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COST containment strategies and their relationship to quality of care within the SOUTH AFRICAN private healthcare industry

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A research project submitted to the Gordon Institute of Business Science, University of Pretoria, in partial fulfilment of the requirements for the degree of Master of Business Administration.

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Abstract

The purpose of this research was to understand cost containment strategies used by private hospitals under managed care plans and their relationship to quality of care within the South African environment. The data was collected using a questionnaire consisting of closed questions requesting respondents to rate statements about costs and quality of care, as well as open questions for additional information about costs and quality of care. The study found that managed care has the ability to control costs and that hospitals monitor LOS and prescribe generic medication in order to control costs. The study also found that cost control strategies have a negative impact on quality of care and that hospitals place more emphasis on cost control than quality of care. In addition, large hospitals that enjoy high occupancy rates experienced an increase in patient complaints since the introduction of managed care, compared to small and medium hospitals. The study found that managed care has had a better than average impact on controlling costs and a better than average impact in quality reduction, however the correlation between cost control and quality reduction was negative. Finally, the study found that technology has an impact on rising healthcare costs and that any constraints placed on rising costs associated with technology will have a negative impact on quality of care.

Keywords

Cost containment
Cost drivers
Managed care
Quality of care

Declaration

I declare that this research project is my own work. It is submitted in partial fulfilment of the requirements for the degree of Master of Business Administration at the Gordon Institute of Business Science, University of Pretoria. It has not been submitted before for any degree or examination in any other University. I further declare that I have obtained the necessary authorisation and consent to carry out this research.

Modongwaze Dennis Marivate

Date

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This research is dedicated to my late daughter Makhanani Elisabeth Marivate (named after my wonderful mother), who would have been celebrating her 10^{1h} birthday in 2010. I still miss you my little girl.

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Chapter 1

1.1. Introduction

Two of the major concerns in the healthcare industry are cost containment and quality of care (Mohaghegh, 2007). High costs of care result from prolonged hospitalisation, brief hospitalisation with intensive use of resources, or repeated hospitalisation for the same condition (Bodenheimer & Fernandez, 2005). According to Mohaghegh (2007), healthcare providers have strived to strike a balance between cost containment and quality of care with very little success.

Managed care was introduced in the USA in order to control rising healthcare costs (Mohaghegh, 2007) and South Africa followed international trends in the early 1990's. Significant amount of research indicates that managed care does have the ability to slow down costs (Konetzka, Zhu, Sochalski and Volpp 2008). One of the concerns about managed care in the last decade has focused on whether quality of care and access to care suffered due to cost cutting efforts (Konetzka *et al* 2008). In its 2008 private hospital review (Hospital Association of South Africa (HASA), 2008), concludes that the private hospitals sector supports alternative reimbursement models (ARM) on the principle that they are transparent, fair, cost effective and align incentives between hospitals and funders. However, the report also indicated, "balancing these principles with the realities of providing quality healthcare is sometimes difficult…" (Hospital Association of South Africa (HASA), 2008, pg36).

1.2. Research Problem

A great amount of literature exists on the subject of cost containment and quality of care in managed care environment. There is however, no conclusive evidence on how quality of care is affected by cost containment strategies (Mohaghegh, 2007). Consumers desire and expect the best possible quality of care, but it is still questionable whether or not this is likely with the financial pressures put on healthcare providers (Mohaghegh, 2007). Moreover, no empirical or scientific study could be found in South Africa on whether or not managed care is able to contain hospital costs and the impact of cost containment strategies on quality of care. The problem is whether managed care is able to contain costs given rising healthcare expenditures, and whether in an attempt to control healthcare costs and remain profitable, healthcare providers sacrifice quality of care. Managed care has changed the face of private healthcare in South Africa, but so little is known about its impact on cost and quality of care.

1.3. Research Aim

The aim of the research is to understand the cost containment strategies used by private healthcare providers (hospitals and clinics) under managed care plans and the impact of these strategies on the quality of healthcare provided. The study will examine the extent to which managed care improves the cost of providing patient care (through cost containment strategies) by compromising quality.

1.4. Research Motivation

According to Mays, Claxton, & White (2004) large increases in healthcare costs have created pressures on health plans and employers to reconsider cost containment strategies. Although adequate research on the topic of cost containment and quality of care has been conducted, there is still no conclusive evidence on how quality of care is affected by cost containment strategies (Mohaghegh, 2007). The literature reviewed indicates mixed results (Chang & Hung, 2008; Cutler, McClellan, & Newhouse, 2000; Miller & Luft, 1997; Mohaghegh, 2007; Raffoul, 2002) and in addition, most of these studies were conducted in the USA with very limited local studies, which mainly focused on quality of care.

Rising healthcare expenditures motivated the introduction of managed care initiatives in the US and other parts of the world, including South Africa. Under managed care, the individual components contributing to the total hospitalization fee, such as drugs, theatre time and overheads are managed in order to reduce cost of care to patients, while quality of care should be maintained. These factors are discussed in more detail below.

1.4.1. Rising healthcare spending

South African consumer expenditure on outpatient and hospital services was twenty eight billion rands while government expenditure was five billion rands in 1999 (table 1). The total consumer expenditure on healthcare and government

expenditure in 2009 increased by 287% and 282% respectively from their 1999 levels. The increase in total health expenditure per capita was 81% for the same period, thus outpacing the level of economic growth and inflation.

Table 1: South African Healthcare Expenditure and other Economic indicators (Source Euromonitor, 2010)

South Africa - Historic values at Current Prices		1999	2000	2006	2007	2008	2009
Categories	**Unit of Measure**						
Consumer Expenditure on Outpatient Services	R mn	25,170.7	29,025.2	66,125.0	76,684.3	88,264.7	93,165.2
Consumer Expenditure on Hospital Services	R mn	3,444.4	4,356.1	11,546.7	13,756.8	16,270.4	17,679.2
Real GDP Growth	% growth	2.4	4.2	5.6	5.5	3.7	(1.8)
Inflation	% growth	5.2	5.3	4.6	7.1	10.4	7.2
Government Expenditure on Health	R mn	5,211.0	5,858.8	13,214.5	15,724.5	18,087.1	19,886.7
Total Health Expenditure	US$ per capita	259.1	237.1	458.0	504.6	491.2	468.7
Public Health Expenditure	% of total health expenditure	41.1	42.4	41.9	42.0	42.3	42.5
Private Health Expenditure	% of total health expenditure	58.9	57.6	58.1	58.0	57.7	57.5
Share of Total Health Expenditure in GDP	% of total GDP	8.7	8.1	8.6	8.6	8.7	8.7

Sources:
1. Consumer Expenditure on Hospital Services: National statistical offices/OECD/Eurostat/Euromonitor International
2. Consumer Expenditure on Outpatient Services: National statistical offices/OECD/Eurostat/Euromonitor International
3. Government Expenditure on Health: Euromonitor International/International Monetary Fund (IMF), Government Finance Statistics/national statistics
4. Inflation: Euromonitor International from International Monetary Fund (IMF), International Financial Statistics and World Economic Outlook/UN/national statistics
5. Private Health Expenditure: Euromonitor from trade sources/national statistics
6. Public Health Expenditure: Euromonitor from trade sources/national statistics
7. Real GDP Growth: Euromonitor International from International Monetary Fund (IMF), International Financial Statistics and World Economic Outlook/UN/national statistics
8. Share of Total Health Expenditure in GDP: Euronmonitor from WHO
9. Total Health Expenditure: Euromonitor International from OECD/WHO/national statistics

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The rising healthcare expenditure is also confirmed by various stakeholders in the private healthcare sector, such as Discovery health, Medi-Clinic and Netcare (Discovery, 2009; Medi-Clinic, 2009; Netcare, 2009). The trend occurred during the period when managed care was growing in the private healthcare industry, which contributes about 57% of the total healthcare expenditures (table 1). Despite this increase, the South African healthcare system remains dominated by quality of care and accessibility issues, which led to the plan to introduce the National Health Insurance (Department of Health, 2010). In addition, there is a question of whether the private healthcare sector was able to contain costs, given this trend. It is

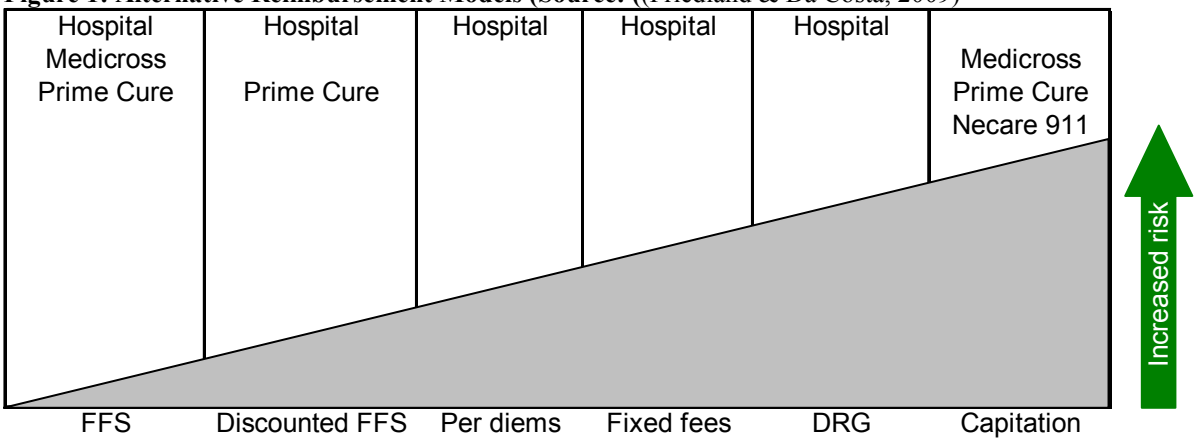
therefore the intention of this study to establish whether managed care had an impact on quality and cost of healthcare as discussed in the section that follows.

1.4.2. Changing environment

The trends in healthcare spending are forcing the private healthcare sector to move away from the traditional fee-for-service (FFS) arrangements to forms of managed care plans such as reimbursement for service on a fixed fee basis, per-diems and diagnostic related groupings (DRGs). Figure 1 highlights alternative reimbursement models as currently adopted by managed care organisations, such as Discovery health and Medscheme.

Figure 1 below indicates that as the method of reimbursement moves away from the traditional FFS to capitation, the risk also moves away from the medical funder and insurer such as Discovery Health, to the healthcare service provider (e.g. Hospital).

Figure 1: Alternative Reimbursement Models (Source: ((Friedland & Da Costa, 2009)



According to Netcare 2008 annual report (Netcare, 2008), almost 40% of their fees are charged on alternative reimbursement models (ARMs). Life healthcare and Medi-Clinic hospital groups also follow the alternative reimbursement models.

The ARM ultimately forces hospitals to control costs in order to remain competitive in the market. As the risk is being shifted away from the medical administrators and insurers to the hospitals, there is an additional risk that quality may be compromised in favour of cost containment. Traditionally under the FFS or pay-as-you-use basis, there was no incentive on the part of healthcare providers to manage or contain costs as under the ARM, the providers were reimbursed for all costs. As a result, these providers were encouraged to provide the best quality often accompanied by higher costs. The adoption of ARM under managed care plans require that healthcare providers assume greater risk in managing hospital utilisation and costs, thus effectively sharing the risk with medical funders. As a result of this environment, there is a question as to whether ARM under managed care actually result in cost containment (given rising healthcare expenditures) and if so whether quality is not sacrificed in the process.

As discussed above, shifting risk to providers is a strategy for cost control because money flowing into the health sector through FFS produces more medical care, perceived quality and higher provider income (Bodenheimer, 2005c; Simonet, 2005a). As a result, payments that place the providers at risk for increased costs may turn them from cost-increasing providers to cost-controlling providers (Bodenheimer, 2005c), often at the price of quality. Hospitals that receive a fixed

DRG payment earn more money by increasing admissions, but may lose money by increasing the LOS (Bodenheimer, 2005c). The question is therefore whether or not the shift of risk from the medical insurer to the provider from FFS to capitation has an impact on quality and whether this shift in risk forces providers to emphasise cost control over quality.

The literature review indicates that there are still mixed results on the impact of managed care plans on quality (Simonet, 2005a). According to Kaestner & Guardado (2008), limiting or reducing provider payments may alter treatment and as a result, may adversely affect health outcomes. A number of studies have shown that providers alter treatment practices in response to changes in reimbursement (Hemenway, Killen, Cashman, Parks, & Bicknell, 1990; Hillman et al., 1990; Kessler & McClellan, 1996; Rice, 1983; Santerre, 2002; Yip, 1998). However, other studies concluded that managed care in contrast to FFS does not negatively affect health outcomes even though there is evidence that managed care was effective at reducing payments to providers and reducing utilisation (Cutler et al., 2000; Glied, 2000; Polsky & Nicholson, 2004). Several studies were carried out to establish the impact of a change in Medicare reimbursement to Prospective Payment System (PPS) (DRG-based method) had any impact on cost and quality. Results from these studies are mixed, although it is clear that the change resulted in decrease in hospital LOS, and decreased nursing resources in the case of nursing homes (Cutler, 1995; Ellis & McGuire, 1996; Grabowski, 2001; Hodgkin, 1994; Konetzka, Yi, Norton, & Kilpatrick, 2004). One earlier study on the effect of PPS in patient health (quality) show no increase in hospital mortality,

however the results reported an increase in the number of patients discharged in unstable condition (Kosecoff et al., 1990).

In a recent study about the effect of reimbursement on medical decision-making (Melichar, 2009), it was found that that physicians spend less time with their capitated patients than with their non-capitated patients. Another study found that a change in the type of reimbursement did not have any meaningful effect on hospital use of resources (cost control) or patient outcomes (quality) (Kaestner & Guardado, 2008).

The above literature review leads to a few conclusions. There is no consensus on whether the type of reimbursement has any impact on quality of care. Secondly, the type of reimbursement or a reimbursement that shifts the risk to the provider may turn that provider to a cost-controlling provider, often at the price of quality. Thirdly, the type of reimbursement may not necessarily affect cost control or quality. This study will partly investigate whether a shift in the type of reimbursement from FFS to alternative reimbursement methods have any impact on quality.

1.5. Research scope

The scope of the research will be limited to private hospitals that operate under managed care. Hospitals that operate solely on a Fee-for-service basis will be excluded from the scope of the research. In addition, the study will focus on technology as the main cost driver for rising healthcare expenditure. Main forms of

cost containment strategies such as Utilisation Management, Disease and Case Management will form part of the scope of this study.

Chapter 2 Literature Review

2.1. Introduction

The literature that is reviewed under this section defines and describes many variables that have a bearing on healthcare cost and quality of care under managed care. The ability of managed care plans to contain costs is reviewed with specific reference to whether or not cost control has an influence over treatment and care decisions. This is followed by a literature review on the understanding of technology as the main cost driver as well as cost containment strategies that are used in practice. The link between cost control strategies and quality of care is established through a review of various behaviours affecting quality of care in relation to cost control measures.

2.2. Managed care

The rapid medical spending growth during the early 1990's as well as resulting pressure from employers and purchasers of medical services prompted health plans to adopt a more aggressive approach to cost containment which collectively became known as managed care (Mays et al., 2004). However, by 2000, because of growing consumer and provider dissatisfaction with managed care and tight labour markets, employers started adopting less restrictive insurance products and health plans to discontinue or scale back on their cost containment efforts (Mays et al., 2004). This suggests that private insurance markets may no longer provide sufficient pressure for healthcare cost containment and efficiency (Mays et al.,

2004). However, more recently because of large increases in health insurance premiums and the economic slowdown, employers and health insurers are reconsidering their approaches for managing care and containing costs (Mays et al., 2004).

2.2.1. Definition of Managed Care

The South African Medical Schemes Act defines managed health care as a clinical and financial risk assessment and management of healthcare (Republic of South Africa, 2004). The essence of this definition is that managed care facilitates the appropriateness and cost effectiveness of health services within constraints of what is affordable, using rule-based and clinical management-based programmes. A Managed Care Organisation (MCO) is defined as a person who is contracted with a medical scheme to provide a managed healthcare service (Republic of South Africa, 2004).

According to Glied (2000), the term “managed care” encompasses a diverse array of institutional arrangements, which combine various sets of mechanisms, namely, selection and organisation of providers, the choice of payment methods and the monitoring of service utilisation. In addition, managed care encompasses some of the traditional insurance mechanisms such as the insured being expected to pay a premium for cover, a set of covered benefits (such as inpatient hospitalisation) and a set of cost-sharing provisions that apply to these benefits (such as an out-of-pocket payment limit and limits on annual or lifetime payments) (Glied, 2000). These mechanisms are discussed in more detail below.

Managed care plans cover a broad range of benefits and offer more generous preventive services than the traditional health insurance plans (Glied, 2000). Proponents of managed care argue that if plans prevent disease, then overall healthcare costs will be reduced (Duston, 1978). However the other view is that few preventative health services associated with managed care are cost saving, as the investment value of such services is more limited because members frequently change plans before the payoffs can become evident (Doherty, 1979; Mohaghegh, 2007).

Managed care plans use cost sharing to control the use of services within their restricted network of providers (Glied, 2000). Empirical evidence and economic theory suggested that cost sharing could reduce the use of services in managed care costs (Cherkin, Grothaus, & Wagner, 1989; Ellis & McGuire, 1993; Rubin, Mendelson, & Rasell, 1995; Trivedi, Rakowski, & Ayanian, 2008). However, recent studies found that cost sharing may have adverse health consequences and may increase total spending on health care (Trivedi, Moloo, & Mor, 2010), while other studies show no impact or mixed results (Wharam et al., 2008). The other way that cost sharing is used, is a financial incentive to encourage members to use services provided by the plan's own network of providers (Glied, 2000). PPOs and POS plans offer members a choice of network services with low co-payments or out of network services with high co-payments (Glied, 2000). In addition, most plans have adopted some form of co-payments for routine, non-preventative visits to physicians (Glied, 2000). However, managed care relies less on cost sharing than

the traditional plans (Glied, 2000), hence provider selection and organisation becomes a critical mechanism for cost control.

Managed care and providers bear a higher share of financial risk because of the relative low use of cost-sharing (Glied, 2000). This risk gives plans or providers the incentive to encourage optimal use of services and to substitute less costly for more costly services (Glied, 2000). One of the ways of managing this risk is through the selection and organisation of providers, thus requiring or encouraging their members to use selected providers (Glied, 2000). This is often done through HMOs in which a group of physicians and sometimes hospitals contract exclusively with an organisation that takes on insurance risk. Examples of HMOs in the South African private healthcare industry include Medicross, Prime Cure and Netcare 911. Another form of organization is through contractual arrangements with independent providers, such as IPAs or through PPOs. In case of IPAs, insured people are restricted to a defined set of providers (Glied & Janus, 2008). The PPO is a health care network of providers that offers care to patients for a negotiated fee, which is typically discounted (Fang & Rizzo, 2010). In addition, plans may restrict access to pharmaceuticals by formularies, whereby the insurers cover the cost only if pharmaceuticals are selected from among those on a predetermined list (Glied, 2000). Some studies in the area of provider selection and organization suggest that managed care plans choose providers with low-cost practice styles (Robinson, 1993). Most of the South African private hospitals and hospital groups fall within the PPO forms of managed care and the largest private hospital groups are contracted with most managed care organisations. In addition, low cover plans

such as Discovery Key Care tend to monitor hospital costs on a regular basis and consequently they choose low cost providers.

Managed care plans use a wide range of methods to pay physicians and hospitals (Glied, 2000). Different methods are FFS, discounted FFS, Per diems, Fixed Fees, DRGs and capitation (Glied & Janus, 2008). With FFS, the provider bill the insurer for accommodation, drugs, surgicals, theatre time and other costs associated with taking care of the patient. The FFS does not incentivise the management of level of care, drugs, surgicals or length of stay. As a result, FFS is seen to be costly as hospitals maximize their revenue by maximizing the service they provide. Managed care was therefore developed in order to encourage healthcare cost control.

Per diem is a negotiated single charge for a day in the hospital regardless of any actual charges or costs incurred by the hospital (Kongstvedt, 2007). This means that the insurer will only pay a single fixed fee per night that the insured is admitted in hospital. Days are also authorised through case management between the insurer and the hospital. The hospital is therefore incentivised to manage costs in order to be profitable.

Fixed Fee is a method of reimbursement in which hospitals are paid a fixed fee for a procedure, which is identified by a CPT procedure code, or combined codes. Certain exclusions are built into the model in order to act as safety measures. With this method, hospitals carry more risk than with Per Diems, with the main areas of risk for the hospital including utilisation of drugs and surgicals, length of stay, level of care and theatre utilisation.

Diagnosis-Related Groups (DRGs) is a statistical system of classifying any inpatient stay into groups for purposes of payment (Kongstvedt, 2007) and it is used to manage the case mix. A fixed fee is paid according to the group to which the patient is assigned. The risk is moved over to the hospital and therefore the management of cases prior to admission and throughout hospital stay by the hospital is critical. Accordingly, this method of reimbursement makes the hospital an active partner in controlling utilization and managing plan expenses (Kongstvedt, 2007).

Capitation is another form of reimbursement whereby the service provider carries all the risk. With capitation, the insurer reimburses the hospital on a per member per month basis to cover institutional costs for a defined population of members (Kongstvedt, 2007). Under capitation, providers can earn more if they enrol more patients, as long as the capitation fee exceeds expected costs (Glied & Janus, 2008). According to Kongstvedt (2007), the use of capitation is generally restricted to HMOs. This form of reimbursement is currently not adopted by the majority of private hospitals in South Africa, due to its relatively high risk.

Each one of these mechanisms comes with different incentives for cost control and distribution of financial risk from the insurer to the service provider as the method of reimbursement moves from FFS to capitation. As already discussed, FFS is no longer a preferred method of reimbursement as hospitals and physicians collect more revenue the more the service is provided and this can generate excessive service utilisation.

Managed care plans monitor service utilisation by placing limits on which service providers an enrolee may see as well as by placing limits on what those providers can do (Glied, 2000; Glied & Janus, 2008). Integrated plans such as IPAs and HMOs limit members choices by restricting reimbursement to the services of those providers who belong or contract with the plan (Glied, 2000), which means they will only be reimbursed by the provider if they are part of their selected network. The choice may also be restricted through the use of gatekeeper arrangements in which members are required to obtain referral from a specified primary care physician (such as those in Netcare's prime cure) before consulting a specialist (Glied, 2000; Glied & Janus, 2008).

Managed care plans also monitor utilisation directly and this is most common for high cost services such as hospitalisations and surgical procedures (Glied, 2000). Most plans require pre-admission authorisation for hospitalisation and surgical procedures and the number of days that the patient can stay in hospital is directly limited. Most studies found that utilisation review reduces LOS and therefore costs (Lindrooth, Norton, & Dickey, 2002; Wickizer, Wheeler, & Feldstein, 1989).

Managed care plans also use case management, especially for high-cost services, to ensure that medical care is delivered to patients in the least costly way (Glied & Janus, 2008).

The above arguments are best summarized by De Hert (2009) who defines the concept of managed care as being a set of activities that health care plans can

undertake to mitigate the propensity for the provision of increasingly expensive services fostered by unmonitored and heavily insured fee-for-service medicine. Guo (2008) agreed by describing managed care as an organised effort by health insurance plans and providers to use financial incentives and organisational arrangements to alter provider and patient behaviour so that services are delivered in a more efficient and cost-effective manner.

The above definitions are meant to create a platform for a better understanding of operating characteristics of managed care. Accordingly, these all suggest that managed care is a tool with which to provide healthcare in a cost efficient manner, in response to rising healthcare expenditures. All these arrangements and mechanisms from provider selection and organisation, methods of payment to healthcare providers, limits on benefits, cost sharing and the monitoring of utilisation of healthcare resources, are aimed at encouraging providers, including hospitals to control healthcare costs. Similarly, hospitals are left with no option but to manage healthcare costs, in order to remain competitive and for their long-term profitability.

2.2.2. Forms of Managed Care Organisations

According to Mas & Seinfeld (2008), different forms of managed care organisations include Health Maintenance Organisations (HMOs) being the most restrictive ones, followed by Independent Practice Associations (IPAs), Point of Service (POS) and Preferred Provider Organisations (PPOs). In the HMOs, insurance and provision of healthcare are fully integrated, doctors are paid a salary, and members

are allowed to visit the network providers (Mas & Seinfeld, 2008). In the IPA, the insured are restricted to a panel of doctors who are independent contractors to the HMO that are contracted with the IPA to provide care (Mas & Seinfeld, 2008). The POS is a mix between traditional insurance and HMO in that the insured may use a doctor that belongs to the HMO without paying a co-payment, and that a low cover is faced if the insured consult a doctor outside the network (Mas & Seinfeld, 2008). PPOs provide greater flexibility for patients to choose non-participating providers for covered services (Guo, 2008). Accordingly, with PPOs, the insured pays very little when they use a physician from the network but much more when they use other physicians (Mas & Seinfeld, 2008). The differentiating factor between POS and IPA is that the insured in a POS can consult with a doctor in the network, without a referral from the primary care physician, which is a requirement in terms of POS (Mas & Seinfeld, 2008).

These forms of MCOs are also prevalent in the South African private healthcare sector, with HMO mainly practiced by primary care settings such as Medicross and Prime Cure, as well as Netcare 911 who are reimbursed on a capitated basis. The IPA and POS are also practiced, with several private hospitals following the PPO form through agreements with medical schemes. The understanding of these forms is important as methods of contracting, reimbursements are different, and depending on the setting, the impact on quality may be different as will be discussed later.

2.2.3. History and Origin of Managed Care

The first health insurance programs appeared in the 1930s and offered care to a predefined population in exchange for a fixed sum paid in advance by the insured (similar to what is today called capitation) (Simonet, 2005a). Increasing health costs resulted in the US government recognising HMOs, the first form of managed care, by passing the HMO Act in 1973 (Simonet, 2005a). The HMO Act allowed HMOs to receive subsidies and request major employers to offer their employees HMO coverage in addition to traditional assurance (Simonet, 2005a). HMOs grew during the 1970s and 1980s and they moved towards greater flexibility, differentiating their services according to needs and financial means of their clients (Simonet, 2005a). IPAs or Network model HMOs appeared later, offering physicians the possibility of joining a practitioner network, while also having the flexibility of looking after their traditional FFS regime (Simonet, 2005a). The PPOs were developed in the early 1980s with the aim of paying practitioners and hospitals at preferential rates, thus allowing patients to consult a health care professional outside the HMO network (Simonet, 2005a).

The rapid growth of managed care, its effects on provider incomes and restrictions placed on members generated a legal backlash against managed care (Glied & Janus, 2008). In one study cited by Miller (2006) regarding the reasons for the backlash, it was found that 30% of MCO members trust their health plan to provide the right level of care, as opposed to 55% of people in traditional plans. In addition, 61% of MCO members believed their health plan were more concerned with saving

money than with giving patients the best treatment, as compared with 34% of people in traditional plans (Miller, 2006) . The backlash resulted in managed care plans moving to offer consumers greater flexibility and choice through less restrictive managed care products, and providers more autonomy and control (Debra, Robert, Cara, & Bradley, 2002). According to Debra et al. (2002), as plans move to less restrictive manage care products, they lose their ability to control costs. New types of plans that have recently been introduced in the market are centred on consumer directed healthcare that involves greater cost sharing by consumers with more access to cost and quality data, with the aim of making consumers more active in managing their own health and healthcare resources (Kongstvedt, 2007). The question arises as to whether these new forms of managed care will result in reduction in healthcare spending, given the fact that the consumers now has some degree of control as discussed above.

2.2.4. Ability of MCOs in controlling costs

MCOs were developed to provide health care to groups of individuals and consist of practices to control and maintain costs (Mohaghegh, 2007). According to Mohaghegh (2007), although MCOs have become popular, their long-term ability to control costs is uncertain. MCOs have been scrutinised because they place restrictions on consumers in choosing physicians and hospitals as well as the ability of physicians to provide quality of care under managed care (Mohaghegh, 2007). These organisations have also been scrutinised for providing incentives to physicians in order to control costs by keeping utilisation low, tightly controlling

frequency of patient visits and number of medical tests required (Mohaghegh, 2007).

In the South African context, the incentive to contain costs is a function of reimbursement in that depending on the form of ARM in place, the service provider will only be reimbursed according to the method, irrespective of cost and the level of care. This in turn may incentivise medical providers to keep utilisation low and tightly reduce the number of tests required. Hospital managers may also participate in some form of profit sharing mechanisms and accordingly, medical scheme rules will play an important role in treatment and care decisions. This is also confirmed through the results of a survey that was carried out by Mohaghegh (2007) in which respondents indicated that clinical/health factors and health care plan restrictions/rules have a better than average influence over treatment and care decisions (Mohaghegh, 2007).

The ability of MCOs to contain costs is also affected by the fact that consumers tend to change plans at least annually when this opportunity become opened by medical schemes. There is therefore no long-term commitment to one specific MCO and as a result, this affects the costs associated with preventive care (Mohaghegh, 2007). The MCO will pay costs for preventive screening if it expects the costs to decline due to this level of care, however, if consumers continue to change plans, these costs may not be recovered and in turn may affect quality of care (Mohaghegh, 2007).

In a recent survey that was conducted for California hospitals (Konetzka, Zhu, Sochalski, & Volpp, 2008), it was found that managed care appeared to have lost its ability to significantly reduce the rate of increase in hospital costs. Another study that was conducted by Mohaghegh (2007) reached a different conclusion when respondents indicated that managed care organisations have an average ability to contain costs.

2.3. Cost containment strategies

Managed care uses different combinations of mechanisms to control costs, referred to as cost containment strategies. According to Mohaghegh (2007), the three most popular cost containment strategies that are practiced by MCOs are Utilisation Management (UM), Disease and Case Management as well as financial incentives given to physicians. These strategies have been used by MCOs for many years in an effort to control costs, and as already discussed; there is still no conclusive evidence that they are effective in reducing costs. Moreover, efforts by MCOs to control cost through these strategies may have a negative impact on quality as discussed in detail below.

2.3.1. Utilisation Management

Utilisation Management (UM) represents a broad array of techniques designed to influence the consumption of healthcare services, with the objective of promoting cost containment (Wickizer & Lessler, 2002). Under UM, each case is reviewed to determine the most appropriate level of services and the settings in which they

should be delivered; most cost-efficient methods for care delivery; as well as the need to plan subsequent care (Mohaghegh, 2007). Patients who are already admitted in hospitals are also monitored in the form of decisions by MCOs about the patient LOS as well as discharge procedures. The question that arises with UM as a cost control strategy is whether necessary procedures are being avoided (Mohaghegh, 2007). In a study conducted by Mays et al. (2004), it was noted that requests that are not medically necessary are often discouraged because of the authorisation requirement.

Another study on UM focused on shorter LOS and found that, although UM has become a key cost strategy, there is little understanding of its effects on patterns of care as the LOS often associated with UM is restricted, thus increasing the risk of readmission for medical and mental health patients (Mohaghegh, 2007). Mohaghegh (2007) concluded that data relating to the relationship among LOS, readmission and quality of care are contradictory. Another study that focused on the utilization of health care services found that LOS was similar across managed care and fee-for-service enrolees (Xu & Jensen, 2005). The question is whether given these mixed results, this strategy is still able to control cost and if so, whether quality is not sacrificed through shorter LOS or avoidance of necessary procedures.

2.3.2. Disease and Case Management

Disease and Case Management as a cost containment strategy is used to improve care and reduce costs for patients with chronic illnesses (Mohaghegh, 2007). Case

Managers are assigned to these patients in order to determine the level of proper care required while controlling costs of treatment. One community tacking study found that there was little evidence of any cost saving, although the cost savings may increase if the programmes are allowed to run over a long term (Mays et al., 2004).

Another strategy used by MCO is programmes designed to provide incentives to physicians based on quality and efficiency of care. Physicians are encouraged to prescribe generic medicines that have lower costs and in return, these physicians are offered a portion of the money that is saved by not using brand names (Mohaghegh, 2007). Although the monetary incentives are not practiced in South Africa, there is an indirect incentive in the form of profit that is made when cost of care is less than reimbursements from the medical schemes. There is therefore an incentive to use generic medicines.

2.4. Cost drivers

A number of explanations for the rising healthcare expenditures have been cited in the health economics literature. Primary explanations include cost drivers such as ageing population, lack of competition in healthcare, low patient cost sharing, technology, and use of defensive medicine (Bodenheimer, 2005a; Bodenheimer, 2005b; Bodenheimer, 2005c; Civan & Köksal, 2010).

Ageing population contribute towards rising healthcare expenditure, however, research consistently showed that this trend explains only 6% to 7% of health

expenditure growth (Reinhardt, 2003). According to Bodenheimer (2005a), lack of competition in the healthcare sector is due to the absence of a free market. Patients do not purchase physicians and hospital services in a free market because they cannot compare cost of medical services as different health conditions lead to widely differing costs (Bodenheimer, 2005a). In addition, a free market will require that the insured choose a service provider of their choice among a number of competitive providers. This may not be possible under managed care as most hospitals have been consolidated into larger groups (e.g. Netcare, Medi-Clinic, and Life healthcare) and managed care enrolees are given very limited choice through provider selection and organisation strategies as discussed earlier.

Low patient cost sharing refers to the fact that consumers are not responsible for a great share of their health care costs (Bodenheimer, 2005a). A number of studies confirmed that patient cost sharing can reduce the use of services in managed care and therefore reduce costs (Cherkin et al., 1989; Ellis & McGuire, 1993; Rubin et al., 1995; Trivedi et al., 2008). A study cited by Bodenheimer (2005a) found that patients receiving free care utilised more services and higher expenditures than cost-sharing patients who are expected to pay co-payments for hospitalisations and surgical procedures.

Bodenheimer (2005b) concludes that most, if not all, economists and policy analysts believe that technological advance is the main driver of growing healthcare expenditure, and other scholars share the same view (Baker, Birnbaum, Geppert, Mishol, & Moyneur, 2003; Civan & Köksal, 2010; Cutler & McClellan,

2001; De Hert, 2009; Esposto, 2008; Mas & Seinfeld, 2008). This study will mainly focus on technology because healthcare providers such as hospitals have some control over the decisions to adopt or not to adopt new medical technology, as well as the fact that technology contributes a significant portion of rising healthcare costs.

2.4.1. Technology as a key cost driver

Slade & Anderson (2001) noted that there is nearly a consensus among health economists that a substantial portion of the increase in healthcare spending is due to the diffusion of new medical technologies. Other cost drivers can explain approximately half of the rise in the health expenditures and the rest of the increase relate to technological improvement in health services (Civan & Köksal, 2010). New technology is defined as new knowledge regarding the delivery of care; this idea includes new equipment, pharmaceuticals, and procedures, as well as using existing services in new ways (Chernew, Hirth, Sonnad, Ermann, & Fendrick, 1998). Cutler & McClellan (2001) classify the effects of new technologies into two groups, namely, “treatment substitute effect” and “treatment expansion effect”. “Treatment substitute effect” is used to indicate that new technologies often substitute older technologies, the cost of which may be lower or higher than the substituted ones. However, Cutler & McClellan (2001) argue that new technologies may also make treatment possible for patients who were not able to get treatment with old technologies. This, Cutler & McClellan (2001) call it “treatment expansion effect”. Cutler & McClellan (2001) noted that the diagnosis rates for depression

doubled after Prozac-like drugs became available, and cataract surgery was performed much more frequently as the procedure improved. This is just one example of the treatment expansion effect on new medical technologies. Civan & Köksal (2010) argued that when the new treatment is effective, making it available for more people is beneficial, but this would increase the health-care spending. However, it is also possible that new technology will lower the overall health spending by reducing other types of medical spending (Civan & Köksal, 2010; Garber, 2006). According to Civan & Köksal (2010), the treatment expansion effect is a major factor in both the benefits of technological innovation and cost increase.

There are differing viewpoints relating to the impact of technology on healthcare expenditures.

A broadly held view is that the increase in medical costs associated with technology is a result of market forces such as advertising as well as doctor and consumer demands. The high rate of technological diffusion is due to its acceptance by the medical profession, often influenced by medical providers and suppliers that advertise new technologies through mass media (Bodenheimer, 2005b). Direct marketing of pharmaceutical products to doctors and physicians in hospitals is one example of a study cited by Bodenheimer (2005b) on the impact of high technological diffusion in the healthcare industry. Other scholars agreed (Civan & Köksal, 2010; Palesh et al., 2010). Moreover, since physicians and other specialists receive income for the number of procedures performed, they tend to insist that hospitals invest in facilities to support those technologies (Bodenheimer,

2005b; De Hert, 2009). Hospitals are left with little option, but to adhere in order to retain their services, since in South Africa, private hospitals are not allowed by regulators to employ doctors (there is a risk of losing a good doctor to a competitor, by not investing in new technologies that the doctor demands).

Another widely held view is that new technology reduces overall spending and improves quality of care. In one recent study about the effect of newer drugs on health spending, it was found that newer drugs increase the spending on prescription drugs since they are usually more expensive than their predecessors (Civan & Köksal, 2010). However, the same study also found that newer drugs lower the demand for other types of medical services, which causes the total spending to decline, with the biggest decline being spending on hospital care (Civan & Köksal, 2010). The above study therefore suggests that medical technology reduces overall healthcare expenditures and improves patient outcomes. This supports other earlier studies in the subject, such as another study, which found that new drugs not only reduces mortality rate by 68%, but they also decrease short-term health-care spending by reducing expenditures on other categories of health costs (Duggan & Evans, 2008). Another study found that the use of newer cardiovascular drugs has reduced the average LOS and the age-adjusted cardiovascular mortality rate (Lichtenberg, 2009). Other studies support the above findings that the replacement of older drugs by new drugs results in reductions in total medical expenditures; and that this also results in improvement in patient outcomes (Lichtenberg, 2006; Stuart, Doshi, & Terza, 2009).

There are also a few studies that suggested that new technologies do not necessarily cause rising healthcare expenditure (Bodenheimer, 2005b; De Hert, 2009). This school of thought believes that, although new technologies represent medical advances, they are subject to overuse and therefore excess costs (Bodenheimer, 2005b; De Hert, 2009). Variation exists in care delivered by different physicians and in different regions and this variation is caused by huge hospital investments in expensive technologies that are directly linked to their economic stability (Bodenheimer, 2005b). Accordingly, the cost problem is not a matter of technology, but of technology diffusion (De Hert, 2009). James & Mark (2008) agreed by stating that moderation in healthcare spending must be sought in new products and processes. A study by Mohaghegh (2007) indicated that 30% of respondents prefer costs associated with medical technology to be contained in order to reduce rising healthcare expenditures. Practices associated with containing these costs should include new drugs, tests, devices and other products that are cheaper to manufacture or use than those they replace (James & Mark, 2008).

A number of studies suggest that new technologies result in improved patient outcomes (Civan & Köksal, 2010; Lichtenberg, 2006; Lichtenberg, 2009; Stuart et al., 2009). In a study carried out in the USA, it was found that managed care discourages technology adoption by hospitals (Mas & Seinfeld, 2008). The questions are whether the health benefits of new technologies improve on existing technologies and whether these new technologies are cost-effective compared to existing ones (Bodenheimer, 2005b). In the USA, Medicaid or private health plans

may deny payment for innovations that are deemed ineffective or minimally effective (Bodenheimer, 2005b). In South Africa, major MCOs such as Discovery health uses formulary list to prescribe a list of drugs that may be prescribed by healthcare providers and drugs that are not on the list, often expensive innovations, are not reimbursed to the service providers. According to Bodenheimer (2005b), advances in technologies improve quality; however, these can be overused if offered to patients for whom the innovations do not provide any benefit. Although there is a case for limiting the spread of technological diffusion there is no agreement as to whether this is a solution. This is proven by the fact that in a recent study, only 50% of respondents agreed that constraints placed on rising costs associated with technology and research and development would have a negative effect on quality (Mohaghegh, 2007).

In conclusion, it is evident from the above literature review that most economists and analysts agree that advances in technologies are a key contributor towards increasing healthcare expenditures. However, there are still mixed results relating to the impact of technological diffusion on overall costs, as discussed above. Given that studies cited above were all conducted elsewhere, it is the intention of this study to investigate whether advances in medical technology create major increases in healthcare expenditure, with specific reference to the South African private healthcare industry.

2.5. Measuring quality of care

There are number of complaints about the quality of care under managed care (Simonet, 2005b). Measuring quality of care is challenging due to its subjectivity (Mohaghegh, 2007). Different scales and measurements such as surveys/questionnaires, checklists, patients' complains and peer reviews are accepted in practice (Mohaghegh, 2007). According to Guo (2008), the definition of quality varies according to patient, physician, healthcare manager, purchaser, payer or policymaker interests. Patients perceive quality based on their personal health outcomes derived from their encounters with the healthcare provider (Guo, 2008). In contrast, physicians define quality based on clinical and technical knowledge, while healthcare managers define quality based on their concerns with service cost effectiveness (Guo, 2008). For the purpose of this study, the emphasis will be placed more on quality from the healthcare manager's point of view, in relation to cost control efforts. Often the healthcare provider's emphasis on cost control could result in the opposite, namely sacrificing quality to realise savings in costs as discussed in the paragraph that follows.

The growing shift in risk towards health providers under managed care may result in certain procedures or treatments being avoided in order to control costs. Under FFFS arrangements, fees paid to providers depend on service intensity, thus prompting care providers to perform more medical acts (Simonet, 2005a). In contrast, a care provider such as a physician can be prompted to deny a service to his patient in order to make savings on costs (Simonet, 2005a). Denying as service

to a patient in order to make savings on costs could have a negative impact on quality.

2.6. Relationship between cost and quality of patient care

Some studies that were conducted by Mohaghegh (2007) on the relationship between costs and quality indicate that only 31% of the respondents believe that cost containment strategies have a positive impact on quality of care, 27% says that there is no impact and the other 27% says that cost containment has a negative impact on quality of care, thus giving mixed results. Another recent study that was conducted in Taiwan, found that the introduction of cost control strategies had a negative impact on quality of care in Taiwan hospitals (Chang & Hung, 2008). Other studies found no impact (Cutler et al., 2000). These are in agreement with earlier studies on the topic (Raffoul, 2002) that shows a significant higher cost in FFS plans as compared to capitated plans, and no significant difference between quality under capitated plans and FFS plans as measured by patient satisfaction rates. However, the same study (Raffoul, 2002) indicates an improvement in quality as measured by low readmission rates and low mortality rates under capitated plans as compared to FFS.

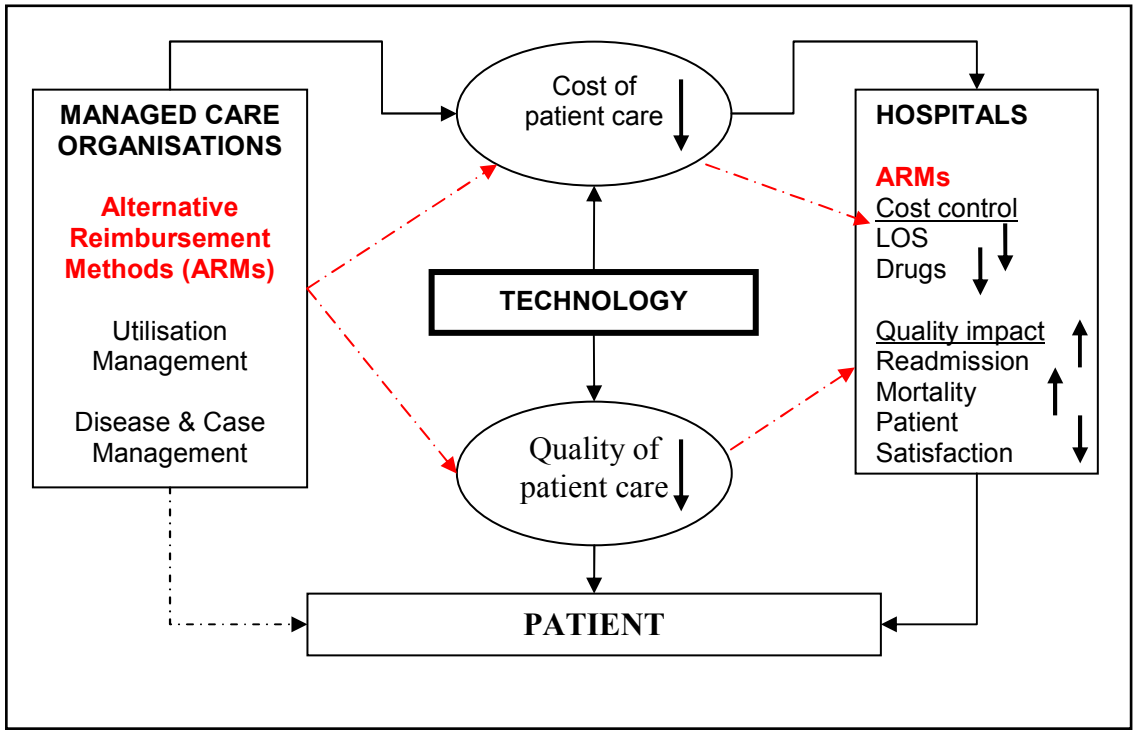
2.7. Theoretical Framework

As mentioned in Chapter 1, the aim of the research is to look at cost containment strategies and their impact on quality of care. In order to provide a framework for the theory that will be explored and to determine the statistical relationships that

may exist between cost containment strategies and quality of care, a framework was adopted from Raffoul (2002) and modified for the current study. The difference between the adopted model and the original model by Raffoul (2002) is that the proposed model incorporates all aspects of alternative reimbursement models, while the original model mainly concentrated on capitation. In addition, the proposed model incorporates technology as the key cost driver and it focuses on private hospitals rather than managed care organisations.

Figure 3 graphically displays the concepts of cost containment and quality of patient care, as well as the proposed correlations between them.

Figure 2: Theoretical Framework of the impact of managed care on patient care



Source: Adapted from Raffoul (2002) and modified for the current study

As depicted in Figure 2, ARMs affect both the cost and quality of patient care. ARMs affect the cost of patient care by reducing healthcare costs through better controls on resource utilisation. The costs are reduced through managed care organisations' cost control strategies of utilisation management, disease and case management and through the management of LOS and drug utilisation by hospitals. On the other hand, ARMs decrease the quality of patient care resulting in higher readmission rates, higher mortality rates and lower patient satisfaction scores, as explained by increasing patient complaints. Similarly, technology has an impact on rising healthcare and therefore indirectly affects cost of patient care. In addition, any constraints on rising costs associated with technology will have a negative impact on quality of patient care.

The four general propositions are that cost containment strategies reduce cost of patient care; cost containment strategies reduce quality of patient care; technology drives healthcare costs and therefore affect cost of patient care; and that any constraints on rising costs associated with technology will negatively influence quality of care. The theories behind these propositions have been adopted from Raffoul (2002) who proposed that capitation, another form of managed care, reduce cost and quality of patient care. The cost of patient care is reduced through cost-per discharge as well as average LOS. Quality of patient care is reduced through an increase in readmission and mortality rates as well as a reduction in patient satisfaction scores. The research questions as presented in chapter 3 will strive to prove or disprove the general propositions as discussed above.

2.8. Literature review conclusion

The literature review highlighted some of the variables that may have a bearing on the ability of hospitals to control costs as well as the impact of cost control on quality of patient care. As already discussed, the introduction of managed care in South Africa was meant to control healthcare costs. To date there has not been any study on whether South African private hospitals are able to contain costs and whether cost containment strategies have any impact on quality of patient care. The current study is meant to address this gap, especially given the fact that there are mixed results from other studies as already discussed. The model as described in the above section will form the basis of the current study.

Chapter 3 Research Questions

This study will investigate whether hospitals under managed care are able to contain costs; whether cost containment under managed care affects quality of care; whether technology plays a role in rising healthcare costs and assuming it does, whether constraints placed on rising costs associated with technology affect quality of care.

From a critical literature review as well as the theoretical framework as discussed in the previous chapter, we can therefore derive the following research questions:

Research question 1: Are hospitals under managed care able to contain costs?

Research question 2: Does cost control under managed care have any impact on quality of care?

Research question 3: Do advances in technology have an impact on rising healthcare costs?

Research question 4: Do constraints placed on rising costs associated with technology affect quality of care?

Chapter 4 Research Methodology

The research is mainly quantitative in nature and descriptive in form. According to Zikmund (2003), the purpose of a quantitative research is to determine the quantity or extent of some phenomenon in the form of numbers. As this is the first study of this nature in the South African environment, a triangulation approach would have been appropriate in order to incorporate the exploratory aspects of the research. This approach was not followed, due to time constraints and cost implications. This limitation has been listed as part of the recommendations for future study.

4.1. Research Classification

According to Zikmund (2003), business research is classified into three main classes based on the purpose or function, namely exploratory, descriptive and causal research. Descriptive research is undertaken to describe characteristics of a population or phenomenon and is distinguished from exploratory research as it is based on some previous understanding of the nature of the research problem (Zikmund, 2003). Exploratory research was not appropriate in this instance, as the nature of the problem is already understood as described in the first chapter of this study. The research also incorporates causal methods in order to establish the relationship between cost control and quality of care. According to Zikmund (2003), the main goal of causal research is to identity cause-and-effect relationships. The research undertaken in this study can therefore best be described as descriptive, although it does cover some causal as well as exploratory aspects, which is

additional information required about costs and quality of care as well as their relationships, in part three and four of the questionnaire respectively.

4.2. Research Design

The research was carried out through survey. Zikmund (2003) describes a survey as a method of gathering primary data based on communication with a representative sample of individuals. Some of the objectives of survey are to identify characteristics of a particular group, to measure attitudes, and to describe behavioural patterns. Surveys have the advantages of being quick, inexpensive, efficient and accurate means of assessing information about the population (Zikmund, 2003). The disadvantage is that surveys may result in errors, such as random sampling error and systematic error, which includes forms of respondent error such as non-response error and response bias, as well as administrative errors, which include data processing and sample selection errors. The potential for these errors has been listed as a limitation to this study.

Observation methods were not appropriate in this research. Zikmund (2003) describes scientific observation as the systematic process of recording the behavioural patterns of people, objects, and occurrences as they are witnessed. Survey research was therefore most appropriate for this research as some of the objectives were to measure attitudes and behavioural patterns of private healthcare providers under managed care with regard to cost and quality of care.

Qualitative analysis involves the use of open-ended questions and in this study, the main questionnaire consists of closed question and therefore the analysis can best be described as quantitative in nature.

4.3. Data collection

The methods of data collection available under survey research include personal interviews, phone interviews and self-administered questionnaires (Zikmund, 2003). The method of survey was self-administered questionnaires, which were e-mailed to respondents. The reason for this choice was that this was relatively inexpensive, there was a better chance that respondents will take time to think about their replies and that time was a major factor. Since there is a potential issue with anonymity owing to the fact that the sender's e-mail is always displayed, a covering letter was attached in order to assure respondents of confidentiality of information provided (Appendix 1).

One of the disadvantages of mail survey as described by Zikmund (2003) is that there is a high possibility for respondent misunderstanding as no interviewer is present for clarification. Pre-testing of the questionnaires was conducted with a group of respondents in order to detect problems in questionnaire instructions or design. The questionnaire was evaluated for evidence of ambiguous questions, potential misunderstandings and evidence that the questions mean the same thing to all respondents. The final questionnaire was modified in line with discussions and recommendations from the participants.

4.4. Questionnaire Design

According to Zikmund (2003), relevance and accuracy are the two basic criteria a questionnaire must meet if it is to achieve the researcher's purpose. A questionnaire is relevant if no unnecessary information is collected and if the information that is needed to solve the business problem is obtained (Zikmund, 2003). The accuracy of the questionnaire is determined by it being reliable and valid. The validity of the survey instrument was assessed by literature review and expert judgement.

The questionnaire included a total of thirty five questions, twenty eight of them on a five point Likert scale. The other two questions were on a scale of one to ten (part 3) and the balance of the questions were exploratory in nature, thus requiring respondents to provide additional information about cost and quality of care. The questionnaire was informed by the following sources:

Table 2: Questionnaire Design - Literature Source

Research questions		Questions	Main literature sources
1	Are hospitals under managed care able to contain costs?	1; 4; 5; 8	(R. T. Konetzka et al., 2008; Mays et al., 2004; Mohaghegh, 2007; Raffoul, 2002)
2	Does cost control required under managed care have any impact on quality of care?	2; 3; 6; 7; 15; 22; 23; 24; 25; 26; 28	(Bodenheimer, 2005c; Chang & Hung, 2008; Cutler et al., 2000; Glied, 2000; Kaestner & Guardado, 2008; Konetzka et al., 2008; Mohaghegh, 2007; Polsky & Nicholson, 2004; Raffoul, 2002; Simonet, 2005a; Xu & Jensen, 2005)

3	Do advances in technology have an impact on rising healthcare costs?	9; 10; 11; 12; 13; 14; 16; 18	(Baker et al., 2003; Bodenheimer, 2005b; Civan & Köksal, 2010; Cutler & McClellan, 2001; De Hert, 2009; Duggan & Evans, 2008; Esposto, 2008; Lichtenberg, 2009; Mas & Seinfeld, 2008)
4	Do constraints placed on rising costs associated with technology affect quality of care?	19; 20; 21; 27	(Mas & Seinfeld ,2008; Bodenheimer, 2005b; Mak & Roush, 1994; Mohaghegh, 2007)

4.5. Scale

Zikmund (2003) defines attitude as an enduring disposition to consistently respond in a given manner to various aspects of the world, including persons, events and objects. There are three components to this definition, namely, affective, cognitive and behavioural components (Zikmund, 2003). Various measures of attitude include simply attitude scales, category scales, summated ratings, semantic differential scales, numeric scales, constant-sum scale as well as staple scale (Zikmund, 2003). The Likert scale is one of the most popular method of measuring attitudes and according to Zikmund (2003), it is simple to administer. With Likert scale, respondents indicate their attitudes by checking how strongly they agree or disagree with carefully constructed statements that range from very positive to very negative toward the attitudinal object (Zikmund, 2003). Accordingly, individuals choose from five alternatives: strongly agree, agree, uncertain/neutral, disagree, and strongly agree (Zikmund, 2003).

A Likert scale was chosen for this study, with the following response anchors: strongly agree, agree, neutral, disagree and strongly disagree. Responses were converted to a point scale for data analysis as follows: 1= strongly disagree, 2 = disagree, 3 = neutral, 4 = agree and 5 = strongly agree.

4.6. Population of relevance and unit of analysis

Zikmund (2003) describes a population as any complete group that share some set common set of characteristics. The population of relevance consisted of private hospitals/clinics from the three largest hospital groups in South Africa, namely, Netcare, Life healthcare and Medi-Clinic. These groups were selected because they represent a significant portion of the private hospitals in South Africa and that their hospitals operate under managed care plans.

The unit of analysis was hospital managers in private hospitals under managed care. This is because of the fact that these individuals are expected to have a greater understanding of costs and quality in their business environment and are the main decision makers.

4.7. Sampling method

The sampling frame is defined as the list of elements from which a sample may be drawn (Zikmund, 2003). The sampling frame for this study was hospital managers at the three major private hospital groups, namely Netcare, Life healthcare and Medi-Clinic.

According to Zikmund (2003), alternative ways of taking a sample include probability and non-probability sampling. Non-probability sampling includes convenience sampling, quota sampling and snowball sampling (Zikmund, 2003). Convenience sampling was not selected because this method is best used for exploratory research when additional research will subsequently be conducted with a probability sample (Zikmund, 2003). The possible source of bias with quota sampling is that there is tendency to include people who are easily found and willing to participate in the study (Zikmund, 2003). Accordingly, a stratified probability sampling technique has been selected for this study.

According to Zikmund (2003), in a probability sampling technique, every element in the population has a known nonzero probability of selection. Ideally a simple random sample should have been followed as each member of the population, thus, all hospitals under managed care, would have had an equal probability of being selected. The choice of a stratified probability sampling was motivated by the fact that the study covers all the three main hospital groups. According to Albright, Winston, & Zappe (2006), in stratified sampling, the population is divided into relatively homogenous subsets called strata, and then random samples are taken from each of the strata. The advantage is that separate estimates are obtained within each status, which would not be obtained if a simple random sample is selected (Albright et al., 2006). Accordingly, a representative sample of all three main hospital groups was achieved. The strata in the study are Netcare as the first

biggest private hospital group, Life healthcare as the second largest and Medi-Clinic as the third largest, based on the number of registered beds.

4.8. Sample size

The sample size was 40 out of approximately 160 local private hospitals owned by the three groups. This size was appropriate, as a larger size may have resulted in additional problems such as increased costs, delays in collection of data and an increase in non-sampling error, such as non-response bias (Albright et al., 2006). This ultimately resulted in 25% of each major private hospital group being sampled.

4.9. Data analysis process

According to Zikmund (2003) data analysis is the application of reasoning to understand and interpret the data that has been collected. The type of statistical tests to be used depend on how the sample was collected (random vs. non-random selection); the type of data collected (nominal, ordinal, interval or ratio) and assumption about normality of data distribution. The following sections outlines the statistical tests used for this study, based on the measurement instrument used and the type of data collected.

Descriptive analyses were conducted and Zikmund (2003) describes these as the transformation of raw data into a form that will make them easy to understand and interpret. In addition, inferential statistics were performed in order to test hypothesis posed by the researcher. These tests are outlined in detail below.

Frequency analyses were performed in order to count responses for each of the codes assigned to each question. Accordingly, the main type of the descriptive analysis was the mode. The next step in the analysis involved the use of cross-tabulations, which involved organising data by categories of hospital size, occupancy rates and location to facilitate comparisons. Hospitals were divided into three subgroups, small, medium and large, based on the number of registered beds. Small hospitals represented those with registered beds of up to 100, medium with 101 to 200 beds and large hospital with more than 201 beds. Hospitals were also categorised into three levels of occupancies, namely, low, moderate and high occupancies, with low representing occupancies of less than 65%, moderate at 65% to 74% and high occupancy at occupancies of at least 75%.

Non-paramedic chi-square (X^2) test for goodness-of-fit was used in order to test for significance in the analysis of frequency distributions. This test was used because the data collected was mostly ordinal and normality could not be assumed. The test was conducted in order to determine if the differences between the observed frequency distribution could be attributed to sampling variation (Zikmund, 2003). The null hypothesis was that there is no difference in the proportions of each category within a hospital size, occupancy rate and province. The test analysis was conducted at the significant level of 0.05, meaning that the probability level of significance for conducting Type I error is 0.05. The study indicates the confidence level that the probability of rejecting the null hypothesis when we should not have is 95%

- The Null Hypothesis (H_o) = There is no difference in proportions in each category
- The Alternative Hypothesis (H_a) = There are differences in proportions in each category

The Kruskal-Wallis (K-W) test was used to compare the data between the categories within each group of hospital size, occupancy rate and province. This test was used because the data collected was mostly ordinal and normality could not be assumed. The K-W test was used to test the null hypothesis that all medians are equal, thus, there is no significant difference between the medians of the categories within each group, or alternatively, whether observations in one sample tend to be significantly larger than observations in the others (Zikmund, 2003).

The K-W test analysis was conducted at the significant level of 0.05, meaning that the probability level of significance for conducting Type I error is 0.05. The study indicates the confidence level that the probability of rejecting the null hypothesis when we should not have is 95%

- The Null Hypothesis (H_o) = All medians are equal
- The Alternative Hypothesis (H_a) = At least two medians are different

The non-paramedic chi-square (X^2) test for independence was used to explore relationships between categorical variables. In order to perform the X^2 test for independence, the scale was reduced by combining adjacent categories of

variables, such that strongly agree and agree, becomes “Agree” and that neutral, disagree and strongly disagree, become “Disagree”. In addition, the categories in hospital size, occupancy rates and province were also collapsed into two. The new categories became small/medium (small + medium) and large for hospital size, and occupancies become low/moderate (low + moderate) and high, while provinces became Gauteng/Western Cape and Other. This data transformation was done in order to enable a meaningful analysis as well as due to the stringent assumption of the chi-square test, that requires the lowest expected frequency of 5 or more in each cell. As a result, the test was performed on a 2 by 2 table.

The X^2 test for independence was conducted at the significant level of 0.05, meaning that the probability level of significance for conducting Type I error is 0.05. The study indicates the confidence level that the probability of rejecting the null hypothesis when we should not have is 95%

- The Null Hypothesis (H_o) = There is no significant difference between categories within each group
- Alternative Hypothesis (H_a) = There is a significant difference between categories within each group

The Yates Continuity Correlation was used as the test statistic, instead of the Pearson chi-square test statistic, in order to compensate for an overestimate of the chi-square when used with a 2 by 2 table. Where there was a violation of the assumption that the lowest expected frequency in any cell should be 5 or more, the Fisher’s Exact Probability Test was used instead. Furthermore, the phi coefficient,

which is a correlation coefficient, was used in order to determine the effect size and association between variables.

T-tests were performed on the two questions that required respondents to rate the impact that managed care has had on controlling healthcare costs and in reducing the quality of patient care (part 3 of the questionnaire). This was appropriate as the data was interval in nature, the scores were obtained using a random sample and it was assumed that the populations from which the samples are taken are normally distributed. Histograms were used to assess normality of sample distributions and the Levene's test for equality of variances was used to test the variability of scores in order to confirm homogeneity of variances between two groups. Finally, the Eta squared was used to test the magnitude of the differences in the means using the guidelines proposed by Cohen (1988), namely, 0.01 for small effect, 0.06 for moderate effect and 0.14 for large effect. The t-tests analysis was conducted at the significant level of 0.05

- The Null Hypothesis (H_o) = There are no differences in means between groups
- Alternative Hypothesis (H_a) = There are differences in means between groups

In addition to the t-tests, a correlation analysis was performed in order to establish whether there was any relationship between the amount of cost reduction brought about by managed care and the related impact on quality reduction.

4.10. Research limitations

The research has the following limitations:

- Only three hospital groups were sampled and these exclude other private hospitals under managed care, but who are not part of Netcare, Life healthcare and Medi-Clinic. The results may therefore not be generalised for the entire private hospitals in South Africa

- The use of sampling may give rise to a number of survey errors as described above

- It would also be useful to include medical schemes who are registered Managed Care Organisations in order to gain another perspective from their point of view on quality of care from their experiences with members in their networks.

Chapter 5 Results

5.1. Introduction

In order to answer the research questions as set out in chapter 3, a questionnaire (Appendix 1) was designed based on the literature review. The questionnaire was divided into four sections, with the first section collecting data on the demographics of the respondents, the second and the third sections being content related and the last section requesting additional qualitative data from respondents regarding cost and quality of care. The responses were coded and captured. The SPSS 18 package was used for statistical analysis. The main questions in section two of the questionnaire were close-ended allowing respondents to rank statements about healthcare costs and quality of care on a five point Likert scale ranging from strongly agree to strongly disagree. Part three required respondents to rank the impact of managed care on healthcare costs and quality of care on a scale from 1 to 10. The last section consisted of open-ended questions and required respondents to provide additional information about healthcare costs and quality of care in order to address potential missing dimensions. The results of the survey are presented in the sections that follow.

5.2. Sample description

The questionnaire was e-mailed to a representative sample of 40 hospital managers at Netcare, Life Healthcare and Medi-Clinic hospitals. Respondents were required to indicate the number of beds in their facility in order to establish

the sizes of the hospitals, occupancy rates, as well as the province of their employment. Table 3 below presents the statistics of respondents. The table shows that there was only one missing value with regard to the occupancy rate (also Table 7).

Table 3: Statistics of respondents

		Position	Province of employment	Hospital Size	Occupancy Rate
N	Valid	35	35	35	34
	Missing	0	0	0	1
Total		35	35	35	35

Table 4 below presents the percentage split of the respondents based on the position held in their respective hospitals. A significant portion of the respondents (88.6%) was hospital managers and 11.4% were nursing managers who are responsible for running the hospitals, in the capacity of hospital managers.

Table 4: Respondents by position

Position	Frequency	Percent split
Hospital Manager	31	88.6
Nursing Manager	4	11.4
Total	**35**	**100.0**

An 87.5% response rate was obtained from 40 questionnaires that were distributed.

Table 5 below indicates that a reasonable spread of responses from across the country was obtained. Gauteng had the highest spread of responses at 40%, followed by Western Cape at 22.9% and finally Kwazulu Natal at 11.4%. The remaining provinces, six in total, contributed 25.7% towards the total responses.

Table 5: Percentage split of province of employment

Province	Frequency	Percent Split
Gauteng	14	40.0
Western Cape	8	22.9
Kwazulu Natal	4	11.4
Other	9	25.7
Total	**35**	**100.0**

Hospitals were divided into three categories, small, medium and large, based on the number of registered beds. Small hospitals represented those with registered beds of up to 100, medium with 101 to 200 beds and large hospital with more than 201 beds. Table 6 below presents a percentage split of responses based on hospital size.

Table 6: Percentage split of hospital size

Hospital size	Frequency	Percent split
Small (1 - 100 Beds)	7	20.0
Medium (101 - 200 Beds)	15	42.9
Large (201+ Beds)	13	37.1
Total	**35**	**100.0**

Small hospitals contributed 20% of the respondents, medium and large hospitals contributed 42.9% and 37.1% respectively.

Finally, Table 7 presents the responses based on the average level of occupancy that the hospital had at the time of sending the response. Hospitals were categorised into three levels of occupancies, namely, low, moderate and high occupancies. Low occupancy hospitals were considered to be operating at less than 65%, moderate and high occupancy hospitals at rates of between 65% and 74%, and at 75% and more, respectively.

Table 7: Percentage split of responses by occupancy rate

		Frequency	Percent	Valid Percent
Valid	Low (less than 65%)	8	22.9	23.5
	Moderate (65% - 74%)	11	31.4	32.4
	High (75% +)	15	42.9	44.1
	Total	**34**	**97.1**	**100.0**
Missing	System	1	2.9	
Total		35	100.0	

The above table shows that there was a reasonable spread of hospitals based on their current level of occupancy, with 42.9% of hospitals operating at high occupancies, 31.4% at moderate occupancies and 22.9% of hospitals at low occupancy rates.

5.2.1. Differences in proportions of respondents

Non-paramedic chi-square tests for goodness-of-fit were performed to test for any significance in the analysis of frequency distributions. This was necessary in order to determine if the difference between the observed frequency distribution (if any) can be attributed to sampling variation (Zikmund, 2003). The null hypothesis was that there is no difference in the proportions within each category of hospital size, occupancy rate and province of employment. The alternative hypothesis was that there were differences in those categories. The tests were performed at alpha of 0.05. The results of the analysis are presented in Table 8 below.

Table 8: Chi-square test analysis of differences in observed frequency distributions

	Province	Size	Occupancy
Chi-square	5.800[a]	2.971[b]	2.176[c]
Df	3	2	2
Asymp. Sig. (p-value)	.122	.226	.337
a. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 8.8.			
b. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 11.7.			
c. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 11.3.			

Chi-square goodness-of-fit tests indicated that there were no significant differences in the proportion of respondents by hospital size, occupancy and province in the current sample as compared to the expected values that all categories are equal. The chi-square (X^2) test result for province was 5.8 at a degree of freedom (df) of 3, with a sample of 35 and a significant value (p) of < .12. The X^2 for hospital size was 3 at df = 2 and p < .23, while X^2 for occupancy was 2.2 at df = 2 and p < .34. Therefore, we cannot reject the Null hypothesis that there are no differences in the proportion of each category within hospital size, occupancy rate and province.

The scale and categories were collapsed in order to allow for further analysis of the data, as discussed above. The results are presented in the sections that follow. The results have been arranged with research questions as the main themes.

5.3. Are hospitals under managed care able to contain costs?

Table 9 presents frequencies of responses with regard to the statements about the ability of hospitals under managed care in containing healthcare costs.

Table 9: Frequency table of ability of hospitals under managed care in containing costs

Item		Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
		5	4	3	2	1
1	Managed care has the ability to contain healthcare costs	5	22	4	3	1
4	Length of stay is monitored and controlled in order to contain healthcare costs	11	21	2	1	0
8	Practitioners are encouraged to prescribe/dispense generic medication	23	12	0	0	0

A significant number of respondents agreed with all the three statements about the ability of managed care and hospitals under managed care in containing costs, with the most frequent response being 4 (agree) for the first two questions and 5 (strongly agree) for the third question. All respondents agreed that practitioners are encouraged to prescribe generic medication in their organisation.

5.3.1. K-W analysis of managed care has the ability to contain costs

Non-parametric Kruskal-Wallis (K-W) test was performed in order to determine whether there were differences among groups within categories. The K-W test analysis was conducted at the p value of 0.05. This means that the probability of rejecting the null hypothesis of equal medians when it is actually true (Type I error) is 0.05.

- The Null Hypothesis (H_o) = All medians are equal, thus, there is no significant difference between the medians of the subgroups within each category

- The Alternative Hypothesis (H_a) = At least two medians are different, thus, there is significant difference between medians of two or more groups.

Table 10 below presents summaries of K-W analysis, where 'y" indicates that the Null hypothesis cannot be rejected and "n" indicates that the Null hypothesis can be rejected. The symbols 'a' to 'c' in the table represent small, medium and large hospital size respectively; low, moderate and high for occupancy rates respectively, and symbols 'a' to 'd' represent Gauteng, Western Cape, Kwazulu Natal and Other provinces respectively, as coded in SPSS.

Table 10: Outcome of K-W test for managed care has the ability to contain costs

Managed Care has the ability to contain costs								
	Accept H_o	**X^2**	**Df**	**p-value**	**Median**			
					a	**b**	**c**	**d**
Hospital Size	y	4.69	2	0.10	4	4	4	n/a
Occupancy rate	y	0.57	2	0.97	4	4	4	n/a
Province	y	2.14	3	0.54	4	4	3.5	4
Length of stay is monitored and controlled in order to contain healthcare costs								
	Accept H_o	**X^2**	**Df**	**p-value**	**Median**			
					a	**b**	**c**	**d**
Hospital Size	y	3.11	2	0.21	4	4	4	n/a
Occupancy rate	y	1.60	2	0.45	4.5	4	4	n/a
Province	y	0.85	3	0.84	4	4	4	4
Practitioners are encouraged to prescribe/dispense generic medication								
	Accept H_o	**X^2**	**Df**	**p-value**	**Median**			
					a	**b**	**c**	**d**
Hospital Size	y	3.79	2	0.15	4	5	5	n/a
Occupancy rate	y	0.87	2	0.65	5	5	5	n/a
Province	y	1.86	3	0.60	5	5	4.5	5

Table 10 above points out that there were no statistically significant differences in all the statements about ability of hospitals and managed care in controlling costs across the respective three groups within hospital size (small, medium, large)

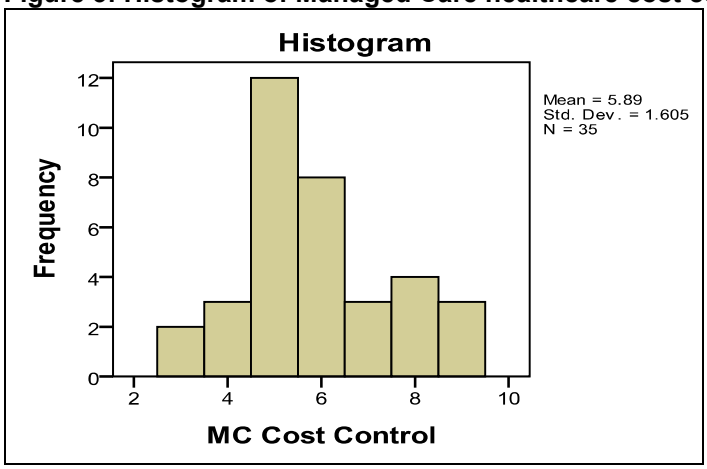
occupancy rates (low, moderate, high), as well as province, as in all cases the p-values were greater than the alpha level of 0.05. Therefore, we cannot reject the Null hypothesis that all medians are equal.

5.3.2. The impact that managed care has had on controlling costs

Respondents were asked to rate the impact that they believed managed care has had on controlling costs, on a scale from 1 to 10, with 1 representing no impact, 5 representing moderate impact and 10 representing high impact. The outcome of the research is presented in Figure 3 below.

The histogram below indicates that managed care has had a better than average impact on controlling healthcare costs (mean = 5.89; Standard deviation = 1.605; median = 6).

Figure 3: Histogram of Managed Care healthcare cost control



Independent-samples t-tests were performed in order to compare the mean scores of two different groups, namely small/medium vs. large for hospital size, as well as low/moderate vs. high occupancies. The tests were performed in order to test the

probability that the two sets of scores in hospital size (small/medium vs. large) and occupancies (low/moderate vs. high occupancies) came from the same population. The analysis was conducted at the p value of 0.05, meaning that the probability of rejecting the null hypothesis of equal means when it is actually true (Type I error) is 0.05.

- The Null Hypothesis (H_o) = All means are equal
- The Alternative Hypothesis (H_a) = The means are not equal

The results of the t-test analysis for hospital size are presented in Appendix 2. The Levene's test for equality of variances was 0.107 with a significant level of 0.745, meaning that that the assumption of equal variances has not been violated (p >0.05). The analysis showed that there was no significant difference in scores for low/medium hospitals (Mean = 5.77, Standard deviation = 1.57) and large hospitals (Mean = 6.08, Standard deviation = 1.71); t (33) = -0.54, p = 0.60 (two-tailed). The magnitude of the differences in the means (mean difference = -0.30, 95% Confidence Interval: -1.46 to 0.85) was small (eta squared = 0.009). This means that the null hypothesis that means are equal cannot be rejected.

The results of the t-test analysis for occupancy are presented in Appendix 3. The Levene's test for equality of variances was 1.484 with a significant level of 0.232, meaning that that the assumption of equal variances has not been violated (p >0.05). There was no significant difference in scores for low/moderate occupancies (Mean = 5.47, Standard deviation = 1.68) and high occupancies (Mean = 6.2, Standard deviation = 1.27); t (32) = -1.391, p = 0.17 (two-tailed). The magnitude of

the differences in the means (mean difference = -0.73, 95% Confidence Interval: -0.79 to 0.34) was small (eta squared = 0.057). This means that the null hypothesis that means are equal cannot be rejected.

5.4. Does cost control required under managed care have any impact on quality of care?

Table 11 below represents a frequency analysis of the impact of cost control strategies on quality of care. The original statement about managed care emphasises quality over cost control was reversed in SPSS in order to help prevent response bias by reversing the rating scales (item R24 in the table).

Table 11: Frequency analysis of cost control impact on quality of care

Item		Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
		5	4	3	2	1
2	Medical Aid restrictions impact on quality	6	24	1	2	2
3	Authorisation requirements impact on quality	6	19	2	6	1
5	Granted LOS impact on discharge procedures	8	18	1	6	2
6	Medical Aid limits on LOS impact on quality	7	20	7	1	0
7	LOS limits impact on readmissions or complications	7	20	7	1	0
15	MC environment emphasise cost control over quality	9	11	9	4	2
R24	MC does not emphasise quality over cost control*	8	14	7	6	0
19	Drug formulary compliance impact on quality	2	2	12	17	3
25	MC encourages avoidance of procedures	6	21	4	3	1
26	Reimbursements limits impact on quality	5	21	2	6	1
28	Alterations of treatment procedures in response to changes in reimbursements	2	18	7	7	1

Most of the respondents agreed with all the statements regarding the impact of cost control on quality of care, with the exception of statement about drug formulary compliance on quality (item 19), where most respondents disagreed with the statement. A chi-square test for independence was performed and the difference was not significant as discussed below.

5.4.1. Chi-square analysis of cost control impact on quality

As discussed in section 5.2.2 above, the scale was reduced to two and subgroups within each category were reduced as well, resulting in the use of 2 by 2 tables for further analysis.

Non-parametric chi-square tests for independence were performed in order to determine whether there were differences among proportions of respondents within categories of size and occupancy. The X^2 test analysis was conducted at the p value of 0.05.

- The Null Hypothesis (H_o) = there is no significant difference between the subgroups within each category
- The Alternative Hypothesis (H_a) = there is significant differences between the subgroups within each category

The results of the chi-square test for independence are presented in tables 12 and 13 below. The Yates Continuity Correlation (measure 'a' in the table) was used and where the 2 by 2 table violated the assumption that cells should have expected frequencies of 5 or more, the Fisher's Exact Probability Test (measure 'b' in the

table) was used instead. The effect size statistics were calculated using phi coefficient and the analysis was performed using Cohen's (1988) criteria of 0.10 for small effect, 0.30 for medium effect and 0.50 for large effect.

Table 12: Chi-square analysis (Occupancy) of the impact that cost control has on quality of care

Item		Measure	X^2	Sigma		Signi-ficant?	Phi Coefficient	Asso-ciation
				2-sided	1-sided			
2	Medical Aid restrictions impact on quality	b	-	1.00	0.62	no	-0.034	Small
3	Authorisation requirements impact on quality	b	-	0.44	0.29	no	0.163	Small
5	Granted LOS impact on discharge procedures	b	-	1.00	0.64	no	0.004	Small
6	Medical Aid limits on LOS impact on quality	b	-	0.50	0.31	no	-0.222	Small
7	LOS limits impact on readmissions or complications	b	-	0.26	0.20	no	-0.214	Small
15	MC environment emphasise cost control over quality	a	-	0.44	-	no	-0.193	Small
R24	MC does not emphasise quality over cost control*	a	-	1.00	-	no	-0.036	Small
19	Drug formulary compliance impact on quality	b	-	0.57	0.41	no	-0.141	Small
25	MC encourages avoidance of procedures	b	-	0.23	0.20	no	-0.214	Small
26	Reimbursements limits impact on quality	b	-	0.24	0.12	no	-0.265	Medium
28	Alterations of treatment procedures in response to changes in reimbursements	a		0.44	-	no	-0.193	Small

The above table points that there were no significant association between the statements about the impact of managed care on quality of care and occupancy at 0.05 alpha level (p values are < 0.05). The effects size statistics as calculated by the phi coefficient were all small, with the exception of statement 26, which resulted in a medium effect (phi = -0,265).

Table 13: Chi-square analysis (Size) of the impact that cost control has on quality of care

Item		Measure	X^2	Sigma		Signi-ficant?	Phi Coefficient	Asso-ciation
				2-sided	1-sided			
2	Medical Aid restrictions impact on quality	b	-	1.00	0.63	no	0.024	Small
3	Authorisation requirements impact on quality	b	-	1.00	0.53	no	-0.061	Small
5	Granted LOS impact on discharge procedures	b	-	0.70	0.44	no	0.089	Small
6	Medical Aid limits on LOS impact on quality	b	-	1.00	0.61	no	0.066	Small
7	LOS limits impact on readmissions or complications	b	-	0.12	0.10	no	0.286	Medium
15	MC environment emphasise cost control over quality	a	0	1.00	-	no	0.051	Small
R24	MC does not emphasise quality over cost control*	b	-	0.01	0.01	yes	-0.469	Large
19	Drug formulary compliance impact on quality	b	-	0.28	0.24	no	0.235	Small
25	MC encourages avoidance of procedures	b	-	0.68	0.36	no	-0.137	Small
26	Reimbursements limits impact on quality	b	-	0.24	0.18	no	0.224	Small
28	Alterations of treatment procedures in response to changes in reimbursements	a	1.86	0.17	-	no	0.290	Medium

The above table points that there were no significant association between the statements about the impact of managed care on quality of care and hospital size at 0.05 alpha level ($p < 0.05$), with the exception of item R24. For item R24, a chi-square test for independence (with Fisher's Exact Probability Test) indicated a significant association between the variable (R24) and the hospital size, X^2 (1, n = 35), p = 0.01, phi = -0.469. This means that there is a significant association between the statement that organisations (managed care) do not emphasise quality of care over cost control, and hospital size. The phi coefficient value of this

variable (R24), -0.469 is considered a large effect, as the value is close to 0.50, meaning a stronger association between this variable and the hospital size.

A review of the cross tabulation for statement R24 (Appendix 4) indicates that of the 22 hospitals that agreed that managed care does not emphasise quality over cost, 55% were large and 45% small/medium. Only 8% of large hospital disagreed while 92% agreed with the statement. Of the 22 small/medium hospitals, 45% agreed while 55% did not agree with the statement. The results of phi coefficient (phi = -0.469) indicate a large effect and therefore there is a strong association.

A third category, province, was introduced in order to perform further analysis on the above variable (R24). A chi-square test for independence (with Fisher's Exact Probability Test) indicated no significant association between the statement that managed care does not emphasize quality over cost control and province, (1, n = 35) p = 0.721, phi = -0.10. This means that there was no significant relationship between the variable and the province, as $p > 0.05$, and there association is very small as indicated by phi coefficient.

5.4.2. Quality of care

All respondents agreed that they had an effective system in their organisations to measure quality of care. However, there was a spread of responses with regard to the statement about patient complaints, as indicated in Table 14 below.

Table 14: Frequency analysis of patient complaints and effective quality system

Item		Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
		5	4	3	2	1
22	Number of patient complaints increased	3	13	6	12	1
23	There is an effective system to measure quality	21	14	0	0	0

The results of the cross tabulation analysis of hospital size (Appendix 5) indicated that 54% of the respondents disagreed that the number of patient complaints increased since the introduction of managed care and of those who disagreed, 58% were in small/medium hospitals. The same results were found for province, except that 58% of those who disagreed with the statement were from Gauteng/Western Cape. Finally, 53% of respondents in the occupancy category disagreed with the statement and those who disagreed, the majority (56%) had low/medium occupancies in their hospitals.

Chi-square tests for independence were performed to establish whether there were any association between the increase in the number of patient complaints and hospital size as well as occupancy rates.

Table 15: Chi-square analysis of increase in number of patient complaints

Category	N	X^2	p-value	Signi-ficant?	Phi Coefficient	Asso-ciation
Hospital size	35	0.097	0.508	no	0.112	Small
Occupancy	34	0.000	1.000	no	0.007	Small
Province	35	0.097	0.508	no	0.112	Small

Chi-square test for independence (with Yates Continuity Correlation) indicated no significant association between the increase in the number of patient complaints

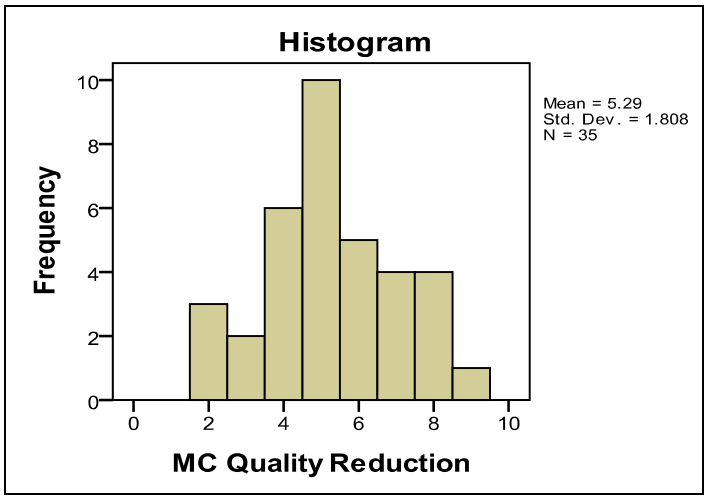
and hospital size, occupancy and province. P-values are all greater than the 0.05 alpha level and the phi coefficient tests (phi) were considered small, meaning that there was no significant association in all cases.

Respondents were also requested to indicate whether they measure patient satisfaction as well as readmission and mortality rates. As per Appendix 6, all respondents measure patient satisfaction in their organisations and 66% and 86% measure readmission and mortality rates respectively, as part of quality. Appendix 6 also indicates tools that respondents use to measure patient satisfaction as well as other quality measures in place in respondents' organisations.

5.4.3. The impact that managed care had in reducing quality

Respondents were asked to rate the impact that they believed managed care has had in reducing quality of patient care, on a scale from 1 to 10, with 1 representing no reduction, 5 representing moderate reduction and 10 representing significant reduction. The outcome of the research is presented in Figure 4 below. The histogram below indicates that managed care has had a better than average impact in quality reduction (mean = 5.29; Standard deviation = 1.808; median = 5).

Figure 4: Histogram of Managed Care Quality Reduction



Independent t-tests were performed in order to compare the mean scores of two different groups, namely small/medium vs. large for hospital size, as well as low/moderate vs. high occupancies. The analysis was conducted at the p value of 0.05.

- The Null Hypothesis (H_o) = All means are equal
- The Alternative Hypothesis (H_a) = The means are not equal

The results of the t-test analysis are presented in Appendix 7 and 8. The Levene's test for equality of variances was 1.232 with a significant level of 0.275 for hospital size, while the test was 0.183 with a significance level of 0.672 for occupancies. This means that that the assumption of equal variances has not been violated as the Levene's test's p >0.05 in both cases.

The analysis (Appendix 7) showed that there was a significant difference in scores for small/medium hospitals (Mean = 5.86, Standard deviation = 1.81) and large

hospitals (Mean = 4.31, Standard deviation = 1.38); t (33) = 2.67, p = 0.01 (two-tailed). The magnitude of the differences in the means (mean difference = 1.56, 95% Confidence Interval: 0.37 to 2.74) was large (eta squared = 0.178). This means that the null hypothesis that means are equal is rejected. This means that the above results that managed care has had a better than average impact in quality reduction as depicted in Figure 4 above did not come from the same population, since there was a statistically significant differences in scores for low/medium and large hospitals.

As pointed out in Appendix 8, there was no significant difference in scores for low/moderate occupancies (Mean = 5.05, Standard deviation = 1.78) and high occupancies (Mean = 5.53, Standard deviation = 1.92); t (32) = -0.755, p = 0.46 (two-tailed). The magnitude of the differences in the means (mean difference = -0.48, 95% Confidence Interval: -1.78 to 0.82) was small (eta squared = 0.018). This means that the null hypothesis that means are equal cannot be rejected.

5.4.4. The impact of cost containment strategies on quality of care

Respondents were requested to indicate whether cost containment strategies have a positive, negative or no impact on the quality of care in their organisations. A fourth variable, ‘varies’ was added in SPPS in order to accommodate respondents who motivated that the impact varies as part of their responses, and did not select one of the choices given on the questionnaire. The results are presented in Table 16 below.

Table 16: Frequency analysis of the impact of cost containment strategies on quality of care in organisations

Impact	Frequency	Percent
Positive Impact	8	23%
No Impact	11	32%
Negative Impact	12	34%
Varying Impact	4	11%
Total	**35**	**100%**

Due to the spread of responses across all the scales in Table 16, a cross tabulation was performed in order to understand whether there were any differences between the responses based on hospital size, rate of occupancy and province. Appendix 9 points that most of the respondents believed that cost containment strategies have a negative impact on quality, with the highest respondents being based in Gauteng/Western Cape provinces, operating small/medium hospitals and experiencing low/moderate occupancy rates.

5.4.5. Relationship between cost control and quality reduction

The relationship between the impact that managed care has had on controlling healthcare costs and the impact that it had in reducing quality of patient care was investigated using Pearson and Spearman's correlation coefficients. Both correlations were used as it was not possible to establish whether there was a linear or curvilinear relationship between the variables due to the spread of the data points in the Scatterplot (Appendix 9). The results of the correlation are presented in table 17 below.

Table 17: Correlation analysis of the impact of managed care on cost control and quality reduction

	Correlation coefficient	Coefficient of determination	Significant level (2-tailed)	N
Pearson Correlation	-.151	.02	.388	35
Spearman's rho	-.178	.03	.306	35

The above table indicate a weak negative correlation between cost control and quality reduction (r = -.151, rho = -.178), with high impact of cost control associated with lower levels of quality reduction. The results also indicated that the two variables share a small variance, meaning that cost control helps to explain nearly 2% (or 3% on Spearman's rho) of the variance in respondents' scores on quality reduction.

5.5. Do advances in technology have an impact on rising healthcare costs?

The frequency analysis of statements about whether advances in technology have an impact on rising healthcare costs, is presented in Table 18 below. The two last statements were negatively scored in SPP and statements reversed from the original questionnaire in order to reduce bias.

Table 18: Frequency analysis of impact of technology on rising healthcare costs

Item		Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
		5	4	3	2	1
9	Advances in medical technologies increase costs	14	12	6	3	0
13	Newer drugs increase spending (costs)	7	19	6	2	1
R14	Newer technologies do not reduce overall healthcare costs*	4	13	7	9	2
R18	Newer technologies do not reduce admissions and LOS*	7	15	8	5	0

The above table indicates that most of the respondents agreed with all the statements about the impact of technology on rising healthcare expenditures.

Chi-square tests of independence were performed in order to establish whether there were any differences between the statements about the impact of technology on rising healthcare costs and subgroups within each category of hospital size, occupancy rate and province. The Yates Continuity Correlation (measure 'a' in the tables) was used and the Fisher's Exact Probability Test (measure 'b' in the table) was used where there was a violation of the assumption that cells should have expected frequencies of 5 or more.

- The Null Hypothesis (H_o) = there is no significant difference between the subgroups within each category
- The Alternative Hypothesis (H_a) = there is significant differences between the subgroups within each category

The results are presented in Tables 19 and 20 below.

Table 19: Chi-square analysis of the impact of technology on rising healthcare costs: occupancy

By Occupancy		Measure	X^2	Sigma		Signi-ficant?	Phi Coefficient	Asso-ciation
				2-sided	1-sided			
9	Advances in medical technologies increase costs	b	-	1		no	0.066	Small
13	Newer drugs increase spending (costs)	b	-	0.257		no	-0.214	Small
R14	Newer technologies do not reduce overall healthcare costs*	a	0.150	0.699	-	no	-0.081	Small
R18	Newer technologies do not reduce admissions and LOS*	a	0.000	1.000	-	no	-0.101	Small

Table 20: Chi-square analysis of the impact of technology on rising healthcare costs: Size

By Hospital Size		Measure	X^2	Sigma		Signi-ficant?	Phi Coefficient	Asso-ciation
				2-sided	1-sided			
9	Advances in medical technologies increase costs	b	-	1.000	0.557	no	-0.046	Small
13	Newer drugs increase spending (costs)	b	-	0.000	0.000	yes	0.630	Large
R14	Newer technologies do not reduce overall healthcare costs*	a	0.017	0.897	-	no	-0.081	Small
R18	Newer technologies do not reduce admissions and LOS*	b	-	0.721	0.409	no	-0.101	Small

The above tables points that the chi-square test for independence indicated no significant association between hospital size as well as occupancy rate, and the statements about the impact of technology on rising healthcare costs, with exception of the statement about newer drugs increasing spending on prescription drugs. For this statement, the chi-square test for independence (with Fisher's Exact Probability Test) indicated a significant association between hospital size and the statement that newer drugs increase spending, at an alpha level of 0.05. The effect size statistic as measured by phi indicated a large effect, meaning that there is a stronger association between hospital size and the statement that newer drugs increase spending. A cross tabulation of hospital size and this variable (Appendix 10) is points that the majority of small/medium hospitals agreed with the statement that newer drugs increase the spending on prescription drugs, while the majority of large hospitals disagree. As already explained by the phi coefficient of 0.63, this association is strong. Therefore, there are strong differences between hospital sizes with regard to statement.

A further analysis by province did not find any significant differences as measured by Fisher's Exact probability ($p > 0.05$, $n = 35$, phi = -0.182). Majority of respondents in each category of provinces agreed with the statement (Appendix 11).

5.5.1. Drivers of medical costs associated with technology

Respondents were given statements about some of the drivers of technology on rising healthcare costs. Table 21 below presents a frequency analysis of drivers of increases in medical costs associated with technology..

Table 21: Frequency analysis of drivers of increases in medical costs associated with technology

Item		Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
		5	4	3	2	1
10	Advertising and direct marketing of medical products	6	16	6	7	0
11	Doctor demands for new technologies	10	14	5	6	0
12	Patient demands for new technologies	3	10	6	14	2

The above table indicates that most of the respondents agreed with the first two statements, with the mode of 4 respectively. The majority or respondents did not agree with the statement that increase in medical costs associated with technology is a result of patient's demand for new technologies (mode is 2).

Chi-square tests of independence were performed to establish whether there was any relationship between the statement that increase in medical costs associated with technology is a result of patients' demands for new technologies (item 12) and hospital size and occupancy, owing to the fact that most respondents disagreed

with the statement as compared to the other two statements. The Fisher's Exact Probability test ('a') and Yates Continuity Correlation ('b') were used for size and occupancy respectively, for the same reasons as discussed earlier.

The chi-square tests for independence did not find any significant differences as pointed in Table 22 below, p-values > 0.05 and the association is small, as measured by the phi coefficient. Therefore, the null hypothesis that there are no differences cannot be rejected.

Table 22: Chi square test analysis of increase in medical associated with technology is a result of patient demands

	Measure	X^2	Sigma		Signi-ficant?	Phi Coefficient	Asso-ciation
			2-sided	1-sided			
Hospital Size	b	-	0.721	0.409	no	0.101	Small
Occupancy	a	0.295	0.587	-	no	-0.154	Small

Furthermore, most respondents also indicated that costs associated with medical technology should be contained in order to reduce rising healthcare expenditures (Table 23 below).

Table 23: Frequency analysis of the containment of medical technology associated healthcare costs

Item		Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
		5	4	3	2	1
16	Medical technology associated costs should be contained	6	16	2	9	2

5.5.2. Other cost drivers

Respondents were also requested to list some of the factors, beside technology, that drive increasing healthcare costs. As per Appendix 12, most of the respondents mentioned staff costs as one of the cost drivers (driven by shortage of

skilled labour). Hospital operating costs mentioned included energy costs, security, high currency exchange rates as well as other services costs. Other costs listed included population growth, ageing population, patient and doctor preferences.

5.6. Do constraints placed on rising costs associated with technology affect quality in healthcare industry?

Table 24 presents a frequency analysis of the impact that constraints placed on rising costs associated with technology have on quality of care.

Table 24: Frequency analysis of the impact on quality of constraints placed on rising costs associated with technology

Item		Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
		5	4	3	2	1
20	Constraints on use of certain drugs negatively impact quality	1	19	7	7	1
21	Constraints on medical technology affect quality	2	21	5	6	1

Most of the respondents agreed that constrains on the use of certain drugs by the medical administrators have a negative impact on quality (mode = 4), and that constraints placed by managed care organisations on rising costs associated with advances in medical technology negatively affect quality of care in the healthcare industry (mode = 4).

Chi-square tests of independence were performed to establish whether there were any differences among subcategories in relation to the statements about the impact of constraints on rising costs associated with technology on quality of care. The null hypothesis was that there were no significant differences and the analysis

was performed at 0.05 significant level. The results are presented in Table 25 below.

Table 25: Chi-square analysis of the impact of constraints on rising costs associated with technology on quality by hospital size and occupancy

By Size		Measure	X^2	Sigma		Signi-ficant?	Phi Coefficient	Asso-ciation
				2-sided	1-sided			
20	Constraints on use of certain drugs have a negative impact on quality	a	0.431	0.512	-	no	0.171	Small
21	Constraints placed on rising costs associated with technology negatively impact quality	b	-	0.726	0.483	no	0.068	Small
By Occupancy								
20	Constraints on use of certain drugs have a negative impact on quality	a	0.604	0.437	-	no	-0.193	Small
21	Constraints placed on rising costs associated with technology negatively impact quality	a	0.000	1.000	-	no	-0.036	Small

The above table points that the chi-square test for independence indicated no significant association between the two categories (size and occupancy) and the two statements about the impact that constraints placed on rising costs associated with technology have on quality of care. All p-values are greater than the significance value of 0.05 and the effect sizes is small as measured by the phi coefficient.

Furthermore, most respondents agreed that newer technologies result in a reduction in mortality and readmission rates (quality of care) and most of them disagreed with the statement that managed care discourages technology adoption by hospitals. Table 26 below summarises the results.

Table 26: Frequency analysis of additional statements about technology

Item		Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
		5	4	3	2	1
17	Newer technologies reduce mortality and readmissions	5	16	11	3	0
27	Managed care discourage technology adoption	3	12	12	7	1

Chi-square tests for independence were performed to establish whether there were any differences among subgroups in relation to the above two statements. The null hypothesis was that there are no differences, and the alpha level is 0.05. The outcome of the chi-square tests is presented in Table 27 below.

Table 27: Chi-square analysis of additional statements about technology

By Size		X^2	Sigma 2-sided	Signi-ficant?	Phi Coefficient	Asso-ciation
17	Newer technologies reduce mortality and readmissions	0.250	0.617	no	-0.145	Small
27	Managed care discourage technology adoption	2.144	0.143	no	0.307	Medium
By Occupancy						
17	Newer technologies reduce mortality and readmissions	0.225	0.635	no	-0.142	Small
27	Managed care discourage technology adoption	0.377	0.539	no	-0.165	Small

The above table points that the chi-square test for independence indicated no significant association between the two categories (size and occupancy) and the above two statements.

Chapter 6 Discussion of Results

6.1. Introduction

This chapter will answer the research questions as posed in Chapter 3. The previous chapter presented the outcome of the results from the research and Chapter 6 will analyse and interpret these results based on literature review conducted in Chapter 2 as well as the results presented in Chapter 5. This will provide more insight into the research problem, thus giving evidence that it was answered.

6.2. Discussion of the results for research Question 1

Are hospitals under managed care able to contain costs?

6.2.1. Ability of Managed Care in controlling costs

The aim of this question was to understand whether in the views of hospital managers, managed care is able to contain healthcare costs, given rising healthcare costs as discussed in chapter 1 and cost control strategies as discussed in chapter 2. The ability of managed care in controlling costs does have a direct influence on the hospital's ability to proactively manage their costs in order to remain profitable.

The research outcomes pertaining to this question are shown in Tables 9 and 10 in chapter 5. The data analysis in Table 9 showed that the majority of respondents (77%) agreed with the statement that managed care has the ability to control costs,

while and equal number of respondents either disagreeing (11.4%) or being neutral (11.4%). Although eight respondents were neutral/disagreed, at least five of them practice cost control in their organisations as reflected by the drop in the number from eight to three who were either neutral of disagreed with the second and third statements about control of LOS and prescription of generic medication as discussed in the sections that follow.

The analysis in Table 10 also pointed out that there were no statistically significant differences between the respondents in terms of hospital size, occupancy rates and province of employment, with regard to the statement about the ability of managed care in controlling costs. This means that the level of agreement was not influenced by either the size of the hospital, its occupancy rate or its location.

These results contradict an earlier study by Mohaghegh (2007) who concluded that managed care have an average ability to contain costs.

6.2.2. Ability of Hospitals in controlling costs

Hospitals that operate under managed care are expected to manage their costs in line with cost control strategies that are exercised by managed care organisations. Hospitals are therefore required to control length of stay (LOS) and drug utilisation in terms of cost, as part of their cost control measures as discussed below.

6.2.2.1. LOS control

Table 9 pointed out that a significant number of respondents (91.4%) agreed that they do monitor LOS in their organisations in order to contain healthcare costs, as compared to 8.6% who either disagreed (2.9%), or were neutral (5.7%). The high level of agreement among respondents was not influenced by the size of the hospital, its occupancy rate or its location as pointed out in Table 10. The results therefore indicate that hospitals under managed care respond to managed care's cost containment strategy of utilisation reviews by monitoring LOS in order to control costs in their organisations. This is because of the fact that MCOs do monitor utilisation in the form of making decisions about the LOS for patients who are already admitted in hospitals. These findings are in agreement with earlier studies that suggested that utilisation review reduces LOS and therefore costs (Lindrooth et al., 2002; Wickizer et al., 1989), meaning that hospitals do respond to this managed care cost control strategy.

6.2.2.2. Control over cost of drugs

As pointed out in Table 9, all respondents agreed that practitioners (i.e. doctors, specialists and pharmacists) are encouraged to prescribe/dispense generic medication in their organisations, of which 66% strongly agreed. The use of generic medication is encouraged by MCOs who often do not pay for branded products, as a means of encouraging hospitals to control costs. This is also a result of ARMs, which encourages hospitals to become more effective in managing their costs.

6.2.3. Conclusion on research question 1

The above results confirm that there is a general agreement that managed care has the ability to contain healthcare costs. In particular, private hospitals in South Africa do monitor LOS and encourage the prescription of generic medication in order to control costs. These results conflicts a study by Konetzka et al. (2008) who found that managed care has lost its ability to significantly reduce the rate of increase in hospital costs.

6.3. Discussion of the results for research Question 2

Does cost control under managed care have any impact on quality of care?

6.3.1. Quality of care

All respondents agreed that there is an effective process in place to measure quality of care, with 60% strongly agreeing with the statement (Table 14). One can therefore assume that the 40% who did not strongly agree, but agreed with the statement, do have systems, but those systems might not necessarily be effective or in their opinion, they may not address all of their quality requirements. This can also be linked to the fact that some of the respondents do not measure readmission and mortality rates (Appendix 6), which are the most important quality metrics as discussed below.

Appendix 6 shows that all respondents measure patient satisfaction in their organisations and the most frequent tools in use, are questionnaires/checklists,

hand-held electronic devices, telephone interviews as well as patient opinion surveys. However, not all respondents measure readmission and mortality rates, which are also important quality metrics. A total of 34% and 14% of respondents do not measure readmission rates and mortality rates respectively. This can explain the fact that some of the respondents did not strongly agree that they have an effective system in their organisations to measure quality, as discussed above. Despite this, respondents indicated in Appendix 6 that they do measure infection rates, patient slips and falls, general patient incidents and medication errors. It was also interesting that some respondents measure extended LOS as part of their quality metrics. Extended LOS is also a measure of cost as already discussed.

It is clear that most of the respondents have systems in place to measure quality of care. This is an important part of the hospital's ability to continue to serve its patients and given cost control strategies exercised by managed care, it is important that quality is monitored in order to ensure that the impact of those cost control strategies can be measured against the ability of the hospital in providing quality of patient care. This impact of cost control strategies on quality of care is discussed in the sections that follow.

6.3.2. Impact of cost control strategies on quality of care

The following sections discuss the impact of managed care cost control strategies on quality of patient care.

6.3.2.1. Authorisation requirements

The majority of respondents (71%) agreed that the authorisation requirements by medical insurers/administrators could lead to avoidance of necessary procedures (Table 11). This confirms a study by Mays et al. (2004) who noted that requests that are not medically necessary are often discouraged because of the authorisation requirement. However, avoidance of necessary procedures could have a negative impact on patient outcomes. From the response, it appears that the hospital may not be incentivised to request authorisations especially when they had experienced rejections in the past from the medical insurers, despite the fact that the procedures may be medically necessary. In addition, often the medical insurers and not the healthcare provider make the decision about the necessity of the procedure, which could be to the detrimental of the patient, since the physician is expected to have a broader knowledge of the medical condition of the patient and can therefore be expected to make an informed medical decision to perform a procedure.

6.3.2.2. LOS control

Table 11 pointed that 74% of respondents agreed that their patient discharge procedures are sometimes based on available LOS as granted by medical administrators. In addition, an equal number of respondents (77%) agreed that a limit placed by medical administrators on LOS can have a negative impact on patient outcomes, and that limits on LOS can result in patient readmissions for the same diagnosis or complications from previous hospitalisations. From the results, it

can be concluded that LOS as a cost control strategy may have a negative impact on quality, especially when hospitals base their discharge procedures on granted LOS. It is therefore possible that due to cost control pressures hospitals may be induced to discharge patients when the granted LOS has been reached, and this may be done even when the patient is not yet ready for discharge. Consequently, quality may be compromised and even so, the patient may return to the hospital for readmissions or may experience complications from the previous admission, which could also lead to readmission to the hospital, or even worse and increase in mortality rates. Literature review indicates that a limit on LOS can result in readmission rates (Mohaghegh, 2007).

6.3.2.3. Restrictions on drug usage

As per Table 11, the majority of respondents (57%) disagreed with the statement that hospital procurement processes in favour of drug formulary compliance have a negative impact on quality, while 35% were neutral. This means that only a fraction of respondents (11%) agreed with the statement. The responses confirm the earlier result where most respondents agreed that practitioners are encouraged to prescribe or dispense generic medication as a cost control measure (Table 9). This is encouraging as in an effort to control healthcare costs, most hospitals encourage the use of generics, which do not necessarily negatively impact quality of patient care. One of the explanations could be due to the fact that formulary list is researched thoroughly (including research and publication by the University of

Cape Town) and only products, which meet a certain quality standards, are included in the formulary list.

6.3.2.4. Reimbursement limits

Table 11 showed that 77% of respondents agreed that limits on medical aid reimbursements or reductions in reimbursements from medical funders might result in the amount of care for the patient being reduced. However this ratio decline to 57% when respondents indicated that treatment practices are often altered in response to changes in medical aid reimbursements (e.g. from FFS to DRG). This means that although a significant number of respondents agreed that any limit/reduction in reimbursements could result in the reduction of amount of care, some of the respondents (43%) do not actually alter their treatment practices in response to changes in reimbursements, although the majority (57%) do.

These results support earlier studies that found that providers alter treatment practices in response to changes in reimbursements (Hemenway et al., 1990; Hillman et al., 1990; Kessler & McClellan, 1996; Rice, 1983; Santerre, 2002; Yip, 1998). Another study reported an increase in the number of patients discharged in unstable condition as a result of changes in reimbursements (Kosecoff et al., 1990) and another found that physicians spend less time with their capitated patients than with their non-capitated patients (Melichar, 2009). From the analysis of responses, it is clear that the majority of hospitals agree that limits/reductions in reimbursement rates may result in alterations of treatment practices, meaning a reduction in resource utilisation, which may result in a reduction in quality of care.

In addition, the majority or hospitals actually alter practices in response to changes in reimbursements (e.g. from FFS to DRGs). This response by hospitals may have a negative impact on patient outcomes, especially when the amount of care is reduced.

6.3.2.5. Other/General

A significant number of respondents (86%) agreed that medical aid restrictions or rules under managed care do influence the amount of care given to patients, while 9% disagreed and the other 9% were neutral (Table 11). These results are in agreement with an earlier study by Mohaghegh (2007) who found that healthcare plans/restrictions have a better than average influence over treatment and care decisions.

Table 11 shows that the majority of respondents (57%) agreed that the current management care environment results in more emphasis being place on cost control than quality of care. This ratio increased when the respondents were asked to rate the statement that in their organisations, more emphasis is placed on quality of care than cost control. A significant amount of respondents (63%) disagreed with the statement, meaning that in their organisations more emphasis is not placed on quality than cost control. Alternatively, this may be interpreted as meaning that in their organisations, more emphasis is placed on cost control than quality of care. The findings contradict the study by Mohaghegh (2007) who found that respondents put a higher emphasis on the quality of care as compared to cost

containment measures. Further analysis indicated that that was a significant association between the statement that managed care do not emphasise quality of care over cost control and hospital size (Table 13). As per Appendix 4, a significant number of respondents from large hospitals agreed (92%) while only 8% disagreed with the statement. Of the 22 small/medium hospitals, 45% agreed while 55% did not agree with the statement. This means that a majority of large hospitals believe that in their organisations, more emphasis is placed on cost control than quality of care, while the majority of small/medium hospitals disagree.

As pointed out in Table 11, 77% of respondents agreed that managed care often encourages the avoidance of certain procedures or treatments that are not fully funded by medical insurers, due to their high costs. This is in agreement with the view by Simonet (2005a) who suggested that a care provider can be prompted to deny a service to his patient, under managed care arrangements, in order to make savings on costs. However, these findings are not in agreement with the study by Mohaghegh (2007) in which respondents indicated that procedures and treatments are rarely avoided due to their high costs.

6.3.3. Impact of managed care on quality

As discussed in 6.3.2 above, there is a general agreement that managed care cost containment strategies have an impact on quality of patient care. The following sections discuss how quality of patient care is being impacted by managed care cost containment strategies.

Table 14 pointed out there was a spread of responses with regard to the statement that the number of patient complaints increased in their organisation since the introduction of managed care, with 46% of respondents agreeing, 37% disagreeing and 17% being neutral. The majority of respondents who disagreed with the statement were in small/medium hospitals (58%), they were experiencing low/medium occupancies (56%) and we mostly from Gauteng/Western Cape provinces (58%) (Appendix 5). As pointed out in Table 15, further tests did not find any significant association between the increase in the number of patient complaints and hospital size, occupancy and province.

Table 16 shows the frequency analysis of the impact of cost containment strategies on quality of care. Thirty-four percentage of respondents indicated that cost containment strategies has a negative impact on the quality of care in their organisations, as compared to 32% and 23% who indicated that cost containment strategies has no impact and positive impact on quality of care in their organisations respectively. Appendix 9 indicated that most of the respondents believed that cost containment strategies had a negative impact on quality, with the highest respondents being in Gauteng/Western Cape provinces, operating small/medium hospitals and experiencing low/moderate occupancies. The results contradicts a study by Mohaghegh (2007) where there were mixed results in that, 27% of respondents indicated that cost containment strategies had a negative impact on quality as compared to 31% for positive impact and another 27% for no impact.

6.3.4. Relationship between cost control and quality reduction

Figure 3 indicated that managed care has had a better than average impact on controlling healthcare costs (mean = 5.89; Standard deviation = 1.605; median = 6), while Figure 4 indicated that managed care has had a better than average impact in quality reduction (mean = 5.29; Standard deviation = 1.808; median = 5). Further analysis found that there was a statistically significant difference in scores for small/medium hospitals and large hospitals (Appendix 7) with regard to the impact that managed care had in quality reduction. The small/medium hospitals had a mean score of 5.86 meaning that they believed that the impact of managed care on reducing quality was above moderate, while large hospitals believed that the impact was below moderate (mean score of 4.31). This also confirms the results about the impact of cost containment on quality of care in Appendix 9 as discussed above, where most of the small/medium hospitals indicated that cost containment strategies have a negative impact on quality of care in their organisations.

The results of the correlation in Appendix 1 (Scatterplot) and Table 17 indicated a weak negative correlation between cost control and quality reduction. This means that the high impact that managed care has had on controlling healthcare costs, is associated with a lower reduction of quality of patient care, and vice versa, although these two variances share a small variance.

One would have expected a strong positive relationship between these two variables., given the fact that most respondents believe that managed care has the

ability to control costs and that most agree that cost control strategies do have an impact or a negative impact on quality of care. Three points that can be taken form the results are, firstly, although most respondents agree that managed care has the ability to control costs, its impact on controlling healthcare cost is slightly above moderate. Secondly, most respondents agreed that cost containment strategies have a negative impact on quality of care; however, its impact is also slightly above moderate. Thirdly, there is a negative weak correlation between managed care's cost control impact and its quality reduction.

6.3.5. Conclusion for research question 2

The results as discussed in the previous sections give a strong evidence that cost control strategies do have a negative impact on quality of patient care. One deviation was the fact that the use of generics, which is another form of hospital cost containment measures, does not have a negative impact on quality of care. The results also points that small/medium hospitals strongly believe that cost containment strategies have negative impact on quality of care in their organisations and that its impact on quality reduction was more than moderate. Other cost containment strategies such as authorisation requirements, LOS control and re-imbursement limits do have an impact on quality of care. In addition, managed care does place emphasis on cost control than quality of care and respondents also indicated that managed care may result in avoidance of procedures. All respondents do measure quality of care and some of the measures are patient satisfaction, mortality rates, readmission rates as well as other

measures as already discussed. Measuring quality is important as any tightening of costs by managed care may affect quality of care, as the results of this study suggests.

6.4. Discussion of the results for research Question 3

Do advances in technology have an impact on rising healthcare costs?

6.4.1. Drivers of increase in technology demand

Table 18 pointed that 63% of respondents agreed that increase in medical costs associated with technology is a result of advertising and direct marketing of medical products and equipment. In addition, 69% agreed that increase in medical costs associated with technology is a result of doctors' demands for new technologies. These results are in agreement with literature reviewed and earlier studies that found that increase in medical costs associated with technology is a result of market forces (Bodenheimer, 2005b; Civan & Köksal, 2010; Palesh et al., 2010).

However, only 37% of the respondents agreed that increase in medical costs associated with technology is a result of patients' demand for new technologies, thus contradicting the studies cited above. Furthermore, as pointed out in Table 26, 63% of respondents agreed that costs associated with technology should be contained to reduce rising healthcare expenditures, as compared to 31% who disagreed and 6% who were neutral. This contradicts a study by Mohaghegh (2007) where only 30% of respondents agreed with a similar statement.

6.4.2. Technology impact on rising healthcare costs

The results for the impact of technology on rising healthcare costs are presented in Tables 18 to 23. Most of the respondents agreed that advances in medical technology have an impact on rising healthcare costs as discussed below.

Table 18 pointed that a significant number of respondents (74%) agreed that advances in medical technology create major increased in healthcare expenditures, while 9% disagreed and 17% were neutral. This is in agreement with Slade & Anderson (2001) and other scholars such as Bodenheimer (2005b); Civan & Köksal (2010); De Hert (2009) and Esposto (2008) who noted that technological advance is the main driver of growing healthcare expenditure.

The result of the research as presented in Table 18 indicates that 74% of respondents agreed that newer drugs increase spending on prescription drugs, while 9% disagreed and 17% were neutral. These findings supports a recent study by Civan & Köksal (2010), who also found that newer drugs increase the spending on prescription drugs since they are usually more expensive than their predecessors.

A further analysis found that there was a significant association between hospital size and the statement that newer drugs increase spending on prescription drugs (Table 20). Appendix 10 pointed that 21 out of 22 of respondents (95%) from small/medium hospitals agreed with the statement, while 8 out of 13 of

respondents (62%) from large hospitals disagreed. Therefore, there were strong differences between hospital sizes with regard to this statement.

6.4.3. Technology reduce overall healthcare costs

The results as presented in Table 18 showed that 49% of respondents disagreed with the original statement (14) that newer technologies lower the demand for other types of medical services, which causes the overall cost of hospital care to reduce; 31% agreed while 20% were neutral. This means that most respondents (49%) agreed that newer technologies do not reduce overall cost of hospital care by lowering the demand for other types of medical services. In addition, most respondents (63%) disagreed with original statement (18) that newer technologies result in a reduction in hospital admissions and LOS, while 15% agreed and 23% were neutral. This means that most respondents (63%) agree that newer technologies do not reduce costs as measured by hospital admissions and LOS.

The above findings directly contradict a widely held view that new technology reduces overall spending as well as studies conducted in this area (Civan & Köksal, 2010; Duggan & Evans, 2008; Lichtenberg, 2009; Stuart et al., 2009).

6.4.4. Other cost drivers

Appendix 12 presents a bar chart of frequencies of other costs associated with increasing healthcare costs. Staff costs were listed by most respondents as one of the cost drivers, with 46% of respondents listing this factor. This was followed by hospital operating costs such as energy, cleaning, security, at 31%. Twenty six

percent of respondents also mentioned shortage of skilled labour, which include nursing and other medical professionals. The other cost drivers included disease burden (23%), such as HIV and other life style diseases (e.g. diabetes) as well as costs associated with administering managed care (17%). Of particularly to note was the fact that managed care has resulted in the employment of additional staff such as case managers at hospital level. Other cost drivers listed included population growth, ageing population, patient expectations as well as doctor treatment practices.

6.4.5. Conclusion on research question 3

The above results confirm that advances in technology do have an impact on rising healthcare costs. In addition, the results contradict a widely held view that new technologies reduce overall healthcare costs, meaning that new technologies only result in increase in healthcare costs.

6.5. Discussion of the results for research Question 4

Do constraints placed on rising costs associated with technology affect quality in the healthcare industry?

Table 24 pointed that 57% of respondents agreed that constraints on the use of certain drugs by the medical administrators have a negative impact on quality of care. Twenty three percent of respondents disagreed, while twenty percent were neutral. Furthermore, Table 24 pointed that 66% of respondents agreed that constraints placed by managed care organisations on rising costs associated with advances in medical technology negatively affect quality of care in the healthcare

industry; 20% of respondents disagreed while 14% were neutral. These findings are in agreement with a study by Mohaghegh (2007) whereby 50% of respondents agreed that constraints placed on rising costs associated with technology and research and development will have a negative impact on quality in the healthcare industry, while 23% and 27% believed these constraints would have a positive impact and no impact respectively. Further analysis did not find any differences in terms of hospital size and occupancy rates.

In conclusion, the above results confirm that constraints placed on rising costs associated with technology affect quality of care in the healthcare industry.

Chapter 7: Conclusion

The purpose of this chapter is to consolidate the outcomes of this study in line with the research objectives as stated in Chapter 1 and to lead to recommendations for implementation and ideas for future research. The chapter provides a summary of the main findings and conclusion of each research question and this is followed by a list of recommendations to stakeholders and recommendations for future research.

7.1. Research findings

7.1.1. Ability to contain costs

The study found that managed care has the ability to contain costs and that hospital managers control costs by managing LOS and encouraging the prescription of generic medication in their organisations. The study found that the ability of hospitals to control costs is not influenced by either the size of the hospital, its occupancy rate or location. These results indicates that hospitals respond to managed care's cost containment strategy of utilisation management by monitoring LOS and using generic drugs rather than branded names, in an effort to control costs. Therefore, South African private hospitals under managed care have the ability to contain costs.

7.1.2. Cost containment impact on quality

Given the above finding that managed care has the ability to contain costs, it is also evident from results of the current study that this ability to contain costs does have a negative impact on quality of patient care. The use of LOS as a cost control strategy does have a negative impact on quality of patient care. The study found that patient discharge procedures are sometimes based on LOS and that any limit placed by medical administrators on LOS can have a negative impact on quality of care. In addition, limits on medical aid reimbursements or reductions thereof may result in the amount of patient care being reduced. The study found that treatment practices are often altered by hospitals in response to changes in medical aid reimbursements.

Managed care has resulted in an increase in patient complaints for large hospitals that experience high occupancy rates and are from other provinces other than Gauteng or Western Cape. Although further tests performed did not find any significant association between the increase in the number of patient complaints and hospital size, occupancy and province; this area require further investigation as pointed out in the section about further research.

Managed care encourages the avoidance of procedures or treatments that are not fully funded by medical insurers. In addition, the study found that medical aid restrictions or rules do influence the amount of care given to patients.

When asked to indicate what impact cost containment strategies have on quality of care, the majority of respondents indicated that cost containment strategies have a negative impact on quality of care. The study found that the majority of respondents who believe that cost control strategies have a negative impact on quality of care in their organisations were mainly from small/medium hospitals and experienced low/moderate occupancy rates. In addition, the study found that the current managed care environment results in more emphasis being placed on cost control than quality. There was a strong association between the statement that organisations do not place more emphasis on quality of care than cost control. Majority of respondents in large hospitals disagreed with the statement meaning that in their organisations more emphasis is placed on cost control than quality of can, while majority of respondents from small/medium hospitals disagreed with the statement. The differences were statistically significant.

7.1.3. The relationship between cost control and quality reduction

Managed care has had a better than average impact on controlling healthcare costs and a better than average impact in quality reduction. The correlation between cost control and quality reduction was negative, meaning that the high impact that managed care has had on controlling costs is associated with a lower reduction of quality of patient care, and vice versa, although the correlation was weak. The study also found significant differences in mean scores for small/medium hospitals and large hospitals with regard to the impact that managed care has had in reducing quality of patient care. Small/medium hospitals believed

that managed care had has a more than moderate impact in quality reduction as compared to large hospitals who believed that managed care has had a below moderate impact in quality reduction.

7.1.4. Technology and its impact on costs and quality

The increase in costs associated with technology is a result of advertising and direct marketing of medical products and equipment. In addition, the study found that increase in medical costs associated with technology is a result of doctor demands for new technologies but not patient demands for those technologies. Furthermore, the study found that there is a general agreement among hospital managers that costs associated with technology should be contained in order to reduce rising healthcare costs.

When presented with the statement that newer drugs increase spending on prescription drugs, the results showed that a significant number of respondents agreed. The study also found that there was a significant association between hospital size and this statement. A significant number of respondents from small/medium hospitals agreed with the statement, while majority of respondents from large hospitals disagreed.

The study also found that newer technologies do not reduce overall cost of hospital care by lowering the demand for other types of medical services. This contradicts a widely held view that new technology reduces overall spending as discussed in chapter 2.

Finally, the study confirmed that constraints placed on rising costs associated with technology have a negative impact on quality of care. The study found that constraints on the use of certain drugs by the medical administrators have a negative impact on quality of care.

7.2. Recommendations to stakeholders

Hospitals are expected to manage their costs in line with managed care cost containment strategies. It is therefore important that LOS in monitored, given the fact that not all hospitals in the study monitor this important cost control measure. In addition, data should be kept on LOS and compared to quality metrics such as patient satisfaction, readmission and mortality rates over a period of time. A number of respondents also indicated that they do not measure mortality and readmission rates in their organisations. It is important that these quality measures be introduced and monitored, as this will enable hospital managers to measure these against their cost control efforts.

Hospital managers should also continue to request authorisations for procedures, with a doctor motivation as a backup for the request, in order not to avoid procedures that may be necessary for the patients. These requests should be monitored and where the medical aid has declined the requests, these should be regularly compared against readmission rates or patient complaints after discharge. This should also assist medical funders in reassessing their refusal for certain types of procedures. In addition, discharge procedures should not be

placed on available LOS as this may have a negative impact on quality and any refusal by medical funders to extend LOS should be measured against readmissions and mortality rates. Hospital groups when negotiating for reimbursement rates with medical administrators should then use this data.

Furthermore, hospital managers should consider the impact of altering treatment practices on quality of patient care, in response to changes in medical aid reimbursements (e.g. from FFS to DRG). In addition, quality of patient care should be emphasised before cost control, but there should also be a balance so that hospitals continue to remain profitable.

Managed care organisations (MCOs) should also monitor the impact of their cost control strategies on hospitals' ability to provide quality of patient care. The hospital's quality metrics should form part of the decisions regarding reimbursement types and rates. MCOs should encourage new technologies provided they result in better quality of care or they reduce overall healthcare costs.

The pending introduction of the National Health Insurance in South Africa will significantly change the way private hospitals operate. Since the expectation is that models similar to Medicare and Medicaid will be followed, it will be very important that hospitals continue to manage their costs efficiently in anticipation for even a tighter reimbursement system. The management of costs should not override the quality requirement as already discussed, otherwise the objective of the NHI of providing access to quality of care for all will not be realised. Policy makers should

also take into account the impact of any additional cost containment strategies and reimbursements method on the ability of hospitals in providing quality of patient care.

7.3. Further research

A triangular approach is required in order to gain more insight into cost containment strategies adopted by hospitals as well as how hospitals measure these strategies against quality metrics such as patient satisfaction, mortality and readmission rates.

The results of the current study give a strong indication that managed care and South African private hospitals are able to control healthcare costs. More research is required to quantify the differences in cost of patient care between hospitals under managed care and those who operate on a FFS arrangement only.

There was a spread of responses on the question about patient complaints increased since the introduction of managed care, with majority of small/medium hospitals at low/medium occupancies disagreeing with the statement. More research is required to determine factors that influenced the differences in responses between large hospitals that experience high occupancies and small/medium hospitals that experience low/medium occupancies.

Respondents identified a number of other drivers of healthcare costs, the main one being staff costs. More research is required on what strategies are in place in

hospitals to control staff costs. In addition, research is required to establish how those strategies impact quality of care.

This study can be replicated for other participants in the healthcare industry such as doctors who are contracted with managed care organisations. The study can also be expanded to other hospitals that do not belong to the three largest hospitals groups in South Africa, but operate under managed care.

Patient cost and quality data are not publicly available in South Africa, but hospital groups as well as medical administrators do have access to this data. Research is required to compare cost of patient care against quality measures for each hospital, in order to sharply confirm the results of this study.

Finally, further research is required to answer some of the questions that evolved from this study:

- Why are there differences between small/medium hospitals with regard to the impact that managed care has had on reducing quality of care in their organisations?
- Why are small/medium hospitals or low/medium occupancy hospitals believe that cost containment strategies have a negative impact on quality of care, while large hospitals of hospitals with high occupancy differ?
- Why do majority of large hospitals disagrees that newer drugs increase spending on prescription drugs, when small/medium hospitals agree?

7.4. Conclusion

This study confirms that hospitals under managed care have the ability to contain costs, and that cost containment strategies do have a negative impact on quality of patient care. In addition, the study found that advances in technology have an impact on rising costs, and that any constraints placed on costs associated affect quality of care. It is therefore important that a balance is found between cost containment and quality of patient care. Quality of patient care should override any cost containment effort and any negative outcomes from medical funders' rules should be documented and measured over time. The medical administrators should also play an important role in hospital quality measures and not only concentrate on cost control.

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Appendices

Appendix 1: Questionnaire

Universiteit van Pretoria
University of Pretoria

GORDON INSTITUTE OF BUSINESS SCIENCE

RESEARCH SURVEY

COST containment strategies and quality of care within the SOUTH AFRICAN private healthcare industry

Gordon Institute of Business Science (GIBS) - University of Pretoria

Please send me your completed questionnaire to:

modongwaze@gmail.com

Or fax to:

086 688 0290

Introduction

I am doing research on cost containment strategies and quality of care within the South African private healthcare industry. To that end, it will be greatly appreciated if you could find 25 minutes in your schedule to complete the attached questionnaire. This will help us better understand cost containment strategies used by private hospitals and clinics that operate under managed care, and the impact of those strategies on quality of care. Your participation is voluntary and you can withdraw at any time without penalty. Of course, all data will be kept **confidential**. By completing the survey, you indicate that you voluntarily participate in this research. If you have any concerns, please contact me or my supervisor. Our details are provided below.

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Phone: 011 771 4155

In order to ensure that the scheduled constraints are met, please complete and return the questionnaire within TEN (10) days of receipt.

There are four parts to this questionnaire:

(a) Demographic data (required for statistical purposes)
(b) Statements related to healthcare costs and quality of care
(c) Ranking of the impact of managed care on cost and quality
(d) Additional information on cost and quality of care (open-ended questions)

Further, the results of the survey will be used in an aggregated manner and hence, **there is no attention drawn to individual responses.** On request, the respondents will be offered a copy of the results of the research.

Thank you in advance for participating in this research. I truly appreciate your willingness to complete this questionnaire, and assist in this research project.

Best regards
Dennis Marivate

Part 1: Demographic data

Your current position: _____

Province of employment: _____

Number of registered beds in your facility : _____

Current average occupancy rate : _____

Part 2: Statements about healthcare costs and quality of care

Instruction

The following statements describe some of the elements associated with rising healthcare costs and how cost containment strategies exercised by hospitals/clinics and managed care organisations can influence quality of care. Kindly review these statements and indicate, based on your experience, the extent with which you agree or disagree with the statements. Please respond to the statements by placing a cross (X) in the applicable box.

	Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1.	Managed care has the ability to contain healthcare costs.					
2.	Medical aid restrictions/rules under managed care do influence the amount of care given to patients.					
3.	The authorisation requirements by medical insurers/administrators can lead to avoidance of necessary procedures.					
4.	In my organisation, length of stay is monitored and controlled in order to contain healthcare costs.					
5.	Our patients discharge procedures are sometimes based on available length of stay as granted by medical administrators.					

	Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
6.	A limit placed by medical administrators on length of stay, can have a negative impact on patient outcomes (quality of care)					
7.	Limits on length of stay can result in patient readmissions for the same diagnosis or complications from the previous hospitalisation.					
8.	In my organisation, practitioners (doctors, specialists, pharmacists) are encouraged to prescribe/dispense generic medication.					
9.	Advances in medical technology (drugs and equipment) create major increases in healthcare expenditures.					
10.	Increase in medical costs associated with technology is a result of advertising and direct marketing of medical products and equipment.					
11.	Increase in medical costs associated with technology is a result of doctors' demands for new technologies.					
12.	Increase in medical costs associated with technology is a result of patients' demand for new technologies.					
13.	Newer drugs increase the spending on prescription drugs since they are usually more expensive that their predecessors.					
14.	Newer technologies lower the demand for other types of medical services, which causes the overall cost of hospital care to reduce.					

	Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
15.	The current managed care environment results in more emphasis being placed on cost control than quality of care.					
16.	Costs associated with medical technology should be contained to reduce rising healthcare expenditures.					
17.	Newer technologies result in a reduction in mortality and re-admission rates.					
18.	Newer technologies result in reductions in hospital admissions and LOS.					
19.	Hospital/Clinic procurement processes in favour of drug formulary compliance have a negative impact on patient outcomes (quality of care).					
20.	Constraints on the use of certain drugs by the medical administrators (e.g. exclusions of drugs for treatment purposes), have a negative impact on quality of care.					
21.	Constraints placed by managed care organisations, on rising costs associated with advances in medical technology negatively affect quality of care in the healthcare industry.					
22.	The number of patient complaints in my organisation has increased in the last few years, since the introduction of managed care.					

	Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
23.	There is an effective process in place to measure quality of care in my organisation.					
24.	In my organisation, more emphasis is placed on quality of care than cost control.					
25.	Managed care often encourages the avoidance of certain procedures/treatments that are not fully funded by medical insurers, due to their high costs.					
26.	Limits on medical aid reimbursements or reductions in reimbursements from medical funders may result in the amount of care for the patient being reduced.					
27.	Managed care discourages technology adoption by hospitals/clinic.					
28.	Treatment practices are often altered in response to changes in medical aid reimbursements (e.g. from FFS to DRG).					

Part 3: Ranking

29. On a scale from 1 to 10, please rate the impact that you believe managed care has had on controlling healthcare costs (1 = no impact, 5 = moderate impact, 10 = high impact). Please place a cross (x) in the applicable box.

1	2	3	4	5	6	7	8	9	10

30. On a scale from 1 to 10, please rate the impact that you believe that managed care has had in reducing the quality of patient care (1 = no reduction, 5 = moderate reduction, 10 = significant reduction). Please place a cross (x) in the applicable box.

1	2	3	4	5	6	7	8	9	10

Part 4: Additional Information about healthcare costs and quality

31. Besides technology as the potential driver to rising healthcare costs, please list other drivers/factors that you believe drive healthcare costs inflation

32. Do you have a system in place to measure the impact of alternative reimbursement models on your profitability? Please place a cross (x) in the applicable box.

☐ Yes ☐ No

Please motivate your choice

33. Do you currently have a system in place to measure patient satisfaction? Please place a cross (x) in the applicable box.

☐ Yes ☐ No

Kindly list/describe the tools that are in place (e.g. electronic hand-held devices, checklists, questionnaires, e.t.c.)

34. Do you have a system to measure the following quality metrics? Please place a cross (x) in the appropriate column.

	YES	NO
Readmission rates		
Mortality rates		

What other patient related quality metrics (measures) besides patient satisfaction as well as readmission and mortality rates (where applicable), are in place in your organisation *(please limit your answer to 5 measures)*

35. Finally, in your opinion, what effect does cost containment strategies have on the quality of care in your organisation? Please place a cross (x) in the applicable box.

☐ Positive ☐ No impact ☐ Negative

Please motivate your choice

This concludes the questionnaire. I truly appreciate your willingness to complete this questionnaire, and assist in this research project.

Please send me your completed questionnaire to modongwaze@gmail.com

Alternatively, fax to **086 688 0290**

Appendix 2: T-test analysis for managed care cost control for hospital size

Group Statistics

	Hospital size in 2 groups	N	Mean	Std. Deviation	Std. Error Mean
MC Cost Control	<= 2 (Small/Medium)	22	5.77	1.572	.335
	3+ (Large)	13	6.08	1.706	.473

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means	
		F	Sig.	t	df
MC Cost Control	Equal variances assumed	.107	.745	-.536	33
	Equal variances not assumed			-.525	23.654

Independent Samples Test

		t-test for Equality of Means		
		Sig. (2-tailed)	Mean Difference	Std. Error Difference
MC Cost Control	Equal variances assumed	.595	-.304	.567
	Equal variances not assumed	.605	-.304	.580

Independent Samples Test

		t-test for Equality of Means	
		95% Confidence Interval of the Difference	
		Lower	Upper
MC Cost Control	Equal variances assumed	-1.458	.850
	Equal variances not assumed	-1.502	.893

Eta Squared = t^2/((t^2+(N2+N2-2)); t = -0.536, N1=22, N2=13
= 0.009

Appendix 3: T-test analysis for managed care cost control for occupancy

Group Statistics

	Occupancy in 2 groups	N	Mean	Std. Deviation	Std. Error Mean
MC Cost Control	<= 2 (Low/Moderate)	19	5.47	1.679	.385
	3+ (High)	15	6.20	1.265	.327

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means	
		F	Sig.	t	df
MC Cost Control	Equal variances assumed	1.484	.232	-1.391	32
	Equal variances not assumed			-1.438	31.952

Independent Samples Test

		t-test for Equality of Means		
		Sig. (2-tailed)	Mean Difference	Std. Error Difference
MC Cost Control	Equal variances assumed	.174	-.726	.522
	Equal variances not assumed	.160	-.726	.505

Independent Samples Test

		t-test for Equality of Means	
		95% Confidence Interval of the Difference	
		Lower	Upper
MC Cost Control	Equal variances assumed	-1.790	.337
	Equal variances not assumed	-1.755	.302

Eta Squared = t^2/((t^2+(N2+N2-2)); t = -1.391, N1=19, N2=15
= 0.057

Appendix 4: Cross-tabulation of managed care does not emphasise quality over cost control for hospital size

Hospital size in 2 groups * Emphasis is not on Quality than Cost control Crosstabulation

			Emphasis is not on Quality than Cost control		
			Agree	Disagree	Total
Hospital size in 2 groups	<= 2 (Small/Medium)	Count	10	12	22
		% within Hospital size in 2 groups	45.5%	54.5%	100.0%
		% within Emphasis is not on Quality than Cost control	45.5%	92.3%	62.9%
		% of Total	28.6%	34.3%	62.9%
	3+ (Large)	Count	12	1	13
		% within Hospital size in 2 groups	92.3%	7.7%	100.0%
		% within Emphasis is not on Quality than Cost control	54.5%	7.7%	37.1%
		% of Total	34.3%	2.9%	37.1%
Total		Count	22	13	35
		% within Hospital size in 2 groups	62.9%	37.1%	100.0%
		% within Emphasis is not on Quality than Cost control	100.0%	100.0%	100.0%
		% of Total	62.9%	37.1%	100.0%

Appendix 5: Cross tabulation analysis of patient complaints for hospital size, occupancy and province

Hospital size in 2 groups * Patient complaints increased Crosstabulation

			Patient complaints increased		
			Agree	Disagree	Total
Hospital size in 2 groups	<= 2 (Small/Medium)	Count	11	11	22
		% within Hospital size in 2 groups	50.0%	50.0%	100.0%
		% within Patient complaints increased	68.8%	57.9%	62.9%
		% of Total	31.4%	31.4%	62.9%
	3+ (Large)	Count	5	8	13
		% within Hospital size in 2 groups	38.5%	61.5%	100.0%
		% within Patient complaints increased	31.3%	42.1%	37.1%
		% of Total	14.3%	22.9%	37.1%
Total		Count	16	19	35
		% within Hospital size in 2 groups	45.7%	54.3%	100.0%
		% within Patient complaints increased	100.0%	100.0%	100.0%
		% of Total	45.7%	54.3%	100.0%

Occupancy in 2 groups * Patient complaints increased Crosstabulation

			Patient complaints increased		
			Agree	Disagree	Total
Occupancy in 2 groups	<= 2 (Low/Moderate)	Count	9	10	19
		% within Occupancy in 2 groups	47.4%	52.6%	100.0%
		% within Patient complaints increased	56.3%	55.6%	55.9%
		% of Total	26.5%	29.4%	55.9%
	3+ (High)	Count	7	8	15
		% within Occupancy in 2 groups	46.7%	53.3%	100.0%
		% within Patient complaints increased	43.8%	44.4%	44.1%
		% of Total	20.6%	23.5%	44.1%
Total		Count	16	18	34
		% within Occupancy in 2 groups	47.1%	52.9%	100.0%
		% within Patient complaints increased	100.0%	100.0%	100.0%
		% of Total	47.1%	52.9%	100.0%

Provinces in 2 groups * Patient complaints increased Crosstabulation

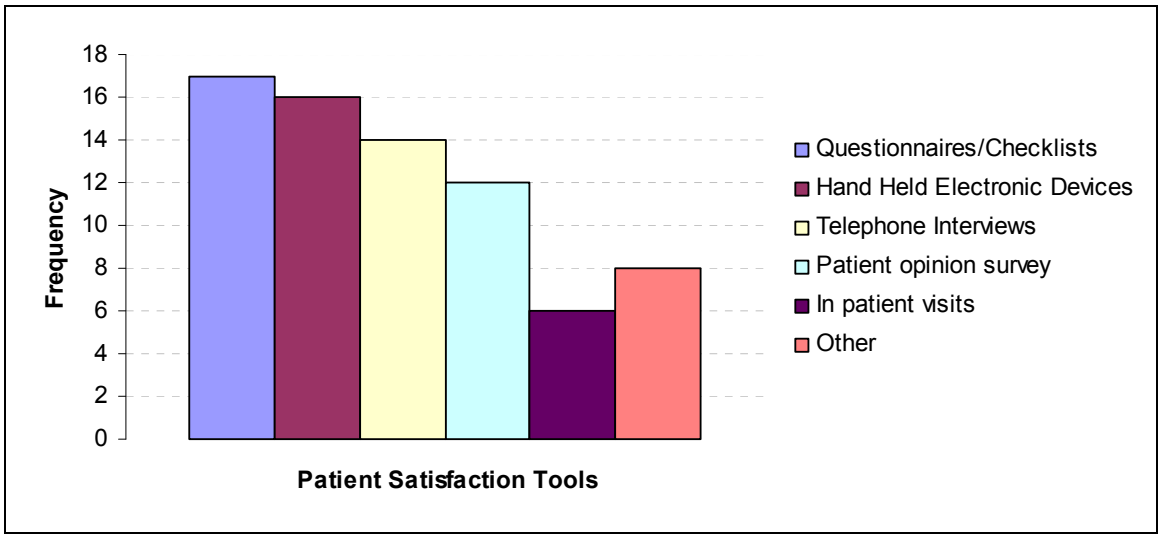
			Patient complaints increased		
			Agree	Disagree	Total
Provinces in 2 groups	<= 2 (Gauteng/Western Cape	Count	11	11	22
		% within Provinces in 2 groups	50.0%	50.0%	100.0%
		% within Patient complaints increased	68.8%	57.9%	62.9%
		% of Total	31.4%	31.4%	62.9%
	3+ (All other provinces)	Count	5	8	13
		% within Provinces in 2 groups	38.5%	61.5%	100.0%
		% within Patient complaints increased	31.3%	42.1%	37.1%
		% of Total	14.3%	22.9%	37.1%
Total		Count	16	19	35
		% within Provinces in 2 groups	45.7%	54.3%	100.0%
		% within Patient complaints increased	100.0%	100.0%	100.0%
		% of Total	45.7%	54.3%	100.0%

Appendix 6: Other Quality measures

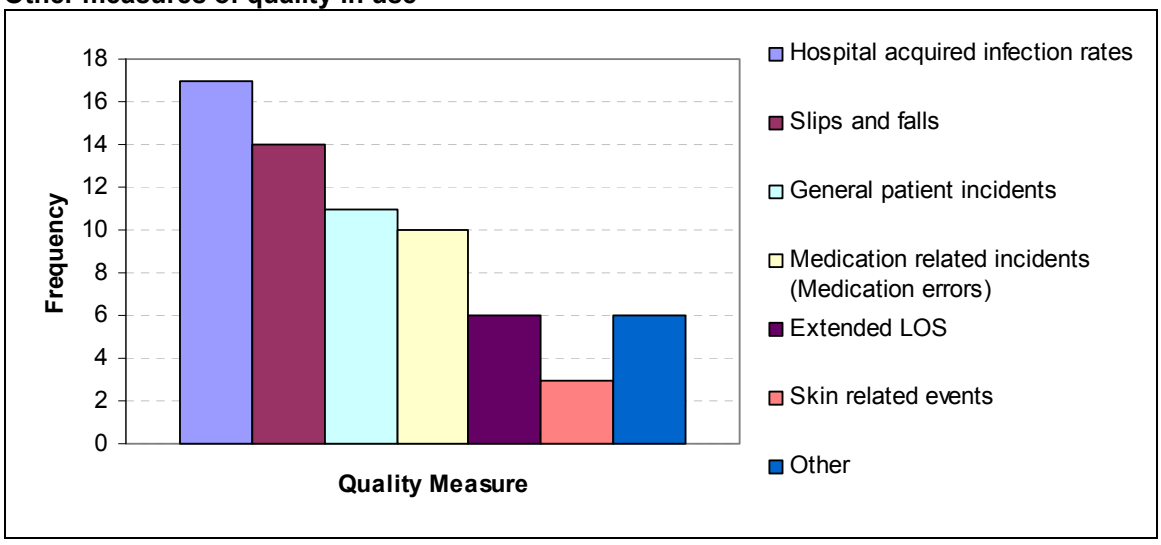
Tabulation of other quality measures

	Patient Satisfaction		Readmission rates		Mortality Rates	
Yes	35	100%	23	66%	30	86%
No	0	0%	12	34%	5	14%
Total	**35**	**100%**	**35**	**100%**	**35**	**100%**

Tools used to measure patient satisfaction



Other measures of quality in use



Appendix 7: T-test analysis for managed care quality reduction for hospital size

Group Statistics

	Hospital size in 2 groups	N	Mean	Std. Deviation	Std. Error Mean
MC Quality Reduction	<= 2 (Small/Medium)	22	5.86	1.807	.385
	3+ (Large)	13	4.31	1.377	.382

Independent Samples Test

		Levene's Test for Equality of Variances	
		F	Sig.
MC Quality Reduction	Equal variances assumed	1.232	.275
	Equal variances not assumed		

Independent Samples Test

		t-test for Equality of Means			
		t	df	Sig. (2-tailed)	Mean Difference
MC Quality Reduction	Equal variances assumed	2.673	33	.012	1.556
	Equal variances not assumed	2.868	30.686	.007	1.556

Independent Samples Test

		t-test for Equality of Means		
		Std. Error Difference	95% Confidence Interval of the Difference	
			Lower	Upper
MC Quality Reduction	Equal variances assumed	.582	.372	2.740
	Equal variances not assumed	.543	.449	2.663

Eta Squared = t^2/((t^2+(N2+N2-2)); t = 2.673, N1=22, N2=13
= 0.178

Appendix 8: T-test analysis for managed care quality reduction for occupancy

Group Statistics

	Occupancy in 2 groups	N	Mean	Std. Deviation	Std. Error Mean
MC Quality Reduction	<= 2 (Low/Moderate)	19	5.05	1.779	.408
	3+ (High)	15	5.53	1.922	.496

Independent Samples Test

		Levene's Test for Equality of Variances	
		F	Sig.
MC Quality Reduction	Equal variances assumed	.183	.672
	Equal variances not assumed		

Independent Samples Test

		t-test for Equality of Means			
		t	df	Sig. (2-tailed)	Mean Difference
MC Quality Reduction	Equal variances assumed	-.755	32	.456	-.481
	Equal variances not assumed	-.748	29.013	.460	-.481

Independent Samples Test

		t-test for Equality of Means		
		Std. Error Difference	95% Confidence Interval of the Difference	
			Lower	Upper
MC Quality Reduction	Equal variances assumed	.637	-1.777	.816
	Equal variances not assumed	.643	-1.795	.833

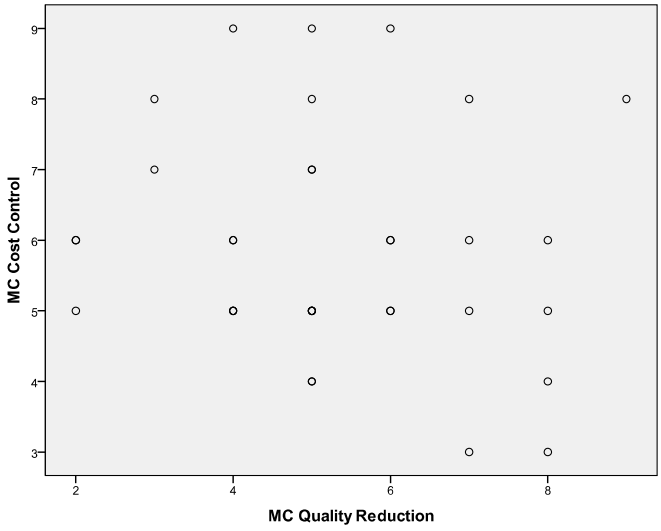
Eta Squared = t^2/((t^2+(N2+N2-2)); t = -0.755, N1=19, N2=15
= 0.018

Appendix 9: Supporting tables and charts for the impact of cost containment strategies on quality of care

Cross-tabulation of the impact of cost containment strategies on quality of care in organisations

Category	Positive	No impact	Negative	Varying	Total
Small/Medium	5	7	8	2	22
Large	3	4	4	2	13
Total Size	**8**	**11**	**12**	**4**	**35**
Low/Moderate	4	4	9	2	19
High	3	7	3	2	15
Total occupancy	**7**	**11**	**12**	**4**	**34**
Gauteng/Western Cape	6	3	11	2	22
Other	2	8	1	2	13
Total provinces	**8**	**11**	**12**	**4**	**35**

Scatterplot of Managed Care cost control impact and Managed Care quality reduction impact



Appendix 10: Cross tabulation of newer drugs increase spending

Cross-tabulation analysis of newer drugs increase spending (costs) on prescription drugs

Hospital Size	Agree	Disagree	Total
Small/Medium	21	1	22
Large	5	8	13
Total	26	9	35

Appendix 11: Cross tabulation and chi-square analysis of newer drugs increase spending on prescription drugs for provinces

Provinces in 2 groups * Newer drugs increase spending Crosstabulation

			Newer drugs increase spending		
			Agree	Disagree	Total
Provinces in 2 groups	<= 2 (Gauteng/Western Cape	Count	15	7	22
		% within Provinces in 2 groups	68.2%	31.8%	100.0%
		% within Newer drugs increase spending	57.7%	77.8%	62.9%
		% of Total	42.9%	20.0%	62.9%
	3+ (All other provinces)	Count	11	2	13
		% within Provinces in 2 groups	84.6%	15.4%	100.0%
		% within Newer drugs increase spending	42.3%	22.2%	37.1%
		% of Total	31.4%	5.7%	37.1%
Total		Count	26	9	35
		% within Provinces in 2 groups	74.3%	25.7%	100.0%
		% within Newer drugs increase spending	100.0%	100.0%	100.0%
		% of Total	74.3%	25.7%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	1.155[a]	1	.282		
Continuity Correction[b]	.455	1	.500		
Likelihood Ratio	1.219	1	.270		
Fisher's Exact Test				.431	.254
Linear-by-Linear Association	1.122	1	.289		
N of Valid Cases	35				

a. 1 cells (25.0%) have expected count less than 5. The minimum expected count is 3.34.

b. Computed only for a 2x2 table

Symmetric Measures

		Value	Approx. Sig.
Nominal by Nominal	Phi	-.182	.282
	Cramer's V	.182	.282
N of Valid Cases		35	

Appendix 12: Other costs associated with increasing healthcare costs

Other costs associated with increasing healthcare costs