing of pharmaceuticals,

56

on behalf of DHBs. PHARMAC's objective is to obtain, for eligible people in need of pharmaceuticals, the best health outcomes, which are reasonably achievable from pharmaceutical treatment — and from within the funding provided. PHARMAC also has a function to promote the responsible use of pharmaceuticals, which includes communicating with health professionals, in order to encourage optimal prescribing. Pharms (New Zealand Health Information Service, 2002) is the pharmaceutical collection that contains claim and payment information (gathered from pharmacists) for the PHARMAC subsidised dispensing. This data has also been used as a secondary data source for this research.

The Ministry also collects data, from professional bodies, on the number of clinical staff employed by DHBs, for example; data is supplied by the Nursing Council of New Zealand on the number of nurses in active employment in DHBs and the numbers who are inactive despite still being registered. This data has also been used as secondary data for the KPP outcome evaluation.

3.4 New Zealand mental health services in an International context

Data from the World Health Organisation's Department of Mental Health and Substance Abuse (2005) are used to compare New Zealand with four other countries: Australia, United States (US), The Netherlands, and the United Kingdom (UK).

As shown in Table 3.1, New Zealand mental health services have:
- the highest funding (by a short measure), as a percentage of the total health budget
- no psychiatric institutions
- the lowest rate of psychiatric hospital beds
- a low rate of psychiatrists, per 100,000 population
- a moderate rate of psychiatric nurses, per 100,000 population.

New Zealand also spends approximately 30% of its total mental health budget on the non-governmental organisations (NGOs) (Mental Health Commission, 2005). NGOs provide rehabilitation, residential, advocacy and some limited treatment services.

All countries bar the USA have a mental health strategy. The USA has by far the highest health expenditure as a percentage of GDP and lowest percentage of the funding spent on mental health. The Netherlands have a similar percentage of GDP spent on health as New Zealand but they spend less on mental health. The Netherlands have an institutionalised treatment approach with the rate of psychiatric beds being nearly five times as high as New Zealand. The UK has the lowest level of health funding as a percentage of GDP and the median rate of spend on mental health; they have the highest rate of psychiatric nurses of any of the countries compared. Only the UK and New Zealand have no psychiatric institutions.

Mental health services in Australia have had similar funding increases to New Zealand. However, in 2005 an Australian senate select committee enquiry was held because of ongoing concerns regarding mental health services. A submission states; "mental health services are in crisis to varying degrees all around Australia, barely able to cope with people experiencing acute episodes of illness, let alone provide ongoing treatment and support" (Sane, 2005).

Table 3.1 Funding and Inputs for the Mental Health Systems in New Zealand, Australia, USA, The Netherlands and the UK (Department of Mental Health and Substance Abuse, 2005)

	Country				
Criteria	New Zealand	Australia	USA	Netherlands	United Kingdom
Total Population (million)	3.9	20	297	16	59
National mental heath policy	Yes	Yes	No	Yes	Yes
Health expenditure as a % of GDP	8.3	9.2	13.9	8.9	5.8
Mental health expenditure as a % of the health expenditure	11	9.6	6	7	10
Psychiatric hospital bed FTE/100,000	3.8	3.9	7.7	18.7	5.8
Psychiatrists FTE/100,000	6.6	14	13.7	9	11
Psychiatric nurses FTE/100,000	74	53	6.5	99	104
NGO services	Full Range[1]	Full Range	Advocacy & Promotion only	Advocacy & Rehabilitation only	Full Range
% funding Increase	125% (1994-2003)	128% (1993-2002)	No data available	No data available	No data available
% of total acute inpatient beds in Institutions	Nil	31	40	82	Nil

[1] NGOs provide a full range of services that cover rehabilitation, housing, treatment, advocacy and promotion.

David King, in his role as a Chief Executive of health organisations played an active role in the deinstitutionalisation process in both England and New Zealand. David had the following to say about his experience of deinstitutionalisation. "There was a

series of named structural components created, and it was trusted that the component broadly did what the name suggested it would. The hospitals were closed in good faith, thinking that people knew what to do, when in fact they did not, it was a 'horseless carriage' phase" (D. King, personal communication, October 2000).

Willshire (1999) contends that because madness is difficult to define, staff work with a task that defies a universally accepted definition. Without a clear task definition, it is difficult to organise services. Further, Powell & DiMaggio (1991, p. 184) contend that mental health treatment technology is ambiguous and its outputs difficult to define much less measure. For example, research into the outcomes of psychotherapy treatment conducted by Lambert (1992), found that only 15% of client's positive outcomes were attributable to the psychotherapy intervention, highlighting the difficulty of defining the task of mental health services. Willshire (1999) called for clarification by management of the primary task of mental health services.

Community mental health team studies generally do not use standard evaluation methods (Knudsen & Thornicroft, 1996). Studies of systems typically suffer from; a lack of ability to randomly assign clients, inadequate comparison groups, inability to deal with the complexities of time and funding (Goldman, 2000). Ozcan (1995) proposed effectiveness and efficiency dimensions of community mental health team (CMHT) performance. Effectiveness was measured using length of stay while efficiency was based CMHT utilisation. The research found that client age, median income of the community, rural location, management type and board composition, all had an affect on community length of stay and utilisation.

Higher rates of acute admissions are an indication of inadequate community based treatment (Ozcan, Shukla, & Tyler, 1997). The impact of revolving door consumers, on staff and families is one of significant frustration (Harris, 1979). In New Zealand, very little of the variation in outcome, length of stay, and costs in relation to inpatient mental health services can be explained by the diagnosis (Mellsop, Lombard, Mathieson, Turner, & O'Brien, 2000). A lack of medication compliance also cannot explain multiple admissions (Casper, 1990).

Strong evidence exists to show how a small proportion of consumers require a disproportionate amount of service. Abbott, Smith, Clarke, Curson, Gomes & Heslop, (1997, p. 745) state "…..they are a definable subgroup that routinely represent a small portion (6.5% – 18%) of all inpatient admissions for a given period, but account for 20- 33% admissions over the same period". Lavik (1983) measured total inpatient and outpatient service consumption and reported that 11% of patients surveyed consumed 75% of all the total services used.

3.5 Knowing the People Planning (KPP)

The purpose of this section is to describe and discuss the development of 'Knowing the People Planning' (KPP) and to relate its features to co–production and the customer relations theory framework.

3.4.1 KPP development

David King (Research Fellow) and I were commissioned, in 1999, to study high needs mental health patients in the South Island of New Zealand. We interpreted our study as having two questions:

1.3.   What makes a good community mental health service?

2.4.   How can the features of a good community mental health service be applied to all mental health services?

This study occurred against a backdrop of a poor public impression of mental health services, numerous government reviews (as discussed on page 48) and a wide unexplained variation in DHB acute admission rates. There had been no agreement between key mental heath stakeholders as to what constituted a 'good' service. Anderson & Lyons (2001) identified that the differing goals, values, and philosophies of patients, families, clinicians and funders were often hard to reconcile.

We could not find any comprehensive record of health and social needs, which long-term mental health patients might require, so therefore we set about compiling

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one. This record later became known as the 'Ten Key Features'. Since we were aware of the dangers of too much detail and over-elaboration, our aim was a basic — but comprehensive — framework of needs. Time was required to hold a relaxed conversation with as many stakeholders as possible (King & Welsh, 2005, p. 9). Stakeholders included consumers, managers, doctors, nurses, families and Māori. In our discussions with the stakeholders, either individually or in groups, we adopted an 'appreciative enquiry' style (Akdere, 2005). This constructivist approach enabled us to learn from stakeholders experiences and to understand their expectations. We made a number of return visits to the DHBs, in order to check and confirm this information.

We began this work in June 1999 and the exercise took 20 months to complete. The significant result of this work was the 'negotiated list of service deliverables', now known as the 'Ten Key Features', which is an agreed list of essentials for a good mental health service for chronic patients. The 10 key features represent a reconciliation of mental health stakeholder values.

KPP was first implemented in 2002 and eight of New Zealand's 21 DHBs implemented KPP, during the course of this research. Details of the KKP implementation are covered in Chapter Six. Initially, the KPP DHBs were unaware of the number of patients, for whom they were providing mental health services to. They were counting the number of patients seen in each service, but patients can (and often do) use more than one service, within a given period. This can lead to an over-estimate of the number of individuals being treated. Furthermore, whilst there was an expectation that there would be a review of a patient's treatment, every three or six months, there was not any mechanism in place for either checking this, or knowing how long patients had been in contact with services.

DHBs were aware that they had mental health patients with high needs, but there was no way to define them or count the number of patients. The matter of defining the population was resolved by negotiating a classification with the DHB stakeholders, based on patients, who had their first contact with secondary care services two or more years previously. Perkins & Rinaldi (2002) also used the 'two year or more' definition in their study of long–term mental health patients. We

assumed that people's needs must be high, if they required long-term use of secondary care services. Consequently, we used 'chronic/long-term' as synonymous with (and as a proxy for) 'high needs.'

KPP was implemented into DHBs without any underpinning theory. KPP is however, entirely consistent with the concepts of recovery and empowerment. In 2002/03, a milestone was reached, when the Ministry of Health allowed DHBs to include KPP as part of their District Annual Plans (DAPs). This formalisation represented the Ministry's acknowledgement that KPP was a worthwhile tool that could assist with service planning.

The Ministry also encouraged the implementation of KPP, by using a number of other mechanisms. The Health Minister's 'Improving Quality' action plan included KPP, as an action for evaluation and as a system redesign method (Minister of Health, 2003b, p. 9). Early findings from this KPP research pointed to a possible link between high admission rates and a low percentage of patients with relapse prevention plans. From late 2004, the certification process for hospital and residential services (described on page 38) focused on the need for DHBs to meet the standards for treatment and relapse prevention plans. In December 2006, two of New Zealand's largest DHBs had their certification period reduced by up to two years, because they did not meet the treatment and relapse prevention plan standard. In the 2006/07 year — also as a result of the findings of this research — DHBs were required to report the number of patients, who were in contact with services, for two years or more (the KPP group) and to indicate their work status and relapse prevention plan status. In 2007/08 the Minister of Health (2007) introduced 10 health targets, which set expectations for all DHBs. The mental health target required DHBs to ensure that 90 to100% of all long-term patients had a relapse prevention plan. This target was selected as a direct result of the findings of this research.

The Ministry's actions, to allow KPP to form part of the DHB's District Annual planning process, meant that KPP formed part of the DHBs business strategy. Co–production is enabled, as customer relations theory suggests, when the organisation recognises long–term customers, as part of their strategy.

63

3.4.2 The purpose of KPP

KPP describes the work undertaken for the chronic patient population and looks at the results for all patients — not just a sample of patients. KPP is a practical way to record met and unmet needs, for every long-term chronic patient. KPP makes it possible to have information based on a census of patient experience, for the planning and management of mental health services (Ministry of Health, 2002). The KPP patient census is based on the 10 key features of service delivery.

3.4.3 Ten Key Features

The 'Ten Key Features' (Ministry of Health, 2000) is a basic set of service requirements, which were defined as necessary, in order to meet the needs of long-term patients, by all stakeholders. These 10 key features represent a reconciliation of mental health stakeholder values. Four features relate to the patients and six features relate to the organisation.

Patient features

1. Treatment plans[6] are regularly reviewed and updated
2. Relapse prevention plans[7] are accepted and used by the community mental health team (CMHT), the crisis team and the acute unit
3. Health advice for mental health (psychiatric) and physical conditions (GP)
4. Social support, where needed — work, housing, education, and social contact

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[6] A treatment plan was not formally defined as part of the research, since a plan is defined by the National Mental Health Sector Standards (criteria 16.3). A plan would be expected to consider key features three and four (health advice and social support).

[7] A relapse prevention plan was also not formally defined, as part of the research, since the plan is defined by the National Mental Health Sector Standards (criteria 16.4) and it is developed as a consequence of having a treatment plan. A relapse prevention plan identifies early relapse warning signs of patients and what the patient can do to minimise the likelihood of a relapse — and what the organisation will do. The patient, ideally, will have a copy of the treatment and relapse prevention plan.

Organisation features

5. A personal growth focus and self-management
6. Guaranteed patient access and recognition on re-entry
7. Accountability — a comprehensive service with common aims
8. Co–ordination point for all health and social support
9. Contact is maintained with the patient
10. Evaluation, learning from experience and involving patient information, when making improvements to service (the KPP annual plan).

Participants (new to KPP) have always been unanimously in agreement with the ten key features. This agreement on the 10 key features is very significant as it reconciled the values of stakeholders, which is a situation that had previously been unattainable. The interaction of the four patient and six organisation features sets the scene, for long-term patients to co-produce value.

Māori are New Zealand's indigenous people. Whanau ora, the ultimate aim of the New Zealand Māori Health Strategy (Minister and Associate Minister of Health, 2002), is described as 'Māori people being supported to have more control, so they can maximise their health and well being'. KPP is entirely consistent with the tenet of Whanua ora.

3.4.4 KPP data

Co-production, when considered in terms of the customer relations management framework and long-term customers, requires data to be collected on individuals. The KPP data collection (described here) aligns with Payne & Frow's (2005) customer relationship management framework's information process. Chapter Four provides details of the ethics approval process for this evaluation research.

Case managers[8] collected the information for each of their chronic patients, on a specially developed paper based template. The data collected included: the patient's national health index number (NHI); name; age; gender; the case manager's name; and the patient's status in relation to plans, medication, GPs, housing and employment. If a patient required a change, then that information was reported in the template as a C. An Excel spreadsheet was also specifically designed, in order to collate the KPP data and was made available to clinicians to use in place of the paper based template. A KPP tool kit was made available to DHBs, via the internet, at www.kpp.org.nz. Data entry was neither time-consuming nor burdensome as many of the items did not vary from month to month. Case managers loaded the KPP data into the Excel spreadsheet, or the KPP project manager arranged for it to be loaded (if the data was paper based). The spreadsheet automatically aggregated and analysed the data. This spreadsheet also allowed KPP patients to receive a summary sheet of their details, for their verification and agreement. Some DHBs built the KPP process into their existing information systems.

3.4.5 KPP plan

The annual KPP plan is written for management and is based on the KPP data collection. The plan has four parts and it is written according to a basic template (An example KPP plan is provided in Appendix One). The four parts of the KPP plan template are outlined in the box over the page and they are accompanied by a description of what information fits under each section of the plan.

The KPP annual plan provides management with an account of both met and unmet needs, and the required changes, which may need to be addressed by management.

For the purpose of this thesis, the KPP plan targets were generalised to:

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[8] Case managers are those clinicians who have primary responsibility for coordinating the patient's care.

- All patients should have up-to-date treatment and relapse prevention plans, to enable co-production
- Minimising the number and time patients spend in restrictive environments (acute and rehabilitation services), thereby improving patient and organisational value
- Maximising the number of patients in employment, thereby improving patient value

XX DHB KPP Plan

1. Introduction
The DHB provides an introduction to its service including the summary statistics for the KPP patients.

2. 10 key features data

The nine headings of the plan relate to the KPP 10 key features (key feature ten is the KPP plan). The patient data was extracted from the KPP spread sheet. The plan was written up under the following broad headings:

1. Personal Development — describes service policy

2. Enumerating the Clientele — the number, age, gender and ethnicity of the patients

3. Accountability — explains organisational arrangements which will deliver the quality of service described in service policy

4. Contact with Patients and their Families — explains how the service stays in contact

5. Health Advice — the number of patients who have access to appropriate medication and primary (GP) care

6. Social Support — enumerates the housing and education status of the patients

7. Co-ordination for health and social services — enumerates if all patients have case managers

8. Anticipating crisis/guaranteed patient access — enumerates the number of patients with relapse prevention plans

9. Personal Review — enumerates the number of treatment plans that are reviewed every three months.

3. Achievements/ Results to Celebrate

The DHB records here, the achievements in patient results over the year. The achievements could cover: any increase in the number of patients with plans; changes in service demand (decreased acute bed use); and changes in employment rates.

4. Targets/focus issues

The DHB sets targets, no more than five, for what needs to be done in the coming year, based on the changes identified in part 2 (ten key feature data) of the plan.

3.6 Conclusion

New Zealand has, like many countries, under gone significant health reform over a relatively short period. The quasi–market period of heath reforms were considered detrimental to the provision of community mental health services. However, the research that led to the development of KPP began during the quasi–market period.

New Zealand closed its psychiatric hospitals and successive governments have committed significant increases in funding to DHBs for the provision of recovery focused mental health services. However, high needs patients and unexplained acute admission variation were well known issues impacting on service delivery both nationally and internationally. Despite this DHBs, until the development of KPP, relied on service provision frameworks, standards, sample audits, and consumer advice, in order to ensure organisational effectiveness and patient centeredness.

KPP's development occurred against a backdrop of a poor public impression of mental health services and three government reviews. Further, there had been no agreement between key mental heath stakeholders as to what constituted a 'good' service. KPP is comprised of ten key features — four that relate to the patient and six that relate to the organisation and these features reconciled stakeholders values as to what constituted a 'good' service. The KPP outcome results (in Chapter Seven), will demonstrate improved patient co–production through less acute bed use and improved employment. The KPP research strategy will be described in the following Chapter Four

The Ministry modified DHB environments (in relation to long–term chronic patients) in three ways over the period of the research. The first modification was to enable KPP to be included in the District Annual Planning (DAP) process. The second modification was to use the certification process in order to focus DHBs attention on treatment and relapse prevention planning. The third modification was to introduce DHB accountability measures, which were specific to long-term mental health patients.

Chapter Four

Research Strategy

KPP was implemented in-situ, thus making true experiments impossible. The research strategy is designed to answer three questions:

1. Whether it is possible for DHBs to implement KPP in mental health services?
2. Whether implementing KPP improves value for long–term chronic mental health patients and DHB mental health organisations?
3. How does the KPP tool contribute to the theoretical development of co–production?

This chapter is comprised of seven sections. The first two sections cover researcher involvement and ethics and the third section covers the rational for choosing the research method. The fourth and fifth sections cover the implementation and outcome theory. Section six covers the theory development whilst section seven offers the conclusion.

4.1 Researcher Involvement

My motivation for undertaking this research arises from significant disquiet I have felt over the treatment that I have received from secondary mental health services, over a twenty–five year period. A psychiatrist once described my relationship with mental health services as "stormy". I hold a Bachelor of Agriculture Science degree, and (for 15 years) I owned and operated a very successful dairy farming operation on the West Coast of the South Island. I also completed (whilst farming) a Post Graduate Diploma in Psychology.

David King and I were joint project managers in the development and implementation of KPP, since its inception in 1999. David worked as an Honorary Research Fellow for Auckland Uniservices (University of Auckland), having held

significant executive health management positions, both in New Zealand and in the UK. The Ministry of Health (Ministry) contracted with Auckland Uniservices, for the development and implementation of KPP into DHBs. I have worked as a Senior Advisor (Quality) in the Mental Health Directorate of the Ministry of Health, for the duration of the research.

Adler & Adler (1987, p. 33) classify researchers on a continuum of field research involvement — from active to peripheral research members. David King and I were very much active research members during the development and initial implementation of KPP and we drew heavily on our respective experiences. For the purposes of this research, I adopted the stance of peripheral member of the KPP process.

My direct involvement in the development of KPP (and in this evaluation) is justified by two theoretical positions. Knorr-Cetina, Colins, Pinch, Shapin and Latour (reported in Kaghan & Phillips (1998)) asserted that the importance of the social constructivist view of science is that science is socially constructed, both in the laboratory and in the wider community. A significant implication of this view, in relation to business research, is that the researcher interacts with the research environment, rather than being an objective observer. Existential sociologists further advocate that researchers shed detachment and draw on their own subjective experiences, in order to investigate behind the fronts of individuals and groups (Adler & Alder, 1987). The immersion of the researcher in the 'subject' of study provides the ability for researchers to handle their own 'rats' and this situation is found amongst the common features of exemplary research (Frost & Stablein, 1992).

4.2 Research Ethics

This thesis is the culmination of my eight years extramural study in health management, whilst working full time for the Ministry of Health. There is no doubt that my agricultural and patient backgrounds have been significant influences, both in the development of KPP and the selection of research methods. Bowling (2002)

considered the principles of ethical health research are that participants; are not harmed; participation is voluntary; informed consent is given; and confidentiality is maintained.

I had long-term working relationships with many individuals, in the majority of the DHBs that implemented KPP. In my role at the Ministry, I held national responsibilities for the non-financial accountability and monitoring of the DHBs and I assisted with the improvement of mental health service quality. In my role, I led KPP as a key quality improvement project. My position in the Ministry of Health was probably influential, in terms of implementing KPP; modifying the DHB environments; influencing strategic documents; and being able to undertake this research. My work role has placed me in a somewhat privileged position, in which to undertake this research, due to the existing relationships I have with key stakeholders and my ease of access to national data.

Conflicts of interests were minimised through internal reporting requirements to the Ministry of Health Mental Health Directorate, Senior Management team and by the DHBs agreeing to be involved in the research. All New Zealand DHBs had equal access to the KPP concept and information and this situation also minimised any ethical concerns. I had no direct authority with DHBs and I was not involved in the treatment of individual patients. Any bias, which I may have towards the KPP concept, has been minimised by the research design and the academic supervision provided by Professor Ralph Stablein, at Massey University. The bulk of the data analysis and writing has been carried out in my own time for no personal financial gain.

Key DHB stakeholders were asked to complete a short voluntary questionnaire about the usefulness of KPP and its implementation. An information sheet was provided with details of the research. This sheet clearly set out that the completion of the questionnaire was anonymous and voluntary. The questionnaire (refer Appendix Three) was distributed and collected by a DHB representative: the returned survey implied consent. Completed anonymous survey forms were securely stored and will be destroyed after a five year period. Electronic data were

stored on password protected computer. In this research individuals were not identified.

All KPP DHBs were asked to support this evaluation, through a request in a letter sent to the respective DHB CEOs, by Dr Janice Wilson (Deputy Director General Mental Health Directorate, Ministry of Health). Agreement was received from all KPP DHBs. Ethics approval was initially obtained for the voluntary questionnaire and its accompanying information sheet (refer Appendix Two) as part of my research for a Masters in Management, from Massey University (HEC: PN Protocol 03/119) — Refer Appendix Four, for a copy of this approval. The approval was carried through to this PhD thesis.

4.3 Rationale for choosing the research methods

Science provides explanations of some observable phenomena, without resorting to a reliance on supernatural explanations. Kuhn (1996), however, challenged the view that science was a uniquely rational activity. 'Normal Science', as described by Kuhn (1996), is research firmly based upon past scientific achievements, which some particular scientific community acknowledges (for a particular time) as supplying the foundation for its further practice.

Scientists commonly recognise that they study their 'conceptualisation' of the world and that there is no such objective independent entity as the 'real world'. For business research studies, Stablein (1996) proposed a definition of data for organisation studies: "data in organisational studies are representations which maintain a two way correspondence between an empirical reality and a symbol system" (p. 514). Science is not an isolated activity and the collection of data, by any researcher, will be based on a frame of reference, from which the researcher has come — and the area of the research, to which he/she is contributing. This is the paradigm of research (Kuhn, 1996).

A continuum of views exists on the nature of science: at one end, a reductionist/ positivist type paradigm of scientific work and at the other end, an irreductionist/

constructivist type paradigm of science. The reductionists aspire to a hierarchy of sciences, where mature sciences, such as physics and chemistry, are at the top. These sciences have significant theory development and a high level of quantitative ('objective') measures and predictability. The irreductionists/constructivists accept qualitative research approaches and they view incommensurable and partially incommensurable paradigms and theories, as normal aspects of the ongoing development of scientific knowledge (Kaghan & Phillips, 1998).

Organisations are complex and they can be viewed in a number of different ways, which require different research paradigms. The positivist and constructivist type viewpoints of science make significant assumptions concerning research methodology and the research approaches to be used (Kaghan & Phillips, 1998). The research approaches that need to be considered are: an experimental or non-experimental approach; an inductive or deductive research approach; and a quantitative or qualitative approach. Worthwhile research frequently uses both a quantitative or qualitative approach, in order to obtain a high-quality understanding of the subject of study (Robson, 2002).

KPP was implemented into DHBs without any underpinning theory or previous validation. . The purpose of this research was to both evaluate KPP and explain the findings which in turn contribute to the further development of co–production theory. Ticehurst & Veal (2000) assert that evaluation research arises from the need to make judgements on the success or effectiveness of programs, strategies, policies or practices. Explanatory research seeks to explain the patterns or trends involved, in order to establish causality or the likelihood of causality. Establishing causality requires rigorous data collection, analysis, and interpretation of data within a theoretical framework. A quantitative approach was taken in this research in order to enable causality to be tested. A qualitative approach using observation, informal and in depth interviewing and participant observation would not have enabled me to test for causality. Further, a qualitative approach would have increased the cost of the research and presented significant ethical issues in relation to interviewing long–term clients.

In practice, data is rarely collected without some explanatory model in mind so there is some element of deduction, further it is not possible to develop hypotheses and theories without at least some initial information on the subject in hand, so there is also always an element of induction. This research has both inductive and deductive and retroductive aspects.

KPP was implemented in-situ, thus making true experiments impossible however a quasi–experimental analysis of secondary data was possible.

Management thinking and research has continued to develop in recent times building on the classical (scientific and administrative theories), behavioural, and human relations thinking and research. Modern management thinking and research approaches use both the quantitative approaches and systems theories. Quantitative research is also known as management science or operational research and grew out of statistical approaches first developed during the Second World War. This approach is used to improve the allocation of resources, work scheduling and management decision–making and relies heavily on computer–based applications. Systems theory considers an organisation as a system of interrelated parts.   Closed systems are seen to operate independently of their environment and they reflect the frame of reference of the classical management school of thinking and research. Open systems are seen to interact with their external environment (Ticehurst & Veal, 2000). The long–term KPP mental health patients are external to the health organisation, so this research requires an open system theoretical dimension.

Anderson & Lyons (2001) stated that there is only limited evidence to guide the organisation of mental health services. Community mental health service studies have not generally used a standard set of evaluation methods (Dewa, Durbin, Wasylenki, Ochocka. Eastbrook, Boydell & Georing, 2002). Goldman, Thenlander & Westerin, (2000) contend that overall studies of systems typically suffer from a lack of ability to:

- randomly assign clients
- have adequate comparison groups,

- deal with the complexities of longitudinal studies and funding.

Evaluating Managed Mental Health Services: The Fort Bragg Experiment. (Bickman, Gutherie, Foster, Lambert, Summerfelt, Breda & Heflinger, 1995) is considered to be exemplary research in the field, as it won an American Mental Health Research award. The study used program theory, as a basis for the research. Programme theory alerts us to the importance of ensuring clarity of context and rationale for the research, and having a plausible and sensible model of how a program is supposed to work. The possibility of ambiguous temporal precedence is significantly reduced by having clear implementation information that provides baseline data for the evaluation (Shadish, Cook, & Leviton, 1991). The Fort Bragg experiment consisted of two broad phases, the first was to implement a Continuum of Care for Child & Youth at Fort Bragg, and provide evidence that the continuum of care was implemented with sufficient fidelity to allow meaningful examination of the program outcomes. The second phase was to evaluate the outcomes of the program in a quasi-experimental way by comparing a standard of care approach to the continuum of care approach. The types and methods of data collection included: semi structured diagnostic interviews, behavioural checklists, family well-being measures, satisfaction scales, and provider surveys and records review. Data was also collected on acute inpatient care, residential treatment, non-residential activity, crisis calls, and clinical case management, out patient and psychiatric/psychological assessment.

A program theory approach was chosen to evaluate KPP that included an implementation phase and an outcome phase based on open systems theory supported by a quasi–experimental analysis of secondary data to rule out other possible explanations of the outcome findings. Various versions of open system theories were reviewed and their approaches ruled out as not being suitable for this research. For example, Selsky & Barton (2000) undertook a significant study using opens systems theory, based on domains, at New Zealand's Otago shipping port. The study identified a set of tools for effectively managing ports however; my interest was in identifying a method for evaluating the KPP tool that we had already developed. Further, mental health service delivery relies heavily on the relationships with client, staff, families and other services (Alexander, Bloom,

76

Zazzali & Jinnett, 1999). Emery's open systems theory (Emery, 2000) was chosen as a basis for the outcome research, as it is designed to cope with the uniqueness of human nature, and it provides the theoretical basis for the socioecological action research method (Gloster, 2000), which was able to be applied to the KPP process.

4.4 Implementation research theory

The rationale for the implementation evaluation component of this KPP evaluation is to assist with making the important distinction between programme implementation failure and programme theory failure. Programme implementation is widely discussed as an essential component of evaluation practice (Brekke & Test, 1992). McGrew, Bond, Dietzen, & Salyers (1994) describe three approaches to assessing implementation fidelity: Firstly by using average conditions in other programmes; secondly, by comparison with the ideal, as specified by either the author or by participants: and thirdly, a theoretical analysis of a 'judgment of good fit'. Bickman (1995) contended that there also needs to be a plausible and sensible model of how a programme is supposed to work. The possibility of ambiguous temporal precedence is also significantly reduced, by having clear implementation information, which provides baseline data for the evaluation (Shadish, Cook, & Leviton, 1991). Programme theory alerts us to the importance of ensuring clarity of context and rationale for the research.

The KPP implementation fidelity assessment criteria are detailed in the Research Procedures chapter — Chapter Six.

4.5 Outcome research theory

The fundamental requirement, for the outcome evaluation of this research, is that it must be able to demonstrate the potential for patients to co–produce services. Furthermore, KPP was implemented in-situ, thus making true experiments impossible. With social science field research, such as this, researchers have limited ability to control for variance. To the greatest extent, approximately 20% of

the variables can be controlled, compared with the 80-90% control, which is achieved in laboratory sciences (Dick, 1997).

This outcome evaluation needed to account for:
- KPP being implemented in situ
- the different timing of KPP implementation
- the impact KPP had on those patients who require services for the short term
- the diffusion of learning and changes that occurred within a DHB
- the diffusion of learning and changes that occurred between DHBs
- the possibility of cost shifting

4.5.1 The ontology of the outcome research paradigm

Emery (2000) argued that, historically, two major streams of accumulating knowledge can be discerned, based on two viewpoints of the nature of reality. Each school, within the two streams bears greater resemblance to others within that stream than it does to those in the other stream. The two streams are characterised as either Platonic ('realism') or Aristotelian ('idealism'). Emery (2000) asserted that, for social science research, the choice between these two streams is stark and consequential — in practice.

The realism stream runs through many philosophers, including Charles S. Peirce (Eisele, 1985). Peirce's philosophical position is one of pragmatism: truth is what works. Pragmatism is consistent with the values that underpin both qualitative and quantitative research methods. Fundamentally, they are both value-laden methods of enquiry, producing value-laden facts. Pragmatism acknowledges that reality is multiple, complex, constructed, stratified and that any particular set of data is explicable, by more than a single theory (Eisele, 1985).

Human knowledge develops from the identification and classification of particulars principally classified as material and abstract. Material universals describe a material or real world, which is derived from particular dynamic instances or events. They identify the limits of reality within which a claim to 'truth' is made (Chein,

1972). The material is defined by what the subject does in a particular context. The abstract question is defined by what is true about the subject, in any circumstance.

Contextualism, based on the pragmatic philosophy, contends that there is a whole changing over time and that we can know this, by investigating a series of historic events within the changing context of the whole. It is the only world hypothesis that can deal with novelty and change (Pepper, 1970). In terms of causality, we assume a working hypothesis that certain combinations of actions increase the likelihood of certain outcomes, in certain situations, as opposed to a precise causal relationship between narrowly defined variables (Posavac & Carey, 1997).

The realism stream takes a person-in-environment stance, because people transact and co-evolve with their physical and social environments and this is entirely consistent with the co-production ideals. People behave very differently from inanimate things, such as machines and they are different from animals that are without consciousness. For example, machines do interact to exchange information, but they do not change their minds about the meaning of the information exchanged — that is, they do not mutually influence. People however, do mutually influence — they are transacting.

The choice, of the person in an environment, yields a holistic social science. The realist approach, in all its forms, is the movement toward the recovery of a sense of transaction, as opposed to self-action and interaction. I consider myself a realist and I reject that sufficient conditions of behaviour lie purely within the person. A person with mental illness may travel from their home, to the workplace, then onto a community mental health team appointment and further on to a sports game and s/he can behave differently within each of these settings. People can deliberately create novel phenomena. The emphasis of self-action and interactions is on analysis, whilst transaction has an emphasis on the synthesis of information.

Two major definitions of a system contrast the difference between transaction and interaction. The first definition states: "in a system the members are, from the holistic viewpoint, not significantly connected with each other except with reference to the whole" (Angyal, 1958, p. 250). This unitary system transacts with a humanly

created social field in a whole-to-whole relation of mutual influence; an open system. The second definition states: "a system, is a whole that cannot be divided into independent parts and relies on interaction"(Ackoff & Emery, 1972, p. 16). This definition flows from closed rather than open system logic because there is no relation to an environment.

Emery's Open System Theory (OST [E]) is comprised of a system (L11) and an environment (L22). A system (L11) is defined by its system principle unit (Angyal, 1958, p. 259). This principle expresses the unique relationship between the entity (persons) and the environment and it governs the behaviour of the system and the arrangement of its parts. The environment (L22) is a social field, which consists of the changing values, expectations, and ideals (Emery, 2000). This conceptualisation provides a framework for cultural change. OST (E) uses extracted knowledge and it views people as ecological learners, rather than people who need teaching. This aligns with the co–production theory where the patient is viewed as a resource who can be assisted to develop strategies, to better manage his/her long–term chronic illness.

The open system expresses the transaction of the system and the environment — knowable laws (L) govern all components. The system (designated 1) acts upon the environment (designated 2). This is the planning function (L12). The environment acts upon the system — the learning function (L21). L11 and L22 express the intrinsic nature of the system and environment, respectively. The laws that govern them are implicitly learnt about in the OST(E) method and they can be determined by using a number of approaches including search conferencing (Emery, 2000) and grounded research (Dick, 1997).

Directive correlation (DC) underpins the open system. From the original condition at time one (consisting of the system and the environment) both the system and the environment make changes between time one and time two, thus resulting in a new set of conditions, which consists of a changed system and environment, at time two. Directive correlation expresses when adaptation (in this case co-production) is (or is not) occurring, over time (Sommerhoff, 1969).

Directive correlation can elaborate different levels of the environment. We can distinguish 'task environments', since these are simply slices of the L22, which are relevant to a given system. Task environments allow a system to better approximate active adaptation. Similarly, we can distinguish systems within systems, which function as environments, for smaller units within them.

The key concepts of OST(E) — namely, the system (the long-term chronic patient population) and environment (DHB treatment and employment), transaction and directive correlation — represent a significant departure from the mechanistic, reactive and closed system bases of standard research frameworks. The OST(E) approach enabled me to take the patient's viewpoint of the system, rather than the more standard research, which takes a service view of the system. "OST(E) has proven to be a reliable and practical framework because it has stuck with material universals derived from collaboration with people around their everyday concerns and circumstances" (Emery, 2000, p. 640). Gloster (2000) drew on Emery's open system theory (OST [E]), in order to develop the Emery socio-ecological action research methodology.

4.5.2 Socio-ecological action research

'Socio-ecological' means 'people-in-environments' and this method is comprised of two main components. The first, 'ar' (local action research cycle) and the second, 'AR' theory is developed by retroduction, from a series of repeated ar cycles, across sites and over time.

Socio-ecological action research provides a theoretical framework for the development of an idea (inductive reasoning), in order to bring about a system change, through the idea's implementation and by measuring the results (deductive analysis). The expectation is that by looking back through the research process and the results and the literature, a theory (AR) can be generated (retroductive reasoning).

Local knowledge and theory are used to co-produce local socio-ecological action research, through active adaptive planning and redesign. Successive cycles of action research, based on the ar logic, enable mapping of emergent system–environment relationships (through time and, hence) and they can assist in finding the way forward, in order to achieve a sought change in the people/environment relationship at hand.

Any single action research, cycle consists of an existing situation appraisal ($L11$, $L22$); goal setting ($L'22$, $L'11$) intervention design ($L12$, $L21$): and evaluation of results ($L''22$, $L''11$, and gap analysis). The model guides the generation of progressive hypotheses, either through parallel and/or a series of ar cycles.

Time one is the initial system (long-term chronic patient)–environment relationship ($L22$, $L11$): Time two is the sought system–environment relationship at ($L'22$, $L'11$). The planned interventions occur between time one and time two and they seek to bring about the sought people–environment relationship at time two (by changing what the environment is trying to do to the system).

The actual or achieved system–environment relationship, at time two, following the intervention, is calculated. The difference between the desired system–environment relationship at time two and the actual relationship, at time two, provides evidence for the effectiveness, or otherwise, of the intervention. At time two, the action research cycle is complete and the foundations are in place for the commencement of the next cycle.

A comparison of actual results and sought results occur at the completion of each research cycle. Any proposed changes to the intervention/s and the reasons for them are clearly articulated. During the activities, between time one and time two, the researcher acts in an advisory capacity and at the end of each cycle the action researcher assists with local data analysis, in order to support further developments at a local level. S/he may be able to draw on similar ar cycles to inform any changes.

This KPP outcome evaluation is based on Emery's socio-ecological action research methodology (Gloster, 2000). This method can contend with the KPP patient population and the organisation transacting and co–producing and it also allows a KPP theory to be developed, retrospectively. These are key requirements for evaluating the outcome of KPP. Socio-ecological action research — and its application to KPP — are discussed in the following section.

4.5.3 KPP as socio-ecological action research

Chapter Three described the development of KPP and its alignment with value co–production and customer relations theory. The components of a DHB KPP plan also divide precisely into the socio-ecological action research framework, as outlined below.

The number of KPP patients (long-term chronic patient population) identified in the KPP plan, equates to the system (L11). The environment (L22) divides into two task environments. The first one is the treatment task environment (T), which equates with the KPP patients' use of acute and rehabilitation services. The second task environment is the health environment (H) and this equates to the KPP patients' employment status. The learning function (L21) equates to the collection and review of the KPP plan data, in order to record achievements in part three of the KPP plan. The planning function (L12) equates to the targets set in part four of the KPP plan. Figure 4.1 shows KPP, as a socio-ecological research method. Directive correlation occurs as result of having annual KPP plans (ar cycles). The research methods in Chapter Six detail KPP as an applied socio-ecological action research method.

ar: KPP as a Socio-ecological Action Research Method
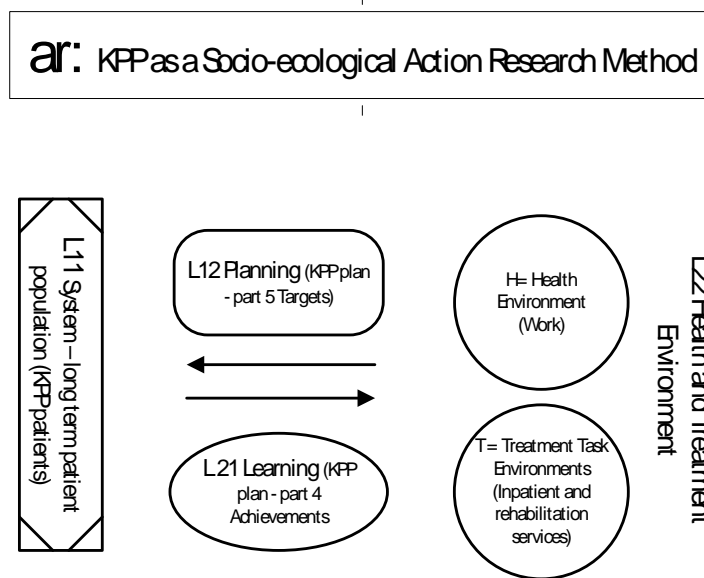
Figure 4.1 KPP as Socio-ecological action research

Value is created for the KPP chronic patients, when they spend less time in restrictive treatment environments (acute beds) and their time in the health environment is maximised. The health environment is represented by chronic patient employment and discharge rates. Value is created for the organisation, through the decreasing demand on acute services, without increasing costs or compromising services to those people who require services for the short term.

4.5.4 Secondary data analysis: excluding other possible explanations

Research findings are only as credible as the evidence upon which they are based. Action researchers can improve the credibility of their research, by ensuring that attempts are made to exclude other explanations. Dick (1997) suggested six ways to exclude other explanations, from emerging findings. They include:

- using multiple research cycles
- refining and critiquing methods at each cycle
- ensuring data collection and interpretation are included at each cycle, thus allowing both data collection and interpretation to be tested, in later cycles

- using divergent data
- using the literature as a possible source of other explanations
- planned changes in the programme, which emerge from an interpretation of the data also enable other opportunities for disconfirmation.

An analysis of secondary data, using a quasi-experimental design, allowed me to test for other factors, which may have been affecting the results. The secondary data sources and analyses are described in the next chapter — Research Methods. These analyses will also furnish evidence of the impact KPP has had on people, who require mental health services and who do not fit the KPP definition.

4.6 Theory development

A theory is a set of interrelated concepts, definitions and propositions, which present a systematic view of specifying relationships amongst variables with the purpose of explaining and predicting phenomena. A theory includes more than one concept and it explains how these concepts are linked together. The concepts and relationships involved in the theory should represent a coherent whole (Ghauri & Kjell, 2005).

Local logics and retroductive logic are key components of the sociological action research approach to theory development, annotated as AR. Retroduction is reasoning from the consequent to the antecedent and thus, after the fact, extracting the hypothesis (de Guerre, 2000, p. 340)

By looking back over the action research cycles and the emergent pattern of L22, L21, L12, and L11 relationships, it is possible to generate a hypothesis that contributes to theory development. This is possible due to the nature of the evolving people/environment relationship (L22, L11). This evolving relationship occurs because the theory developed, concerning the interventions, is designed to change the relationship (L21, L12) and how the relationship has been co-produced.

Within the socio-ecological methodology, theory occurs by the grasping of the particular, not by a separate intellectual process of abstraction. AR (action research theory) often begins with ar (action research cycles) in a pragmatic real world situation, rather than in a hypothetical pursuit of theory. Frequently, neither the researcher, nor the researched, begin with the view that their relationship and mutual concerns will lead to new scientific knowledge (de Guerre, 2000, p. 333). This assertion is entirely consistent with the way KPP was developed. The researcher conducts the AR research, with technical assistance, but s/he does not directly involve the local groups themselves — only the ar cycle data generated by their efforts. The retroductive theoretical approach enables the development of a KPP underpinning theory.

4.7 Summary

Action research achieves research rigour, in settings where other research paradigms struggle to achieve rigour, because the environment is fluid and uncertain and there is little possibility of control. The socio-ecological (people in environments) action research creates a framework, which can provide the empirical evidence for chronic patients (KPP patients) as co-producers. These patients are the principal system unit and there are two main task environments: the treatment environment (acute bed use) and the health environment (employment rates). The credibility of this research is significantly improved by having multiple action research cycles and secondary data analysis, which use a quasi experimental design, in order to assist with excluding other explanations.

The socio-ecological action research methodology, combined with an implementation phase and secondary data analysis provides the basis for a sound evaluation method. In the following chapter, I describe the research procedures.

Chapter Five

Research Procedures

The research procedures, used for the implementation and outcome assessment of KPP, are detailed in this chapter. The chapter is divided into six sections. The first section describes the KPP implementation fidelity procedures, whilst section two describes the KPP outcome procedures. The quasi experimental pre-test/post-test, of secondary data, is described in section three. Section four provides justification for the choice of statistical methods, whilst section five discusses the strengths and weaknesses of the research. Section six concludes the chapter.

5.1 KPP implementation fidelity

I have chosen seven criteria to assess KPP's implementation fidelity. The seven criteria include:

- Reporting KPP implementation in the DHB District Annual Plans (DAPs) for 2002/03 & 2003/04
- A KPP plan
- The DHB retaining a KPP lead staff member
- KPP data reported in the Ministry accountability process
- DHB representatives attend the annual KPP workshops
- The number of KPP patients is at least half the number of chronic patients in the DHB service profile[9]
- The number of KPP patients in rehabilitation beds covered at least half the number of contracted rehabilitation beds[10]

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[9] In order to achieve full KPP implementation, the number of KPP patients, recorded in the DHB KPP plan, must be at least half the number of long–term clients recorded in the DHB's mental health service profile (Service Profile).

[10] At least 75% of the KPP chronic patients would be expected to occupy rehabilitation beds.

McGrew, Bond, Dietzen, & Salyers (1994) described three approaches to assessing implementation fidelity. Firstly, by using average conditions in other programmes; secondly, by comparison with the ideal, as specified by either the author or by participants; and thirdly, a theoretical analysis of a 'judgement of good fit'. As the joint author of KPP I contend that a legitimate implementation specification for KPP implementation fidelity is achieved when at least six of the seven implementation criteria are met. However, a KPP annual plan is essential. The writing of the KPP plan indicates the DHBs commitment to the KPP 10 key features. Partial implementation was achieved, if the KPP data covered less than half the number of chronic patients recorded in the DHB service profile.

5.1.1 KPP Stakeholder Survey

The DHB stakeholder survey was designed to supplement the implementation results, in order to gauge stakeholders' understanding, commitment and satisfaction with KPP — and its implementation process. The key stakeholders included: CEOs; Mental Health Service Managers; Funding and Planning Managers; Mental Health Service Team Leaders; Consumer Advisors; Family Advisors; and the Quality Managers. Clearly, from a co–production perspective the long–term patients are crucial stakeholders but they were not directly involved in this survey, however it is their individual data that is collected against the four KPP patient key features.

Consistent with what Ticehurst & Veal (2000) deemed as effective questionnaire structure, the key DHB stakeholder survey asked one question at a time; it used simple language; and it avoided ambiguity and leading questions. Pilot testing was undertaken, in order to assess other important components of effective questionnaire design validity, such as wording and question sequencing.

Two–way correspondence of the constructs (question and subject) was improved, by asking questions that directly related (attributed) to KPP. By asking stakeholders to cite changes — which they believed had directly resulted from KPP implementation — ensured that the results were meaningful.

88

The seven KPP stakeholder survey questions were as follows:

1. Have you had any involvement in the development and implementation of KPP?
2. Have you seen the KPP plan?
3. Do you think the KPP approach has the potential to improve services for long–term clients?
4. What do you believe are the benefits of the KPP approach?
5. What are the limitations of the KPP approach?
6. How could the implementation of KPP be improved?
7. Any other comments?

Massey University's Ethics Committee approved the voluntary survey tool and its accompanying information sheet. The surveys were given directly to participants, at KPP meetings, which I attended. The surveys were frequently returned immediately and the balance were gathered up by the DHB KPP project leader and returned to me by post.

A simple count of the Yes/No responses was reported for questions 1 – 3. A content analysis (Kvale, 1996; Lofland & Lofland, 1995; Neuendorf, 2002) was used to analyse the written responses to the survey questions 4 – 7. Responses were categorised and analysed, based on recurring response themes. The surveys were read through twice and the key points were categorised. These categories were then summarised into the key findings for each question. These results provide an indication of the level of stakeholder commitment to the KPP approach.

5.2 KPP outcome procedures

The KPP outcome is determined by analysing the ar cycles from both patient and organisational value perspectives. A quasi experimental pre-test/post-test analysis (of KPP and non-KPP DHBs secondary data) considers all adult (short and long–term) patient outcomes and organisational value. Table 5.1 summarises the KPP outcome analyses, by groupings.

89

Table 5.1 KPP outcome analysis matrix

Analysis grouping	Patient outcome		Organisation value	
	KPP patient co-production of value	All adult patients	Management	Staff outcome
KPP DHBs	ar analysis of treatment and relapse plans, housing, employment, and GP contact.	Access and discharge rates.	Co-production of value: KPP regression model (dependant variable: acute bed days).	Performance: percentage of patients with plans
KPP vs non KPP DHBs pre (2002/03) and post (2005/06) test	Not applicable	Access and discharge rates.	Efficiency: costs ($) of acute beds, medication, and patients seen.	Turnover: percentage of active and inactive nurses

5.2.1 KPP DHB socio-ecological action research (ar) analysis method (KPP patient co–production outcome)

The action research (ar) outcome evaluation method is designed to answer the two research questions:

1. Does implementing KPP improve value for both the chronic mental patients and DHB mental health organisations?
2. How does the KPP tool contribute to the theoretical development of co–production?

The action research method consists of two parts: the socio-ecological action research cycles and the retroductive analysis. The retroductive analysis is essentially the Chapter Eight (Discussion) of this thesis, where the outcome results and the literature review findings are examined, in order to determine the theory which underpins the KPP method.

The basic system and environment data, for each action research cycle, was sourced from the KPP annual plans, provided by the DHBs. KPP as a socio-ecological action research method is described in Chapter Four and — to assist with providing detail on the research procedures figure 4.1 (KPP as a socio-ecological action research method) — it is restated here, as Figure 5.1.

ar: KPP as a Socio-ecological Action Research Method
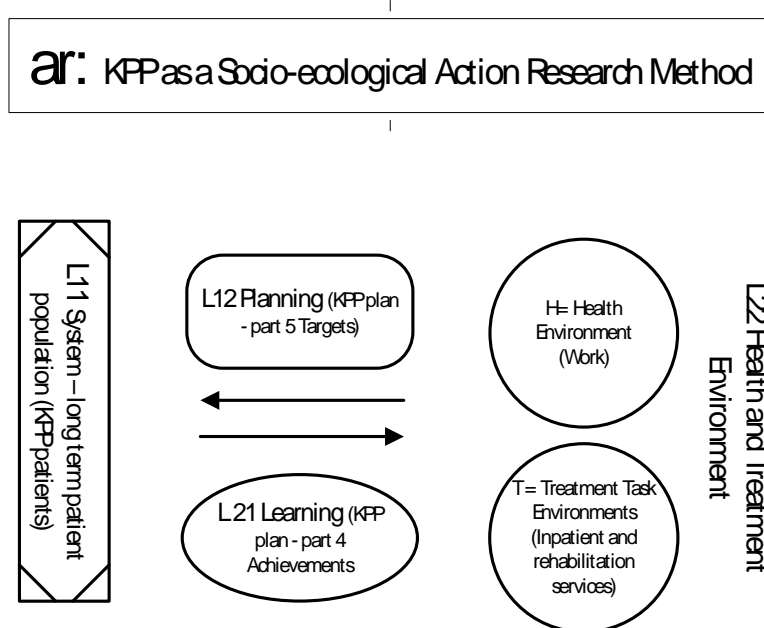
Figure 5.1 KPP as a socio-ecological action research cycle (ar)

The system (L11) is defined as the KPP patient population. The environment (L22) is defined by two task environments. The first one is the treatment environment (T) and the second one is the health environment (H). The planning law (L12) is the targets, set in part five of the KPP plan. The learning law (L21) is part four (achievements) of the KPP plan. The ar data is extracted from the KPP plans, as described below.

L11 System (KPP patients)

- The number of long-term chronic patients, their gender and ethnicity

L22 Environment (Heath and Treatment)

"Treatment" Task Environment

- The number of patients with up to date relapse prevention plans and treatment plans
- The number of patients in rehabilitation beds and the number requiring change
- The number of patients requiring a medication change
- The number of patients requiring a change in General Practitioner (GP)
- The number of chronic patient acute inpatient bed days

"Health" Task Environment

- The number of chronic patients in fulltime employment (FTE)

Employment generates economic value for patients. Full-time work is defined as employees who regularly work 30 hours or more per week, whilst part-time employees work fewer than 30 hours per week. A full time equivalent (FTE) is the number of full-time employees, plus half of the part-time employees (Statistics New Zealand, 2006).

L12 Planning (sought condition)

The ideal conditions assumed for this evaluation are that:

- patients all have treatment and relapse prevention plans
- their employment is maximised
- acute inpatient bed days are minimised
- all patients have a GP
- all patients have appropriate accommodation
- all patients have appropriate medication

Directive correlation occurs when there are changes between each ar cycle at time one (T1) and time two (T2). The T1 and T2 are approximately one year apart.

5.2.2 Decision rules

Timing

The calendar year, within which the first KPP plan was written, counted as the year of the first action research cycle (ar1). The secondary data analysis used the financial year data (1st June-31 May).

Acute bed use

Minimising acute beds use, at systems level, is an indicator of a more effective and responsive service: However, at an individual level, an acute admission may be a very appropriate intervention. Acute bed use is a commonly used health system indicator. In order to ensure consistent accurate acute bed use comparisons, all the data was extracted from the DHB Mental Health Service Profile [Service Profile] (Welsh & Kokaua, 2005) at a cohort level, i.e. the total long-term (KPP) patient bed days by DHB.

Exclusions

KPP data was extracted from the plans, based only on complete responses only. If there were no data recorded for particular criteria, it was assumed that the criteria were not present for the patient, i.e. if there was no data for a treatment plan, it was assumed the patient did not have a treatment plan.

5.2.3 ar data summary analysis (KPP patient outcomes)

KPP patient results are drawn from an analysis of the raw treatment and health environment data, for the eight DHB ar1 cycles (first KPP plan). This analysis includes the two DHBs, which achieved partial implementation, because they had written a KPP plan. The data is aggregated and presented as percentages of the total KPP clients, in a series of tables. For the three DHBs with ar1 and ar2 data, the percentage change in the treatment and health environment data is tabulated.

5.2.4 Poisson Regression Analysis (KPP organisational value: management)

A Poisson regression analysis was used, in order to determine what factors were impacting on the KPP patients' acute bed use. Acute inpatient bed use acted as the

dependant variable, in the KPP regression analysis. Acute bed use is a commonly used measure in health services management and research and also for making international comparisons of health service performance (OECD, 2005). The regression analysis was undertaken at a KPP patient cohort level, consistent with the L11 system of the ar cycles. For this reason, only those DHBs, which achieved full KPP implementation (having at least half the number of long–term patients recorded in their KPP plan, compared to the Service Profile number) were included in the regression analysis. KPP patients' acute bed use was regressed against the percentage of patients with treatment plans; relapse prevention plans; GPs; rehabilitation housing; and funding levels. The analysis was undertaken for the six DHBs and 11 ar cycles, where KPP was fully implemented.

5.3 Pre-test and post-test quasi experimental analysis of secondary data

Secondary data was analysed, using a pre- and post-test quasi experimental design, to support KPP causality interpretations, by attempting to exclude other interpretations of the results. The secondary data items are widely used, nationally and internationally. In order to simplify the analysis and to acknowledge that it is difficult to determine exactly when the KPP principles were first applied, I have used 2002/03 as the pre-test year and the 2005/06 year, as the post-test year. Data were summed for the eight KPP DHBs and the 13 non-KPP DHBs, in order to allow a KPP, non-KPP DHB pre- and post-test quasi experimental design. ANOVA analysis was used, to test for significant difference. The secondary data are described below and they relate to the outcome analysis groupings in Table 5.1.

5.3.1 Total adult access rates (adult patient outcome)

Access to services, within an appropriate and timely way, is a key dimension of service quality and patient value. Total adult access rate data was extracted from the DHB mental heath service profile (Service Profile). The KPP DHBs and non-KPP DHBs total adult access rates are compared, as a percentage of the adult

population pre- and post-KPP. The implementation of KPP is not expected to negatively impact on general adult access rates.

5.3.2 Total adult discharge rates (adult patient outcome)

Discharge from secondary care assumes that the severity of symptoms no longer require specialist intervention; consequently, discharge is used as a proxy for recovery. The rates do not include those people who self-discharge. The KPP and non-KPP DHBs percentage of adult discharges are compared pre- and post-KPP. Implementing KPP is not expected to decrease the rate of discharges.

5.3.3 DHB Blueprint expenditure data (organisation management value)

'The Blueprint' (Mental Health Commission, 1998) was mandated by the Government and it has had a significant impact on the planning; contracting; service models; staffing levels; and consequent structure and intentions within mental health services. 'The Blueprint' spend relates to the amount of funding DHBs spent on actual services.

The KPP DHBs and non-KPP DHBs Blueprint spend is compared pre- and post-KPP, both per 100,000 adult population and per adult seen. KPP is not expected to increase expenditure, per person seen. Relative DHB funding is also important to assess, because people with an interest in this area could argue that KPP could only be implemented into well-funded DHBs.

5.3.4 Antipsychotic medication use (organisation management value)

Increasing drug costs are likely to be associated with improved medication regimes for patients. However, if there was significantly higher medication use in the KPP DHBs, post-KPP, then that may indicate cost shifting. Anti-psychotic drug costs were extracted from the Pharms (New Zealand Health Information Service, 2002)

95

database. KPP and non-KPP DHB anti-psychotic drug costs, per 100,000 total population, are compared pre- and post-KPP. This measure tests if there has been any significant change in drug use, which may indicate cost shifting.

5.3.5 Acute inpatient bed days (patient and management outcomes)

Minimising acute bed use, at systems level, is an indicator of a more effective and responsive service: However, at an individual level, an acute admission may be a very appropriate intervention. Acute bed use is commonly used as a health system indicator. The acute bed day data was extracted from the Service Profile, for all adults admitted to an inpatient unit. The KPP and non-KPP DHBs total adult acute bed days are compared, pre- and post-KPP. KPP is expected to decrease acute bed use.

5.3.6 Staff turnover (organisation staff outcome)

The Ministry of Health routinely collects information relating to the number of nurses who are active and inactive in the workforce on 31 March in a particular calendar year. This measure was used to compare changes in staff turnover, which occurred as a result of implementing KPP. The percentage change in the total number of nurses, both inactive and active (as at 31 March), for the KPP and non-KPP DHBs, is measured pre- and post-KPP. Higher relative turnover would mean higher costs and decreased DHB value.

5.4 Justification for statistical methods

5.4.1 Summary raw data

The KPP information (key features one to four) is simple count data. Summary data are provided for the eight ar1 cycles. Changes in KPP patient feature data are presented as percentages, for the three DHB ar1 and ar2 cycles. There being

only three ar1 and ar2 cycles means that statistical significance testing is
unrealistic.

5.4.2 Poisson Regression

Standard linear regressions are premised on a normal population distribution
however, the KPP data is simple count data. The Poisson distribution arises when
a number of events are counted across time (or over an area) and the count is
represented as a rate. The Poisson regression is well documented, as a robust
form of analysis for count data (Jones, Ford, & Hamman, 1988; Lawless & Nadeau,
1995; Lenk & Rao, 1995; Shieh, 2000).   The Poisson regression is used to
determine if there is any cause and effect relationship between the implementation
of KPP and reduced acute bed use.

5.4.3 ANOVA

ANOVA tests the null hypothesis that population means are all equal. A two-way
analysis of variance (ANOVA) is a common statistical method used to compare
population means, when populations are classified according to two factors, in this
case KPP and non-KPP DHBs, compared pre- and post-KPP. ANOVA assumes
that the population distributions are normal, with possible different means and the
same standard deviation, and that independent simple random samples are drawn
from each population (Moore & McCabe, 1999, p. 813). The ANOVA test is used to
compare the KPP and non-KPP DHBs pre- and post-KPP. The 21 DHB data was
tested and followed a normal distribution pattern. The KPP DHBs, as the
implementation results in Chapter Six demonstrate, are reasonably representative
of all New Zealands DHBs.

Both the Poisson regression analysis and ANOVA analysis were undertaken by
Jesse Kokaua, a Ministry of Health Biostatistician. The outputs of the statistical
analysis are provided in appendix six.

5.5 Strengths and limitations of the research

The probing value of any study needs to be considered, relative to its limitations (Speroff, 2004).

KPP does not directly measure clinical outcomes, rather it measures process: whether or not services are delivered, e.g. the number of patients with relapse prevention plans. The social indicators that KPP uses, such as work, are of major significance in any person's life.

Multiple base line designs minimise weaknesses in the research design (Shadish et al., 1991). Ambiguity relating to causality of the KPP method has been minimised, by ensuring implementation fidelity and by ensuring that significant secondary base line data is available for analysis.

Diffusion obscures the true change effects in the treatment group (Cook & Campbell, 1979). Diffusion was recognised as a threat to the validity to this research, as a result of the KPP DHBs communicating within and between each other — and because the Ministry of Health introduced accountability requirements, as a result of some early findings in this research.

The stakeholder survey was only conducted in three DHBs and responded to by a total of 22 stakeholders, making the validity and reliability of the findings of this survey somewhat compromised. Patient advisors and some long–term patients were involved in the development of KPP. Only patient advisors were respondents to the stakeholder survey and that also limits the value of the survey findings. However, it is actual long–term patient data that comprises the KPP data set.

There is a possibility that the "Hawethorne effect" was in play during this research, in that DHBs were being closely observed over the course of the research. However, based on recent reporting to the Ministry of Health, the DHBs involved in this research seem to have continued with KPP approach post this research.

98

The service profile data, used in the quasi–experimental pre–test post–test service analysis, is drawn from MHINC, the national mental health data collection. MHINC is a 'live' system, so data can change depending on the date the data was extracted.

'History' is an event that takes place, in addition to the measure under observation. An example of a relevant history event was the introduction of the 'Strengths' treatment model into South Canterbury (SouthCant) DHB. The validity threat is minimised by the multiple action research cycles over multiple sites. The New Zealand health system design and mental health policy were stable over the period of this research.

Selection may impact on the findings, because KPP DHBs are inherently different to the non-KPP DHBs. This validity threat, however, is not seen as significant and it is discussed in Chapter Six.

The generalisability of the results, to New Zealand's mental health services, seems unlikely to be questioned, since the research has been conducted in a wide range of DHBs including: rural; urban; large; small; and those DHBs with high and low funding and varying ethnicity mix.

I was able to gather and check KPP data in real time, because I was both the joint KPP Project Manager and I was also employed by the Ministry of Health. This helped to make timely and accurate data available for the research.

The Ministry of Health only uses the SAS statistical package and given I am not trained in SAS programming, the statistical analysis of the data was undertaken by a Ministry Biostatistician.

Starbuck (2004) contended that natural experiments are the research approach of choice and they occur when exogenous events displace social systems, from their normal equilibrium. In these situations, one can see some of the systems adaptive and reactive capabilities and this opens the possibility of discovering why the

99

equilibrium exists. KPP and this evaluation equate with a natural type of experimental approach.

5.8 Conclusion

Undertaking an implementation evaluation ensures that a distinction is made between programme theory failure and implementation failure. Emery's socio-ecological action research provides an excellent method to determine the outcome of KPP — and to develop a theory. The research is data rich and it has considerable base line data, which enables significant testing for other factors that may be causing the result. Whilst individually, the validity of each of the research methods and their data sources can be questioned, when the results are synthesised, they represent a robust evaluation. The outcome results are recorded in Chapter Seven, whilst the KPP implementation results follow immediately in Chapter Six.

Chapter Six

KPP Implementation Fidelity

Undertaking an implementation evaluation enables a distinction to be made between implementation failure — and programme theory failure. Eight of New Zealand's 21 DHBs were involved in this research. This chapter details how KPP implementation fidelity was achieved by those eight DHBs and it begins with an implementation overview and a map of the DHB locations. This is followed by a profile and implementation summary, for each DHB. Any issues peculiar to a DHB, which may have influenced the research findings, are also highlighted in the implementation summary. The results of the KPP stakeholder implementation survey are then summarised and discussed. Prior to the conclusion, I provide an overall implementation summary and I discuss possible reasons why KPP was adopted by some DHBs — and not others.

6.1 Implementation overview

KPP implementation fidelity was deemed to be fully achieved, when at least six of the implementation criteria (including a KPP plan), outlined in Chapter Five were met, and partially achieved when data were collected for less than half the expected number of long-term chronic patients.

Eight of New Zealand's 21 DHBs (listed below) developed a KPP plan and these plans are included in this research:

- South Canterbury DHB (SouthCant)
- West Coast DHB (WestCo)
- Hawkes Bay DHB (HawkB)
- Bay of Plenty DHB (BayoP)
- Southland DHB (Southla)
- Tairawhiti DHB (Tairaw)
- Otago DHB (Otago)

- Canterbury DHB (Canterb)

New Zealand's DHBs can be identified on the map of New Zealand Figure 6.1.
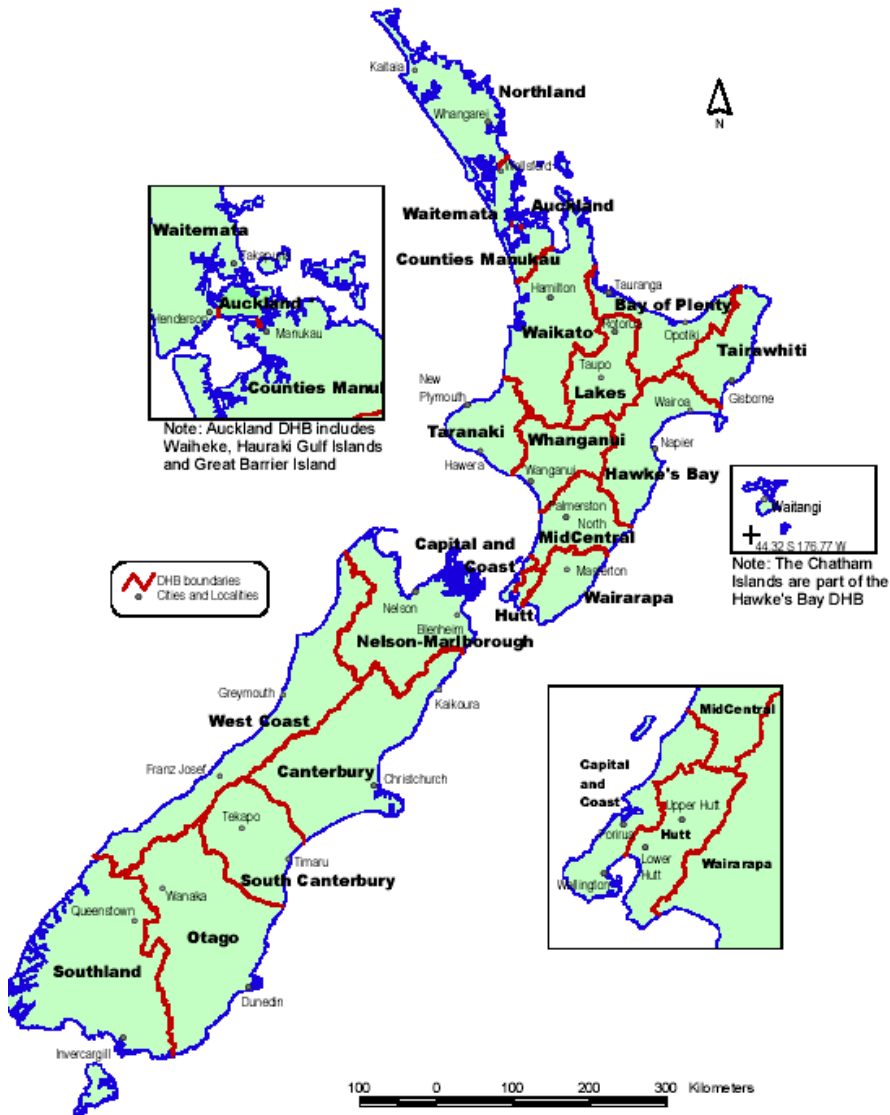
Figure 6.1 New Zealand District Health Boards (DHBs) Locality Map (2001a)

For each DHB, I provide profile and implementation information. The profile provides contextual information on the DHB's population size, the percentage of population that are Māori and funding levels. Subsequently, I detail each of the DHB's KPP implementation results.

Table 6.1 summarises the KPP DHB profiles and implementation results and shows whether or not the DHB was involved in the initial development of KPP, in addition to the implementation status of each DHB. The DHBs are ordered according to the timing of their implementation and the number of ar cycles (KPP plans) completed.

Table 6.1 KPP DHB profile implementation overview

District Health Board	Adult Population	% Māori	Funding ($) per head of population	Involved in developing KPP	Knowing the People Planning (KPP)
SouthCant	29,950	5%	$127	Yes	Implemented
WestCo	17,670	7%	$294	Yes	Implemented
HawkB	83,540	22%	$127	No	Implemented
Southla	63,955	7%	$124	Yes	Implemented
Tairaw	24,429	45%	$169	No	Implemented
BayoP	109,640	31%	$134	No	Partial implementation
Otago	106,880	5%	$216	Yes	Implemented
Canterb	271,130	6%	$155	Yes	Partial implementation

The DHB funding, per head of population, shows quite a large variation, which is generally the result of historical funding patterns, for example, the WestCo DHB had a large psychiatric hospital within its boundary and when this hospital closed a great

deal of the funding stayed with that DHB. Conversely, South Canterbury did not have such a psychiatric hospital within its boundary and further, since it is a relatively wealthy area with a low Māori population it does not receive extra funding based on ethnicity and deprivation. However, the Ministry funding policy has been to ensure that DHB funding per head of population becomes more equitable over time.

6.2 South Canterbury DHB (SouthCant)

6.2.1 Profile

SouthCant is a small rural DHB, situated on the east coast of the South Island: It has been a participant in the KPP research since 1999. Funding for this DHB during 2002/03, was $127/head, for the adult population of 29,950 — of which 5 % were Māori. Since 2000, the SouthCant DHB has also implemented the 'Strengths' model (Rapp, 2006) of service delivery.   The Strengths model is a case management approach, which focuses on patients' strengths, especially in the social areas of functioning. Patients are encouraged to focus on what they can do: rather than focusing on their mental illness and how that limits them.

6.2.2 Implementation

The SouthCant DHB reported KPP, via the District Annual Plan for the 2002/03, 2003/04, 2004/05 years — and via the accountability reporting in 2005/06. The Quality Manager and Consumer Advisor both had day-to-day responsibility for ensuring the collection of data and implementation of KPP. SouthCant DHB representatives attended and presented at all three annual KPP workshops.

The initial KPP data were collected manually. Prior to this situation, a caseload review – the first for some time – led to the discharge of 79 chronic patients. The first KPP plan was written by mid–2003 (ar1) and it included 129 long-term patients, compared to 108 adults (20-64 years) recorded in the service profile[11]. The eight contracted residential rehabilitation beds were accounted for in the KPP plan.

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[11] The DHB mental health service profile (Welsh & Kokaua, 2005).

Three KPP plans were available for inclusion in this evaluation. SouthCant DHB staff completed the key stakeholder survey.

6.3 West Coast DHB (WestCo)

6.3.1 Profile

WestCo is a small rural DHB, situated on a long (450km), narrow strip of land on the west coast of the South Island. This DHB has participated in the KPP research, since 1999, and it had a large psychiatric hospital situated in the district, until 2001. The WestCo DHB is funded at $294/head for their adult population of 17,670, — of which 7% are Māori.

6.3.2 Implementation

The WestCo DHB reported KPP via the District Annual Plan in both the 2002/03 and 2003/04 years and also via the accountability reporting requirements in 2005/06. The Quality Manager had day-to-day responsibility for the implementation and ongoing maintenance of KPP. WestCo DHB representatives attended and presented at all three KPP workshops.

The first KPP plan was written by July 2004 (ar1) and it covered 219 total long-term patients compared to the 215 adults (20-64 years) recorded in the Service Profile. From the 19 contracted rehabilitation beds, 15 were accounted for in the KPP plan. Two of this DHB's KPP plans are included in this evaluation and the WestCo DHB staff also completed the KPP stakeholder survey.

6.4 Hawkes Bay DHB (HawkB)

6.4.1 Profile

HawkB is a medium sized rural DHB, situated on the east coast of the North Island. This DHB is funded at $127/head for their adult population of 83,540 — of which 22 % are Māori.

6.4.2 Implementation

Their first KPP plan was written in July 2004 and it was based on a sample of the caseload. Two community team leaders led the implementation of KPP. The first plan (ar1) covered 142 long-term patients, compared to the 255 adults (20-64 years) recorded in the Service Profile. Seventeen of the 18 contracted rehabilitation beds were accounted for in the plan. The HawkB DHB attended and presented at the 2005 annual KPP workshop and they reported KPP via the accountability process for 2005/06. This DHB produced three KPP annual plans. The HawkB DHB was runner up in New Zealand's 2007 Health Innovation Awards (Ministry of Health and ACC, 2007), for its implementation of KPP.

6.5 Southland DHB (Southla)

6.5.1 Profile

Southla is a medium sized rural DHB, situated at the bottom of the South Island and has been a participant in the KPP research since 1999. This DHB had a major incident early in the research period: a patient killed his mother. The incident resulted in three separate enquiries and involved sporadic media headlines, for over two years. It became known as the 'Burton Enquiry' and had a significant effect on staff morale during that time. The Southla DHB is funded at $124/head for its adult population of 63,955 — of which 7% are Māori.

6.5.2 Implementation

An initial analysis of the Southla database revealed approximately 1,100 clients had been on their caseload for more than two years. The KPP patient group was predicted to be approximately 350. The Southla DHB undertook a project to 'clean up' their patient data system.

A KPP plan was written by July 2004 (ar1) and it covered 252 chronic patients, which compared to the 384 adults (20-64 years), recorded in the Service Profile. This difference of 132 patients is largely explained by patients being on 'psychiatrist

only' case loads. From the 43 contracted rehabilitation beds, 42 were accounted for in the KPP plan.

The Southla DHB reported KPP, via the District Annual Planning process, during 2002/03 and 2003/04 and via the accountability reporting in 2005. Southla DHB representatives attended and presented at all three annual KPP workshops. Southla DHB staff also completed the KPP stakeholder survey.

6.6 Tairawhiti DHB (Tairaw)

6.6.1 Profile

Tairaw is a small rural DHB, situated on the east coast of the North Island. This DHB is funded at $169/head for its adult population of 24,429 (2003) — of which 45% are Māori.

6.6.2 Implementation

Their first KPP plan was by written by September 2004 (ar1) and included 147 chronic patients, compared to the 131 adults (20-64 years) recorded in the Service Profile. The quality manager and two consumer advisors (on short-term contracts) led the implementation. A project manager eventually took on responsibility for the KPP data. The Tairaw DHB undertook a detailed study of the patients, who used their acute services during 2005 and 2006. Thirteen patients were recorded as being in the 13 contracted residential rehabilitation beds. The Tairaw DHB reported KPP data, via the 2005/06 accountability reporting process.

6.7 Bay of Plenty DHB (BayoP)

6.7.1 Profile

BayoP is a medium sized rural DHB, situated in the mid-east coast of the North Island and it has two main towns, Tauranga to the west and Whakatane to the east. This DHB is funded at $134/head for its adult population of 109,640 (2003) — of which 31% are Māori.

6.7.2 Implementation

The first KPP plan was by written by September 2005 (ar1) and it covered 120 of the 462 adults (20-64 years) recorded in the Service Profile. Twenty of the 38 contracted rehabilitation beds were accounted for in their plan. The other 342 patients would probably have been on 'psychiatrist only' caseloads and also on the Whakatane team case load, since they were not being included in the initial data collection. BayoP reported KPP data via the 2005/06 Ministry accountability reporting process. BayoP only achieved partial implementation: However a complete data set has subsequently been collected, but this data falls outside the period of this research.

6.8 Otago DHB (Otago)

6.8.1 Profile

Otago is a medium metropolitan/rural DHB, situated in the middle of the South Island. This DHB was involved in the initial KPP research, but it was not a KPP pilot site. The Otago DHB is funded at $155/head for its adult population of 106,880 (2003) — of which 5% are Māori. Historically, the Otago DHB had a large psychiatric hospital within its boundary.

6.8.2 Implementation

Their first KPP plan was written by November 2005 (ar1) and it covered 814 chronic patients, compared with the 1123 adults (20-64 years) recorded in the Service Profile. Patients not included in the plan would probably have been on 'psychiatrist only' caseloads. All but 10 (9%) of the residential rehabilitation beds were accounted for in the KPP plan. The Otago DHB reported KPP data in the 2005/06 Ministry accountability reporting process.

6.9 Canterbury District Health Board (Canterb)

6.9.1 Profile

Canterb is a large metropolitan/rural DHB, situated on the east coast of the South Island. This DHB has historically had a psychiatric hospital situated within its boundary. The Canterb DHB has been a participant in the KPP research, since 1999 and they agreed to pilot KPP in their assertive outreach team, known as the Hereford Centre. The Canterb DHB is funded at $225/head, for an adult population of 271,130 — of which 6% are Māori.

6.9.2 Implementation

The Hereford centre team leader led the implementation of KPP and (early in 2003) the plan covered 194 patients. As a result of this initial pilot, the Canterb DHB began to expand implementation into other mental health teams. The integrated care and KPP co-ordinator manually identified 1,181 long–term patients, this compared with the 1,117 adults (20-64 years) recorded in the Service Profile. The co-ordinator also found that the KPP patients made up 65% of the DHB's total adult mental health service caseload at any one time. A KPP plan was not written to cover the 1,181 long–term patients. However, in January 2006, a second KPP plan was written, by two of the six community teams, for 367 patients. One hundred and sixty seven of those patients were in the 167 contracted residential rehabilitation beds, in addition to the Hereford centre patients.

The Canterb DHB reported KPP data via the 2005/06 Ministry accountability reporting process, but it only achieved partial implementation.

6.10 KPP implementation summary

Table 6.2 summarises the KPP implementation data for the eight DHBs. 14 KPP plans (ar cycles) were completed by the 8 KPP DHBs. SouthCa and HawkB completed three KPP plans (ar cycles). WestCo completed two KPP plans (ar cycles). Canterb completed two KPP plans (ar cycles), which covered two of their

six community mental health teams. Tairaw, BayoP, Otago and Southla completed one KPP plan (ar cycle) each. Partial implementation was achieved in BayoP and Canterb, because they only reached 26% and 32%, respectively, of the expected number of chronic patients. Consequently, they were excluded from the KPP acute bed use, Poisson regression analysis which is discussed in section 5.2.4 in Chapter Five.

Overall, 2% of the KPP plan data items were unrecorded. 95% of all the contracted residential beds were accounted for in the KPP plans. 52% of the KPP patients were male and 48% female. 14% of the KPP patients were Māori, compared with a national adult Māori population of 13%.

Table 6.2 KPP DHB implementation summary

District Health Board (DHB)	Knowing the People Planning (KPP)	First KPP plan (ar 1) year	# of ar 1 patients	# of ar1 patients as a % long term patients in the Service Profile	% rehabilitation beds accounted for	# of action research cycles (ar)
SouthCant	Implemented	2003	129	119 %	100%	3
WestCo	Implemented	2004	219	101%	79%	2
HawkB	Implemented	2004	142	56%	90%	3
Southla	Implemented	2004	252	81%	98%	1
Tairaw	Implemented	2004	147	112%	100%	1
BayoP	Partial implementation	2005	120	26%	53%	1
Otago	Implemented	2005	818	72%	91%	1
Canterb	Partial implementation	2003	194	32%	100%	2
Total			2021			14

6.11 Stakeholder survey

Three DHBs participated in the KPP stakeholder survey: SouthCant, WestCo and Southla. The survey tool is provided in Appendix Two. The number of surveys and responses to questions 1, 2 and 3 are included in Table 6.3. The survey response rate, by DHB, was as follows: SouthCant 77%, WestCo 66% and Southla 70%. The stakeholders included: CEOs; Mental Health Service Managers; Funding and Planning Managers; Mental Health Service Team Leaders; Consumer Advisors; Family Advisors; and the Quality Managers. Two respondents had not been directly involved in KPP, but they believed that KPP had the potential to improve services for the long-term chronic patients.

Table 6.3 Stakeholder implementation survey: A summary of results.

DHB	Survey Date	Number of surveys	Question 1. # who have been involved in KPP	Question 2. # who have seen the KPP plan	Question 3. # who think the KPP approach has the potential to improve services for long term patients
SouthCant	May -04	7	7	6	7
WestCo	May -05	8	6	8	8
Southla	May -05	7	7	7	7
Total		22	20	21	22

A content analysis (Kvale, 1996; Lofland & Lofland, 1995; Neuendorf, 2002) was used to analyse the written responses to the survey questions 4 – 7. Responses were categorised and analysed, based on recurring response themes. The surveys were read through twice and the key points were categorised. These categories were then summarised into the key findings for each question. These results provide an indication of the level of stakeholder commitment to the KPP approach.

The results of content analysis for the open-ended survey questions 4 — 7 are detailed below.

Question 4: The benefits of having KPP are best summarised as being:

- Patient-centred
- Common sense
- Able to focus action
- Able to measure results

Questions 5 and 6: ask the respondent about the implementation of KPP. The responses to each of these questions were essentially the same and consequently the results have been combined. The content analysis identified three factors that impacted on the implementation of KPP:

- The need to have dedicated staff time, in order to drive the implementation
- A lack of knowledge and/or understanding and — as one respondent commented: "sometimes its beautiful simplicity makes it hard for people to grasp and embrace, in this world of high academia"
- Ministry of Health support and endorsement for KPP was an important positive factor when implementing KPP.

Question 7: No comments were made on this question, which requested any other comments.

DHB stakeholders, despite some concerns with KPP's implementation, considered KPP as being: patient-centred; able to focus action; and measure results.

6.12 Selection: Why these particular DHBs

KPP evolved from the study of high needs patients in the South Island, as outlined in Chapter Three. All but one of the six South Island DHBs (that being the Nelson Marlborough DHB) went on to implement KPP and they provided data for this research. It is not clear why Nelson Marlborough DHB did not formally implement KPP, although they have been able to provide data on chronic long-term patients, as required by the Ministry's accountability reporting requirements.

The Ministry of Health (Ministry) has made a significant investment in developing a new information system, in order to collect a 'clinician rated' patient outcome measure, known as HoNOS[12]. In order to assist with the implementation of the new system, the Ministry funded an information co-ordinator in each DHB, to support the

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[12] HoNOS Health of the Nation outcome scale is a clinician rated, five item score that rates a patient's psychiatric and social health status.

outcome collection. In contrast, KPP was voluntary and DHBs received no extra funding to support its implementation. Nevertheless, eight DHBs implemented KPP and they all provided data for this research. The main reason for DHBs choosing to implement KPP is probably best demonstrated in the KPP implementation stakeholder survey results (Table 6.3): KPP made sense to the clinicians and other key DHB stakeholders.

The Ministry has, in 2008, contracted a researcher to investigate why DHBs have not formally adopted KPP and what processes they have in place in order to ensure quality care for their long-term chronic patients.

6.13 Implementation conclusion

Prior to the implementation of KPP, DHB management did not differentiate long-term chronic mental health patients from the total mental health patient population. KPP was fully implemented into six DHBs and partially implemented into a further two DHBs, thus demonstrating that long-term patients can be known. Key stakeholders, who were surveyed, believed KPP was patient–centred and able to focus action and measure results. KPP was able to be implemented, irrespective of DHB funding, size, ethnicity make up and whether or not the DHB had historically had a psychiatric hospital within its boundary. The Ministry of Health provided no direct funding for DHBs to implement KPP, but it provided encouragement for its implementation, via accountability mechanisms.

The answer to the research question — *can KPP be implemented into DHB mental health services*? — is a resounding 'Yes', where DHBs have the organisational commitment to do so, by including KPP as part of their business strategy. Six out of the eight DHBs fully implemented KPP. While the stakeholder survey only included three DHBs, the findings suggest the respondents saw value in KPP. With KPP implementation fidelity achieved, the outcome results are described in the following chapter.

114

Chapter Seven

Outcome Results

KPP implementation fidelity has been demonstrated in eight of New Zealand's 21 DHBs. This chapter answers the second research question of this thesis: *Does implementing KPP improve value for long–term mental health patients and DHB mental health organisations?* The results show that KPP is a co–production intervention that enhances long–term chronic patient outcomes. The outcome results are grouped, in order to separately demonstrate patient and organisation outcomes. The KPP outcomes matrix table from Chapter Five (p. 88) is reproduced here as Table 7.1, in order to re-orientate the reader to the outcome analyses. This table also includes the type of statistical analysis and the chapter section number, to which the analysis relates. The outcomes matrix is also included, at the conclusion, of this chapter as a simple way of summarising the results.

Table 7.1 KPP outcomes results matrix

Analysis grouping	Patient outcome		Organisation value	
	KPP patient value	All adult patients	Management	Staff outcome
KPP DHBs	ar analysis of treatment and relapse plans, housing, employment, and GP contact. Count data as percentages: Section 7.1.1	Access and discharge rates. ANOVA Section 7.1.2	Value: KPP regression model (dependant variable: acute bed days). Poisson analysis Section 7.2.1	NA
KPP vs non- KPP DHBs pre (2002/03) and post (2005/06) test	NA	Access and discharge rates. ANOVA Section 7.1.2	Efficiency: costs ($) of acute beds, medication, and patients seen. ANOVA Section 7.2.2	Turnover: % of active and inactive nurses ANOVA section 7.2.3

7.1 Patient outcomes

The KPP long-term patient outcomes, which directly relate to the four KPP patient key features, are reported first. These results demonstrate whether the organisations' commitment to the KPP 10 key features were successful in improving patient outcomes. The pre- and post-adult access and discharge rates are then compared, between the KPP and non-KPP DHBs.

7.1.1 KPP patient value

The KPP patient outcomes are measured in both terms of ar1 findings and changes between ar1 and ar2. These measures relate to the KPP patient key features of; treatment and relapse prevention plans; employment; residential housing; medication; and general practitioners (GPs)[13]. These measures relate to customer relations co–production and service provision processes.

Table 7.2 shows the average percentage of patients with treatment plans and relapse prevention plans for the eight ar1 cycles (the first KPP plans). The eight cycles are made up of data from 2021 long-term patients.

Table 7.2 Percentage of clients with treatment plans and relapse prevention plans at first ar 1 cycle

		Percentage of patients with:	
	Number of ar 1 cycles (N)	treatment plans	relapse prevention plans
ar1	8	50	66

Note. N=8 DHBs

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[13] Medication and general practitioners make up KPP key Feature Three: Health advice

The National Mental Health Sector Standards (NMHSS), described in Chapter Five, are a legislative requirement and they stipulate that patients must have treatment and relapse prevention plans. On average, 50% of patients had treatment plans and 66% had relapse plans at ar 1 (the first KPP plan). This was a surprising result and it indicates that the contemporary quality and audit procedures, described in Chapter Two, were not adequate for ensuring the standards of care for these chronic patients.

Given that KPP was implemented over the three years (2003, 2004 and 2005) the potential, for the diffusion of the early KPP findings was high. An observation at the end of 2003 — when comparing SouthCant, and WestCo DHBs data — was that a high percentage of patients, without relapse prevention plans, appeared to be correlated with higher acute bed use. This observation was communicated to those DHBs that were preparing to implement KPP during 2004 and 2005. A relapse prevention plan would normally be developed, based on information from a treatment plan. However, the average of the ar1 (Table 7.2) results shows that there were 16% more relapse prevention plans, than treatment plans. This finding suggests that communicating the relapse prevention plan observation, to the other DHBs, may have impacted on their data and this finding supports the assertion that there has been diffusion of the KPP findings.

Table 7.3 shows the percentage of patients with treatment plans and relapse prevention plans, together with their work status, for those three DHBs (SouthCant, WestCo, HawkeB) that had both first and second ar cycles (N = 3). These three ar1 and ar2 cycles are represented by 921 patients. The percentage of patients with treatment plans increased by 22%, whilst patients with relapse prevention plans increased by 24%. The percentage of KPP patients (in paid employment) increased by 4%, and this increased by 7% when measured as full time equivalents. These results clearly demonstrate that knowing the status of long-term chronic patients improves both process (more patients have plans) and patient value (more patients with plans and who are in employment). Having a plan (which will be demonstrated in section 7.2.1 p. 119-121) is more than just a process: It is an aspect of value in its own right, since it indicates an occurrence co–production and therefore the patient

has had a better understanding and control of their life — resulting in a reduced chance of re-admission.

Table 7.3 Percentage change in treatment plans, relapse prevention plans and employment between the ar 1 and ar 2 cycles for those DHBs having both cycles

| | Number of ar cycles (N) | Percentage of patients: | | | |
		with treatment plans	with relapse prevention plans	in paid employment	as FTEs
ar1	3	68	56	15	10
ar2	3	90	70	19	17

Note. N=3 DHBs

An average of 50% of patients had treatment plans when all eight ar1 cycles were included (Table 7.1). This compares with the 68% of patients with treatment plans (at ar1) in the three DHBs that had an ar2 cycle (table 7.3). The difference in the percentage of plans between the ar1's is mostly explained by the fact that SouthCant DHB had 100% of patients with treatment plans at ar1, and the DHB was also involved in the development of KPP as previously described in Chapter Six (p 71). The reason relapse prevention plans are lower in the three DHBs with ar1 and ar2 cycles (table 7.3), compared to the eight ar1 DHBs, has probably been caused by the diffusion of the early research findings. These findings indicated a correlation between higher relapse prevention plans and lower acute bed use, as previously discussed in Chapter Three (p. 62).

Table 7.4 shows the percentage of patients requiring changes to their: GP, medication and residential rehabilitation, for the three DHBs that had two ar cycles.

Table 7.4 Percentage change in GP, medication and rehabilitation housing status between the ar1 and ar2 cycles

	Number of cycles (N)	Percentage of patients requiring a change in:		
		GPs	medication	NGO rehabilitation housing
ar1	3	11	7	13
ar2	3	6	4	5

Note. N=3 DHBs

Patients who required a GP, a medication and housing change decreased by 5%, 3% and 8%, respectively. These results demonstrate that where the KPP DHB organisations commit to the 10 key features, the needs of the long-term chronic (KPP) patients can be more appropriately met.

7.1.2 Adult patient outcomes; access and discharge rates

In order to test whether the implementation of KPP came at the expense of short-term patients, access and discharge rates are compared, for all adults seen in the KPP and non-KPP DHBs, pre- and post-KPP implementation, using ANOVA. Approximately 60,000 adults are seen per year in New Zealand's 21 DHBs (N). Table 7.5 shows the pre- and post-KPP access and discharge rates, for the KPP and non-KPP DHB adults.

Table 7.5 Adult pre- and post-access and discharge rates

	Pre: 2002/03		Post: 2005/06	
	Non-KPP	KPP	Non-KPP	KPP
% adult population accessing services	2.56	2.97	2.67	2.82
% of adults discharged	63	67	61	71

Note. N=21 DHBs

Overall, there was no significant change (F= 0.03, p= 0.85) in access rates pre- and post-KPP observation periods. Despite KPP DHBs access rates being 0.15% higher, than non-KPP DHBs, post KPP, this result was not able to be explained, beyond random variation (F=1.97, p=0.17). The pre-test KPP verses non-KPP DHB access rates were also not significantly different (F= 0.46, p=0.50) compared to post KPP differences.

Discharges did not increase significantly, post-KPP (F=0.01, p=0.92). Similarly, there was also no significant difference between the KPP and the non-KPP DHB's discharges, pre-test (F=0.10, p=0.76) or post-test (F=1.13, p=0.29). These results suggest that the implementation of KPP did not have a detrimental effect on the treatment outcomes for short-term patients. Patients were able to access services and be discharged, at a similar rate, irrespective of KPP.

7.1.3 Summary of patient results

Patient value improved as a result of DHBs having implemented KPP. More patients had treatment and relapse plans and employment rates increased. There was a decrease in the number of patients, who required changes to their rehabilitation, medication and GP status. The general population had equivalent

access to services and patients were discharged at an equivalent rate, in both the KPP and non-KPP DHBs, post KPP, suggesting that the implementation of KPP did not have a detrimental effect on the care of short term patients.

7.2 Organisation Outcomes

This section demonstrates whether the KPP DHBs gained value from implementing the 10 KPP key features. The KPP management value results are detailed first and the management efficiency and staff turnover results follow, sequentially.

7.2.1 Management value

A Poisson regression was used to develop a model that could explain what variables in the KPP DHBs were impacting on the reduction of acute bed use. Acute bed use is used as an indicator of management value, because hospital beds are expensive and often in short supply.

KPP patients' acute bed use (dependant variable) was initially regressed against five independent KPP patient variables. The five variables were the percentage of patients who had treatment and relapse prevention plans; GPs; residential rehabilitation; and paid employment. Funding per head of population, for each DHB, was also included as an independent variable within the regression model. Data from eleven ar cycles, from six[14] DHBs, was used for the regression analysis. The ar data used in this regression analysis is provided in Appendix Five.

The initial regression analysis showed that relapse prevention plans and treatment plans had a high co–linearity (-0.56), and therefore relapse prevention plans were excluded from further analysis. Relapse prevention plans are very important, but they are a subset of a comprehensive treatment plan. The ar1 findings show that there were 16% more relapse prevention plans, than treatment plans, possibly

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[14] Canterb and BayoP ar data was excluded from this analysis because KPP was partially implemented in these DHBs.

because the early KPP DHB implementation findings (the more patients without relapse plans the higher acute bed use) were presented to those DHBs who had not yet implemented KPP. Residential rehabilitation housing also demonstrated a high co-linearity (0.78) with treatment plans on the initial regression analysis and this was also excluded from further analysis. Residential rehabilitation is a treatment, which is a service for those most disabled by their illness and these patients only make up 10% of the total long-term chronic patient population (209 from a total of total 2021 ar1 patients).

Acute bed days were then regressed against the percentage of patients with treatment plans, GPs, employment and DHB funding, per head of population. The percentage of patients, with GPs and in employment, made no significant difference to acute bed use and they were subsequently excluded from the final regression. GPs are primarily concerned with the physical health needs of the long term chronic patient — not their psychiatric needs — and therefore this non-significant result is not surprising. Despite employment rates meaningfully increasing (by 7% in the three DHBs that had two ar cycles), employment showed a non-significant result, in the regression analysis. This non-significant result is probably a consequence of low employment rates (10% at ar1).

The final Poisson regression model shows that both treatment plans and funding contribute to a decrease in inpatient bed use, as shown in Table 7.6. These results show that 34% of the variation ($R^2 = 34\%$), in acute bed use, can be explained by treatment plans and funding. Patients are much less likely to have an inpatient stay if they have treatment plans ($B = -0.74$, $z = -11.70$). Increasing the levels of funding was also significant in reducing acute bed use ($B = -0.001$ and $z = -4.58$). However, the funding effect on acute bed use was much smaller relative to treatment plans with funding having an adjusted beta of $\beta = -0.13$, compared with treatment plans of $\beta = -0.74$.

The important findings of the regression analysis are that as the percentage of long-term chronic patients with plans increases from 50% to 90%, their inpatient bed use decreases by 26%. Nationally, long-term chronic mental health patients used a total of 98,000 acute bed days, during 2004/05 (approximately 42% of the total adult

acute bed days) and — assuming 50% of these patients had plans and if this could be increased to 90% — the KPP results would suggest there would be a reduction of 25,480 acute bed days used nationally. At an average bed cost of $550, per day, this represents a saving of approximately $14 million in bed days; furthermore, KPP was implemented within existing DHB resources. If funding was increased, for example, by 50% (from $200 to $300 per head of total adult population — approximately 2.4 million people; total cost $240 million), KPP data would suggest a 10% reduction in acute bed use (or 9,800 acute bed days) and a saving of $5.4 million. This potential saving is substantially less than the investment required of $240 million, which would be required to increase funding from $200 to $300 per head of population.

Table 7.6 Regression analysis (Poisson): acute bed use against treatment plans and funding

Acute Bed Use	β	B	Z	95% CI
Treatment Plans &	-0.74	-0.74	-11.10	-0.61 -0.87
Funding	-0.13	-0.001	-4.58	-0.002 -0.000

Note. N=11 DHBs, R² = 34%

Three other findings add weight to the validity of the regression finding. Firstly, the number of KPP patients (with treatment plans) increased from 68% to 90% (Table 7.3) and secondly Blueprint spend increased significantly (Table 7.7).   Thirdly the total adult acute bed use decreased by 27%, in the KPP DHBs, over the course of this research (Table 7.8). This regression result occurred within the context of the KPP method being implemented into DHBs and it illuminates the importance of plans for patient co–production. This co–production finding aligns with the co–production process of customer relations theory. Patients are not just passive, end user recipients of services. Co–production recognises the patient as a management resource: By ensuring patients have treatment and relapse prevention plans, and

their social health needs addressed (employment, housing), service demand is reduced.

7.2.2 Management efficiency

Pre- and post-KPP and non-KPP DHB expenditure, cost per person seen, acute bed use and antipsychotic medication costs, are compared using ANOVA, in order to determine if co–production improves value for a healthcare organisation. Furthermore, if the KPP DHBs had significantly higher Blueprint spend, per head of adult population, or cost per person seen, then this may explain why the DHBs were able implement KPP.

Spend, per head of population and per person seen, are compared between the KPP and non-KPP DHBs pre- and post-KPP, in Table 7.7. The results show that, overall, in both DHB groups there were significant increases in spending per head of population over time (F=11.17, p= 0.0019) and cost per person seen (F=8.36, p=0.0063) increased significantly post KPP. This finding is consistent with successive governments' commitment to increasing funding to mental health services, which I described in Chapter Three (p27-28).

No significant difference was found in funding per head (F=0.41, P= 0.52), between the DHB groups post-KPP implementation. The KPP verses non-KPP DHBs funding per head were also not significantly different, pre-KPP (F=0.35, p=0.55)

KPP DHBs costs were \$569 lower, per person seen, between the DHB groups post-KPP implementation. However, this difference was not found to be statistically significant (F=1.7, p=0.2). The KPP verses non-KPP DHBs cost per person were also not significantly different, pre-KPP (F=0.00, p=0.96). These results suggest that expenditure was not a significant factor, when implementing KPP, nor did KPP increase costs.

Table 7.7 Pre- and post-KPP Blueprint spend and cost per adult seen

	Pre 2002/03		Post 2005/06	
	Non-KPP	KPP	Non-KPP	KPP
Adult Blueprint spend per head of population	$219	$235	$262	$264
Cost per adult seen	$8,458	$7,843	$9,655	$9,086

Note. N=21 DHBs

Table 7.8 shows that the eight KPP DHBs total adult acute inpatient bed days decreased by 20,499, or 27%, whilst the thirteen non-KPP DHB inpatient use increased slightly, post-KPP. These results support the finding of the Poisson regression (Table 7.6) that, when the percentage of patients with plans increased, acute bed use decreased. These results also support the assertion that diffusion was a validity threat to this research since the 27% decrease relates to all adults seen in acute services not just long-term chronic patients. Case managers have both long- and short-term patients on their case loads, so therefore it seems plausible that the expectation of long-term patients having treatment and relapse prevention plans probably spilled over to short-term patients, thus leading to more short-term patients with plans.

Table 7.8 Pre- and post-KPP inpatient bed days

	Pre 2002/03		Post 2005/06	
	Non KPP	KPP	Non KPP	KPP
Total inpatient bed days	151,989	76,100	152,720	55,651

Note. N=21 DHBs

Table 7.9 compares KPP and non-KPP DHBs spending on antipsychotic medication, pre- and post-KPP. Medication costs increased significantly ($F = 65.97$, $p<0.0001$) in both KPP and non-KPP DHBs post-KPP. There was no significant difference in the antipsychotic medication spend, between the KPP and non-KPP DHBs, post-KPP implementation ($F=0.03$, $p=0.87$) or pre-KPP ($F= 0.33$, $p=0.72$). These results suggest that there was no cost shifting, as a result of implementing KPP, but rather the increase in medication costs were probably being driven by improved medication for all patients, coupled with increases in medication costs, over time.

Table 7.9 Pre- and post-KPP antipsychotic medication costs per 100,000 of total population

	2003/04		2005/06	
	Non-KPP	KPP	Non-KPP	KPP
Antipsychotic medication cost	$458,069	$509,252	$1,355,055	$984,869

Note. N=21 DHBs

7.2.3 Staff turnover

The KPP stakeholder implementation survey results (Chapter Six, p. 109-11) showed that key stakeholders, including clinicians, believed that KPP was patient-centred, able to focus action, and measure results. These nursing staff turnover results determine whether the KPP DHBs gained value from having significantly lower nursing turnover rates, than the non-KPP DHBs, possibly because staff were more content working in KPP DHBs. The Ministry of Heath routinely collects information on the number of nurses, who are both active and inactive in the workforce, at 31 March, in a particular year. The total numbers of nurses (both active and inactive) pre- and post-KPP are compared for the KPP and non-KPP DHBs in Table 7.10.

Table 7.10 Pre- and post-KPP active and inactive nursing rates

	Pre 2002/03		Post 2005/06	
	Non -KPP	KPP	Non-KPP	KPP
Number of active nurses	1,892	1,115	2,432	1,347
% of nurses who became inactive	5.5 %	6.7 %	2.4%	2.1%

Note. N= 21 DHBs

The total number of active nurses increased by 28%, in the non-KPP DHBs and by 20% in the KPP DHBs. The number of inactive nurses decreased significantly (F=65.97, p=0.0001) post-KPP in both KPP and non-KPP DHBs. These two findings are consistent with the increases in funding to mental health services and the increase in nurses' remuneration which I discussed in Chapter Three (p28).

No significant difference in the percentage of inactive nurses was found between the KPP and non-KPP DHBs pre-KPP (F=0.33, p=0.72) or post-KPP (F= 0.87, p=0.33), despite the KPP DHBs having a 0.3% lower turnover, post-KPP. Both the KPP and non-KPP DHBs had improved organisation value as a result of having a more stable workforce.

7.2.3 Summary of organisation results

KPP DHBs gained significant value, through reduced acute bed use. KPP was implemented, without relatively increasing costs or staff turnover. There was also no evidence of cost shifting: Medication costs increased significantly, post-KPP, but there was no difference in these costs between the KPP and non-KPP DHBs.

7.3 Conclusion

Table 7.11 summarises the outcome results, a ☺ signifies a positive outcome result. A — signifies that no difference was found and NA means that no analysis was undertaken. Individually, the validity of each of these outcome results can be questioned: However, collectively, there is little doubt that the implementation of KPP improved both patient and organisational value. KPP has demonstrated that co–production is a useful approach within the management of services that improves outcomes for long-term chronic patients.

Table 7.11 KPP outcome matrix results summary

Analysis grouping	Patient outcome		Organisation value	
	KPP adult patient value	All adult patients	Management	Staff outcome
KPP DHBs	☺	—	☺	NA
KPP vs Non-KPP DHBs pre (2002/03) and post (2005/06) test	NA	—	☺	—

Chapter Eight

Discussion: Co–production — a valid approach in health services management

Health management has typically been premised on the patient being a consumer/end user. Co–production recognises the client (patient) as a resource, in that value cannot easily be created or delivered unless the patient actively contributes to the service (Alford, 1998). This chapter answers the third research question of this thesis: *How does the KPP tool contribute to the theoretical development of co–production?* This chapter represents the retroductive analysis of the socio-ecological action research method, where the outcome results and the literature review findings are examined, in order to determine a theory that underpins the KPP method.

The chapter is comprised of eight sections. The first five sections discuss the KPP findings and how they relate to co–production strategy, value, services, information and performance. Section six of this chapter details the Co–productive Health Management theory, which I have developed, based on KPP and these research findings. Section seven explains how this theory can be applied to other areas of healthcare — outside of the mental health area. The final section of this chapter outlines further areas for research.

8.1 KPP, co–production and strategy

The customer relations management framework (described in Chapter Two) requires that organisations, in addition to a typical business strategy, have a strategy that recognises long-term customers. Within clinical healthcare patient-centredness has been the strategic approach used to involve patients, but this strategy has not tended to differentiate long-term patients from the general patient population. Concepts of patient centredness and empowerment and patients as partners, together with shared decision making and informed choice, illustrate

patient emancipation (Edwards & Elwyn, 2001). Empowerment refers to the political processes that affect individuals and organisations and it directs attention to processes that involve individuals in decisions about their heath options, including self management (Opie, 2000). Patient–centred care, including self management, has been targeted at the clinician–patient relationship. However, the 'pigeon holing' of patients into services has meant that 'the category' has replaced the person (Glouberman & Mintzberg, 2001a). If there is a strategy in place that firstly identifies the long term patients and recognises long–term patients as co–producers, then it can offer a way to lift patient–centred care to a new level. Prior to the implementation of KPP, DHBs' business strategies did not allow these organisations to acquire knowledge relating to the number of long–term patients in their care — nor could their patient management systems offer them this information.

Inherently, the implementation of KPP required DHBs to commit to a long-term patient strategy, where people — rather than services — were the unit of measure. KPP was implemented into eight DHBs and the results of this implementation did not appear to be contingent on:

- funding
- DHB size
- a DHB previously having had a psychiatric hospital within its boundaries
- a DHB's involvement in the development of KPP
- the treatment model adopted by the DHB

Within the mental health services of the eight KPP DHBs, funding ranged from $127 (SoutCant and HawkB) to $294 (WestCo), per head of population. These DHBs also represent the highest and lowest funded DHB mental health services in New Zealand, thus suggesting that funding levels were not a factor in the implementation of KPP.

The largest DHB to fully implement KPP was Otago, which had an adult KPP population of 814, whilst the largest DHB in New Zealand is expected to have a KPP population of approximately 1,500 people. With the numbers of long-term

chronic patients being relatively small, even for the largest DHB, collecting data for this group of patients is not an onerous task, which would prevent the implementation of KPP within larger organisations.

KPP was implemented into DHBs, irrespective of whether or not they were involved in the initial KPP development, or whether there had previously been a psychiatric hospital located within their geographical catchment areas. In addition each DHBs particular treatment model did not appear to impact on the implementation of KPP, for example SouthCa had implemented the Strengths treatment model, whilst HawkB had no specific generic treatment model.

DHBs formalised the implementation of KPP through local stakeholder meetings and by the inclusion of KPP, as part of their District Annual Plan, agreed upon with the Ministry of Health and ultimately the Minister of Health. DHB stakeholders, despite some concerns with KPP's implementation, considered KPP as being patient-centred, able to focus action and to measure results. KPP was implemented within the existing resources of the eight DHBs and it did not increase costs, per person seen.

The long–term patient business strategy adopted by the KPP DHBs, aligns with the long-term customer strategy component of the customer relations management framework.

8.2 KPP and patient co–production of value

Co–production means that the service is not simply undertaken by the organisation in a one way transfer, but that the customer (patient) jointly contributes to the service (Alford, 1998). Contemporary health management has been predicated on the patient as a consumer, rather than the patient being a co–producer. Patients with chronic conditions consume the greatest use of healthcare resource and they are the most reliant on the trust and professionalism of their clinicians (Robinson, 2001). The literature review findings showed that patients wished to be involved in

and self-manage the treatment of their condition and — where this was assisted by clinicians — outcomes improved (Trummer et al., 2006) .

The co-production of health care value from KPP is demonstrated by two key findings of this research:

1. As the percentage of long-term patients with treatment plans increased from 50% to 90%, acute bed use decreased by 26%.
2. A 7% increase (10% to 17%) of KPP patients in full time equivalent employment after one year.

KPP patients gained value in terms of wellbeing and independence through spending less time in hospital. Patients are much less likely to have an inpatient stay if they have treatment and relapse prevention plans (B= -0.74, z = -11.70, Table 7.6).   KPP patients also gained value through the ability to generate an income as demonstrated by employment rates increasing from 10%-17% (Table 7.3). The patients provided important supplies (resources) to the health care organisation, including information, compliance, co-operation and productive effort as a result of having treatment and relapse prevention plans, which enabled them to manage their own condition. Meaningful plans simply cannot be developed without a significant contribution by the long–term patient. Plans also require a commitment from the long–term patient and the service to action them. A treatment plan would be expected to consider medical advice/treatment and social support (these relate to the KPP key features 3 and 4). A relapse prevention plan identifies early relapse warning signs for patients and what the patient can do to minimise the likelihood of a relapse — and what the organisation will do. The patient will ideally, have a copy of her/his treatment and relapse prevention plans.   The eight DHBs, which implemented KPP, gained significant value from the reduction in acute bed day use. These results clearly justify the theory that long-term patients can be viewed as co–producers by management.

Ideally, long-term patients should have a single, negotiated, personal health plan based on factors that maximise their ability to co–produce — that is, they have an understanding of their condition and what they can do to better manage their

condition. Inherent in a negotiated plan is risk sharing. Bovaird (2007) stated that co–production means that service users and professionals must develop mutual relationships in which both parties take risks – the patient has to trust the professional's advice and support, and the professional has to be prepared to trust the decisions of (and the behaviours of) the service user — rather than merely dictate to them.

The KPP findings do not appear to be the result of cost shifting or compromising the care of short-term patients. The access and discharge rates, of short-term patients to secondary mental heath services, were not significantly different between the non-KPP and KPP DHBs, post-KPP implementation. Antipsychotic medication costs increased significantly in both the KPP and non-KPP DHBs but there was no significant difference between the DHB groups pre- and post-KPP. Nursing staff turnover decreased significantly, in both KPP DHBs and non-KPP DHBs, but there was no significant difference between the DHB groups, post-KPP.

Both patient and organisation value increased as a result of KPP, with treatment and relapse prevention (health) plans providing the vehicle for patients to co–produce. These results align with the 'dual value creation' (co-production) process of customer relations theory.

8.3 KPP, co–production and services

The effective use of relapse plans requires patients to know and understand how to manage the early warning signs of their illness and for the crisis and acute services to respond to their deteriorating health condition, in accordance with their relapse prevention plan. The increase in the percentage of patients, with both treatment and relapse prevention plans, appears to have better enabled KPP DHBs to respond more effectively, to patients' health and social needs.

The KPP annual plan summarises the patient information, in order that the level of met and unmet needs can be measured, and action can be taken where necessary. The results showed that a small number of patients had unmet needs (apart from

plans and employment) and that these needs could be decreased, by appropriate service provision. The number of patients who required housing, medication, and GP (primary care) change, decreased, between the ar1 and ar2 cycles. There was a 3% decrease in patients requiring a medication change, an 8% decrease in patients requiring a housing change and a 5% decrease in patients requiring a change to their GP status. These results demonstrate that more appropriate service provision could occur within the KPP DHBs and they provide further evidence of co–production. These results align with the third customer relations process of 'service integration'.

8.4 KPP, co–production and information

Information is a key component in the development and operation of a high quality, cost efficient health system. The service–centric health information approach sorts episodes of care, either by diagnosis or specialism. This was the normal practice in mental health and (prior to the implementation of KPP) DHBs did not know the number of their long-term chronic patients, nor could their patient management systems tell them. The implementation of KPP data collection required detailed information on each of the long-term patients and it identified the clinician responsible for each patient's care. For both business and ethical reasons, health care organisations should have reliable up-to-date information on the combinations of health and social needs of people with long-term chronic illnesses within their areas. A single unified patient information system, such as the KPP system, could also assist with the early identification of patients who make high (frequent or prolonged) use of health care services, particularly secondary care services. Information systems (patient management systems, data repository and analytical tools), which can provide a person-based viewpoint, are crucial to the enhancement of long-term patients' ability to co–produce health care value. A person-based information view aligns with customer relations 'information-management' processes.

8.5 KPP, co–production, monitoring and control

Regulations have tended to legitimise health care organisations but they have paid minimal regard to their efficiency: consequently they have failed to ensure organisational success (Ozcan et al., 1997). Sampling is commonly employed for audit processes, in order to measure compliance with regulatory standards. Although there was a statutory requirement that every patient should have a treatment and relapse plan, on average, at the first action research cycle (ar1), only 50% of the long–term patients had treatment plans, and only 66% had relapse prevention plans. In the KPP DHBs, clinicians, whose clients did not have up–to–date treatment and relapse plans, were expected to develop plans with their patients: This requirement resulted in a significant increase (20%) in the number of patients with plans, after one year. These findings suggest that health managers who have control and monitoring processes, based on a census of the long–term patients rather than just relying on samples, will enable patients to co-produce. In a co–production framework ensuring that patients have the best opportunity to co–produce is as much an organisation concern, as employee effectiveness (Payne & Frow, 2005). These findings align with the fifth customer relations process of 'performance assessment'.

8.6 Co-productive Health Management theory

Ghauri & Kjell (2005) stated that a theory is a set of inter-related concepts, definitions and propositions that present a systematic view of specifying relations amongst variables, with the purpose of explaining and predicting phenomena. A theory includes more than one concept and it demonstrates how these concepts are linked together (Ghauri & Kjell, 2005).

KPP was implemented without any underpinning theory: However this research has demonstrated that KPP can be underpinned by co–production and it aligns with customer relations theory. The customer relations management framework provides the basis for the Co–productive Health Management theory. The KPP

evaluation findings, demonstrate how KPP contributes to the theoretical development of co–production, by providing the empirical evidence that patients can — and do — co–produce health value, with plans providing the vehicle for co-production. It is also clear from the evaluation findings that the four other customer relation processes (strategy, service integration, information and performance) are required, in order to support the co–production of health care value.

Co–productive Health Management theory is comprised of five management processes, which are required to ensure improved co–production by long–term chronic patients:

- A long–term patient co-productive strategy process
- A health value co–production process (negotiated plan)
- A long–term patient service provision process
- A long–term patient information-management process
- A long–term patient monitoring and control (performance) process

A long-term patient co–productive strategy process recognises chronic patients as co–producers: People are the unit of measure. This was exemplified by KPP DHBs being able to recognise long–term patients, in their District Annual Plans, reported to the Ministry of Health. The value co–production process requires that long-term patients have negotiated plans that create autonomy and the ability to self co-ordinate care and maintain wellness. This is exemplified by KPP patient key features one and two: Patients have treatment and relapse prevention plans. The long–term patient service provision process requires long-term patients to have access to primary, secondary and social health care services, which create value for the patient and the organisation. This is exemplified by KPP patient key feature three and four, where patients' medical and social health needs are considered. The long-term patient information-management process allows managers to measure and to respond to an individual's met and unmet needs and for co–productive value to be reflected, through the organisation and onto the stakeholders. This is exemplified by the KPP annual plan. Long-term patient monitoring and control processes ensure that people have appropriate plans and access to the agreed range of services and that they have contributed to this

planning process. This is exemplified in the KPP process, by monitoring the percentage of long–term patients with plans.

These five interrelated processes better enable long–term patients to co–produce health value. Co–production occurs when long–term patients can negotiate their health needs, via a personalised health plan(s) (covering treatment and relapse prevention) that allows them to minimise the impact of the chronic illness on themselves and the health system.

Co–productive Health Management aligns with global, current business thinking: In a world wide survey of company executives, Rigby & Bilodeau (2007) identified customer relations management as having high use and high satisfaction, amongst the executives.

8.7 Broader application of Co–productive Health Management

This thesis has demonstrated that Co–productive Health Management has added value, in the 'difficult to manage' area of mental health and it therefore seems reasonable to assume that this approach could be applied to the management of other long-term chronic conditions.

Chronic conditions affect all age groups, with about two thirds of those affected being people under 65 years old with 44% also having co-morbid conditions (Singh, 2005). Chronic patients can also have multiple medical and social health needs, for example:

- asthma combined with mental illness (Scott et al., 2007).
- the frail elderly with mental illness (Bruce et al., 2005)
- psychosocial needs of minority groups with cancer (Moadel et al., 2007)
- housing impacts on health (Dunn et al., 2006)
- psychiatric disability and employment (Salkever et al., 2000)

A patient with one chronic condition costs twice that of a patient with an acute condition and approximately six times as much, if the patient has multiple chronic conditions (Institute of Medicine, 2001, p. 27). In the UK, two thirds of those admitted to hospital are people with chronic conditions (Singh, 2005).

Chronic disease has been inadequately treated and prevented due to poorly organised health systems (Bodenheimer, 2000; Institute of Medicine, 2001). Sang (2007) believed, based on interviews with patients with chronic conditions that they are not so much concerned about choice and waiting times, but about holism and self–management (co–production). Crucially, as Edwards & Elwyn et al (2001) stated we need to identify: what approaches are needed to involve patients with what specific problems — and at what moment in time they are required to improve patient outcomes. Co–production offers a way to do this for long-term chronic patients.

Co–productive health management theory comprises five management processes, which are required, in order to ensure improved co–production, by long–term chronic patients. Wilson (1994) contended that managers, who understand that chronic patients are actually co-producers, will be more able to deliver suitable services. Healthcare organisations could reasonably commit to a co–productive management approach, since there appears to be only minor risk and a great deal of potential value could be gained, for both organisations and patients. The initial implementation of Co–productive Health Management, into other areas of health care, would require a strategic commitment from healthcare organisations to long–term chronic patients as co-producers. Organisations would need to know how many patients were placing significant demand on their services over time and/or those patients who made frequent use of hospital beds.

The initial review of long-term patients, in any healthcare organisation could be based on the KPP patient features (Features one to four). These four features cover an expectation that there is a treatment plan and a relapse prevention plan (for each patient), and that their health and social needs are also taken into consideration. The data collection could have enough flexibility for patients and clinicians to identify any specific needs, which may contribute to the patient and the

138

organisation's value. These data would, also, ideally identify the patient's involvement with other health and social organisations/services. The case management approach, used by New Zealand mental health services, provided a single point of contact for collecting the KPP patient data. Applying the Co–productive Health Management practice, to non-mental health areas, may require the services of a dedicated clinical researcher (in the first instance) in order to collect the data.

In a Co–productive Health Management process, managers would need to have information feedback loops, based on the number of long term patients and their use of the service. This is required in order to improve the organisation's response to these people, in a way that added value for both parties. This information would be used to ensure that all patients had individualised plans and it would also be used during staff training, to demonstrate how patients could be better supported as co–producers. In a co–production environment, managers would be as concerned with long–term chronic patient performance, as they are with efficiency (Payne & Frow, 2005).

The co–production approach requires management to ensure that long–term patients have a personal health plan, which creates value for both the patient and the organisation: a plan that can also inform management action, where necessary. Patient and organisation value is gained, when patients can better manage their illness. Co–production has as its starting point the patient — not the service. Self-management education teaches problem-solving skills, whereas traditional patient education offers information and technical skills (Bodenheimer et al., 2002). A study of cardiac surgery patients, by Trummer, Mueller, Nowak, Stidl, & Pelikan (2006), showed that, where health professionals aimed to empower patients to be more effective co–producers of their surgery recuperation, by using more effective communication strategies, improved clinical outcomes were demonstrated.

The negotiation of a personal plan could cover risk factors that are common to a large number of diseases. Diet, smoking, alcohol intake, injury, hygiene, stress, and a lack of exercise are linked with a wide range of long-term conditions, such as cancer, heart disease, diabetes and oral diseases (Daly, Watt, Batchelor, &

Treasure, 2002). A person with diabetes, for example, would have an individualised plan, which enabled her/him to manage their condition. However, if the person could not afford the preventative medication (identified in their plan) and this was resulting in hospitalisations, then it may be in the organisation's interest to provide the medication free of charge. If the patient had the medication, then it would improve both the patient outcome (by the patient not becoming acutely unwell) and it would save the organisation acute bed stays. Alternatively, a person with diabetes may not be managing her/his diet, nor having sufficient exercise. It may be in the interest of a healthcare organisation to pay for a personal trainer, where the expectation of both parties is that health and organisation value would improve. A negotiated plan would obtain agreement on risks and solutions, in order to minimise the impact of the illness on the person and the health system. A person with multiple health conditions, ideally, requires a single comprehensive personalised plan, which covers all their treatment and relapse prevention approaches, in a co-ordinated way. Co–production means that patients and professionals must develop mutual relationships, in which both parties take risks. The service user has to trust the professional's advice and support, but the professional has to be prepared to trust the decisions of (and behaviours of) the service user rather than merely dictating to them (Bovaird, 2007).

Pfeffer & Sutton (2006) claimed that managers, from all types of organisations, can learn from the practitioners of evidenced–based medicine, which is a movement that has taken the medical establishment by storm in the past decade. Similar to medicine, management is learned through practice and experience. Managers (in the same way as clinicians) can practice their craft more effectively, if they relentlessly seek new knowledge and insight, from both inside and outside their companies, so they can keep updating their assumptions, skills and knowledge (Pfeffer & Sutton, 2006, p. 62). Management's recognition of long–term patients as co-producers provides a long–term patient lens, where both managers and clinicians can continually learn.

8.8 Future Research

There are three main areas where further research into the Co–productive Health Management approach would be appropriate.

KPP was evaluated at cohort level, within this research. Further research could be undertaken at an individual level, to further refine the precise needs of long term patients and how meeting those needs could create value, for both the patient and the organisation. The research could identify what are the most worthwhile techniques needed to engage patients, in order to improve their ability to co–produce. Such research could also identify the detailed training needed for the workforce, which would result in improved response to long–term chronic patients.

Scott, Mannion, Marshall, & Davies (2003) argued that consideration of organisational culture has typically been conceived of the organisation as being a closed system, thus giving limited or indeed no weight to the role of patients. Menzies (1970) identified a culture of de-personalisation and the denial of the individual, e.g. 'the liver in bed ten' and 'the pneumonia in bed fifteen'. Hyde & Davies (2004) asserted that, without fundamentally changing service design, this culture will be perpetuated. Organisational culture has not been specifically studied, as part of this research, but — given that Co–productive Health Management focuses on people not services — then this may have an impact on service culture and is worthy of further research.

The co–production paradigm, that views the patient as a resource, rather than simply a consumer, opens up the possibility of paying long–term patients to be well. Further research would be required in order to identify the circumstances, under which (and with what constraints) paying patients to be well, would create value for the organisation and the patient.

Chapter Nine

Conclusion

Patients remain the justification for the health system and they are the recipients of its benefits. Long–term chronic patients justify a significant portion of the health care resource.

Typically, health management has been premised on the patient as a consumer/end user. This has led to two distinct approaches to improving care for patients. The first approach is service centric and has resulted in a focus on: integrating services, re-engineering, quality improvement and the development of chronic care teams. These service centric approaches cannot account for the significant contribution patients can and could make to the health care. The second approach is patient centric and is exemplified by patient centred care and self management. Patient centred and self management approaches occur independently of direct management support.

Information systems are also developing along the same binary lines, with electronic medical records being service centric and self management information systems being patient centric. Ideally, information systems will be able to recognise long–term patients and have a facility in the medical record that enables the development of an agreed health plan, which can also inform management action.

Despite health care organisation's obsessions with strong regulatory frameworks and quasi consumerism, this research shows that only 50% of long–term patients had treatment plans and it clearly demonstrates the need for patient based information.

Managers have tended to focus on populations, government agendas and efficiency. They rarely have contact with patients or patients' families. Co–production rejects the binary service centric and patient centric approaches. Co–production needs to happen at the point of delivery and through conversation and

dialogue rather than through choice alone, learning to understand and map people's experience and the interface between the service and their lives, is essential for creating conditions for co–production. Such an approach also has the potential to improve the often tense doctor and management relations because the co–productive management processes can support improved outcomes for patients.

Co–production has as its starting point the patient (not the service) and how value can be created for the patient, thus resulting in the creation of value for the organisation. The development of KPP and the results of this evaluation provide substantive evidence for an emerging Co–productive Health Management theory. This theory hinges on a negotiated personal health plan that enables each patient to better manage her/his health. It also demonstrates how the organisation can assist patients in their endeavours. Co–productive Health Management theory argues that five management processes are required in order to ensure improved co–production by long–term chronic patients:

- A long–term patient co-productive strategy process
- A health value co–production process (negotiated plan)
- A long–term patient service provision process
- A long–term patient information-management process
- A long–term patient monitoring and control process

KPP has demonstrated the inclusion of co–productive processes, into existing health management processes utilising existing resources, can lift patient–centred care to a new level. Better facilitation of patients as co–producers improves both patient and heath system value.

The findings of this research for New Zealand mental health services, in particular, provide a compelling case for all DHB mental health services to adopt a KPP/Co–productive Health Management approach. In fact the New Zealand Government has, as a result of the 'Sally Fisher petition 2008/01 and 1283 others' (New Zealand Parliament 2009), advised DHBs that they must adopt KPP or something similar into their mental health services. This directive provides the strategic expectation for recognising long–term mental health patients as co–producers

In a co–productive health management environment, management values the patient as producer (a resource) rather than simply a consumer; it facilitates negotiation rather than just providing choice, and is as concerned about patient results as it is about service efficiency. Table 9.1 simply contrasts contemporary health management, with co-productive health management for patients, with long–term chronic conditions.

Table 9.1 A summary of the part long–term chronic patients play in contemporary and co-productive health care organisation and management

	Long–term chronic patients in:	
	contemporary health management	co-productive health management
Organisational value	Consumer	Producer
Organisational premise	Choice	Negotiated plan
Organisation manages	Services	Patients

Patients with chronic long–term conditions are the core business of health care and the focus of health policy and planning. From both an ethical and business perspective, healthcare organisations should ideally have reliable up–to–date information on every long-term patient, in order to deliver healthcare services more effectively.

This research has demonstrated for the first time that an alternative health management viewpoint — of the long–term patient as a co–producer — offers a way to significantly improve both patient and health system value. This thesis provides empirical evidence for the theory that co–productive management processes need to be in place to support effective co–production by long–term patients. When these management processes are in place both patient and organisational value is improved: a win/win situation for both patient and the health service.

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161

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Appendix One: Sample KPP plan

XXXXX DHB, First Annual KPP Review and Plan of Mental Health Services for Long-term Clientele, March 2003

Introduction

To assess how well health care is working for an individual you need to look at that person's experience. Knowing the People Planning (KPP) adopts this approach to a total client group to give an assessment how the service is responding to their needs: what is working well and what calls for attention and action.

XXXXXXX Mental Health Service Policy for Long-term clients

The care and treatment of people with severe and enduring mental illness is the core business of mental health services There are currently 208 long-term (> 2 years) mental health clients known to the DHB in xxxxxx, many of them receive support, treatment and care from a number of health and social agencies and 129 of them are currently receiving treatment from secondary care services.

Clients are encouraged to the view that their condition is something they can learn to manage so as to carry on with their lives: and that mental illness is not the basic determinant that redefines their existence, excluding them from ordinary society, or making them dependent upon mental health services to cater for all their needs for evermore.

With effective medication, an understanding of their condition so as to anticipate possible problems, timely support and treatment if needed, clients' are helped to build on their own abilities and strengths to manage their illness. Their families/whanau can and should make an essential contribution and the normal expectation is for them to be included.

To be consistent with this approach, secondary mental health services must be seen not as a one-stop shop to meet all needs but one part of a local system of health and social agencies that between them provide the essentials clients need. Health Boards have the responsibility for co-ordinating these arrangements and ensuring that they are effective as measured by client experience and opinion.

Within the local system, clients should be in contact with secondary mental health services for no longer than is necessary to meet their current health needs. Though some clients are wary of being 'discharged', this arrangement is introduced as appropriate and not a 'rationing' device. Discharge from secondary care does not mean abandonment by the local system for many clients will continue to be supported by primary care and other social agencies even though they are not in contact with the community mental health team. However, they must have quick and easily arranged access should they need treatment from secondary care services at any time. There are no waiting lists and the scale of local potential demand has also been assessed. The test will be whether this is how it feels to clients and works for them. Good and effective communication between primary and secondary health services are essential and crisis plans must work in practice.

Another implication of this approach is to assist individual clients to find the answer to their needs from what is generally available to the public instead of congregating mental health clients so as to provide exclusive work and leisure activities e.g. membership of a golf or social club instead of the only option being attendance at a drop-in centre.

The law requires a small number of clients to be treated without their consent and secondary mental health care must meet these obligations.

Review of the 10 Key Features

The 10 headings of the assessment that follows are have been agreed by stakeholders across the South Island as key features of service that clients and their families look for and that providers seek to deliver.

1. Personal Development – service policy and how it should feel to clients and their families/whanau

The adoption of the Strengths approach has galvanised and focussed client casework.

Strengths is a common policy accepted by all local agencies

Case workers and care workers are trained in the practice of the Strengths approach. The change in style has been characterised by one key worker as: moving from a position of 'I'm managing you' to 'I'm managing the resources to assist you in what you want to do.'

There is effective consumer involvement and participation in the framing of policy and monitoring its effects by conducting consumer audits and surveys.

Māori workers and Kaumatua speak well of their involvement and service response to Māori clients.

SF speaks well of family involvement and that families no longer need to be long-term members of the local SF as a pressure group to improve family involvement.

2. Enumerating the Clientele

In the past few months, there has been a thorough examination of clients on the community team caseload in the light of the Service Provision Framework (the specification for secondary mental health care) and for whom there are records.

Of 208 clients, 79 have been discharged from secondary care back to their GP, though social and other supports remain in place where necessary.

One benefit has been the reduction of individual key worker caseloads (on average from 35 to 22) enabling more time to be given to those with greatest need.

There are 129 long-term clients on the current active caseload.

There are approximately equal numbers of men and women.

50% of clients are between 30 and 50 years old.

17% are over 60 and the oldest is 84.

There are 4 Māori and 1 Pacific Island clients, the Māori service reports no under-provision and states that Māori clients are well cared for.

A small number of clients, whose condition falls outside the Service Provision Framework, need support and care but no specific service has responsibility for them and they have been taken under the wing of mental health. Sometimes this can involve long-term hospital care.

ACTION – identifying these people and making adequate provision for them

Having established a baseline, it will be important from year to year to observe client flow – the number new to local services, the number discharged, and the number of clients returning who have previously used local secondary care services.

ACTION – keeping a continuous annual record of these numbers

3. Accountability and Quality – organisational arrangements to deliver the quality of service described above

There is a simple two level management structure 4 Clinical leaders, includes the areas of CYMHS and Alcohol and other Drug Services,

Consumer, Māori and Family Adviser, Quality Facilitator, Clinical Director and a Service Manager accountable to the CEO

Working arrangements with the Funding arm of the DHB are effective in the financing of the total service and sensitive to providing packages of care in individual cases.

Supervision of various kinds and frequency e.g. daily case review meetings, complex case conference for multiple admissions, group supervision, personal supervision, is directed at achieving the consistent implementation of the Board's care policy.

Quality Management has moved from managing quality process e.g. Accreditation, to including an examination of outcomes e.g. the client review that reduced case loads from 35 to 25, consumer audits and satisfaction surveys.

NGO services in XXXX have a history of adapting to changing need that pre-dates the changes in the Board services and the introduction of Strengths. They continue to adapt and develop and there would be some benefit in describing their changing role and functions which are completely in accord with the overall client care policy in XXXX

XXXXX Trust

XXXXXX Mental Health Support Trust

101 XXXXX Street

Within the local mental health care system, there is general agreement that the relationships with primary care and related secondary care services require attention and improvement (see below, Section 5).

Relationships with other government agencies, child and youth, income support work well.

The level of satisfaction   mental health services enjoy in the community is an outcome of the combination of factors outlined in this section: demand is being met – there are no waiting lists; overall need is being measured by the KPP project; and quality is being delivered. The Strengths approach and quality assurance measures such as consumer satisfaction surveys make the quality intended, the quality experienced by consumers and their families.

4. Contact with Clients and their families – come what may

There is no evidence of clients losing contact with secondary care against clinical advice.

However, substantiation would be easy by adding to the client turnover information suggested in Section 2, the number of clients who self-discharge against clinical advice or simply disappear from service.

ACTION – add this category in the discharge statistics

5. Health Advice

Medication – for the majority of clients, atypical medications have benefits compared with the older, depot medications. The drawback is the need for consistency in their use and for some clients this is only possible with assistance.

Data is to be collected to assess the extent of the use of atypical medication.

ACTION – explore ways of enabling this to happen

Liaison with other secondary care services

Liaison between the age related and mental health services needs attention both in regard to clinical services and needs assessment. The difficulties experienced affect the service given to elderly clients. A protocol is to be negotiated between the services to make improvement.

The difficulties experienced would also be eased with the introduction of specialist psychogeriatric advice.

ACTION – identify the likely demand negotiate a protocol, provide some extra psychogeriatric input, and report on the benefit to elderly clients.

Liaison with Primary Care Services – the need for a better understanding and closer working relationships with the 37 local GPs is widely recognised. Long-term clients have much to gain from closer involvement of GPs in the local support and treatment network. There could be benefits not only for clients but also for primary care and specialist services.

Every client should have a GP 26 people have no GP

GPs require specialist support and liaison. Further information is to be collected to assess how many of those clients who use atypical medication, receive their prescription from a hospital doctor and not their GP. Repeat prescriptions are better provided by GPs and should not require clients to attend the hospital.

GPs need a better understanding of therapeutic policy, SPF and Strengths if they are to contribute

ACTION – achieving these objectives, jointly and in negotiation with local general practitioner services.

6. Social Support

Work – clients say that having a job and proper income are add significantly to their ability to recover from major mental illness:

58 (45%) of the long-term clients on the active caseload have no vocational activity.

44 (34%) engage in voluntary or paid work on a part-time basis from 10 to 30 hours a week, including 13 (10%) in full time employment.

There are a number of initiatives to help people into the work force. XXXXX MH Support Trust makes a major contribution providing work at the farm for 25 people daily and with a grant from WINZ individual clients are assisted to find work and accompanied into their new employment until they are fully confident.

101 Stafford Street, provides consumer organised work opportunities.

23 of the voluntary workers would like to find paid employment and there is need to discover more part-time jobs

ACTION – Increase the number of clients employed. Establish a task force to tackle these issues with the objectives of (a) to help 15 people move from voluntary to paid part-time employment in the next 12 months, and (b) reduce the number of clients

with no vocational activity by 20 (c) research and report on the local resources available to advise clients and key workers with a local directory of work opportunities.

Education

58 (45%) of the active long-term clients on the active caseload have no educational qualifications.

50 (39%) of the active long-term clients have School Certificate or higher, including 14 with Bachelors or Masters Degrees.

Accommodation

No client is homeless for long periods, but one or two at any time may be temporarily so and there is emergency accommodation provided by Victoria Trust to meet this eventuality.

25 (19%) of the long-term clients on the active caseload are in some form of dependent accommodation.

88 (68%) of the active long-term clients live in either semi- or fully independent accommodation.

Victoria Trust is an excellent and innovative approach to providing clients with their own rented property.

There is need to survey accommodation for long-term clientele and predict need over the next year or two. To see if there is a trend away from supported accommodation and also to determine how best to manage this at a time when rents are increasing and the supply of rental property is said to be decreasingly.

It is also important to discover the number of people who want to move to greater independence in their housing provision.

ACTION – Conduct an accommodation survey as outlined above and report.

7. Co-ordination for health and social services

Every month the key health and social service agencies attend the XXXXXX Community Mental Health Network Meeting at the XXXXX Centre. This meeting is a vehicle to share relevant information, to assist in providing a co-ordinated approach to planning, to facilitate project teams, organise training, and to discuss

any issues with regards to quality improvement. The chair is rotated each month and minutes distributed on the Yahoo Group

8. Anticipating Crisis

Crisis Plans - Each of the 208 long-term clients, whether or not on the active caseload, has a crisis plan that involves family/whanau where requested and can be activated by them as well as the client. As verification of this an audit will be conducted in the next year.

ACTION – Conduct an audit and satisfaction survey of crisis plans

Respite - Provision at XXXXX House is good, much appreciated and well-used. Nevertheless, some older clients (8 of the 66 aged 50 and older) would prefer an alternative and do not use XXXXX House.

ACTION – Discover the number of clients affected and provide alternatives.

Acute Beds - The use of beds has decreased in the past year: in 2002 there were **115** admissions compared to **295** in 2001.The reasons for this reduction are being evaluated but among them are a policy of allowing certain clients access to a bed whenever they feel the need. It appears that the assurance of help being available when required reduces the frequency of its use.

9. Personal Review

Staff, clients and families report that the requirement for care plans to be reviewed at a maximum of 3 monthly intervals works well.

Satisfaction with the service is high and on the inevitable occasions when things do not go as they were planned there is general recognition that the matter will be examined and rectified. There is confidence in the management of the service.

Some clients say they have moved to XXXXX to benefit from the service here.

10. Evaluation of services – KPP

Evaluating KPP as a planning method that focuses on service quality and client outcome - XXXXXXX used KPP on this occasion because it is perceived as a service planning system that is complementary to the Strengths approach: they both have client outcome as their primary focus.

ACTION – Examine whether KPP has met expectations and what adaptations are needed.

If the decision is to remain with KPP two other steps to be considered are:

Training local staff to use KPP

Extending the KPP approach to the entire mental health clientele and service.

Results to Celebrate

Successful introduction of the Strengths method of casework that is adopted by all service providers and has resulted in client, whanau/family approval and satisfaction

A spirit of co-operation among providers and the monthly Mental Health Network Meeting.

As a result of a thorough examination of clients on the community team caseload in the light of the Service Provision Framework (the specification for secondary mental health care) and for whom there are records. This has identified 208 long-term clients, 79 of whom have been discharged from secondary care back to their GP, though social and other supports remain in place where necessary. This has resulted in a reduction of individual key worker caseloads (on average from 35 to 22 on average) enabling more time to be given to those with greatest need. The process has also identified a number of features of the 129 long-term client group on the active caseload e.g.

44 (34%) engage in voluntary or paid work on a part-time basis from 10 to 30 hours a week, including 13 (10%) in full time employment. 50 (39%) have School Certificate or higher, including 14 with Bachelors or Masters Degrees.

88 (68%) live in either semi- or fully independent accommodation.

The use of beds has decreased in the past year: in 2002 there were **115** admissions compared to **295** in 2001.

Focus Issues to March 2004

1. Improve response to older people by improving psychogeriatric input and respite options.
2. Improve relationships with GP's
3. Facilitate improving employment options as per employment action point.
4. An accommodation status survey.
5. Add additional data collection items as indicated in action points.

Appendix Two: KPP Implementation Survey Information Sheet
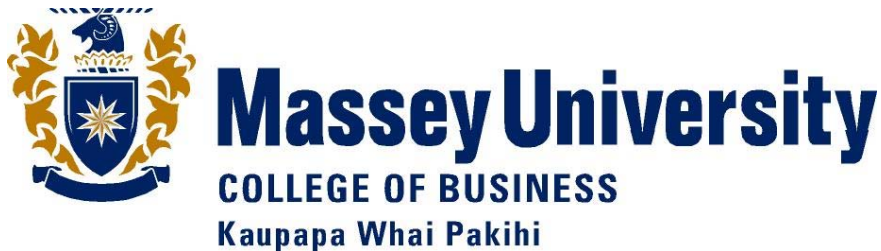
DHB Mental Health Service KPP Implementation Survey Information Sheet
Knowing the People Planning Evaluation Research

Introduction

I am undertaking a research evaluation of the Knowing the People Planning Pilots as part my Masters Degree in Health Services Management. The research will assist the Ministry of Health and District Health Boards as to the effectiveness of KPP and inform its further development. The research is supervised by; Professor Ralph Stablein of the Management Department, and Dr Patrick Dulin of the Psychology Department at Massey University (Ethics Committee Reference HEC:PN Protocol 03/119).

Based on program theory Knowing the People Planning (KPP) is being evaluated in two phases. Phase one will determine how well KPP has been implemented into the 5 participating DHBs while phase two will determine the outcome of KPP using a quasi-experimental approach.

As a part of the implementation evaluation the views of DHB staff are being elicited using a voluntary anonymous questionnaire (attached).

Participant Recruitment

There will be no payment for filling out the short questionnaire.

KPP project leaders are being asked to complete the short survey.

Project Procedures

The survey data will be analysed and comparisons made between the participating DHBs.

If you require a summary of findings or to read to the final research report please contact Barry Welsh, (contact details below).

The questionnaires are not individually identified; returning the questionnaire implies consent.

Research results will be used for Journal publications and presentations.

Participant involvement

Can you please fill out the enclosed questionnaire (which will take about 10 minutes of your time) and return to return in the addressed postage paid envelope.

Participant's Rights

You have the right to:

 ask any questions about the study at any time during participation;

decline to answer any particular question;

decline to participate;

completion and return of questionnaire implies consent;

be given access to a summary of the project findings and the full report when the research   is   concluded

please contact Barry Welsh (contact details below) if you require a summary of the project findings or access to the full report.

Support Processes

If you have any concerns please contact Barry Welsh.

Project Contacts

If you have any questions please contact Barry Welsh 03 384 1143 or Ralph Stablein 06 350 5799 ext 2795

Ethics Committee Approval Statement

This project has been reviewed and approved by the Massey University Human Ethics Committee, PN Protocol 03/119. If you have any concerns about the conduct of this research, please contact Professor Sylvia V Rumball, Chair, Massey University Campus Human Ethics Committee: Palmerston North, telephone 06 350 5249, email S.V.Rumball@massey.ac.nz.

Thank you for your time.

Barry Welsh, 139A Moncks Spur, Redcliffs, Christchurch. PH 03 384 1143

Appendix Three: Stakeholder Implementation Questionnaire

Please read the information sheet attached to this survey.

I would appreciate you filling out this short, anonymous, voluntary questionnaire. Return of the survey implies consent to use the survey information as part of the evaluation of KPP.

Your position title (optional) _____

1) Have you had any involvement in the development and implementation of KPP (e.g. being interviewed, attending meetings etc)?

    Yes   No   (please circle your response)

2) Have you seen the KPP plan?

    Yes   No   (please circle your response)

3) Do you think the KPP approach has the potential to improve services for long-term clients of mental health services?

    Yes   No (if No please move to question 5) (please circle your response)

4) What do you believe are the benefits of the KPP approach? (Please write comments below)

5) What are the limitations of the KPP approach? (Please write comments below)
    .

6) How could the implementation of KPP be improved? (Please write comments below)

    7) Any other comments? (Please write below)

    Thank you for your time please return your response in the prepaid envelope to:

Barry Welsh
139 A Moncks Spur Road
Redcliffs
Christchurch

Appendix four: Ethics Approval

Committee Approval Statement

This project has been reviewed and approved by the Massey University Human Ethics Committee, PN Protocol 03/119. If you have any concerns about the conduct of this research, please contact Professor Sylvia V Rumball, Chair, Massey University Campus Human Ethics Committee: Palmerston North, telephone 06 350 5249, email S.V.Rumball@massey.ac.nz.

Appendix Five: Six DHB adult ar cycle results used in the regression analysis

DHB	Year	Cycle	KPP #	Funding $/hd	Percentage of patients with a -				Acute bed days*	FTE %
					treatment plan	relapse plan	rehabilitation	GP		
SouthCant	2003	1	113	136	100	74	7	77	63	8
SouthCant	2004	2	92	201	100	100	9	89	45	20
SouthCant	2005	3	87	156	100	100	9	98	50	17
WestCo	2004	1	189	309	43	30	10	54	152	13
WestCo	2005	2	138	399	86	82	7	76	90	17
HawkB	2004	1	82	121	34	90	6	100	139	6
HawkB	2005	2	159	215	89	84	10	100	129	10
HawkB	2006	3	199	229	91	89	9	100	140	16
Southla	2004	1	221	206	21	78	16	92	210	21
Tairaw	2003	1	138	191	73	81	9	91	106	19
Otago	2005	1	763	293	27	60	13	80	121	17

Appendix Six: Statistical Analysis

Poisson Regression

Poisson Regression 2 ACUT2 = ACUT*KFWT/100

Original model.

```
. poisson acut2 tmnt rprv hous gppt fund empl, exposure(kfwt)

Iteration 0:   log likelihood = -105.31838
Iteration 1:   log likelihood = -100.64519
Iteration 2:   log likelihood = -100.63093
Iteration 3:   log likelihood = -100.63093

Poisson regression                              Number of obs   =         11
                                                LR chi2(6)      =     173.33
                                                Prob > chi2     =     0.0000
Log likelihood = -100.63093                     Pseudo R2       =     0.4627

------------------------------------------------------------------------------
      acut2 |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
------------+-----------------------------------------------------------------
       tmnt | -.3443114   .1274635    -2.70   0.007    -.5941351   -.0944876
       rprv | -2.935076    .495565    -5.92   0.000    -3.906366   -1.963787
       hous | -2.963495   2.080644    -1.42   0.154    -7.041482    1.114492
       gppt |  2.801975   .5137593     5.45   0.000     1.795025    3.808924
       fund | -.0026277   .0006338    -4.15   0.000    -.0038698   -.0013855
       empl |  2.898573   1.099196     2.64   0.008     .7441889    5.052957
      _cons |  .7030491   .4285089     1.64   0.101    -.1368129    1.542911
       kfwt | (exposure)
------------------------------------------------------------------------------

------. vce,corr

           | acut2:
           |    tmnt      rprv      hous      gppt      fund      empl     _cons
-----------+-------------------------------------------------------------------
acut2      |
      tmnt |  1.0000
      rprv | -0.1173    1.0000
      hous |  0.5607    0.6092    1.0000
      gppt |  0.0856   -0.8392   -0.4599    1.0000
      fund |  0.1847    0.5596    0.5668   -0.1162    1.0000
      empl | -0.2208   -0.6780   -0.8309    0.4742   -0.5737    1.0000
     _cons | -0.4352   -0.2319   -0.5570   -0.2392   -0.8549    0.3875    1.0000
```

```
 poisson acut2 tmnt gppt fund empl, exposure(kfwt)

Iteration 0:   log likelihood = -124.48658
Iteration 1:   log likelihood = -123.25125
Iteration 2:   log likelihood = -123.25032
Iteration 3:   log likelihood = -123.25032

Poisson regression                              Number of obs   =         11
                                                LR chi2(4)      =     128.09
                                                Prob > chi2     =     0.0000
Log likelihood = -123.25032                     Pseudo R2       =     0.3420

------------------------------------------------------------------------------
      acut2 |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       tmnt | -.7472071    .0713914   -10.47   0.000    -.8871318   -.6072825
       gppt |  .1304986    .2773812     0.47   0.638    -.4131585    .6741557
       fund | -.0011316    .0004729    -2.39   0.017    -.0020584   -.0002048
       empl |  .0580104    .5306093     0.11   0.913    -.9819647    1.097986
      _cons |  .7971346    .3458163     2.31   0.021      .119347    1.474922
       kfwt | (exposure)
------------------------------------------------------------------------------

------------------------------------------------------------------------------
. vce,corr

             | acut2:
             |    tmnt     gppt     fund     empl    _cons
-------------+------------------------------------------------
acut2        |
       tmnt |   1.0000
       gppt |  -0.1705   1.0000
       fund |   0.0320   0.7952   1.0000
       empl |   0.3301  -0.1916  -0.1346   1.0000
      _cons |  -0.0787  -0.9183  -0.8925  -0.0985   1.0000


. poisson acut2 tmnt, exposure(kfwt)

Iteration 0:   log likelihood = -134.37476
Iteration 1:   log likelihood = -133.89114
Iteration 2:   log likelihood = -133.89103
Iteration 3:   log likelihood = -133.89103

Poisson regression                              Number of obs   =         11
                                                LR chi2(1)      =     106.81
                                                Prob > chi2     =     0.0000
Log likelihood = -133.89103                     Pseudo R2       =     0.2851

------------------------------------------------------------------------------
      acut2 |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       tmnt |  -.657853     .064975   -10.12   0.000    -.7852017   -.5305044
      _cons |  .5517238     .037038    14.90   0.000     .4791306     .624317
       kfwt | (exposure)
------------------------------------------------------------------------------

------------------------------------------------------------------------------
. vce,corr

             | acut2:
             |    tmnt    _cons
-------------+-----------------
acut2        |
       tmnt |   1.0000
      _cons |  -0.8541   1.0000
```

182

```
. poisson acut2 rprv, exposure(kfwt)

Iteration 0:   log likelihood = -175.34687
Iteration 1:   log likelihood = -175.33823
Iteration 2:   log likelihood = -175.33823

Poisson regression                              Number of obs   =         11
                                                LR chi2(1)      =      23.92
                                                Prob > chi2     =     0.0000
Log likelihood = -175.33823                     Pseudo R2       =     0.0638

------------------------------------------------------------------------------
       acut2 |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        rprv |  -.5075893   .1028474    -4.94   0.000    -.7091665   -.3060122
       _cons |   .5700686    .074272     7.68   0.000     .4244981    .7156391
        kfwt | (exposure)
------------------------------------------------------------------------------


. vce,corr

             | acut2:
             |    rprv     _cons
-------------+------------------
acut2        |
        rprv |  1.0000
       _cons | -0.9658    1.0000



 poisson acut2 hous, exposure(kfwt)

Iteration 0:   log likelihood = -133.29371
Iteration 1:   log likelihood = -133.18482
Iteration 2:   log likelihood = -133.18482

Poisson regression                              Number of obs   =         11
                                                LR chi2(1)      =     108.22
                                                Prob > chi2     =     0.0000
Log likelihood = -133.18482                     Pseudo R2       =     0.2889

------------------------------------------------------------------------------
       acut2 |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        hous |   7.135209    .685914    10.40   0.000     5.790842    8.479575
       _cons |  -.5879424   .0811128    -7.25   0.000    -.7469205   -.4289642
        kfwt | (exposure)
------------------------------------------------------------------------------


. vce,corr

             | acut2:
             |    hous     _cons
-------------+------------------
acut2        |
        hous |  1.0000
       _cons | -0.9714    1.0000



 poisson acut2 gppt, exposure(kfwt)

Iteration 0:   log likelihood = -187.22179
Iteration 1:   log likelihood = -187.22134
Iteration 2:   log likelihood = -187.22134

Poisson regression                              Number of obs   =         11
```

```
                                                         LR chi2(1)      =         0.15
                                                         Prob > chi2     =      0.6985
Log likelihood = -187.22134                              Pseudo R2       =      0.0004

------------------------------------------------------------------------------
      acut2 |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       gppt |   .0590774   .1526669     0.39   0.699    -.2401443    .3582991
      _cons |   .1617356   .1303993     1.24   0.215    -.0938424    .4173136
       kfwt |  (exposure)
------------------------------------------------------------------------------


. vce,corr

             | acut2:
             |    gppt     _cons
-------------+-----------------
acut2        |
        gppt |   1.0000
       _cons |  -0.9890    1.0000

.
. poisson acut2 fund, exposure(kfwt)

Iteration 0:   log likelihood = -186.76744
Iteration 1:   log likelihood = -186.76394
Iteration 2:   log likelihood = -186.76394

Poisson regression                           Number of obs   =         11
                                             LR chi2(1)      =       1.06
                                             Prob > chi2     =     0.3021
Log likelihood = -186.76394                  Pseudo R2       =     0.0028

------------------------------------------------------------------------------
      acut2 |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       fund |  -.0002762   .0002677    -1.03   0.302    -.0008009    .0002486
      _cons |   .2893126   .0775592     3.73   0.000     .1372994    .4413259
       kfwt |  (exposure)
------------------------------------------------------------------------------


------------------------------------------------------------------------------
      acut2 |        IRR   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       fund |   .9997239   .0002677    -1.03   0.302     .9991994    1.000249
       kfwt |  (exposure)
------------------------------------------------------------------------------

. vce,corr

             | acut2:
             |    fund     _cons
-------------+-----------------
acut2        |
        fund |   1.0000
       _cons |  -0.9687    1.0000

.
. poisson acut2 empl, exposure(kfwt)

Iteration 0:   log likelihood = -181.31327
Iteration 1:   log likelihood = -181.31327

Poisson regression                           Number of obs   =         11
                                             LR chi2(1)      =      11.97
                                             Prob > chi2     =     0.0005
Log likelihood = -181.31327                  Pseudo R2       =     0.0319

------------------------------------------------------------------------------
      acut2 |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
```

```
-------------+----------------------------------------------------------------
        empl |   1.780203     .52082      3.42   0.001     .7594141    2.800991
       _cons |  -.0724707    .0859486    -0.84   0.399    -.2409268    .0959854
        kfwt |  (exposure)
------------------------------------------------------------------------------


------------------------------------------------------------------------------
       acut2 |       IRR   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        empl |   5.931058    3.089014     3.42   0.001     2.137024    16.46095
        kfwt |  (exposure)
------------------------------------------------------------------------------

. vce,corr

             | acut2:
             |     empl      _cons
-------------+-----------------
acut2        |
        empl |   1.0000
       _cons |  -0.9746    1.0000


. poisson acut2 tmnt rprv, exposure(kfwt)

Iteration 0:   log likelihood = -133.37659
Iteration 1:   log likelihood = -132.87526
Iteration 2:   log likelihood = -132.87513
Iteration 3:   log likelihood = -132.87513

Poisson regression                              Number of obs   =          11
                                                LR chi2(2)      =      108.84
                                                Prob > chi2     =      0.0000
Log likelihood = -132.87513                     Pseudo R2       =      0.2906

------------------------------------------------------------------------------
       acut2 |     Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        tmnt |  -.7209035    .0784383    -9.19   0.000    -.8746398   -.5671673
        rprv |   .187939    .1324743     1.42   0.156    -.0717058    .4475838
       _cons |   .451721    .0799017     5.65   0.000     .2951167    .6083254
        kfwt |  (exposure)
------------------------------------------------------------------------------


------------------------------------------------------------------------------
       acut2 |       IRR   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        tmnt |   .4863127    .0381455    -9.19   0.000     .4170122    .5671297
        rprv |   1.20676    .1598646     1.42   0.156     .9308047    1.564527
        kfwt |  (exposure)
------------------------------------------------------------------------------

. vce,corr

             | acut2:
             |     tmnt      rprv      _cons
-------------+---------------------------
acut2        |
        tmnt |   1.0000
        rprv |  -0.5642    1.0000
       _cons |   0.1745   -0.8867    1.0000
```

```
.
. poisson acut2 tmnt hous, exposure(kfwt)

Iteration 0:   log likelihood =   -128.545
Iteration 1:   log likelihood = -127.14873
Iteration 2:   log likelihood = -127.14783
Iteration 3:   log likelihood = -127.14783

Poisson regression                              Number of obs   =         11
                                                LR chi2(2)      =     120.30
                                                Prob > chi2     =     0.0000
Log likelihood = -127.14783                     Pseudo R2       =     0.3211

------------------------------------------------------------------------------
      acut2 |     Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       tmnt | -.3646959   .1041849    -3.50   0.000    -.5688945   -.1604974
       hous |  4.005057   1.109939     3.61   0.000     1.829618    6.180497
      _cons | -.048574    .1713915    -0.28   0.777    -.3844951    .2873471
       kfwt | (exposure)
------------------------------------------------------------------------------


------------------------------------------------------------------------------
      acut2 |      IRR    Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       tmnt |  .6944078   .0723468    -3.50   0.000      .566151    .8517201
       hous |  54.87497   60.90785     3.61   0.000     6.231505     483.232
       kfwt | (exposure)
------------------------------------------------------------------------------

. vce,corr

             | acut2:
             |    tmnt     hous    _cons
-------------+--------------------------
acut2        |
       tmnt |   1.0000
       hous |   0.7866   1.0000
      _cons |  -0.8811  -0.9767   1.0000

.
. poisson acut2 tmnt gppt, exposure(kfwt)

Iteration 0:   log likelihood =  -126.6343
Iteration 1:   log likelihood = -126.11461
Iteration 2:   log likelihood = -126.11447
Iteration 3:   log likelihood = -126.11447

Poisson regression                              Number of obs   =         11
                                                LR chi2(2)      =     122.36
                                                Prob > chi2     =     0.0000
Log likelihood = -126.11447                     Pseudo R2       =     0.3267

------------------------------------------------------------------------------
      acut2 |     Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       tmnt | -.7391166     .06787   -10.89   0.000    -.8721394   -.6060938
       gppt |  .6562053   .1686585     3.89   0.000     .3256407    .9867698
      _cons |  .0398309   .1372616     0.29   0.772    -.2291968    .3088586
       kfwt | (exposure)
 vce,corr

             | acut2:
             |    tmnt     gppt    _cons
-------------+--------------------------
acut2        |
       tmnt |   1.0000
       gppt |  -0.3103   1.0000
      _cons |   0.0814  -0.9633   1.0000
```

```
.
. poisson acut2 tmnt fund, exposure(kfwt)

Iteration 0:   log likelihood = -124.06328
Iteration 1:   log likelihood = -123.38256
Iteration 2:   log likelihood = -123.38231
Iteration 3:   log likelihood = -123.38231

Poisson regression                              Number of obs   =         11
                                                LR chi2(2)      =     127.83
                                                Prob > chi2     =     0.0000
Log likelihood = -123.38231                     Pseudo R2       =     0.3412

------------------------------------------------------------------------------
      acut2 |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       tmnt | -.746027    .0669528   -11.14   0.000    -.8772521   -.6148018
       fund | -.0013106   .0002862    -4.58   0.000    -.0018715   -.0007497
      _cons |  .9663149   .0968751     9.97   0.000     .7764431    1.156187
       kfwt | (exposure)
------------------------------------------------------------------------------

vce,corr

             | acut2:
             |   tmnt     fund    _cons
-------------+--------------------------
acut2        |
       tmnt |  1.0000
       fund |  0.2870   1.0000
      _cons | -0.5744  -0.9255   1.0000

 poisson acut2 tmnt empl, exposure(kfwt)

Iteration 0:   log likelihood = -134.56616
Iteration 1:   log likelihood = -133.82306
Iteration 2:   log likelihood = -133.82281
Iteration 3:   log likelihood = -133.82281

Poisson regression                              Number of obs   =         11
                                                LR chi2(2)      =     106.95
                                                Prob > chi2     =     0.0000
Log likelihood = -133.82281                     Pseudo R2       =     0.2855

------------------------------------------------------------------------------
      acut2 |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       tmnt | -.650177    .0681756    -9.54   0.000    -.7837987   -.5165554
       empl |  .1995143   .5408528     0.37   0.712    -.8605378    1.259566
      _cons |  .5159245   .1039062     4.97   0.000     .3122721    .7195768
       kfwt | (exposure)
------------------------------------------------------------------------------

. vce,corr

             | acut2:
             |   tmnt     empl    _cons
-------------+--------------------------
acut2        |
       tmnt |  1.0000
       empl |  0.3043   1.0000
      _cons | -0.5742  -0.9344   1.0000

.
. poisson acut2 rprv hous, exposure(kfwt)

Iteration 0:   log likelihood = -131.70964
Iteration 1:   log likelihood =  -131.5253
Iteration 2:   log likelihood = -131.52528
Iteration 3:   log likelihood = -131.52528
```

```
Poisson regression                          Number of obs   =        11
                                            LR chi2(2)      =    111.54
                                            Prob > chi2     =    0.0000
Log likelihood = -131.52528                 Pseudo R2       =    0.2978

------------------------------------------------------------------------------
      acut2 |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       rprv | -.2074834   .1132665    -1.83   0.067    -.4294816    .0145148
       hous |  6.773468   .7182034     9.43   0.000     5.365815    8.181121
      _cons | -.401064    .130152     -3.08   0.002    -.6561572   -.1459709
       kfwt | (exposure)
------------------------------------------------------------------------------

. vce,corr

             | acut2:
             |    rprv      hous     _cons
-------------+--------------------------------
acut2        |
       rprv |   1.0000
       hous |   0.2702   1.0000
      _cons |  -0.7782  -0.7979   1.0000

.
. poisson acut2 rprv gppt, exposure(kfwt)

Iteration 0:   log likelihood = -122.40621
Iteration 1:   log likelihood = -122.39893
Iteration 2:   log likelihood = -122.39893

Poisson regression                          Number of obs   =        11
                                            LR chi2(2)      =    129.79
                                            Prob > chi2     =    0.0000
Log likelihood = -122.39893                 Pseudo R2       =    0.3465

------------------------------------------------------------------------------
      acut2 |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       rprv | -2.797249    .26504    -10.55   0.000    -3.316717    -2.27778
       gppt |  3.58406    .368097      9.74   0.000     2.862603    4.305517
      _cons | -.8410843   .162197     -5.19   0.000    -1.158985   -.5231839
       kfwt | (exposure)
------------------------------------------------------------------------------

 vce,corr

             | acut2:
             |    rprv      gppt     _cons
-------------+--------------------------------
acut2        |
       rprv |   1.0000
       gppt |  -0.9127   1.0000
      _cons |   0.6102  -0.8770   1.0000

. poisson acut2 rprv fund, exposure(kfwt)

Iteration 0:   log likelihood = -149.16422
Iteration 1:   log likelihood = -149.14257
Iteration 2:   log likelihood = -149.14257

Poisson regression                          Number of obs   =        11
                                            LR chi2(2)      =     76.31
                                            Prob > chi2     =    0.0000
Log likelihood = -149.14257                 Pseudo R2       =    0.2037

------------------------------------------------------------------------------
      acut2 |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       rprv |  -1.43586   .1703803    -8.43   0.000    -1.769799   -1.101921
```

```
       fund |  -.0031149   .0004441     -7.01   0.000    -.0039854   -.0022444
      _cons |   2.101284   .2317359      9.07   0.000      1.64709    2.555478
       kfwt |  (exposure)
------------------------------------------------------------------------------


------------------------------------------------------------------------------
      acut2 |        IRR   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       rprv |   .2379107   .0405353     -8.43   0.000     .1703672    .3322324
       fund |   .9968899   .0004427     -7.01   0.000     .9960226    .9977581
       kfwt |  (exposure)
------------------------------------------------------------------------------

. vce,corr
            | acut2:
            |     rprv      fund     _cons
-------------+---------------------------
acut2       |
       rprv |   1.0000
       fund |   0.7994    1.0000
      _cons |  -0.9427   -0.9477    1.0000
.
. poisson acut2 rprv empl, exposure(kfwt)

Iteration 0:   log likelihood = -167.39362
Iteration 1:   log likelihood = -167.38209
Iteration 2:   log likelihood = -167.38209

Poisson regression                              Number of obs   =          11
                                                LR chi2(2)      =       39.83
                                                Prob > chi2     =      0.0000
Log likelihood = -167.38209                     Pseudo R2       =      0.1063


------------------------------------------------------------------------------
      acut2 |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       rprv |  -.5578802   .1049551     -5.32   0.000    -.7635883   -.3521721
       empl |   2.125089   .5415984      3.92   0.000     1.063575    3.186602
      _cons |   .2663234   .1072203      2.48   0.013     .0561754    .4764714
       kfwt |  (exposure)
------------------------------------------------------------------------------

. vce,corr

            | acut2:
            |     rprv      empl     _cons
-------------+---------------------------
acut2       |
       rprv |   1.0000
       empl |  -0.1427    1.0000
      _cons |  -0.5668   -0.7149    1.0000
```

ANOVA

Weight: wt2p

Cost per Adult

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	3	821.742841	273.914280	3.98	0.0147
Error	38	2616.947570	68.867041		
Corrected Total	41	3438.690411			
Error	38	2364.754008	62.230369		
Corrected Total	41	2431.402895			

R-Square	Coeff Var	Root MSE	PCost Mean
0.238970	3.409359	8.298617	243.4069

Source	DF	Type I SS	Mean Square	F Value	Pr > F
Year	1	768.9636441	768.9636441	11.17	0.0019
KPP	1	28.4295911	28.4295911	0.41	0.5244
Year*KPP	1	24.3496058	24.3496058	0.35	0.5556
KPP	1	17.08704619	17.08704619	0.27	0.6033
Year*KPP	1	37.59497743	37.59497743	0.60	0.4418

Weight: wt1p
Cost per Client

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	3	901440.853	300480.284	3.35	0.0288
Error	38	3404883.109	89602.187		
Corrected Total	41	4306323.963			

R-Square	Coeff Var	Root MSE	PCIcost Mean
0.209330	3.375422	299.3362	8868.114
0.054482	3.288861	271.6272	8259.004

Source	DF	Type I SS	Mean Square	F Value	Pr > F
Year	1	749174.4607	749174.4607	8.36	0.0063
KPP	1	152038.1878	152038.1878	1.70	0.2005
Year*KPP	1	228.2050	228.2050	0.00	0.9600
KPP	1	161491.1559	161491.1559	2.19	0.1473
Year*KPP	1	20.3308	20.3308	0.00	0.9868

Weight: wt2p
% Access

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	3	0.03907962	0.01302654	0.82	0.4909
Error	38	0.60358262	0.01588375		
Corrected Total	41	0.64266224			

R-Square	Coeff Var	Root MSE	Pacc Mean
0.060809	4.669335	0.126031	2.699116

Source	DF	Type I SS	Mean Square	F Value	Pr > F
Year	1	0.00054456	0.00054456	0.03	0.8541
KPP	1	0.03127610	0.03127610	1.97	0.1687
Year*KPP	1	0.00725896	0.00725896	0.46	0.5031

Weight: wt1p
% Discharges per client

191

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	3	27.1372515	9.0457505	0.41	0.7458
Error	38	835.8514393	21.9960905		
Corrected Total	41	862.9886908			

R-Square	Coeff Var	Root MSE	Pdis Mean
0.031446	7.279820	4.689999	64.42465

Source	DF	Type I SS	Mean Square	F Value	Pr > F
Year	1	0.23531898	0.23531898	0.01	0.9182
KPP	1	24.78482492	24.78482492	1.13	0.2952
Year*KPP	1	2.11710760	2.11710760	0.10	0.7581

PHARMS: Cost per head population

Weight: WGT

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	5	14.20920531	2.84184106	26.52	<.0001
Error	57	6.10722333	0.10714427		
Corrected Total	62	20.31642864			

R-Square	Coeff Var	Root MSE	Pdrug Mean
0.699395	4.407822	0.327329	7.426093

Source	DF	Type I SS	Mean Square	F Value	Pr > F
year	2	14.13565936	7.06782968	65.97	<.0001
KPP	1	0.00281023	0.00281023	0.03	0.8719
year*KPP	2	0.07073572	0.03536786	0.33	0.7202