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**THE EFFECT OF ORGANISATIONAL STRUCTURE AND
MANAGERIAL PRACTICES ON THE CLINICAL
BEHAVIOUR AND JOB SATISFACTION OF PRIMARY
HEALTH CARE DOCTORS, AS KNOWLEDGE WORKERS,
IN THE MANAGED HEALTH CARE INDUSTRY IN SOUTH
AFRICA**

A THESIS

**For submission to the Graduate School of Business, Faculty of
Commerce, University of Cape Town, for the degree of Doctor of
Philosophy (Business Administration)**

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Supervisor: Professor F.Horwitz

November 2002

DECLARATION

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To Sharlene, Serita, Almira and Jana

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Abstract

Background: The financial crisis in the South African health care industry has forced participants in the industry to look for ways to contain costs. The subsequent deregulation of the private sector has resulted in the introduction and rapid growth of managed health care. This shift to a new paradigm where cost-effectiveness is a prerogative, has major implications for the doctor workforce. Due to concerns about the potential negative impact of this philosophy of health care delivery on the recruitment, retention and motivation of medical doctors, this study investigated the effect of managed care on their clinical performance and job satisfaction.

Methodology: A cross-sectional survey on a probability sample of 2023 general practitioners throughout South Africa was conducted using a mailed questionnaire. Exploratory factor analysis and internal consistency measures were used to assess the instrument's validity and reliability. Univariate, bivariate and multivariate statistical models were used to evaluate the organisational structures and managerial practices associated with managed care, and to assess the impact of these on the clinical freedom and job satisfaction of the respondents.

Results: IPAs and group practices were the predominant practice structures. Although managed care interventions were not used extensively, doctors generally perceived them negatively. Practicing under managed care was also associated with lower perceived clinical freedom and job satisfaction. Regression analysis revealed that practice demographics and managerial practice variables were significant predictors of perceived clinical freedom, while doctor characteristics, organisational structure, practice demographics, managerial practice variables and perceived clinical freedom were important in explaining satisfaction.

Conclusion: Policymakers and administrators should be cognisant of the effects various organisational structures and management interventions may have upon doctor clinical freedom and satisfaction as they consider new approaches to health care organisation. Implications of these findings for management of health care organisations are discussed.

Key Words: managed health care, clinical freedom, job satisfaction, organisational structure, managerial practices, primary health care, knowledge worker

Glossary of Terms and Acronyms

ANOVA: Analysis of Variance. A statistical procedure for testing the effect of one or more treatments on different groups by comparing the variability between groups to the variability within groups.

BHCF: Board of Health Care Funders. A statutory body, which represents the interests of medical schemes. Previously known as the Representative Association of Medical Schemes (RAMS).

Benefit Package: The health services and products offered to a group or individuals by the health plan.

Bivariate Analysis: Statistics derived from the analysis of two variables simultaneously for the purpose of assessing the empirical relationship between them.

Capitation: Fixed fees paid to the provider per member per month, regardless of the services required by the patient.

Chi-square test: A test of statistical significance used to assess whether or not a relationship exists between two categorical variables.

CME: Continuing medical education programs

Community Rating: A system where membership fees are pooled to meet the costs of care for all members regardless of age, income and previous medical history.

Co-payment: The portion of a claim or medical expense that a member must pay out of pocket

CPG: Clinical practice guidelines

Cronbach's Alpha: A reliability index that estimates the internal consistency or homogeneity of a measure composed of several items or subparts.

CSS: Central Statistical Services

Direct contract model: A managed care health plan that contracts directly with doctors in private practice in the community rather than through an intermediary, such as an IPA or a medical group.

Discounted fee-for-service: A system where providers agree to discount their services in return for guaranteed or accelerated payment.

Factor Analysis: A statistical procedure for reducing a large set of variables into a smaller set of variables with common characteristics or underlying dimensions.

Fee-for-service: A method of reimbursement in which health care providers receive payment for each unit of service provided.

Funder: Person or organisation that pays a provider for services rendered to patients.

Gatekeeper: In this model, all care from providers other than the primary care doctor, except for true emergencies, must be authorised by the primary care doctor before rendered. This is a predominant feature of managed health care.

Group model HMO: A health care model involving contracts with doctors organised as a partnership, professional corporation, or other association. The health plan compensates the group, who in turn, compensate its doctors.

Group Practice: three or more doctors who deliver patient care, make joint use of equipment and personnel, and divide income by a prearranged formula.

HDI: Human development index

HMO: Health maintenance organisation. An arrangement between health fund administrators and providers of health care for the purpose of delivering health services to an enrolled population. It places at least some of the providers at risk for medical expenses.

HST: Health Systems Trust.

IPA: Independent practice association. A healthcare model that contracts with an individual practice association entity to provide health care services in return for a negotiated fee. The individual practice association in turn contracts with doctors who provide care to HMO members from their private offices and continue to see their fee-for service patients.

Knowledge Workers: professionally qualified and scientifically trained persons who carry knowledge rather than 'muscle' as a powerful resource.

Managed Health Care: A system of health care delivery that influences utilisation and cost of services and measures performance. The goal is a system that delivers value by giving people access to quality, cost-effective health.

Multiple Regression: A statistical procedure for understanding the simultaneous effects of two or more independent variables on a dependant variable

Network model HMO: A health care model in which the HMO contracts with more than one group practice, which may be single and multi-specialty groups.

Path Analysis: A form of multivariate analysis in which the causal relationships among variables are presented in graphic format.

PCP: Primary care physician. Generally applies to doctors who are general practitioners.

Peer Review: The mechanism used by medical staff to evaluate the quality of total health care provided by medical staff with equivalent training.

PMS: Percentage of maximum possible score

PPO: Preferred provider organisation. A plan that contracts with independent providers at a discount, for services. The panel is limited in size and usually has some type of utilisation review.

Primary health care: Comprehensive care emphasising prevention, early detection and early treatment of conditions. Based on practical, scientifically sound and socially acceptable methods and behaviours made acceptable to communities through their full participation.

Risk Rating: The process of setting member contribution rates based partially, or wholly on previous claims experience for a specific member group.

Risk Pool: A defined account to which revenue and expenses are posted. It is a method of sharing and managing the risk between the providers and funders of health care in a capitation payment system.

Staff Model: A model in which the HMO employs doctors to provide health care to its members.

UNDP: United Nations Development Program.

Univariate Analysis: Statistical procedures for analysing a single variable for purpose of description.

Utilisation Review: The process of evaluating the necessity, appropriateness and efficiency of health care services. Information gathered from patients and health care providers is reviewed to determine whether it meets established guidelines and criteria.

Withhold: The "at risk" portion of a claim that is deducted and withheld by the health plan before payment is made to a participating provider as an incentive for appropriate utilisation and quality of care.

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CHAPTER ONE

Introduction and Background

1.1. Introduction

The legacy of apartheid has left South Africa with a health care system that is highly fragmented, inefficient, inequitable and biased towards curative care and the private sector. The recognition of these ills in the health sector and the emphasis placed on addressing these is the most important principle underlying the government's transformation of the health system. In its belief that every person has the right to achieve optimal health, the ANC has adopted the Primary Health Care Approach as the underlying philosophy for restructuring the health system.

The private sector health care system is characterised by a history of inadequate planning, control and management. The structure of this sector has created incentives, which allowed financial interests to take precedence over the patients' interests, thus detracting from the ultimate goal of "health for all". It is for this reason that the government envisages that the restructuring and change in the ethos of the private sector will enhance its important role in ensuring that equity, access and efficiency objectives are achieved for the health system as a whole.

The subsequent introduction of the managed health care philosophy has altered the traditional boundaries and relationships between the public, health professionals and the financiers of health care. It has introduced business principles to the provision of health care with the aim of improving efficiency and access and reducing the cost of care within this sector. The rise of managed care has been met with trepidation by doctors, many of whom fear that managed care will lower quality of care while reducing their income and autonomy (Warren et al., 1999). Researchers, too, have adopted a similar stance, arguing that managed care has contributed to the deprofessionalisation of doctors by restricting their control over the key factors that define a profession, by threatening doctors' freedom to make everyday decisions about work conditions, and by compromising patient loyalty and trust in doctors (Kletke et al., 1996; Light, 1993; McKinley and Stoeckle, 1989; Stoeckle, 1988).

Provider satisfaction is one of the four crucial outcomes of health care along with patient health status, patient satisfaction, and cost. Dissatisfied providers not only create unstable organisations and bad marketing, they give poorer quality, less efficient and less satisfying (to patients) health care. In addition, there is mounting evidence from a variety of occupations that workers feeling more control over their work are healthier, happier, and more productive (Mullins, 1999). Doctors are no exception, and bureaucratic efforts to micromanage their patient care, or control their staff or work setting, need careful reconsideration.

The key to the success of managed care is the management of doctors' practices and practice styles. The managed care revolution is now well established and this transformation of the medical marketplace has had, and will continue to have major implications for doctors with respect to training, employment, and medical practice. Doctors, as knowledge workers, are a scarce resource and consequently their recruitment, motivation and retention is dependant upon policies, practices and work environments that are commensurate with their value systems. What is important is a working environment that is empowering and enabling to them and favours practices that promote individualism, independence and personal achievement (Drucker, 1989; Handy, 1989).

Few efforts to assess health care delivery systems have used provider evaluations. Doctors have an important perspective on the general operation of health care organisations and the methods used to influence their clinical behaviour. Information collected directly from doctors may provide important information about the extent to which managed care plans facilitate or inhibit the provision of high quality care. The purpose of this research is to assess doctors' perceptions of managed health care and to determine what will influence their commitment to this philosophy of health care delivery. South Africa is an emerging managed care market and consequently there is a paucity of locally based research. Although it is possible to extrapolate findings of research from more mature managed care markets to our local situation, some caution should be used as their economies and societies differ significantly. This study can therefore be considered as pioneering in this context and will therefore make a contribution in the following areas:

- It will provide baseline data for the different variables under investigation in the managed care industry in South Africa.

- It will define organisational structures and managerial practices that facilitate optimum clinical performance and job satisfaction for doctors in the South African context.
- It will provide evidence for the relationship between institutional characteristics and the clinical performance and job satisfaction of doctors in South Africa.

It is hoped that the results of this report can be used to optimise the relationship between managed care organisations, doctors and patients, and in so doing fulfil our desire to maximise the quality of health care while minimising the cost of providing that care.

The structure of the report is as follows;

Chapter one explains the research problem and its relevance to the various stakeholders. It also provides the background to the topic and defines the philosophy of managed health care. The objectives of the research are outlined and the conceptual framework for the study is introduced.

Chapter two presents an extensive review of the literature pertaining to subjects relevant to the research topic. The hypotheses for the study are generated from this review. The role of this research in supplementing the existing work is also discussed.

Chapter three describes the methodology employed for sample identification, data collection and data analysis.

Chapter four presents the results obtained. Findings pertaining to each of the study variables are presented and appropriate relationships between variables are highlighted.

Chapter five provides a detailed analysis and interpretation of the key findings. Assumptions and limitations of the research procedure are defined and areas of future research suggested.

1.2 The Research Problem and its Relevance to Stakeholders in South Africa

Traditionally, the performance of health care organisations was ranked according to rates of death (mortality) and complications (morbidity). Coincident with the growth of managed care, and due in part to the concerns about the potential impact of these cost-saving strategies on health care quality, there has been a dramatic increase in the use of quality monitoring strategies. Organisations develop systems for explicit or implicit reviews (Brook and Cleary, 1996) and consumer groups conduct patient surveys (Cleary and McNeil, 1988). In the United States, the most widely used of these performance measures is the Health Plan Employer and Data Information Set (HEDIS), developed by the National Committee for Quality Assurance, to assess quality, access, patient satisfaction, membership, utilisation, finance and management of different plans (Borowsky et al., 1996).

Ironically, none of these quality assessment activities ask doctors how these organisations contribute to or compromise the delivery of quality medical care. *Why then should the doctor's perspective be added to assess the quality of managed care?* Almost since the beginning of the managed care movement, critics and proponents have debated what the effects of managed care practice would be on doctors engaging in it. Assuming that there will be a trend towards managed care in organised settings, the factors within organisations that relate to job satisfaction and optimal clinical practice of these knowledge workers will become more important.

With their different organisational structures and cost-saving strategies, managed care organisations have the potential to either facilitate or create barriers to the delivery of high quality care. Doctors who are at the front-line of delivering care are in a pivotal position for observing and commenting on practices and policies that facilitate or impede the delivery of high quality care and they also possess unique knowledge, information and perspectives for evaluating the performance of health organisations (Boransky, 1996). Doctors are trained and motivated to treat patients in ways that are appropriate, effective and consistent with standards of high quality care. Because managed care is at odds with the historical roots of the medical profession, it is posited that they are more likely to be responsive to structures and strategies that govern clinical behaviour in ways consistent with their professional norms. This research is an attempt to learn more about doctor perceptions of the factors that affect their ability to provide high quality care. The aim of this investigation is to explore organisational and management process variables that may predict doctor satisfaction and

optimal clinical practice. If doctor satisfaction affects patients, colleagues, and organisations, many stakeholders would benefit from an accurate and comprehensive measurement of this phenomenon. It is hoped that the results obtained will have important practical and theoretical significance for all the relevant stakeholders.

This will ultimately assist managers to ameliorate conditions linked to dissatisfaction, improve doctor and perhaps patient satisfaction, and foster quality care by facilitating good clinical behaviour.

Doctors can use the information when selecting into organisations or provider networks that are consistent with their practice and lifestyle patterns and that afford them maximum clinical autonomy and job satisfaction.

Individual consumers and large purchasers of care will have an extra tool to make better informed choices among alternate systems, one that is based on the views of "their doctor". Patients, who have already developed negative views about managed care, are looking for reassurance that they are receiving the best care under the best possible conditions (La Puma, 1997).

Managed care organisations will be able to identify and retain doctors with the appropriate professional, personal and practice characteristics and who have a willingness to accept their philosophy. They can utilise the data to make internal quality improvements and adopt structures and strategies that most enhance their doctor's clinical practice and job satisfaction - a measure of health organisation effectiveness (Georgiopoulos, 1978).

The government, as a provider of care for the indigent and a purchaser of care for its employees, is looking to managed care to solve the woes of the private sector, and to promote the objectives of their National Health Policy (ANC, 1994). This data could be valuable in terms of encouraging appropriate organisational structures and managerial practices via regulatory mechanisms or financial grants or merely as a major purchaser of health care.

1.3. Background to the Research Problem

1.3.1. Health and Health Care in South Africa

The health of a nation is determined by many factors. Demographic, socio-economic and environmental factors interact with individual and corporate behaviour and health service interventions to result in a particular health profile. Social inequalities in a society can also be expected to be reflected in health status. South Africa, today, remains a land of contrasts between those that have and those that have not, a land where some people have among the best standard of living and good health and access to health services and care and where some have very poor living standards, a great deal of ill health and poor access to health care. Infant and maternal mortality rates - both indices of the health status of a population - are high and the standards of care in some parts of the country are lower than it is in poorer Sub-Saharan countries (HST, 1999).

1.3.1.1 Economic and Social Structure of South Africa

The first census of reintegrated South Africa conducted in 1996, showed a population of forty million, and population growth during the last decade was estimated at 2.04% per annum (HST, 1997). The South African population is highly mobile with over half of the population (53.7%) residing in urban areas. Age distribution showed a young population with nearly half (45%) of the population younger than twenty years of age. However, with the current demographic transition, it is anticipated that the population aged sixty years and over will increase from 6.1% in 1995 to 9.2% in the year 2020 (HST, 1997).

South Africa still has a poor record in terms of social indicators and income inequality. About half (44%) of South Africans are poor. Poverty is to a large extent an African, rural, female and child phenomenon (HST, 1999). Income disparities are captured in the fact that the poorest 40% of the households earn less than 6% of the total income while the richest 10% earn more than half. The average income of the richest 20% of the households is forty five times higher than the income of the poorest 20% (HST, 1997). Increasingly, the income gap is shifting from being race based to being class based. Unemployment in South Africa is a widespread problem with an estimated 33% of the economically active population unemployed (HST, 1999).

Placed in a global context, South Africa has a Human Development Index (HDI)¹ of 0.7 (0.5 in 1980), ranking it seventh in Africa and ninety fifth internationally (UNDP,1996). However, large disparities exist in the HDI for different provinces and the urban - rural divide.

‘Health for all’ requires socio-economic, civic and political rights to become a reality. The socio-economic and developmental indicators reviewed above reflect the challenges faced by policy makers, administrators, business and health care providers, in ensuring accessible, affordable and appropriate health care to all South Africans.

1.3.1.2 Health Sectors in South Africa

South Africa has a two-tier health system characterised by large public and private sectors. These sectors are of equivalent size in terms of overall expenditure, but cover substantially different population sizes, groups and geographic areas.

The public sector serves the indigent population and low-income groups that constitute 82% of the total population numbering thirty three million (Van den Heever, 1998). Public sector primary care services are free for all citizens while the public hospital system is free only for indigent patients with various income - related tariffs applying for the rest. Health services in this sector are funded almost entirely (94%) from general tax revenue and are therefore dependant on the economic growth rate and government fiscal policy (McIntyre, 1995). Total government expenditure for the public health sector amounted to R26.4 billion for the 2000/2001 financial year, or 45% of the total health expenditure (HST, 2000). This reliance on a single source of finance for the majority of the public sector limits the ability of health authorities to restructure health services and respond to the growing needs of the population. In general, the public sector suffers from poor access, bad management, inequitable regional allocations, and poor information and information management systems inherited from the apartheid government.

In the public sector the state owns all the infrastructure and health care personnel are employed on a fixed salary basis. There are approximately 5398 general practitioners (27.4% of total) and 1938 specialists (25% of total) working in the public sector, which serves an estimated 82% of the population. There is also a significant intra and inter provincial

¹ The HDI is a measure of the socio-economic development of countries on a scale of 0-1, with low being < 0.5; medium 0.5 - 0.8; and high > 0.8. It is based on income, education level and life expectancy.

variation in distribution of professionals with most concentrated in the more urbanised provinces (BHCF, 1999).

1.3.2. The Private Health Sector

South Africa's private health industry is large and highly developed, but it is estimated that less than 20% of the population have regular access to this sector (Kinghorn, 1996). High-income earners are the major users of the private sector, as they tend to be members of medical aid schemes and/or holders of medical insurance policies. Some employees have access to services provided by employers or belong to employee benefit funds which cover limited ambulatory care by private practitioners. A small but unknown proportion of the population utilises private practitioners on a direct out-of-pocket payment system.

Private health care professionals and private hospitals provide health care in this sector. In the health professions, enormous disparities exist between the public and private sectors, all in favour of the latter. Approximately 73% of general practitioners and 77% of specialists are employed in this sector. The trend is the same for dentists and pharmacists, with 93% and 76% respectively in the private sector (BHCF, 1999). Once again, there is enormous intra- and inter-provincial variation in the distribution of private health professionals and facilities, all in favour of the more developed, urban, and affluent regions of South Africa.

Total expenditure in the private sector increased from R8.5 billion in 1992 to over R30 billion in 2000, or 55% of total health expenditure. The financing of health care in this sector has predominantly come from medical schemes, which are the principal financial intermediaries in the private sector, accounting for nearly two thirds of total private sector funding (BHCF, 2000).

1.3.2.1. Medical Aid Schemes

A medical aid scheme is a form of health insurance that pays for services received by members and dependants from practitioners of their choice. They are non-profit, pay-as-you-go mutual funds regulated in terms of the Medical Schemes Act (No 72 of 1967), falling within the ambit of the Minister of Health. Members make monthly contributions, with

employers contributing up to 50%. A tax deduction is available to the employer for up to two thirds of his contribution (Van den Heever, 1998).

Private financing of health care expenditure in South Africa is not new. The first medical scheme in South Africa, the De Beers Consolidated Mines Limited Benefit Society was established in 1889. By 1910 seven such schemes were in existence. However, after the Second World War medical schemes proliferated to the stage where by 1960 there were 169 schemes covering 1.5 million persons. Historically, medical schemes served the needs of the urbanised "white" middle class, as it was often a condition of employment and most whites were formally employed. In contrast, 95% of "non-whites" were reliant on public sector services, which were largely free for them (Van den Heever, 1998).

However, since the mid-1980's there has been a steady growth in the number of non-whites being covered by medical schemes. While much of this has been due to rapid upward mobility in this group, the organised labour movement had become active in setting up medical schemes for their members during this period. Although the proportion of African members has increased markedly from 23% in 1990 to 36% in 1995, total membership of medical schemes however, seems to have plateaued out. Currently, only 7.2 million persons are either members or beneficiaries of medical aid schemes. (BHCF, 2000; Soderlund 1998, cited in HST, 1998; Van den Heever, 1998).

1.3.2.2 The Medical Schemes Act

The relationship between medical aid schemes and practitioners in the private sector is governed by statutory legislation, namely the Medical Schemes Act (No.72 of 1967). The key features of the Act, prior to amendment were:

- a) Schemes had to provide benefits for medical, dental and allied services, hospitalisation, and prescribed medicines on a 'fee-for-service' basis.
- b) Specified minimum and maximum benefits were to be provided in respect of services (a) above.
- c) Tariffs payable were determined by a Scale of Benefits as determined by the Representative Association of Medical Schemes (RAMS). RAMS was a

statutory body formed in terms of the Act to represent the interests of medical schemes.

- d) Guaranteed direct payment to private practitioners within four and a half months of service if tariff was according to Scale of Benefits.
- e) Amendments in 1989, allowed schemes to calculate premiums based on risk (health status, age, occupation).
- f) Insurance companies and corporations were precluded from underwriting health care cover

The net effect of this Act created a private sector that was a highly regulated environment, not subjected to normal market forces, with high barriers to entry for funders of health care.

1.3.3. Forces of Change in the Private Health Sector

The major determinants of health lie outside the health care system. Fundamental demographic, political and economic factors, coupled with specific health sector determinants, determine not only the design of, but also the effectiveness of the health care delivery system of any country (Abel-Smith, 1994).

1.3.3.1. Trends in the Macro-environment

The legacy of apartheid has left many inequalities and inefficiencies in the health care system. Gross inequalities exist in the distribution of resources between races, between the public and private sectors, between levels of care and between geographic areas. Recognising the need for the total transformation of the health sector in South Africa, the African National Congress initiated a process of developing an overall National Health Plan based on the Primary Health Care Approach. This involved the complete transformation of the national health care delivery system and all relevant institutions. The restructuring of the private health sector was aimed at enhancing its important role in improving the health of the nation (ANC, 1994).

The current status of the South African economy suggests that less money will be available for health care in the future. This is evidenced by the low economic growth rate, high

inflation, increasing unemployment (SA Reserve Bank, 2001), and the government's tight fiscal policy and broader developmental objectives (Manuel, 2001). The global economic downswing also means that there will be less foreign aid and capital inflow.

Demographic factors, such as population growth amongst the most disadvantaged groups, increasing urbanisation, and the emergence of illnesses such as AIDS - 4.2 million South Africans already infected (HST, 2000) - will continue to burden the public sector to an ever increasing extent.

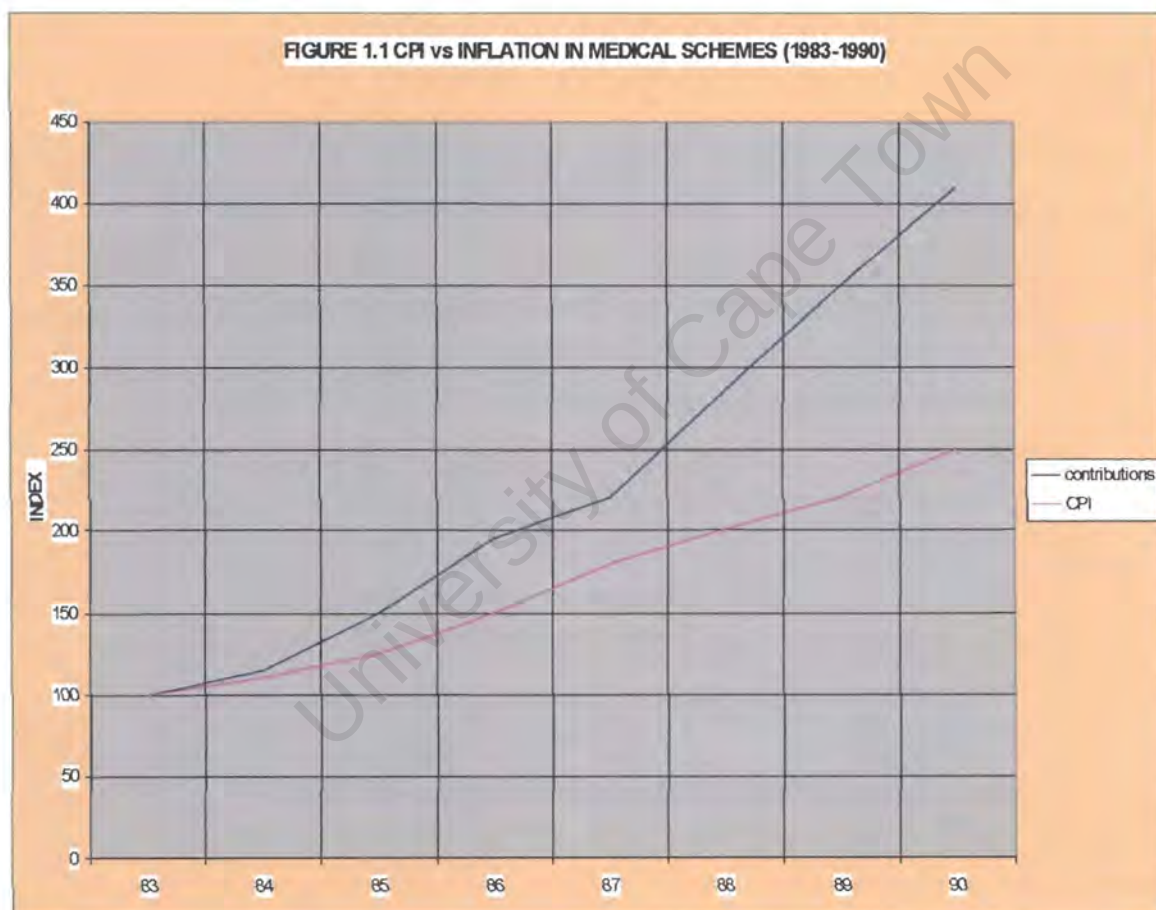
Worldwide, technology is a major factor driving the global medical inflation spiral. This phenomenon is particularly prevalent in the private health sector in South Africa, where modern technology is used by private hospitals to attract health care providers and patients alike. Since most sophisticated medical equipment has to be imported, the devaluation of the rand against most major currencies increases the cost of technology.

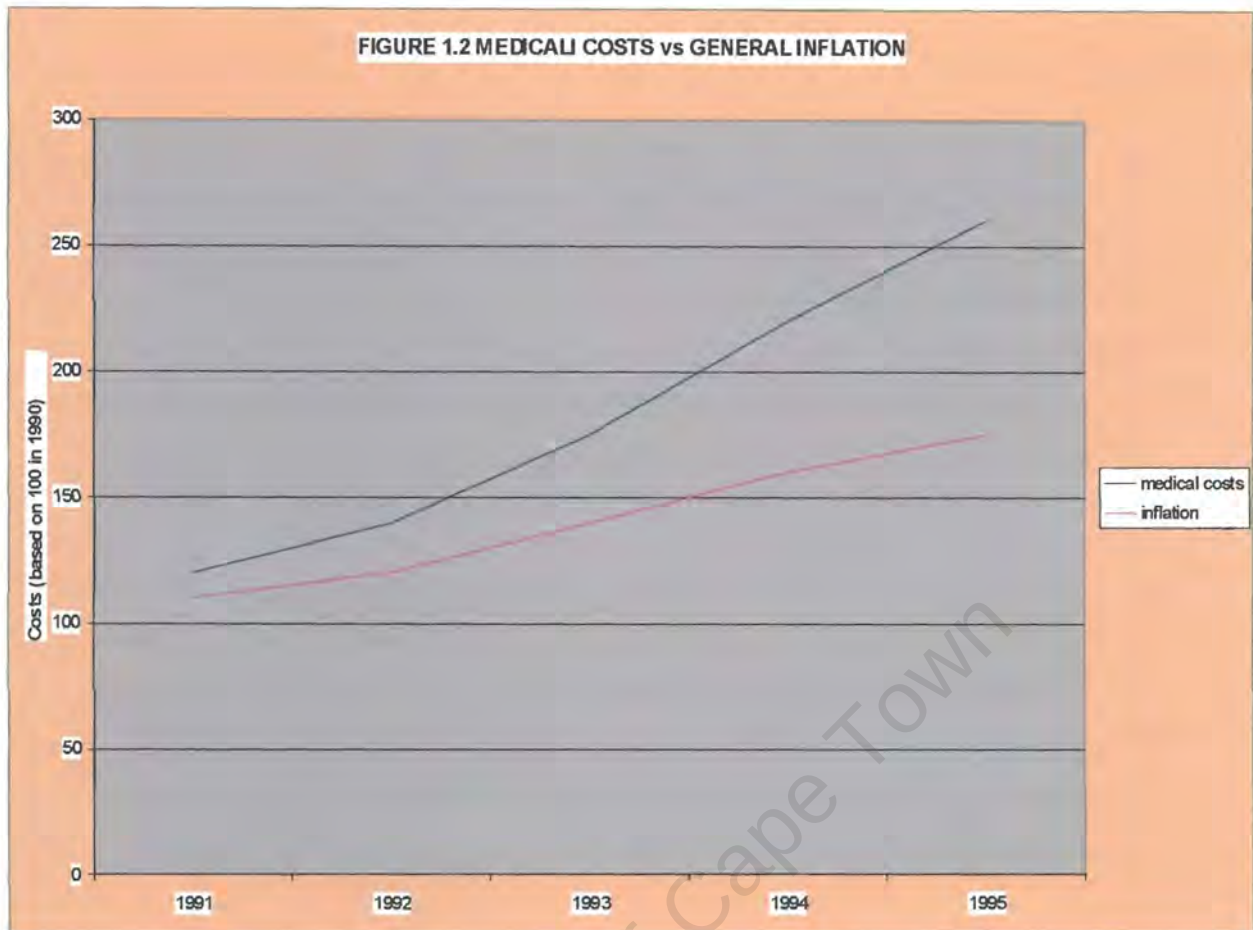
1.3.3.2 Health Sector Determinants

South Africa had one of the most expensive and ineffective health systems in the past regime. In 1992 the country was spending 8.4% of the GDP on health care, amongst the highest in the world. Yet, it was ranked below 60th in terms of 'health status indicators'. This was attributed to the fact that the private sector spent 60% of the expenditure on a beneficiary population of less than 20% of the country's total population (McIntyre et al., 1995). Real per capita health expenditure by population group also varied markedly with the ratio of black to white per capita expenditure being 1: 4,3 in 1987. In the public sector, average per capita expenditure was R159 per patient while for those in the private sector it was R555 per patient (McIntyre, 1990). Further, only 5% of the total expenditure was spent on preventative care (Brown, Commission Report 1986).

The allocation of resources between the private and public sectors also showed marked disparities. Although the private sector is responsible for the needs of less than 20% of the population, it boasts the majority of doctors (73%), specialists (77%) and dentists (93%) (BHCF, 1999). Statistics relating to the number and geographical distribution of hospital beds also indicates a mal-distribution between urban and rural areas. Private sector beds tend to be concentrated in urban areas while the need is greater in rural areas (HST, 1996).

The medical schemes industry has also been characterised by a high cost spiral. Private medical costs have consistently exceeded general inflation by approximately 10% (Figure 1.2). The increased cost of medical cover - 7.1% of average salary in 1982 and 15.2% of average salary in 1992 (CSS, 1993) - led to a reduced enrolment of younger, healthier people, therefore proportionately increasing the number of aged within medical schemes, which carries its own costs. Although subscriptions have consistently exceeded the CPI it has not kept up with expenditure and benefits (Figure 1.1). The cumulative effect of this has impacted on the solvency status of several of the traditional schemes (MASA, 1997).





The high cost spiral within this sector has been partly attributed to the fee-for-service and direct payment system. This system linked volume of work and earnings thus creating incentives for suppliers to oversupply and create demand. Patients, on the other hand, had little incentive to minimise health care expenditure (Bloomberg and Price, 1990). As medical aids and private sector care become unaffordable, an increasing number of people are forced to revert to the already strained public sector for their health care needs.

The preceding discussion clearly highlights the inequities and inefficiencies prevalent in the health sector in South Africa. The public sector is faced with a limited budget and depleted human resources to cover the majority of the population while the private sector, which is larger in terms of overall expenditure, covers a significantly smaller proportion of the population. It is within this context that the government had reached the unavoidable conclusion that the private sector had to play some role in ensuring that equity, access and efficiency objectives are achieved for the health system as a whole (ANC, 1994). In essence, the challenge was to improve efficiency in the resource-draining private sector so as to

relieve pressure from the overburdened, resource poor public sector. The approach taken by the government has been to define a new, highly flexible environment, which leaves the market open for extensive competition but removes from organisations the ability to compete by discriminating against high health risk persons. The only alternatives left to the private market will be to go out of business or to survive through productivity improvements.

1.3.4. The De-regulation of the South African Private Health Sector

As a result of health care expenditure rising consistently faster than overall economic growth, and other demographic, political, and technological factors, it was becoming increasingly difficult for the government to provide the necessary services. This extra burden on the State provides opportunities for the private health sector. The challenge that the private sector faces is to provide care to a larger portion of the population more cost effectively. In order to introduce systems that emphasised and promoted cost awareness by providers and consumers of health care, increased flexibility in the private sector was required.

Legislation aimed at increasing flexibility and reducing costs in the private sector was therefore proposed. To this end the Medical Schemes Act (72 of 1967) has seen many amendments. The last important amendment to the previous legislation took place in 1993 and significantly deregulated the medical schemes industry. The main features of the Medical Schemes Amendment Act (23 of 1993) were:

- The abolition of compulsory direct payment to providers of services
- The abolition of the statutory status of the scale of benefits
- The acquisition by medical schemes of the power to vary benefit levels and structures as they saw fit.
- The acquisition by medical schemes and corporations of the capacity to operate pharmacies, hospitals and other health establishments.

The removal of the scales of benefit and the abolishment of the direct payment system has had many effects. Individual schemes could now negotiate prices with providers, and could also determine levels of co-payment. Members are first required to settle accounts with providers and then claim reimbursement from their schemes, or they are forced to pay a portion of the total bill. This creates a greater awareness of the cost of health, which hopefully will lead to reduced utilisation. Secondly, it allows more effective utilisation review by schemes, as there is a degree of discretion in settling accounts where schemes assess services to have been unnecessary. The abolishment of prescribed benefit levels also allowed greater flexibility in the design of benefit packages. This facilitates the expansion of the medical schemes market, particularly to low income earners and other demographic groupings.

The Medical Schemes Act (131 of 1998), which was implemented on the 1 January 2000, prohibits risk rating and the exclusion from membership on the basis of age, medical history and state of health. In many ways, this is the state's indictment of the manner in which the medical schemes industry had responded to the 1993 amendments to the previous legislation. Benefits offered by medical schemes for the elderly and ailing were greatly diminished as a consequence of the 1993 deregulation. Schemes designed their benefit structures so as to attract the young and healthy and in some cases actively discouraged membership by high-risk individuals and groups through contribution loadings on the basis of risk profile. This resulted in increased demands on public sector hospitals by the elderly and ailing who fell out of the medical system (HST, 2000).

The cumulative effect of these amendments has contributed to the deregulation of the private sector. The entrance of corporations and schemes into the provider arena, has led to the emergence of new entities that either merged the role of health care financiers and providers, or increased the contractual contact between the two groups. This entails a greater health care oversight and management role on the part of the scheme - the advent of managed health care (MHC).

1.4. Managed Health Care

1.4.1. Definition

The definition of managed health care is by no means universally agreed to, but it is usually understood as a means of providing health care services within a defined network of health care providers who are given the responsibility to manage and provide quality and cost effective care. Iglehart (1992), defined managed care "as a system that integrates the financing and delivery of appropriate care by means of contracts with physicians and hospitals that furnish a comprehensive set of health care services to enrolled members usually for a predetermined monthly premium; utilisation and quality controls that contracting providers agree to accept, financial incentives for patients to use the providers and facilities associated with the plan; and the assumption of some financial risk by doctors, thus fundamentally altering their role from serving as agent for the patients' welfare to balancing the patients' needs against the need for cost control".

The Medical Association of South Africa (1992) defined managed care plans "as contractual arrangements which can bring medical fund managers, health care providers and an enrolled population together in such a way that each party has an incentive to keep the enrolled population healthy through the use of the most cost effective medical treatment methods".

The salient point that underpins both these definitions is that funders have increased influence over the provision of health care by applying constraints on the encounters between doctors and patients. In the traditional 'fee-for-service' type medical insurance the patient determines who provides care and the care provider determines the type of care whereas in managed care limits are placed on the panel of providers and criteria are used to determine the appropriateness of care. Although managed care plans vary in their abilities to balance access to care, cost, quality control, benefit design and flexibility, there are certain principles that apply to most.

1.4.2. Principles of Managed Health Care (Kongstvedt, 1997)

- They embrace the concept of primary health care (preventative health) and the primary care doctor who is pre-assigned and responsible for co-ordinating all care and referrals to specialists - the gatekeepers!

- Access to care is restricted by limiting a patient's choice of doctor, specialist, hospital and medication.
- There is a contractual arrangement with doctors regarding volume, price and quality to provide care on an exclusive or non-exclusive basis.
- There is a sharing of financial risk between managed care organisations and the doctor
- Utilisation of medical resources is controlled by various managerial practices including utilisation review and pre-authorisation systems.
- Quality of care is monitored via quality assurance programmes, which include provider credentialing, therapeutic protocols and peer review.

Chapter two provides a critical and in-depth discussion of all of the above principles.

1.4.3 History and development of managed health care

The concept of managed health care has its origins in the United States of America and dates back some 90 years. In 1910, the Western Clinic in Tacoma, Washington, provided a broad range of medical services exclusively through its own providers for a premium payment of \$0,50 per member per month. The programme was available to lumber mill owners and their employees (Fox, 1997).

In 1929, a rural farmers' co-operative in Oklahoma, established a health plan where participating farmers purchased shares of \$50 each to raise capital for a new hospital in return for receiving medical care at a discounted rate. Also in 1929, the Baylor Hospital in Texas agreed to provide some 1500 teachers prepaid care at its hospital, a program which subsequently expanded to include other employees and hospitals.

These three plans marked the beginning of managed care and several prepaid group practice plans started up between 1930 and 1960 despite strong opposition from local medical societies and the American Medical Association, who favoured the fee-for-service underwriting type insurance (Kongstvedt, 1997). Prominent among the plans founded during this period were the Group Health association in Washington DC in 1937, the Kaiser

Permanente Medical Care Program in 1937, and the Health Insurance Plan of greater new York in 1944 - all among the leaders today. The initial impetus for the process came variously from employers, providers seeking patient revenues and customers seeking access to improved and affordable health care.

A variant of the prepaid group practice appeared in 1954 when an Individual Practice Association (IPA) was established in California. This was as a result of the increased competition from the prepaid group practices. Doctors in independent practice were contracted on a fee - for - service basis and also accepted capitation payment, making it the first IPA model managed care organisation.

Since the early 1970's the number of managed care organisations proliferated as a result of the Nixon administration's enactment of the federal Health Maintenance Organisation (HMO) Act of 1973. The promulgation of this Act was in response to the growing health care expenditure, and provided financial incentives and opportunities for start-up plans and stipulated that all employers with more than 25 employees were required to offer their employees the opportunity to enrol in a qualified HMO (Kongstvedt, 1997).

The term health maintenance organisation was coined as a substitute for the term prepaid group practice, principally because it had greater public appeal. It was defined " as an arrangement between health fund administrators and providers of health care for the purpose of delivery of health services to an enrolled population for a prepaid fee" (Kongstvedt, 1997). Although there are many ways of characterising HMO's, five general types describe the majority of current organisations (Welch et al., 1990):

- a) Staff model HMO's, which directly hire their doctors
- b) Group model HMO's, which contract with a single group, usually exclusively.
- c) Network model HMO's, which contract with several groups on a non- exclusive basis.
- d) Independent Practitioners Associations (IPA) which contract with doctors on an individual basis.
- e) Preferred provider organisations (PPO), which contract with doctors on a discounted fee-for-service basis, with the PPO usually not assuming risk.

These definitional distinctions are, however, blurring as organisations constantly undergo a process of hybridisation. With the American government fostering HMO development both through its regulatory processes and also as a purchaser under its employee benefit programme, rapid growth in enrolment ensued, rising from 6.3 million in 1977 to 29.3 million in 1987 and to approximately 56 million in 1995 (Kongstvedt, 1997). Current trends in the USA show that the government is increasingly turning to managed care for the health needs of those who are eligible to receive publicly financed health services - the poor (Medicaid) and the aged (Medicare). This accelerated movement towards managed care has been the crux of current health care reform initiatives in the USA (Fox, 1997), and indeed, in the South African private health sector.

1.4.4. The Performance of Managed Health Care

Managed care has the potential to form an important link between the private sector and the public sector. It can cater for the health care needs of people who are unable to afford a comprehensive medical aid scheme, but because of the income threshold, do not qualify for cover in the public sector. It is possible that managed care systems could be extended to provide services to the public sector in the future.

The South African private health sector has been looking to managed health care to control the unsustainable cost escalation of the last decade and to create access to affordable private health care for more South Africans in lower income groups. Evidence is therefore required on whether managed care plans can contain costs, maintain or improve the quality of care, and contribute to the equity objectives of the National Health Plan.

Evidence from the USA, which has the most experience of MHC, seem to suggest that the introduction of MHC and the application of free market principles may hold benefits (Miller and Luft, 1994; Iglehart, 1992). However, some caution should be used when extrapolating from the USA experience to South Africa, as their economies and societies differ significantly, as may their MHC models.

1.4.4.1. MHC and Cost Containment

The available evidence seems to suggest that MHC principles can have a significant impact on resource use and cost of services for their enrollees. Miller and Luft (1994), in a review of studies dated from 1980 forward into the performance of MHC organisations, noted the following trends:

- MHC had lower hospital admission rates
- MHC had shorter hospital lengths of stay
- MHC had consistently lower hospital days per enrollee compared with fee-for-service
- There was no significant difference in the number of enrollee visits to the MHC doctor relative to the fee-for-service doctor.
- MHC plans used an average of 22% fewer procedures, tests or treatments that were expensive and/or had less costly alternatives
- MHC enrollees were more satisfied with costs compared to the more traditional fee-for-service enrollees.

Luft (1981), who evaluated studies using data through the latter half of 1970, found consistently moderate to large HMO plan differences in hospital admissions (15% to 40% lower), no significant differences in hospital lengths of stay and many fewer hospital days per enrollee - an average of 35% less! Iglehart (1992), on the other hand, found no empirical evidence that managed care plans save money, but reported that in a survey of 2400 employers, 41% agreed that MHC plans were effective in controlling their costs with regard to employee benefits. Steiner and Robinson (1998), also reported a reduction in hospitalisation and the use of high cost discretionary services.

In the local MHC industry, Rothberg et al (1999), have noted marginal savings in medication and primary care costs for two major medical scheme administrators. However, Pillay (2002), in his evaluation of doctors' perceptions of MHC, found that the majority of general practitioners did not believe that MHC held any cost benefits. This is not surprising, given the potential threats that MHC poses to their patient bases and incomes.

1.4.4.2. MHC and Quality of Care

By focusing on cost containment, MHC may create incentives for providers not only to avoid over-treatment but also to under-treat. Where providers' incomes improve when they cut costs (e.g. capitation or bonus systems), they may generate savings at the expense of quality. Limits on patient's choice of provider may also reduce competition for patients and thus quality of care (Kingham, 1996).

American data provide no conclusive evidence of declining quality of care under MHC, and some studies suggest that it may even improve. Miller and Luft (1994), found that MHC enrollees received consistently more preventative tests, procedures and examinations of health promotion activities. MHC and fee-for-service plans also provided enrollees with roughly comparable quality of care, according to process or outcome measures. Similarly, Steiner and Robinson (1998) also found an increase in preventative screening and no difference in clinical outcomes for enrollees of MHC organisations, relative to those belonging to fee-for service plans. Although South African doctors perceive MHC as having a profit motive at the expense of quality (Pillay 2002), Rothberg et al. (1999) found that there were significant improvements in the quality and cost of diabetes management of patients who were members of a local MHC network.

Based on the fact that the quality of care cannot be assumed to be better in the fee-for-service system, as compared with the managed care system, and that cost of care can better be controlled in managed care, the changes in medicine towards increasing numbers of individuals being insured under a managed care system will be inevitable. Admittedly though, cost cutting and not cost-effectiveness may potentially become the focus of MHC plans operating in a deregulated environment. At risk of inferior care, are disadvantaged groups, or those who may be less able to identify poor service or to protest against it. These may include the politically weak and unsophisticated client groups who could potentially form a large proportion of the MHC patient base. Rigorous quality review will therefore be critically important to protect these groups and proponents of MHC argue that peer and utilisation review, quality assurance programs, ongoing medical education and development of optimal treatment protocols can ensure quality (Kingham, 1996).

1.4.4.3. MHC and Equity of Care

In principle, MHC should create access to affordable private health care for more South Africans in lower income groups. In the USA, MHC has lowered out of pocket expenses, which is a major obstacle for poorer people requiring medical care, thus extending medical insurance cover to significant numbers of people previously not covered (Iglehart, 1992; Gold, 1991).

By cutting costs and making private care affordable to people who cannot afford current premiums, MHC may draw patients from the public sector, reducing public sector costs or freeing resources for it to extend care to currently under-served communities. This would have an indirect positive effect on equity (Kinghorn, 1996).

MHC management techniques and expertise may also be used to considerable benefit to increase cost-effectiveness within the public sector. Furthermore, it has been suggested that MHC delivery units within the private and/or public sectors, may be the optimal delivery units under a National Health Insurance-funded or alternative scheme to extend cost-effective, quality health care to more South Africans (Kinghorn, 1996).

Overall, although MHC cannot guarantee to increase equity by extending quality healthcare to many more South Africans, it may well do so. At worst, it is unlikely to exacerbate the disparities and inefficiencies in South African healthcare under the present system.

1.4.5 Ethical Issues in Managed Health Care

The managed care environment is replete with situations that create ethical conflicts for primary care doctors. The most notable areas of concern have been over doctor autonomy, the doctor-patient relationship and patient autonomy.

Managed care plans may restrict the ability of doctors to perform certain procedures or to order certain medications or diagnostic tests. The use of clinical practice guidelines or parameters of care are often mandatory and utilisation review programs are aggressively used to detect what they consider unnecessary or inappropriate practice patterns. Financial incentives are often used to encourage cost conscious treatment decisions and the parsimonious use of resources.

Historically, the patient contracted with the doctor to provide medical care. The doctor's ethical and legal obligations were to the patient. In managed care, an employer or the government contracts with an HMO who in turn contracts with the doctor. The doctor thus has two, at times competing and possibly conflicting loyalties to the patient and the third party- the HMO (Swartz and Brennan, 1996).

Without the commitment that doctors place patients' interests first and act as agents for their patients alone, there is no assurance that the patient's health and well-being will be protected (American Medical Association, 1995). The primary care doctor often has to weigh the legitimacy of a patient's medical need against that of the organisation's need to serve all enrolled patients and control costs.

Managed care also threatens patient autonomy because it curtails patients' freedom of choice. Patients are usually limited in their choice of primary care doctor and, to a much greater degree, specialists. They are also limited in their choice of treatments and may not be able to receive a desired test or referral and their freedom to personally tailor treatment can be thwarted. In addition, continuity of care may be disrupted if a patient is forced for a variety of reasons to change doctors to keep their health benefits.

The American Medical Association (AMA) Council on Ethical and Judicial Affairs (1995), has released a set of guidelines for doctors and organisations that are a first step in incorporating ethical considerations into managed care organisational policies and procedures regarding the provision of care. To avoid ethical dilemmas, it is incumbent upon doctors to attend to each individual patient's needs as appropriate, regardless of the health care delivery system in which the doctor practices. By providing care in a patient centred, cost-effective manner, doctors can feel comfortable that they have their patients' best interest at heart.

1.5 Managed Health Care in South Africa

The South African private sector has been confronted with costs rising at rates well above inflation, increasing financial insecurity and declining membership of medical schemes in the face of increasing premiums (Kinghorn, 1996). This, coupled with the challenge to provide cost-efficient care to a greater proportion of the population, has prompted the

introduction of managed care principles to the private health care market. Regulatory changes have also created an environment that encourages decentralised decision making in relation to price setting and the negotiation of provider contracts.

Just on six years after its introduction, managed care principles and plans are beginning to proliferate. Most of the larger traditional medical schemes have begun with the traditional package of interventions including hospital bill review, utilisation review, hospital pre-authorisation, medical case management and disease management, all with varying degrees of sophistication and performance evaluation (van den Heever, 1998). Medical schemes are also offering their members the choice of the traditional fee-for-service package, or cheaper managed care packages which come with their associated rules and restrictions. In most instances patients still have the freedom to choose a provider, although increasingly, preferred provider networks are being created.

By far, the most prominent HMO model in South Africa is the fee-for-service independent practitioner association (IPA). IPAs exist in most cities and towns and were initially formed by groups of general practitioners as representative bodies to stave off the threat of larger managed care companies or to negotiate with funders such as employer groups and medical schemes. IPAs also tend to aggregate in geographical clusters and form regional umbrella IPAs to co-ordinate the activities of each of the smaller, individual IPAs. For example, the Cape IPA (CIPA) is an association of thirteen IPAs situated in the Western Cape. Each IPA is autonomous and has its own constitution, which conforms to the principle of the CIPA (Brown, 1997).

In September 1995, representatives of all major IPAs agreed to establish a business unit that could serve the interests of all doctors in South Africa. The South African Managed Care Coalition (SAMCC) was formalised in May 1996. It is a non-profit, self funded organisation that represents approximately 4000 practitioners in the private sector and is essentially an advisory, negotiating and administrative body. To date their achievements have included the standardisation of provider contracts, the development of joint ventures with funders, and the development of a national practice database (Dyer, 1997).

Unions such as the South African Clothing and Textile Worker's Union and the Food and Allied Workers Union have traditionally used a network of preferred providers to provide health services to their members and their dependants. This is done on a discounted fee-for-

service basis, usually a fixed amount for services and medicines dispensed. The unions are, however, now in the process of developing their own staff model HMOs to serve their members only.

Although managed care in South Africa is in its infancy, its principles are being widely applied with increasing confidence. It is the responsibility of all stakeholders and role players to build on this foundation and nurture and develop whatever holds promise.

1.4.The Research Approach

1.4.1. Scope and objectives

The expanding role of managed health care has been one of the most profound organisational changes in the South African private sector in the last decade. Managed care organisations, in their various forms, employ a range of interventions to encourage the parsimonious use of health care resources in their quest to achieve their goal of quality care at cost effective rates. Of particular relevance, in evaluating their performance, is determining how they influence the clinical behaviour and job satisfaction of their primary care doctors - the gatekeepers.

Job satisfaction of doctors, per se, has been well studied (Blankenfield et al., 1990; Kerr et al., 1997; Lichtenstein et al., 1984; Linn et al., 1985; Schultz et al., 1992; Williams et al., 1999). However, there is a paucity of empirical research aimed at gauging in a systematic manner how institutional characteristics (organisational structure and managerial practices) in the managed care environment impede or promote optimal clinical practices. This is of particular relevance in the context of South Africa, where managed care is still developing, thus making it more amenable to adopting recommendations based on sound, local research.

The empirical focus of this research involves an in-depth survey of primary health care doctors in the managed health care industry, conducted on a national basis. The overall objective of the research was to ascertain the effect of institutional characteristics on the performance and satisfaction of doctors, as knowledge workers. The more specific objectives were:

- a) To understand sources of satisfaction and dissatisfaction in different settings in order to optimise medical practice arrangements;

- b) To explore managerial practice variables that may predict doctor satisfaction and ultimately assist managers to improve doctor work satisfaction;
- c) To determine how organisational structure influences clinical behaviour of doctors in the managed care environment;
- d) To analyse the effect of the different managerial practices on the clinical behaviour of doctors in the managed care environment;
- e) To elicit individual doctor characteristics most positively related to optimal clinical performance and job satisfaction in the managed care environment.

It is postulated that the different types of managed care organisations employ one or more of the various cost-saving and behaviour change strategies, and what will emerge from this empirical work will be the organisational structure and managerial practices that most facilitate optimal clinical performance and job satisfaction.

The scope of the research includes all primary health care doctors (general practitioners) who are working in the private sector and therefore exposed to the philosophy of managed health care in South Africa. The sample was accessed nationally to include all geographic regions.

1.4.2. The Conceptual Framework and the Research Hypotheses

The conceptual framework for this study and the hypotheses have been derived from the objectives and after extensive review of the literature. They illustrate and specify the anticipated relationships between the variables. The conceptual framework and the hypotheses, as well as the theory and the literature from which they have been generated are discussed in depth in Chapter 2.

1.4.3. Research Methodology

To test the hypotheses, a vigorous methodology was selected that fulfilled all the characteristics of the deductive approach to research (Saunders and Lewis, 1999). The methodology that was ultimately selected was that of a descriptive survey. This is a design with a fair amount of rigour that produces results that have high external validity and reliability, and was achievable given our resource constraints (Leedy, 1993). The survey tool was a specially developed and tested questionnaire, which was mailed and self-administered to a probability sample of primary care doctors selected from a national database. The framework of the study presented in figure 1.5, above, guided the analysis of the data. The research methodology is explained in detail in Chapter 3

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CHAPTER TWO

Literature Review and Generation of Hypotheses

2.1 The Management of Knowledge Workers

2.1.1 Overview

The knowledge era has been described as the economic and social order of the twenty-first century where knowledge is the key resource as opposed to labour, raw materials or capital. According to Drucker (1999), by the end of the 20th century knowledge workers will make up a third or more of the work force in the United States. The vast majority of jobs today require a great deal of formal education and the application of theoretical and analytical knowledge. These jobs pay for knowledge rather than for manual work, whether skilled or unskilled. Knowledge workers are a scarce resource and organisations can no longer rely on the loyalty of these highly skilled and marketable employees (Kinnear and Sutherland, 2000). In South Africa, the problem is exacerbated by the general lack of high-level professional skills in the country, especially among designated groups. As a result, organisations need to understand how employees, and in particular professionals, should be recruited, developed, motivated and rewarded if they are to function effectively and gain competitive advantage.

Consequently the relationship between organisations and employees are transforming and organisations are constantly challenged to adopt innovative approaches and mindsets in their quest to attract, motivate and retain these workers. Doctors are no different and gaining insight into what determines commitment to the goals and aspirations of organisations will assist us to understand their responses to the managed care philosophy. This will, in turn, enable the adoption of appropriate organisational structures and managerial practices.

2.1.2 Knowledge workers - who are they?

Drucker (1989) coined the term 'knowledge worker' and describes these individuals, as employees, who carry knowledge as a powerful resource, which they, rather than the organisation, own. They apply their theoretical and practical understanding of an area of knowledge to produce outcomes that have commercial, social or personal value and are likely to be drawn from a wide variety of professionally qualified and scientifically trained staff. Among them would be doctors, lawyers, scientists, computer specialists, accountants, teachers, and upper middle managers and above (Mullins, 1999). Despres and Hilltop (1995), characterise knowledge workers as having careers that are external to an organisation through years of education, rather than through internal training and career schemes. Their loyalty is therefore to professions, networks and peers rather than to the organisation and its career systems, and it is this characteristic of knowledge workers that differentiates them from other process dominant workers.

Their work can also be distinguished in different ways (Mullins, 1999; Tampoe, 1997). It is:

- Problem oriented as opposed to being task oriented and they are therefore more critical to an organisation's long-term success rather than its short-term efficiencies.
- Carried out to professional rather than to work standards.
- Intrinsically motivational (as opposed to external stimulus), and contributes to knowledge and skill development.
- Not easily supervised, but amenable to self-management.
- Susceptible to many different yet feasible solutions and outcomes.

This supports the view that knowledge workers cannot be managed using conventional management practices. The challenge for managers is therefore to recognise what drives the preferences of knowledge workers in terms of how they want to be managed.

2.1.3 Managing knowledge workers

Organisations who rely on knowledge workers in their business need to establish how to gain their commitment so as to retain them. Loss of knowledge workers to an organisation means loss of both tangible and intangible knowledge and potential competitive advantage (Kinnear and Sutherland, 2000). In order to achieve this, Tampoe (1997) suggested that managers should define and create work climates that are conducive to fulfilling the expectations of these employees. These include:

- Personal growth, especially self development
- Autonomy, which gives them the freedom to work within the rules
- Creative achievement, where the work is intellectually stimulating and not aimed at meeting assigned targets
- Rewards based on personal effort rather than on group effort

Subsequently, Kinnear and Sutherland (2000) have also demonstrated that the broader needs of knowledge workers relate to individualism, independence and personal achievement. Individualism highlights the knowledge workers' focus on individual gain as opposed to collectivism. Independence is related to the knowledge workers' desire to operate in an environment free of constraints to satisfy their individual needs. Similarly, the achievement orientation is based on individual success. These findings supported that of Arnold (1995), who also found that a high locus of control was negatively related to organisational commitment among knowledge workers. They need a great deal of autonomy and discretion in their work environment (Jooste, 1997; Handy, 1989).

Davenport (1999, cited in Chibambo et al., 2000), on the other hand, views knowledge workers as possessing human capital, which they invest in organisations for a certain return on investment. He believes that this is solely what drives the preferences of knowledge workers in terms of how they want to be managed. He describes the components of human capital as:

- **Ability**, their proficiency in a set of activities or forms of work. [This comprises knowledge, skill and talent.
- **Behaviour**, which includes observable ways of acting that contributes to accomplishment of a task
- **Effort**, which refers to the conscious application of mental and physical resources towards a particular end.
- **Time**, which refers to the chronological element of human capital investment.

He quantified their commitment to an organisation as:

$$\text{Total Human Capital Investment} = [\text{Ability} + \text{Behaviour}] \times \text{Effort} \times \text{Time}$$

Clearly, the total commitment of knowledge workers to an organisation is dependant upon retaining their services for a prolonged period in an environment that fosters appropriate behaviour and encourages the utilisation of their abilities for the purpose for which it has been acquired. For organisations to gain maximum benefit from these workers, they need to align corporate needs with individual values.

Drucker (1989) claims that in the knowledge workers' value system, business values are subordinate to, and may even be seen as an obstacle to their performance. Issues like organisational structure, management style and the managerial practices employed are an indication of the values and indeed the culture of an organisation. According to Maheshwari (2000, cited in Chibambo et al., 2000), the facets of an organisation that should prevail in a knowledge worker environment should be empowering and enabling to them. Knowledge workers require flexibility with regard to rules, reporting relationships and work organisation. They generally prefer to work in self - directed autonomous teams. They operate better in less hierarchical environments characterised by flatter organisational structures and multifunctional teams. The structures and strategies should support the responsive and agile organisation in which these knowledge workers prefer to operate.

Attracting, motivating and retaining knowledge workers have also become important in this tight labour market. Knowledge based organisations will therefore need to align their human resource and organisational strategies if they are to remain competitive. Capelli (2001), and Kalra (1997) have argued that retention efforts required a shift from broad based programs to highly targeted initiatives including job customisation, a 'hot skills' premium, and tailoring jobs and locations to individual needs. Consistent with Capelli, Alvesson (2000) and Alvesson and Karreman (2001) also demonstrated that common practices for the motivation and retention of knowledge workers related to work design and reorganisation, a challenging work environment, and a need for personal control. Horwitz et al (2002) have also proposed distinctive 'bundles' of human resource practices for managing knowledge workers, which varied by industry and foreign versus local ownership. Recruitment strategies, and opportunities for career and talent development were important attraction strategies, while freedom to plan work, a challenging work environment and the support of top management were high effective for motivation. The most popular retention strategy was related to compensation, while challenging work assignments and opportunities to develop in specialist fields were also important.

2.2 Organisation Structure of Managed Care Organisations

"Form follows function."

Loius Sullivan, 1890

2.2.1. Overview

Delivery of health services in the South African private sector has increasingly become an organisational, as opposed to an individual process. The expanding role of managed care over the last five years reflects this trend, with greater percentages of doctors being employed by organisations and more consumers looking to organisations rather than individual practitioners for receipt of health services. Changes in the socio-political-economic environment, and developments in medical technology have been major forces in reshaping the delivery of health services. Operating in this complex and dynamic

environment demands for greater organisational responsiveness and accountability, thus making it imperative for health care professionals to understand how organisations work as well as their potential for growth and change. Regardless of which organisational modalities for health care prevail, some may be more effective than others in terms of criteria such as quality, cost, access, patient satisfaction and employee satisfaction. Through organisational research the effectiveness of particular healthcare delivery systems can be more rigorously assessed and compared. Developments in the field of organisation theory can provide guidelines to those charged with the management and provision of care in health service organisations, and a theoretical framework to generate hypotheses, for researchers in the field of health care management.

2.2.2. Organisation Structure

In this study the term organisation structure refers to the basic anatomy of a system, more specifically, to the four commonly considered research dimensions (Shortell, Brown, 1976): (1) hierarchy of authority – the degree to which authority and responsibility are centralized in a few individuals in the organisation; (2) formalization – the degree to which there are specifically designed rules and procedures to follow in carrying out organisational activities; (3) job codification – the degree to which tasks are specifically defined in detail; and (4) division of labour – the degree to which tasks are broken down into their simplest components. Mintzberg (1993), defined organisation structure “as the sum total of the ways in which it divides its’ labour into distinct tasks and then achieves coordination among them”. Thus the organisation structure constitutes the basic problem-solving framework of a system and provides a relatively stable base on which groups and members can rely in performing their respective tasks . They also facilitate behaviour that is both appropriate to the tasks and consistent with the culture of the system (Mintzberg, 1999). Different structures may have negative as well as positive consequences for organisational functioning and performance, and it is the task of empirical research to determine the relationship of the different structural variables to system effectiveness.

2.2.2.1. Classical Organisation Theories

The key organisation design concepts that guide the formal structure of most organisations today were developed by a group of general administrative theorists who worked early in the twentieth century. Most important amongst these theorists were Henri Fayol, a French industrialist and Max Weber, a German sociologist. Their writings have come to be called the “classical concepts of organisation design”.

Fayol, in 1920 (Dressler, 1980), in his “principles of management”, advocated a more centralised, functionally specialised organisation structure in which everyone and everything had a precisely defined place. He popularised terms such as *unity of command* (a subordinate should have a single superior), *scalar chain* (line of command through successive superiors and subordinates), and *span of control* (the number of subordinates reporting to a single superior). He prescribed penalties, close supervision and the subordination of individual interests to those of the firm, in addressing the issue of employee compliance.

Also in the early 1920's Weber (Dressler, 1980) conceived the idea of an ideal or “pure form” of organisation, which he called *bureaucracy*. For Weber, bureaucracy was the most efficient form of organisation, and was a basis for theorising on how work should be done in large complex organisations. He described bureaucracy as having:

- A well-defined hierarchy of authority (vertical communication)
- A clear division of work
- A system of rules covering the rights and duties of position incumbents
- A system of procedures for dealing with the work situation
- Impersonality of interpersonal relationships
- Selection for employment and promotion based on technical competence (high percentage non professionals)

The highly centralised and standardised structures of classical theory had their genesis in a relatively stable, routine and repetitive industrial milieu where efficiency rather than creativity was the rule and where societies were marked by low transience. The employee

was viewed as “an inert instrument performing the tasks assigned to him” and the organisation as “machines that could be laid out in blueprints (organisation charts), designed to provide the most efficient service, and oiled periodically (financial incentives) to keep the human ‘parts’ operating as they were designed to”. They were closed systems, impervious to the environment. They did, however, conform to the description of the “*mechanistic*” structure by Burns and Stalker in 1961 (Dressler, 1980) and the “*machine bureaucracy*” described by Mintzberg (1979). The main thread running through these descriptions is that a structure can be defined as bureaucratic (or mechanistic), to the extent that its behaviour can be predetermined or predictable, in effect, standardised.

2.2.2.2. Contemporary Organisation Theories

The prescriptions of organisation theorists changed as organisations were forced to cope with complex, changing environments and creative entrepreneurial tasks. Empirical research such as the Hawthorne Studies of 1933 and writings by Argyris and McGregor (Dressler, 1980) recognised the employee as an invaluable asset and the organisation structure as a means to encourage compliance by improving their mental health and motivation. They recommended structures in which leadership was participative, decision making was decentralised, jobs varied and management was by objectives as opposed to the line of command or enforcing rules. The efficiency oriented ‘machine structure’ of the classicists was thus replaced by the more adaptive and relatively open structure described by Katz and Khan (Mintzberg, 1993).

Increasingly, research began to demonstrate that the best organisational structures could not be prescribed but were dependant on contextual factors such as the environment, organisational size, technology employed and overall business strategy. Burns and Stalker (in Mintzberg, 1979) showed that organisations in stable, unchanging environments tended to develop more formal and mechanistic structures (Weber’s bureaucracy) while those that had to deal with more complex and dynamic environments developed more adaptive, ‘organic’ structures. The organic structure was characterised by:

1. Decentralisation of decision-making processes
2. Informal operational relationships

3. Tasks are not clearly defined and are flexible
4. Communication is consultative and participative (lateral)
5. Appreciation of employee expertise (high percentage of professionals)
6. Commitment of employee to organisation goals.

These findings supported that of Woodward (1965) who introduced the notion of the contingency theory (Shortell and Kaluzny, 1994). Contingency theorists do not advocate an either or approach but rather view the process as a continuum from more or less bureaucratic (mechanistic) to more or less organic depending on the contextual factors and the contingencies facing each organisation. In effect, organisational effectiveness resulted from a match between situation and structure.

Engel (1968), in her study on the effect of bureaucracy on the professional autonomy of the doctor, conceptualised bureaucracy as consisting of two components, the administrative structure with which Weber deals and the physical structure which included finance and the other physical facilities necessary for effective practice. Based on this premise, she suggested that administrative characteristics limited autonomy and physical characteristics enhanced autonomy by facilitating better service provision. She therefore hypothesised that there had to be an optimal level of bureaucratic organisation with regard to professional autonomy and found that a moderately bureaucratic setting provided the greatest opportunity for autonomy when compared with non-bureaucratic and highly bureaucratic settings. Georgopoulos (1986) also viewed health service organisations as “complex, work performing and problem solving systems that function partly on the basis of programmed activity, authority relations, and bureaucratic procedures and partly on the basis of professional autonomy and discretion, non-programmed communication and co-ordination”. In short they are *mechano-organic* systems and their structures determine which positions on the mechanistic – organic continuum they occupy. Thus the contingency perspective appears to have wide application to health service organisations and is therefore drawn on in this study.

2.2.2.3. Mechanistic versus Organic Systems

An organisation's formal structure is best represented in the form of an organisation chart, its' main objectives being to assist in the creation of an effective and efficient organisation and to reflect its core functions. Vertical differentiation establishes the hierarchy of authority and the number of levels while horizontal differentiation is used to illustrate the separation of tasks and the span of control. Mechanistic organisations (Fig. 2.1) tend to have tall structures. This results from extreme differentiation and specialization of numerous and varied departments and the consequent need for limited spans of control. Organic organisations, on the other hand tend to have flat structures (Fig. 2.2) as employees are professionalised and highly trained (as in health service organisations) and require less supervision, which permits wider spans of control.

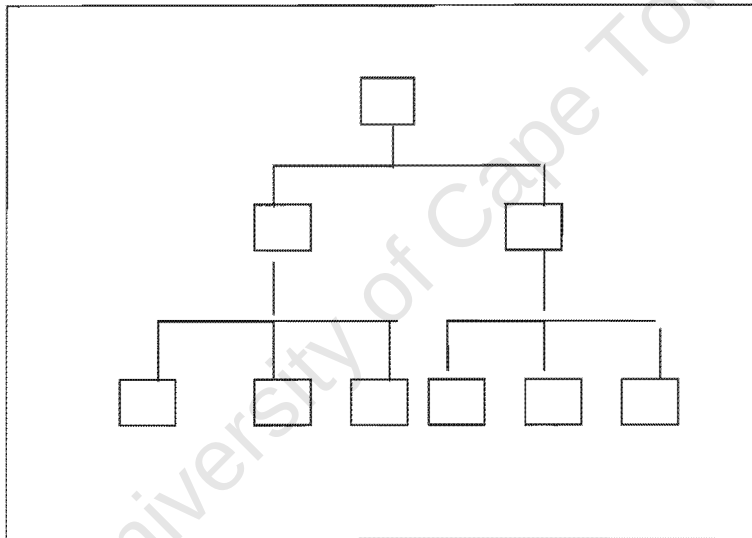


Fig. 2.1. Mechanistic structure

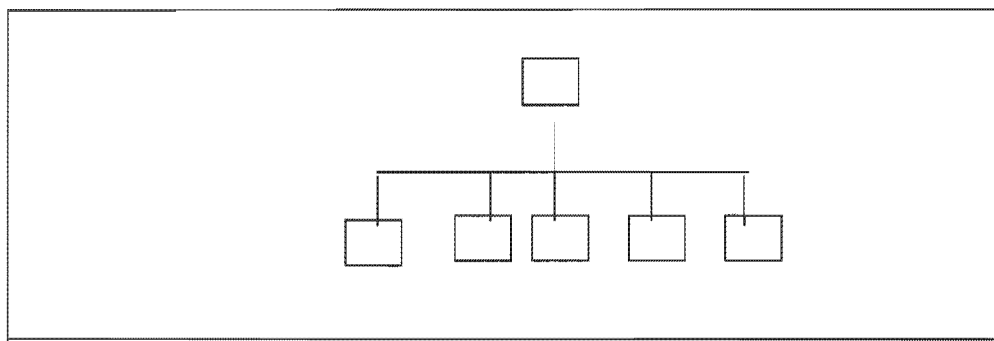


Figure 2.2. Organic Structure

The mechanistic form with its rigidly departmented structures and top-down chain of command face significant problems of coordination across departments. It is effective in stable, predictable circumstances, but is at a distinct disadvantage when flexibility to changing circumstances is more important. The organic design is flexible and adaptable to changing environmental demands because its design encourages greater utilisation of human potential and communications flow throughout the organisation and not only down the chain of command (Rakich and Longest, 1992). Early studies by Worthy in 1950, and Porter and Lawler in 1964 (Dressler, 1980) also suggested that employees in taller more mechanistic organisations tended to have lower staff morale. They attributed this to man's inherent propensity to resist formalisation and impersonalisation, factors that limit the functioning of individuals within organisations. More recently, researchers (Linn et al., 1985; Schulz and Schulz, 1988; Barr, 1995) have found negative associations between hospital size and complexity and physician satisfaction.

Health service organisations (HSO's) may be viewed as organisations within which a very complex set of work processes is carried out in order to bring about certain outcomes for patients. Increasing environmental volatility (patient and third party payer demands) calls for an organisation structure that pushes responsibility, resources and accountability as close to the market as possible (Shortell and Kaluzny, 1994). Thus the theory on organisations, and on the management of knowledge workers prompts us to posit that HSOs with structural arrangements that support professional autonomy and encourage personal growth and responsibility will be more effective. We therefore anticipate that managed care organisations on the organic end of the mechanistic – organic continuum will tend to facilitate greater clinical freedom and lead to more job satisfaction among their primary care doctors.

2.2.2.4 Managed Care Organisation Models

The vehicle for the provision of managed health care is the *health maintenance organisation* (HMO), which combines the delivery and financing of health care within one organised system. In general the HMO develops and markets the plan to payers, sets benefits and premiums, contracts with doctors to deliver the care, and monitors that care. Luft (1980)

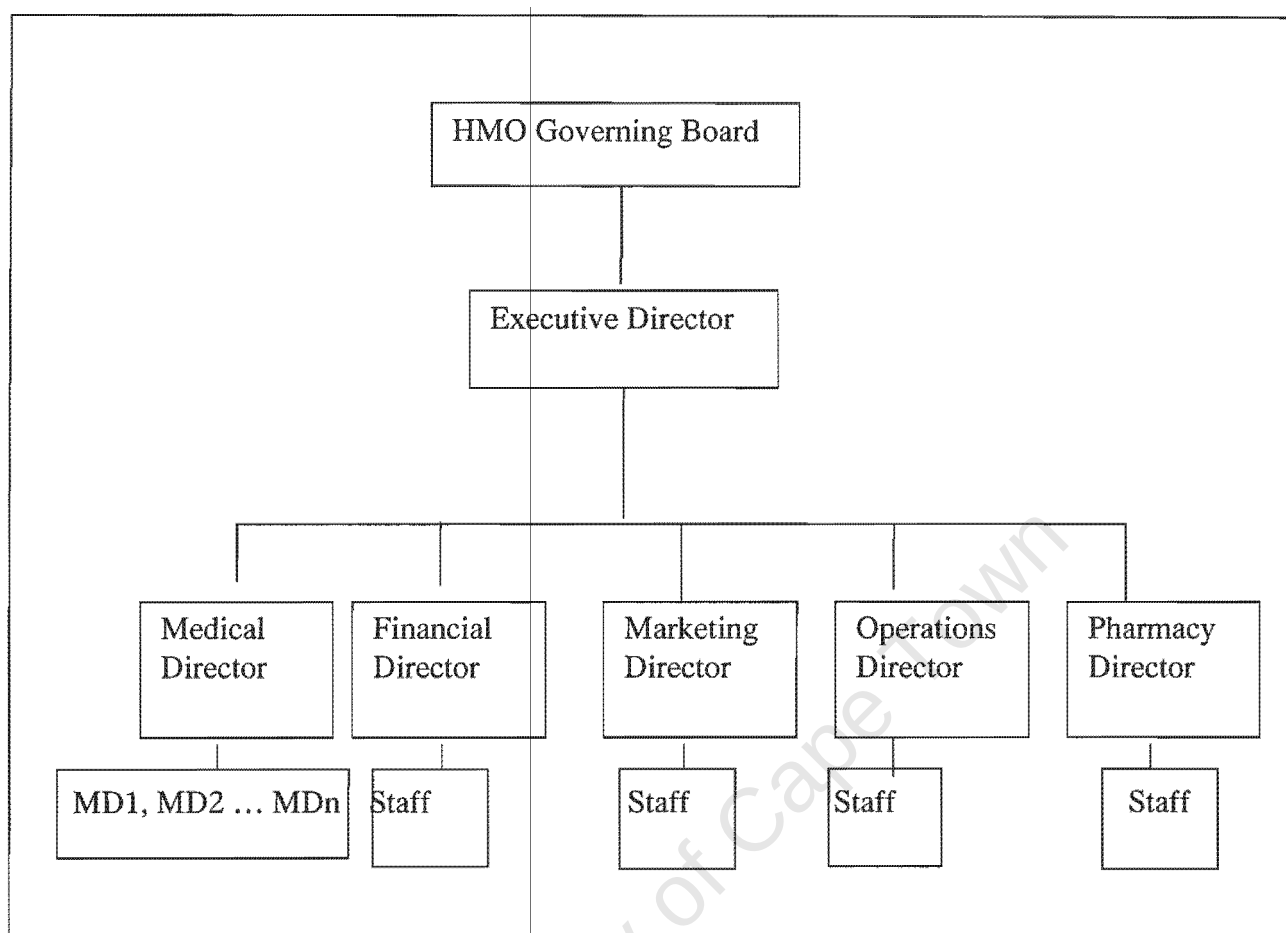
pointed out five major characteristics distinguishing HMOs generally from other health care delivery systems:

1. The HMO assumes a contractual responsibility to provide or insure the delivery of a stated range of health services.
2. The HMO services an enrolled, defined population.
3. The HMO has a voluntary enrolment of subscribers.
4. The HMO has a responsibility to deliver care within a fixed budget.
5. The HMO assumes at least part of the financial risk and/or gain in the provision of services.

The organisations and arrangements that meet this definition run a wide gamut and although there are many ways of characterising managed care organisations, six general types describe the majority of current health maintenance organisations (Welch 1990): (a) staff – model HMOs; (b) group – model HMOs; (c) network model HMOs; (d) independent practice associations; (e) preferred provider organisations and (f) direct contract model. The major differences among these models pertain to the relationship between the HMO and the primary care doctor.

2.2.2.4. (a) Staff–model HMO

In this model the HMO owns the health care facility and primary care doctors are employed to provide care to the covered beneficiaries. The doctors are typically paid on a salary basis and may also receive bonus or incentive payments that are based on their performance and productivity. They are also subject to internal policies regarding leave, continuing medical education and peer review (Kongstvedt, 1997). Management tightly controls the kind and amount of care received by enrolled patients by carefully selecting the numbers and types of doctors in their panels and by enforcing management reporting (Iglehart, 1992). Fig. 2.3 is an example of an organisation chart for a staff model HMO.



MD = primary care physician

Fig. 2.3. Organisation structure of a staff model HMO (Shouldice 1998)

The governing board sets policy and evaluates overall policy while the executive director (CEO) is responsible for all the operational aspects of the plan. The medical director usually has responsibility for provider relations, provider recruiting, quality management, utilization review and the development and implementation of policies related to medical services. The primary care physician (PCP) is a general practitioner who serves as the entry point of the system – the gatekeeper. He is responsible for the diagnosis and management of patients as per protocols approved by the medical director and may refer patients to contracted specialists. The various aspects of patient care *viz a viz* administrative, nursing, special investigations and other support functions are co-ordinated by the different departments. The

PCP reports to the medical director who in turn reports directly to the CEO or the governing board.

From a management perspective, staff model HMOs can have an advantage relative to other HMO models because they have a greater degree of control over the practice patterns of their doctors. Consequently they are able to better manage and control the utilization of health facilities. Far greater economies of scale are also achievable and they also offer the convenience of one-stop shopping for their members as the HMO's facilities tend to be full service (ie. laboratories, radiology, and other departments).

However, the disadvantages include the high capital requirement to build and sustain these HMO models due to high fixed costs, the limited choice of participating doctors and the inherent productivity problems associated with a larger staff complement and fewer financial incentives. Patients may also perceive the idea of a clinic setting as being uncomfortable.

2.2.2.4 (b) Group – model HMO

A group practice (Fig. 2.4) is a separate legal and fiscal entity from the HMO. The doctors within the group can be organised as a partnership, professional corporation or other association, and each has a clear proprietary interest in the success or failure of the group. Group practices can be single or multi-specialty practices and facilities, equipment, accounting systems and supporting staff are normally shared (Veliotes et al., 1993).

The HMO contracts with the group practice to provide part or all of the clinical services to an enrolled population. The plan compensates the group for contracted services at a negotiated rate and that group is responsible for compensating its primary care doctors. Remuneration could be by way of salary, dividend or profit share, depending on the way in which the entity is constituted.

Group models can be captive groups, which cater exclusively for the beneficiaries of the HMO, or independent groups in which participating doctors are free to see non-HMO members and private patients. Both types of group model HMOs share the advantages of staff model HMOs, making it somewhat easier to conduct utilisation management because of the integration of doctor practices. They also provide a broad range of services at their

facilities. In addition, group practices may have lower capital needs than staff model HMOs because they do not have the burden of large fixed salary costs associated with staff-model HMOs.

The disadvantages of group model HMOs also include the restriction in the choice of doctors and limited geographic access resulting from the limited number of locations of the participating medical groups.

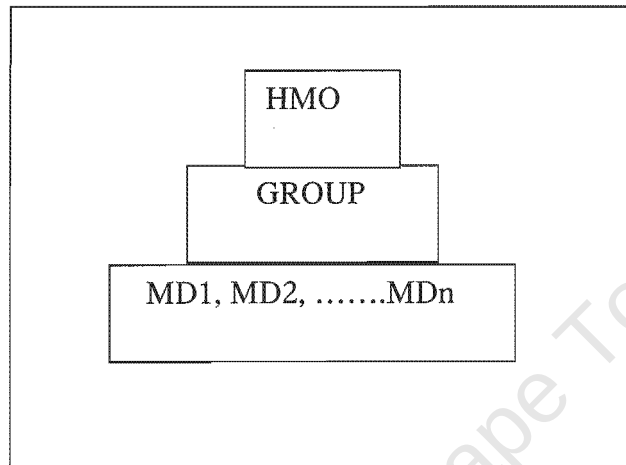


Figure 2.4. A Group model HMO

2.2.2.4 (c) The Independent Practice Association

The independent practice association (IPA) is a loose federation of independent, individual doctors who contract with a third party HMO to provide services for a negotiated fee (Shenkin, 1995). These doctors maintain their own consulting rooms, medical records and support staff and continue to see non-HMO patients. IPA's often have contracts with more than one HMO on a nonexclusive basis (unmarried – Fig. 2.5a) but may sometimes be formed to exclusively serve the enrollees of a specific HMO (married – Fig. 2.5b). Most HMOs compensate their IPAs on an all-inclusive basis to provide services to the HMO's members. The IPA then compensates its participating doctors on either a fee-for-service or a combination of fee-for-service and capitation

The IPAs require little capital to establish and operate. They can provide a broad choice of participating doctors who practice in their private consulting rooms and it creates an organised forum to negotiate as a group. The process of utilization management is also

generally more difficult in an IPA because doctors remain individual practitioners with little sense of being part of an HMO (Kongstvedt, 1997).

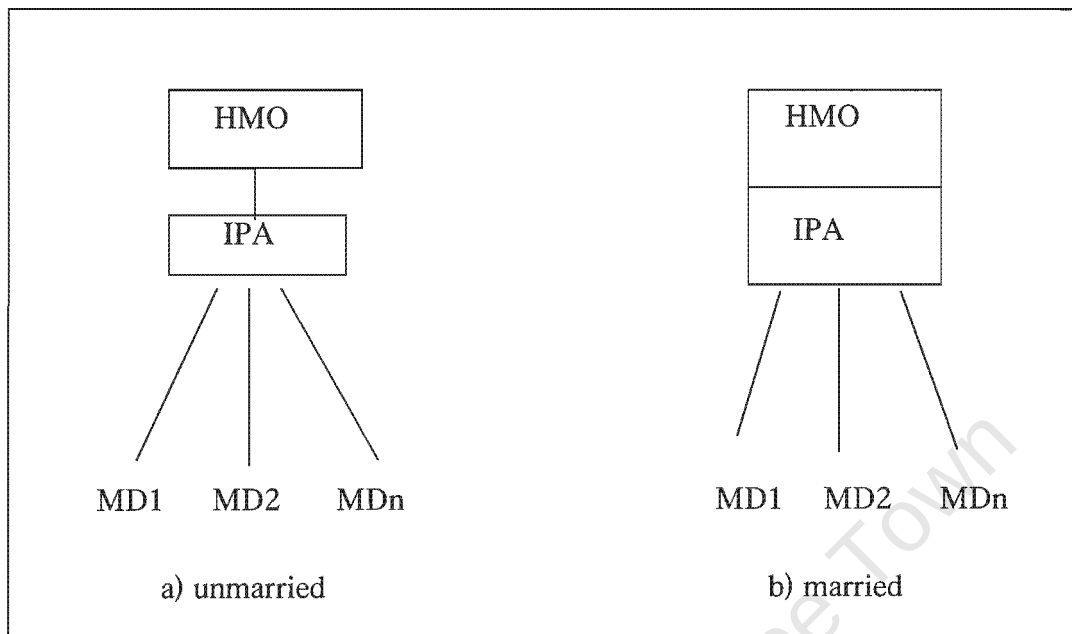


Figure 2.5. Independent Practitioner Associations

2.2.2.4. (d) Network model HMOs

The network model HMO uses group and IPA models as its building blocks. It develops when groups of doctors coalesce with other groups and some individual practitioners to provide health care services to a health maintenance organisation (Burns and Wholey, 1999). These groups may be broad based, multi-specialty groups or several small groups of primary care doctors. Typically the HMO compensates these groups on an all inclusive capitation basis and the group is then financially responsible for reimbursing other doctors, specialists or hospitals for referrals that it makes,

The network model offers patients a far broader choice of doctors over a larger geographical area.

2.2.2.4 (e) Preferred Provider Organisations (PPOs)

PPOs are entities through which employer health benefit plans and health insurance carriers contract to purchase health care services for covered beneficiaries from a selected network or panel of participating doctors (Kongstvedt, 1997). These doctors are referred to as preferred providers and may be practising either individually or in groups. Typically, participating doctors in PPOs agree to abide by utilization management and other procedures implemented by the PPO and agree to accept the PPO's reimbursement structure and payment levels, usually on a discounted fee for service basis.

The beneficiaries of PPOs are given incentives to use participating providers, but unlike other traditional HMOs, they are permitted to use non-PPO providers. Higher levels of co-payments routinely apply for services provided by these non-participating providers. When organisations restrict their beneficiaries to participating providers, they are termed exclusive provider organisations.

2.2.2.4 (e) Direct contract model

In this model the HMO contracts directly with the individual practitioners to provide medical services to their members (Kongstvedt, 1997). In most cases practitioners are free to see non-HMO patients and private patients. Remuneration is usually on a fee-for-service basis or on a capitation basis.

Contracting directly with individual practitioners eliminates the potential for doctors to negotiate collectively and can therefore place them at a disadvantage.

2.2.2.5. Managed Care Organisational Trends

From the preceding descriptions, it can be seen that the typology of HMOs form an organisational spectrum, stretching from isolated individual practitioners without group relations to doctors amalgamated into a large bureaucratic scheme without practice autonomy. As one progresses from one end of the continuum to the other, one adds new and greater elements of control and accountability. One tends to increase both size and the

complexity of the plan, thus achieving greater potential for control of resource utilization and quality monitoring (Newhouse,2002). In short one moves from a relatively organic to a relatively more mechanistic organisation. Fig. 2.6 illustrates this continuum.

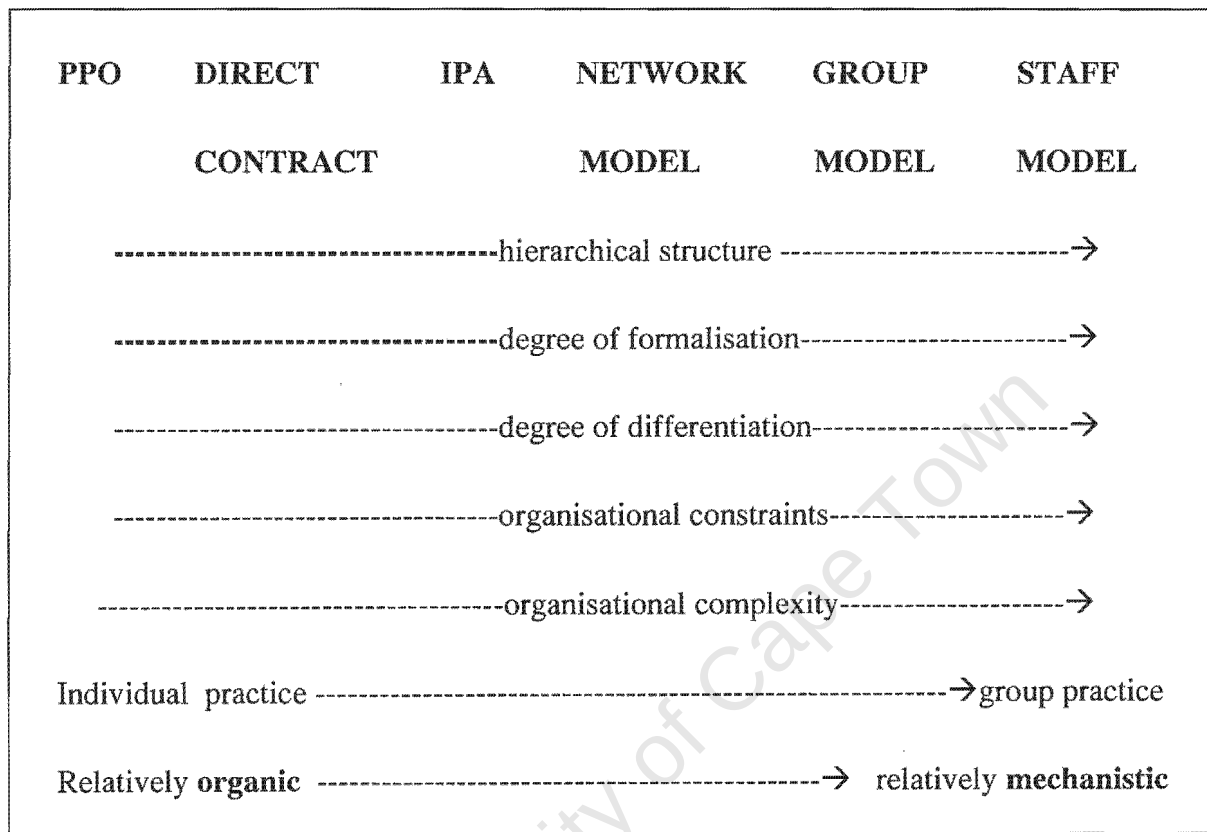


Fig. 2.6. Managed care continuum (adapted from Interstudy, 1988)

In an evaluation of trends in medical practice arrangements in the United States of America, Kletke et al. (1996), found that between the period 1983 and 1994, the proportion of doctors in solo practice fell from 40.5% to 29.3% while the proportion of doctors working in organisations increased from 24.2% to 42.3%. They attributed this to the economic efficiencies associated with larger more complex organisations and the increasing pressures on solo and small group practices by managed care organisations. Luft and Greenlick (1996) also highlighted public benefits associated with these staff and group model HMOs, namely, its contribution to alternative financing and organisation of medical care, the provision of a locus for important clinical and health services research and it's contribution to reducing

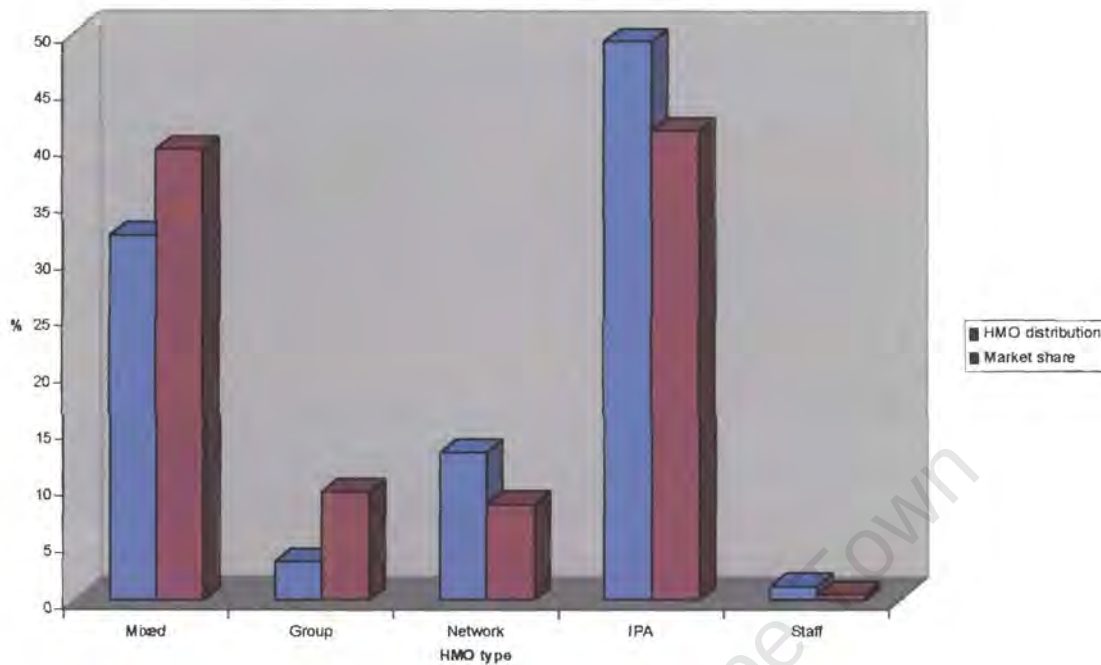
costs of health care provision. Kenkel (1988), also empirically demonstrated that the staff model HMO was the most economically efficient with the best expense ratios, when compared to other managed care models.

Despite these positive attributes, the staff model HMO has moved from being the dominant form of managed care in the USA to being virtually extinct (Guglielmo, 1996; Newhouse, 2002). There are currently only eight remaining with a total market share of 0.5% (see Fig. 2.7) and this Trespacz (1999), attributes to the 'physician centric, user unfriendly bureaucracy' that the staff model HMOs have evolved into. They also offer a limited choice of doctors, have a narrow geographic accessibility and their doctors often adopt an "employee outlook" as opposed to being custodians of their patients. Barr (1995) also suggests that doctors in these larger organisational systems tend to rely more on specialised organisational supports, thus removing them from much of the actual care received by the patient. There is thus a trade off between service and efficiency, with decreasing patient and doctor satisfaction the end result.

The larger group model HMO's appear to be suffering a similar fate, while in contrast IPAs have continued to grow in popularity among doctors in the USA. Today they account for approximately half of all HMO types with a total market share of just over 40% (Trespacz, 1999). Shenkin (1998) attributes this to the combined advantages 'of being able to preserve the small entrepreneurial, efficient, personal practice model of care delivery, while grafting on necessary business, informational, and care rationalizing functions at the collective level'. This sentiment correlates with the finding of Engel (1968) that an element of bureaucracy was necessary to facilitate the optimal provision of health care, and suggests that for health service organisations to be rational and effective, they need not be crazily bureaucratic or insanely entrepreneurial. It also supports the findings of Maheshwari (2000) that knowledge workers function optimally in less hierarchical environments characterised by flatter organisational structures and multifunctional teams.

Thus IPAs appear to have theoretically superior attributes when compared to the larger, more integrated and relatively mechanistic, group and staff model on the one hand, and the relatively more organic, direct contract and preferred provider models on the other.

Figure 2.7 Distribution and market share of HMO models



2.3. Managerial Practices in Managed Care Organisations

2.3.1 Overview

As health care organisations organise and operate more like large businesses, managers find themselves confronting many of the issues that face their counterparts in other service industries. Key among these issues is managing the customer-staff bond and reconciling it with the staff-organisation bond (Smithson and Koster, 1997). The principal goal of managed health organisations is to provide quality care at cost effective rates and managers are therefore challenged to optimise the behaviour of their doctors so as to create value for their organisations while at the same time meeting the expectations of their patients. Skilled managers have to balance this tension by aligning the interests of all three parties. To achieve this they employ various quality monitoring strategies while encouraging the

parsimonious use of health care resources by their primary care doctors (Hillman et al., 1989).

The practice behaviour of doctors in managed care organisations is the most important element in controlling cost and quality (Kongstvedt, 1997). Grego and Eisenberg (1993) described six general strategies that are employed by management to influence the practices of their doctors. These include economic strategies such as financial incentives and financial penalties and non-economic strategies such as education, feedback, administrative rules and normative influence strategies. Plans differ substantially in the behaviour change strategies and combinations thereof that they employ, and it is the task of this research to determine the differential effect of these strategies on the clinical behaviour and job satisfaction of primary care physicians.

2.3.2 Education Strategies

Knowledge workers value knowledge and intellectual capital and always strive to be at the forefront of developments in their area of expertise. This ensures that they remain relevant, informed and retain a sense of worth. Continuous professional development is therefore of major importance to knowledge workers.

Medical research is part of our ongoing quest to elucidate not only the biological basis of health and disease but also to determine both clinically effective and cost effective diagnostic and management protocols. It is indeed the latter that managed care organisations attempt to impress upon their primary care doctors in order to minimise resource utilisation. The dissemination of this knowledge is aimed at changing the beliefs, attitudes and behaviour of these doctors and it is accomplished by the use of clinical practice guidelines, opinion leaders and continuing medical education programmes, all with varying degrees of success.

2.3.2.1 Clinical practice guidelines

Clinical practice guidelines (also known as clinical pathways or protocols of care) have been defined by the Institute of Medicine as 'systematically developed statements to assist practitioner decisions about appropriate health care for specific clinical circumstances'

(Grimshaw and Russel, 1993). Klasinga (1994) identified three reasons for the development of clinical practice guidelines (CPG), namely, professionalisation, accountability and efficiency.

Professionalisation refers to the use of CPGs as a means for practising doctors to acquire knowledge on the latest developments in evidence-based medicine and in medical science. It provides an interface between medical science and clinical practice.

Clinical guidelines also act as a concrete instrument for the health care profession to meet the expectations of patients, management and third party payers. They make the desired medical practice explicit and therefore transparent to other parties.

The efficiency perspective regards CPGs as an instrument used by management and the medical personnel to justify the use of resources and medical behaviour respectively, as it is based on scientific knowledge. It is this argument that forms the core for the use of CPGs in managed care organisations.

Proponents of CPGs believe guidelines will lower costs by eliminating inappropriate tests and procedures, enhance quality by minimising variation in diagnostic and treatment regimens and lower the incidence of malpractice claims by establishing clearly defined standards of care (Conroy and Shannon, 1995). Sceptics on the other hand doubt the ability of CPGs to alter the practice behaviour of doctors and cite the possible reduction of clinical freedom and the encouragement of so called 'cookbook' medicine as negatives. The evidence in the literature supports both these contrasting viewpoints.

In a review of 59 published evaluations of CPGs, Grimshaw and Russel (1993), found statistically significant improvements in the process of care in all but 4 studies after the implementation of CPGs and an improvement in outcome of care in all but 2 of 11 studies. In contrast, Lomas (1989), reported that CPGs per se had no impact on practice patterns after evaluating caesarean section rates prior to and after the publication of CPGs. This he attributed to other economic, administrative and social barriers that prevented practitioners from altering their actual practice, even when predisposed on medical grounds to do so.

The attitudes of doctors towards CPGs have also been extensively evaluated. Tunis et al. (1994), found that although doctors recognised the potential benefits of CPGs, they were concerned about possible effects on clinical autonomy and satisfaction with practice. Doctors

who were salaried employees also rated CPGs more positively than those who were in private practice. Shye and Brown (1995), also found that doctors in a large group model HMO did not perceive CPGs as a threat to clinical autonomy. Similarly, Salem-Schatz et al. (1997), found overall positive attitudes towards CPGs with some differences observed by HMO type and experience. Doctors in IPAs and those with more than 15 years of experience tended to view CPG less favourably as opposed to those in staff model HMOs. The authors attributed this to greater goal congruence between the doctors and their organisations, in the latter.

The available evidence on the effectiveness of CPGs is therefore not conclusive but doctors in more independent practices perceive it as being a threat to clinical autonomy and therefore a potential source of dissatisfaction.

2.3.2.2 Opinion leader strategies

Opinion leaders are typically persons who are viewed positively by their peers and are well known in the local community. This approach uses these influential, charismatic individuals (such as postgraduate tutors) to transmit information. Opinion leaders have been found to play a key role in shaping consensus regarding new technologies and thereby encouraging or blocking new behaviour (Conroy and Shannon, 1995). Such opinion leaders are seen as respected colleagues who embody the norms of the group, and appear competent in evaluating the appropriateness of new treatment protocols and methodologies. This reinforces the view that although doctors are members of a national or international medical culture, they function primarily through their participation in smaller local sub-groups, a feature of most knowledge workers. They also play an important role in convincing doctors to become active in the process, rather than passive recipients of information. Lomas and colleagues (1991), found a dramatic reduction in the caesarean section rate when opinion leaders were recruited and trained to educate their colleagues with the aim of reducing unnecessary caesarean sections. In another study (Everett et al., 1990), dramatic changes in the use of antibiotics were seen when department leaders were given guidelines to disseminate to their colleagues.

The use of opinion leaders therefore appears to be effective in the process of behaviour change and it is the task of empirical research to determine to what extent it is used by

managed care organisations in South Africa, and to elicit the effect that it has on the practice patterns and job satisfaction of doctors. However, based on the available evidence we posit that these strategies will positively enhance clinical performance and contribute to job satisfaction of primary care doctors in all managed care organisation types.

2.3.2.3 Continuing medical education

Formal continuing medical education (CME) is the provision of additional clinical training through seminars, conferences, home study, and so forth (Kongstvedt, 1997). It is highly variable, ranging from passive, didactic large group presentations to highly interactive learning methods such as workshops, small group discussions and individual training sessions. The hallmark is that it provides CME credits by virtue of the accreditation of the sponsoring body. These credits are required to maintain registration as a practising doctor. Although this form of information dissemination is most prevalent, its' effectiveness in altering practice behaviour and improving clinical outcomes is not convincing.

In a large review of the effectiveness of CME programs, Davis et al. (1992) found a relatively weak effect of formal, planned traditional CME methods, such as conferences and lectures, on clinical behaviour or clinical outcomes. In a subsequent review (1995), he found that practice based interventions and outreach visits were more effective than other widely used methods such as conferences. These findings were repeated in his latest review (1999) where he found that didactic sessions were not effective in changing the practice behaviour of doctors. On the other hand, interactive CME sessions that enhanced participant activity and provided an opportunity to enhance practical skills showed some potential in perceiving change in professional practice and health care outcomes. The effect of CME on clinical autonomy and on job satisfaction is however unknown.

2.3.3 Feedback

Feedback involves giving doctors information about how their practices or patient outcomes compare with those of other doctors or with an external standard such as a practice guideline. It may be active or passive. Active feedback occurs where the interest of clinicians has been

engaged in a particular aspect or aspects of care while passive feedback is the unsolicited provision of information with no stated requirement for action (Kongstvedt, 1997).

The research literature pertaining to the effectiveness of feedback in altering the clinical behaviour of doctors is inconclusive, although the preponderance of research data is positive. Berwick et al. (1986), found that doctors in an HMO did reduce their rate of use of common blood tests and X-rays after having received confidential feedback compared with their peers who did not. In a review of 36 studies evaluating the effects of feedback on clinical practice, Mugford and Banfield (1991), demonstrated a reduction in test ordering in 8 of 11 studies, a reduction in operative procedures in 3 of 5 studies, a reduction in the number of medicines prescribed in 5 of 7 studies and an improvement in the process of care in 7 of 12 studies.

Grego and Eisenberg (1993), postulated that for feedback to be effective, certain conditions had to exist. Firstly, the doctors had to recognise that their current practices needed improvement. Second, the person receiving the feedback had to be able to act on it, and finally they had to be able to act on it immediately. For the changed behaviour to be sustained, Kongstvedt (1997) suggested that feedback had to be regular, consistent and comprehensible. The evidence therefore seems to suggest that feedback does have some potential in influencing clinical practice. Information on how feedback is perceived by the doctors in different organisational milieus is therefore vital if one is to utilise this strategy effectively.

2.3.4 Administrative interventions

Administrative interventions are rules and regulations or institutional policies that are aimed at forcing doctors to alter their clinical practices. At one extreme, changes in behaviour can simply be encouraged by reducing barriers to desired practice, such as eliminating certain diagnostic tests from order forms, or reflecting prices of medication and tests on order forms so as to increase awareness. At the other extreme, barriers to undesired practices can be created. These include utilisation review, authorisation systems and clinical audit (Grego and Eisenberg, 1993).

2.3.4.1 Utilisation review

Utilisation review refers to the process of evaluating the necessity, appropriateness and efficiency of services provided. Information gathered from both the patient and the provider is reviewed to determine whether it meets established criteria and guidelines. This review can be prospective, concurrent or retrospective. (Kongstvedt, 1997).

Prospective review occurs before the service is rendered. It usually applies to specialty and hospital services. The referral has to be authorised by the plan or the patients allocated primary care doctor who has to specify the nature and number of services.

Concurrent review takes place while the service is being rendered. This generally applies to hospital and emergency services. The utilisation control staff play an active role in co-ordinating the services at the hospital and constantly communicate with doctors, the nursing staff and the patients family with the aim of eliminating redundancy and exploring alternatives to costly, more traditional methods of care.

Retrospective review takes place after the service has been rendered. It is the dominant method used by managed care plans to analyse utilisation patterns of their primary care doctors. The review may include evaluating their adherence to practice guidelines and drug formularies, the utilisation of diagnostic services and the monitoring of specialist and hospital referrals.

Although the effective management of resource utilisation is at the core of successful managed care organisations, its' success as a management tool is doubtful. Wickerser and Lessler (1998), found that although utilisation management reduced access and lengths of stay for psychiatric patients, it also increased the risk of early re-admission, and Kerr et al. (1999), also reported lower patient satisfaction and an increased desire to disenroll among patients whose plans subjected their health care needs to greater utilisation review.

In order to maintain costs, utilisation review programs will continue to form a necessary part of managed health care (Veliotes, 1993). For it to be successful, it has to be considered by all parties to be acceptable and reputable. Little however, exists in the literature to describe how these utilisation management strategies impact on the clinical performance and job satisfaction of primary care doctors but we intuitively posit that doctors will perceive this

process as an unnecessary intrusion into the realm of clinical practice, the effect of which will be diminished job satisfaction.

2.3.4.2 Peer Review

Grol and Lawrence (1995), define peer review as ‘ continuous, systematic and critical reflection on their own and others performance by a number of colleagues in general practice, with the aim of achieving a continuous improvement in the quality of care.’ This systematic reflection on each other’s performance by colleagues, who respect each other and know the general practice situation well, may be a powerful stimulus for bringing about desirable change in practice patterns and patient care.

Research has shown that a combination of activities and interventions over an extended period is a particularly effective method of inducing change and improvement in practice, and that evaluation and support by peers should be the core of these activities (Grol, 1992; Lomas et al., 1988; Soumerai et al., 1990). Peer review also has its limitations (Kongstvedt, 1997). First, opportunities for improvement may be missed by a paradigm that rests on conformance with standards. This ensures the status quo but does not result in continuous improvement. Second, inter-reviewer reliability between groups of reviewers has been shown to be poor and third, peer review is limited by the scope of the indicators or process under review.

Despite these limitations, managed care organisations often contractually bind their primary care providers to subject themselves to peer review, in their quest to improve quality, reduce practice variation, change practice patterns and create a positive learning and work environment (Grol and Lawrence, 1995). Kinnear and Sutherland (2000) have also found that knowledge workers value learning from professional colleagues in their specialist area. It is therefore important to assess whether doctors perceive this management tool as a facilitator or inhibitor of quality health care.

2.3.4.3 Authorisation systems

One of the definitive elements in managed care is the presence of an authorisation system. This is a system that approves certain services in accordance with predetermined criteria. There are multiple reasons for an authorisation system (Kongstvedt, 1997). One is to allow the plan to review a case for medical necessity. A second reason is to channel care to the most appropriate location (e.g. approved specialists or hospitals). Thirdly, it provides information for utilisation review and large case management and fourthly it helps the plan to estimate accruals for medical expenditure on a monthly basis.

In order for authorisation systems to be efficient it must be timeously applied, clearly understood, and acceptable to employers, patients and providers of health care. A list of services requiring authorisation has to be supplied to all patients and providers, with special provisions made for emergency situations. Those responsible for the authorisation must be clearly identified and the process and documentation required has to be stipulated (Kongstvedt, 1997). Doctors are only remunerated for their services upon submission of the appropriate authorisation details.

The use of authorisation systems makes it possible for plans to achieve desired changes in practice but there is little in the research to suggest how doctors may perceive these interventions. It does however have the potential to contribute to the 'hassle factor' that increasingly burdens practising doctors and we therefore posit that authorisation systems may lead to reduced job satisfaction and clinical autonomy for primary care doctors in managed care organisations.

2.3.5 Participative management

A desire most commonly expressed by employees, is that of involvement not only in the daily activities of their organisation, but also in management decisions that will facilitate quality production (patient care) and ensure an optimum work environment for all employees (Muller, 1995). Stewart (1999) describes an appropriate management style for knowledge workers as that which encourages participation, questioning of conventional wisdom, motivation and risk taking. Participative management involves interactive assessment, planning, implementation and evaluation by management and the employees in an

organisation. Stander (1992) defined participative management as 'a dynamic process of mutual decision-making and creative problem solving through the active participation of the employees, with the distribution of authority and shared accountability'.

The objective of participative management in a health care delivery system is the promotion, maintenance and restoration of quality health care services, financial efficiency, and quality personnel services to the employees (Muller, 1995). According to Swansberg (1993), the components of effective participatory management are trust, informed commitment, goals and objectives, and autonomy. The employee is trusted to make decisions, facilitated by adequate training, in a climate conducive to problem solving by joint planning, consultation, consensus and negotiation.

One way to involve doctors in changing their own practices is to give them a role in setting the standards against which their practices will be judged (Grego and Eisenberg, 1993), *vis a vis* their participation in the development of guidelines. Secondly, the techniques of total quality management could be applied where the focus is on improving quality of care and efficiency of the processes of care, rather than on cost control. Thirdly, managers may seek to facilitate the doctors' goals by joint policy making, participative decision-making, and joint goal setting (Herbert-Carter, 1988).

Barr and Steinberg (1983), in their evaluation of the effect of doctor participation in organisational decision making in four staff model HMOs, found that doctors who reported greater participation were more satisfied with their work, perceived greater staff consensus and had more favourable attitudes towards patients. Merkel and Pollard (1987) also found that a participative, personnel- oriented approach also led to minimal staff turnover and high staff morale in an in-patient psychiatric unit. These positive perceptions and the consequent organisational stability were attributed by both sets of investigators to the sense of 'ownership' and shared governance that a participative approach imparts.

The evidence therefore seems to suggest that a participative management approach is likely to have a positive impact on the clinical performance and job satisfaction of doctors. We therefore posit that in HMOs with more decentralised authority structures, doctor satisfaction may be enhanced and clinical performance may be perceived as being optimised.

2.3.6 Financial Contingencies

"It is not from the benevolence of the butcher, the brewer, or the baker that we expect our dinner, but from their regard to their own interest"

Adam Smith, 1776

Doctors are the central decision makers in managed care organisations and consequently their practice patterns often make the difference between satisfactory financial performance and financial losses. Managers often use financial incentives and disincentives to increase doctor awareness of the impact of their practice patterns on costs of care. The three basic methods for compensating doctors are capitation, fee-for-service and salary. Over and above these base units of payment, other bonuses or penalties may apply.

2.3.6.1 Capitation

Capitation is defined as the fixed prepayment for services, on a per member per month (PMPM) basis. In other words a primary care doctor is paid the same amount of money every month for a member regardless of whether that member receives services and regardless of how expensive those services are (Kongstvedt, 1997). The scope of services to be covered is usually defined in the contract and may include preventive services, outpatient care and hospital visits. The calculation of a capitation rate is based on several factors and may include estimated utilisation rates, age and gender, risk profiles, current health status and geographic location of patients.

The essence of capitation is a shift in risk from insurers to providers, where risk refers to the potential to lose money, earn less money or spend more time without additional money (Bodenheimer and Grumbach, 1996). There are essentially two broad categories of risk for capitated primary care doctors: service risk and financial risk (Kongstvedt, 1997). Service risk refers to situations when volumes of capitated patients are high and doctors are at risk for their time. The doctor then receives a relatively lower income per encounter and also loses the ability to sell services to someone else.

Financial risk refers to actual income placed at risk. The two common forms of financial risk are withholds and capitated pools for non - primary care services. A withhold is a percentage

of the primary care capitation that is withheld every month and used to pay for extra costs incurred for referral or other services, over and above that already budgeted for by the managed care plan. If withholds are unused or partially used, the balance is then paid back to the doctor as a bonus.

When primary care doctor services are covered by a capitated fee, payment for all other services are made from risk pools held by the plan. Typically there are separate pools for primary care, specialists, hospitals, medicines and ancillary services such as laboratories. Funds in the different risk pools comprise that allocated by the plan for the different categories, together with the withholds from the capitation fee of primary care doctors. Once again surplus funds from the various pools are paid out to the doctor as an annual bonus, commensurate with their performance and rate of resource utilisation. Deficits, on the other hand, are drawn from the withholds. The effect of this is to discourage referrals for expensive specialist care, hospitalisation and laboratory investigations.

The main advantages of capitation, from the perspective of the primary care doctor, is that it provides a good positive cash flow, regardless of services rendered, and it also eliminates any disagreements over the fees that a provider may charge a patient. The commonest problem with capitation is that a doctor may end up with a disproportionate enrolment of 'high risk' patients who drain the fixed resources. Another perceived problem is that capitation may lead to inappropriate under utilisation as doctors are paid more for using fewer services.

2.3.6.2 Fee for service

This refers to the method of charging whereby health care providers receive payment for each unit of service provided. Costs for each unit are usually calculated according to a fee schedule such as the Scale of Benefits or a negotiated fee schedule. This is currently the predominant method of payment used by medical aid societies and preferred provider organisations in South Africa (Veliotis et al., 1993). The greatest problem with this system is that it is inflationary, as all the incentives tend to stimulate overprovision of inappropriate or unnecessary care (Molteno, 1991).

2.3.6.3 Salary

A salary is a fixed, predetermined amount of money paid to the health care provider for rendering services over a period of time. Payment can be on a monthly, hourly, daily or sessional basis and virtually all-salaried doctors are in an employer-employee relationship. Although performance bonuses may apply, salaried doctors are usually oblivious to the incentives that fee-for-service and capitated doctors routinely face because utilization of services is not related directly to compensation levels (Molteno, 1991).

2.3.6.4 Doctor reimbursement in managed care organisations

There appears to be no ideal or correct way to compensate doctors for their professional activities. Fee-for-service is inherently inflationary at a time when cost is a primary consideration for third party payers and the public alike. Capitation poses an ethical dilemma as doctors are rewarded for conserving resources to promote cost restraint, and salaried practice has the potential to promote a lax practice style. The challenge then is to figure out how to provide incentives for reducing health spending without seriously compromising quality or patient confidence in the integrity of the medical care system.

Large surveys in the United States of America such as the Physician Payment Review Commission (1995), have reported that approximately 60 percent of open panel plans (IPAs/networks) used capitation and that the remainder used fee-for-service while a small percentage used salary. The principal reimbursement method of closed panel HMO's (staff/group) was salary while that of PPO's was a discounted fee-for-service.

This distribution of reimbursement methods has been relatively stable for several years. Nelson et al. (1989), showed that 61 percent of HMO's capitated primary care doctors, 17 percent paid salaries and 7 percent paid fee-for-service. The Interstudy Group (1994) also reported that 69 percent of HMO's used capitation to reimburse primary care doctors. Capitation thus appears to be the predominant mode of payment for primary care doctors in the USA and it is anticipated that this trend is likely to be emulated in the South African managed care industry. It is evident that this form of reimbursement provides the financial rationale for stakeholders to intervene in the socio-economic fabric of communities to

prevent illness and avoid the utilisation of unnecessary resources, thereby increasing the bottom lines of providers and insurers alike (Boland, 1997).

Studies in behaviour change in business and industry have shown that although many types of rewards can be effective motivators, financial incentives have been considered the strongest motivator and have been used most often to reward desired behaviour (Goodpastor and Mantoya, 1999). Doctors are no different, and there is ample research evidence to show that financial incentives do indeed influence the clinical behaviour of doctors to a very significant extent.

Hillman et al. (1989), investigated the relationship between the presence of financial incentives and two measures of the use of resources (the rate of hospitalisation and the rate of outpatient visits) for all operating HMOs in the USA in 1987. They found that the use of capitation and salaries was associated with a lower rate of hospitalisation than the use of fee-for-service. This they attributed to the possible lack of additional revenue and the absence of a financial reward respectively, for these extra services. The presence of financial risk was also associated with fewer visits per enrollee. This they attributed to doctors scheduling fewer visits in order to use fewer services. However, when doctors were placed at risk for the cost of outpatient tests, this resulted in an increase in the number of visits. They attributed this to the possible substitution of more outpatient visits for the costly tests and procedures. They concluded that financial incentives did influence the behaviour of doctors towards patients.

Calnan et al (1992), in a multinational study evaluating professional reimbursement and time management in general practice, found that doctors who were remunerated by a combination of fee-for-service and capitation, when faced with increased patient loads, responded by increasing their total consulting hours. Doctors who received a combination of capitation and salary, on the other hand, reduced their consultation time per patient, to cope with the similar increase in case load. This they speculated would have an adverse effect on quality of care and demonstrated that doctors do respond differently to different financial incentives.

McCleary et al. (1995), in a review of empirical evidence of the effect of financial incentives on doctor behaviour, found that primary care doctors were often responsible for ensuring organisational cost effectiveness. Those who were capitated tended to order fewer high cost tests and discretionary services than those who were remunerated on a fee-for-service basis. They were also associated with fewer referrals to specialists and used outpatient facilities

less. They concluded that financial incentives did have an effect on the clinical behaviour of doctors; more specifically that capitation encouraged the parsimonious use of resources.

Grumbach et al. (1998), in a study to evaluate the effect of financial incentives on doctor satisfaction, found that doctors who reported greater pressure to limit the use of referrals or hospital services and to see more patients per unit time were less likely to be satisfied than those doctors whose incentives were based on quality of care or patient satisfaction. Similarly, other studies (Hillman, 1990, 1995; Manning, 1984) further supported the argument that financial contingencies do have an impact on the clinical performance of primary care doctors.

In contrast though, one study (Conrad et al., 1998) found that financial incentives were not significantly related to resource utilisation and cost of health services, but that individual doctor characteristics and the type of managed care organisation determined these. However, the limitation of this study was that the nature of the incentives was perhaps not significant enough to alter the clinical behaviour of doctors.

The evidence therefore seems to support the notion that financial incentives do indeed influence doctors' clinical behaviour and job satisfaction. We therefore posit that primary care doctors who are compensated predominantly on the basis of capitation or salary will perceive these incentives as encouraging the use of fewer resources, thereby reducing clinical autonomy, resulting in them being less satisfied than those compensated on a fee-for-service basis.

2.4. Doctor Clinical Behaviour

2.4.1 Overview

Doctor clinical behaviour is the process of medical action with relation to patient care. The basic objective is the transformation of the clinical status of the patient, which requires not only information about the patient, but is also dependant on the doctor's perceptions, judgements and reasoning, and the way in which they maintain and perfect their clinical knowledge and skills. Today, more than ever, doctors practice amid conflicting expectations. They face conflicts between the ethic of undivided loyalty to patients and pressures to use

clinical methods and judgement for social purposes and on behalf of third parties (Bloche, 1999).

2.4.2 Medical professionalism and clinical autonomy

Medicine has always been the ideal example of a profession – an occupational group characterised by specialised technical knowledge, public faith in its moral and scientific authority, the autonomy to make decisions and regulate its work conditions and members, and dominance over other occupations in its work sphere (Warren et al., 1998). Implicit in this conception and in most of the writings about professions (Engel, 1968; Crum, 1991) is the crucial role of professional autonomy, which appears to be an essential dimension of professionalism. In addition, factors demonstrated as important in motivating knowledge workers include a work culture permitting relative autonomy (Tampoe, 1993)

Professional autonomy exists on two separate but related levels, autonomy with respect to the individual professional and autonomy with respect to the occupational group or profession (Engel, 1969). On the group level, autonomy is defined as the control an occupational group possesses over its decisions and activities in the community in which it functions, or its' freedom to direct the activities of the profession. Autonomy on the individual level is defined as the professional's self control over both his decisions and his work activities within a particular work setting, or his freedom to deal with his client. In the context of doctors this autonomy could be conceptualised in terms of clinical autonomy, associated with choices about patient care such as control over the nature and volume of medical tasks, acceptance of patients, control over diagnosis and treatment and control over the evaluation of care (Schulz and Harrison, 1986). It is this aspect of professional autonomy that forms the focus of this study.

Control over the nature and volume of medical tasks represents the extent to which doctors can decide their times and intensity of work: total consulting hours, number of patients seen and time spent on each patient; acceptance of patients is concerned with how far the system allows the doctor to accept and retain in care all patients who attend or are referred and whether patients can be rejected; control over diagnosis and treatment relates to doctors' decisions about patients: what tests and examinations to order, what medications, surgery or therapies to prescribe and to whom to refer; control over evaluation of care is concerned

about the perceived appropriateness of the content of care for particular patients and its apparent impact on their health status.

Thus the common theme of clinical autonomy is that the doctor, who has a more comprehensive knowledge of the problem, has the prime responsibility of determining which of the resources should be brought to bear, in order to be able to treat the patient as he sees fit. The essence of this is that the contact between patient and doctor should not in any way be influenced by managerial decisions (Rendall, 1985).

2.4.3 Medical ethics and the doctor–patient relationship

The profession of medicine distinguishes itself by placing special moral obligations and responsibilities on its members. The morality of medicine is based very broadly on the obligation to protect and promote the best interests of the patient. Historically medical ethics relied on the Hippocratic tradition, embodied in the Hippocratic Oath. The Hippocratic ethic obliges the medical practitioner to always act in the best interest of the patient and to avoid doing harm. Further, the practitioner is obliged to attain the required level of skill and is duty bound to make that skill maximally available to all patients. The doctor is thus the advocate of the patient! Implicit in this ethic is trust – trust that the doctors are dedicated first and foremost to serving the needs of their patients (Povar and Moreno, 1988; AMA, 1995).

The Hippocratic ethic is largely paternalistic and the emergence of an empowered public and the development of individual rights required that an alternative framework for biomedical decision making be found. An ethical framework derived from the common morality (morality shared in common by the members of society) was developed for moral decision making in clinical medicine. The four principles are the principle of beneficence, non-maleficence, respect for autonomy, and justice (Beauchamp and Childress, 1983). The first two principles are synonymous with the Hippocratic tradition of always acting in the best interest of the patient and to avoid doing harm. Autonomy was developed out of the pre-eminence of the individual and the need to respect and facilitate the self-determination and choices of autonomous persons. The principle of justice obliges one to treat equals equally and to distribute benefits and burdens fairly and to justify in a morally acceptable way any differential treatment. The doctor is obliged to consider all principles in a situation, and no principle is absolute or dominant over the other

The Hippocratic ethic and the principles derived from the common morality constitute the foundation of an ideal doctor – patient relationship, which is the cornerstone for achieving, maintaining, and improving health. Patients should expect doctors to always come to their aid and they should trust that doctors would do everything in their power to help them. It is this trust that enables patients to communicate private information and to place their health, and indeed their lives, in the hands of their doctors. Without the commitment that doctors place patients' interests first and act as agents for their patients alone, there is no assurance that the patients' health and well-being will be protected (AMA, 1995).

Emanuel and Dubler (1995) characterised the ideal doctor – patient relationship as consisting of several facets. They based these on ideals explicitly defined in the literature and by standards of practice embodied in the ethical guidelines above, on legal rulings and on health care policies. They expressed them as choice, competence, communication, compassion, continuity and the absence of conflict of interest.

Choice refers to the doctor's ability to choose his practice type and setting and the ability to select his patients. Similarly patients have the right to choose their doctors. The relationship is thus based on mutual choice.

Competence of the doctor is a necessary precondition and entails possessing a good body of current knowledge, good technical skill, good clinical judgement and an awareness of their limitations.

Communication refers to the ability of the doctor to listen to and understand the patient and to be able to explain the nature of the illness and consequences of the treatment. Similarly, the patient should be able to convey to the doctor all the relevant information, and to use information gleaned from the doctor to enable them to be active participants in choosing between different treatment options and assertions of self-determination. The effect of this is the strengthening of the bond and an increase in trust between doctor and patient.

Compassion is the ability of the doctor to empathise with their patients and to understand their problems in terms of their own values, feelings and experiences.

Continuity is the ability of the doctor–patient relationship to endure over time. This ensures mutual trust and facilitates clinical efficiency, as each gets to know each other better.

The absence of conflict of interest refers to the expectation that the doctors' care of patients and their concern for the patients well being will take precedence over their own personal interests and that of third parties.

Thus the fundamental elements of appropriate clinical behaviour are embodied not only in the ethical and moral obligation that doctors have to their patients, but is also shaped by the desire of doctors to maintain their professional status, by public expectation, legislation, and health policy. Clinical autonomy is one of the most dearly espoused principles in the practice of medicine and doctors continue to aspire to maintain the sanctity of the doctor-patient relationship. We therefore posit that doctors will respond positively to organisations and strategies that ensure and enhance their clinical autonomy while facilitating a healthy doctor-patient relationship.

2.4.4 Managed care and doctor clinical behaviour

The rise of managed care has the potential to preclude the realisation of the ideal doctor-patient relationship and undermine the preservation of clinical autonomy. Managed care organisations employ economic and non-economic leverage to an unprecedented degree to influence clinical behaviour, and health professionals face growing pressure to serve ends that fit awkwardly with their ideal of fidelity to their patients. Doctors are trained and motivated to treat patients in ways that are appropriate, effective and consistent with standards of high quality care (Epstein and McNeil, 1986). They want plans to facilitate their efforts to render high quality care and are most likely to respond favourably to systems that govern clinical behaviour in ways consistent with their professional norms. Managed care, however, is replete with strategies that attempt to compromise the quality and integrity of the doctor-patient relationship and reduce the quality of care, as perceived patients (Salmon et al., 1990). In particular, by creating conflicting loyalties for the doctor, some of the strategies employed can undermine the doctor's fundamental obligation to serve as patient advocate.

The primary care doctor's role in managed care organisations is to act as a 'gatekeeper' - to orchestrate and control the health care of its enrollees, including referrals to specialists, hospitalisations and other expensive services. The rationale for gate keeping is that it can both reduce costs and increase the quality of care by increasing co-ordination, decreasing duplication of services, substituting less expensive primary care for specialist or emergency

care and eliminating unnecessary and potentially harmful procedures (Kongstvedt, 1997). However, gate keeping is inherently unethical and has an adverse effect on the doctor-patient relationship (Taylor, 1989). The further treatment of a patient depends not only on the doctor's judgement about the legitimacy of that patient's present medical need but also on the relative weight of that need in comparison with the organisation's need to serve all patients and control costs. While this need to guard society's resources is an important one, doctors must remain primarily dedicated to the health care needs of their individual patients. They should not engage in bedside rationing (AMA, 1995). It is the responsibility of doctors to disclose to patients all available treatment alternatives, regardless of cost, including those potentially beneficial treatments that are not offered under the terms of the plan.

Managed care also poses potential threats to competence. Pressures of cost containment may encourage some primary care doctors to try to manage cases longer than they should. Doctors may feel compelled to stretch their competence to keep patients at the primary care level and thereby conserve resources. Inappropriate treatment and improper or missed diagnoses are potential outcomes of such decisions to delay or deny referral.

As discussed previously, managed care organisations use several financial contingencies to encourage doctors to be more cost conscious. Bonuses, fee withholds and other financial incentives to limit care exploit the financial motive of doctors. With these incentives, doctors recognise that they may reduce their income when they order tests, hospitalise patients, or provide other services. This compromises the doctor's duty of loyalty to patient care by encouraging them to withhold services although they are obliged to place patients' interests ahead of their own interests, including financial remuneration. This conflict of interest begins to erode the patients trust in their doctors as they begin to wonder whether they are receiving all necessary care, or are being denied care because of the doctor's own pecuniary interests (Taylor, 1989). Hadley et al. (1999) in their evaluation of the effect of financial incentives on practice styles and satisfaction, found that doctors with financial incentives to reduce services were more likely to report that their expectations regarding professional autonomy and ability to practice good quality medicine were not met. They were also less likely to report having the freedom to care for patients the way they would to, along with several measures of practice style, such as sufficient time with patients, ability to hospitalise, ability to order tests and procedures, and ability to make referrals.

The limitation of choice is also a hallmark of managed care. Employers limit the choice of health plans and workers often have to select a doctor from a pre-approved list, or face increased out of pocket expenses to see a doctor of their choice. Restrictions are also placed on choice of specialists, hospitals and other services. Doctors on the other hand are also contractually obliged to see all patients allocated to them. The effect of this is that the doctor - patient relationship in the managed care environment is often not based on mutual choice.

Continuity of care is also difficult to maintain in the managed care environment as price competition often forces employers to switch to cheaper plans. De-selection of doctors from plans also forces patients to abandon often-longstanding relationships.

Control over the nature and volume of tasks could also be undermined, as contractual obligations or practice efficiencies and productivity requirements in the more bureaucratic plans pressurise doctors to see more patients in shorter time periods. The result is that communication and compassion in the doctor patient relationship is compromised due to the limited time to discuss patient values, alternative treatments or the impact of therapy (Schulz and Harrison, 1986; Emanuel and Dubler, 1995).

The use of educational strategies such as clinical practice guidelines, and administrative interventions such as utilisation review procedures and clinical audit are aimed at restricting clinical autonomy by influencing diagnosis and treatment interventions and controlling the process and content of care (Schulz and Harrison, 1986). Schlesinger et al. (1996) reported that the increased involvement of managed care organisations in the monitoring of patient care encroached on psychiatrist's autonomy in making clinical decisions. More than three quarters of those surveyed reported pressure from plans to discharge patients early and to limit lengths of stay, while more than half had been discouraged from admitting severely ill patients.

Halm et al. (1997), also confirmed that managed care strategies were perceived by doctors as negatively affecting the overall quality of care by reducing clinical autonomy, hindering the doctor-patient relationship and restricting access to resources. They did however concede that managed care was perceived as being more cost effective and promoted the utilisation of preventive services.

Similarly, proponents of managed care assert that these institutions have incentives to provide a cost effective, equitable, and high quality alternate health care system. They argue

that HMO's promote both principles of beneficence, or taking positive action to do good, and justice, by facilitating the equitable distribution of social goods among enrolled members. Further, they believe that the lack of incentives to over treat, as in fee-for-service systems, promotes the goal of nonmaleficence, the avoidance of needless pain and suffering (Povar and Moreno, 1988).

Bloche (1999), on the other hand believes that the challenge for doctors is to mediate the tensions between their ethic of undivided loyalty to patients and the pressure to use their clinical judgement for social and public health purposes. The enormity of this task is only appreciated when one considers the conflict between the culture of doctors and the goals of managed care (Leider, 1980). Doctors are trained to acquire skills and to make difficult clinical decisions without assistance while managed care environments frequently require doctors to function in a larger system with defined rules and procedures. Traditional clinical training also emphasises technical skill and encourages the utilisation of procedures whereas managed care uses procedures wisely so as to control costs. Clinical training also emphasises improvement of the health of the individual patient who seeks care while managed care wants doctors to improve the health of a defined population. Doctors view their primary goal as delivering high quality care and view cost as secondary, while cost is a primary issue in managed care.

This 'clash of cultures' between the worlds of traditional medicine and managed care makes it hard for leaders of healthcare organisations to influence the clinical behaviour of doctors. Often, doctors view the goals of managed care as an attack on their autonomy and professional values, and we therefore posit that they will be more responsive to organisational structures and managerial practices that they perceive as being less of a threat.

2.5. Job Satisfaction

2.5.1 Overview

To make the best use of people as a valuable resource of the organisation, attention must be given to the relationship between staff and the nature and content of their jobs. The work organisation, the design of jobs, and management practices can have a significant effect on staff satisfaction and their levels of performance. It is therefore imperative for us to

understand how best to make work more satisfying for our staff and to overcome obstacles to effective performance.

Provider satisfaction is one of the four crucial outcomes of health care along with patient health status, patient satisfaction, and cost. Dissatisfied providers not only create unstable organisations and bad marketing, they also give poorer quality, less efficient and less satisfying (to patients) health care. Health care organisations that promote the specific working conditions that health professionals desire are therefore more likely to increase a professional's work satisfaction and provide an organisational climate in which provider–client transactions will be more effective. Because doctor job satisfaction has been linked to clinical outcomes, better measures might help to ameliorate conditions linked to medical dissatisfaction, possibly improving health care.

Identifying the factors that cause doctor satisfaction and dissatisfaction within the various types of practice settings becomes increasingly important as current health care reform efforts continue to promote more structured practice environments. Policymakers should be cognisant of the effects various structures and strategies may have on doctor satisfaction and performance as they consider new approaches to health care organisation. This research is aimed at identifying positive organisational attributes so that doctors' professional level of satisfaction can be maximised.

2.5.2 The Importance of Job Satisfaction

The relationship between job satisfaction and performance is an issue of continuing debate and controversy. The traditional assumption in the organisational literature has been that workers whose needs are satisfied in the workplace will exert greater effort on behalf of the organisation, resulting in higher levels of performance at both the individual and organisational levels. Mullins (1999), in a review of the literature, found definitive evidence that satisfied employees had lower rates of absenteeism and turnover. The relationship between employee satisfaction and work output was however not conclusive. Robbins (1993), in his review, found a positive relationship between job satisfaction and employee health. He found that employees who were dissatisfied with their jobs were more prone to health setbacks ranging from headaches to heart disease. Lower medical costs and the

premature loss of valued employees may thus also be a justification for employee job satisfaction.

In one of the first studies linking clinical outcomes to provider satisfaction, Weisman and Nathanson (1985) demonstrated that the job satisfaction levels of nursing staff were the strongest determinant of the aggregate satisfaction level of clients, and that client satisfaction level in turn predicted the rate of client compliance. Similarly, DiMatteo et al. (1993) showed that patient compliance was also positively related to levels of doctor satisfaction.

Linn et al. (1985) also demonstrated a positive correlation between doctor and patient satisfaction. They found that this positive relationship resulted in increased continuity of care, lower patient no-show rates, more efficient use of resources and more reasonable charges for follow-up visits. They concluded that improving doctor and patient satisfaction might therefore also have economic as well as psychological and social benefits

Job satisfaction is also important, not only as a goal in itself, but also to enable the recruitment and retention of the best persons to the field. Pillay (1996) found that job satisfaction was perceived as an important determinant of where, and for whom, newly qualified medical doctors intended to practice.

Hence, if doctor dissatisfaction has the propensity to affect patients, colleagues, and organisations, many stakeholders would benefit from an accurate and comprehensive measurement of this phenomenon.

2.5.3. Motivation Theory and Job Satisfaction

Given the key role of doctors in the health care system, it is important to understand what motivates them and to what extent the organisation satisfies their needs. The theories of motivation help us to understand how best to motivate staff so that they work willingly and effectively to achieve the goals and objectives of the organisation.

The underlying concept of motivation is the existence of some driving force within individuals by which they attempt to achieve some goal in order to fulfil some need or expectation. These needs and expectations can be categorised into intrinsic and extrinsic motivation (Mullins, 1999).

Extrinsic motivation is related to tangible rewards such as salary, benefits and work environment. Intrinsic motivation is related to 'psychological' rewards such as the opportunity to use one's ability, a sense of challenge and achievement, receiving appreciation, and positive recognition. A person's motivation, job satisfaction and work performance is determined by the comparative strength of these sets of needs and expectations, and the extent to which they are fulfilled.

The most important motivation theories can be divided into two broad categories: content theories and process theories. Content theories focus on the internal needs and desires that initiate, sustain and eventually terminate behaviour. They focus on what motivates people. In contrast, process theories seek to explain how behaviour is initiated, directed and sustained. It places emphasis on the actual process of motivation.

In order to reconcile people and their jobs, sufficient knowledge of the employees' needs are of paramount importance in order to foster effective functioning. Of the content theories espoused by Maslow in 1943, (cited in Mullins, 1999), the most widely used theory contends that man has five basic categories of needs: 1) *physiological needs* such as food, water, oxygen and sex; 2) *safety*, ordered existence in a stable environment; 3) *social*, the need for relations with others and the need to be accepted by peers; 4) *esteem*, need for self confidence, independence, freedom, recognition, appreciation and achievement; 5) *self-actualisation*, need for self-fulfilment and the need to realise one's full capacity for doing.

These five classes form a 'hierarchy of needs' and proceed from the very basic (level 1 and 2) to a cluster of higher needs (levels 3, 4 and 5). Maslow's basic premise is that the behaviour of any person is dominated by groups of needs which are unfulfilled and that the individual will systematically satisfy his needs, starting with the most basic and moving up the hierarchy. This model provides us with a useful base for the evaluation of motivation at work. Steers and Porter (1991), and Skinner and Ivancevich (1992), proposed a list of general rewards and organisational factors that may be used to satisfy different levels of needs (see table 2.1,below). In order to ensure a satisfied workforce, the challenge for managers is to motivate their staff by identifying and meeting their needs in the workplace.

	Needs Level	General Rewards	Job Satisfactors
1	<i>EXTRINSIC</i> Physiological	Food, water, sleep, sex	• Pay • Pleasant working conditions
2	Safety	Safety, security, stability	• safe work conditions • company benefits • job security
3	Social	Love, affection, belongingness	• cohesive work group • friendly supervision • professional associations • team work
4	<i>INTRINSIC</i> Esteem	Self-esteem, self-respect, prestige, status	• social recognition • job title • high status job • feedback from job itself
5	Self-actualisation	Growth, advancement, creativity	• challenging job • opportunities to demonstrate creativity • achievement in work, advancement in organisation

Table 2.1 Application of Maslow's needs hierarchy

Adapted from Skinner and Ivancevich (1992), and Steers and Porter (1991)

Vroom's expectancy theory is one of the major models of processes by which motivation occurs. Vroom, in 1964 (cited in Mullins, 1999), theorised that people are not driven by their needs but that they make choices about what they will and will not do to fulfil their needs based on three conditions:

1. The person must believe that effort to perform at a particular level will make the desired performance or behaviour more likely;
2. The desired performance or behaviour must lead to some concrete outcome or reward and;
3. The person must value the outcome (see figure 2.8, below).

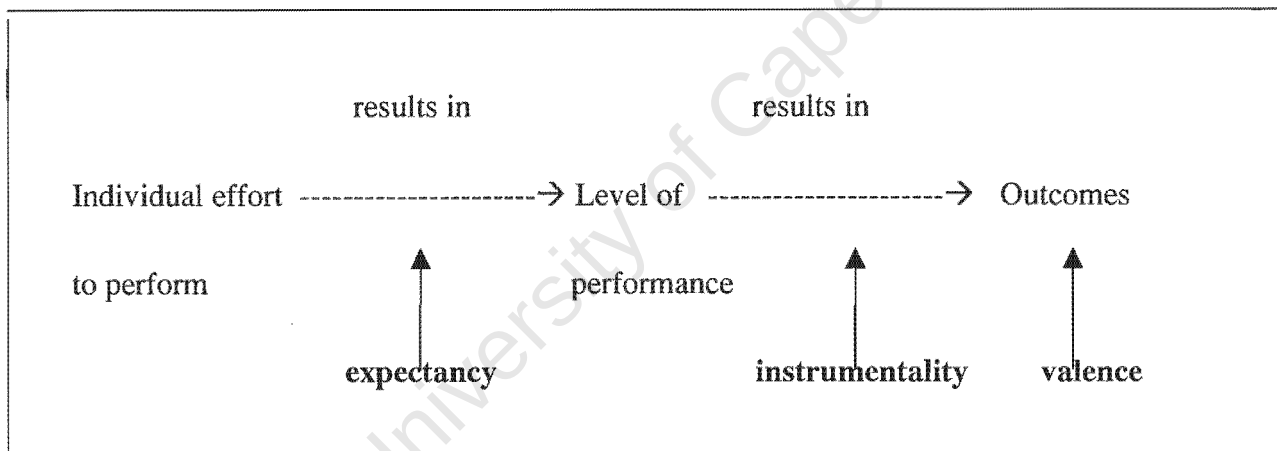


Figure 2.8. Simplified Model of Expectancy Theory

Expectancy (E) is what individuals perceive to be the probability that their efforts will lead to a desired level of performance. The higher the probability of achieving a specific goal, the greater the effort that will be made. Instrumentality (I) is the probability perceived by individuals that their performance would lead to desired outcomes or rewards. Outcomes are the reward or satisfaction associated with performance. Vroom terms the value that an individual attaches to a particular outcome, its valence (V).

The three components of expectancy theory can be combined into an equation to express the motivation to work:

$$\text{Motivation} = \text{expectancy (E)} \times \text{instrumentality (I)} \times \text{valence (V)}$$

For motivation to be high, expectancy, instrumentality and valence values must be high.

Management can redesign a task, provide training or introduce incentives to increase an employee's expectancy. Similarly, instrumentality can be affected by introducing a compensation system and promotion policy that is linked to performance. To ensure high valence, management must take into consideration and try to satisfy individual preferences in respect of compensation method, promotion, recognition and so on.

Porter and Lawler (1968), integrated the motivation theories to emphasise the relationship between effort, performance, rewards and satisfaction (see figure 2.9).

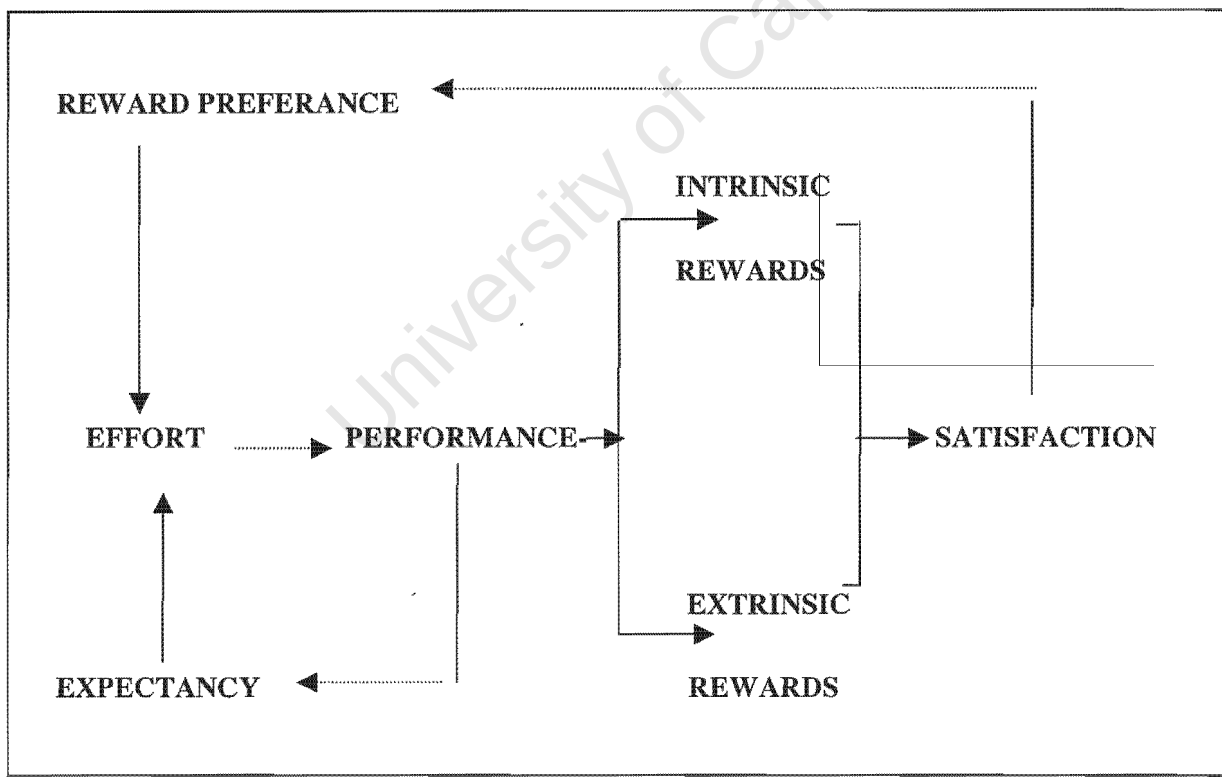


Figure 2.9. A model of motivation and job satisfaction (Porter and Lawler, 1968 *Managerial attitudes and performance*, 165. Homewood, Illinois)

In order for managers to ensure that their employees are motivated and satisfied, they have to take into consideration two types of expectancies. The first expectancy is the person's perception of the probability that a given amount of effort will result in achieving an intended level of performance. The second expectancy is the person's perception of the probability that a given level of performance will actually lead to particular need related outcome (intrinsic or extrinsic). The first expectancy is determined in part by the person's ability and self-confidence, past experience, and the difficulty of the task. The second is determined by the attractiveness of the outcomes and the belief about who controls the outcomes, the person himself or other people (Mullins, 1999). Expectancy theory indicates that managers should give attention to a number of factors, including:

- Outcomes or rewards with high valence should be used as an incentive for improved performance
- Establish clear relationships between effort-performance and rewards, as perceived by the individual
- Establish clear procedures for evaluation of individual levels of performance
- Pay attention to intervening variables such as organisational procedures and support facilities which may affect performance

Motivational researchers and theorists (Tampoe, 1997) who have studied the motivation of knowledge workers agree that the Expectancy Theory of motivation is the most appropriate for this category of employee. As alluded to earlier on, the rewards and expectations of these knowledge workers include personal growth, autonomy, and creative achievement. Reward strategies should therefore be designed to optimise these inherent and intrinsic motivational drivers while allowing for factors such as work environment and work content. Similarly, Arnolds and Boschoff (2000), have also demonstrated that job performance of higher level employees was significantly influenced by higher order need satisfaction while lower order need satisfaction was the dominant determinant of job performance of lower level employees. The notion that a positive relationship exists between job level ascendance and need progression from lower to higher order needs, makes it theoretically possible for physician managers to target specific higher order or intrinsic needs.

2.5.4. Dimensions of job satisfaction

Job satisfaction is not a single concept. Rather, it has multiple dimensions or facets that correspond to different aspects of the work environment (Lichtenstein, 1984). Mullins (1999), categorised the range of variables that affected job satisfaction:

Individual factors include personality, education, intelligence and abilities, age, marital status, orientation;

Social factors include relationships with co-workers, group working and norms, opportunities for interaction, informal organisation;

Cultural factors include underlying attitudes, beliefs and values;

Organisational factors include nature and size, formal structure, personnel policies and procedures, employee relations, nature of work, technology and work organisation, supervision and styles of leadership, management systems, and working conditions;

Environmental factors include economic, social, technical and governmental influences.

These different factors all affect the job satisfaction of certain individuals in given sets of circumstances but not necessarily in others. Both theoretic and empirical bases have been used to identify the distinct facets of job satisfaction that are salient in various settings. Lichtenstein (1984), pioneered the multifaceted scale for measuring the job satisfaction of doctors. He identified work place concerns and core professional work issues, and hypothesised seven facets of job satisfaction consisting of 46 items (resources, autonomy, relationships with patients, professional relations, status, pay, and flow of work). In addition to facet specific aspects of satisfaction, he also identified global or overall satisfaction as an important component. Exploratory factor analysis using data from 588 prison doctors yielded 33 items loading on six factors. Flow of work was not identifiable as an individual facet.

Stamps and Cruz (1994) culled facets from job satisfaction literature to develop a multidimensional instrument, with which they surveyed 1302 community doctors in Massachusetts. Exploratory factor analysis revealed six factors: personal issues, resources for practice, review by profession, satisfaction of medicine as a profession, regulatory climate and community.

Konrad and Williams et al (1999) used previous research, doctor focus groups, secondary analysis of survey data, interviews with doctor informants, and a multi-specialty doctor panel to develop distinct job facets and items to represent these facets – the Physician Worklife Survey (PWS). After conducting a pilot study, a national sample of 2325 doctors was used in a subsequent validation study. Factor and reliability analyses yielded a 36 item, 10 facet satisfaction measure including autonomy, relationship with colleagues, patient care, relationship with staff, personal time, relationship with patients, community, compensation administrative support and resources. Three scales measuring global job, career, and specialty satisfaction were also constructed. The PWS is thus a culmination of a conceptual developmental approach coupled with empirical studies, which supported face, content, convergent, and discriminant validity of the measures. It is to date the most substantive measure of physician job satisfaction and because of its methodological strengths, it will be adapted for use in our study.

2.5.5 Job Satisfaction of Doctors– Previous research

Identifying the factors that cause doctor satisfaction and dissatisfaction within the various types of practice settings becomes increasingly important as current health care reform efforts continue to promote more structured practice environments. Understanding how managed care arrangements affect doctor satisfaction and what factors make managed care more or less palatable to doctors is an important step in assuring a successful transition to what appears to be an increasingly common form of medical practice. Because managed care is at odds with the historical roots of the medical profession, there have been many studies focusing on how satisfied or dissatisfied doctors are with the organisational structures and management practices associated with this mode of care delivery.

2.5.5.1 Organisational structure and doctor job satisfaction

Differences in doctors' job satisfaction between large organisational settings and traditional independent practices relate to various aspects of the conditions and content of work. Organisational theory and empirical evidence (Breslau et al., 1978) suggest that in large medical organisations there will be a greater division of labour and consequently work will

be less varied and less complex than in traditional solo or small practices. Since varied and complex tasks, in contrast to routine and repetitive tasks, lead to greater job satisfaction, the diminished scope of activities of primary care doctors in large organisations would expect to be associated with lower levels of job satisfaction. The pervasive system of rules and regulations inherent in large health care organisations may also decrease workers' autonomy and the satisfaction derived from the exercise of discretion. Engel (1969) reported that moderate bureaucratic settings provided more professional autonomy than both the larger more bureaucratic organisations or the solo practices that had fewer resources for care and treatment. Similarly, a number of studies dating to the 1970's and earlier (Ben David, 1958; Demlo, 1975; Freidson and Rhea, 1963, cited in Schulz, Girard and Scheckler 1992), suggest that practicing within large bureaucratic organisations compared with solo or small group practice adversely affects doctors' work practice. Involvement in HMO's in contrast to fee-for-service was also related to lower satisfaction

Conventional wisdom suggests that increases in competition brought on by increases in HMO market share may reduce levels of autonomy and satisfaction among doctors. Increases in competition may subject doctors to increasing levels of review and other forms of oversight, which may reduce autonomy or satisfaction. Alternately, HMO activity may increase their uncertainty about the future, force private practice doctors to adapt their practice styles to remain competitive, or change the expectations and perceptions of patients with whom these doctors interact. All these factors, and perhaps others as well, could lead to reduced levels of satisfaction (Burdi and Baker, 1997). After analysing data from a United States of America national survey of younger doctors held in 1991, Hadley and Mitchell (1997), found that a doubling of HMO penetration level was associated with a significantly higher relative odds of doctors reporting that they were less than satisfied with their practice. These doctors also reported greater constraints on the process of care. On the other hand, those doctors that reported that they were very satisfied also reported that they had more freedom to care for patients without practice constraints. Similarly, in a survey of 510 Arizona doctors, Warren et al. (1998) also demonstrated that doctor satisfaction was inversely correlated with the percentage of their patients enrolled with managed care organisations.

Not only are doctors working in managed care organisations subject to different influences than doctors outside of managed care, but significant variation also exists both between and

within different organisational forms of managed care. Warren et al (1998), in the above study, also found that participation in IPA's did predict higher satisfaction. Stamps (1995), in her survey of 1302 Massachusetts doctors, found that doctors who were in solo practice were more dissatisfied than their colleagues who practiced in groups of three or more, or who were employed by a hospital or a staff model HMO. She offered four possible explanations for the positive association between doctor satisfaction and a structured work environment. The first is that organisations are not all inherently dissatisfying, as evidenced by the observed trends of doctors choosing more structured environments. The second is that organisations helped buffer doctors from external regulations and also allow doctors to more successfully balance their competing responsibilities such as patient care and income. Her final theory draws on the work of Herzberg, who suggested that job satisfaction is composed of two discrete types of factors: those that induce satisfaction, and those that result in dissatisfaction. She believes that organisations are better able to provide ways to reduce elements of dissatisfaction (such as patient scheduling or assistance with administration), and augment elements that promote satisfaction (such as provision of resources).

In their 1986 survey of 850 doctors in Dane County, Wisconsin – most of whom practised in a managed care environment- Schulz et al. (1992) found that 70% of all primary care doctors were satisfied or very satisfied with their practice. Compared with doctors not affiliated with an HMO, IPA membership was associated with greater satisfaction with status in the profession and greater satisfaction with resources. Although HMO affiliation had negative effects on perceived clinical freedom, most doctors practising in managed care environments were satisfied as opposed to independent practices (solo or group), which was not associated with job satisfaction. There was, however, no statistically significant difference in satisfaction between different HMO types. They also observed that Dane County HMO's were organised and controlled by the doctors themselves, and concluded that doctor participation in organisational decision making was important to job satisfaction. Their follow-up survey in 1993 (Schulz et al., 1997), revealed a trend towards diminishing independent practice, and a substantial increase in HMO affiliation. There were also no significant differences over time in the percentage of doctors reporting satisfaction with their current work situation, believing that HMO's provided more cost effective care than fee-for-service. Doctors in small group model HMO's were also significantly more satisfied with their practices than those in staff model or solo practices.

Data from a 1991 survey of USA young doctors were also analysed by Baker and Cantor (1992). Analyses of doctors' satisfaction with their practices and careers showed that practising under managed care was not uniformly associated with lower levels of satisfaction. Further dissection of the same data by Baker et al (1993), revealed that of those doctors working in a group or staff model HMO, nearly 80% reported that they were satisfied with their practices and careers within medicine.

Thus the evidence seems to suggest that doctors working in HMO's such as IPAs and small groups that are generally of a moderately bureaucratic nature tend to be more satisfied and whereas doctors twenty years ago may have been horrified at the prospect of managed health care, doctors now accept it more readily. Since the South African managed care industry is still in its infancy we speculate that local doctors may have the same initial negative response to managed care, with those in HMO structures that are moderately bureaucratic and afford a degree of independence, perhaps being relatively more satisfied.

Overall, doctors appear to be satisfied with their work, but those who report being dissatisfied tend to have a higher percentage of patients belonging to managed care organisations and tend to be practising either as solo practitioners with no organisational support or are employed by highly bureaucratic organisations.

2.5.5.2 Managerial Practices and Physician Job Satisfaction

One of the hallmarks of the managed health care revolution is the use of a variety of management interventions to influence the clinical behaviour of doctors and encourage the parsimonious use of resources. Research to determine the differential effect of these various strategies on doctors' job satisfaction has however been limited.

In a survey of 1549 doctors who worked in a managed care environment, Hadley et al (1999) reported that doctors who had a moderate or strong incentive to reduce services were from 1.5 to 3.0 times more likely to be very dissatisfied with their practices and were 0.2 to 0.5 times as likely to report that their expectations regarding professional autonomy were met, compared to doctors who had a neutral incentive. Factors found to significantly increase the likelihood of reporting an incentive to reduce services included being employed by a staff

model HMO, being paid a straight salary that lacks bonus or incentive options and being remunerated by capitation.

Although capitation is becoming the dominant form of remuneration in the managed care environment, research (Tyranee et al., 1999; Nadler et al., 1999; Bates et al., 1998; Kerr et al., 1997) has demonstrated that doctors have strong negative perceptions about it. Doctors were less satisfied with the quality of care they deliver to patients covered by capitated contracts than with quality of care they deliver to patients covered by other payment sources. Clearly, the expansion of capitation should be accompanied by doctor education and other management relation efforts, to ensure that satisfaction of practising doctors with the care they deliver, does not decline.

A few empirical studies have also demonstrated that doctors were pointedly dissatisfied with their involvement in managerial decision-making (Schulz et al., 1997; McBride and Rearick, 1995; Kravitz and Linn, 1990). The general sentiment was that things were 'too tight at the top, with too few people having input'.

Their discontent with decision-making probably reflects clinical as well as socio-economic concerns since satisfaction with aspects of clinical autonomy and remuneration systems are often also relatively low (Schulz and Girard, 1992; Kravitz and Linn, 1990). This negative relationship between doctor job satisfaction and their role in administrative and organisational decision-making lends credence to the findings of Muller (1995), that health care workers perceived a participative management approach as an important prerequisite for optimal health outcomes.

Although the efficacy of the various educational strategies employed by managed care organisations have been extensively evaluated (Everett et al 1990; Davis et al 1992); Grimshaw & Russel, 1993; Lomas 1989; Lomas et al 1991) little in the literature describes how these strategies impact on doctor job satisfaction. It is the task of this research to evaluate the differential effects of these various strategies on the job satisfaction, and we posit that strategies that are not perceived as impinging on clinical autonomy will be perceived positively.

Similarly, although administrative interventions continue to form a vital role in the quest of management to limit the utilisation of resources, very little empirical work has been conducted to ascertain their impact on the job satisfaction of doctors. We do however

intuitively posit that doctors will perceive these interventions as contributing to the bureaucratisation of medical practice and consequently it will lead to increased job dissatisfaction, especially in primary care.

Berwick et al (1986), and Mugford and Banfield (1991), have also demonstrated the efficacy of feedback as an effective tool to influence clinical practice, but there is little empirical evidence to suggest how doctors perceive this strategy. Information such as this is vital if we are to utilise this strategy effectively.

2.5.5.3 Clinical autonomy and doctor job satisfaction

As alluded to previously, clinical autonomy is defined within the framework of 'clinical freedoms important to good patient care', and includes choices about patient care such as control over the nature and volume of medical tasks, acceptance of patients, control over diagnosis and treatment and control over the evaluation of care (Schulz and Harrison, 1986). The existing literature (Byers and Mays, 1999; Baker et al 1994; Warren et al., 1998; Schulz et al 1997; Schulz et al 1992; Schulz and Schulz, 1988) is replete with evidence suggesting that clinical autonomy has a substantial influence on job satisfaction and is perhaps one of the best predictors of job satisfaction. Although none of these studies have established a cause-effect relationship between clinical autonomy and job satisfaction, the strong positive correlations prompt us to predict that changes in health care systems that reduce, or appear to reduce the primary care provider's autonomy in clinical matters will reduce provider satisfaction as well.

Based on these findings, the perceived ability of doctors to treat patients as he or she thinks is best, is an important precursor to work satisfaction, and we have therefore proposed perceived clinical autonomy as an intervening variable between doctor and institutional characteristics and job satisfaction (see Figure 1.5).

From the above review of the literature on doctor job satisfaction, it becomes abundantly clear that managed care plans cannot afford to ignore doctor satisfaction as it affects quality of care and patient satisfaction, in addition to ensuring the economic success of the organisation. To this end these organisations have to ensure that they are optimally structured, so as to minimise the limits placed on clinical autonomy whilst simultaneously

involving doctors in the processes of administrative and organisational decision-making and strategy implementation. It is also incumbent on health care administrators to ensure that changes to the current system are carefully evaluated for their effects on provider outcomes before they are universally implemented. It is hoped that this research will assist in addressing these concerns.

2.6. Some 'Gaps' in the Literature Review

Although the preceding review of the literature has offered us a sound theoretical and empirical basis for the development of a framework for our research model and for the generation of hypotheses, there are however a few striking lacunae. The design of our research methodology is aimed at addressing these voids and validating or refuting the findings of other studies.

Perhaps the most striking 'gap' in the literature is that there has evidently been a paucity of empirical research in South Africa, which evaluates the managed care industry as a whole and doctor behaviour and performance in particular. Although the results of foreign studies may be extrapolated to predict doctor attitudes and responses in the local context, it is imperative that we conduct sound locally based research at this early phase in the development of the managed care industry. Comparison of our results with foreign studies will assist us to ascertain whether there are cross national, cultural and system differences in the perceptions of doctors on the impact of managed care and will also enable the various stakeholders to develop structures and strategies that are locally relevant. Follow up studies will also help us to track trends in doctors' perceptions of this relatively new (in South Africa) health care delivery system, which will be vital for the development of recruitment and training programs, and future health care planning.

Secondly, the bulk of the previous research looked at the impact of individual aspects of managed care on doctor performance and satisfaction. The effects of organisation structure (Baker et al, 1994; Engel 1964; Kenkel 1988; Trespacz 1999; Shenk, 1998; Schulz et al 1992; Stamps et al 1995; Warren et al 1998), or individual strategies (Barr & Steinberg 1983; Berwick et al 1986; Grimshaw & Russel 1993; Lomas 1991; Schulz & Scheckler 1997) were assessed separately in different populations. The research method employed here will enable a more comprehensive analysis of the organisational structures and managerial

practices employed, in the same study population. Consequently, these results may better reflect the overall impact of managed care on doctors.

2.7. The Conceptual Framework

The basis of the conceptual framework for this study has been drawn from empirical work by Shortell (1975) and Georgiopoulos (1978).

Shortell, in addressing the issue of analysing health service organisations, grouped variables into four classes: environment, organisation structure, organisational processes and organisational effectiveness. He graphically depicted their interrelationship as in Figure 1.3, below.

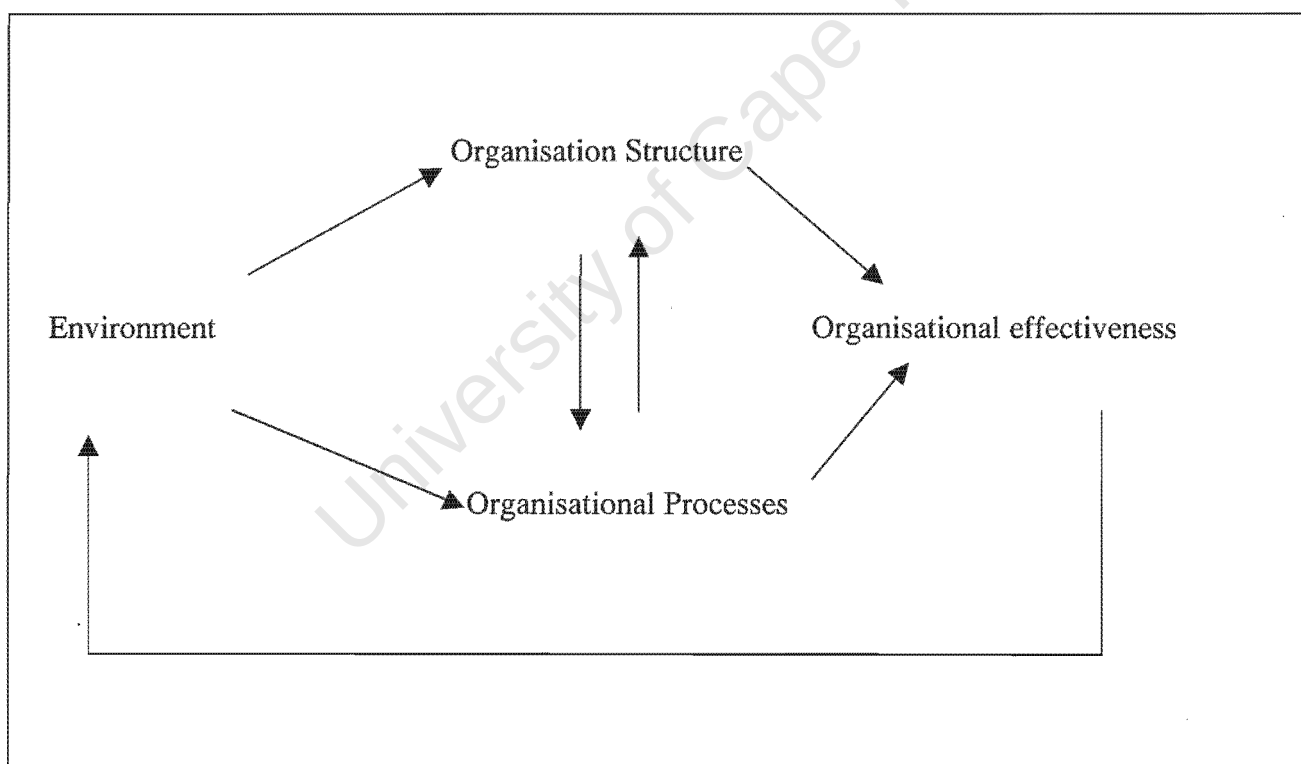


Figure 2.10. Model for Organisational Analysis of Health Service Delivery Systems (Shortell 1995).

The environment consisted of those factors outside the organisation that health service administrators must consider in decision-making. These included patient demands, regulatory groups and third party payers. Organisational structure referred to the four commonly considered organisational research dimensions - centralisation, formalisation, job codification and division of labour. Organisational process variables described how activities within the organisation were carried out and included co-ordination, communication, decision-making, goal setting, staff relations and shared decision-making. Organisational effectiveness described the ability of the organisation to survive over time and included goal task effectiveness - that is to provide services and achieve some quality of care, flexibility in responding as demands grow from the environment, and stability.

Goergiopoulous (1978), suggested that if one controlled for the external environment, the overall effectiveness of health service organisations depended on two of their basic aspects:

- 1) The nature of their organisational structure including size, staffing patterns, complexity and other structural variables;
- 2) The strategy they employ to manage key areas such as resource allocation and co-ordination (Shortell's organisation processes).

He described organisational effectiveness "as the ability of the system to maintain high levels of output in terms of quantity, quality, cost, acceptability, and related criteria given the human and non-human resources at its disposal". He further viewed organisational effectiveness as consisting of three essential but different kinds of efficiency - clinical efficiency was defined in terms of medical input, and included the performance of doctors and the achievement of clinical rationality. Economic efficiency reflected the economic performance and productivity. Social efficiency was defined in terms of the personal or psychosocial investment of participants and the satisfaction of their individual needs through membership and work in the system (See Figure 1.4).

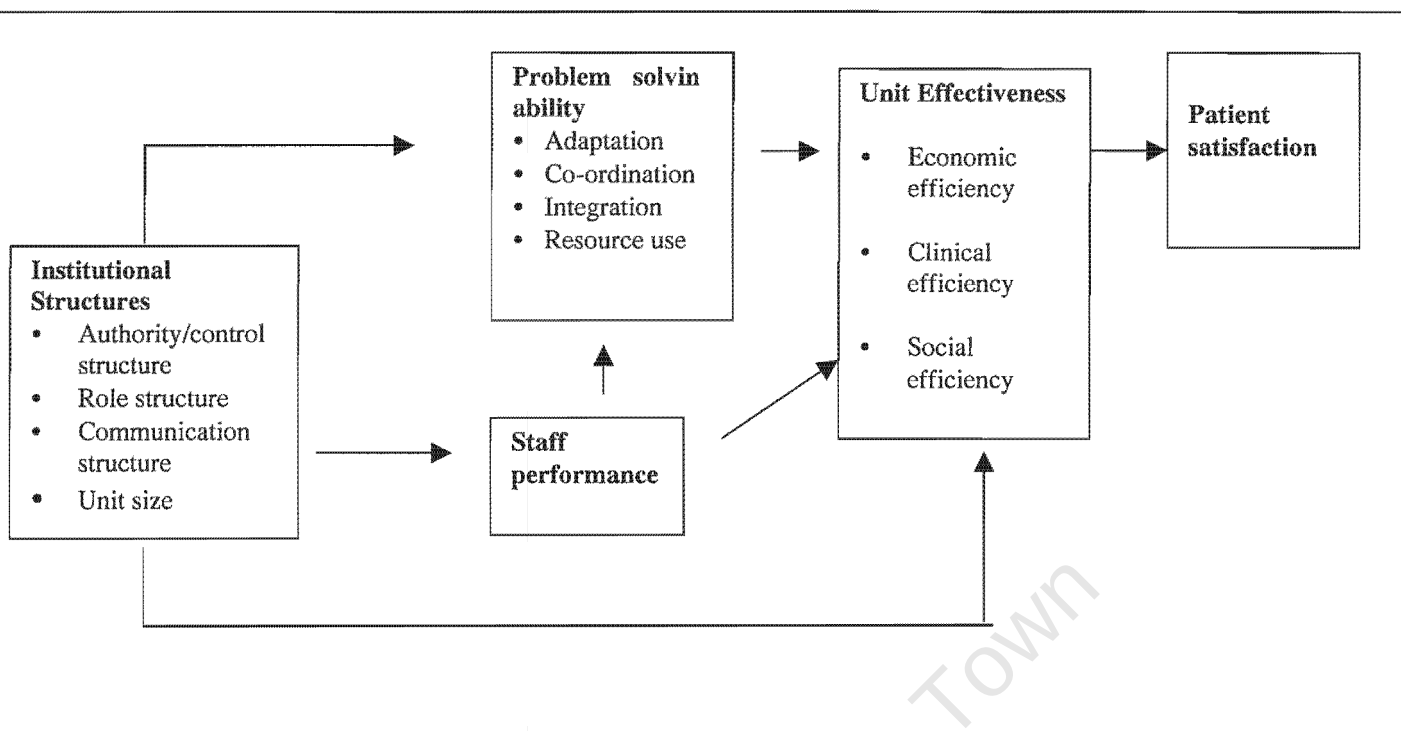


Figure 2.11 An Open System Approach to Evaluating Effectiveness of Hospital Departments
(Adapted from Georgiopoulos, 1978)

The effectiveness of managed care organisations can thus be assessed by adapting the models of Shortell and Georgiopoulos. The variables of our research interest have however been selected for their relevance and anticipated importance, both on pragmatic grounds and on the basis of the above organisation theory considerations. Figure 1.5 illustrates the conceptual framework for this study.

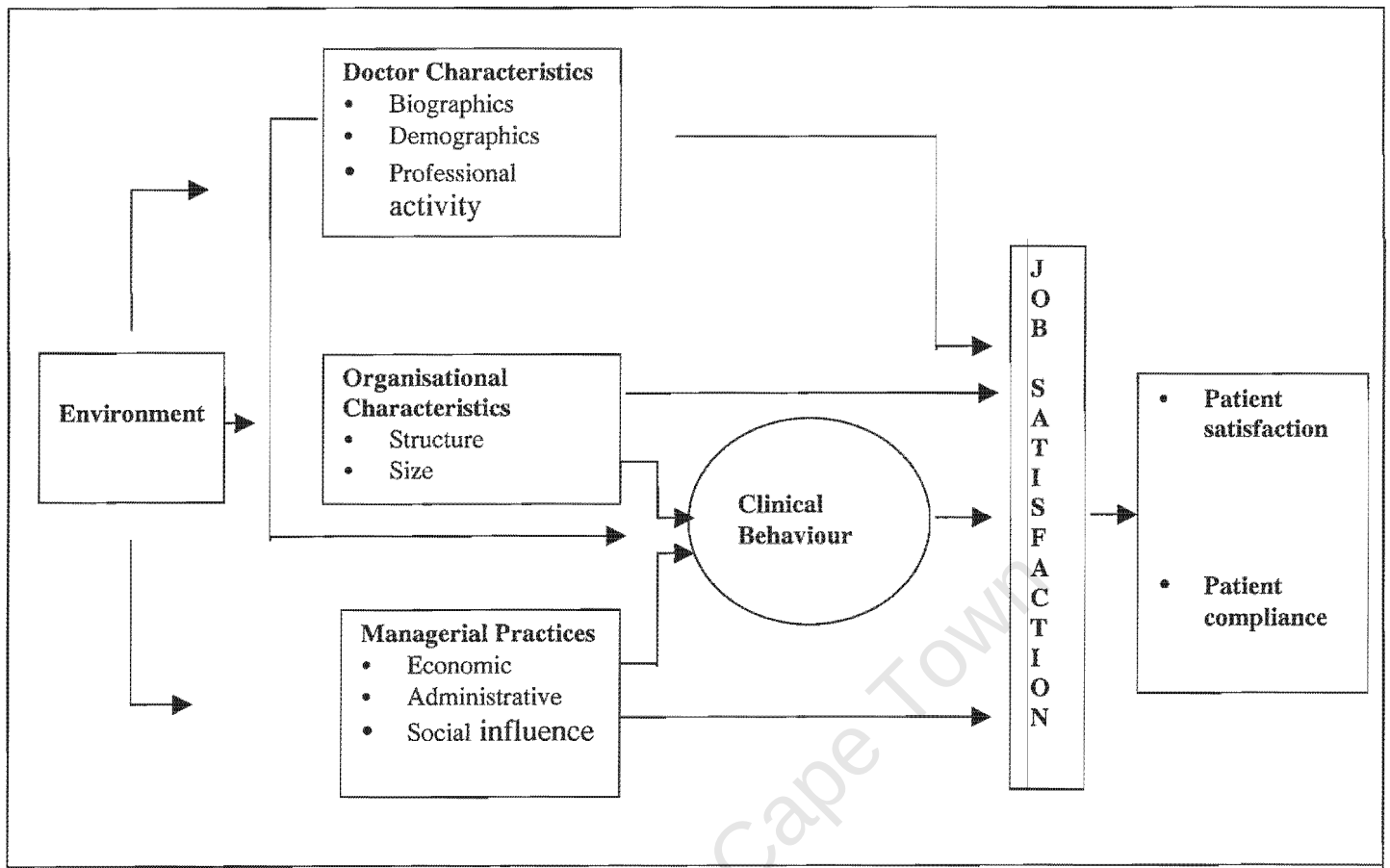


Figure 2.12. The Conceptual Framework - Inter-relationships between Organisation Structure, Managerial Practices, Clinical Behaviour and Job Satisfaction of Doctors in Managed Care Organisations.

The socio-political and economic pressures (environment) that have warranted the introduction of managed care principles have already been dealt with earlier on in this chapter, as have the perceived economic benefits. Schulz and Schulz (1988) proposed that the perceived clinical autonomy of doctors was an important predictor of job satisfaction, thus making it an intervening variable between doctor and institutional characteristics and job satisfaction. Lin et al. (1985) and Blankenfield et al. (1990) have already demonstrated a positive relationship between doctor satisfaction and patient compliance and satisfaction respectively. Carol et al. (1985) also demonstrated a strong relationship between nurse job satisfaction and the satisfaction of their clients. This study is therefore limited to determining the impact of doctor and institutional characteristics on the clinical behaviour and job satisfaction of primary health care doctors in the managed health care environment. It is

posited that organisations that are appropriately structured and that adopt strategies that are congruent with the goals of their doctors will provide a climate in which these knowledge workers will provide a more effective service and in which patients will perceive them as being highly service-orientated.

The independent variables (causal) are doctor and organisational characteristics and managerial practices while the dependant variables (effect) include clinical behaviour and job satisfaction.

Doctors bring to institutions certain of their own characteristics that may relate to the way they perform their tasks and to their satisfaction. Professional qualifications, years of employment in the institution and gender may all be expected to relate to clinical behaviour and satisfaction. Organisational characteristics considered in the model refer to the different HMO types and the practice demographics. Managerial practices include the various social influence, economic and administrative practices employed to encourage cost saving behaviour by doctors.

For the purposes of this study, clinical behaviour includes clinical autonomy and will be defined within the framework of "clinical freedom important to good patient care" (Schulz, 1991). Job satisfaction will include global satisfaction levels as well as the various facets of job satisfaction as adopted by Lichtenstein (1984), Schulz and Schulz (1988) and Williams (1999). All of the variables above are discussed comprehensively in Chapter Two.

2.8 Integration of Literature and Generation of Hypotheses

2.8.1 Variables

The process of hypothesis formulation, sampling procedures and data analysis considers the relationship between the following variables:

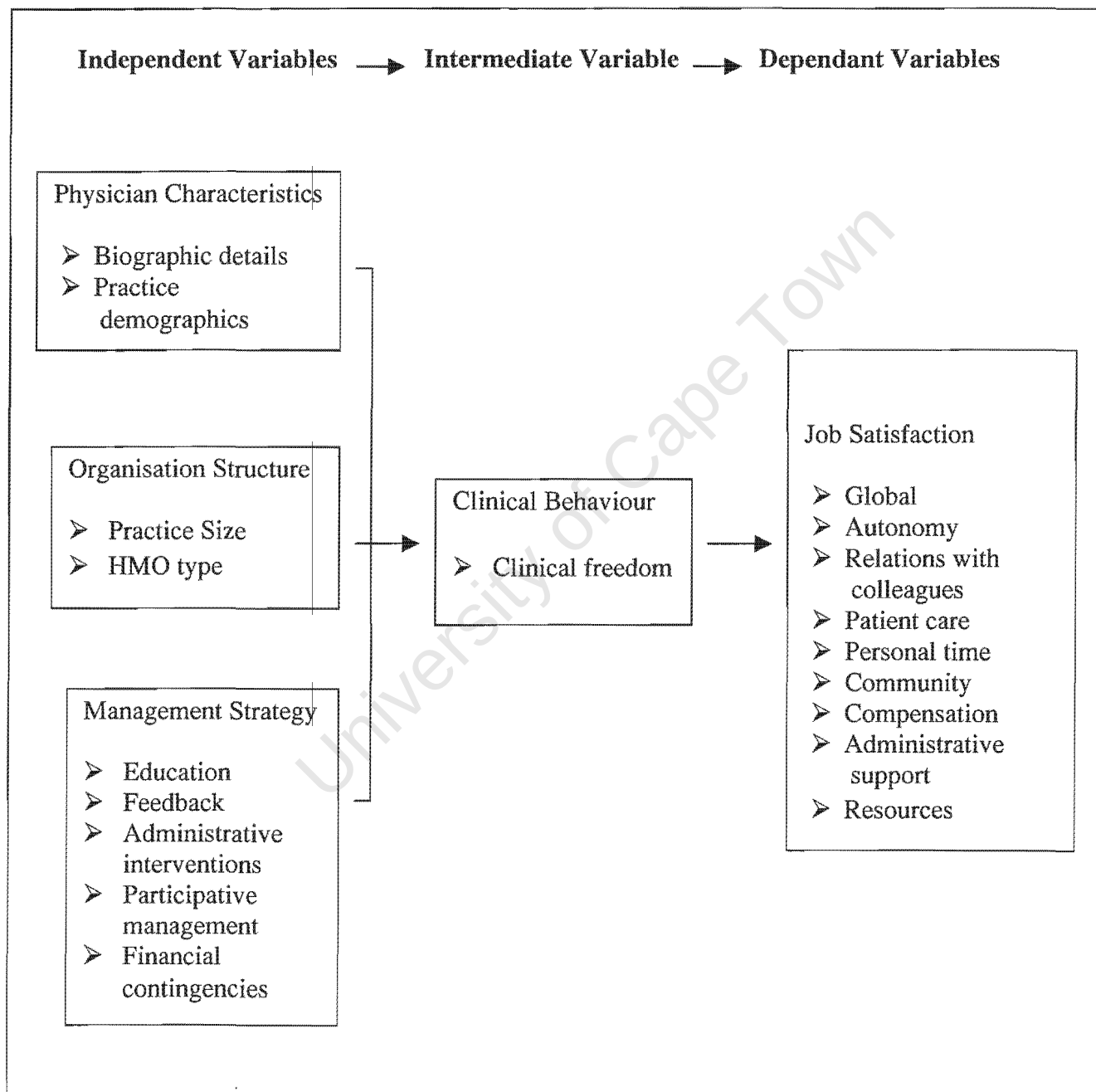


Figure 2.13 The Interrelationships Between the Study Variables

2.8.2 Generation of Hypotheses

The following section reviews our hypotheses concerning the impact of organisational structure and managerial practices on the clinical autonomy and job satisfaction of primary care doctors in managed care organisations. These hypotheses have been derived from the objectives and are based on previous theories and research, some pertaining directly to doctors. They specify the anticipated relationship between the variables as illustrated in the conceptual framework.

2.8.2.1 Organisational Structure

The review of the theory on organisational structure points to the notion that doctors who practice in large managed care organisations will have difficulty providing high-quality primary care and are expected to experience greater dissatisfaction and conflict than doctors who practise in smaller organisations. The organisational literature suggests that increased size affects other structural variables (such as formalisation, complexity, differentiation and communication), which may foster impersonal and dissatisfying work experiences (Weber, 1947, cited in Dressler, 1980). In support of this view, early research on job satisfaction indicated that large size and organisations at the mechanistic end of Woodward's mechano-organic continuum promotes dissatisfaction and lower staff morale (Porter and Lawler, 1964, cited in Dressler, 1980). More recent studies also confirm that these larger and relatively more bureaucratic organisations also have shortcomings in both patient and doctor satisfaction (Barr, 1995; Linn et al., 1982; Schulz and Schulz, 1988).

At the opposite end of the continuum, solo practitioners lack the support and influence that larger organisations afford while also coming under increasing competitive pressure from these larger managed care organisations. The inherent disadvantages of organisations at both ends of the mechano-organic spectrum are evidenced by the findings of Kletke et al (1996) and Gugliemo (1996), who found that the proportion of physicians in solo practice was falling and that staff model HMOs were losing market share and were becoming virtually extinct.

IPAs on the other hand, continue to grow in popularity among both doctors and patients (Trespacz, 1999) and this is attributed to the combined advantages of a small, personal

practice model and the organisational benefits at the collective level (Shenkin, 1998). These findings echo the sentiments of Engel (1968), who found that an element of bureaucracy was essential to facilitate the optimal provision of health care, from the perspective of the physician. More recently Stamps (1995), also demonstrated that doctors in solo practice were more dissatisfied than their colleagues who practised in an organisational environment. Of those who practised in managed care organisations, participation in IPAs tended to predict higher satisfaction (Schulz et al., 1992; Warren et al., 1998).

The most useful conclusion to be drawn from the above findings is that IPA's appear to have theoretically superior attributes when compared to other managed care organisations. Doctors also find it particularly satisfying to work in IPAs, which offer more clinical autonomy, entrepreneurial autonomy, and control over work conditions than any other options under managed care. We therefore hypothesise thus:

Hypothesis 1

IPA's offer primary care doctors greater job satisfaction relative to other managed care models

Hypothesis 2

IPA's provide an environment more conducive to optimal clinical practice relative to other managed care models.

2.8.2.2. Managerial Practices

The review of the literature on managerial practices has highlighted the different interventions that managed care organisations can employ to affect the way clinical services are provided. Doctors want plans to facilitate their professional efforts to render high quality care and we posit that they are most likely to respond positively to management strategies that govern clinical practice in ways consistent with their professional norms and values. Further, we posit that autonomy and work conditions that facilitate attainment of work goals will be important to job satisfaction (Locke, 1976 cited in Schulz and Schulz, 1988).

There is a widespread assumption that education strategies lead to behaviour change and job satisfaction. Unfortunately, studies have indicated that education has only limited influence on doctor behaviour (Davis, 1992, 1995, 1999; Lomas, 1989). In fact there is evidence that behavioural changes brought about by education tend to be transient, and when educational efforts are discontinued, doctors revert to “business as usual” (Goodpastor and Mantoya, 1996).

Only the use of opinion leader strategies was associated with sustained changes in clinical practice (Everett et al., 1990; Lomas et al., 1991).

Although doctors recognise the potential benefits of educational strategies, they were concerned about possible effects on clinical autonomy and satisfaction with practice (Salem-Schatz et al., 1997; Tunis et al., 1994). They perceive it as attempting to influence diagnosis and treatment, control the process and content of care (Schulz and Harrison., 1986), and restrict access to resources (Halm et al., 1997). Managing patients according to third party protocols also creates a conflict of interest in the doctor– patient relationship (Emanuel and Dubler, 1995), and contradicts the Hippocratic ethic of putting the concern and well-being of patients first (AMA, 1995).

Thus, although education strategies appear to have some merit, we posit that they will be perceived by doctors as limiting their clinical autonomy and thence job satisfaction. We therefore hypothesise thus:

Hypothesis 3

Doctors perceive educational strategies as limiting clinical autonomy, which will subsequently result in reduced job satisfaction.

Although it is not yet known whether feedback can affect patient outcomes, previous research has found feedback to be an effective means of altering clinical practice (Berwick et al., 1986; Mugford and Banfield, 1991). Feedback serves an educational function while indirectly reinforcing the importance of the underlying message (Epstein, 1991). Active feedback also creates a work environment where doctors feel that their efforts are being recognised and appreciated. The potential impact of this strategy is a probable increase in expectancy, instrumentality and valency for their tasks (Vroom 1964, cited in Mullins, 1999), and a consequent increase in job satisfaction. We therefore hypothesise thus:

Hypothesis 4

Active feedback is an effective strategy to enhance clinical performance and job satisfaction in a managed care environment.

A more extreme approach to allocation of medical resources is through the imposition of administrative interventions. This explicit rationing is increasingly used to exclude certain services or to preview the use of expensive services. It is the mode of control most resented by working professionals since it intrudes on their practising autonomy and discretion in a direct way (Mechanic, 1980). Administrative authority frequently becomes insensitive to the human dilemmas and variabilities so obvious at the clinical level and are also frequently insensitive to important contingencies. Although there is a paucity of literature on the impact of administrative interventions on doctor clinical performance and job satisfaction, Williams (1997), found that physicians perceived the use of rules and regulations as hindering the provision of high quality care.

We therefore posit that doctors will perceive administrative interventions as impinging on their professional autonomy - an essential facet of their professionalism (Crum, 1991; Engel, 1968) - and contributing to the bureaucratisation of medicine, which increasingly burdens practising doctors. We therefore hypothesise thus:

Hypothesis 5

Doctors perceive administrative interventions as limiting their clinical autonomy, thus reducing their job satisfaction.

Many of the efforts to change doctors' behaviour are imposed by outsiders who may not share doctors' personal and professional concerns. Management theory (Maslow, 1954), and common sense suggests that doctors will oppose changes they perceive as threatening to their livelihood, self esteem, sense of competence, or autonomy. According to these notions, involving doctors in the effort to effect change should make change less threatening.

Encouraging doctors to participate in the process of decision-making has been found to be somewhat effective in altering their behaviour. Research in both industrial and health settings has found that participative management increases satisfaction and perceived

autonomy (Argyris and McGregor, cited in Dressler, 1980; Barr and Steinberg , 1983; Merckel and Pollard, 1987; Schulz and Schulz, 1988).

Involvement in decision-making and governance creates a sense of 'ownership' and a perception that strategies employed are personally relevant and appropriate to their own professional practice. Contributing innovative ideas enhances the self esteem and self actualisation needs of doctors while simultaneously assisting managers to design tasks and incentives that are perceived positively by their employees (Maslow, 1954; Vroom, 1964). We therefore hypothesise thus:

Hypothesis 6

Doctors perceive a participative management approach as enhancing their clinical autonomy and job satisfaction.

In the context of the workplace, research attempting to understand motivation and behaviour change in business and industry has shown that although many types of rewards can be effective motivators, money has been considered the strongest motivator, and has often been used to reward desired behaviour (Gellerman, 1968 cited in Goodpastor and Montoya, 1996). There is ample research evidence to show that financial incentives do indeed influence doctor behaviour to a very significant extent. Calnan et al. (1992), Grumbach et al. (1998), Hillman et al. (1989), and McCleary et al. (1995), have all demonstrated that the use of capitation and salary adversely affected the nature and volume of care provided by doctors.

This implicit rationing compels the doctor to confront priorities and to more carefully consider the benefits and costs of alternative allocations. This puts an ethical burden on doctors by requiring that they possibly deny services when a patient may demand them, which contradicts the Hippocratic ideal of acting solely on behalf of the patient. Fee- for-service, on the other hand, although inherently inflationary is believed to facilitate strong professional commitment, effort, and responsiveness to the needs of patients, while encouraging doctor motivation (Mechanic, 1980). We therefore hypothesise thus:

Hypothesis 7

Doctors compensated predominantly on the basis of capitation or salary will perceive these incentives as limiting their clinical autonomy, resulting in them being less satisfied, as opposed to those being compensated on a fee-for-service basis.

2.8.2.3 Doctor Characteristics

Older doctors are expected to experience greater satisfaction and fewer conflicts with their practice environment. The industrial sociology literature indicates that work satisfaction increases over the lifespan (Argyle, 1972 cited in Dressler, 1980). As people grow older, they gravitate to the types of organisations and jobs at which they like to work. Evidence from organisation research indicates that age is positively associated with both job satisfaction and organisational commitment (Steers, 1977; Glisson and Durick, 1988 cited in Burns et al., 1990). In support of this view, Schulz and Schulz (1988) report that physician satisfaction and autonomy are positively associated with the number of years that the doctor has spent at the hospital. Older doctors who have established practices should also be less affected by competitive changes in the marketplace than younger doctors still trying to build their practices. They may also possess greater leverage to obtain desired assistance and resources from management.

We also expect female doctors to report greater dissatisfaction and conflicts than male doctors. Female doctors experience greater conflict due to age and gender discrimination by the older, more numerous male medical staff members and administrators. Previous evidence indicates that female doctors and workers express lower job satisfaction (Glisson and Durick, 1988 cited in Burns et al., 1990; Schulz and Schulz, 1988) and enjoy less clinical autonomy (Schulz and Schulz, 1988), although only the latter relationship is significant. We therefore hypothesise thus:

Hypothesis 8

Older male doctors enjoy greater clinical autonomy and job satisfaction than their female counterparts.

CHAPTER 3

Research Methodology

3.1 Overview

Research design is a creative process, which reflects the personal tastes and preferences of the researcher, cost considerations, time available, audience and the many factors that shape design decision. At the same time there are broad guidelines for designing a research project that most people in the field would agree are the basic or essential components of that particular activity. The methodology that is ultimately selected is dependant on the overall level of rigour that is sought, constraints placed on the researcher and resources available to conduct the research (Leedy, 1993). Following a critical evaluation of the various research techniques, the descriptive survey was found to be the most appropriate, given the context of this research.

A survey usually adopts both a qualitative and a quantitative methodology whereby a sample of subjects is drawn from a population and studied to make inferences about the population (Babbie and Mouton, 2001). If the sample is representative, it is then possible to use statistical techniques to demonstrate that the characteristics of the sample will also be found in the population. It is a popular research method as it is easily understood, has a fair amount of rigour and it produces results that have a high degree of validity and reliability. It also allows one to collect data from a sizeable population, which may be geographically dispersed, without incurring heavy costs (Saunders et al., 2000; Leedy, 1993). It is for this reason that the survey, utilising a self administered questionnaire as the survey tool, has also been the methodology of choice for many researchers who have previously studied the responses, attitudes and perceptions of medical doctors to a wide range of different subjects (Konrad et al., 1999; Warren et al., 1998; Schulz et al., 1997; Barr, 1995; Baker et al., 1994; Kravitz and Linn, 1990; Schulz and Schulz, 1988; Linn et al., 1982; Engel, 1968).

3.2 Data Collection

3.2.1. The Sample

Eligible subjects for this study included all the primary care doctors (general practitioners) in active practice in the private health sector in South Africa. The sample was selected from the database of the South African Medical Association, which consisted of 8070 practitioners (the sampling frame). A simple random sampling technique was used as this form of probability sampling is most commonly associated with survey based research where one endeavours to make inferences from the sample about a population (Saunders et al., 2000).

Assuming that data was collected from all cases in the sample, the minimum sample size was calculated at 353, at a 95 % level of certainty and allowing for a margin of error of 5 %. Further, assuming a response rate of approximately 18% (based on the pilot study and on personal experience), the actual sample size was calculated at 2017, which translated into a sampling fraction of approximately $\frac{1}{4}$.

The final sample was then selected from the sampling frame by selecting every fourth doctor on the list, commencing at number 2, which was the randomly selected starting point. This systematic sampling yielded a list of 2023 doctors, which comprised the final sample (Saunders et al., 2000; Hussey and Hussey, 1997; Leedy, 1993)

3.2.2. The Questionnaire

The content of the questionnaire was developed through a process that began with a literature review of existing instruments for assessing doctor autonomy, doctor job satisfaction, and doctors' attitudes toward managed care (Konrad et al., 1999; Williams et al., 1999; Hadley et al., 1999; Conway et al., 1998; Grumbach et al., 1998; Salem-Schatz et al., 1997; Shye and Brown, 1995; Tunis et al., 1994; Kravitz et al., 1990; Schulz and Schulz, 1988; Lichtenstein, 1984; Barr and Steinberg, 1983). Items that were perceived as being relevant to the research objectives and hypotheses were then extricated and adapted or adopted for inclusion in the questionnaire, while other questions were newly developed for this study. Items adopted or adapted for use were found to exhibit high internal consistencies in their respective studies. This ensured the *reliability* of the instrument.

The questionnaire (Appendix A), was designed to encourage a maximal response, and consequently was kept to a length of eight pages. It consisted of closed questions where respondents were either required to select from lists, rank according to order of preference or record responses on a *Likert-style* rating scale (Hussey, 1997; Leedy, 1993; Saunders et al., 1997). The questionnaire focused on the doctors' perceptions of various aspects of practice in the managed care environment as well as measures of individual and practice characteristics. It consisted of five questions, each covering one of the major variables.

Question one sought information on the biographic and socio-demographic details of respondents including gender, age, professional and practice characteristics.

Question two elicited information on the independent variable pertaining to organisational structure. Respondents were asked to indicate the organisational structure/HMO type that best described their practices and to indicate their practice size as determined by the number of doctors in their practice.

Question three evaluated attitudes about the various managerial practices employed *viz a viz* education, feedback, administrative interventions, peer review, participative management and financial contingencies. Familiarity with, confidence in, and attitudes about the various strategies were assessed using 4-point ordinal scales, with anchors appropriate to the judgement requested (for example 1 = "strongly agree" to 4 = "strongly disagree"; 1 = "almost always" to 4 = "almost never"). The 4-point scale has been used to force respondents to express their feelings as opposed to "sitting on the fence" by ticking the "unsure" category. The responses reflected an implicit comparison with each individual's ideal for that aspect of practice. Agreement with positively worded items and disagreement with negatively worded items indicated positive attitudes to these strategies. Financial contingencies employed by organisations were determined by asking respondents to select from lists, while doctor preferences were determined by asking respondents to rank their preferences from 1 = "most preferred" to 3 = "least preferred". Information was also sought on the prevalence and extent of withholds and bonuses and the factors used to calculate them.

Question four was aimed at evaluating the impact of managed care on the clinical behaviour of primary care doctors. Part 1 assessed their overall perceptions of their clinical freedom while Part 2 was aimed at ascertaining whether doctors perceived their practice as

facilitating the attainment of the ideal doctor–patient relationship as espoused by Emanuel and Dubler (1995) and Schulz and Harrison (1986). This included their ability to bring to bear all the necessary resources and to satisfy these ideals based on choice, competence, communication, compassion, continuity of care and the absence of conflict.

Question six measured doctors' job satisfaction. For this the Physician Worklife Survey (PWS) questionnaire, developed in the United States (Williams et al., 1999; Konrad et al., 1999), was adapted for use. The original PWS questionnaire contained a 36 item, 10-facet satisfaction measure and 3 scales (12 items) measuring global job, career and specialty satisfaction. These were developed from a national study, and the results supported face, content, convergent and discriminant validity of the measures. After adaptation, the questionnaire yielded a 12 facet measure containing 48 items. Global job, career, and specialty satisfaction were incorporated as a single scale, "overall/my career", consisting of five items. A further facet, "current practice environment", consisting of five items was developed to evaluate perceptions about practicing in this new managed care environment. All items borrowed from the PWS survey were adapted through wording changes so as to facilitate responses on a 4-point *Likert* scale ranging from "very satisfied" to "very dissatisfied"

3.2.2.1. The Pilot Study

The purpose of the pilot study was to refine the questionnaire so as to ensure that respondents would have no problems in answering the questions and that there would be no problems in recording the data. It also enabled the researcher to assess the validity and likely reliability of the data that was to be collected.

Content validity of the questionnaire (Mitchell, 1996 as cited in Saunders et al., 2000), was established through a process that began with a literature review of existing instruments, as noted above. At the same time, a series of qualitative interviews were conducted with key informants, such as medical doctors who held senior management positions at managed care companies and who were well versed in the concept of managed care. *Face validity* was established by having five medical doctors on the MBA program at the Graduate School of Business, evaluate the relevance of the questionnaire to the proposed study objectives.

The main pilot survey was conducted among 78 primary care practitioners who were attending a continuing medical education lecture in Cape Town. The questionnaire was handed out to each doctor together with a reply paid envelope. The context of the survey was then verbally explained to all participants and they were further encouraged to provide feedback regarding the time taken to complete the questionnaire, clarity of instructions, ambiguity of questions, omissions and overall layout, as espoused by Bell (1999, cited in Saunders et al., 2000).

The initial response rate, after one telephonic follow up, was approximately 18% (15 responses), which was insufficient to enable statistical analysis of the data. Non-respondents were thereafter contacted on a weekly basis until a minimum of 30 responses were obtained.

Each of the completed pilot questionnaires was individually checked as recommended by Fink (1995, cited in Hussey, 1997), to ascertain whether respondents had had any problems in interpreting or answering questions, to determine whether instructions were followed correctly, and to take note of criticisms and comments made by respondents. Preliminary statistical analysis using appropriate tests were also performed to test for *construct validity* and to determine whether the data collected would enable our investigative questions to be answered.

Based on the above observations and statistical analyses, changes were made to the wording and layout of question 3.5.6 while question 4.2 was changed from a yes/no response to a four point *Likert-style* rating scale. The final questionnaire is appended as Appendix B.

3.2.1. Survey Procedure

The timetable and administration process for the survey was adopted from that developed by deVaus (1996, cited in Saunders et al., 2000), for postal questionnaires. The self administered questionnaire was accompanied by a reply- paid envelope and a covering letter from the Dean of the Graduate School of Business and the researcher, encouraging participation in the survey. These were mailed in mid-April 2001 to the probability sample of 2023 primary care practitioners selected in systematic fashion from the database of the South African Medical Association. The initial mailing was followed by a postcard reminder (Appendix C1) to all participants at one week. A follow up mailing of the questionnaire

together with a second, more tactful and diplomatic covering letter (Appendix C2) was sent to non-respondents at three weeks. Data collection was terminated six weeks after the final mailing.

Each practitioner was assigned a unique identifier number, known only to the researcher that was placed on the first page of the questionnaire. This made it possible to identify non-responders, compare demographic characteristics of responders and non-responders, and preserve the anonymity of practitioners during data abstraction and analysis.

3.3 Data Analysis

The procedure used for data capture, data checking and data analyses followed that recommended by Saunders et al. (2000). The data was entered into a spreadsheet format using Microsoft Excel software. Each column represented a variable and each row, a case. Each of the data items in the questionnaire was treated as a separate variable. All data was entered using numerical codes so as to transform the research information into symbols compatible with computer analysis and to facilitate the efficient capture of information. Missing data codes were used to indicate whether data was missing because no data was required or whether the respondent had no opinion. Once the data was entered, it was 'cleaned'. This entailed:

- Looking for incorrect and incomplete capture of responses.
- Determining whether instructions were followed.
- Looking for the use of illegitimate codes.
- Looking for illogical relationships between responses to different but related questions, and
- The conversion of negative statement responses to the same scale as positive statements.

Once it was determined whether errors were made during coding or data capture, the necessary corrections were made. The spreadsheet data was linked to the original data via the unique identifier number.

The model presented in Figure 2.12 guided the analysis of the data. It permitted the researcher to determine the extent to which managed care structures and managerial practices affected perceived clinical freedom and job satisfaction. Exploratory analyses were undertaken using analysis software. Data for individual variables were summarised using frequency distributions, while the statistics to describe the variables focused on the central tendency (mean) and the dispersion (standard deviation).

Factor analysis was used to evaluate the construct validity of *a priori* groupings of survey items. Principal components analysis was used for factor extraction and Kaiser's eigenvalue rule was used to determine the number of factors to be extracted. The eigenvalue rule specifies that factors with eigenvalues exceeding 1.0 should be retained (Polit and Hungler, 1983). Varimax normalised rotation was used to refine the association between the factors and the raw response variables. Two criteria were employed in item selection, psychometric quality and conceptual coverage. Psychometric quality required that items selected have a factor loading greater than .40 on their factor and minimal cross-loadings (ie, factor loadings should be less than .30) on other factors. The second criteria, conceptual coverage, required selected items to "cover the conceptual waterfront" of the facet (Konrad et al., 1999; Williams et al., 1999). Decisions about the conceptual coverage were based on the literature and the judgement of the researcher. The factor analysis is appended as Appendix D. Scales were modified if the factor analyses and face validity of items suggested that different groups of items were more appropriate. The reconstituted scales are appended as Appendix E. The reliability of the resulting scales with three or more items was estimated by assessing the internal consistency of the scales using Cronbachs alpha (Nunally, 1978). Most scales exceeded the 0.70 criterion while the rest nearly met it.

The validity of scales consisting of items too few for factor analysis, were evaluated using correlation coefficients. Items that showed measurable correlations were retained as a factor.

The ultimate score that each doctor received for each factor was based on the simple summation of the item scores for that measure. Mean factor scores by this method of construction therefore depended on the number of items in each particular factor, that is, the score range. Scores could range from the lower end of the score range (highest satisfaction; always; strongly agree) to the higher end (lowest satisfaction; never; strongly disagree). Therefore doctors were considered to be "positive about", or "satisfied" with a particular

facet if their mean scores were low in the score range. Similarly, higher scores in the score range denoted “dissatisfaction” or “negativity”.

The chi – squared test was used to investigate the statistical significance of associations between categorical variables such as doctor and practice characteristics. In order to ensure that the data met the requirements of the chi – squared statistic, it was necessary to exclude or combine categories with low numbers of respondents. p values of less than 0.05 suggested a statistically significant relationship between two variables, at the 95% confidence interval. The chi-square worksheet is appended as Appendix F1.

For quantifiable variables such as the managerial practice facets, the statistical significance of differences between ratings for different doctor and practice sub groups was tested using analysis of variance (ANOVA). p values of less than 0.05 indicate statistically significant differences between the subgroups. Analysis of variance, however, assumes that the variances of scores are similar in all groups. The Levene Test was therefore used to test for homogeneity of variances. p values of less than 0.05 indicate that there are significant differences between the variances. For these scores, where the variances were significantly different, the non – parametric Kruskal – Wallis analysis of variance was used. The Kruskal – Wallis test makes no assumptions about the variance of scores, and is therefore a more appropriate test for scores with different variances (Dunne and Sommerfield, 2001). p values of less than 0.05 indicate statistically significant differences between scores for the different doctor and practice sub groups. Where statistically significant differences existed, the group means were referred to, to see where the differences occurred. Lower mean scores indicate a relatively positive response while higher mean scores indicate a relatively negative response. The ANOVA worksheet is appended as Appendix F2.

Inferences about the effect of the independent variables on the dependant variables were drawn from multiple regression models. As many of the independent variables were categorical in nature, dummy variables were created for these so that they could be included in the multiple regression analyses, together with the quantifiable variables.

The following dummy variables were created to represent the categorical variables that were considered as independent (or explanatory) variables:

GENDER

Female

(Male represented by intercept)

- **AGE**

Age 32-36

Age 37-41

Age 42-46

Age > 47

(27-31 represented by intercept)

-

- **NUMBER OF YEARS IN PRESENT PRACTICE**

5-9 yrs

10-14 yrs

15-19 yrs

> 19 yrs

(< 5 represented by intercept)

- **PERCENT OF PATIENTS IN MANAGED CARE/MEDICAL AIDS**

26-50%

51-75%

76-100%

(0-25% represented by intercept)

- **PRACTICE TYPE**

PP – Preferred Provider

NW – Network

IPA – Independent Practice Association

GP – Group Practice

SMHMO – Staff Model HMO/Private Hospital

(Direct Contact represented by intercept)

- **PRACTICE GROUP SIZE**

2-3 size

4-5 size

6+ size

(1 represented by intercept)

- **PRINCIPAL METHOD OF PAYMENT BY MEDICAL AIDS**

Salary

FFS – Fee-for-service

DFFS – Discounted fee-for-service

(Capitation represented by intercept)

- **DO YOU RECEIVE INCENTIVES TO REDUCE SERVICES?**

Incentive

(No represented by intercept)

Because of the relatively large number of variables whose influence we sought to measure, we used a stepwise regression procedure to select the variables that made the most important marginal contribution to explaining the variation in each of the dependant variables. All the variables were considered simultaneously and the combinations of variables providing the most predictive power were chosen. This technique finds subsets of predictor variables that most adequately predict responses on a dependant variable by linear or non-linear regression. It involves analysing the correlations between the independent variables and the dependant variable, and including one-by-one those independent variables that best explain the variation in the dependant variable, into the regression model (STATISTICA). At each step the model fit and regression coefficient of each independent variable is tested (t statistic) to see whether they are statistically significant. R^2 measures the percentage of the variation in the dependant variable that is explained by the independent variables that are included in the regression model. The F statistic and the corresponding p value test whether the entire regression model (with only the selected variables) explains a statistically significant portion of the variability in the dependant variable. The regression worksheets are appended as Appendix G.

CHAPTER FOUR

Presentation of Results

4.1. Respondents and Non-Respondents

Of the 2023 primary care doctors selected for the study, 15% returned questionnaires after the first mailing, 11% after the postcard follow up, and 6% after the second questionnaire mailing. Ten doctors from the original sample were determined to be ineligible because of retirement (n=2), emigration (n=2) or no forwarding address (n=6). Thus, we received completed questionnaires from 615 (32%) of the 2013 eligible doctors.

To assess survey response bias, characteristics of those who did and did not respond to the survey were compared using data available from the South African Medical Association. Respondents and non-respondents were similar in terms of their gender, age, race, and year of graduation.

4.2 Univariate Analysis

4.2.1 Respondent and Practice Characteristics

Study respondents were primarily male (82%), white (63%), and above the age of thirty seven years (79%). Over 80% of the respondents had graduated more than ten years ago, and fifty seven percent have been in their present practices for more than ten years. The majority of the respondents (64%) reported devoting less than sixty hours per week in patient care while sixty percent reported seeing between fifty and a hundred and fifty patients per week. Approximately sixty percent of respondents reported that less than half of their patients were in managed care or managed medical aids while 15% obtain three quarters or more of their patients in this way. See Table 4.1, below.

Table 4.1 Respondent and Practice Characteristics

Gender N=615		Male	Female	
	Count	503	108	
	Percent	82	18	

Age N=610		27-31	32-36	37-41	42-46	>47	
	Count	50	77	107	120	256	
	Percent	8	13	17	20	42	

Population group N=609		White	Indian	African	Coloured	FW	FO
	Count	385	134	61	22	4	3
	Percent	63	22	10	3.5	1	0.5

Years since graduation N=613		0-9	10-19	20-29	30-39	40-49	50-59
	Count	101	204	195	83	21	9
	Percent	16.5	33	32	13.50	3.5	1.5

Years in this practice N=612		<5	5-9	10-14	15-19	>19	
	Count	132	134	122	68	156	
	Percent	21.5	22	20	11	25.5	

Hours per week N=607		<20	20-39	40-59	60-70	>80	
	Count	26	74	291	149	67	
	Percent	4.5	12	48	24.5	11	

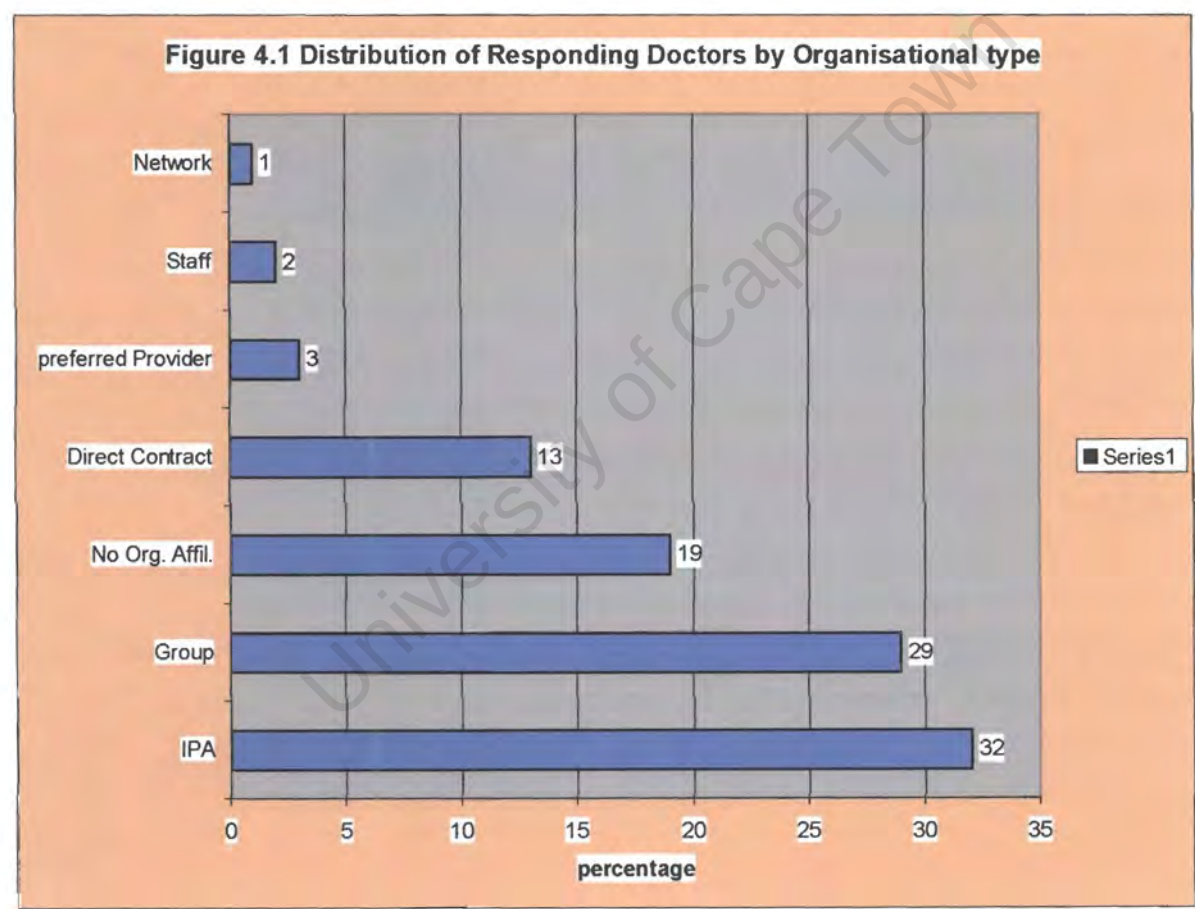
Patients per hour N=609		<2	2-4	5-6	6-8		
	Count	28	329	187	65		
	Percent	4.5	53.5	31.5	10.5		

Patients per week N=612		<50	50-99	100-149	150-199	>200	
	Count	54	186	182	106	84	
	Percent	9	30.5	29.5	17	14	

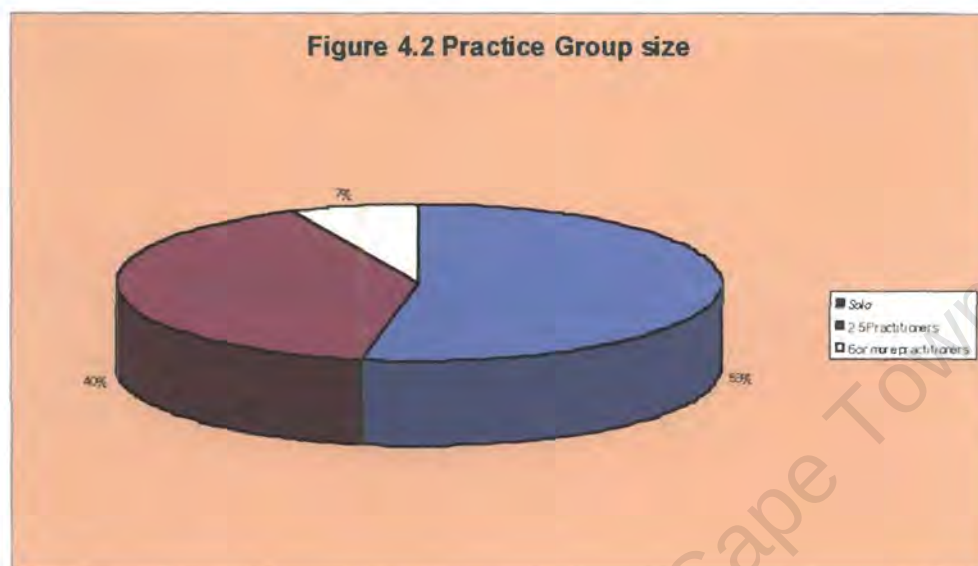
% Patients in managed care N=600		0-25	26-50	51-75	76-100		
	Count	234	118	159	89		
	Percent	39	20	26	15		

4.2.2 Organisational Structure and Size

Among the respondents, about one fifth had no organisational affiliation whereas approximately one third belonged to an independent practitioner association. Twenty nine percent of doctors worked in group practices, while only two percent were employed by staff model health maintenance organisations (Figure 4.1).



Over half the respondents were solo practitioners whereas forty percent practiced in groups of five or fewer doctors (Figure 4.2).

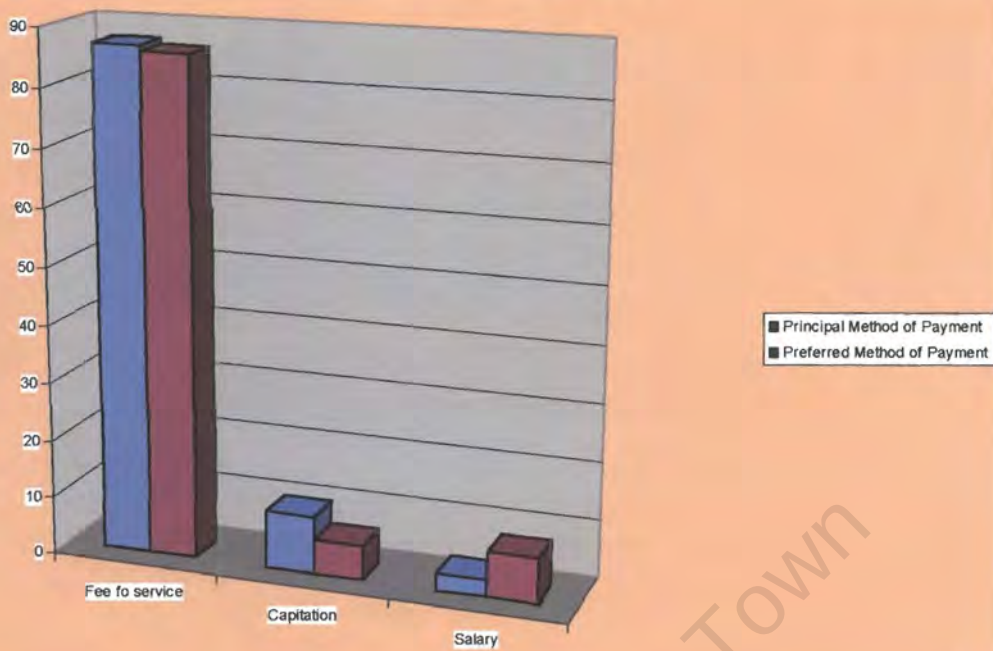


4.2.3 Managerial Practices

4.2.3.1 Financial Contingencies

The majority of doctors (87%) reported that their principal method of remuneration was based on a fee for service. Ten percent were paid primarily by capitation while only three percent received a salary. Fee for service was also the preferred mode of remuneration among the majority of respondents (86%), followed by salary and capitation (Figure 4.3).

Figure 4.3 Remuneration of Doctors



More than three quarters of the respondents reported that some proportion of their payments was withheld. Of these, more than half had up to twenty percent of their payments withheld, the most frequent rate being 11 to 20 percent (Table 4.2).

Table 4.2 Percent of Income Subject to Withhold (n=571)

1 – 10	21%
11 – 20	31%
21 – 30	15%
31 - 40	12%
None / Does not apply	21%

Seventy eight percent of doctors reported not receiving any rewards from surplus funds held in referral pools. The majority of those who received rewards reported that their allocations were based primarily on productivity (42%). Others received a fixed rand amount (33%) or a fixed percentage (25%).

Only eleven percent of all respondents reported that their contracts with managed care organisations/managed medical aids included some form of incentive. Of these, the majority faced incentives linked to their patients' use of prescription medicines (47%), or indexed to their use of referrals to specialists (27%). A much smaller proportion of these doctors reported incentives related to the quality of care, while none reported patient satisfaction as a criterion (Table 4.3).

Table 4.3 Calculation of Incentives (n = 62)

Referrals to Specialists	27%
Prescriptions	47%
Use of Laboratory services	11%
Quality of care	15%
Patient Satisfaction	0%

4.2.3.2 Education

Factor analysis was performed on the ten items of clinical practice guidelines, the six items of continuing medical education and the six items of opinion leaders. Six distinguishable facets, accounting for 58% of the variance in responses, and consisting of eighteen items pertaining to educational strategies, emerged. Most scales with more than two items had Cronbach's alpha reliability scores of more than 0.7, which are usually considered acceptable for scaling. Factors with two items or less demonstrated strong statistical

parameters, including factor loadings, inter-item and item-total correlations. (See Table 4.4 below.

Table 4.4 Reliability of Education Strategy Subscales

Education Factors	Number of items	Average inter-item correlation	Cronbach's alpha
1.Perceptions of clinical practice guidelines (CPG)	5	0.41	0.77
2.Perceptions of continuing medical education (CME)	3	0.57	0.79
3.Impact of continuing medical education	2	-	-
4.Educational strategies and practice patterns.	2	-	-
5.Perceptions of opinion leaders	4	0.26	0.57
6.Use of educational strategies	2	-	-

Table 4.5 below shows the mean, standard deviation and range of each subscale. In each case perceptions of educational strategies are positively skewed.

Table 4.5 Descriptive Statistics for the Educational Strategy Subscales

Education Factors	N	Scoring Range	Mean Total Score *	SD	Skewnes	Min	Max
1.Perceptions of CPG's	597	5 - 20	12.50	2.66	0.31	5	20
2.Perceptions of CME's	609	3 - 12	5.45	1.52	0.33	3	12
3.Impact of CME's	611	2 - 8	3.87	1.11	0.73	2	8
4.Educational strategies and practice patterns	606	2 - 8	4.99	1.02	0.04	2	8
5.Perceptions of opinion leaders	609	4 - 16	8.46	1.57	0.33	4	16
6.Use of educational strategies	591	2 - 8	4.72	0.99	0.00	2	8

* Mean total score in the lower half of the scoring range indicates a more positive response

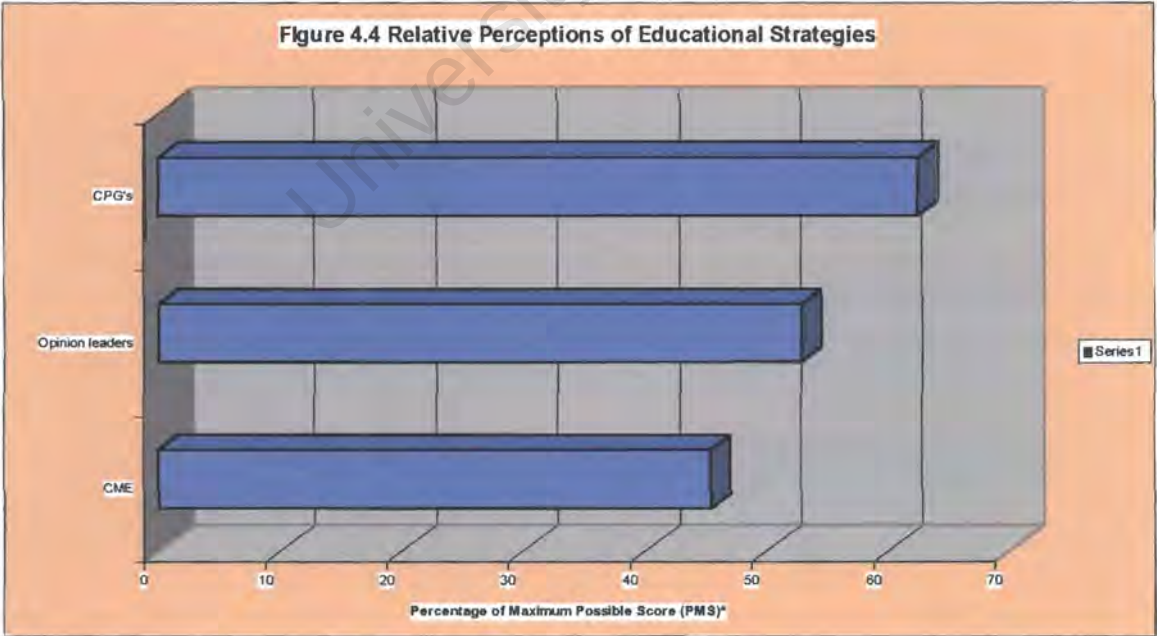
Scale: 1 (most positive) to 4 (least positive)

The relatively high mean total score for the facet '**use of educational strategies**' (Mean = 4.72, SD = 0.99) suggest that, on average, educational strategies such as clinical practice guidelines, continuing medical education programs and the use of opinion leaders were not frequently employed by managed care and managed medical aid organisations. Mean total scores for '**perceptions of clinical practice guidelines**' (Mean = 12.50, SD = 2.66) and '**perceptions of opinion leaders**' (Mean = 8.46, SD = 1.57) also fell into the upper half of

their respective scoring ranges, thus indicating overall negative perceptions of these educational strategies. These tools were also not perceived as being effective in altering practice patterns, as evidenced by the relatively high mean total score for **‘educational strategies and practice patterns’** (Mean = 4.99, SD = 1.02)

In contrast, mean total scores for **‘perceptions of continuing medical education’** (Mean = 5.45, SD = 1.52) and **‘impact of continuing medical education’** (Mean = 3.87, SD = 1.11) fall into the lower half of their respective scoring ranges. This suggests that doctors perceived CME programs as being better educational tools. They also had greater confidence in the efficacy of formal CME programs with regards to the altering of clinical practice patterns and it’s impact on the quality of care.

The percentage of maximum possible score (PMS) was used to measure the relative perceptions of the different educational strategies. Noting that higher scores indicate a more negative perception, clinical practice guidelines (PMS = 62.5%) were rated more negatively than opinion leaders (PMS = 52.87%), than continuing medical education programs (PMS = 45.41%). See Figure 4.4,below



4.2 3.3 Administrative Interventions

Factor analysis was performed on the twenty items incorporated into the three hypothesised facets of administrative interventions *vis a vis* utilisation review, authorisation systems and peer review. As a result of these analyses seven discriminable facets of administrative interventions accounting for 71% of the variance in responses, and comprising sixteen items, were identified. They are presented in table 4.6 below.

Table 4.6 Reliability of Administrative Intervention Subscales

Administrative interventions	No.of items	Average inter-item correlation	Cronbachs alpha
1.Perceptions of authorisation systems	3	0.71	0.87
2.Impact of peer review	2	-	-
3.Administrative interventions and practice patterns	2	-	-
4. Participation in peer review	2	-	-
5.Perceptions of utilisation review	3	0.73	0.88
6.Perceptions of Peer review	2	-	-
7.Use of administrative interventions	2	-	-

The Cronbach's alpha for factors consisting of three items or more, are well in excess of the 0.7, which indicates on acceptable level of reliability. Item analysis was performed for each of the other facets to examine the correlation of each individual item to all items in the facet. The results of these item analyses, all of which were acceptable for scaling are included in Appendix D.

The descriptive statistics for the indices measuring administrative interventions are presented in Table 4.7, below.

Table 4.7 Descriptive Statistics for Administrative Intervention Subscales

Administrative interventions	N	Scoring range	Mean total score*	SD	Skewness	Min	Max
1.Perceptions of authorisation systems	605	3 - 12	9.22	2.03	-0.21	3	12
2.Impact of peer review	608	2 – 8	4.40	1.17	0.59	2	8
3.Administrative interventions and practice patterns	599	2 – 8	5.13	1.11	-0.03	2	8
4.Participation in peer review	599	2 - 8	5.19	1.33	0.01	2	8
5.Perceptions of utilisation review	597	3 – 12	8.67	1.99	0.07	3	12
6.Perceptions of peer review	606	2 – 8	4.77	1.15	0.68	2	8
7.use of administrative interventions	582	2 - 8	4.09	1.00	0.08	2	8

* Mean total scores in the lower half of the scoring range indicate a positive response

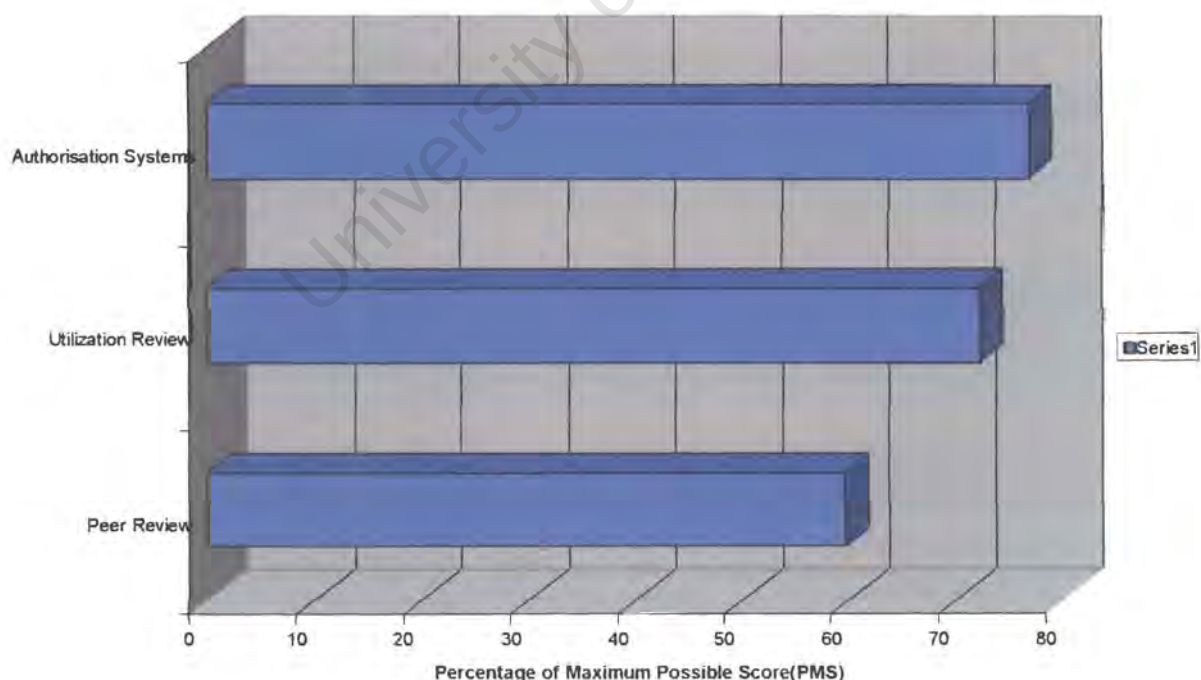
Scale: 1 (Positive) to 4 (Negative)

On average respondent doctors did not believe that the ‘**use of administrative interventions**’ (mean = 4.09; SD = 1.00) such as utilisation review, peer review and authorisation systems, by managed care/ managed medical aid companies, were excessive. The relatively high mean score for the facet ‘**administrative interventions and practice patterns**’ (mean = 5.19; SD = 1.11), coupled with a negative skew (-0.03), indicates that doctors, in general, also did not believe that administrative interventions were effective tools to alter clinical behaviour.

Mean total scores for perceptions of individual administrative interventions (authorisation systems, peer review, utilisation review), all exceeded half their respective scoring ranges, indicating that doctors, on average, felt that these strategies were a hindrance to their clinical freedom and job satisfaction. Doctors, on average, also did not **participate in peer review** exercises (mean = 5.19; SD = 1.33) either as reviewers or as reviewees. They also felt that peer review did not impact positively on their clinical practice patterns or on the quality of care as a whole (mean = 4.40; SD = 1.17).

Percentage of maximum possible scores (PMS), were used to measure the relative perceptions of the individual administrative interventions. Noting that higher scores indicate a more negative response, authorisation systems (PMS = 77%) were rated more negatively than utilisation review (PMS = 72%), than peer review (PMS = 60%). These are illustrated in Figure 4.5, below.

Figure 4.5 Relative Perceptions of Administrative Interventions



4.2.3.4 Participative Management

Factor analysis on the nine items in the two participative management questions, revealed the existence of two factors, incorporating all nine items and accounting for 79% of the variance in responses. The internal reliability of the factor consisting of more than two items was also high (Cronbachs alpha = 0.94).

Table 4.8 Reliability of Participative Management Subscales

Participative management	No. of items	Average inter item correlation	Cronbach's alpha
1.Participation in decision making	7	0.72	0.94
2.Information dissemination	2	-	-

Participation in decision-making measured the extent to which doctors participated either formally or informally in various areas of organisational decision making. Dissemination of information measured the extent to which doctors were informed or have knowledge about processes and outcomes within the organisation. The descriptive statistics for these subscales are shown in Table 4.9, below.

Table 4.9 Descriptive Statistics for the Participative Management Subscales

Participative management	N	Scoring range	Mean total score*	SD	Skewness	Min	Max
Participation in decision making	570	7 – 28	14.99	7.05	0.47	7	28
Information dissemination	605	2 - 8	4.47	1.63	0.19	2	8

*Mean total scores in the upper half of the scoring range indicate a negative response

Scale 1 (always) to 2 (never)

Relatively high mean total scores for both the participative management factors indicate that doctors, on average, felt that they did not participate enough in decision making, and did not have sufficient access to information regarding processes and outcomes, in their respective organisations.

4.2.3.5 Feedback

The four items in the hypothesised feedback scale were too few for factor analysis. The correlation coefficient, however, showed measurable correlation (0.75) between two items, which comprised the scale 'perceptions of feedback'.

Table 4.10 Descriptive Statistics for the Feedback Scale

Feedback	N	Scoring range	Mean total score*	SD	Skewness	Min	Max
Perception of Feedback	606	2 - 8	5.27	1.46	0.21	2	8

* Mean total scores in the upper half of the scoring range indicate a negative response

Scale 1 (strongly agree) to 4 (strongly disagree)

The relatively high mean total score for the solitary feedback scale, 'perceptions of feedback' (mean = 5.27; SD 1.46) indicate that doctors, on average, felt that feedback about their practice patterns impacted negatively on their clinical freedom and job satisfaction levels.

4.2.3.6 Clinical Freedom

Factor analysis on the eleven items in the original clinical freedom scale, resulted in the emergence of three subscales comprising eight items, and accounting for 55% of the variance in the responses. Cronbach's alpha for the scale comprising more than two items exceeded 0.7, while factor loadings and item total correlations for the remaining factors were also acceptable for scaling (see Appendix D; E).

Table 4.11 Reliability of Clinical Freedom Subscales

Clinical Freedom	No. Of items	Average inter item correlation	Cronbach's alpha
1.Treatment and work freedoms	5	0.37	0.74
2.Patient care	2	-	-
3.Patient choice	1	-	-

Descriptive statistics for the reconstituted clinical freedom subscales are shown in Table 4.13 below.

Table 4.12 Descriptive Statistics for Clinical freedom Subscales

Clinical freedom	N	Scoring range	Mean total score*	SD	Skewness	Min	Max
1.Treatment and work freedoms	598	5 – 20	10.54	2.53	0.14	5	20
2.patient care	611	2 – 8	4.32	1.34	0.14	2	8
3.Patient choice	611	1 - 4	2.28	1.02	0.29	1	4

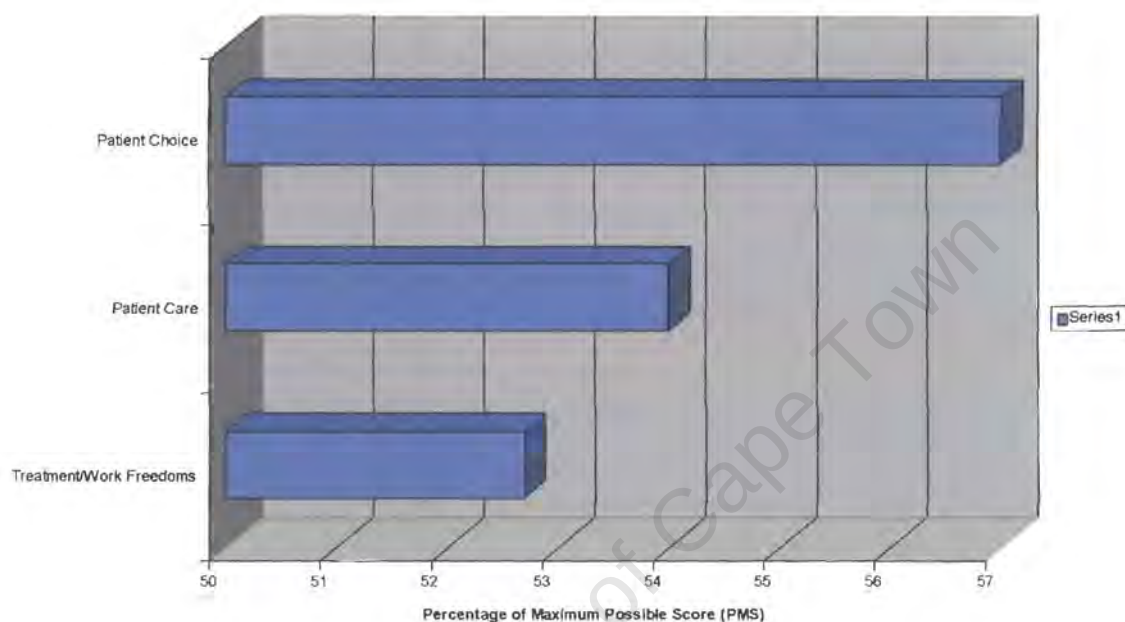
* Mean total scores in the upper half of the scoring range indicate a negative response

Scale 1 (maximum freedom) to 4 (minimum freedom)

Mean total scores for all the clinical freedom subscales fell in the upper half of the scoring range, indicating that doctors, on average, felt that their clinical freedom was restricted: they did not have the freedom to bring to bear all the necessary resources to enable optimal diagnosis and treatment, they were unable to care for patients who required heavy use of resources or were unable to afford care, and they also did not have the freedom to treat patients of their choice.

A comparison of the percentage of maximum possible scores (PMS) for the three subscales indicated that doctors perceived the greatest restrictions to be on their choice of patients (PMS = 57%), followed by their ability to care for patients (PMS = 54%), followed by treatment and work freedoms (PMS = 52.7%). These are illustrated in Figure 4.6, below.

Figure 4.6 Relative Perceptions of Clinical Freedom Facets



4.2.3.7 Job Satisfaction

Factor analysis on the forty-eight satisfaction items (12 hypothesised facets), yielded eleven facets comprising forty items. These eleven factors captured 66% of the variance in doctor responses to facet satisfaction items, and they were in most part consistent with the initial formulation. One facet, 'relationship with patients' was omitted as items had high cross-loadings with the 'patient care' facet. Most of the internal consistency reliabilities were in the acceptable range ($\alpha > 0.7$), but the satisfaction with 'patient care' ($\alpha = 0.68$) was only marginally so.

Table 4.13 Reliability of Job Satisfaction Subscales

Job satisfaction	No. Of items	Average inter item correlation	Cronbach's alpha
1. Patient care	4	0.36	0.68
2.Current practice environment	5	0.51	0.83
3.Personal time	4	0.70	0.90
4.Relationship with staff	4	0.75	0.91
5.Pay	3	0.72	0.88
6.Relationship with colleagues	3	0.74	0.89
7.Clinical freedom	5	0.42	0.78
8. Resources	4	0.45	0.76
9.My career	3	0.64	0.84
10.Administration	3	0.55	0.77
12.Community	2	-	-

Table 4.14, below, shows the descriptive statistics for each subscale. The relatively low mean total scores and percentage of maximum possible scores (PMS), coupled with the positive skewness, indicate that doctors expressed greatest satisfaction with their relationships with staff (mean = 6.39; SD = 2.23; PMS = 39.93%), and colleagues (mean = 5.05; SD = 2.04; PMS = 42%), the communities within which they work (mean = 3.62; SD = 1.34; PMS = 45.25), their resources (mean = 7.29; SD = 2.03; PMS = 45.56%), and their relationship with, and their ability to care for their patients (mean = 7.81; SD = 1.82; PMS = 48.8%).

The relatively high mean total scores and percentage of maximum possible scores, coupled with the negative skewness, indicate that doctors expressed least satisfaction with their current practice environment (mean = 15.15; SD = 3.01; PMS = 75.75%), their pay (mean = 8.91; SD = 2.30; PMS = 74.25%), their administrative load (mean = 8.61; SD = 1.99; PMS = 71.25%), and their personal time (mean = 9.24; SD = 3.20; PMS = 57.75%). On average, doctors also expressed marginal dissatisfaction with their careers as a whole (mean = 6.27; SD = 2.22; PMS = 52.25%), and their clinical freedom (mean = 10.22; SD = 2.86; PMS = 51.1%).

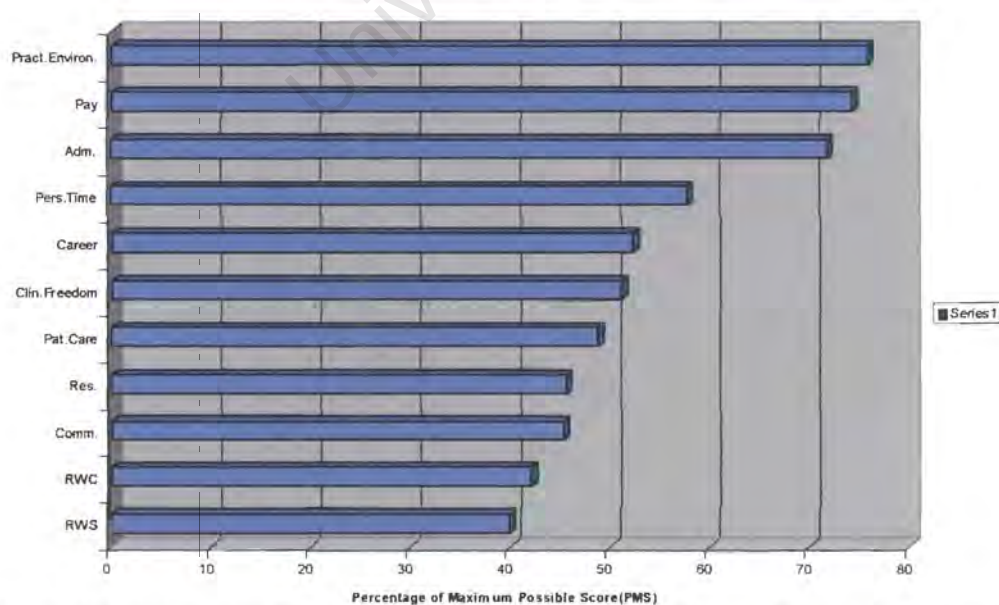
Table 4.14 Descriptive Statistics for the Job Satisfaction Subscales

	N	Scoring range	Mean total score*	SD	Skewness	Min	Max
1.Patient care	603	4 – 16	7.81	1.82	0.22	4	15
2.Current practice environment	600	5 - 20	15.15	3.01	-0.42	5	20
3.Personal time	610	4 –16	9.42	3.20	0.18	4	16
4.relationship with staff	607	4 – 16	6.39	2.23	0.70	4	16
5.Pay	604	3 – 12	8.91	2.30	-0.50	3	12
6.Relationship with colleagues	607	3 – 12	5.05	2.04	0.91	3	12
7.Clinical freedom	594	5 – 20	12.22	2.86	0.32	5	20
8.Resources	609	4 – 16	7.29	2.03	0.20	4	16
9. My career	607	3 – 12	6.27	2.22	0.37	3	12
10. Administration	604	3 – 12	8.61	1.99	-0.17	3	12
11.Community	607	2 - 8	3.62	1.34	0.53	2	8

*Mean total scores in the upper half of the scoring range indicate dissatisfaction

Scale 1 (very satisfied) to 4 (very dissatisfied)

Figure 4.7 Facet Specific Job Satisfaction



RWS: Relationship with Staff; **RWC:** Relationship with Colleagues; **Comm:** Community; **Res:** Resources; **Adm:** Administration

The sum of the mean total scores indicates that, overall, doctors are marginally dissatisfied with their jobs ($\bar{x}$ = 88.56; PMS 55.69%).

4.3. Bivariate Analysis

In our bivariate model, significant associations were found between specific practice characteristics, and the various bio-demographic sub-groups of respondents. Statistically significant differences were also found in management strategy scores for the different practice and doctor sub-groups. The contingency tables, chi-square tests, analysis of variance worksheets and tables of group means are appended as Appendix F.

4.3.1 Practice Demographics

There were no statistically significant associations between the time that practitioners spent in patient care, or the number of patients that they consulted per unit time, and the proportion of patients in their practices that were members of managed care or managed medical aids.

Table 4.15 Bivariate Relationship between Proportion of Patients in Managed care and Time Spent on Patient Care: Chi-square (df)

	% Patients in Managed Care
Hours/week in Patient care	12,267 (9)
Number of Patients/Hour	10,731 (8)

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

4.3.2 Organisation Structure

4.3.2.1 Practice Type

Older doctors (> 47 years) have a tendency not to be affiliated to any specific organisational entity, while a greater number of younger doctors (27 – 31 years) tend to practice in groups ($p = 0.01699$). This is supported by the finding that doctors with more experience (> 30 years since graduation) also tend not to have any organisational affiliation as opposed to the more recently qualified (0–9 years since graduation) who tend to gravitate to group practices

($p = 0.03352$). A greater number of White practitioners also tend to practice in groups, as opposed to their Indian, African and Coloured colleagues ($p = 0.00004$). There was no significant association between gender and practice type.

4.3.2.2 Practice Size

Among the bio-demographic characteristics of respondents, gender, population group and the proportion of patients in managed care, were significantly associated ($p < 0.05$) with practice size. A greater number of female doctors than expected, practiced in groups of 2-3, whereas a fewer number than expected practised as solo practitioners ($p = 0.00089$). White doctors were also over represented in larger group practices (4+ doctors), in contrast to their Indian colleagues who were over represented in the solo practitioner category ($p = 0.000$). Practices that also have a high proportion of managed care/managed medical aid patients (75 – 100%), also tended to comprise a greater number of doctors (> 6) than expected ($p = 0.00520$).

Table 4. 16 Bivariate Relationships between Practice and Doctor Characteristics: Chi – square (df)

Doctor characteristics	Practice Type	Practice size
Gender	5.999(3)	16.517(3) ***
Age	24.573(12) *	8.885(8)
Population group	36.1647(9) ***	55.643(6) ***
Years since graduation	18.1465(9) *	8.578(9)
% Patients in managed care	12.2677(9)	23.46 8(9)**

* $P < 0.05$; ** $p < 0.01$; *** $p < 0.001$

4.3.3 Managerial Practices

4.3.3.1 Financial Contingencies

Several significant associations were found between the practice and doctor variables, and the different financial contingencies employed by managed care and managed medical aid companies. These are illustrated in Figure 4.17, below.

Table 4.17 Associations between Financial Contingencies and Practice and Doctor Characteristics: Chi – square (df)

	Reimbursement	Preferred Reimbursement	Payment Withheld	Performance Incentives
Gender	1.757(3)	2.632(3)	2.097(4)	1.645(11)
Age	17.799(8)*	18.210(8)**	14.325(16)	6.758(4)
Race	21.651(6)***	5.470(6)	30.215(12)**	10.222(3)*
Experience	15.022(6)*	11.802(6)	17.568(12)	0.811(3)
% Patients in Managed Care	13.139(6)*	3.887(6)	20.163(12)	0.662(3)
Hrs/week in Patient care	4.559(6)	2.954(3)	3.704(12)	2.793(3)
Practice type	13.338(6)*	14.555(6)*	10.889(12)	15.368(3)***
Practice size	6.821(6)	3.053(4)	12.007(8)	8.137(2)**

*p < 0.05; ** p < 0.01; *** p < 0.001

Pearson Chi-square analysis revealed statistically significant associations between the predominant method of compensation and age, race, experience, percentage of patients in managed care, and practice type. A greater number of younger doctors reported capitation as their primary mode of reimbursement than expected, as opposed to their older colleagues, more of whom reported that fee-for-service was their primary mode of reimbursement (p=0.02). More experienced doctors were also significantly more likely to report that they were being compensated on a fee-for-service basis as opposed to their more recently graduated colleagues who were more likely to report being compensated on a capitation or discounted fee-for-service basis (p=0.02). Doctors who had no organisational affiliation were also less likely to report that capitation was their principle mode of reimbursement, as

opposed to those in IPAs who were more likely to do so ($p=0.03$). Similarly, doctors who had a lower proportion of patients enrolled in managed care, were also more likely to have reported being compensated predominantly by capitation ($p=0.04$). More Indian doctors also reported being compensated on a discounted fee-for-service basis, than expected ($p=0.001$).

Significant associations were also found between the preferred mode of reimbursement and age and practice type. A greater number of younger doctors preferred salary as their mode of reimbursement, as opposed to their older colleagues, fewer of whom preferred a salary than expected ($p=0.01$). Although not statistically significant, there was also a strong association between experience and the preferred mode of reimbursement. Doctors who had graduated more recently were more likely to have reported their preference for salary as a means of reimbursement ($p=0.06$). Doctors who were directly contracted to managed care or managed medical aids were also more likely to report that salary was their preferred mode of reimbursement. Similarly, of the doctors who worked in groups, fewer than expected, reported that salary was their preferred mode of reimbursement ($p=0.02$).

Doctors, who had no organisational affiliation, were also less likely to have reported receiving performance incentives. In contrast, more of their colleagues who belonged to IPAs, reported receiving incentives, than expected ($p=0.01$). Similarly, doctors in practices comprising four or more doctors were more likely to have reported receiving performance incentives than their colleagues who were solo practitioners, who were less likely to do so ($p=0.01$). Indian doctors were also significantly more likely to report that they received incentives, than their colleagues ($p=0.01$).

Of those doctors who reported that a proportion of their payments were withheld by managed care or medical aid societies, African doctors were significantly more likely to report that a higher proportion ($> 30\%$) of their payments were withheld, while their white counterparts were more likely to report not having any part of their payments being withheld ($p=0.002$). Although not statistically significant, there was a strong association between the numbers of patients enrolled in managed care, and the proportion of payments withheld. Doctors who reported having fewer patients enrolled in managed care were more likely to report not having part of their payments withheld, while those who had the majority of their patients enrolled were more likely to report that a high proportion of their payments (30%) were withheld ($p=0.06$).

4.3.3.2 Educational Strategies

Parametric and non – parametric analysis of variance revealed significant associations between differences in doctor characteristics and perceptions of clinical practice guidelines, perceptions and impact of continuing medical education programs, and on the impact of educational strategies on clinical practice patterns.

Table 4.18 Bivariate Relationship between Educational Strategy Variables And Practice and Doctor Variables

Education factors	Gender	Age	Population group	Experience	Practice Type	Practice Size
Perceptions of CPG's EDFACT1	(.09) [1.81]	(.78) [.72]	(5.14)*** [.57]	(1.09) [1.83]	(.76) [.46]	(.63) [2.54]
Perceptions of CME EDFACT2	(4.83)* [1.28]	(4.10)*** [1.13]	(10.82)*** [.08]	(4.56)*** [.33]	(1.27) [3.17]* {3.84}	(.97) [1.34]
Impact of CME EDFACT3	(2.93) [3.45]* {3.924}*	(4.12) [2.32]* {13.34}**	(1.57) [.81]	(2.63) [1.08]	(1.33) [1.50]	(2.62) [3.24]* {7.64}*
Educational strategies and practice patterns EDFACT4	(.42) [.00]	(4.07)*** [3.06]* {17.390}**	(5.68)*** [1.54]	(4.95)*** [.60]	(3.40) [3.55]** {11.509}	(.28) [3.29]* {1.114}
Perceptions of opinion leaders EDFACT5	(3.49) [.30]	(.83) [1.41]	(1.04) [.15]	(.91) [.42]	(2.37) [1.89]	(1.11) [1.84]
Use of educational strategies EDFACT6	(.00) [.30]	(.24) [1.16]	(2.01) [1.75]	(.11) [2.44]	(1.90) [1.74]	(.21) [1.12]

* p < 0.05; ** p < 0.01; *** p < 0.001

(F): Parametric ANOVA test statistic; **[LF]:** Levene Test statistic; **{H):** Non-parametric Kruskal-Wallis test statistic

Younger doctors (Kruskal Wallis: $H = 17.390$ $p = 0.0016$), and those who have graduated most recently (Anova: $F = 4.95$ $df = 3$ $p = 0.000$), believed that educational strategies in general were effective in altering clinical practice patterns as opposed to their older and more experienced colleagues. These findings are supported by the overall negative perceptions of older, more experienced doctors, towards CME programs ($F = 4.10$ $df = 4$ $p = 0.00$ and $F = 4.56$ $df = 3$ $p = 0.00$ respectively) and the impact thereof ($H = 13.346$ $p = 0.0097$ and $F = 2.63$ $df = 3$ $p = 0.05$ respectively). In general, white doctors were also more sceptical about the benefits of clinical practice guidelines ($F = 5.14$ $df = 3$ $p = 0.00$) and CME programs ($F = 10.82$ $df = 3$ $p = 0.00$), and the impact that educational programs have on clinical practice patterns ($F = 5.68$ $df = 3$ $p = 0.00$), than their Indian, African and Coloured colleagues. Female doctors also tended to be more positive about the benefits of ongoing educational strategies than their male colleagues ($H = 3.924$ $p = 0.0476$).

4.3.3.3 Administrative Interventions

Doctors with no organisational affiliation reported the least exposure to administrative interventions, relative to the others. Of their colleagues who were more formally organised, those in IPAs reported greater exposure to administrative interventions than those who were directly contracted or who belonged to group practices (ANOVA: $F = 5.13$ $df = 3$ $p = 0.000$). Older doctors ($H = 11.576$ $p = 0.020$), and those who have graduated more than 20 years ago ($F = 2.89$ $df = 3$ $p = 0.03$) were also more likely to express negative sentiments about the possible impact of administrative interventions such as peer review, on the quality of care or in altering clinical practice patterns. White doctors were also more likely to express negative perceptions about the impact of administrative interventions on clinical practice patterns ($F = 7.72$ $df = 3$ $p = 0.00$), and about specific interventions such as authorisation systems ($F = 5.15$ $df = 3$ $p = 0.00$). However, when it comes to peer review, Indian doctors were the most objectionable ($F = 3.70$ $df = 3$ $p = 0.01$). There were no other significant associations between the doctor and practice sub-groups and the different administrative intervention variables.

Table 4.19 Bivariate Relationship between Administrative Strategy Variables And Doctor and Practice Characteristics

Administrative factors	Gender	Age	Population Group	Experience	Practice Type	Practice size
Perceptions of authorisation systems ADMFACT 1	(.09) [.13]	(.69) [.97]	(5.15)*** [1.14]	(1.40) [2.50]	(1.18) [2.53]	(2.20) [.13]
Impact of peer review ADMFACT2	(.45) [.42]	(3.39) [3.01]* {11.576}	(5.83)*** [1.54]	(2.89)* [1.96]	(.99) [.63]	(1.29) [3.03]* {2.91}
Administrative interventions and clinical practice ADMFACT3	(1.31) [.07]	(.16) [1.79]	(7.72)*** [.27]	(.78) [1.50]	(1.29) [.25]	(.12) [.87]
Participation in peer review ADMFACT4	(0.00) [7.49]** {.025}	(.99) [1.25]	(1.64) [.69]	(1.51) [1.66]	(2.23) [2.43]	(.84) [3.47]* {2.33}
Perceptions of utilisation review ADMFACT5	(.13) [1.03]	9.35) [1.01]	(1.07) [1.97]	(.51) [.23]	(.44) [.44]	(1.24) [1.51]
Perceptions of peer review ADMFACT6	(9.08)* [.02]	(.74) [1.46]	(3.70)** [.93]	(.61) [3.22]* {1.61}	(1.62) [.84]	(.91) [1.04]
Use of administrative interventions ADMFACT7	(2.26) [0.00]	(2.06) [.78]	(2.03) [4.14]** {10.00}	(2.00) [.55]	(5.13)*** [.17]	(.30) [.20]

* p < 0.05; ** p < 0.01; *** p < 0.001

(F): Parametric ANOVA test statistic; [LF]: Levene Test statistic; {H}: non-parametric Kruskal-Wallis test statistic

4.3.3.4 Feedback

Analysis of variance revealed that perceptions of feedback were not significantly associated with differences in any of the bio-demographic or practice sub-groups, except for gender. Females tended to perceive feedback more positively than males ($F = 5.50$ $df = 1$ $p = 0.02$).

Table 4.20 Bivariate Relationship between Feedback Variable And Doctor and Practice Characteristics

Feedback	Gender	Age	Population Group	Experience	Practice Type	Practice Size
Perceptions of feedback FDBFACT1	(5.50)* [2.21]	(.14) [1.05]	(0.03) [1.92]	(.84) [.63]	(2.32) [.25]	(1.33) [1.30]

p < 0.05; ** p < 0.01; *** p < 0.001

(F): Parametric ANOVA test statistic; **[LF]**: Levene Test statistic; **{H}**: Non-parametric Kruskal-Wallis test statistic

4.3.3.5 Participative Management

Non – parametric analysis of variance showed a significant difference in participation in decision-making between respondents belonging to different practice structures and sizes. Doctors who belonged to group practices reported greater participation in decision-making than their colleagues who had no organisational affiliation, belonged to IPAs or were directly contracted ($H = 27.916$ $p = 0.0001$). Those who worked in groups of 4 to 5 doctors reported the greatest participation, as opposed to those who worked in smaller or larger groups ($H = 14.458$ $p = 0.0023$). Doctors who reported greater participation in decision-making also tended to be white ($F = 9.52$ $df = 4$ $p = 0.000$), younger ($F = 3.23$ $df = 4$ $p = 0.01$) and were more recent graduates ($F = 4.09$ $df = 3$ $p = 0.01$).

Similarly, those who reported a greater awareness of what was happening within their respective organisations also tended to be younger ($H = 9.49$ $p = 0.00$), white ($F = 7.21$ $df = 3$ $p = 0.00$) and female ($H = 7.6613$ $p = 0.0056$). There were no statistical differences between any of the other organisational and doctor characteristics and the participative management variables.

Table 4.21 Bivariate Relationship between Participative Management Variables And Doctor and Practice Characteristics

	Gender	Age	Population group	Experience	Practice Type	Practice Size
Participation in decision-making PMFACT1	(.39) [.40]	(3.23)** [1.22]	(9.52)*** [.30]	(4.09)** [1.02]	(7.61)*** [6.82]*** {27.916}***	(5.61) [2.78]* {14.458}**
Information dissemination PMFACT2	(7.06) [4.39]* {7.66}**	(2.49) [2.96]* {9.46}*	(7.21)*** [1.82]	(2.54) [2.07]	(1.52) [.75]	(1.51) [2.30]

* p < 0.05; ** p < 0.01; *** p < 0.001

(F): Parametric ANOVA test statistic; [LF]: Levene Test statistic; {H}: Non-parametric Kruskal-Wallis test statistic

4.4. Multivariate Analysis

In our multivariate model, three series of stepwise regressions were done to investigate the predictive power of the independent variables on the intermediary variables, the independent variables on the dependent variables, and the combination of the independent and intermediary variables on the dependent variable. The latter was to determine whether the addition of the intermediary variable improved the predictive model. All the variables were considered simultaneously and the combinations of variables providing the most predictive power were chosen. Analyses revealed independent associations between the facets of clinical freedom and job satisfaction, and several of the demographic, practice and strategy variables. The adjusted R^2 is reported to compensate for any over-estimation error. The regression worksheets are appended as Appendix G.

4.4.1 Clinical Freedom

Table 4.22, below, presents the final results from model 1- the stepwise regression performed to ascertain which of the variables best predicted the perceived clinical freedom of doctors.

Table 4.22 Effects of Doctor, Practice and Managerial Practice Variables on Clinical Freedom – Stepwise Regression Coefficients and their *t* Statistics (in Parentheses)

Independent Variable	Overall Clinical Freedom	Treatment and Work Freedoms (FREFACT I)
Insured Patients • 51-75 • 76-100	0.663 (1.927)	0.600 (2.357)* -0.598(-1.954)
Practice Size • 6+	-1.430 (-2.498)*	- 1.359 (-3.290)**
Financial Contingencies • DFFS	1.036 (2.684)*	0.753 (2.704)**
Administrative Interventions • Peer review • Util. review		0.218 (2.183)* 0.111 (1.920)
Educational Strategies • Opinion Leaders	0.219 (2.293)*	0.152 (2.155)*
Participative Management	0.102 (4.691)*	0.050 (3.251)**
R ² (adjusted)	0.072	0.099
F	(5,496)=8.859	(8.493)=7.928
p	< 0.0000	<0.0000

*p < 0.05; **p < 0.01

In the equation that regressed the independent variables on treatment and work freedoms, larger practice size (6+ doctors) was a predictor of lower treatment and work freedom ($p < 0.01$), while having 51 to 75 percent of insured patients ($p < 0.05$), positive perceptions of peer review ($p < 0.05$), remuneration on a discounted fee-for-service ($p < 0.01$), participation in decision making ($p < 0.01$), and positive perceptions of opinion leaders ($p < 0.05$), were predictors of higher treatment and work freedoms. The explanatory power of the equation was low ($R^2 = 0.099$; $F(8.493) = 7.92$), but significant ($p < 0.000$). Although not statistically significant, having a very high proportion of insured patients (>75%), and positive perceptions of utilisation review were also positive predictors of treatment and work freedoms ($p < 0.512$ and $p < 0.055$, respectively).

The results were similar when overall clinical freedom (the sum of the clinical freedom sub scales) was regressed on the independent variables. Doctors in larger practices (6+ doctors) reported lower overall clinical freedom ($p<0.05$), whereas those being remunerated on a discounted fee-for-service basis ($p<0.01$), or who reported greater participation in decision making ($p<0.001$), and had overall positive perceptions of opinion leaders ($p<0.05$), were significantly more likely to report greater overall freedom with regards to patient choice, patient care, and treatment and work decisions. The R^2 value for these four statistically significant predictor variables was 0.072 indicating that these four variables explained 7.2% of the total variance in overall clinical freedom. Respondent and practice demographics, organisation structure, and feedback strategies were not found to be predictors of perceived clinical freedom. Although not statistically significant, having from 51 to 75 percent of insured patients was also a positive predictor of perceived overall clinical freedom ($p<0.054$).

4.4.2 Job Satisfaction

In model 2, stepwise multiple regressions of the independent variables on the facets of job satisfaction as well as overall satisfaction (the sum of the satisfaction sub-scales) revealed that some of the coefficients of the predictor variables were positively correlated, while others were negative. These are presented in Table 4.23.

The first equation tested for the impact of the independent variables on overall job satisfaction. Being female ($p<0.01$), having been in practice for over nineteen years ($p<0.001$), practising in groups of more than six doctors ($p<0.05$), and receiving incentives to conserve resources ($p<0.05$), were significant predictors of lower overall satisfaction. Remuneration on a discounted fee-for service basis ($p<0.001$), participation in decision-making ($p<0.01$), positive perceptions of feedback ($p<0.01$) and positive perceptions of the administrative interventions (authorisation systems $p<0.01$; utilisation review $p<0.05$; peer review $p<0.01$) were all significant predictors of overall higher satisfaction. These variables accounted for 22% of the variance in overall job satisfaction ($R^2=0.22$; $F(13,451)=11.307$). Although not statistically significant, group practice was also a positive predictor of overall job satisfaction ($p<0.06$).

Similarly, female doctors ($p<0.01$), those who have been in practice for over nineteen years ($p<0.01$), who had high proportions ($>75\%$) of insured patients ($p<0.05$), and who reported greater use of educational strategies ($p<0.05$), were also more likely to be dissatisfied with their careers as doctors. Positive perceptions of all of the administrative interventions were also significant positive predictors of satisfaction with their careers. Although not statistically significant, remuneration on a discounted fee-for-service was also a predictor of greater career satisfaction ($p<0.06$), while incentives to conserve resources was a predictor of lower career satisfaction ($p<0.055$).

Satisfaction with patient care was positively related to increasing age ($p<0.05$), participation in decision-making ($p<0.01$), positive perceptions of feedback ($p<0.05$) and positive perceptions of authorisation systems ($p<0.05$), and negatively related to the use of educational strategies ($p<0.01$) and remuneration on a fee-for-service basis ($p<0.001$). Although not statistically significant, female doctors were more likely to report being dissatisfied with their patient care ($p<0.06$), while having between 50 and 75 percent of insured patients predicted greater satisfaction with patient care ($p<0.054$).

Satisfaction with the practice environment was positively related to remuneration on a discounted fee-for-service basis ($p<0.01$), to positive perceptions of authorisation systems ($p<0.001$) and utilisation review ($p<0.001$) and feedback strategies ($p<0.001$), and negatively related to working in a staff ($p<0.05$) or network model ($p<0.05$) like practice, to having between a quarter and a half of their patients belonging to managed care/managed medical aids ($p<0.001$), and to being in practice for between five and ten years ($p<0.05$). Although not statistically significant, incentives to conserve resources was also a predictor of lower satisfaction with the practice environment ($p<0.0504$).

Female doctors ($p<0.001$) and doctors who have been in practice for more than nineteen years ($p<0.001$) were significantly more likely to be dissatisfied with their personal time while those who worked in group practices were more likely to be satisfied with their personal time ($p<0.05$). Although not statistically significant, doctors who participated in decision-making were less likely to report satisfaction with their personal time ($p<0.07$), while those who had a lower proportion of insured patients ($<50\%$), were more likely to be satisfied with their personal time ($p<0.058$).

Younger doctors ($p<0.05$), doctors who worked in larger practices ($p<0.05$) and those working in staff model like practices ($p<0.05$) and IPAs ($p<0.05$) were also more likely to be dissatisfied with their pay. Although not statistically significant, doctors who were remunerated on a discounted fee-for-service reported greater satisfaction with pay ($p<0.059$)

Doctors who reported positive perceptions of opinion leaders ($p<0.001$) and peer review ($p<0.05$), and who reported participation in decision-making ($p<0.06$), were also more likely to report being satisfied with relationships with their colleagues, whereas the more experienced doctors (>19 years, $P<0.01$) and those who practiced in smaller groups (2-3 doctors, $p<0.01$; 4-5 doctors, $p<0.01$) were more likely to express dissatisfaction with relationships with their colleagues.

Satisfaction with autonomy was positively related to positive perceptions of educational strategies (CPGs $p<0.001$) and administrative interventions (authorisation systems $p<0.001$; utilisation review $p<0.005$; peer review $p<0.001$), to remuneration on a discounted fee-for-service basis ($p<0.001$) and to participation in decision-making ($p<0.01$), and negatively related to having a high proportion (76-100%) of patients in managed care ($p<0.01$) and to working in practices with more than six doctors ($p<0.01$).

Doctors who worked in staff model like practices ($p<0.01$), had high proportions of patients belonging to managed care/managed medical aids ($p<0.05$), participated in decision-making ($p<0.000$) and had positive perceptions of feedback ($p<0.05$) and administrative interventions ($p<0.001$) were more likely to be satisfied with the resources at their disposal.

Positive perceptions of administrative interventions (authorisation systems $p<0.01$; utilisation review $p<0.01$; peer review $p<0.001$) and remuneration on a discounted fee-for-service ($p<0.001$) were also positive predictors of satisfaction with the administrative workload of their practices.

Although the strength of the relationship between the independent variables and the job satisfaction variables varied from low to moderate (22% of the variation of the satisfaction total score and 7% to 30% of the variation in the satisfaction facets), they were all significant at $p<0.000$ levels.

Table 4.23 Stepwise Regression of Doctor, Practice and Strategy Variables on Job Satisfaction– Regression Coefficients

	Overall	Patient care	Practice environ	Personal time	RWS	Pay	RWC	Auton	Res	Career	Admin
Female	-4.956**	-.388		-0.331***						-.745**	
Age 32-36 42-46		0.430*				-0.662**				.456	
Yrs in Practice 5-9 >19	-5.276***		-0.629*	-1.241***			-.662*			-.631**	
Insured Patients 26-50% 76-100%			-0.836*	.667				-.93*	-.492*	-.564*	
Practice Type IPA Group Network Staff	2.477		-2.384* -2.138**	0.313*		-0.448* -2.784** -1.352*	-1.87*		1.708**		
Practice Size 2-3 4-5 6+	-4.937*				.498*		-0.49* -.87**	-1.12**	-.687*		
Payment FFS DFFS Salary	6.497***	-0.692***	0.842**		.850***	.468	-.531* -1.77*	1.20***	-.489**	.455	.700***
Incentives	-4.009*		-.695							-.564	

Education CPGs Opin.leaders Use of		-0.207**	0.117** 0.342**		.070*		.246***	.178***		-.228*	.164
Administration Authorisation Util.review Peer review Use of	1.019** 0.934* 1.607** 1.606**	0.085* 0.366***	0.235*** 0.351***	0.227***		0.198*** 0.246**	.162*	.224*** .170* .356***	.338***	.173*** .188* .209*	.131** .142** .254***
Feedback	1.431**	0.133*	0.309**						.136*		
Participative Management	0.262**	0.032**			.088***		.024	.046**	.063***		
R ² (adjusted)	0.224	0.096	0.299	0.069	.105	0.115	0.116	0.218	0.102	.092	.131
F	(13.451)=11.3	(9.490)=6.9	(11.490)=20.4	(6.498)=7.2	(5.498)=12.9	(8.491)=9.1	(9.492)=8.3	(9486)=16.3	(7.499)=9.2	(10.492)=6.1	(6.495)=13
P	<0.0000	<0.0000		<0.0000	<0.0000	<0.0000	<0.0000	<0.0000	<0.0000	<0.0000	<0.0000

RWS-Relationship with staff; RWC-Relationship with Colleagues; Auton- Autonomy; Res- Resources

*p<0.05; **p<0.01; ***p<0.001

In the final model, presented in Table 4.24, the intermediary clinical freedom variables were added to the regression equations. Adding the intermediary variable had a marginal effect on the relationship between the independent variables and job satisfaction but did improve the predictive models for the job satisfaction total and the factor subtotals to some extent. This is evidenced by the increased R^2 value for most of dimensions of job satisfaction in the revised model.

At least one of the clinical freedom factors entered into each of the equations, except for satisfaction with pay and personal time. Clinical freedom factors were found to be significant positive predictors of most of the dimensions of job satisfaction. Treatment and work freedoms resulted in increased overall satisfaction ($p<0.000$), as well as satisfaction with patient care ($p<0.000$), the practice environment ($p<0.01$), relationships with staff ($p<0.05$) and colleagues ($p<0.01$), autonomy ($p<0.000$), resources ($p<0.000$), career ($p<0.001$) and administration ($p<0.05$). Freedom to care for patients who demand heavy use of resources or who are unable to afford care (patient care) resulted in overall job satisfaction ($p<0.05$) as well as satisfaction with patient care ($p<0.000$), relationships with staff ($p<0.01$) and autonomy ($p<0.05$). Finally, doctors who had the freedom to accept or reject any patient who attended their practice (patient choice) also reported greater overall satisfaction ($p<0.05$) as well as satisfaction with patient care ($p<0.05$), the practice environment ($p<0.05$), relationships with staff ($p<0.01$) and colleagues ($p<0.001$), autonomy ($p<0.001$) and with resources ($p<0.01$).

The percentage of variation in job satisfaction attributable to doctor, practice, strategy and clinical freedom variables ranged from 6.5% to 40% and all were statistically significant at the $p<0.000$ level.

Table 4.24 Stepwise Regression of Doctor, Practice, Strategy and Clinical Freedom Variables on Job Satisfaction – Regression Coefficients

	Overall	Patient care	Practice environ	Personal Time	RWS	Pay	RWC	Auton	Res	career	Admin
Female	-4.299**			-1.434***						-.850***	
Age 32-36 37-41 42-46	-3.057*					-.639*					
Yrs in Practice 5-9 >19	-3.823**		-.562*	-1.350***			-.578**			-.823***	
% Insured patients 26-50 76-100			-.725**					-.652*			
Practice type IPA Group Network Staff				0.782**		-.503* -3.241*** -1.358*	-1.858*		1.658**		

Practice size 2-3 4-5 6+					.410*		-.619*** -1.039***				
Incentives	-3.334		-.790*							-.587*	
Payment DFFS	5.192***		.669*		.677**	.480		.818*	.469*		.700***
Education CPGs Opinion Leaders Use of			.101*		.081*		.226***	.182***		-.214*	
		-.197**	.290**								
Administration Authorisation Util. Review Peer Review Use of	.962** .907* 1.342* 1.547**	.077 .333***	.234*** .354***	.239***		.192*** .267**	.148	.225*** .130* .244**	.314***	.155***	.141** .141** .231**
Feedback	1.219*	.116*	.264**								
Participative management					.069***				.462***		

Clinical freedom Treat/work Pat. Care Pat.Choice	1.432*** .889* 1.474*	.150*** .263*** .183*	.116* .246*		.090* .207** .266**		.093** .328***	.435*** .180* .402***	.171*** .237**	.152***	.071*
R ² (adjusted)	.289	.186	.304	.065	.156	.121	.149	.396	.156	.102	.145
F	(13,44)=15	(8,48)=15	(12,48)=19	(4,49)=9	(9,48)=10	(8,48)=9	(10,48)=9	(10,47)=33	(7,49)=14	(7,48)=14	(7,48)=12
p	<0.0000	<0.0000	<0.0000	<0.0000	<0.0000	<0.0000	<0.0000	<0.0000	<0.0000	<0.0000	<0.0000

RWS- Relationship with staff; RWC- Relationship with colleagues; Auton- Autonomy; Res- Resources

*p<0.05; **p<0.01; ***p<0.001

CHAPTER FIVE

Discussion and Conclusion

5.1 The Survey Response

The overall response rate of 31% was similar to those obtained in other nationwide studies of doctors (Pillay, 2002; Bekker 1995), and was consistent with rates commonly obtained among elite professionals including the fields of medicine, law and business (Sorbal et al., 1990). Recent reports have also noted the increasing difficulty of achieving desirable response rates in national surveys of physicians (Hill and Winfrey, 1996; Mcilrath, 1996; Tambor et al., 1993). Although far in excess of the minimum 353 responses required, the response rate suggests that some non-response bias may exist in our estimates. However, the demographic distribution of our respondents did not differ significantly from all private sector general practitioners registered with the South African Medical Association. Nor did our respondents differ greatly from all general practitioners nationally (HPCSA, 2002). Our sample was therefore representative of all general practitioners in the country, thereby making it possible for us to make inferences about the population as a whole, from the data obtained.

5.2 The Respondents

The demographic profile of our respondents is a stark reflection of the legacy of inequity in the South African health sector. The high proportion of whites (63%) and males (82%), coupled with the low proportion of Africans (10%) in this sector is a manifestation of the policies of the apartheid government. Apart from being a major constraint in the transformation and development of the health sector in South Africa, these historically entrenched inequities pose a major challenge for planners and policy-makers to address the inappropriate skills mix and the inequitable distribution of health personnel geographically, racially, sectorally (public versus private), and in terms of class and gender.

Firm foundations have been laid for the transformation of the human resources scene and notable progress is being made towards set targets, and much has been achieved in

establishing innovative structures and measures for managing reform. During the past seven years the policy and legal environment of human resource management nationally and in the health sector has changed significantly. New human resource related legislation includes, amongst others, the Employment Equity Act (1998), the Labour Relations Act (1995) and the Skills Development Act (1999). National policy documents of relevance for human resources in health include the White paper on Affirmative Action (1996), the White Paper on Human Resource Management (1997), and the White Paper for the Transformation of the Health System (van Rensburg, 1999 cited in HST, 1999). All of these policies have impacted on the admission criteria of medical universities, and already some change is evident, although there is a long way to go before student populations reflect the demographic profile of South Africa (Moomal and Edwards-Miller, 1998 cited in HST 1998).

Although foreign doctors account for 5.8% of all registered doctors in South Africa (HST, 1999), the low proportion in the private sector (1.5%) can be attributable to one of several factors. Most have "limited registration" with the Health Professional Council which keeps them in the public sector while others form part of country- to- country contracts which oblige them to work in the rural public services. Further, Wholey and Burns (1991), have suggested that foreign doctors generally elect to concentrate their practice in a hospital environment so as to maximise their own convenience and efficiency.

The predominance of older, more experienced doctors in the private sector could indicate that interventions such as the introduction of compulsory community service, more competitive remuneration packages and the offering of professional allowances to encourage younger, newly graduated doctors to remain in the public sector, is succeeding. Young doctors are also more likely than older doctors to be employees, a pattern partially attributable to a prevalent career cycle in which many doctors begin their careers as employees and later move to self employed positions when they have accumulated significant resources to start new practices or buy into existing ones (Wilke, 1999; Gillis and Wilke, 1989). It may also imply a relative saturation in the market for general practitioner services, with general practitioners having to adapt to lower income levels resulting from recent amendments to the regulation of the medical aid industry as well as the pure financial inability of patients to continue to purchase private health care.

5.3. Practice Demographics

Most of the practitioners reported that less than half of their patient base comprised patients who were members of managed care/medical aid organisations, while only a minority reported that their practices comprised more than three quarters who were members of such schemes. Hence, there is a considerably higher use of private providers by subgroups in the lower income categories than would be indicated by data on medical scheme membership. This seems to corroborate the findings of the 1995 October Household Survey, where 19% of urban residents in the lowest income quintile claimed to usually use the private sector although only 5% were covered by a medical scheme (HST, 1998).

The total time that practitioners spend in patient care, and their average consultation times are also not significantly related to the proportion of patients that belong to managed care/medical aid schemes. This suggests that there is no deterioration in the quality of care as a result of differing patient class, or payment systems (medical aid versus out-of-pocket), which augurs well for health care in general.

5.4 Organisational Structure

The high proportion of doctors that are affiliated to independent practitioner associations (32%), and that belong to group practices (29%) reveals a trend in practice arrangements to establish more competitive practice structures. It reflects some form of collaborative behaviour among private sector practitioners in response to the rapidly changing environment, and in reaction to the opportunities presented by the change in legislation that allows for professionals to form such organisations.

The IPA is popular as a health care delivery system as it does not necessitate a change to the structure and process of the South African tradition of small, independent practices. IPA doctors remain primarily solo, fee-for-service practitioners and see relatively few managed care patients and are therefore least likely to be placed at financial risk for their utility patterns- IPA medical practices resemble traditional practice settings more closely than other practice settings. It retains the advantages of the small private practice that so many doctors

and patients prefer, while at the same time introducing managed care advantages and a business organisation. Doctors continue to practice independently and obtain reimbursement from various insurers, predominantly on a fee-for-service basis. The more *organic* attributes of their structure also make IPAs powerful and theoretically attractive institutions more suited to the aspirations of knowledge workers and to the virtues of small practices: understandable scale, personal responsiveness, actualisation of doctor creativity, clinical freedom and the attitudes and incentives of private care (Maheshwari, 2000; Shenkin, 1995; 1996).

Apart from these organisational advantages, constructing and joining an IPA is also simple: IPAs have been created by local initiatives, their memberships are entirely local, and they are in principle self-governing. It is therefore not surprising that this local trend appears to mirror that of more mature managed care markets such as the USA, where IPA's account for more than half of all HMOs and command over 40% of market share (Trespacz, 1999).

Although 53% of doctors in this sector are currently still in solo practice, it is significantly less than the 70% that were in self employed solo practice in 1995 (Bekker, 1995). Hence, six years after the deregulation of this sector, the trend away from solo practices appear to parallel that of the USA, where the proportion of solo practices has dropped from 40.5% to 29.3% in the twelve year period since 1983 (Kletke et al., 1996). This, perhaps, explains the popularity of group practices in South Africa, although most group doctors are in practice with relatively few doctors. The propensity to form group practices is however not necessarily associated with a trend away from self-employment because doctors have some fiduciary interests in their practices.

This trend towards group practices could also be part of a general evolution in health care systems towards increasing size and complexity. These are fuelled by efforts to slow the growth of health care expenditures. Such practices are often thought to be more economically efficient than solo practices due to economies of scale and scope of services possible. In addition, solo practices are less capable of negotiating favourable managed care contracts.

That these changes are especially pronounced among the young and the recently qualified, suggests that the newer generation of doctors are embracing strategies that will increase their

competitiveness in this deregulated and highly competitive sector. It also allows earlier entry into this market, as start up costs are lower and they are able to leverage the expertise of their more senior partners or associates. Significantly, females are also more likely to join small group practices. This is perhaps due to the greater flexibility that these practices afford them especially with regard to time management, thus making it possible for them to simultaneously fulfil their professional and domestic responsibilities.

It is not surprising to note that practices with a high proportion of insured patients are significantly more likely to comprise many more doctors. Larger groups have greater capacity, a broader service range, a choice of doctors and lower input costs per doctor, all of which strengthens their hand in negotiations for managed care/managed medical aid contracts. They are also better able to attract, serve and retain their patients through the combined efforts of all of the partners. However, it is impossible in this analysis to disentangle whether the numbers of insured patients are a cause or an effect of these larger group practices.

A relatively high proportion of doctors have also opted not to have any organisational affiliation. This may reflect a reluctance to commit to formal co-operation, which could present an obstacle to these practitioners who wish to, or may have to enter into contracts with managed care organisations, which require clear channels of communication in order to monitor cost and quality considerations. It is the older and more experienced of the doctors who are significantly more likely to fall into this category. Their rationale could perhaps be based on their seemingly secure patient bases, which arise from being in practice for longer, and being well established in their respective communities. But, the private sector is a highly dynamic one and this strategy of non- collaboration may be short sighted and unsustainable. This approach may also reflect a naivety among older doctors about the dynamics, demands and challenges of a managed care environment, rather than a deliberate strategy.

The low proportion of doctors who are directly contracted to medical schemes indicates a general reluctance on the part of doctors to enter into direct relationships with funders, preferring perhaps to do so via intermediaries such as the IPA or group. This may arise from the insecurity that individual doctors feel in negotiations with corporations, or even from a fear that their colleagues, who have organised themselves more formally to negotiate with, or resist managed care companies, may brand them as “sell-outs”. The paucity of preferred

providers also lends credence to the argument that individual practitioners are hesitant to enter into strategic relationships with managed care companies.

It is also evident from the findings that a very small proportion of doctors are employed by staff model type organisations. The most plausible explanation for this phenomenon is that despite the presence in South Africa of several of the managed care models, all have not captured the imagination to the same extent. Most notable among the failures have included the Mines Benefit Society's hospital, Medimo's capitation plan and Vaalmed, all of which were based on the staff model concept. They have apparently suffered from the burden of high fixed costs, geographic access and requirements to assume risk for areas, which were becoming increasingly unmanageable (Rothberg et al., 1999 cited in HST 1999). These early complications could well have led to some ambivalence about the viability of this health care delivery model, which appears to be destined for the same fate as its American counterparts. It is also perhaps the first indication that despite vastly different market conditions, doctors and patients in both these countries value autonomy, choice and access ahead of economic objectives.

Thus, the results seem to indicate an evolutionary process in the direction of increased collaboration, structure and formalisation within the private sector. However, the change is not universal, and the older, more experienced doctors who have been in practice much longer, still appear to desire their more traditional practice modalities.

5.5 Managerial Practices

5.5.1 Financial Contingencies

The results suggest that in the changing milieu that is the private sector, fee-for-service continues to be the dominant system of payment. The high percentage of patients in this sector who are serviced on an out-of-pocket basis, which is essentially a fee-for-service one, partly explains this finding. However, there has also been a slow transition from the traditional method of fee-for-service payment models to capitation among insurers. This could be attributed to several factors. Firstly, funders could be using fee-for-service to get doctors and organisations to sign up, especially in this initial period of development, and

where managed care penetration is low. Secondly, because fee-for-service has been the primary mode of reimbursement for the preceding decades, funders are comfortable to continue to do so either because they feel it is appropriate under current market conditions, or because they lack the capacity to implement change at this stage. Thirdly, doctors, via organisations such as the SAMCC, are resisting the introduction of capitation. They fear that it will impact on their bottom lines, a fear that stems from their lack of experience with a remuneration system that requires them to bear risk and make alterations to their practice patterns. It is therefore not surprising that the older, more experienced doctors are more likely to report being compensated on a fee-for-service basis.

Fee-for-service is also the preferred mode of reimbursement for the overwhelming majority of practitioners in this sector. Those who prefer fee-for-service believe perhaps that fee-for-service medical care results in better quality of care because of the perception that there are no financial barriers to having the patients best interests at heart. On the other hand, their preference may be based on their own pecuniary self-interest. Doctors do respond to contingencies that affect their financial status. This self-interest is a normal characteristic of human behaviour, and is no more or less common among doctors than in any other group of individuals. These proponents of fee-for-service may believe in a system where economic reward is predicated on how much one does, rather than on the basis of cognitive input, especially when one is paid more for doing more.

Medical aid schemes and managed care companies have attempted to counteract the moral hazard of the incentive to over service inherent in fee-for service arrangements, by withholding proportions of payments due to practitioners. Hence, doctors who reported having high proportions of insured patients also reported having greater proportions of their payments being withheld. Although the most frequent rate of withholding is 11 to 20 percent, more than a quarter of the respondents reported that more than 30 percent of their payments are withheld. This is of concern as withholds greater than 20 percent could have a risk of incenting inappropriate underutilisation (Hillman et al., 1991). However, our fears of potential under servicing are allayed by the finding that for the majority of doctors (78%), these withholds amount to a straight discount. They receive no rewards from surplus funds.

The small minority of doctors who receive a salary as remuneration is congruent with our finding that a very small proportion of private sector doctors work in staff model type

organisations. However, the proportion of doctors who have expressed their preference for salary as their principle mode of reimbursement is marginally higher. This could be indicative of the turbulence within this sector, and a desire among doctors for a guaranteed fixed monthly payment. It is also not surprising that younger doctors and those who have graduated more recently were significantly more likely to express this preference. They are the more recent entrants to the marketplace and a salary buffers them from changes in income in a market where they have a small market share. The positive perception about salaries among this group of doctors is also a validation of the government's new remuneration structure for the public sector, from which they would have recently emerged.

The 10% of doctors who reported that their principle mode of reimbursement was capitation is an indication that we are indeed facing a changing paradigm- albeit slow- in the way that medical services are delivered and reimbursed. That the younger and more recently graduated doctors, and those with a large proportion of insured patients in their practice, were more likely to report capitation as their principle method of reimbursement, is not surprising. They embrace it as a means to make their services more attractive and to ensure adequate market share. But even more significantly, it indicates a greater acceptance of the managed care philosophy among the newer generation of doctors, which augurs well for the future success of the system.

The reluctance to accept the structures and strategies of managed health care among the older, more experienced doctors is evident by the fact that doctors with no organisational affiliation – where this group predominates- are less likely than expected to report capitation as their principle mode of reimbursement. In contrast, their colleagues in IPAs were more likely to report that they were being reimbursed principally by capitation. This is not unexpected, as IPAs have been formed with the explicit purpose of negotiating such contracts with insurers. It also shows a willingness among this group of doctors to embrace both the structures and strategies that are necessary if one is to survive and thrive in a managed care environment.

Overall, though, capitation was the least preferred of the payment systems (6% of respondents). This is worrying if one considers that health economists predict that capitation will not only replace most fee-for-service systems but will become the dominant payment mechanism over the next decade. It is therefore prudent for doctors to start thinking about

capitation and begin evaluating the management of the inevitable circumstances. As health care funders begin to shift significant financial risk to providers, it is important for doctors to develop a keen understanding of capitation and be prepared to make the transformation. There is danger in doing nothing. Doctors who continue to practice in the same way as they did for the last 20-30 years will be left without market share or profit and may even be forced to move if they are locked out by insurers who predominate in their areas. Thus, as managed care evolves in South Africa, understanding the nuances of capitation payment will not simply be the prerogative of entrepreneurial doctors seeking to stay ahead of the market, but will be a necessity of economic survival for most practitioners. Doctor education and focusing on management relations may help smooth the transition to capitated reimbursement (Tyrance et al., 1999).

Further, only 11 percent of practitioners were aware of some type of financial incentives in their practices, over and above their basic method of remuneration. The overwhelming majority of these doctors (85%) indicated that such incentives depended on their performance in restraining the use of specialist and laboratory services, and limiting the costs of prescription medicines. Only a few doctors (15%) cited the quality of care and patients' satisfaction as factors in the determination of incentives. This approach, which rewards individual doctors for the parsimony of his or her approach to individual patients and favours the conservation of resources not only raises an ethical dilemma, but also ignites much opposition and concern about their potential effect on the quality of care. It has also been found to heighten doctors' "performance anxiety" and their perceptions that care may be compromised in these areas (Grumbach et al., 1998.). As these incentives become more widespread, these concerns will intensify. Thus, the goal of providing high quality care may be better approached by the use of limited financial incentives based on the quality of care and patients' satisfaction, than incentives that reward doctors for restricting access to care. Reimbursement that serves to promote a standard of 'appropriate' behaviour also helps to maintain the goals of professionalism (AMA, 1995).

The fact that doctors in IPAs and large group practices were more likely to report receiving incentives can be attributed to the fact they have a higher proportion of insured patients. Collectively they are also in a much better position to negotiate such incentives with insurers, than their colleagues who have no organisational affiliation or those who are in solo or small group practices. It is also perhaps an indication that insurers are more willing to

enter into such agreements with organised groups, than with unaffiliated individuals. Doctors will be wise to take note of this.

5.5.2 Educational Strategies

Despite a seemingly inherent potential for educational strategies to facilitate better practice and control expenditure, local organisations appear not to be using them systematically as part of an incentive strategy, and many of our responding practitioners remain sceptical as to whether they can achieve any significant change in their practice behaviour. The limited use of these strategies could be attributed to the fact that it is indeed a daunting task to plan, develop, implement and monitor such strategies. It is exponentially more difficult in a transitional market such as ours, where time, resources and skills to produce high quality programs and guidelines, are limited.

Our findings also corroborate those of other researchers that education has only limited influence on the practice patterns of doctors (Schroeder et al., 1984; Williams et al., 1984). In fact there is evidence that behavioural changes brought about by education tend to be transient, and when education efforts are discontinued, doctors revert to “business as usual” (Rhyne and Gehlbach, 1979; Williamson, 1982).

Clinical practice guidelines, opinion leaders and continuing medical education strategies are primarily educational in nature and are nested in an underlying paradigm that posits a causal pathway to behavioural change- information, belief, attitudes, intention and behaviour. However, the reality of behavioural change is unfortunately more complicated than this. Competing forces - societies interests, patients’ real or perceived demands, financial incentives, doctors’ personality traits and practice habits, to name just a few – also have a powerful influence on behaviour (Goldman, 1990). When these countervailing forces are weak, one might expect education to be effective. This, perhaps, explains why the younger, more recently graduated doctors were more likely to report that educational strategies were effective in altering their practice patterns. They are clinically less mature and therefore not likely to have entrenched practice habits; they feel less threatened by the financial contingencies and incentives employed in managed care; they have been trained in an era of cost containment; they are more aware of the dynamics and trends of the industry and are

therefore more amenable to change than their older, more experienced colleagues who feel threatened by the transition to a deregulated market. Unfortunately, older doctors predominate in this sector, which could perhaps explain why education strategies, overall, are perceived as being unsuccessful in altering practice patterns.

We found that most doctors have positive attitudes about continuing medical education programs in general, perceiving them to be good educational tools and likely to improve the quality of patient care. This finding appears to be in agreement with the prevailing tone of the current literature that suggests that more interactive strategies appeared to be effective in changing the performance of doctors and in improving health care outcomes (Davis et al., 1999; Davis et al., 1998). This matches closely those principles promoted by adult educators, who describe successful adult education as learner-centered, active rather than passive, relevant to the learners' needs, engaging, and reinforcing (Knowles, 1970). Based on this evidence, formal CME will remain a useful tool for disseminating clinical information and will be a useful adjunct in changing doctor behaviour in general.

Despite increasing enthusiasm for clinical practice guidelines, the overall perception of guidelines among our respondents is negative. They view it as oversimplified or "cookbook" medicine, too rigid to apply to individual patients, and unlikely to improve the quality of care. These findings suggest that this disagreement appears to be based on the content of the guidelines and the fact that this increased control over the context of medical practice is antithetical to the ideology of professional control over the content of medical practices. However, guidelines issued by insurers may also engender suspicion based on the presumption that they are intended primarily to decrease costs, and thence doctors' income, rather than to improve the quality of care (Rappolt, 1997).

Importantly, these negative perceptions of guidelines were similar across all doctor groups. This is in contrast to findings by Salem-Schatz et al. (1997), who found that doctors in staff and group model organisations tended to have more positive attitudes about guidelines. They attributed this to greater goal congruence between doctor and organisation, and a predisposition of this group of doctors to accept the values prevalent in these traditional managed care settings. Based on this, we can infer that none of the local doctors feel insulated from the more coercive uses to which guidelines may lend themselves, such as reimbursement incentives and penalties.

Despite these findings, past research seems to indicate that clinical practice guidelines have a role to play in improving the quality of care, in promoting cost-effective use of health care resources, and in reducing medically unjustifiable practice variations (Salem-Schatz et al., 1997; Shye and Bettz Brown, 1995; Grimshaw and Russel 1993). The challenge for all those active in guideline development in South Africa is to create and implement clinical practice guidelines in such a way that they serve the interests of patients and the public as well as those of providers. Only then will guidelines be viewed as a welcome support to the practice of medicine rather than as a limitation or constraint.

Our findings are also at odds with the literature, which suggests that the use of opinion leaders can be effective in altering clinical practices (Lomas et al., 1991; Schaffer et al., 1993; Grego and Eisenberg, 1993). The overall perception about opinion leaders among our respondents was negative. They are construed as being a biased source of advice that is unlikely to have an impact on practice patterns. The only plausible explanation for this distrust of their respected peers could perhaps be rooted in the suspicion that doctors harbour about the organisations that these opinion leaders purport to represent, and not necessarily on the wisdom of the message that they bear. The onus is therefore on organisations to utilise influential and charismatic individuals, who are respected for their clinical independence and judgement, to transmit norms.

Thus, despite the overall tone pertaining to the use and efficacy of educational strategies being negative, it is heartening to note that the younger and more recently graduated doctors appear to have more positive perceptions about these strategies. It is therefore important for organisations wishing to utilise these strategies to convey a particular message, to take cognisance of the impact of the various sources and channels, as well as the characteristics of the potential recipients and their practice settings.

5.5.3 Administrative Interventions

One of the definitive elements in managed health care is the presence of systems aimed at controlling unnecessary utilisation. In transitional markets, such as ours, rules and regulations usually abound (Smithson and Koster, 1997), the most conspicuous of these being authorisation systems, utilisation management programs, and peer review. It is therefore surprising to note that doctors did not perceive that they were being overly subjected to these non-economic strategies. The implication of this is that doctors, in general, are either not aware of the presence of such strategies, which is highly unlikely, or that funders are not employing such strategies to any significant extent. This could either be a legacy from the traditional fee-for-service markets, or it could be a response to doctors who have used their negative experiences with these external rules as a rallying point to oppose their further implementation. On the other hand, organisations themselves may be actively seeking ways to eliminate explicit rules in their quest to reinforce the connection between provider satisfaction, quality of care, customer satisfaction and profitability (Smithson and Koster, 1997).

That doctors with no organisational affiliation were less likely to report being exposed to administrative interventions could be attributed to the fact that they were also less likely to be contractually bound to health insurers. The finding, although not statistically significant, that these doctors were also more likely to report having fewer patients who were insured, supports this assumption.

Although rules are powerful incentives, are highly specific and are valuable as a method of managing the transition to more cost-effective medicine, our doctors, in general, do not believe that these strategies are effective in altering clinical practice patterns. The reality is that it is inherently difficult to change clinical behaviour. Doctors are trained to function in an autonomous way, to stand up for themselves, and to be the authority and the advocate of their patients. This paradigm is ingrained in the older, more experienced doctors which explains why they are more likely to resist rules and regulations that are unilaterally imposed upon them in an effort to alter their practice patterns. Additionally, doctors are also more likely to change their practices if they perceive that these will lead to improved patient outcomes, rather than if they are initiated primarily for financial reasons, which is the

primary issue which drives the use of these administrative interventions (Grego and Eisenberg, 1993).

Despite not being excessively exposed to administrative interventions, doctors in general, expressed strong negative perceptions about authorisation systems, utilisation review and peer review. It is also the mode of control most resented by knowledge workers since it intrudes on their practice autonomy and discretion in a direct way (Jooste, 1997; Handy, 1989). Doctors generally would prefer a practice where there is no retrospective secondary evaluation of their decisions and where they are the unquestioned authority (Kongstvedt, 1997). Doctors, like all other knowledge workers, look upon these measures as unnecessary intrusions into their domain. It is difficult for them to accept a role in which another entity has control over their professional activities whether it is by peer review or by having to get authorisation for services to be rendered. Given their tradition of autonomy, doctors view these rules and regulations as evidence of a lack of trust and when these elements of control are introduced into the arena of health care delivery it is bound to elicit an antagonistic response. If limits on action are to be imposed, it is perhaps more desirable for doctors to impose them on the basis of professional judgement rather than to have them imposed by administrative authority. This, perhaps, explains why doctors perceive peer review less negatively than utilisation review, than authorisation systems. This systematic reflection on each other's performance by colleagues, who respect each other and know the general practice situation well, may be a powerful stimulus for bringing about desirable change in patient care, and should be explored by funders.

Better cooperation and collaboration between doctors and those who wish to change their practice patterns may substantially reduce doctors' fears and suspicions about such interventions. Organisational conditions that promote provider flexibility with respect to patient care decisions are expected to promote higher satisfaction levels among both providers and clients. Ultimately, though, doctors have the best perspective on how rules might compromise or foster clinical quality, and they must decide whether they will resist all regulation or work constructively to develop regulatory approaches consistent both with social need and with good patient care.

5.5.4 Feedback

Despite many of the studies concerning the use and effects of feedback yielding positive results (Berwick et al., 1986; Mugford and Banfield, 1991; Grol and Lawrence, 1995), our findings suggest that feedback is not perceived positively by doctors, and is not used often as a strategy by local insurers to influence the practice patterns of doctors. These negative perceptions could perhaps be attributed to the fact that general practitioners have often worked in isolation for a long time and have not received feedback on their performance. They have generally developed their own implicit standards and are usually satisfied with most of these and experience them as sufficiently effective in their care provision. They regard these explicit criteria coming from 'outside' as perhaps not relevant or realistic for their own situation.

However, feedback is at the heart of the implementation of change in general practice care: "The value of feedback in the modification of behaviour cannot be doubted. It is a fundamental biological process.... It is the basis of all learning" (McIntyre and Popper, 1983, cited in Grol and Lawrence, 1995). The presentation of well based comments and criticism on the performance of a care provider could be an important source for critical reflection on and change of their own routines. Regular feedback also creates a work environment where doctors feel that their efforts are being recognised and appreciated. This translates into a probable increase in the expectancy, instrumentality and valency for their tasks with a consequent increase in job satisfaction (Vroom, 1964).

Thus, feedback programs, which are expensive and difficult to mount, may be influential and organisations will therefore do well to consider using it more often in their efforts to introduce a sense of cost awareness into doctors' practice patterns. For knowledge workers such as doctors, though, people whom they respect and who are involved in the same kind of work as they are should conduct this feedback. It should be concerned with objective performance data that are compared with agreed standards of care; it should be explicit and understandable and must serve the learning process of the group; and it must also be regular, consistent and useable (Grol and Lawrence, 1995; Kongstvedt, 1997). If these feedback conditions are fulfilled, it is possible that perceptions of this inherently effective intervention strategy may improve.

5.5.5. Participative Management

Despite the gradual increase in the provision of medical services through more organised practice arrangements, the overall consensus among doctors is that they are not sufficiently involved in the decision-making pertaining to non-medical activities of their respective organisations. Doctors also reported that they are not adequately informed about the processes and outcomes of health care delivery within their organisations. These findings have implications for these managed care organisations as a context for the delivery of health care.

Research has shown that participation may affect the ultimate organisational outcomes through the development of favourable attitudes about the organisation and its clientele (Barr and Steinberg, 1983; Merckel and Pollard, 1987), and evidence from studies have also shown a positive relationship between doctor participation in decision making and measures of quality of care (Shortell and LoGerfo, 1981; Morlock et al., 1979). The commitment of knowledge workers to an organisation is also dependant upon the organisation's ability to align corporate needs with the individual values of these workers (Davenport 1999; Stewart 1999), a key goal of the participatory approach. The motivation of doctors is also augmented by their individual involvement in decision-making and problem solving. It appeals to their self-esteem and self-actualisation needs and therefore has the potential for continuous personal and professional growth (Maslow, 1964). Thus, the involvement of doctors in roles beyond their core professional functions may result in a more efficient performer both as an individual practitioner and as a member in the system. This ultimately translates into greater organisational effectiveness.

It is also evident from the findings that doctors in larger group practices reported greater participation in decision-making than those in IPAs and other organisational forms. This suggests that these groups provide more opportunity for formal participation and control by their doctors, and that these doctors are actively involved in the focus and functioning of the organisation as well as in shaping the colleague network of which they are a part. This is perhaps due to the fact that these doctors have a fiduciary interest in these organisations. Nevertheless, it augurs well for the continued growth and sustainability of these group

practices. On the other hand doctor leaders within IPAs should make a concerted effort to ensure that their leadership style is conducive to maximising communication and agreement among its members, thereby fostering a sense of ownership and responsibility within their organisations. Only then will the potential for personal, professional and organisational growth within these conceptually superior organisational forms, be unlimited.

The findings also provide evidence that younger doctors, who had graduated recently were more likely to report participation in organisational decision-making, as well as awareness of the context of health care delivery within their organisations. This suggests a greater desire among these doctors to integrate themselves into their practices and may also indicate a greater commitment to practice in a managed care environment, or that they are indeed more responsive to practice in an organised context. Another significant deduction is that participation does not necessarily develop as a process over time, nor is it restricted to the more experienced doctors.

In sum, as far as the managed care strategies are concerned, it appears that insurers, funders and provider organisations are not employing any of the behaviour change strategies to any significant extent. Despite this, doctors harbour negative perceptions about most of these strategies. It is however heartening to note that the younger, more recently graduated doctors were more likely to respond favourably to these strategies, which augurs well for the future of managed health care in this country.

5.6 Clinical Freedom

The breakdown of the concept of clinical freedom into three components suggests that there is no simple score or proxy by which to measure the relative autonomy of doctors. Overall, doctors reported limitations to their clinical freedom. This finding is a logical consequence of the restrictions that managed care typically espouses and the tendency of knowledge workers to resist a 'command and control' culture and their desire for work environments that permit relative autonomy.

The evidence does however suggest that doctors have more freedom to diagnose and treat within available resources, than they have to treat patients of their choice. This perceived greater autonomy over treatment practices could be attributed to the fact that they are still being compensated predominantly on the basis of fee-for-service, coupled with the fact that insurers and funders appear not to be exercising oversight over clinical decision making, to any significant extent.

Perceived constraints on their ability to treat patients of their choice, or to treat patients who are unable to afford care or demand greater use of resources, is a stark reminder of the inaccessibility of this sector to a major proportion of the population. Although one would expect these fee-for-service practitioners to possess greater freedom to accept or reject anyone who seeks a consultation, they are perhaps limited by the fact that a significant proportion of their patients attend on an out-of-pocket basis, which places limits on what they can afford. Thus, this limitation of choice appears to be more a consequence of patients being unable to afford care, as opposed to managed health care, which limits access to care.

Although there was an overall perception of diminished clinical freedom among South African general practitioners, regression analyses revealed that practice demographics, including the number of doctors and the proportion of insured patients, and management strategy variables were significant predictors of perceived clinical freedom.

Relative to solo practitioners and doctors working in small groups, those who worked in practices comprising six or more doctors were significantly more likely to report lower perceived clinical freedom. Increased size leads to greater complexity and differentiation, which calls for greater efforts to coordinate and integrate the organisation's activities. Practices may attempt to achieve such integration by structuring the employment and decision-making of their doctors (Burns et al., 1990). Larger practices have also been found to draw more of their patients from managed care, and consequently face the most restrictions and nuisances.

The results also provide evidence that high levels of managed care/medical aid activity, as defined by high proportions of insured patients (>75%), also had a deleterious effect on perceived clinical freedom. This finding is consistent with previous research (Warren et al. 1998; 1999) and other anecdotal evidence, and is a logical consequence of the increased levels of utilization review and other forms of oversight, treatment protocols, and financial incentives and disincentives that managed care typically establishes. Those with fewer insured patients escape the additional bureaucratic nuances and restraints on their autonomy that managed care plans impose.

Among the management practice variables, the social influence approaches such as opinion leaders, peer review and participation, and financial contingencies such as remuneration on a discounted fee-for-service were significant positive predictors of the perceived clinical freedom of doctors. The way these strategies are perceived by doctors is an important determinant of the extent to which they influence clinical behaviour. Those who reported positive perceptions of opinion leaders and peer review and who participated more in organisational decision-making were more likely to report greater freedom to choose, treat and care for patients in ways that are appropriate, effective, and consistent with standards of high quality care. It is therefore not surprising that doctors were more responsive to strategies, which they perceive as being more consistent with these norms and values. Among the strongest influences on clinical behaviour is information about the practices of peer physicians (Martin et al, 1980; Eisenberg and Williams, 1981; Berwick and Coltin, 1986) and the expectations of more senior medical opinion leaders (Salem-Schatz et al, 1990; Lomas et al, 1991). Past research also suggests that encouraging doctors to participate in the process of decision-making has been found to be somewhat effective in influencing their behaviour (Schaffner et al, 1993; Thompson et al, 1983).

The influence of peers can be especially significant in determining the degree to which individuals perceive given behaviours as normative and how much support they perceive for performance of these behaviours. Opinion leaders, on the other hand, accomplish change by modelling, peer influence and alterations in group norms. Participation appears to lead to a sense of "ownership" among doctors and a perception that strategies are personally relevant and appropriate to their own professional practice (Goodpastor and Montoya, 1996). The

view that social influence strategies create positive perceptions of clinical freedom indicates that there may be some advantage to the development and refinement of these as a management practice.

Consistent with the original hypothesis (Hypothesis 7), remuneration on a fee-for-service basis, albeit discounted, was a significant positive predictor of perceived clinical freedom. This corroborates the findings of previous research (Hillman et al., 1987; 1989; Calnan et al., 1992; McCleary et al., 1995), that payment systems such as capitation and salary implicitly force doctors to ration the allocation of medical resources. They constrain doctor decision-making without dictating medical judgement and they reward or penalise doctors substantially for the parsimony of his or her approach to individual or pools of patients. Similarly, there is an increasing trend for insurers still employing the traditional fee-for-service system, to withhold varying portions of payments to doctors. This is an attempt by funders to increase the financial risks of fee-for-service care, which are inherently limited as compared to those of capitation or salary. In contrast, for a fixed, pre-negotiated discount on consultation and prescription charges, doctors can not only anticipate the freedom to manage patients as they see fit, but they can also expect prompt reimbursement for accounts submitted. Such a payment system offers them additional economic and professional autonomy.

Just as it was important to find from this model that some variables were significant, so it was to find that many variables did not affect the perceived clinical freedom of doctors significantly. Doctor characteristics (including gender, age, and experience), and organisation structure had no significant relation to the measures of perceived clinical freedom. This latter finding does not support the original hypothesis (Hypothesis 2), that independent practitioner associations were significantly more likely to provide an environment for optimal clinical practice. Likewise, some of the managerial practice variables such as administrative interventions and feedback were also found to be unimportant.

The absence of the influence of administrative interventions as significant predictors of clinical freedom suggests that these strategies may not be as effective as financial and social

influence strategies. Doctors, perhaps, see certain rules and regulations as being a “hassle factor” rather than managerial practices that actually change clinical decisions. Similarly, the feedback received by our respondents is perhaps passive in nature and is not conducted under conditions proposed by Grego and Eisenberg (1993), for it to be effective in altering clinical decision-making.

5.7 Job Satisfaction

The findings support that of researchers such as Lichtenstein (1984), Stamps and Cruz (1994) and Williams et al (1999), that job satisfaction is in fact a multi-dimensional concept. The forty-eight items yielded eleven factors, which in most part overlapped that of Williams et al (1999), suggesting that the Physician Worklife Survey may be universally applicable. Doctors were satisfied with certain aspects of their work and dissatisfied with other aspects. Overall, however, results from this survey demonstrate that general practitioners in the private sector were marginally dissatisfied. Since there is preliminary evidence that doctor satisfaction affects patient satisfaction and compliance (Linn et al., 1985; Weisman et al., 1985), and job satisfaction and performance of professional workers may be positively correlated (Mulins, 1999), these findings have important implications for the provision and costs of quality services to clients of health care organisations in today’s environment.

Congruent with earlier research (Baker and Cantor, 1993; Schulz, Girard and Scheckler, 1992; Lichtenstein, 1984), doctors were most satisfied with the social (relationships with staff and colleagues) and personal (practice location, acceptance by community) aspects of their work, and moderately satisfied with factors relating to the resources at their disposal, and their ability to provide quality care for their patients. They were most dissatisfied with their practice environment pressures - the regulatory climate and the introduction of managed care – and with work setting issues such as pay and administrative burdens. They expressed moderate dissatisfaction with the time pressures that they experience, with their clinical freedom and with their careers as doctors.

This dissatisfaction with work context issues is an indication that a considerable number of respondents are lacking in the satisfaction of basic needs and have not reached the stage when intrinsic motivation becomes important to them. It would therefore be beneficial to

managers to take cognisance of this finding in their planning of motivational interventions, especially for new incumbents. The finding that doctors are satisfied with higher order needs but dissatisfied with lower order needs, is however dissonant to Maslow's theory which suggests there is a progression from lower order needs to higher order needs. This could mean that doctors view material things as an expression of some other valued outcome, or that doctors are simply more materialistically inclined than the managers on which Maslow based his original ideas (Arnolds and Boschhoff, 2000).

The general dissatisfaction with their careers is a further measure of the demoralisation of doctors, and offers some evidence for the deleterious outcomes associated with the corporatisation of health care and the introduction of managed care. The declining attractiveness of general practice as a career is of great concern, and as policymakers consider new approaches to improving access and controlling health care costs in South Africa, they should be cognisant of the effects such strategies may have on doctor satisfaction and of the potential for social disruption that such dissatisfaction may imply. Increased absenteeism, coupled with recruitment, retention and motivation difficulties may in the long run offset the gains of an efficient delivery system.

Looking at the issue of what contributes to doctors' satisfaction, regression analyses showed that doctor characteristics, organisational structure, practice demographics, managerial practices and perceived clinical freedom were all strong predictors of job satisfaction. The results do however suggest that the effects of doctor characteristics, organisation structure and some of the managerial practice variables (including practice guidelines, utilisation review, incentives and feedback) on satisfaction are direct rather than indirect.

As hypothesised (Hypothesis 8), female doctors were significantly more likely to report overall dissatisfaction, as well as dissatisfaction with their careers and their personal time. Our findings support that of Glisson and Durick (1988), and Schulz and Schulz (1988), who found that female doctors and workers expressed lower job satisfaction. This difference in practice satisfaction between male and female doctors suggests that the growing number of women in the doctor workforce may hamper the transition to a medical care delivery system dominated by managed care. With an increasing proportion of women graduating from

medical school, health care organisations will therefore need to ensure that their practice environment adapts appropriately, especially as female doctors may experience greater conflict due to age and sex discrimination by the older, more numerous male colleagues and administrators. On the other hand, some women may benefit from an increased emphasis on career counselling, feedback, and mentoring.

Contrary to Hypothesis 8, the older doctors who have been in practice for twenty years or more were significantly more likely to report overall dissatisfaction as well as dissatisfaction with their careers and other aspects of their jobs, than their younger, less experienced counterparts. Although the industrial sociology literature indicates that work satisfaction increases over lifespan as people gravitate to the types of organisations and jobs at which they like to work (Argyle, 1972), and organisational research indicates that age is positively associated with job satisfaction (Glisson and Durick, 1988; Schulz and Schulz, 1988), the findings of this study suggest that despite older doctors having more established practices, they appear to be affected more by the competitive changes in the marketplace and the paradigm shift toward cost management and efficiency. This finding supports that of Stoeckle (1988) and Light (1993) who found that older doctors were more likely to be dissatisfied as a result of the erosion of professional dominance caused by increased external regulation and oversight. However, the finding that older doctors were more satisfied with patient care might reflect a preference for less service intensive practice styles resulting from the clinical maturity and efficiency of these more experienced practitioners. Younger doctors and those who have been in practice for less than five years reported more satisfaction perhaps because managed care has been the norm for much of their lifetime as doctors, and they have assumed from the start of their private sector careers that they would work under managed care. The general responsiveness of these younger doctors to the structures and strategies of managed care may in fact be a barometer of what to expect as managed care continues to grow and as successive cohorts of new doctors replace older doctors.

Practice demographics also proved to be strong predictors of satisfaction. Satisfaction was also inversely related to the percentage of insured patients. Having a high proportion of insured patients was a significant predictor of lower satisfaction. Many factors may cause doctors' satisfaction levels to wane. An obvious one is that managed care penetration erodes their incomes or entrepreneurial opportunities. If this is the case, then no public policy

response is warranted. Another, which may raise greater public policy concern, is that greater managed care penetration creates incentives to cut corners in how they practice medicine, and that these changes leave doctors uncomfortable because of the possible effects on the quality of care. In table 4.24 we provide evidence of the latter. Doctors with high proportions of insured patients reported dissatisfaction with their professional autonomy. If these constraints can be related to differences in patients' health, it may be appropriate to reconsider the desirability of the incentives created by managed care. Alternately, managed care activity may increase doctors' uncertainty about the future, force them to adapt their practice styles to remain competitive, or change the expectations and perceptions of patients with whom they interact. All these factors could lead to reduced levels of satisfaction.

Contrary to the hypothesis (Hypothesis 1), being in a group practice was another strong variable contributing to satisfaction. This, coupled with the finding that doctors are increasingly choosing to practice in more organised medical practice settings seems to suggest that organisations themselves do not necessarily produce working environments that doctors find to be inherently dissatisfying. Group practices are centralised with multiple doctors practising in one site. Doctors in medical groups may therefore lose some degree of autonomy in aspects of practice function, such as absolute control over scheduling. However, doctors may be willing to trade this control for other efficiencies in their overall work environment. These findings confirm those of Engel (1969) and Baker and Cantor (1993), that a moderately bureaucratic setting may provide more autonomy and satisfaction than either a non-bureaucratic setting or a highly bureaucratic one. Practising within organisations may allow them to balance competing responsibilities. There are unique pressures involved in solo practice (such as administrative demands and economic inefficiencies), and group arrangements, perhaps, allow doctors to maximise their direct care time, which is their major responsibility, and leverage the benefits of economies of scale associated with larger organisations. A further advantage is that a group practice provides an environment in which doctors practice near one another – an arrangement in which they may pay closer attention to each other's decisions, which may ultimately improve the quality of care. Prior research has demonstrated that doctor satisfaction in more organised settings is clearly related to the efficiency with which patients can be seen (Linn et al., 1985), with a

particular focus on having adequate resources to care for patients (Linn et al., 1986; Kravitz et al., 1990).

Doctors working in groups comprising more than six doctors were significantly more likely to report being dissatisfied than their colleagues who worked in small groups or as solo practitioners. These findings support the organisational literature, which suggests that size affects other structural variables such as formalisation, complexity and communication which may foster impersonal and dissatisfying work experiences (Weber, 1947; Porter and Lawler, 1965). More recently, health care researchers have also found negative associations between hospital size and doctor satisfaction (Linn et al., 1985; Schulz and Schulz, 1988). Thus, smaller groups appear to provide an optimal level of bureaucratic organisation with respect to professional autonomy and satisfaction within the client-professional relationship. These findings support those of Maheshwari (2000) that knowledge workers preferred to work in small, self directed, autonomous teams and that they operated optimally in less hierarchical environments characterised by flatter organisational structures, that encouraged knowledge sharing.

Although IPAs are the models closest to the traditional forms of private sector health care delivery, and are theoretically superior and more attractive institutions, they do not significantly predict greater job satisfaction. In fact, doctors who belong to IPAs were significantly more likely to be dissatisfied with their incomes. This suggests that the decentralised nature of the network and its less invasive management structure compromises its ability to efficiently coordinate care, and make it more difficult to take advantage of potential economies of scale and to reduce duplication of services. IPAs may also be establishing such control over their constituent doctors that the original objectives of IPAs – to preserve the small scale and autonomy of medical practices- threatens to become lost. It is therefore incumbent upon doctor leaders within these organisations to resolutely adhere to a bottom-up, participatory approach to governance as increasing environmental volatility calls for an organisation that pushes responsibility, resources and accountability as close to the market as possible.

Similarly, doctors employed in staff model like institutions, were significantly more likely to be dissatisfied with the current practice environment and their incomes. These findings are

consistent with previous research (Safran et al., 2000;), and suggests that the high levels of organisational constraints and utilisation management initiatives that are characteristic of these models are a reflection of the managed care philosophy, which is perceived as hindering their ability to deliver high quality care. One way to achieve a high level of commitment and satisfaction within these organisations may be through doctor control over the organisation, or at least by assuring doctor influence on organisational policies and practices. Their dissatisfaction with their incomes suggests that there is a gap between the incomes of doctors who work in organisations where they have a clear proprietary interest (such as IPAs and groups), and employee doctors. By de-emphasising fixed pay and introducing variable pay tied to measurable employee performance goals, these healthcare organisations can gain the flexibility to reward excellent employees, cut costs, and respond to market dynamics.

These findings pertaining to practice structure and size are important to doctors just entering the private sector who are anxious to find practice settings in which their colleagues perceive that they can deliver high quality care to all their patients. They are also important for policymakers and administrators who want to understand which basic changes in group structure and organisation might enhance satisfaction of doctors in a managed care environment. Organisations that appropriately structure their professional staff will provide a climate in which providers as a group deliver services to clients more effectively, and in which clients will perceive providers as being highly service oriented. Better client outcomes are therefore likely to result.

One of the primary goals of this research was to investigate whether the cost-saving strategies that private sector doctors were subjected to, were significantly related to their satisfaction. Although doctors generally were marginally dissatisfied, these findings offer some good news for doctors, managers and funders as there were many significant positive predictors of satisfaction. In support of the hypotheses, doctors were more satisfied when they were compensated on a fee-for- service basis (Hypothesis 7), when they participated in management information and decisions (Hypothesis 6), and when they received and gave feedback on work performance (Hypothesis 4). As expected, the use of educational strategies (Hypothesis 3) and incentives to reduce services were found to be significant predictors of lower satisfaction. Contrary to expectations, positive perceptions of administrative

interventions and educational strategies were significant positive predictors of job satisfaction.

Remuneration on a discounted fee-for-service basis (vs. capitation and salary) and the presence of financial incentives to limit services and costs were significant predictors of several facets of satisfaction, the former positively and the latter negatively. The major difference between salary, fee-for-service and capitation is the assumption of risk in the provision of medical services. The risk shifts progressively from funder to provider in the switch from fee-for-service to salary to capitation, and doctors' satisfaction with the former compensation system could be premised on these economic grounds. Past history has shown that doctors often oppose health care reforms that appear to have adverse monetary consequences (Starr, 1984). Alternately, doctors could perceive fee-for service as being the system that most adequately facilitates their professional commitment, effort, and responsiveness to the needs of their patients. In contrast, salary and capitation set constraints on clinical decision-making and compels doctors to confront priorities and to consider benefits and costs of alternate allocations. This use of economic deterrents (risk) to prevent overuse by doctors raises an ethical dilemma, and although it controls costs from a managed care organisation's point of view, it has been found to contribute little to the variables important to patient care, as perceived by doctors (Calnan et al., 1998).

Although the use of financial incentives were relatively uncommon, doctors who reported receiving incentives were significantly more likely to report that they were dissatisfied with several aspects of their jobs. This finding is consistent with previous research (Hadley et al., 1999; Grumbach et al., 1998) and supports the general concern that the use of incentives to influence doctors' resource use may have a negative effect on the quality of care. The fact that doctors with an incentive to reduce services are much more dissatisfied also suggests that they did not choose to accept these arrangements as consistent with their own clinical philosophies or approaches to practising medicine. Rather, it may suggest that their survival in the market requires that they accept insured patients on the terms of the insurer. High quality care is unlikely to flourish in this environment and the cost and quality goals of health care funders may be better approached by the use of limited financial incentives based on the quality of care and patients' satisfaction, than incentives that reward doctors for restricting access to care. Policies that emphasize the former approach may enhance

satisfaction with the transforming private health sector on the part of both patients and doctors.

Although educational strategies offer the attractive possibility of simultaneously improving the quality of care and saving money, it was found that doctors who reported greater exposure to these strategies, were significantly more likely to report being dissatisfied with their ability to deliver quality care, and with their careers. These findings are congruent with the hypothesis (Hypothesis 3) and suggest that doctors view these strategies as constraining their decision-making. It is, however, interesting to note that doctors who were enthusiastic about educational strategies such as practice guidelines and opinion leaders were significantly more likely to report that they were satisfied with various aspects of their jobs. These divergent views suggest that educational interventions are perceived to have different purposes and that its effects on doctors can be mixed. This presents an opportunity for those wishing to change the practice behaviour of doctors. Better cooperation and collaboration between doctors and themselves may create positive perceptions and substantially reduce doctors' fears and suspicions about these interventions, thereby enhancing the chances for successfully achieving organisational goals.

Similarly, although the respondents generally perceived administrative interventions such as authorisation systems, utilisation review and peer review as an assault on their competence and integrity, those doctors who did express positive perceptions about these strategies were significantly more likely to be satisfied with various facets of their jobs. Rules are powerful interventions and highly specific and those who support these explicit rationing measures find them attractive, perhaps, because they allow direct control over health care allocations, depending more on administrative authority than on persuasion or exhortation. Their expectations are well defined by these interventions, thus avoiding unmet expectations (and conflict) over time. Although organisations are currently not using these rules and regulations to any significant extent, administrative rationing is inevitable as managed care continues to grow. As attempts to manage the discretionary power and the clinical eccentricities of their doctors progressively increase, organisations will need to reconcile these differing viewpoints. Doctors must also decide whether they will continue to resist this direct intrusion on their autonomy and discretion, or work constructively to develop approaches consistent both with social need and with good patient care. If they are to

preserve the most important parts of the medical profession, they need to understand and to participate in the reform that is upon us. Optimally, doctors should take an active role in the creation and administration of rules. They have the best perspective on how rules might compromise or foster clinical quality.

Another potential explanation for doctors who have positive perceptions of educational and administrative interventions being more satisfied, is 'selection bias' among doctors who choose to practice in a managed care environment. These doctors may be predisposed to value practice supports such as practice guidelines, peer review and authorisation systems, which historically have been more prevalent in these traditional managed care settings.

The finding that doctors who participate in non-clinical decision making in practices were more satisfied is consistent with the hypothesis (Hypothesis 6) and with other job satisfaction research (Barr and Steinberg, 1983; Schulz and Schulz, 1988), and is important in the light of increases in the provision of medical services through more organised arrangements. Perhaps involvement in important decisions that will affect them fosters a sense of shared responsibility, accountability and ownership in the health care delivery system. This reduces resistance to change and increases both their commitment to the goals of the organisation and their satisfaction with the work environment (Muller, 1995). Ultimately this should not only effect personal, professional and organisational growth, but provide positive results with regard to the quality of health care rendered, as well as organisational outputs. Therefore, although the meaningful involvement of doctors in governance and decision-making poses a tremendous challenge for health service managers and funders, the potential benefits are unlimited and very worthwhile.

Despite the overall negative perceptions of feedback by doctors, and the minimal use of feedback by organisations as a strategy to influence clinical behaviour, doctors who valued feedback were significantly more likely to be satisfied with various facets of their jobs, than their colleagues. This supports the hypothesis (Hypothesis 4), and suggests that providing regular and accurate data about an individual doctor's performance, from both a utilisation and an economic standpoint, could be vital in changing the practice and improving the satisfaction of doctors. Doctors, like all knowledge workers, want to perform well, but they can do so only when they can judge their own performance against that of their peers or the organisation. This opportunity for self-evaluation can lead to a better understanding of

individual practice characteristics and improved patient care. In the absence of feedback, they have to figure out for themselves what they are doing right, and that may not be optimal.

The findings that doctors who were positive about managed care strategies were more likely to be satisfied, holds out hope that a large-scale move towards managed care might not cause the damage to doctor morale that some observers have expected. The challenge for health care managers is to create a positive 'managed care culture' among doctors. Success is most likely where doctors in these health care delivery systems are having professional fun, where freedom from negativity allows them to perform at their highest level of quality. When a positive culture takes hold, improvements in clinical, economic and social efficiency can occur.

Finally, this study confirmed the hypotheses (Hypothesis 3,4,5,6 and 7) that perceived clinical freedom was a strong and positive predictor of most of the dimensions of job satisfaction. The regression results indicate that the addition of clinical freedom contributes a significant amount of additional explained variation in the satisfaction facets. This finding supports that of other researchers that professional autonomy was an important determinant in the recruitment, motivation and retention of knowledge workers (Handy, 1989; Jooste, 1989; Kinnear and Sutherland, 2000). Because it was both a cause of job satisfaction and an effect of some of the other variables, it fulfilled the thesis that it was an intervening variable between doctor and organisational characteristics, and job satisfaction.

Doctors who perceive that they have sufficient time to spend with their patients, adequate control over their work schedule, and the ability to care for patients who require heavy resource use were much more likely to report overall job satisfaction. In general they also reported high levels of satisfaction with patient care, their careers, the practice environment, professional autonomy, resources and their relationships with staff and colleagues. The literature on management control in knowledge organisations also offers support for the importance of autonomy in medical practice. Friedson (1975), in his analysis of doctors working in groups, described the limitations of formal, external controls on the practice of doctors, and highlighted the importance of professional discretion in practice. Ouchi (1979), refers to "clan control" as the preferred mechanism for managing professions, and rightly points out that more formal control mechanisms have significant limitations in professional

organisations. More recently, Tampoe (1997) and Maheshwari (2000) have also espoused the importance of autonomy and discretion in a knowledge worker environment. It is therefore important for health care managers and insurers to be increasingly mindful of the need to ensure adequate practice autonomy for those caring for patients. Autonomy-reducing managerial techniques may be effective in controlling utilisation and costs but their potentially adverse effects on doctor turnover could have adverse effects on cost, quality, and patient satisfaction. High-quality care is enhanced when doctors are happy, and low doctor turnover is an important quality indicator for the future (Baker et al., 1994).

5.8 Doctors as Knowledge Workers

The medical vocation is one of the classic knowledge worker groups. Doctors have high levels of skills/education, with technological literacy, high cognitive power and abstract reasoning (Horwitz et al 2002). They produce outcomes of high social, commercial or personal value (Tampoe, 1994), and although they are critical to the success of organisations, their loyalty is to their profession, network and peers rather than to organisations and their career systems (Despres and Hiltrop, 1995). These characteristics pose challenges for health care managers and management theorists have been at pains to determine what will influence the commitment of these workers to the work environment. Although this study focussed exclusively on doctors, the findings regarding appropriate organisational forms and managerial practices for these highly skilled workers are consistent with studies of other knowledge worker groups (Horwitz et al., 2002; Capelli, 2001; Kinnear and Sutherland, 2000; Maheshwari, 2000).

The trend towards group practice and the significantly greater satisfaction expressed by doctors who practice in smaller groups is consistent with observations by Drucker (1989) and Handy (1989) that knowledge organisations tend to be flatter, networked structures with disaggregated or coordinated subunits. According to Maheshwari (2000), knowledge workers operate better in less hierarchical environments characterised by flatter organisational structures and small multifunctional teams. These organisational forms support the responsive and agile organisation in which doctors and other knowledge workers prefer to operate. It provides an empowering and enabling environment and affords them the flexibility with regards to rules, reporting relationships, hours of work and how the work is organised.

Managerial practices such as peer review and the use of opinion leaders were significant positive predictors of job satisfaction. The finding indicates that doctors value learning from professional colleagues and development in their specialist area. It is consistent with the finding of Kinnear and Sutherland (2000) and Robertson (2000) that professional development is a significant retention factor for knowledge workers, and it supports the view of Drucker (1989) that development of professional expertise is increasingly important for the knowledge worker and is related to the essential satisfiers of achievement and advancement. Similarly, the high value placed on peer review is consistent with the findings of Tampoe (1994) and Reichers (1985) that the standards of knowledge workers are derived as much from their professional colleagues as from their organisation, and that their commitment would be more likely towards professional peers. The finding that the use of educational strategies was a predictor of lower satisfaction is interesting as it contradicts the notion from the literature quoted above, that knowledge workers value their professional development. As alluded to previously, this could be attributed to the fact that these strategies are intended primarily to reduce costs rather than to cater to the broader needs of these knowledge workers.

Participation in organisational and management issues, coupled with regular feedback was also found to be a key determinant of job satisfaction. This supports the findings of a study of knowledge workers by Anderson Consulting/Accenture (2001), and is also consistent with the findings of Kinnear and Sutherland (2000). It lends weight to the calls of Stewart (2000) and Robertson (2000) for knowledge organisations to foster a management environment that is egalitarian and that encourages participation and regular communication.

The findings also confirm clinical freedom as an important predictor of job satisfaction among doctors. This is consistent with the findings of previous research that sought to identify the links between organisational commitment and the knowledge worker population (Horwitz et al., 2002; Capelli, 2001; Alvesson and Kärreman, 2001; Alvesson, 2000; Kinnear and Sutherland, 2000; Jooste, 1997; Arnold, 1995; Handy 1989). Knowledge workers need a great deal of autonomy and discretion in their work environment so as to apply their unique talents. This need for independence is linked to their individualistic and achievement orientation. Organisations that remove both tangible and intangible barriers,

which hinder this freedom, will help address this need amongst doctors and other knowledge workers.

The congruence in the findings between this study and that of other knowledge worker groups suggests that a knowledge management perspective may therefore be useful in the management of health care professionals, particularly in the light of the attraction, retention and motivation challenges faced by health care managers and doctor leaders in this rapidly changing environment.

Table 5.1, below, summarises the hypothesised relationships between doctor and institutional characteristics, and the clinical behaviour and job satisfaction variables, and the research findings.

Table 5.1 Summary of Hypothesised Relationships between Variables, and the Research Findings

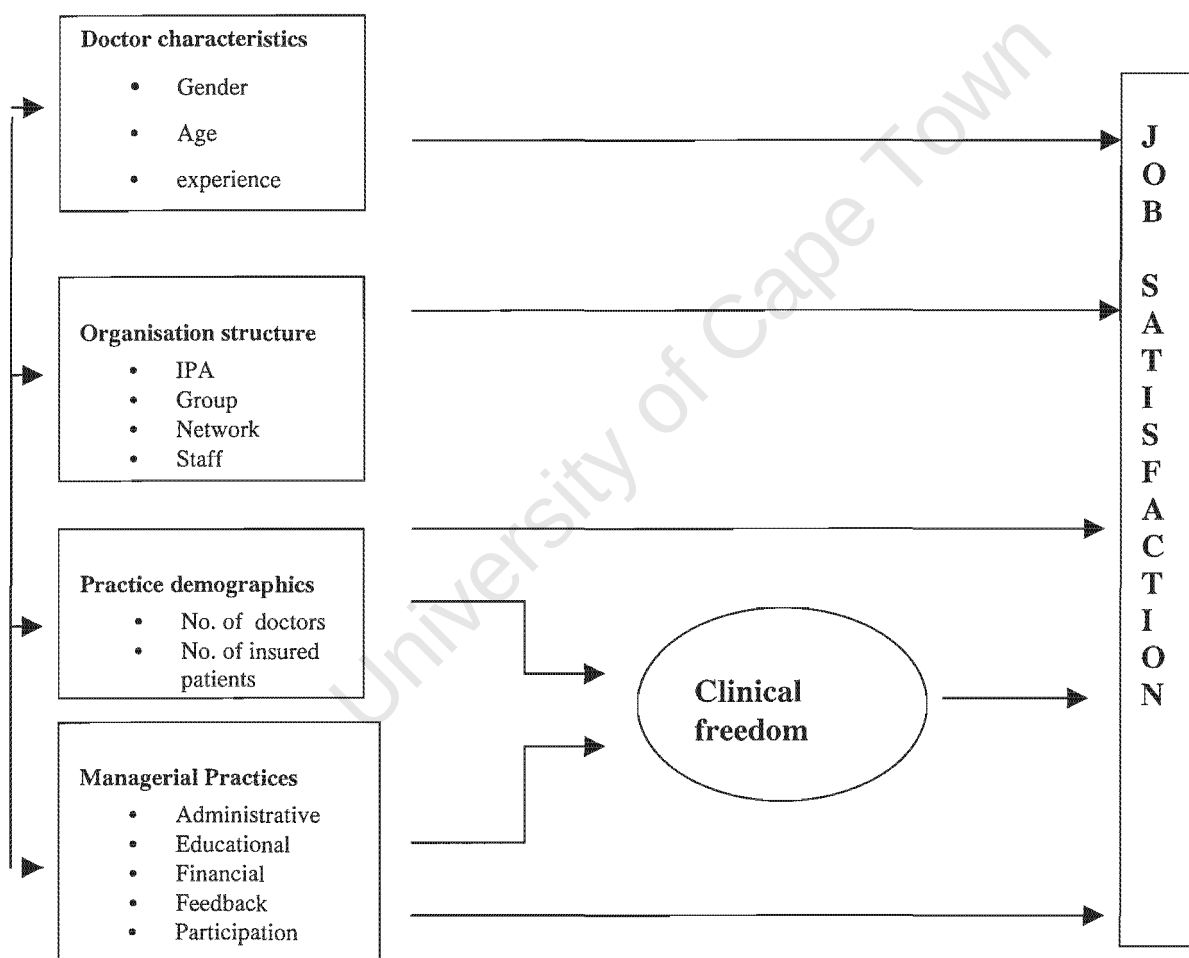
Hypothesis	Independent Variable	Dependant Variable		Findings
		Clinical Freedom	Job Satisfaction	
1	IPA		+	Rejected
2	IPA	+		Rejected
3	Educational Strategies	-	-	Accepted
4	Feedback	+	+	Accepted
5	Administrative Interventions	-	-	Accepted
6	Participative Management	+	+	Accepted
7	Fee-for-service Capitation/Salary	+	+	Accepted
		-	-	Accepted
8	Older Male Female	+	+	Rejected
		-	-	Accepted

5.9 A Proposed Model for the Analysis of Doctor Clinical Freedom and Job Satisfaction

The findings provide rather compelling support for the general conceptual model proposed in Figure 1.5. Apart from minor changes in the relationships between variables, it reaffirms the importance of considering doctor characteristics, organisational structure and managerial

practices when evaluating the clinical performance and job satisfaction of medical doctors. The inter-relationships between variables that have emerged from this empirical work are illustrated in Figure 5.1, below.

Figure 5.1 The Interrelationships between Doctor Characteristics, Organisation Structure, Practice Demographics, Managerial Practices, Clinical Freedom and Job Satisfaction



Doctor characteristics, organisation structure, practice demographics, managerial practices and perceived clinical freedom are all direct predictors of job satisfaction. In addition, practice demographics and managerial practice variables impact on job satisfaction via clinical freedom.

5.9 Conclusion

As a result of the unsustainable rate at which medical costs continue to escalate, we are facing a changing paradigm in the way medical services are delivered. Today, more than ever, doctors practice amid conflicting expectations and pressures from patients and third parties. This dramatic transformation in the way doctors practice medicine will ultimately affect every citizen, and without substantial support from the medical community, the likelihood of success will diminish commensurately. The primary goal of this research was to investigate the effects of managed care structures and managerial practices on the clinical performance and job satisfaction of private sector general practitioners. The structural configuration of practices in this sector was also explored and doctors' perceptions of the various strategies that are employed in a managed care setting were investigated. The broad themes that have emerged from this study support the existing literature. This suggests that there are no cross-national, cultural or systemic differences in perceptions of and responses to the structures and strategies of managed care.

There is evidence of a profession in transition, with doctors changing practice arrangements in the face of a changing practice environment. In support of the growing literature on managed care, these findings identify a trend towards independent practitioner associations and group practices. This move towards increased structure and formalisation in the delivery of care indicate strategies of co-operation and collaboration between doctors in response to the demands of the deregulated practice environment. Given that there are factors in all practice settings that may provide satisfaction or dissatisfaction, autonomy or no autonomy, the challenge is to identify the relevant factors within each environment, especially as more structured work environments for doctors are on the increase.

The findings also suggest a generalised resentment towards managed care managerial practices among the majority of doctors. However there are some doctors who do appreciate

the value and benefits that these interventions can have on the delivery and quality of care. That these positive perceptions are especially pronounced among the younger doctors suggests that their impact on the delivery of medical care will continue long into the future. The challenge for management is to overcome attitudinal barriers to the adoption of these strategies by the majority, and to create and implement them in ways that support doctors' ability to practice according to agreed upon guidelines through education, process improvements and system reengineering. Only then will these strategies be viewed as a welcome support to the practice rather than as a limitation or constraint.

A conceptualised model for predicting and explaining the clinical freedom and job satisfaction of general practitioners in the South African private health sector is also formalised and presented. The most important factor influencing doctor satisfaction appears to be the extent of perceived autonomy. Practice demographics and managerial practice variables predicted the extent of perceived autonomy while doctor characteristics, practice demographics, organisation structure and managerial practice variables were also direct determinants of the aggregate satisfaction levels of doctors. Overall, doctors were marginally dissatisfied with most aspects of their professional lives and also perceived less clinical autonomy. Since maintaining high levels of provider autonomy and satisfaction is a priority in this era of cost and quality consciousness, managers and doctor leaders may wish to consider the implications of organisational changes for the autonomy and satisfaction of their caregivers.

Thus, although it is concluded that managed care does seem to have the deleterious impact forecast for it, the prospects for the achievement of better results in the context of health care reforms that intend to expand the role of managed care, are more promising. Health care organisations that provide specific working conditions that health professionals desire are likely both to increase professional satisfaction and provide an organisational climate in which provider-client transactions will be more effective. It is therefore incumbent on policy makers and administrators to ensure that changes to the system are carefully evaluated for their effect on provider outcomes before they are universally implemented. The findings of this research provide these role players with new, locally relevant information regarding doctors' needs and perceptions, which they can use to review their management practices in order to create a work environment that encourages optimal clinical practice and encourages these knowledge workers to remain with the organisation. Proponents of managed care

cannot afford to ignore the impact that participation in such a health care delivery model has on doctors, for doctors are, of course, the backbone of any health care organisation. It is hoped that the following recommendations will help.

5.10 Recommendations

The data from this study suggest several strategies that health organisations and managers can adopt to increase the clinical autonomy and job satisfaction of their doctors. Managers should be increasingly mindful of the need to ensure adequate practice autonomy for those caring for patients, keeping in mind the relationship between perceived autonomy and higher doctor satisfaction. To strengthen doctors' belief in their clinical decision-making authority, organisations should involve doctors more actively in developing diagnostic and treatment protocols; deciding what and how data should be used for utilisation review; and developing standards for reviewing the performance of their peers. Doctors who participate in such decisions and understand the basis on which they are made are more likely to support them and less likely to feel that their professional prerogatives are under attack. Organisations should also consider using opinion leaders to encourage more cost effective practice patterns among their doctors and adopt reimbursement systems based on a discounted fee-for-service structure.

To enhance the satisfaction of their doctors and thereby reap the benefits of increased productivity and reduced staff turnover, organisations and managers should work with their female as well as their older, more experienced doctors to ascertain the source of their dissatisfaction and to address their fears, concerns and insecurities in this challenging work environment. Special efforts should be made to provide counselling, feedback and mentoring. Educational, administrative and financial strategies currently employed in the managed care environment are all potential satisfactors and organisations and managers will do well to use an interactive, collaborative process with doctors in the conception, development, implementation and monitoring of these strategies. They should be consistent with the responsible exercise of clinical judgement and professional autonomy. This participative approach should be supplemented by regular feedback about the performance of individual doctors, from both a utilisation and an economic standpoint.

For doctors who wish to enter into the private sector, or who want to function optimally within this changing environment, the smaller group practice appears to be the optimal practice structure. Limiting the proportion of insured patients in their practices to less than three quarters of the total will also result in greater perceived clinical freedom and job satisfaction.

Purchasers of health care, both private and public, should also consider these differential outcomes between practice structures before deciding which types of models to use to deliver health care to their beneficiaries. They should pay particular attention to the better performance of group practices especially as far as doctor satisfaction and perceptions of managed care strategies are concerned. Such practices are also often thought to be more economically efficient due to economies of scale and scope in various aspects of the production of services.

From a public policy perspective, it is increasingly imperative that young doctors receive training that will enable them to practice in the emerging standard modes of practice. Changes in medical education should be aimed at producing a new generation of clinicians whose practice more completely reflects the goals of health care reform. Doctors who are exposed to managed care while in training are more likely to develop a positive 'managed care culture' and may therefore respond more positively to this model of health care delivery.

5.11 Limitations and Assumptions

While it is believed that the results reported here have important practical and theoretical significance, it has some limitations. First, the response rate of 32% was modest, though comparable to other survey projects that depend on the co-operation of busy doctors in real world practice. Hence some non-response bias may exist, for instance, particularly dissatisfied doctors may have failed to respond. Second, the research relied on the subjective assessment of respondents to the survey. Although attempts were made to control for characteristics that might have affected their responses, as well as selection effects, it was not possible to externally validate these subjective responses. Third, doctors tend to select

into organisations that are consistent with their practice and lifestyle preferences. Thus, these findings may reflect the fit between preferences and organisations rather than objective measures of clinical freedom and job satisfaction. Fourthly, although the data provide some unique insights into the perceptions of doctors, the managed care market in South Africa is not sufficiently mature to examine whether doctors' autonomy and satisfaction has changed as managed care has developed. Finally, great effort was made to avoid researcher bias, but this is an important consideration that could have influenced questionnaire formation and interpretation of results.

Certain assumptions have also been made in this study. It was assumed that the perceptions of doctors were based on knowledge of the principles of managed care and that the structures and managerial practices implemented were in part directly in response to the introduction of managed care in the industry. It is hoped that these were correct and justified.

5.12 Further Research

Although the present study has made significant contributions to the body of knowledge on the clinical freedom and job satisfaction of medical doctors in a managed care environment, certain areas still need to be explored. These areas include determining whether doctors' perceptions of their clinical freedom and job satisfaction translate into actual differences in the technical quality of care or in the art of care provision. Further investigations of the potential impact of this new mode of health care delivery on the costs and utilisation of health services are also of critical importance. This study is also cross sectional in nature and represents only a 'snapshot' of a dynamic, evolving industry. Longitudinal studies will be important to evaluate trends in the structure and strategy formulation within the private sector and the doctors' response to these. Sequential studies will benefit both the incumbent players and new entrants into the industry.

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University of Cape Town

APPENDIX A

The Pilot Questionnaire

University of Cape Town

The Graduate School of Business

Breakwater Campus, Portsworld Road

Greenpoint, Cape Town

Private Bag, Rondebosch, 770

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February 2001

Dear Doctor

Managed health care principles have been introduced into South Africa as part of an overall strategy to control costs in the private sector. Although anecdotal evidence abounds, there has been no formal evaluation of the impact of managed care on the clinical performance and job satisfaction of general practitioners. This is of particular importance in view of the fact that managed care is set to become the dominant mode of health care delivery in the private sector.

Research in this field is therefore of cardinal importance to the medical fraternity of South Africa. This research project conducted by the UCT Graduate School of Business aims to facilitate a better understanding of the impact of managed care on you, the primary care providers. The enclosed questionnaire forms part of a national study of general practitioners in South Africa. The questionnaire is designed for easy and quick completion and should take no more than 15 minutes.

Please follow the instructions carefully and return the questionnaire in the enclosed addressed envelope as soon as is convenient to you.

Your contribution in this regard would be highly appreciated and we thank you in anticipation for your assistance.

Thank you,

Prof Frank Horwitz

Dr. Rubin Pillay

INSTRUCTIONS

1. Please read all questions carefully and make sure you know exactly what is required.
2. Answer each question, where relevant, by making a cross in the appropriate block next to the question. Please answer all questions.
3. Please return the completed questionnaire at your earliest convenience by making use of the enclosed envelope.
4. All results will be aggregated and statistically treated before being incorporated into the research findings. The general research findings will be made available for publication.
5. **All information will be treated as strictly confidential.**

QUESTIONNAIRE ON THE IMPACT OF MANAGED HEALTH CARE

Answer the following questions by making a cross in the appropriate block

1. BIOGRAPHIC DETAILS/PRACTICE CHARACTERISTICS

1.1 GENDER

MALE	FEMALE

 1.2 AGE

27-31	32-36	37-41	42-46	>47

1.3 YEARS SINCE GRADUATION FROM MEDICAL SCHOOL

0-9	10-19	20-29	30-39	40-49	50-59

1.4 NUMBER OF YEARS IN PRESENT PRACTICE

>2	3-5	5-10	<10

1.5 HOURS PER WEEK IN PATIENT CARE

<20	20-39	40-59	60-70	>80

1.6 NUMBER OF PATIENTS SEEN PER HOUR OF WORK

<2	2 to 4	5 to 6	6 to 8

1.7 NUMBER OF PATIENTS SEEN IN AN AVERAGE WEEK

<50	50-99	100-149	150-199	>200

1.8 PERCENT OF PATIENTS IN MANAGED CARE / MANAGED MEDICAL AIDS

0-25%	26-50%	51-75%	76-100%

2. PRACTICE/PLAN TYPE

2.1 WHICH OF THE FOLLOWING BEST DESCRIBES YOUR PRACTICE TYPE?

DIRECT CONTRACT

PREFERRED PROVIDER

NETWORK

INDEPENDENT PRACTICE ASSOCIATION

GROUP PRACTICE (partnership; association)

STAFF MODEL HMO/PRIVATE HOSPITAL

No organisational affiliation

Other (Please specify) _____

2.2. PRACTICE GROUP SIZE

1	2 – 3	4-5	6 or more

3. MANAGERIAL PRACTICES

3.1 EDUCATION

3.1.1 Clinical Practice Guidelines, are in general:

	Strongly Disagree	Disagree	Agree	Strongly Agree
• Good educational tools				
• Unbiased synthesis of expert opinion				
• Oversimplified or cookbook medicine				
• Too rigid to apply to individual patients				
• Likely to improve quality of care				
• A challenge to clinical freedom of doctors				
• Likely to decrease job satisfaction of doctors				
• Used often by managed care organisations/managed medical aids				
• Likely to change my clinical practice patterns				
• Effective in reducing costs				

3.1.2 Continuing Medical Education Programs (Conferences, lectures, education materials etc.) are:

	Strongly Disagree	Disagree	Agree	Strongly Agree
• Good educational tools				
• Likely to change my clinical practice patterns				
• Likely to improve quality of care				
• Likely to reduce clinical freedom of doctors				
• Likely to decrease job satisfaction of doctors				
• Used often by managed care organisations/ managed medical aids				

3.1.3 Opinion leaders such as academics and specialists are:

	Strongly Disagree	Disagree	Agree	Strongly Agree
• A convenient source of advice				
• Usually a biased source of advice				
• A challenge to clinical freedom of doctors				
• Often used by managed care organisations/ managed medical aids to influence my practice patterns				
• Likely to reduce job satisfaction of doctors				
• Likely to alter my clinical practice patterns				

3.1.4 Feedback about my clinical practice patterns:

	Strongly Disagree	Disagree	Agree	Strongly Agree
• Is received often from managed care organisations / managed medical aids				
• Is likely to alter my practice patterns				
• Is a challenge to my clinical freedom				
• Is likely to reduce my satisfaction levels				

3.2. Administrative interventions

3.2.1 Utilisation Review

	Strongly Disagree	Disagree	Agree	Strongly Agree
• Is conducted by most managed care organisations/managed medical aids				
• Is an effective method of reducing costs				
• Is effective in altering clinical practice patterns				
• Increases my administrative workload				
• Limits my clinical freedom				
• Reduces my satisfaction levels				
• Is likely to reduce the quality of care				

3.2.1 Authorisation Systems

	Strongly Disagree	Disagree	Agree	Strongly Agree
• Are used by most managed care organisations/ managed medical aids				
• Are an effective method of reducing costs				
• Are effective in altering clinical practice patterns				
• Increase my administrative workload				
• Limit my clinical freedom				
• Reduce my satisfaction levels				
• Are likely to reduce the quality of care				

3.2.3 Peer Review

	Strongly Disagree	Disagree	Agree	Strongly Agree
• I often review and discuss the quality of care given by others of equal rank				
• Others of equal or higher rank often review and discuss the quality of my care				
• Limits my clinical freedom				
• Is an effective tool to alter clinical practice patterns				
• Increases my administrative workload				
• Is likely to increase the quality of care				

3.2. Participative Management

3.2.1 How well informed are you about:

	Uninformed	Poorly informed	Informed	Well informed
• Patient outcomes in your organisation?				
• Quality of care in your organisation?				

3.3.2 When the following activities occur in your practice/ organisation, how frequently do you personally participate either formally or informally in each activity?

		Almost never	Seldom	About half the time	usually	Almost always
•	Decisions to appoint new doctors or admit new doctors to the organisation					
•	Decisions to appoint other health care workers					
•	Decisions to appoint non-medical staff					
•	Decisions to adopt new programs or services					
•	Decisions about provision of services (e.g. hours, staffing, etc.,					
•	Quality assurance review of medical records					
•	Resolution of patient grievances					

3.4 Financial Contingencies

3.4.1 Principal method of payment by managed care organisation/managed medical aids

Capitation	
Salary	
Fee-for-service	
Discounted fee-for-service	

3.4.2 Percentage of payment withheld

None	1-10%	11-20%	21-30%	>30%

3.4.3 Method of reward for surpluses

fixed rand amount

fixed percentage

bonus based on productivity

none

3.4.4 Do you receive incentives or bonuses for meeting targets in terms of performance?

YES	NO

3.4.5 If yes, identify the factors used to calculate the bonus from the following list

Referral of patients to specialists

Use of laboratory or other ancillary services

Use of hospital services

The prescription of drugs

The quality of care as measured by reviews

Patients' ratings of their satisfaction with care

Provision of exclusive services to your organisation

3.4.6 What is your preferred mode of reimbursement? Rank from 1 to 3, where 1 is the most preferred and 3 the least preferred.

Salary

Fee-for-service

Capitation

4. CLINICAL FREEDOM

4.1 Does the degree of my professional freedom

Exceed my expectations	Meet my expectations	Fall short of your expectations?

4.2 As a general rule, would you say that in your practice you have the freedom to:

- accept or reject any patient who attends your practice?
- spend sufficient time with your patients ?
- hospitalise patients who, in your opinion , require it ?
- keep patients hospitalised for the length of time you think it is appropriate?
- order tests and procedures whenever you want to?
- Make referrals to specialists whenever necessary?
- Use expensive procedures whenever necessary?
- Care for patients even when they are unable to pay the fees and charges?
- Care for patients who require heavy use of time and resources?
- Control your own work schedule?
- Prescribe medicines that you feel the patient requires?

Yes	No

5. SATISFACTION

Please indicate your level of satisfaction with the following :

5.1 Autonomy

- Autonomy to treat patients as you want
- Ability to order whatever I believe will help my patients
- Ability to refer patients when necessary
- The use of clinical practice guidelines and medicine formularies
- Review of my clinical practice by outside reviewers
- Ability to initiate change in the way work is done in my practice

Very dissatisfied	Somewhat dissatisfied	Somewhat satisfied	Very satisfied

5.2 Relationship with my colleagues

- My relationship with my colleagues
- Professional support and stimulation from my colleagues
- Personal support from my colleagues

Very dissatisfied	Somewhat dissatisfied	Somewhat satisfied	Very satisfied

3 Patient care

- My relationship with my patients
- Patient volume
- Personal gratification from patient care
- Patient demands for potentially unnecessary services/treatments
- My ability to improve the health status of my patients
- Continuity of care for patients

Very dissatisfied	Somewhat dissatisfied	Somewhat satisfied	Very satisfied

5.4 Relationship with staff

- My relationship with non-medical staff
- Support of non-medical staff
- Co-operation of non-medical staff
- Competency of non-medical staff

Very dissatisfied	Somewhat dissatisfied	Somewhat satisfied	Very satisfied

5.5 Personal time

- My after-hours work load
- The amount of time I have for my personal and family life
- My work schedule
- Leisure time off the job

Very dissatisfied	Somewhat dissatisfied	Somewhat satisfied	Very satisfied

5.6 Relationship with patients

- My sense of a personal connection with my patients
- The gratitude displayed by my patients

Very dissatisfied	Somewhat dissatisfied	Somewhat satisfied	Very satisfied

5.7 Community

- My sense of belonging to the community where I practice
- My family's and my connection to the community where I work

Very dissatisfied	Somewhat dissatisfied	Somewhat satisfied	Very satisfied

5.8 Pay

- My income
- My income relative to other medical specialities
- My income given my training and experience

Very dissatisfied	Somewhat dissatisfied	Somewhat satisfied	Very satisfied

5.9 Administration

- Paperwork required by third party payers
- My general administrative workload
- My role in managing the business aspects of my practice

Very dissatisfied	Somewhat dissatisfied	Somewhat satisfied	Very satisfied

5.10 Resources

- The number of support staff in my practice
- Medical equipment and supplies available
- My practice location in relation to the source of my patients
- The time that I have with each patient
- The examination facilities that I have to see my patients

Very dissatisfied	Somewhat dissatisfied	Somewhat satisfied	Very satisfied

5.11 The current practice environment

	Very dissatisfied	Somewhat dissatisfied	Somewhat satisfied	Very satisfied
• The introduction of managed care				
• Regulations governing private practice				
• Patient benefits under managed care				
• Ability to deliver high quality care				
• Relationship with managed care / managed medical aid organisations				

5.12 Overall / My career

	Very dissatisfied	Somewhat dissatisfied	Somewhat satisfied	Very satisfied
• The personal reward that I get from my clinical work				
• My overall practice situation				
• The work in my practice in relation to my expectations				
• My career as a medical doctor				
• The current private practice environment				

APPENDIX B

The Final Questionnaire

University of Cape Town

February 2001

Dear Doctor

Managed health care principles have been introduced into South Africa as part of an overall strategy to control costs in the private sector. Although anecdotal evidence abounds, there has been no formal evaluation of the impact of managed care on the clinical performance and job satisfaction of general practitioners. This is of particular importance in view of the fact that managed care is set to become the dominant mode of health care delivery in the private sector.

Research in this field is therefore of cardinal importance to the medical fraternity of South Africa. This research project conducted at the UCT Graduate School of Business aims to facilitate a better understanding of the impact of managed care on you, the primary care providers. The enclosed questionnaire forms part of a national study of general practitioners in South Africa for which you have been randomly selected. The questionnaire is designed for easy and quick completion and should take no more than 15 minutes.

Please follow the instructions carefully and return the questionnaire in the enclosed addressed envelope as soon as is convenient to you.

Your contribution in this regard would be highly appreciated and we thank you in anticipation for your assistance.

Thank you,

Professor NS Segal
(Director Graduate School of Business)

Dr. Rubin Pillay

INSTRUCTIONS

1. Please read all questions carefully and make sure you know exactly what is required.
2. Answer each question, where relevant, by making a cross in the appropriate block next to the question. Please answer all questions.
3. Please return the completed questionnaire at your earliest convenience by making use of the enclosed envelope. Note that to complete the entire questionnaire will take approximately 15 minutes.
4. All results will be aggregated and statistically treated before being incorporated into the research findings. The general research findings will be made available for publication.
5. *All information will be treated as strictly confidential.*

QUESTIONNAIRE ON THE IMPACT OF MANAGED HEALTH CARE

Answer the following questions by making a cross in the appropriate block

1. BIOGRAPHIC DETAILS/PRACTICE CHARACTERISTICS

1.1 GENDER

MALE	FEMALE

 1.2 AGE

27-31	32-36	37-41	42-46	>47

1.3 POPULATION GROUP (for research purposes)

African	Coloured	Indian	white	Other	Foreign White	Foreign Other

1.4 YEARS SINCE GRADUATION FROM MEDICAL SCHOOL

0-9	10-19	20-29	30-39	40-49	50-59

1.5 NUMBER OF YEARS IN PRESENT PRACTICE

<5	5-9	10-14	15-19	>19

1.6 HOURS PER WEEK IN PATIENT CARE

<20	20-39	40-59	60-70	>80

1.7 NUMBER OF PATIENTS SEEN PER HOUR OF WORK

<2	2 to 4	5 to 6	6 to 8

1.8 NUMBER OF PATIENTS SEEN IN AN AVERAGE WEEK

<50	50-99	100-149	150-199	>200

1.9 PERCENT OF PATIENTS IN MANAGED CARE / MANAGED MEDICAL AIDS

0-25%	26-50%	51-75%	76-100%

2. PRACTICE/PLAN TYPE

2.2 WHICH ONE OF THE FOLLOWING ENTITIES BEST DESCRIBES YOUR PRACTICE TYPE?

DIRECT CONTRACT

☐

PREFERRED PROVIDER

☐

NETWORK

☐

INDEPENDENT PRACTICE ASSOCIATION

☐

GROUP PRACTICE (partnership; association)

☐

STAFF MODEL HMO/PRIVATE HOSPITAL

☐

NO ORGANISATIONAL AFFILIATION

☐

2.2. PRACTICE GROUP SIZE

1	2-3	4-5	6 or more

3. MANAGERIAL PRACTICES

3.2 EDUCATION

3.1.1 Clinical Practice Guidelines, are in general:

	Strongly Disagree	Disagree	Agree	Strongly Agree
• Good educational tools	☐	☐	☐	☐
• Unbiased synthesis of expert opinion	☐	☐	☐	☐
• Oversimplified or cookbook medicine	☐	☐	☐	☐
• Too rigid to apply to individual patients	☐	☐	☐	☐
• Likely to improve quality of care	☐	☐	☐	☐
• A challenge to clinical freedom of doctors	☐	☐	☐	☐
• Likely to decrease job satisfaction of doctors	☐	☐	☐	☐
• Used often by managed care organisations/managed medical aids	☐	☐	☐	☐
• Likely to change my clinical practice patterns	☐	☐	☐	☐
• Effective in reducing costs	☐	☐	☐	☐

3.1.2 Continuing Medical Education Programs

(Conferences, lectures, education materials etc.) are:

• Good educational tools	☐	☐	☐	☐
• Likely to change my clinical practice patterns	☐	☐	☐	☐
• Likely to improve quality of care	☐	☐	☐	☐
• Likely to reduce clinical freedom of doctors	☐	☐	☐	☐
• Likely to decrease job satisfaction of doctors	☐	☐	☐	☐
• Used often by managed care organisations/ managed medical aids	☐	☐	☐	☐

3.1.3 Opinion leaders such as academics and specialists are:

• A convenient source of advice	☐	☐	☐	☐
• Usually a biased source of advice	☐	☐	☐	☐
• A challenge to clinical freedom of doctors	☐	☐	☐	☐
• Often used by managed care organisations/ managed medical aids to influence my practice patterns	☐	☐	☐	☐
• Likely to reduce job satisfaction of doctors	☐	☐	☐	☐
• Likely to alter my clinical practice patterns	☐	☐	☐	☐

3.2 FEEDBACK

3.2.1 Feedback about my clinical practice patterns:

	Strongly Disagree	Disagree	Agree	Strongly Agree
• Is received often from managed care organisations / managed medical aids	☐	☐	☐	☐
• Is likely to alter my practice patterns	☐	☐	☐	☐
• Is a challenge to my clinical freedom	☐	☐	☐	☐
• Is likely to reduce my satisfaction levels	☐	☐	☐	☐

3.3. ADMINISTRATIVE INTERVENTIONS

3.3.1 Utilisation Review

• Is conducted by most managed care organisations/managed medical aids	☐	☐	☐	☐
• Is an effective method of reducing costs	☐	☐	☐	☐
• Is effective in altering clinical practice patterns	☐	☐	☐	☐
• Increases my administrative workload	☐	☐	☐	☐
• Limits my clinical freedom	☐	☐	☐	☐
• Reduces my satisfaction levels	☐	☐	☐	☐
• Is likely to reduce the quality of care	☐	☐	☐	☐

3.3.2 Authorisation Systems

• Are used by most managed care organisations/ managed medical aids	☐	☐	☐	☐
• Are an effective method of reducing costs	☐	☐	☐	☐
• Are effective in altering clinical practice patterns	☐	☐	☐	☐
• Increase my administrative workload	☐	☐	☐	☐
• Limit my clinical freedom	☐	☐	☐	☐
• Reduce my satisfaction levels	☐	☐	☐	☐
• Are likely to reduce the quality of care	☐	☐	☐	☐

3.3.3 Peer Review

• I often review and discuss the quality of care given by others of equal rank	☐	☐	☐	☐
• Others of equal or higher rank often review and discuss the quality of my care	☐	☐	☐	☐
• Limits my clinical freedom	☐	☐	☐	☐
• Is an effective tool to alter clinical practice patterns	☐	☐	☐	☐
• Increases my administrative workload	☐	☐	☐	☐
• Is likely to increase the quality of care	☐	☐	☐	☐

3.4 PARTICIPATIVE MANAGEMENT

3.4.1 How well informed are you about:

	Uninformed	Poorly informed	Informed	Well informed
• Patient outcomes in your organisation?	☐	☐	☐	☐
• Quality of care in your organisation?	☐	☐	☐	☐

3.4.2 When the following activities occur in your practice/ organisation, how frequently do you personally participate either formally or informally in each activity?

	Almost never	Seldom	usually	Almost always
• Decisions to appoint new doctors or admit new doctors to the organisation	☐	☐	☐	☐
• Decisions to appoint other health care workers	☐	☐	☐	☐
• Decisions to appoint non-medical staff	☐	☐	☐	☐
• Decisions to adopt new programs or services	☐	☐	☐	☐
• Decisions about provision of services (e.g. hours, staffing, etc.,	☐	☐	☐	☐
• Quality assurance review of medical records	☐	☐	☐	☐
• Resolution of patient grievances	☐	☐	☐	☐

3.5 FINANCIAL CONTINGENCIES

3.5.1 Principal method of payment by managed care organisation/managed medical aids

Capitation	☐
Salary	☐
Fee-for-service	☐
Discounted fee-for-service	☐

3.5.2 Percentage of payment withheld by managed care organisation/managed medical aids

None	1-10%	11-20%	21-30%	>30%

3.5.3 Method of reward for surpluses by managed care organisation/managed medical aids

fixed rand amount	☐
fixed percentage	☐
bonus based on productivity	☐
none	☐

3.5.4 Do you receive incentives or bonuses for meeting targets in terms of performance?

YES	NO

3.5.5 If yes, identify the **factors used to calculate the bonus** from the following list

Referral of patients to specialists	☐
Use of laboratory or other ancillary services	☐
Use of hospital services	☐
The prescription of drugs	☐
The quality of care as measured by reviews	☐
Patients' ratings of their satisfaction with care	☐
Provision of exclusive services to your organisation	☐

3.5.6 Please rank the following from your most preferred to your least **preferred mode of re-imbursement**.

1. Salary
2. Fee-for-service
3. Capitation
4. Discounted fee for service

Please insert your ranked list using the corresponding bold numbers

a) -----	Most preferred
b) -----	
c) -----	
d) -----	Least preferred

4. CLINICAL FREEDOM

4.1. The degree of my professional freedom

Exceeds my expectations	Meets my expectations	Falls short of my expectations

4.2 As a general rule, would you say that in your practice you have the freedom to:

	Almost never	Seldom	usually	Almost always
• Accept or reject any patient who attends your practice?	☐	☐	☐	☐
• Spend sufficient time with your patients?	☐	☐	☐	☐
• Hospitalise patients who, in your opinion, require it?	☐	☐	☐	☐
• Keep patients hospitalised for the length of time you think it is appropriate?	☐	☐	☐	☐
• Order tests and procedures whenever you want to?	☐	☐	☐	☐
• Make referrals to specialists whenever necessary?	☐	☐	☐	☐
• Use expensive procedures whenever necessary?	☐	☐	☐	☐
• Care for patients even when they are unable to pay the fees and charges?	☐	☐	☐	☐
• Care for patients who require heavy use of time and resources ?	☐	☐	☐	☐
• Control your own work schedule ?	☐	☐	☐	☐
• Prescribe medicines that you feel the patient requires?	☐	☐	☐	☐

5. SATISFACTION

Please indicate your level of satisfaction with the following :

5.1 Clinical freedom

	Very dissatisfied	Somewhat dissatisfied	Somewhat satisfied	Very satisfied
• Freedom to treat patients as I want to	☐	☐	☐	☐
• Ability to order whatever I believe will help my patients	☐	☐	☐	☐
• Ability to refer patients when necessary	☐	☐	☐	☐
• The use of clinical practice guidelines and medicine formularies	☐	☐	☐	☐
• Review of my clinical practice by outside reviewers	☐	☐	☐	☐
• Ability to initiate change in the way work is done in my practice	☐	☐	☐	☐

5.2 Relationship with my colleagues

• My relationship with my colleagues	☐	☐	☐	☐
• Professional support and stimulation from my colleagues	☐	☐	☐	☐
• Personal support from my colleagues	☐	☐	☐	☐

5.3 Patient care

• My relationship with my patients	☐	☐	☐	☐
• Patient volume	☐	☐	☐	☐
• Personal gratification from patient care	☐	☐	☐	☐
• Patient demands for potentially unnecessary services/treatments	☐	☐	☐	☐
• My ability to improve the health status of my patients	☐	☐	☐	☐
• Continuity of care for patients	☐	☐	☐	☐

5.4 Relationship with staff

• My relationship with non-medical staff	☐	☐	☐	☐
• Support of non-medical staff	☐	☐	☐	☐
• Co-operation of non-medical staff	☐	☐	☐	☐
• Competency of non-medical staff	☐	☐	☐	☐

5.5 Personal time

• My after-hours work load	☐	☐	☐	☐
• The amount of time I have for my personal and family life	☐	☐	☐	☐
• My work schedule	☐	☐	☐	☐
• Leisure time off the job	☐	☐	☐	☐

5.6 Relationship with patients

	Very dissatisfied	Somewhat dissatisfied	Somewhat satisfied	Very satisfied
• My sense of a personal connection with my patients	☐	☐	☐	☐
• The gratitude displayed by my patients	☐	☐	☐	☐

5.7 Community

• My sense of belonging to the community where I practice	☐	☐	☐	☐
• My family's and my connection to the community where I work	☐	☐	☐	☐

5.8 Pay

• My income	☐	☐	☐	☐
• My income relative to other medical specialities	☐	☐	☐	☐
• My income given my training and experience	☐	☐	☐	☐

5.9 Administration

• Paperwork required by third party payers	☐	☐	☐	☐
• My general administrative workload	☐	☐	☐	☐
• My role in managing the business aspects of my practice	☐	☐	☐	☐

5.10 Resources

• The number of support staff in my practice	☐	☐	☐	☐
• Medical equipment and supplies available	☐	☐	☐	☐
• My practice location in relation to the source of my patients	☐	☐	☐	☐
• The time that I have with each patient	☐	☐	☐	☐
• The examination facilities that I have to see my patients	☐	☐	☐	☐

5.12 The current practice environment

• The introduction of managed care	☐	☐	☐	☐
• Regulations governing private practice	☐	☐	☐	☐
• Patient benefits under managed care	☐	☐	☐	☐
• Ability to deliver high quality care	☐	☐	☐	☐
• Relationship with managed care / managed medical aid organisations	☐	☐	☐	☐

5.12 Overall / My career

	Very dissatisfied	Somewhat dissatisfied	Somewhat satisfied	Very satisfied
• The personal reward that I get from my clinical work	☐	☐	☐	☐
• My overall practice situation	☐	☐	☐	☐
• The work in my practice in relation to my expectations	☐	☐	☐	☐
• My career as a medical doctor	☐	☐	☐	☐
• The current private practice environment	☐	☐	☐	☐

PLEASE ENSURE THAT YOU HAVE ANSWERED ALL QUESTIONS.

THANK YOU FOR YOUR CO-OPERATION.

APPENDIX C

Follow – up Postcard and Covering letter

University of Cape Town



Dear Doctor,

During the preceding week, you would have received a copy of our Managed Health Care Questionnaire, for which you have been randomly selected. If you have already responded, we would like to take this opportunity to express our gratitude to you. However, if you have not done so as yet, we would like to remind you that your response is important to us and we are eagerly awaiting your reply.

For another copy of the questionnaire, please contact Elsie plumb at (021) 406 1911.

Thank you. We appreciate your co- operation.

Professor Nick Segal
(Director Graduate School of Business)

Dr. Rubin Pillay

Dear Doctor,

All of us are busier these days than we should be, and most of us have a hard time keeping abreast of those obligations, which are essential and required. We know how the little extras sometimes receive our best intentions, but we also know that in reality none of us have the time, which we would desire to fulfil those intentions.

From the questionnaire, which reached you – we hope – about three weeks ago, we have had no reply. Perhaps you mislaid the questionnaire, or it may have miscarried in the mail – any one of dozens of contingencies could have happened.

In any event, you may call Elsie Plumb at (021) 406 1442, for another copy of the questionnaire. We are sure you will try and find fifteen minutes somewhere in your busy schedule to check its several items and drop it in the nearest postal box. Most of them have been returned. We'd like to get them all back. Will you help us?

Thank you. We appreciate your kindness.

Very sincerely yours,

Professor Nick Segal
(Director Graduate School of Business)

Dr. Rubin Pillay

APPENDIX D

1. The original scales

2. Factor analysis

University of Cape Town

1.Original Scales

2. Managerial Practices

3. 3.1 Education

3.1.1 Clinical Practice Guidelines, are

ED311-1	Good educational tools
ED311-2	Unbiased synthesis of expert opinion
ED311-3	Oversimplified or cookbook medicine
ED311-4	Too rigid to apply to individual patients
ED311-5	Likely to improve quality of care
ED311-6	A challenge to clinical freedom of doctors
ED311-7	Likely to decrease job satisfaction of doctors
ED311-8	Used often by managed care organisations/managed medical aids
ED311-9	Likely to change my clinical practice patterns
ED311-10	Effective in reducing

3.1.2 Continuing Medical Education Programs are

ED312-1	Good educational tools
ED312-2	Likely to change my clinical practice patterns
ED312-3	Likely to improve quality of care
ED312-4	Likely to reduce clinical freedom of doctors
ED312-5	Likely to decrease job satisfaction of doctors
ED312-6	Used often by managed care organisations/managed medical aids

3.1.3 Opinion Leaders

ED313-1	A convenient source of advice
ED313-2	Usually a biased source of advice
ED313-3	A challenge to clinical freedom of doctors
ED313-4	Often used by managed care organisations/managed medical aids
ED313-5	Likely to reduce job satisfaction of doctors
ED313-6	Likely to alter my clinical practice patterns

3.3 Feedback

3.3.1 Feedback about my clinical practice patterns

ED321-1	Is received often from managed care organisations/managed medical aids
ED321-2	Is likely to alter my practice patterns
ED321-3	Is a challenge to my clinical freedom
ED321-4	Is likely to reduce my satisfaction levels

3.3.Administrative Interventions

3.3.1 Utilisation Review

ADM 331-1	Is conducted by most managed care organisations/managed medical aid
ADM331-2	Is an effective method of reducing costs
ADM331-3	Is effective in altering clinical practice patterns
ADM331-4	Increases my administrative workload
ADM331-5	Limits my clinical freedom
ADM331-6	Reduces my satisfaction levels
ADM331-2	Is likely to reduce the quality of care

3.3.2. Authorisation Systems

ADM332-1	Are used often by managed care organisations/managed medical aids
ADM332-2	Are an effective method of reducing costs
ADM332-3	Are effective in altering clinical practice patterns
ADM333-4	Increase my administrative workload
ADM333-5	Limit my clinical freedom
ADM333-6	Reduce my satisfaction levels
ADM333-7	Are likely to reduce the quality of care

3.3.2 Peer Review

ADM333-1	I often review and discuss quality of care given by others of equal rank
ADM333-2	Others of equal/higher rank often review and discuss the quality of my care
ADM333-3	Limits my clinical freedom
ADM333-4	Is an effective tool to alter clinical practice patterns
ADM333-5	Increases my administrative workload
ADM333-6	Is likely to increase the quality of care

3.4 Participative Management

3.4.1 How well informed are you about

PM341-1	Patient outcomes in your organisations
PM341-2	Quality of care in your organisation

3.4.2 When the following activities occur in your practice, how frequently do you personally participate either formally or informally in each activity

PM342-1	Decisions to appoint new doctors or admit new doctors to the organisation
PM342-2	Decision to appoint other health care workers
PM342-3	Decisions to appoint non-medical staff
PM343-4	Decisions to adopt new programs or services
PM343-5	Decisions about provision of services (e.g hours, staffing etc.)
PM343-6	Quality assurance review of medical records
PM343-7	Resolution of patient grievances

4. Clinical freedom

4.2 As a general rule, would you say that in your practice you have the freedom to:

FRE42-1	Accept or reject any patient who attends your practice
FRE42-2	Spend sufficient time with your patients
FRE42-3	Hospitalise patients who, in your opinion, require it
FRE42-4	Keep patients hospitalised for the length of time you think it is appropriate
FRE42-5	Order tests and procedures whenever you want to
FRE42-6	Make referrals to specialists whenever necessary
FRE42-7	Use expensive procedures whenever necessary
FRE42-8	Care for patients even when they are unable to pay the fees and charges
FRE42-9	Care for patients who require heavy use of time and resources
FRE42-10	Control your own work schedule
FRE42-11	Prescribe medicines that you feel the patient requires

4. Satisfaction

Please indicate your level of satisfaction with the following:

Clinical freedom

SAT51-1	Freedom to treat patients as I want to
SAT51-2	Ability to order whatever I believe will help my patients
SAT51-3	Ability to refer patients when necessary
SAT51-4	The use of clinical practice guidelines and medicine formularies
SAT51-5	Review of my clinical practice by outside reviewers
SAT51-6	Ability to initiate change in the way work is done in my practice

Relationship with my colleagues

SAT52-1	My relationship with my colleagues
SAT52-2	Professional support and stimulation from my colleagues
SAT52-3	Personal support from my colleagues

Patient care

SAT53-1	My relationship with my patients
SAT53-2	Patient volume
SAT53-3	Personal gratification from patient care
SAT53-4	Patient demands for potentially unnecessary services
SAT53-5	My ability to improve the health status of my patients
SAT53-6	Continuity of care for patients

Relationship with staff

SAT54-1	My relationship with non-medical staff
SAT54-2	Support of non-medical staff
SAT54-3	Co-operation of non-medical staff
SAT54-4	Competency of non-medical staff

5.5. Personal time

SAT55-1	My after hours workload
SAT55-2	The amount of time for my family and personal life
SAT55-3	My work schedule
SAT55-4	Leisure time off the job

5.6 Relationship with patients

SAT56-1	My sense of personal connection with my patients
SAT56-2	The gratitude displayed by my patients

5.7 Community

SAT57-1	My sense of belonging to the community where I practice
SAT57-2	My family's and my connection to the community where I work

5.8 Pay

SAT58-1	My income
SAT58-2	My income relative to other medical specialities
SAT58-3	My income given my training and experience

5.9 Administration

SAT59-1	Paperwork required by third party payers
SAT59-2	My general administrative workload
SAT59-3	My role in managing the business aspects of my practice

5.10 Resources

SAT510-1	The number of support staff in my practice
SAT510-2	Medical equipment and supplies available
SAT510-3	My practice location in relation to the source of my patients
SAT510-4	The time that I have with each patient
SAT510-4	The examination facilities that I have to see my patients

5.11 The current practice environment

SAT511-1	The introduction of managed health care
SAT511-2	Regulations governing managed health care
SAT511-3	Patient benefits under managed health care
SAT511-4	Ability to deliver high quality care
SAT511-5	Relationships with managed care/managed medical aid organisation

5.13 Overall/My career

SAT512-1	The personal reward that I get from my clinical work
SAT512-2	My overall practice situation
SAT512-3	The work in my practice in relation to my expectations
SAT512-4	My career as a medical doctor
SAT512-5	The current private practice environment

2. Factor analysis

Overview

Factor Analysis is a data reduction technique that helps you to explore underlying constructs or common issues that influence the responses to your questions. You may also use it to confirm, or refute, constructs that you think exist.

The following worksheets contain the output from the Factor analysis. A separate analysis was done for each of these sections:

3.1 Management Strategy – Education

3.3 Management Strategy – Administration Interventions

3.4 Management Strategy – Participative Management

4.2 Clinical Freedom

5. Satisfaction

Method

The following were used in all the Factor Analyses:

The data were the responses corrected for data capture errors and/or converted from negative to positive by reversing the scores.

Questionnaires with missing responses, for the relevant section, were excluded.

Principal component analysis (PCA) method was used to extract the factors.

Minimum Eigenvalue of 1 for the existence of a factor - with the exception of *Section 3.4* where a second analysis was done with a minimum of 0.6, both results have been included.

Varimax normalised rotation to refine the association between the factors and the raw response variables.

Results

The following 4 types of Factor Analysis output results are presented:

Correlations matrix – indicates the strength of the relationship between each pair of variables.

Eigenvalue plot – visual indication of the amount of variation in the raw responses that is explained by each of the factors.

Eigenvalue summary – measure and % of the amount of variation in the raw responses that is explained by each of the factors.

Factor loadings – measure of the association of each raw response variable with each of the factors.

Factor analysis

Interpretation

Correlation matrix

The correlation matrix contains the correlation coefficients which indicate the strength of the relationship between each pair of variables.

The matrix contains a column and row for each of the 22 questions (the columns are split into 2 groups for printing).

Each cell in the matrix contains the correlation coefficient for the variables represented by that column and that row e.g. 0.46 is the correlation coefficient for ED311_1 *Clinical Practice Guidelines, are in general: Good educational tools* and ED311_2 *Clinical Practice Guidelines, are in general: Unbiased synthesis of expert opinion*.

Correlation coefficients vary:

from -1 for a perfect negative correlation between 2 variables

through 0 where there is no correlation

to $+1$ for a perfect positive correlation.

There is a diagonal line of 1s across the matrix – each variable correlates perfectly with itself.

The correlation coefficients are duplicated above and below this diagonal so you only need to look at half of the matrix - the correlation between ED311_1 and ED311_2 is the same as the correlation between ED311_2 and ED311_1.

The correlation coefficients in this matrix are low suggesting little measurable correlation between the question responses in this section.

There are a few correlation coefficients greater than 0.5

The highest is 0.67 between ED312_4B *Continuing Medical Education Programs are: Likely to reduce clinical freedom of doctors* and ED312_5B *Continuing Medical Education Programs are: Likely to decrease job satisfaction of doctors*.

(the B in the variable names indicates that these are questions where the response scores were reversed and/or data had to be cleaned).

Eigenvalues

Eigenvalues measure the amount of variation in the raw responses that is explained by a factor. Factors with Eigenvalues of more than 1 are usually considered in identifying questions with related responses.

Factor loadings

Factor loadings measure the association of each question with each of the factors. The summary table gives a column of the loadings for each factor,

factors. The summary table gives a column of the loadings for each factor, with a row for each question in the section. Loadings of more than 0.7 are usually considered important but you can consider lower values if they are high relative to the other loadings for that factor – your interpretation is also informed by your insight and understanding of the questions and responses to them.

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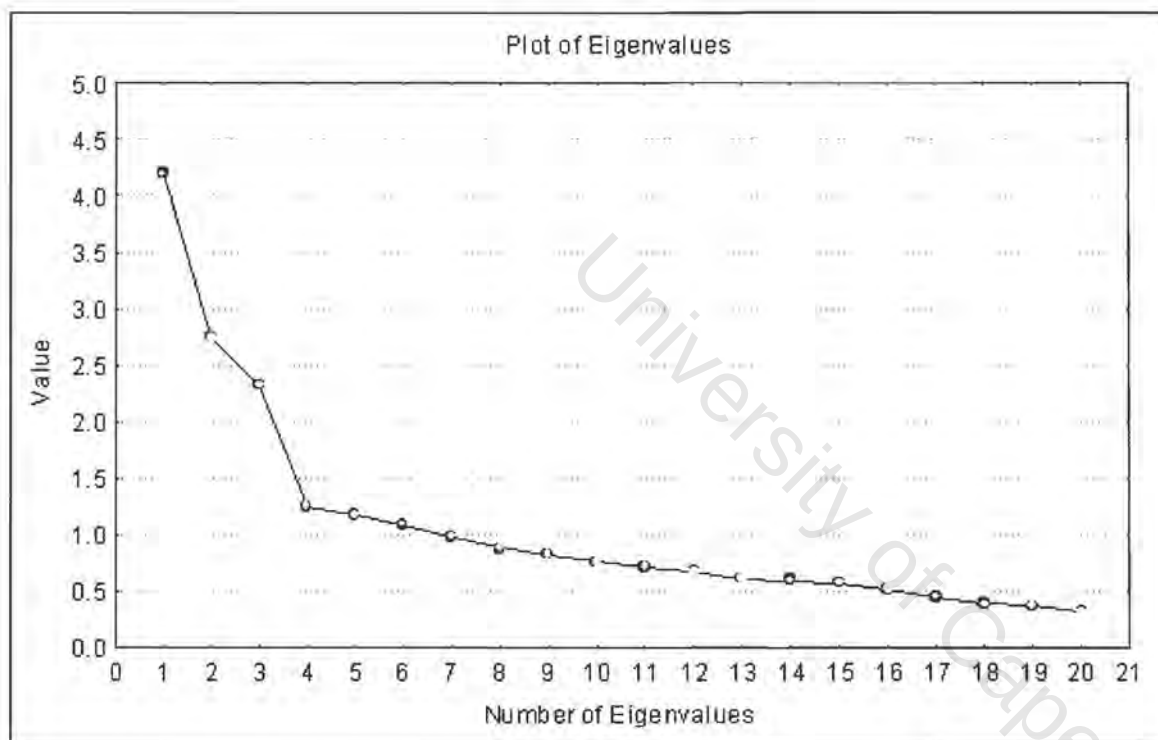
Factor analysis

Section 3.1 Management Strategy Education - 22 questions. Correlations (jemsrubin2.sta) N=561

	ED311_1	ED311_2	ED311_3B	ED311_4B	ED311_5	ED311_6B	ED311_7B	ED311_8	ED311_9	ED311_10	ED312_1
ED311_1	1	0.46	0.43	0.34	0.48	0.22	0.35	-0.05	0.08	0.30	0.30
ED311_2	0.46	1	0.30	0.25	0.33	0.18	0.28	-0.09	0.04	0.29	0.16
ED311_3B	0.43	0.30	1	0.56	0.37	0.30	0.43	-0.27	0.11	0.15	0.09
ED311_4B	0.34	0.25	0.56	1	0.42	0.32	0.49	-0.21	0.07	0.24	0.04
ED311_5	0.48	0.33	0.37	0.42	1	0.22	0.48	-0.09	0.17	0.30	0.20
ED311_6B	0.22	0.18	0.30	0.32	0.22	1	0.52	-0.27	-0.01	0.13	0.05
ED311_7B	0.35	0.28	0.43	0.49	0.48	0.52	1	-0.34	-0.06	0.22	0.09
ED311_8	-0.05	-0.09	-0.27	-0.21	-0.09	-0.27	-0.34	1	0.09	0.02	0.15
ED311_9	0.08	0.04	0.11	0.07	0.17	-0.01	-0.06	0.09	1	0.11	0.04
ED311_10	0.30	0.29	0.15	0.24	0.30	0.13	0.22	0.02	0.11	1	0.24
ED312_1	0.30	0.16	0.09	0.04	0.20	0.05	0.09	0.15	0.04	0.24	1
ED312_2	0.14	0.09	0.00	0.02	0.12	0.02	-0.01	0.10	0.19	0.22	0.49
ED312_3	0.20	0.14	0.05	0.04	0.21	0.02	0.11	0.16	0.05	0.23	0.62
ED312_4B	0.08	0.03	0.11	0.14	0.00	0.10	0.12	0.03	-0.02	0.11	0.27
ED312_5B	0.09	0.00	0.09	0.12	0.03	0.08	0.19	0.00	-0.06	0.20	0.32
ED312_6	0.10	0.09	0.10	0.10	0.15	0.02	0.15	0.05	0.14	0.18	0.01
ED313_1	0.19	0.15	0.07	0.09	0.21	-0.01	0.08	0.09	0.07	0.23	0.34
ED313_2B	0.00	0.09	0.07	0.05	0.00	0.05	0.03	-0.07	-0.10	0.09	0.10
ED313_3B	-0.06	-0.02	0.01	0.02	-0.03	0.09	0.05	-0.08	-0.05	0.05	0.10
ED313_4	0.05	0.00	-0.09	-0.05	0.02	-0.09	-0.06	0.23	0.10	-0.02	0.00
ED313_5B	0.08	0.02	0.13	0.14	0.10	0.13	0.27	-0.13	-0.02	0.18	0.17
ED313_6	0.01	0.05	-0.08	-0.03	0.05	0.04	0.01	0.02	0.20	0.10	0.04

(cont.)

	ED312_2	ED312_3	ED312_4B	ED312_5B	ED312_6	ED313_1	ED313_2B	ED313_3B	ED313_4	ED313_5B	ED313_6
ED311_1	0.14	0.20	0.08	0.09	0.10	0.19	0.00	-0.06	0.05	0.08	0.01
ED311_2	0.09	0.14	0.03	0.00	0.09	0.15	0.09	-0.02	0.00	0.02	0.05
ED311_3B	0.00	0.05	0.11	0.09	0.10	0.07	0.07	0.01	-0.09	0.13	-0.08
ED311_4B	0.02	0.04	0.14	0.12	0.10	0.09	0.05	0.02	-0.05	0.14	-0.03
ED311_5	0.12	0.21	0.00	0.03	0.15	0.21	0.00	-0.03	0.02	0.10	0.05
ED311_6B	0.02	0.02	0.10	0.08	0.02	-0.01	0.05	0.09	-0.09	0.13	0.04
ED311_7B	-0.01	0.11	0.12	0.19	0.15	0.08	0.03	0.05	-0.06	0.27	0.01
ED311_8	0.10	0.16	0.03	0.00	0.05	0.09	-0.07	-0.08	0.23	-0.13	0.02
ED311_9	0.19	0.05	-0.02	-0.06	0.14	0.07	-0.10	-0.05	0.10	-0.02	0.20
ED311_10	0.22	0.23	0.11	0.20	0.18	0.23	0.09	0.05	-0.02	0.18	0.10
ED312_1	0.49	0.62	0.27	0.32	0.01	0.34	0.10	0.10	0.00	0.17	0.04
ED312_2	1	0.58	0.19	0.24	-0.06	0.20	0.03	0.03	0.04	0.09	0.26
ED312_3	0.58	1	0.34	0.37	-0.03	0.30	0.09	0.07	0.01	0.20	0.03
ED312_4B	0.19	0.34	1	0.67	-0.17	0.14	0.13	0.28	-0.10	0.34	0.01
ED312_5B	0.24	0.37	0.67	1	-0.15	0.19	0.19	0.31	-0.13	0.48	0.02
ED312_6	-0.06	-0.03	-0.17	-0.15	1	0.09	-0.08	-0.17	0.31	-0.08	0.07
ED313_1	0.20	0.30	0.14	0.19	0.09	1	0.17	0.17	-0.05	0.27	0.11
ED313_2B	0.03	0.09	0.13	0.19	-0.08	0.17	1	0.25	-0.18	0.22	0.01
ED313_3B	0.03	0.07	0.28	0.31	-0.17	0.17	0.25	1	-0.28	0.45	0.04
ED313_4	0.04	0.01	-0.10	-0.13	0.31	-0.05	-0.18	-0.28	1	-0.40	0.09
ED313_5B	0.09	0.20	0.34	0.48	-0.08	0.27	0.22	0.45	-0.40	1	0.01
ED313_6	0.26	0.03	0.01	0.02	0.07	0.11	0.01	0.04	0.09	0.01	1



		% total	Cumul.	Cumul.
	Eigenval	Variance	Eigenval	%
1	4.208391519	19.12905236	4.208391519	19.12905236
2	2.74522877	12.47831259	6.953620288	31.60736495
3	2.32107989	10.55036313	9.274700178	42.15772808
4	1.250298314	5.683174153	10.52499849	47.84090224
5	1.171884678	5.326748538	11.69688317	53.16765077
6	1.090535416	4.956979163	12.78741859	58.12462994

Factor Loadings (Varimax normalized) (jemsrubin2.sta)

Extraction: Principal components

(Marked loadings are > .700000)

	Factor	Factor	Factor	Factor	Factor	Factor
	1	2	3	4	5	6
ED311_1	0.594881261	0.401532786	-0.169946446	-0.099167103	0.027587708	0.176183408
ED311_2	0.480660488	0.320026774	-0.332854552	-0.079449311	0.168314875	0.104107902
ED311_3B	0.732733447	0.022640682	0.027490508	-0.074348939	0.02261233	0.008815461
ED311_4B	0.732427863	-0.029149504	0.128988021	-0.001500748	0.002738696	0.094131447
ED311_5	0.634876135	0.259758101	-0.143388213	0.09220075	0.052953559	0.210552397
ED311_6B	0.609956075	-0.075209563	0.153797944	0.13974451	-0.023833518	-0.224962344
ED311_7B	0.786152453	-0.035304794	0.188759161	0.015971452	0.041985269	0.014322653
ED311_8	-0.45920007	0.288093563	0.047889911	-0.064740239	-0.139419375	0.433381688
ED311_9	0.064828751	0.065492747	-0.041435049	0.634248452	-0.094336513	0.18583819
ED311_10	0.305641396	0.294252506	-0.001175891	0.136205996	0.285325207	0.368025782
ED312_1	0.068901476	0.78667662	0.161481202	-0.014381212	0.097851374	0.062129466
ED312_2	-0.019549814	0.731076292	0.107814393	0.397827033	-0.04639488	-0.148973339
ED312_3	0.044302488	0.804366477	0.258391286	0.014142861	0.032863375	0.007375327
ED312_4B	0.086455453	0.254272426	0.787894465	-0.072299306	0.100148795	-0.032444032
ED312_5B	0.090723016	0.278571524	0.784548057	-0.057115645	0.234690035	-0.002177505
ED312_6	0.16027345	-0.15340041	-0.076606974	0.149376951	-0.094241167	0.740894783
ED313_1	0.042200232	0.359299324	0.001604953	0.083855869	0.505361677	0.355468958
ED313_2B	0.001036479	0.063475011	-0.009340693	-0.109307422	0.618210264	-0.026978844
ED313_3B	-0.025407752	-0.069245613	0.356797606	0.095626984	0.614544397	-0.126872277
ED313_4	-0.080443346	0.049140271	-0.002189761	0.086280884	-0.561461403	0.520028043
ED313_5B	0.171385917	0.027711542	0.466944668	0.049906014	0.62283838	-0.043547601
ED313_6	-0.034683246	0.069481532	-0.032053744	0.792607961	0.066594609	0.000217401
Expl.Var	3.447860822	2.625313666	1.934015347	1.330738256	1.954130825	1.49535967
Prp.Totl	0.156720946	0.119332439	0.087909789	0.060488103	0.088824128	0.067970894

Section 3.2 Management Strategy Feedback - 4 questions too few to do factor analysis

Correlations (jemsrubin2.sta)

N=604

	FDB321_1	FDB321_2	FDB3213B	FDB3214B
FDB321_1	1.00	0.20	-0.23	-0.21
FDB321_2	0.20	1.00	0.00	0.05
FDB3213B	-0.23	0.00	1.00	0.75
FDB3214B	-0.21	0.05	0.75	1.00

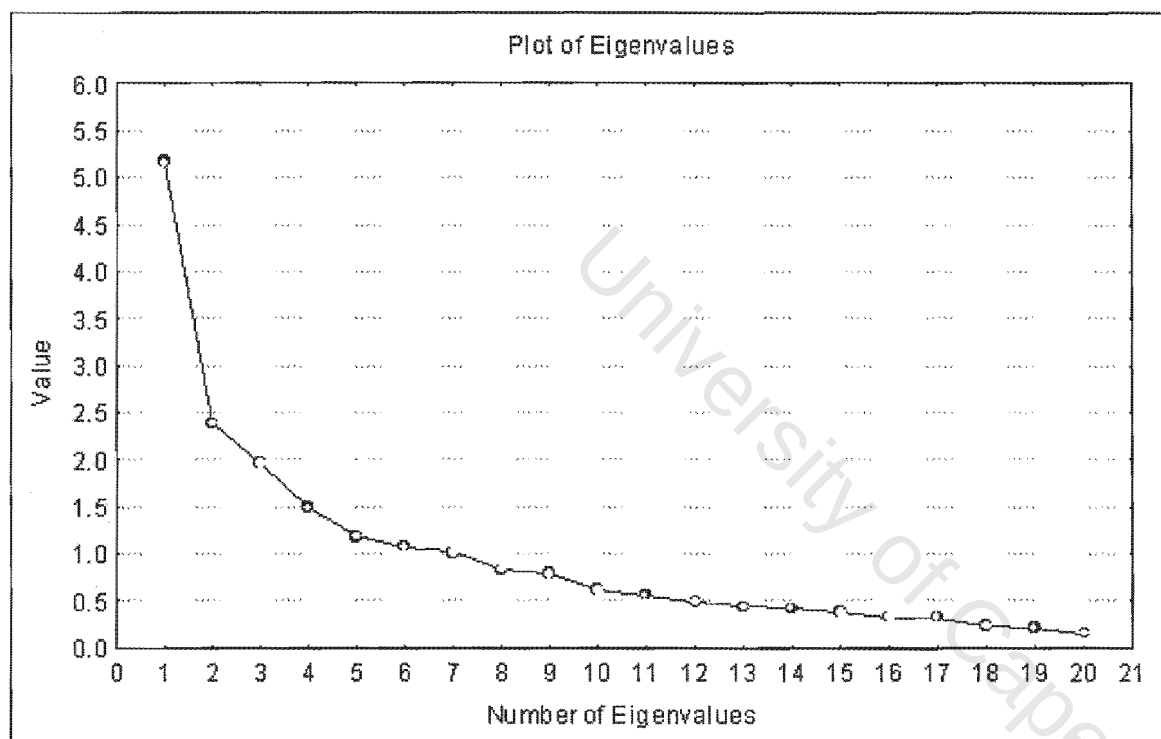
Section 3.3 Management Strategy Administrative Interventions - 20 questions

Correlations (jemsrubin2.sta) N=563

	ADM331_1	ADM331_2	ADM331_3	ADM3314B	ADM3315B	ADM3316B	ADM3317B	ADM332_1	ADM332_2	ADM332_3
ADM331_1	1.00	0.06	0.15	-0.09	-0.18	-0.17	-0.15	0.25	0.06	0.10
ADM331_2	0.06	1.00	0.48	0.21	0.31	0.35	0.35	-0.10	0.40	0.22
ADM331_3	0.15	0.48	1.00	0.14	0.11	0.14	0.17	-0.08	0.30	0.34
ADM3314B	-0.09	0.21	0.14	1.00	0.58	0.56	0.42	-0.15	0.19	0.12
ADM3315B	-0.18	0.31	0.11	0.58	1.00	0.83	0.64	-0.16	0.18	0.03
ADM3316B	-0.17	0.35	0.14	0.56	0.83	1.00	0.68	-0.16	0.19	0.03
ADM3317B	-0.15	0.35	0.17	0.42	0.64	0.68	1.00	-0.15	0.22	0.03
ADM332_1	0.25	-0.10	-0.08	-0.15	-0.16	-0.16	-0.15	1.00	-0.04	0.02
ADM332_2	0.06	0.40	0.30	0.19	0.18	0.19	0.22	-0.04	1.00	0.40
ADM332_3	0.10	0.22	0.34	0.12	0.03	0.03	0.03	0.02	0.40	1.00
ADM3324B	-0.07	0.11	0.12	0.47	0.35	0.34	0.25	-0.25	0.15	0.07
ADM3325B	-0.14	0.14	0.06	0.38	0.49	0.48	0.38	-0.22	0.24	-0.05
ADM3326B	-0.09	0.22	0.12	0.37	0.47	0.50	0.42	-0.23	0.29	0.00
ADM3327B	-0.07	0.22	0.09	0.25	0.39	0.40	0.50	-0.20	0.30	0.01
ADM333_1	0.16	-0.06	0.03	-0.11	-0.04	-0.02	-0.04	0.07	0.04	0.01
ADM333_2	0.17	-0.03	0.09	-0.05	-0.06	-0.04	-0.04	0.00	0.04	0.07
ADM3333B	-0.13	-0.05	-0.04	0.10	0.23	0.24	0.16	-0.07	-0.05	-0.03
ADM333_4	0.02	0.17	0.18	0.02	0.07	0.08	0.07	-0.01	0.14	0.09
ADM3335B	-0.14	0.07	0.10	0.30	0.28	0.30	0.21	-0.09	0.05	0.04
ADM333_6	-0.09	0.12	0.15	0.02	0.10	0.13	0.11	0.02	0.16	0.06

(cont.)

	ADM3324B	ADM3325B	ADM3326B	ADM3327B	ADM333_1	ADM333_2	ADM3333B	ADM333_4	ADM3335B	ADM333_6
ADM331_1	-0.07	-0.14	-0.09	-0.07	0.16	0.17	-0.13	0.02	-0.14	-0.09
ADM331_2	0.11	0.14	0.22	0.22	-0.06	-0.03	-0.05	0.17	0.07	0.12
ADM331_3	0.12	0.06	0.12	0.09	0.03	0.09	-0.04	0.18	0.10	0.15
ADM3314B	0.47	0.38	0.37	0.25	-0.11	-0.05	0.10	0.02	0.30	0.02
ADM3315B	0.35	0.49	0.47	0.39	-0.04	-0.06	0.23	0.07	0.28	0.10
ADM3316B	0.34	0.48	0.50	0.40	-0.02	-0.04	0.24	0.08	0.30	0.13
ADM3317B	0.25	0.38	0.42	0.50	-0.04	-0.04	0.16	0.07	0.21	0.11
ADM332_1	-0.25	-0.22	-0.23	-0.20	0.07	0.00	-0.07	-0.01	-0.09	0.02
ADM332_2	0.15	0.24	0.29	0.30	0.04	0.04	-0.05	0.14	0.05	0.16
ADM332_3	0.07	-0.05	0.00	0.01	0.01	0.07	-0.03	0.09	0.04	0.06
ADM3324B	1.00	0.59	0.58	0.39	-0.03	-0.01	0.04	-0.04	0.28	-0.01
ADM3325B	0.59	1.00	0.78	0.64	-0.02	-0.05	0.15	0.03	0.23	0.05
ADM3326B	0.58	0.78	1.00	0.70	0.07	0.02	0.18	0.07	0.24	0.07
ADM3327B	0.39	0.64	0.70	1.00	-0.03	-0.05	0.10	0.09	0.18	0.07
ADM333_1	-0.03	-0.02	0.07	-0.03	1.00	0.64	0.20	0.27	0.04	0.28
ADM333_2	-0.01	-0.05	0.02	-0.05	0.64	1.00	0.13	0.25	-0.01	0.18
ADM3333B	0.04	0.15	0.18	0.10	0.20	0.13	1.00	0.15	0.46	0.32
ADM333_4	-0.04	0.03	0.07	0.09	0.27	0.25	0.15	1.00	0.16	0.56
ADM3335B	0.28	0.23	0.24	0.18	0.04	-0.01	0.46	0.16	1.00	0.30
ADM333_6	-0.01	0.05	0.07	0.07	0.28	0.18	0.32	0.56	0.30	1.00



Extraction: Principal components

		% total	Cumul.	Cumul.
	Eigenval	Variance	Eigenval	%
1	5.163276467	25.81638233	5.163276467	25.81638233
2	2.38367908	11.9183954	7.546955547	37.73477773
3	1.961569131	9.807845656	9.508524678	47.54262339
4	1.486683783	7.433418915	10.99520846	54.9760423
5	1.183766342	5.918831708	12.1789748	60.89487401
6	1.070964027	5.354820135	13.24993883	66.24969415
7	1.013000333	5.065001666	14.26293916	71.31469581

Factor Loadings (Varimax normalized) (jemsrubin2.sta)
Extraction: Principal components

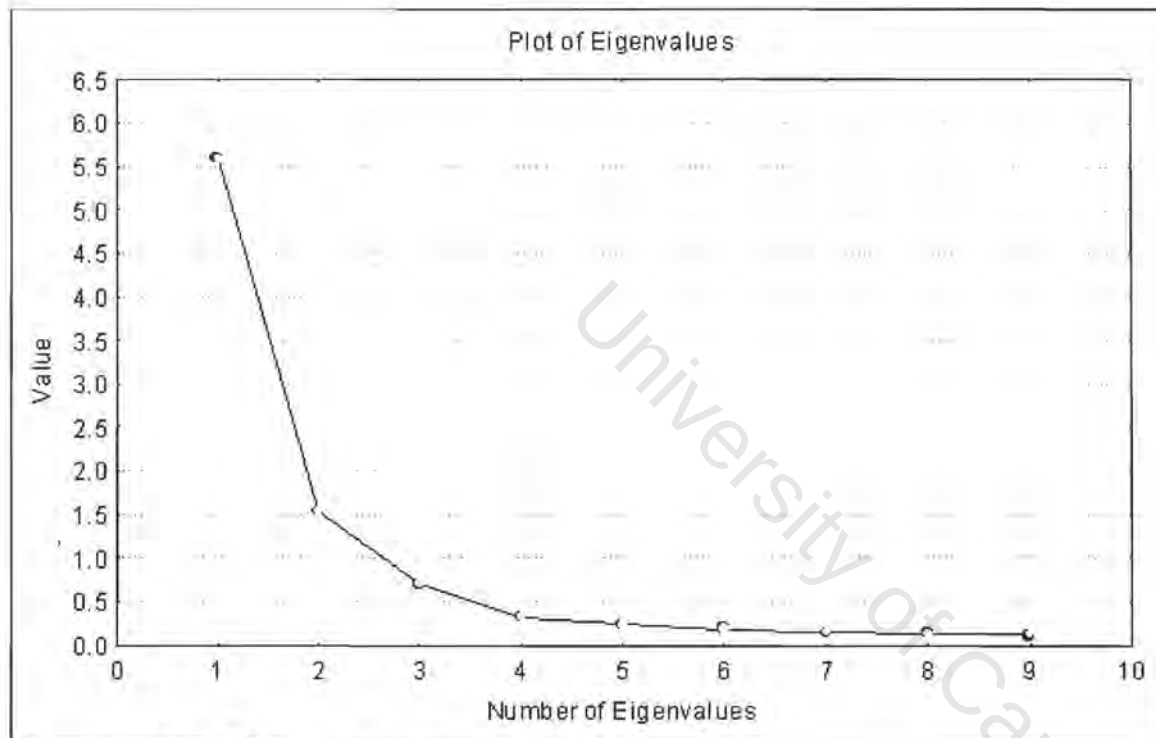
(Marked loadings are > .700000)

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7
ADM331_1	0.001648362	-0.152685406	0.22983846	0.275514272	-0.137459737	-0.144641339	-0.652169336
ADM331_2	0.059180314	0.218176939	0.59220228	-0.084058314	0.432319249	-0.226567754	0.040145069
ADM331_3	-0.002633982	0.102412052	0.740288943	0.077475551	0.132028363	-0.028798465	0.045794774
ADM3314B	0.223043639	-0.279652234	0.222687702	-0.016494421	0.581280046	0.351684473	0.051399216
ADM3315B	0.253993452	-0.007851473	0.040281296	-0.018033062	0.852032402	0.178045106	0.067084253
ADM3316B	0.260872246	0.032847604	0.056019443	-0.002395425	0.863637017	0.162999793	0.062446296
ADM3317B	0.259798201	0.126524665	0.066877697	-0.043940949	0.785419571	-0.027218919	0.06006603
ADM332_1	-0.193724008	0.086198789	-0.106010528	-0.082929751	-0.051275955	0.014066221	-0.856955303
ADM332_2	0.331437743	0.198484319	0.6238275	-0.039675542	0.081777794	-0.10715366	-0.082377291
ADM332_3	-0.052111408	-0.08166606	0.751070627	0.016467981	-0.079175349	0.171653583	-0.060810593
ADM3324B	0.658903194	-0.32105788	0.172913229	0.058476754	0.125768568	0.309798112	0.154873507
ADM3325B	0.847341701	-0.011249866	-0.020576139	-0.026795254	0.268763431	0.108917848	0.078238664
ADM3326B	0.857607608	0.035009522	0.055128377	0.065754939	0.282489403	0.087009233	0.068885466
ADM3327B	0.798030845	0.178249796	0.039129332	-0.082629952	0.25853388	-0.081162796	0.029081776
ADM333_1	0.023643463	0.222507292	-0.042853198	0.849188873	-0.034506342	0.062657194	-0.104000177
ADM333_2	-0.031640372	0.094808271	0.060194264	0.896937963	-0.025046203	-0.001579374	0.008699672
ADM3333B	0.02811406	0.282020857	-0.173645717	0.142285932	0.166784879	0.664331114	0.049421594
ADM333_4	0.029828642	0.741793479	0.168344181	0.216741838	0.020310272	0.09173047	0.022183864
ADM3335B	0.154106257	0.148867015	0.078730026	-0.063860218	0.148622421	0.798225243	0.047390705
ADM333_6	0.017836495	0.77423391	0.1059641	0.128689577	0.03404185	0.328086604	0.010714996
Expl.Var	2.955210672	1.67634666	2.091158002	1.729002698	2.953397418	1.617399023	1.24042469
Prp.Totl	0.147760534	0.083817333	0.1045579	0.086450135	0.147669871	0.080869951	0.062021235

Section 3.4 Management Strategy Participative Management - 9 questions

Correlations (jemsrubin2.sta) N=566

	PM341_1	PM341_2	PM342_1	PM342_2	PM342_3	PM342_4	PM342_5	PM342_6	PM342_7
PM341_1	1.00	0.84	0.26	0.26	0.27	0.32	0.30	0.38	0.32
PM341_2	0.84	1.00	0.29	0.25	0.25	0.30	0.28	0.35	0.28
PM342_1	0.26	0.29	1.00	0.82	0.64	0.64	0.61	0.55	0.50
PM342_2	0.26	0.25	0.82	1.00	0.78	0.74	0.71	0.63	0.57
PM342_3	0.27	0.25	0.64	0.78	1.00	0.83	0.82	0.70	0.68
PM342_4	0.32	0.30	0.64	0.74	0.83	1.00	0.87	0.78	0.74
PM342_5	0.30	0.28	0.61	0.71	0.82	0.87	1.00	0.76	0.76
PM342_6	0.38	0.35	0.55	0.63	0.70	0.78	0.76	1.00	0.75
PM342_7	0.32	0.28	0.50	0.57	0.68	0.74	0.76	0.75	1.00



Extraction: Principal components

		% total	Cumul.	Cumul.
	Eigenval	Variance	Eigenval	%
1	5.590692857	62.11880952	5.590692857	62.11880952
2	1.536924683	17.07694093	7.12761754	79.19575044

		% total	Cumul.	Cumul.
	Eigenval	Variance	Eigenval	%
1	5.590692857	62.11880952	5.590692857	62.11880952
2	1.536924683	17.07694093	7.12761754	79.19575044
3	0.704135353	7.823726143	7.831752893	87.01947659

Factor Loadings (Varimax normalized) (jemsrubin2.sta)

Extraction: Principal components

	Factor	Factor
	1	2
PM341_1	0.178030756	0.941747207
PM341_2	0.1591026	0.944132136
PM342_1	0.764286363	0.148108717
PM342_2	0.862918187	0.0999269
PM342_3	0.900676287	0.096197785
PM342_4	0.910254112	0.167775282
PM342_5	0.905631494	0.147048281
PM342_6	0.814587978	0.268380711
PM342_7	0.799798198	0.193440487
Expl.Var	5.148949485	1.978668055

(Marked loadings are > .700000)

	Factor	Factor	Factor
	1	2	3
PM341_1	0.186887052	0.936557032	0.080770087
PM341_2	0.125978385	0.942945317	0.131209116
PM342_1	0.299184387	0.156709949	0.884611005
PM342_2	0.466089598	0.099409805	0.823373259
PM342_3	0.717847336	0.077463969	0.547179082
PM342_4	0.804584662	0.14278436	0.448892615
PM342_5	0.8299601	0.119825651	0.406175613
PM342_6	0.821545209	0.238303095	0.269105643
PM342_7	0.880871622	0.157920918	0.161597348
Expl.Var	3.659914522	1.923198872	2.248639499

Prp.Totl	0.572105498	0.219852006

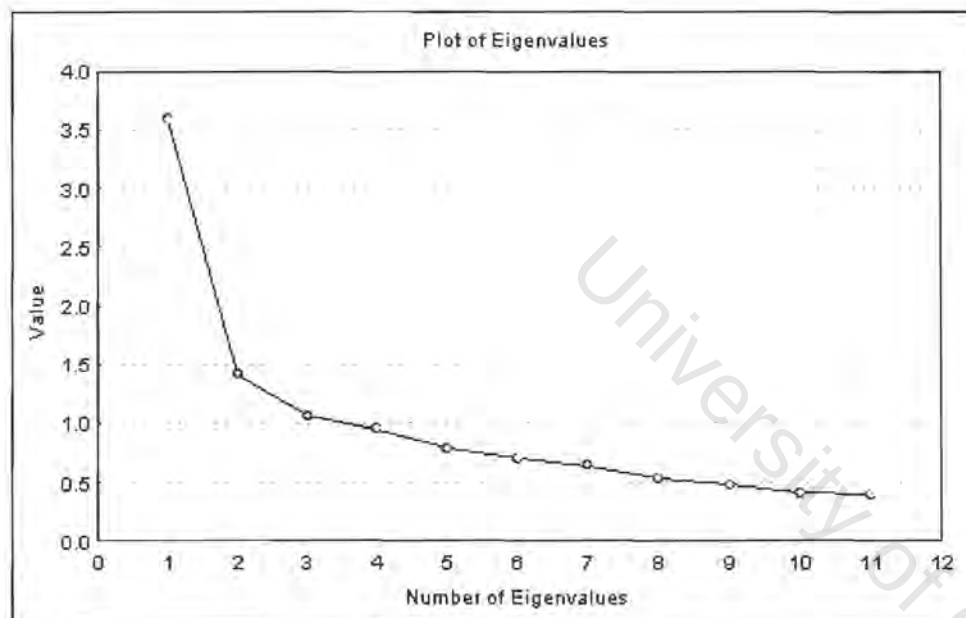
Prp.Totl	0.406657169	0.213688764	0.249848833

Section 4.2 Clinical Freedom - 11 questions

Correlations (jemsrubin2.sta)

N=597

	FRE42_1	FRE42_2	FRE42_3	FRE42_4	FRE42_5	FRE42_6	FRE42_7	FRE42_8	FRE42_9	FRE42_10	FRE42_11
FRE42_1	1.00	0.19	0.10	0.07	0.19	0.16	0.13	0.06	0.13	0.24	0.15
FRE42_2	0.19	1.00	0.25	0.13	0.23	0.28	0.09	0.23	0.34	0.33	0.30
FRE42_3	0.10	0.25	1.00	0.51	0.31	0.35	0.18	0.11	0.19	0.18	0.36
FRE42_4	0.07	0.13	0.51	1.00	0.42	0.34	0.31	0.13	0.21	0.16	0.34
FRE42_5	0.19	0.23	0.31	0.42	1.00	0.51	0.45	0.11	0.25	0.21	0.37
FRE42_6	0.16	0.28	0.35	0.34	0.51	1.00	0.31	0.21	0.28	0.30	0.45
FRE42_7	0.13	0.09	0.18	0.31	0.45	0.31	1.00	0.02	0.24	0.11	0.26
FRE42_8	0.06	0.23	0.11	0.13	0.11	0.21	0.02	1.00	0.52	0.21	0.21
FRE42_9	0.13	0.34	0.19	0.21	0.25	0.28	0.24	0.52	1.00	0.30	0.30
FRE42_10	0.24	0.33	0.18	0.16	0.21	0.30	0.11	0.21	0.30	1.00	0.40
FRE42_11	0.15	0.30	0.36	0.34	0.37	0.45	0.26	0.21	0.30	0.40	1.00



Extraction: Principal components

	Eigenval	% total Variance	Cumul. Eigenval	Cumul. %
1	3.596139228	32.6921748	3.596139228	32.6921748
2	1.416658054	12.87870958	5.012797282	45.57088438
3	1.061212346	9.647384964	6.074009628	55.21826934

Extraction: Principal components (Marked loadings are > .700000)

	Factor 1	Factor 2	Factor 3
FRE42_1	0.062670963	-0.135289813	0.781997461
FRE42_2	0.144004109	0.407981646	0.513271993
FRE42_3	0.65020706	0.163712075	0.018695428
FRE42_4	0.764400929	0.126944569	-0.106780608
FRE42_5	0.735608314	0.026987075	0.226831191
FRE42_6	0.626658305	0.208203192	0.288557054
FRE42_7	0.629997925	-0.065940501	0.107503598
FRE42_8	0.022373356	0.856997096	0.01055732
FRE42_9	0.214052271	0.764924609	0.170644467
FRE42_10	0.147787525	0.317064553	0.634093779
FRE42_11	0.531354952	0.295457069	0.336568398
Expl.Var	2.712958622	1.783472436	1.57757857
Prp.Totl	0.246632602	0.162133858	0.143416234

Section 5 Satisfaction - 48 questions too many for "stable" factor analysis with 615 respondents

Correlations (jemsrubin2.sta)

N=531

	SAT51_1	SAT51_2	SAT51_3	SAT51_4	SAT51_5	SAT51_6	SAT52_1	SAT52_2
SAT51_1	1.00	0.72	0.53	0.35	0.27	0.36	0.24	0.19
SAT51_2	0.72	1.00	0.57	0.37	0.30	0.30	0.23	0.20
SAT51_3	0.53	0.57	1.00	0.31	0.24	0.37	0.28	0.26
SAT51_4	0.35	0.37	0.31	1.00	0.42	0.24	0.10	0.09
SAT51_5	0.27	0.30	0.24	0.42	1.00	0.28	0.20	0.22
SAT51_6	0.36	0.30	0.37	0.24	0.28	1.00	0.24	0.20
SAT52_1	0.24	0.23	0.28	0.10	0.20	0.24	1.00	0.72
SAT52_2	0.19	0.20	0.26	0.09	0.22	0.20	0.72	1.00
SAT52_3	0.13	0.16	0.19	0.08	0.19	0.18	0.66	0.83
SAT53_1	0.30	0.27	0.30	0.13	0.17	0.29	0.25	0.21
SAT53_2	0.19	0.18	0.19	0.09	0.19	0.13	0.19	0.14
SAT53_3	0.28	0.26	0.21	0.17	0.18	0.19	0.17	0.11
SAT53_4	0.15	0.19	0.16	0.06	0.14	0.14	0.08	0.10
SAT53_5	0.24	0.29	0.25	0.13	0.14	0.25	0.22	0.15
SAT53_6	0.25	0.30	0.30	0.09	0.16	0.27	0.21	0.21
SAT54_1	0.20	0.22	0.24	0.08	0.18	0.30	0.32	0.25
SAT54_2	0.19	0.23	0.25	0.06	0.09	0.27	0.25	0.21
SAT54_3	0.22	0.24	0.24	0.07	0.13	0.28	0.27	0.23
SAT54_4	0.17	0.18	0.18	0.01	0.09	0.22	0.22	0.20
SAT55_1	0.17	0.12	0.13	0.08	0.05	0.13	0.09	0.09
SAT55_2	0.24	0.17	0.15	0.16	0.13	0.15	0.10	0.12
SAT55_3	0.26	0.21	0.19	0.20	0.14	0.19	0.15	0.16
SAT55_4	0.21	0.16	0.15	0.17	0.08	0.14	0.14	0.15
SAT56_1	0.24	0.23	0.25	0.09	0.13	0.24	0.23	0.23
SAT56_2	0.20	0.19	0.19	0.11	0.15	0.23	0.13	0.12
SAT57_1	0.27	0.21	0.20	0.09	0.12	0.23	0.23	0.20
SAT57_2	0.24	0.18	0.18	0.07	0.08	0.18	0.19	0.23
SAT58_1	0.27	0.27	0.14	0.20	0.22	0.14	0.13	0.12

SAT58_2	0.19	0.18	0.09	0.16	0.23	0.14	0.14	0.11
SAT58_3	0.25	0.23	0.12	0.18	0.24	0.13	0.10	0.07
SAT59_1	0.25	0.25	0.15	0.23	0.19	0.11	0.03	0.08
SAT59_2	0.25	0.26	0.21	0.20	0.17	0.15	0.04	0.06
SAT59_3	0.21	0.23	0.19	0.10	0.14	0.28	0.18	0.15
SAT510_1	0.29	0.27	0.26	0.10	0.07	0.23	0.20	0.14
SAT510_2	0.24	0.26	0.25	0.09	0.08	0.26	0.18	0.21
SAT510_3	0.19	0.20	0.23	0.01	0.09	0.28	0.21	0.24
SAT510_4	0.27	0.25	0.29	0.08	0.07	0.32	0.19	0.20
SAT510_5	0.16	0.14	0.19	0.06	0.06	0.26	0.19	0.20
SAT511_1	0.22	0.18	0.16	0.26	0.16	0.12	-0.01	0.03
SAT511_2	0.19	0.18	0.16	0.19	0.20	0.07	0.04	0.09
SAT511_3	0.26	0.25	0.19	0.28	0.20	0.11	0.06	0.08
SAT511_4	0.37	0.38	0.33	0.22	0.26	0.24	0.11	0.13
SAT511_5	0.26	0.27	0.19	0.28	0.22	0.11	0.07	0.11
SAT512_1	0.34	0.32	0.30	0.13	0.18	0.30	0.27	0.22
SAT512_2	0.34	0.30	0.27	0.15	0.21	0.27	0.22	0.21
SAT512_3	0.35	0.31	0.30	0.17	0.24	0.31	0.22	0.23
SAT512_4	0.33	0.26	0.25	0.18	0.20	0.27	0.23	0.20
SAT512_5	0.32	0.33	0.26	0.16	0.19	0.21	0.18	0.22

(cont.)

	SAT53_2	SAT53_3	SAT53_4	SAT53_5	SAT53_6	SAT54_1	SAT54_2	SAT54_3
SAT51_1	0.19	0.28	0.15	0.24	0.25	0.20	0.19	0.22
SAT51_2	0.18	0.26	0.19	0.29	0.30	0.22	0.23	0.24
SAT51_3	0.19	0.21	0.16	0.25	0.30	0.24	0.25	0.24
SAT51_4	0.09	0.17	0.06	0.13	0.09	0.08	0.06	0.07
SAT51_5	0.19	0.18	0.14	0.14	0.16	0.18	0.09	0.13
SAT51_6	0.13	0.19	0.14	0.25	0.27	0.30	0.27	0.28
SAT52_1	0.19	0.17	0.08	0.22	0.21	0.32	0.25	0.27
SAT52_2	0.14	0.11	0.10	0.15	0.21	0.25	0.21	0.23
SAT52_3	0.10	0.15	0.11	0.15	0.18	0.24	0.24	0.26
SAT53_1	0.43	0.44	0.19	0.44	0.39	0.30	0.29	0.29
SAT53_2	1.00	0.35	0.19	0.38	0.34	0.22	0.24	0.23
SAT53_3	0.35	1.00	0.28	0.42	0.35	0.20	0.18	0.21
SAT53_4	0.19	0.28	1.00	0.26	0.26	0.12	0.08	0.13
SAT53_5	0.38	0.42	0.26	1.00	0.61	0.24	0.26	0.25
SAT53_6	0.34	0.35	0.26	0.61	1.00	0.29	0.29	0.29
SAT54_1	0.22	0.20	0.12	0.24	0.29	1.00	0.80	0.76
SAT54_2	0.24	0.18	0.08	0.26	0.29	0.80	1.00	0.87
SAT54_3	0.23	0.21	0.13	0.25	0.29	0.76	0.87	1.00
SAT54_4	0.20	0.18	0.17	0.21	0.30	0.57	0.66	0.71
SAT55_1	-0.01	0.18	0.17	0.19	0.11	0.08	0.09	0.06
SAT55_2	0.06	0.15	0.19	0.20	0.09	0.07	0.08	0.04
SAT55_3	0.12	0.23	0.19	0.22	0.17	0.15	0.11	0.07
SAT55_4	0.06	0.20	0.18	0.19	0.09	0.07	0.08	0.06
SAT56_1	0.28	0.41	0.21	0.38	0.47	0.30	0.29	0.30
SAT56_2	0.23	0.45	0.27	0.39	0.37	0.23	0.23	0.26
SAT57_1	0.28	0.36	0.19	0.30	0.38	0.17	0.21	0.25
SAT57_2	0.25	0.23	0.16	0.22	0.36	0.18	0.21	0.23
SAT58_1	0.35	0.27	0.19	0.22	0.19	0.13	0.15	0.15
SAT58_2	0.30	0.22	0.17	0.23	0.15	0.11	0.13	0.13
SAT58_3	0.30	0.25	0.20	0.21	0.18	0.10	0.12	0.14

SAT59_1	0.09	0.12	0.20	0.18	0.10	0.07	0.01	0.01
SAT59_2	0.04	0.09	0.18	0.17	0.12	0.08	0.01	0.02
SAT59_3	0.17	0.17	0.24	0.26	0.26	0.20	0.20	0.16
SAT510_1	0.20	0.23	0.18	0.28	0.30	0.35	0.33	0.31
SAT510_2	0.21	0.25	0.17	0.29	0.36	0.31	0.31	0.27
SAT510_3	0.28	0.24	0.13	0.25	0.31	0.31	0.29	0.30
SAT510_4	0.20	0.22	0.28	0.35	0.30	0.27	0.26	0.25
SAT510_5	0.25	0.26	0.11	0.27	0.37	0.31	0.30	0.32
SAT511_1	0.08	0.10	0.12	0.07	0.00	-0.04	0.00	0.00
SAT511_2	0.09	0.11	0.14	0.06	0.01	-0.03	-0.02	0.00
SAT511_3	0.11	0.17	0.14	0.13	0.03	-0.03	-0.03	-0.03
SAT511_4	0.17	0.21	0.22	0.24	0.24	0.10	0.12	0.09
SAT511_5	0.11	0.15	0.17	0.14	0.06	0.00	-0.01	0.00
SAT512_1	0.33	0.50	0.22	0.34	0.38	0.30	0.29	0.29
SAT512_2	0.45	0.38	0.19	0.31	0.34	0.27	0.27	0.26
SAT512_3	0.39	0.41	0.26	0.35	0.37	0.24	0.24	0.24
SAT512_4	0.34	0.44	0.25	0.30	0.30	0.22	0.21	0.22
SAT512_5	0.28	0.34	0.27	0.27	0.28	0.16	0.17	0.18

(cont.)

	SAT55_2	SAT55_3	SAT55_4	SAT56_1	SAT56_2	SAT57_1	SAT57_2	SAT58_1
SAT51_1	0.24	0.26	0.21	0.24	0.20	0.27	0.24	0.27
SAT51_2	0.17	0.21	0.16	0.23	0.19	0.21	0.18	0.27
SAT51_3	0.15	0.19	0.15	0.25	0.19	0.20	0.18	0.14
SAT51_4	0.16	0.20	0.17	0.09	0.11	0.09	0.07	0.20
SAT51_5	0.13	0.14	0.08	0.13	0.15	0.12	0.08	0.22
SAT51_6	0.15	0.19	0.14	0.24	0.23	0.23	0.18	0.14
SAT52_1	0.10	0.15	0.14	0.23	0.13	0.23	0.19	0.13
SAT52_2	0.12	0.16	0.15	0.23	0.12	0.20	0.23	0.12
SAT52_3	0.13	0.18	0.17	0.25	0.13	0.21	0.24	0.13
SAT53_1	0.09	0.18	0.11	0.52	0.37	0.41	0.32	0.18
SAT53_2	0.06	0.12	0.06	0.28	0.23	0.28	0.25	0.35
SAT53_3	0.15	0.23	0.20	0.41	0.45	0.36	0.23	0.27
SAT53_4	0.19	0.19	0.18	0.21	0.27	0.19	0.16	0.19
SAT53_5	0.20	0.22	0.19	0.38	0.39	0.30	0.22	0.22
SAT53_6	0.09	0.17	0.09	0.47	0.37	0.38	0.36	0.19
SAT54_1	0.07	0.15	0.07	0.30	0.23	0.17	0.18	0.13
SAT54_2	0.08	0.11	0.08	0.29	0.23	0.21	0.21	0.15
SAT54_3	0.04	0.07	0.06	0.30	0.26	0.25	0.23	0.15
SAT54_4	0.03	0.06	0.05	0.26	0.22	0.22	0.21	0.14
SAT55_1	0.71	0.63	0.56	0.15	0.22	0.08	0.11	0.15
SAT55_2	1.00	0.75	0.79	0.14	0.20	0.06	0.12	0.27
SAT55_3	0.75	1.00	0.75	0.22	0.19	0.10	0.17	0.29
SAT55_4	0.79	0.75	1.00	0.14	0.18	0.05	0.10	0.28
SAT56_1	0.14	0.22	0.14	1.00	0.58	0.48	0.42	0.13
SAT56_2	0.20	0.19	0.18	0.58	1.00	0.43	0.34	0.18
SAT57_1	0.06	0.10	0.05	0.48	0.43	1.00	0.75	0.20
SAT57_2	0.12	0.17	0.10	0.42	0.34	0.75	1.00	0.14
SAT58_1	0.27	0.29	0.28	0.13	0.18	0.20	0.14	1.00
SAT58_2	0.21	0.23	0.23	0.11	0.15	0.17	0.13	0.69
SAT58_3	0.27	0.30	0.29	0.10	0.15	0.19	0.13	0.73

SAT59_1	0.29	0.27	0.28	0.09	0.08	0.03	0.05	0.28
SAT59_2	0.27	0.28	0.29	0.06	0.10	0.03	0.03	0.25
SAT59_3	0.22	0.27	0.28	0.21	0.21	0.22	0.21	0.30
SAT510_1	0.21	0.25	0.21	0.32	0.22	0.22	0.24	0.21
SAT510_2	0.09	0.18	0.11	0.26	0.22	0.25	0.27	0.18
SAT510_3	0.02	0.10	0.04	0.28	0.20	0.32	0.30	0.13
SAT510_4	0.33	0.36	0.29	0.38	0.29	0.25	0.22	0.18
SAT510_5	0.04	0.09	0.05	0.41	0.29	0.34	0.32	0.14
SAT511_1	0.09	0.13	0.13	-0.02	0.06	0.04	0.01	0.21
SAT511_2	0.11	0.12	0.11	0.03	0.07	0.04	0.05	0.19
SAT511_3	0.09	0.14	0.14	0.01	0.07	0.10	0.06	0.20
SAT511_4	0.09	0.15	0.13	0.16	0.20	0.23	0.18	0.19
SAT511_5	0.14	0.17	0.15	0.04	0.09	0.08	0.09	0.29
SAT512_1	0.15	0.25	0.19	0.41	0.28	0.34	0.31	0.31
SAT512_2	0.16	0.27	0.21	0.31	0.25	0.30	0.29	0.49
SAT512_3	0.25	0.34	0.27	0.34	0.30	0.33	0.33	0.46
SAT512_4	0.24	0.34	0.27	0.35	0.28	0.35	0.34	0.40
SAT512_5	0.18	0.27	0.22	0.24	0.24	0.27	0.24	0.36

(cont.)

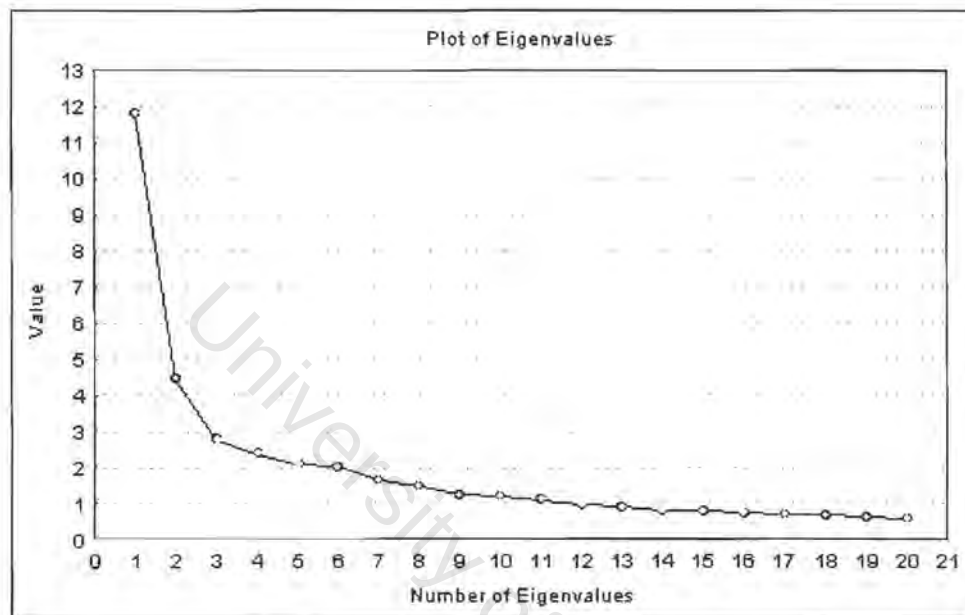
	SAT59_1	SAT59_2	SAT59_3	SAT510_1	SAT510_2	SAT510_3	SAT510_4	SAT510_5
SAT51_1	0.25	0.25	0.21	0.29	0.24	0.19	0.27	0.16
SAT51_2	0.25	0.26	0.23	0.27	0.26	0.20	0.25	0.14
SAT51_3	0.15	0.21	0.19	0.26	0.25	0.23	0.29	0.19
SAT51_4	0.23	0.20	0.10	0.10	0.09	0.01	0.08	0.06
SAT51_5	0.19	0.17	0.14	0.07	0.08	0.09	0.07	0.06
SAT51_6	0.11	0.15	0.28	0.23	0.26	0.28	0.32	0.26
SAT52_1	0.03	0.04	0.18	0.20	0.18	0.21	0.19	0.19
SAT52_2	0.08	0.06	0.15	0.14	0.21	0.24	0.20	0.20
SAT52_3	0.04	0.03	0.12	0.11	0.18	0.20	0.18	0.16
SAT53_1	0.08	0.08	0.17	0.26	0.23	0.28	0.33	0.28
SAT53_2	0.09	0.04	0.17	0.20	0.21	0.28	0.20	0.25
SAT53_3	0.12	0.09	0.17	0.23	0.25	0.24	0.22	0.26
SAT53_4	0.20	0.18	0.24	0.18	0.17	0.13	0.28	0.11
SAT53_5	0.18	0.17	0.26	0.28	0.29	0.25	0.35	0.27
SAT53_6	0.10	0.12	0.26	0.30	0.36	0.31	0.30	0.37
SAT54_1	0.07	0.08	0.20	0.35	0.31	0.31	0.27	0.31
SAT54_2	0.01	0.01	0.20	0.33	0.31	0.29	0.26	0.30
SAT54_3	0.01	0.02	0.16	0.31	0.27	0.30	0.25	0.32
SAT54_4	0.02	0.05	0.19	0.35	0.30	0.25	0.23	0.24
SAT55_1	0.20	0.18	0.18	0.17	0.09	0.03	0.29	0.09
SAT55_2	0.29	0.27	0.22	0.21	0.09	0.02	0.33	0.04
SAT55_3	0.27	0.28	0.27	0.25	0.18	0.10	0.36	0.09
SAT55_4	0.28	0.29	0.28	0.21	0.11	0.04	0.29	0.05
SAT56_1	0.09	0.06	0.21	0.32	0.26	0.28	0.38	0.41
SAT56_2	0.08	0.10	0.21	0.22	0.22	0.20	0.29	0.29
SAT57_1	0.03	0.03	0.22	0.22	0.25	0.32	0.25	0.34
SAT57_2	0.05	0.03	0.21	0.24	0.27	0.30	0.22	0.32
SAT58_1	0.28	0.25	0.30	0.21	0.18	0.13	0.18	0.14
SAT58_2	0.27	0.23	0.27	0.19	0.21	0.14	0.19	0.13
SAT58_3	0.33	0.29	0.28	0.21	0.16	0.09	0.23	0.09

SAT59_1	1.00	0.73	0.38	0.22	0.11	0.01	0.18	0.04
SAT59_2	0.73	1.00	0.50	0.23	0.17	0.00	0.20	0.06
SAT59_3	0.38	0.50	1.00	0.40	0.33	0.25	0.28	0.21
SAT510_1	0.22	0.23	0.40	1.00	0.55	0.36	0.40	0.37
SAT510_2	0.11	0.17	0.33	0.55	1.00	0.46	0.37	0.49
SAT510_3	0.01	0.00	0.25	0.36	0.46	1.00	0.34	0.53
SAT510_4	0.18	0.20	0.28	0.40	0.37	0.34	1.00	0.43
SAT510_5	0.04	0.06	0.21	0.37	0.49	0.53	0.43	1.00
SAT511_1	0.30	0.29	0.20	0.09	0.04	0.07	0.04	0.03
SAT511_2	0.36	0.35	0.19	0.11	0.03	-0.01	0.07	-0.01
SAT511_3	0.39	0.35	0.19	0.15	0.07	-0.02	0.11	0.01
SAT511_4	0.28	0.29	0.30	0.23	0.23	0.14	0.22	0.20
SAT511_5	0.43	0.40	0.29	0.10	0.07	0.05	0.10	0.03
SAT512_1	0.17	0.18	0.29	0.28	0.24	0.26	0.30	0.25
SAT512_2	0.25	0.23	0.37	0.32	0.30	0.28	0.30	0.30
SAT512_3	0.27	0.29	0.43	0.37	0.35	0.30	0.35	0.30
SAT512_4	0.17	0.19	0.34	0.31	0.25	0.20	0.28	0.23
SAT512_5	0.28	0.29	0.33	0.29	0.22	0.16	0.26	0.15

(cont)

	SAT511_3	SAT511_4	SAT511_5	SAT512_1	SAT512_2	SAT512_3	SAT512_4	SAT512_5
SAT51_1	0.26	0.37	0.26	0.34	0.34	0.35	0.33	0.32
SAT51_2	0.25	0.38	0.27	0.32	0.30	0.31	0.26	0.33
SAT51_3	0.19	0.33	0.19	0.30	0.27	0.30	0.25	0.26
SAT51_4	0.28	0.22	0.28	0.13	0.15	0.17	0.18	0.16
SAT51_5	0.20	0.26	0.22	0.18	0.21	0.24	0.20	0.19
SAT51_6	0.11	0.24	0.11	0.30	0.27	0.31	0.27	0.21
SAT52_1	0.06	0.11	0.07	0.27	0.22	0.22	0.23	0.18
SAT52_2	0.08	0.13	0.11	0.22	0.21	0.23	0.20	0.22
SAT52_3	0.06	0.07	0.08	0.22	0.20	0.22	0.21	0.21
SAT53_1	0.09	0.21	0.12	0.40	0.36	0.35	0.36	0.27
SAT53_2	0.11	0.17	0.11	0.33	0.45	0.39	0.34	0.28
SAT53_3	0.17	0.21	0.15	0.50	0.38	0.41	0.44	0.34
SAT53_4	0.14	0.22	0.17	0.22	0.19	0.26	0.25	0.27
SAT53_5	0.13	0.24	0.14	0.34	0.31	0.35	0.30	0.27
SAT53_6	0.03	0.24	0.06	0.38	0.34	0.37	0.30	0.28
SAT54_1	-0.03	0.10	0.00	0.30	0.27	0.24	0.22	0.16
SAT54_2	-0.03	0.12	-0.01	0.29	0.27	0.24	0.21	0.17
SAT54_3	-0.03	0.09	0.00	0.29	0.26	0.24	0.22	0.18
SAT54_4	0.04	0.12	0.02	0.24	0.25	0.24	0.18	0.20
SAT55_1	0.02	0.08	0.10	0.13	0.13	0.22	0.22	0.15
SAT55_2	0.09	0.09	0.14	0.15	0.16	0.25	0.24	0.18
SAT55_3	0.14	0.15	0.17	0.25	0.27	0.34	0.34	0.27
SAT55_4	0.14	0.13	0.15	0.19	0.21	0.27	0.27	0.22
SAT56_1	0.01	0.16	0.04	0.41	0.31	0.34	0.35	0.24
SAT56_2	0.07	0.20	0.09	0.28	0.25	0.30	0.28	0.24
SAT57_1	0.10	0.23	0.08	0.34	0.30	0.33	0.35	0.27
SAT57_2	0.06	0.18	0.09	0.31	0.29	0.33	0.34	0.24
SAT58_1	0.20	0.19	0.29	0.31	0.49	0.46	0.40	0.36
SAT58_2	0.22	0.19	0.27	0.27	0.43	0.46	0.35	0.36
SAT58_3	0.26	0.22	0.29	0.30	0.44	0.45	0.41	0.42

SAT59_1	0.39	0.28	0.43	0.17	0.25	0.27	0.17	0.28
SAT59_2	0.35	0.29	0.40	0.18	0.23	0.29	0.19	0.29
SAT59_3	0.19	0.30	0.29	0.29	0.37	0.43	0.34	0.33
SAT510_1	0.15	0.23	0.10	0.28	0.32	0.37	0.31	0.29
SAT510_2	0.07	0.23	0.07	0.24	0.30	0.35	0.25	0.22
SAT510_3	-0.02	0.14	0.05	0.26	0.28	0.30	0.20	0.16
SAT510_4	0.11	0.22	0.10	0.30	0.30	0.35	0.28	0.26
SAT510_5	0.01	0.20	0.03	0.25	0.30	0.30	0.23	0.15
SAT511_1	0.65	0.38	0.54	0.16	0.15	0.17	0.19	0.27
SAT511_2	0.54	0.39	0.47	0.16	0.18	0.21	0.25	0.39
SAT511_3	1.00	0.52	0.63	0.18	0.17	0.19	0.20	0.33
SAT511_4	0.52	1.00	0.46	0.26	0.29	0.30	0.26	0.38
SAT511_5	0.63	0.46	1.00	0.17	0.23	0.24	0.22	0.33
SAT512_1	0.18	0.26	0.17	1.00	0.62	0.61	0.63	0.44
SAT512_2	0.17	0.29	0.23	0.62	1.00	0.77	0.60	0.50
SAT512_3	0.19	0.30	0.24	0.61	0.77	1.00	0.68	0.58
SAT512_4	0.20	0.26	0.22	0.63	0.60	0.68	1.00	0.56
SAT512_5	0.33	0.38	0.33	0.44	0.50	0.58	0.56	1.00



Extraction: Principal components

		% total	Cumul.	Cumul.
	Eigenval	Variance	Eigenval	%
1	11.8036128	24.59086	11.8036128	24.59086
2	4.432488709	9.234351477	16.23610151	33.82521147
3	2.760503106	5.751048137	18.99660461	39.57625961
4	2.381079658	4.960582622	21.37768427	44.53684223
5	2.086322316	4.346504825	23.46400659	48.88334706
6	2.015832196	4.199650409	25.47983878	53.08299747
7	1.647247783	3.431766214	27.12708657	56.51476368
8	1.479657588	3.082619975	28.60674416	59.59738366
9	1.231138067	2.564870973	29.83788222	62.16225463
10	1.200845329	2.501761101	31.03872755	64.66401573
11	1.106247999	2.304683331	32.14497555	66.96869906

Factor Loadings (Varimax normalized)
(jemsrubin2.sta)

Extraction: Principal components

(Marked loadings are > .700000)

	Factor	Factor	Factor	Factor	Factor	Factor	Factor	Factor	Factor	Factor	Factor
	1	2	3	4	5	6	7	8	9	10	11
SAT51_1	0.060809955	0.13798505	0.131973348	0.068442033	0.042831611	0.022037522	0.746203445	0.126285476	0.240971994	0.07615175	0.124053431
SAT51_2	0.126302467	0.118689897	0.050158886	0.094633367	0.042403467	0.047344541	0.764310523	0.119543202	0.174555274	0.140485168	0.031403821
SAT51_3	0.139948927	0.099849685	0.065451074	0.110773836	-0.10452875	0.127848781	0.678755762	0.18929908	0.184474013	0.052822751	-0.010919189
SAT51_4	0.060011122	0.227296083	0.103211304	-0.003277208	0.202614619	0.01115245	0.623113171	-0.073380169	-0.088715153	0.001173383	0.048192669
SAT51_5	0.174956378	0.153920513	-0.008549186	0.054954734	0.308069187	0.203482079	0.491341375	-0.113391683	-0.06165637	0.042013249	0.016437236
SAT51_6	0.127045842	0.031806661	0.08698058	0.18027279	-0.00614495	0.108557356	0.450501539	0.267832168	0.140434903	0.053020754	0.055024256
SAT52_1	0.10701362	-0.017447372	0.043734006	0.146570079	0.037010122	0.810102739	0.168445721	0.10601733	0.112167166	0.008640669	0.030577308
SAT52_2	0.061295637	0.054764021	0.058649129	0.09316405	0.016256892	0.911830799	0.106438862	0.123825233	0.080429612	0.029549895	0.065416997
SAT52_3	0.069200632	0.024536189	0.096959764	0.132867831	0.025037649	0.888307716	0.04298366	0.05400099	0.090632021	0.001521675	0.108958264
SAT53_1	0.588812968	0.080268659	0.031982451	0.157001873	-0.00153663	0.100259912	0.184133894	0.133715639	0.244138315	-0.098765014	0.150556379
SAT53_2	0.484691791	0.045531349	-0.093854842	0.096934372	0.359788989	0.059105807	0.062397373	0.161842143	0.261416042	-0.110323442	-0.024291377
SAT53_3	0.590402682	0.11333407	0.119136509	0.057178629	0.103826283	0.003495013	0.124589103	0.061847561	0.345024087	-0.113327294	0.093084811
SAT53_4	0.444688141	0.142654549	0.144927438	0.041028341	0.06480626	0.035800572	-0.003324502	0.055200994	0.082060465	0.21975823	0.005364657
SAT53_5	0.72697099	0.016872544	0.093786631	0.088490392	0.108365268	0.059861129	0.133583455	0.199247415	0.076488829	0.133973598	-0.046665717
SAT53_6	0.618149873	-0.085986557	-0.030639515	0.13014919	0.048226048	0.086772997	0.174958588	0.267627859	0.136172018	0.152855096	0.135107049
SAT54_1	0.151234228	-0.064442711	0.037150822	0.816119056	0.024827507	0.14034197	0.13469707	0.176694508	0.092440321	0.051509792	-0.010600392
SAT54_2	0.114893613	-0.029774157	0.044430246	0.894182563	0.042842363	0.083033882	0.103200768	0.170817548	0.09551198	-0.013724565	0.046645764
SAT54_3	0.141805365	-0.023784406	0.00514925	0.894158053	0.055185254	0.104214278	0.116132243	0.134681555	0.085185986	-0.026623372	0.086985225
SAT54_4	0.12634649	0.031112532	-0.021601264	0.78266221	0.06225379	0.079814769	0.01910215	0.155161386	0.085408775	0.051897584	0.088503711
SAT55_1	0.107942042	0.01231378	0.815957657	0.020667278	0.001068929	0.009080368	0.040968108	0.042473278	0.045976142	0.044085266	0.046365815

SAT55_2	0.066454588	0.033030458	0.898081647	0.006815811	0.126501345	0.037531991	0.10270258	0.021381599	0.02952703	0.111625853	0.023476583
SAT55_3	0.094348272	0.06285363	0.831789672	0.013184236	0.115568924	0.073845197	0.122643406	0.092269834	0.163709727	0.090965282	0.021214443
SAT55_4	0.059233128	0.072236215	0.840909453	0.008704018	0.125396452	0.083312374	0.06274602	0.033481571	0.103797894	0.123238688	-0.009906516
SAT56_1	0.56921554	-0.045908913	0.10591448	0.16356917	-0.073132456	0.110923905	0.096893384	0.17335429	0.167967462	0.029036708	0.407066466
SAT56_2	0.598948991	0.057461213	0.168267063	0.152121298	0.021639936	-0.016618143	0.061367287	0.063618951	0.03486453	0.032633124	0.389847965
SAT57_1	0.28237526	0.036477174	-0.019783872	0.069700729	0.09251857	0.093725581	0.107678858	0.179631201	0.163620161	-0.017864907	0.810127521
SAT57_2	0.139490923	0.012083496	0.04931124	0.082453473	0.042697398	0.114494334	0.073516835	0.191435275	0.173209123	0.026167925	0.834874015
SAT58_1	0.089913356	0.111816076	0.146409857	0.053250318	0.796465043	0.029879519	0.11221884	0.070350368	0.235656814	0.106051961	0.04629845
SAT58_2	0.0773605	0.140809623	0.101699939	0.050114324	0.819078582	0.037501415	0.037535535	0.107226116	0.183806645	0.096514093	0.029252595
SAT58_3	0.073206962	0.156865428	0.166664542	0.052600003	0.792683393	-0.020304553	0.085314436	0.03912563	0.231299723	0.153037517	0.045967326
SAT59_1	0.086716102	0.311701683	0.16964169	-0.016371798	0.168308485	-0.00157035	0.134599504	-0.026831431	0.037208303	0.730329325	-0.028849583
SAT59_2	0.050104667	0.276148431	0.156696327	-0.001205022	0.093359905	-0.009787886	0.150021471	0.020220451	0.075200206	0.809851908	-0.035777411
SAT59_3	0.083703505	0.119183619	0.120878603	0.096330218	0.119903602	0.064570726	0.041994231	0.292458718	0.244239591	0.613454319	0.105880523
SAT510_1	0.08937389	0.060149857	0.154541883	0.251999818	0.025741461	-0.017354445	0.110646875	0.583879214	0.196583143	0.247747307	0.04940224
SAT510_2	0.119692519	0.008767315	0.028040054	0.149822069	0.086331087	0.064371183	0.114560243	0.73371389	0.098123274	0.141479031	0.056362745
SAT510_3	0.14897114	0.016002564	-0.040031012	0.135060558	0.072645497	0.129063473	0.074614976	0.708706529	0.091909633	-0.106052209	0.118653131
SAT510_4	0.27274139	0.035754139	0.330232594	0.117874311	0.012974374	0.06333042	0.117042492	0.513581372	0.115345168	0.108686958	0.02583512
SAT510_5	0.230031424	0.017438225	-0.0046	0.134932118	0.053024829	0.078026094	0.031180736	0.714054129	0.041477401	-0.055979907	0.193904063
SAT511_1	-0.001454946	0.823847204	0.058818765	0.00439401	0.090011856	-0.038670586	0.092570341	0.034245568	0.05825008	-0.001640022	-0.028772757
SAT511_2	0.012930458	0.742500026	0.033955051	-0.012674118	0.055619063	0.039575992	0.042967478	-0.053143122	0.161579227	0.13808936	-0.004332598
SAT511_3	0.043385989	0.835571055	0.024570416	-0.036917632	0.084379927	0.018835956	0.143076311	0.014137679	0.056533421	0.114709803	0.002062176
SAT511_4	0.164722466	0.568735861	-0.002131676	0.012863143	0.000228214	-0.00119585	0.294073066	0.197468598	0.141160508	0.145685705	0.088243966
SAT511_5	0.052630022	0.715327732	0.050627583	-0.041475199	0.171293527	0.052690904	0.149058583	-0.003198848	0.051992578	0.231698294	0.033782257

SAT512_1	0.296713225	0.0837264	0.065435429	0.155061593	0.054009365	0.097916778	0.17029681	0.08937771	0.712803819	0.032619626	0.09700881
SAT512_2	0.188089541	0.066996044	0.039456024	0.118402781	0.323102642	0.077966302	0.139794232	0.19601319	0.698946179	0.117269839	0.058513767
SAT512_3	0.202232063	0.08524389	0.137518022	0.080367802	0.292300344	0.083255672	0.137896602	0.221487958	0.70668655	0.169802093	0.103969367
SAT512_4	0.198958595	0.142100065	0.1831501	0.077387052	0.180726159	0.081836157	0.107339309	0.079438593	0.735249845	0.025824677	0.170188214
SAT512_5	0.162297265	0.332599534	0.092963091	0.076198618	0.175824441	0.106186329	0.100505575	0.059127029	0.579283164	0.163140893	0.086918441
Expl.Var	3.501160976	3.359663871	3.367133712	3.326692571	2.687344317	2.552256642	3.019717912	2.973597655	3.327083196	2.100458902	1.929865796
Prp.Totl	0.072940854	0.069992997	0.070148619	0.069306095	0.05598634	0.053172013	0.06291079	0.061949951	0.069314233	0.04375956	0.040205537

APPENDIX E

The reconstituted scales

University of Cape Town

Original constructs

3. Management Strategy

3.1 Education

3.1.1 Clinical Practice Guidelines

Summary for scale: Mean=23.8388 Std.Dv.=3.60555 Valid N:577

Cronbach alpha: .706094 Standardized alpha: .701868

Average inter-item corr.: .198924

	Mean if deleted	Var. if deleted	Stdv. if deleted	Itm-Totl Correl.	Alpha if deleted
ED311_1	21.86482	10.58831	3.253968	0.558158	0.656751
ED311_2	21.51646	10.81472	3.288574	0.422116	0.674744
ED311_3B	21.44021	9.847812	3.138122	0.522435	0.652765
ED311_4B	21.25997	9.970546	3.157617	0.555787	0.648477
ED311_5	21.61699	10.26751	3.204296	0.578693	0.649525
ED311_6B	21.14731	10.701	3.271239	0.350622	0.686548
ED311_7B	21.2253	9.751664	3.122766	0.522251	0.652207
ED311_8	21.87002	13.70061	3.701433	-0.24071	0.768646
ED311_9	21.29116	11.99841	3.463873	0.111913	0.724185
ED311_10	21.31716	10.90981	3.303	0.351964	0.685806

Factors - no Cronbach's alpha for 1 or 2 item factors

3 Management Strategy

3.1 Education

Factor 1 - Perception of Clinical practice guidelines

Summary for scale: Mean=12.5025 Std.Dv.=2.66447 Valid N:597

Cronbach alpha: .774748 Standardized alpha: .774258

Average inter-item corr.: .411935

	Mean if deleted	Var. if deleted	Stdv. if deleted	Itm-Totl Correl.	Alpha if deleted
ED311_3B	10.1005	4.613015	2.147793	0.566839	0.726593
ED311_4B	9.927973	4.696655	2.167177	0.608468	0.712868
ED311_5	10.27806	5.339769	2.310794	0.471876	0.757477
ED311_6B	9.81072	4.994324	2.234798	0.450229	0.766554
ED311_7B	9.892797	4.313466	2.076889	0.650375	0.695096

3.12 Continuing Medical Education Programs

Summary for scale: Mean=12.0608 Std.Dv.=2.23637 Valid N:592

Cronbach alpha: .623524 Standardized alpha: .654290

Average inter-item corr.: .261745

	Mean if deleted	Var. if deleted	StDv. if deleted	Itm-Totl Correl.	Alpha if deleted
ED312_1	10.43919	3.43887	1.854419	0.561465	0.501699
ED312_2	10.04899	3.47226	1.863401	0.455267	0.537886
ED312_3	10.25169	3.30321	1.817473	0.631723	0.472364
ED312_4B	10.11487	3.74694	1.935702	0.386084	0.568311
ED312_5B	10.14189	3.53054	1.878974	0.438334	0.545569
ED312_6	9.307432	4.878458	2.208723	-0.12929	0.771316

Factor 2 - Perceptions of continuing medical education programs

Summary for scale: Mean=5.45156 Std.Dv.=1.52437 Valid N:609

Cronbach alpha: .794623 Standardized alpha: .797179

Average inter-item corr.: .569125

	Mean if deleted	Var. if deleted	StDv. if deleted	Itm-Totl Correl.	Alpha if deleted
ED312_1	3.825944	1.194663	1.093007	0.622808	0.736195
ED312_2	3.43514	1.0898	1.043935	0.603361	0.762837
ED312_3	3.642036	1.126377	1.061309	0.693081	0.663264

Factor 3 - Impact of CME

ED312_4B

ED312_5B

Factor 6 - Use of educational strategies

ED311_8

ED312_6

Factor 4 - Educational strategies and practice patterns

ED311_9

ED313_6

3.1.3 Opinion leaders such as academics and specialists are:

Summary for scale: Mean=13.5000 Std.Dv.=1.68084 Valid N:596

Cronbach alpha: .214297 Standardized alpha: .278028

Average inter-item corr.: .061659

	Mean if deleted	Var. if deleted	Stdv. if deleted	Itm-Totl Correl.	Alpha if deleted
ED313_1	11.60235	2.048249	1.431171	0.279224	0.031444
ED313_2B	11.18624	2.067663	1.437937	0.173574	0.107367
ED313_3B	11.37416	2.103292	1.450273	0.24399	0.062142
ED313_4	10.93121	3.020435	1.73794	-0.28688	0.505195
ED313_5B	11.36913	2.159047	1.46937	0.191716	0.102754
ED313_6	11.03691	2.19998	1.483233	0.117764	0.160704

3.2 Feedback

3.2.1 Feedback about my clinical practice patterns:

Summary for scale: Mean=10.6374 Std.Dv.=1.72274 Valid N:604

Cronbach alpha: .286703 Standardized alpha: .294347

Average inter-item corr.: .129838

	Mean if deleted	Var. if deleted	Stdv. if deleted	Itm-Totl Correl.	Alpha if deleted
FDB321_1	7.854305	2.637713	1.624104	-0.12402	0.547004
FDB321_2	8.05298	2.219048	1.489647	0.137436	0.241977
FDB3213B	7.956954	1.74318	1.320295	0.306773	0.010581
FDB3214B	8.048014	1.651668	1.285172	0.344489	0

Factor 5 Perceptions of opinion Leaders

Summary for scale: Mean=8.45977 Std.Dv.=1.56507 Valid N:609

Cronbach alpha: .571052 Standardized alpha: .575946

Average inter-item corr.: .256338

	Mean if deleted	Var. if deleted	Stdv. if deleted	Itm-Totl Correl.	Alpha if deleted
ED313_1	6.561576	1.707621	1.30676	0.281121	0.554167
ED313_2B	6.147783	1.564367	1.250747	0.282926	0.563651
ED313_3B	6.338259	1.544037	1.242593	0.408843	0.456066
ED313_5B	6.331691	1.472904	1.213632	0.458393	0.414014

3.2 Feedback

Factor 1 - Perceptions of feedback

FDB3213B

FDB3214B

3.3 Administrative Interventions

3.3.1 Utilisation Review

Summary for scale: Mean=19.1310 Std.Dv.=2.99941 Valid N:588

Cronbach alpha: .724025 Standardized alpha: .713239

Average inter-item corr.: .295875

	Mean if deleted	Var. if deleted	StDv. if deleted	Itm-Totl Correl.	Alpha if deleted
ADM331_1	16.86735	8.985805	2.997633	-0.11169	0.803575
ADM331_2	16.56803	6.850815	2.617406	0.470203	0.683766
ADM331_3	16.57143	7.537415	2.745435	0.298623	0.721651
ADM3314B	16.03912	6.707654	2.589914	0.506918	0.674686
ADM3315B	16.18707	6.148676	2.479652	0.663287	0.632939
ADM3316B	16.20238	5.940335	2.43728	0.692713	0.621933
ADM3317B	16.35034	6.142568	2.47842	0.593474	0.648838

3.3.2 Authorisation Systems

Summary for scale: Mean=19.6071 Std.Dv.=2.93027 Valid N:588

Cronbach alpha: .662644 Standardized alpha: .636481

Average inter-item corr.: .232430

	Mean if deleted	Var. if deleted	StDv. if deleted	Itm-Totl Correl.	Alpha if deleted
ADM332_1	17.78231	9.013837	3.002305	-0.22243	0.755666
ADM332_2	16.98809	6.358702	2.521647	0.397198	0.619462
ADM332_3	17.02381	7.506236	2.739751	0.133452	0.693056
ADM3324B	16.23639	6.483233	2.546219	0.47332	0.599296
ADM3325B	16.45748	5.809416	2.410273	0.63136	0.54566
ADM3326B	16.4898	5.603638	2.3672	0.6803	0.526756
ADM3327B	16.66497	5.787412	2.405704	0.567063	0.561933

3.3 Administrative Interventions

Factor 5 - Perceptions of Utilisation Review

Summary for scale: Mean=8.66667 Std.Dv.=1.98935 Valid N:597

Cronbach alpha: .882321 Standardized alpha: .883805

Average inter-item corr.: .728409

	Mean if deleted	Var. if deleted	StDv. if deleted	Itm-Totl Correl.	Alpha if deleted
ADM3315B	5.718593	1.887309	1.373794	0.802816	0.807381
ADM3316B	5.733668	1.783339	1.335417	0.827241	0.782803
ADM3317B	5.881072	1.907129	1.380988	0.691753	0.906141

Factor 3 - Impact of administrative interventions on clinical practice

ADM331_3

ADM332_3

Factor 1 - Perceptions of authorisation systems

Summary for scale: Mean=9.21818 Std.Dv.=2.03007 Valid N:605

Cronbach alpha: .876028 Standardized alpha: .877436

Average inter-item corr.: .709644

	Mean if deleted	Var. if deleted	StDv. if deleted	Itm-Totl Correl.	Alpha if deleted
ADM3325B	6.067769	1.990449	1.410833	0.770602	0.817246
ADM3326B	6.095868	1.898247	1.377769	0.810855	0.780062
ADM3327B	6.272727	1.93719	1.39183	0.706884	0.876687

Factor 7 - Use of Administrative interventions

ADM331_1

ADM332_1

University of Cape Town

3.3.3 Peer Review

Summary for scale: Mean=14.3691 Std.Dv.=2.57421 Valid N:596

Cronbach alpha: .676686 Standardized alpha: .679086

Average inter-item corr.: .271453

	Mean if deleted	Var. if deleted	Stdv. if deleted	Item-Totl Correl.	Alpha if deleted
ADM333_1	11.89933	4.540201	2.130775	0.443684	0.62223
ADM333_2	11.65604	4.957195	2.226476	0.377276	0.645202
ADM3333B	12.12752	5.070988	2.251885	0.397787	0.638619
ADM333_4	12.1443	4.969112	2.229151	0.448983	0.622989
ADM3335B	11.83389	5.195563	2.279378	0.279183	0.678731
ADM333_6	12.18456	4.613587	2.147926	0.506096	0.600049

3.4 Participative Management

3.4.1 How well informed are you about:

PM341_1

PM341_2

Factor 2 - Impact of Peer Review

ADM333_4

ADM333_6

Factor 4 - Participation in Peer Review

ADM333_1

ADM333_2

Factor 6 - Perceptions of Peer Review

ADM3333B

ADM3335B

3.4 Participative Management

Factor 2 - Awareness of outcomes

PM341_1

PM341_2

3.4.2 How frequently do you personally participate in each activity

Summary for scale: Mean=14.9877 Std.Dv.=7.05476 Valid N:570

Cronbach alpha: .942617 Standardized alpha: .944920

Average inter-item corr.: .723746

	Mean if deleted	Var. if deleted	StDv. if deleted	Itm-Totl Correl.	Alpha if deleted
PM342_1	12.59298	36.52206	6.043348	0.716116	0.943702
PM342_2	12.65439	35.39459	5.949335	0.825654	0.932592
PM342_3	12.82281	35.67562	5.972907	0.857633	0.92926
PM342_4	13.00526	36.74208	6.061524	0.887308	0.927339
PM342_5	13.05088	36.92899	6.076923	0.874159	0.928485
PM342_6	12.77544	37.73203	6.14264	0.790822	0.935357
PM342_7	13.02456	38.95729	6.241578	0.753514	0.93865

Factor 1 - Participation in decision making

Summary for scale: Mean=14.9877 Std.Dv.=7.05476 Valid N:570

Cronbach alpha: .942617 Standardized alpha: .944920

Average inter-item corr.: .723746

	Mean if deleted	Var. if deleted	StDv. if deleted	Itm-Totl Correl.	Alpha if deleted
PM342_1	12.59298	36.52206	6.043348	0.716116	0.943702
PM342_2	12.65439	35.39459	5.949335	0.825654	0.932592
PM342_3	12.82281	35.67562	5.972907	0.857633	0.92926
PM342_4	13.00526	36.74208	6.061524	0.887308	0.927339
PM342_5	13.05088	36.92899	6.076923	0.874159	0.928485
PM342_6	12.77544	37.73203	6.14264	0.790822	0.935357
PM342_7	13.02456	38.95729	6.241578	0.753514	0.93865

4 Clinical Freedom

4.2 In your practice you have the freedom to:

Summary for scale: Mean=22.9715 Std.Dv.=4.57754 Valid N:597

Cronbach alpha: .766757 Standardized alpha: .784939

Average inter-item corr.: .253365

	Mean if deleted	Var. if deleted	Stdv. if deleted	Itm-Totl Correl.	Alpha if deleted
FRE42_1	20.68509	17.81038	4.220235	0.239857	0.780754
FRE42_2	21.1139	18.10428	4.254912	0.409731	0.750227
FRE42_3	21.1407	17.7859	4.217333	0.440011	0.746593
FRE42_4	20.68677	17.06939	4.131512	0.445005	0.74565
FRE42_5	20.89447	17.36742	4.167424	0.536929	0.735939
FRE42_6	21.27136	17.85937	4.226034	0.561582	0.737402
FRE42_7	20.32998	17.96649	4.238689	0.360434	0.755994
FRE42_8	20.81407	18.19826	4.265942	0.304097	0.763371
FRE42_9	20.81072	17.37623	4.168481	0.491987	0.740211
FRE42_10	20.88945	17.48527	4.181539	0.420023	0.748742
FRE42_11	21.07873	17.58342	4.193258	0.552916	0.735963

4 Clinical Freedom

4.2 In your practice you have the freedom to:

Summary for scale: Mean=10.5351 Std.Dv.=2.53180 Valid N:598

Cronbach alpha: .738173 Standardized alpha: .745226

Average inter-item corr.: .373248

	Mean if deleted	Var. if deleted	Stdv. if deleted	Itm-Totl Correl.	Alpha if deleted
FRE42_3	8.704014	4.506037	2.122743	0.462847	0.706417
FRE42_4	8.250836	3.843436	1.960468	0.550524	0.674757
FRE42_5	8.458194	4.248252	2.061129	0.592518	0.659201
FRE42_6	8.834448	4.773595	2.184856	0.516004	0.693669
FRE42_7	7.892977	4.44674	2.108729	0.417723	0.725874

Factor 2 - Patient care

FRE42_8

FRE42_9

Factor 3 - Patient choice

FRE42_1

5 Satisfaction

5.1 Clinical Freedom

Summary for scale: Mean=12.7517 Std.Dv.=3.28461 Valid N:576

Cronbach alpha: .788243 Standardized alpha: .786335

Average inter-item corr.: .391134

	Mean if deleted	Var. if deleted	StDv. if deleted	Itm-Totl Correl.	Alpha if deleted
SAT51_1	10.74306	7.180508	2.679647	0.659232	0.724834
SAT51_2	10.56771	7.123888	2.669061	0.665364	0.722956
SAT51_3	10.93403	7.721343	2.77873	0.593988	0.743323
SAT51_4	10.44618	8.104742	2.846883	0.461259	0.774351
SAT51_5	10.25868	8.195237	2.862732	0.426875	0.782714
SAT51_6	10.80903	8.44964	2.906826	0.432178	0.779611

5.2 Relationship with my colleagues

Summary for scale: Mean=5.05272 Std.Dv.=2.04016 Valid N:607

Cronbach alpha: .892424 Standardized alpha: .893496

Average inter-item corr.: .744354

	Mean if deleted	Var. if deleted	StDv. if deleted	Itm-Totl Correl.	Alpha if deleted
SAT52_1	3.514003	2.249804	1.499935	0.723975	0.903329
SAT52_2	3.341021	1.826044	1.351312	0.848933	0.792653
SAT52_3	3.250412	1.762665	1.327654	0.810954	0.830984

5 Satisfaction

Factor 7 - Clinical freedom

Summary for scale: Mean=10.2155 Std.Dv.=2.86469 Valid N:594

Cronbach alpha: .780296 Standardized alpha: .777422

Average inter-item corr.: .424581

	Mean if deleted	Var. if deleted	StDv. if deleted	Itm-Totl Correl.	Alpha if deleted
SAT51_1	8.210438	5.021372	2.240842	0.675304	0.696042
SAT51_2	8.042088	4.939306	2.222455	0.689997	0.690068
SAT51_3	8.40404	5.466382	2.338029	0.618718	0.719136
SAT51_4	7.920876	6.035826	2.456792	0.398028	0.789935
SAT51_6	8.284512	6.193463	2.488667	0.4084	0.783733

Factor 6 - Relationship with colleagues

Summary for scale: Mean=5.05272 Std.Dv.=2.04016 Valid N:607

Cronbach alpha: .892424 Standardized alpha: .893496

Average inter-item corr.: .744354

	Mean if deleted	Var. if deleted	StDv. if deleted	Itm-Totl Correl.	Alpha if deleted
SAT52_1	3.514003	2.249804	1.499935	0.723975	0.903329
SAT52_2	3.341021	1.826044	1.351312	0.848933	0.792653
SAT52_3	3.250412	1.762665	1.327654	0.810954	0.830984

5.3 Patient care

Summary for scale: Mean=11.6595 Std.Dv.=2.76151 Valid N:602

Cronbach alpha: .753685 Standardized alpha: .763339

Average inter-item corr.: .355220

	Mean if deleted	Var. if deleted	StDv. if deleted	Itm-Totl Correl.	Alpha if deleted
SAT53_1	10.26578	5.91275	2.431615	0.544937	0.711674
SAT53_2	9.559801	5.209879	2.282516	0.46117	0.732438
SAT53_3	9.908638	5.305607	2.30339	0.515069	0.712269
SAT53_4	8.953488	6.080893	2.465947	0.318413	0.763186
SAT53_5	9.818937	5.41406	2.326813	0.618932	0.687016
SAT53_6	9.790698	5.361508	2.315493	0.564728	0.698515

5.4 Relationship with staff

Summary for scale: Mean=6.38715 Std.Dv.=2.23238 Valid N:607

Cronbach alpha: .912196 Standardized alpha: .915593

Average inter-item corr.: .745184

	Mean if deleted	Var. if deleted	StDv. if deleted	Itm-Totl Correl.	Alpha if deleted
SAT54_1	4.92257	3.043428	1.744542	0.775464	0.89517
SAT54_2	4.830313	2.83941	1.685055	0.869125	0.862852
SAT54_3	4.825371	2.783343	1.668335	0.878851	0.85858
SAT54_4	4.583196	2.855929	1.689949	0.699507	0.927004

Factor 1 - Patient care

Summary for scale: Mean=7.80929 Std.Dv.=1.81772 Valid N:603

Cronbach alpha: .684278 Standardized alpha: .689223

Average inter-item corr.: .367735

	Mean if deleted	Var. if deleted	StDv. if deleted	Itm-Totl Correl.	Alpha if deleted
SAT53_1	6.416252	2.302688	1.517461	0.438801	0.639648
SAT53_4	5.102819	2.258085	1.502693	0.282605	0.740741
SAT53_5	5.968491	1.864679	1.365532	0.608584	0.524086
SAT53_6	5.940299	1.77753	1.333241	0.580316	0.537722

Factor 4 - Relationship with staff

Summary for scale: Mean=6.38715 Std.Dv.=2.23238 Valid N:607

Cronbach alpha: .912196 Standardized alpha: .915593

Average inter-item corr.: .745184

	Mean if deleted	Var. if deleted	StDv. if deleted	Itm-Totl Correl.	Alpha if deleted
SAT54_1	4.92257	3.043428	1.744542	0.775464	0.89517
SAT54_2	4.830313	2.83941	1.685055	0.869125	0.862852
SAT54_3	4.825371	2.783343	1.668335	0.878851	0.85858
SAT54_4	4.583196	2.855929	1.689949	0.699507	0.927004

5.5 Personal time

Summary for scale: Mean=9.24262 Std.Dv.=3.19742 Valid N:610

Cronbach alpha: .903041 Standardized alpha: .904394

Average inter-item corr.: .709066

	Mean if deleted	Var. if deleted	StDv. if deleted	Itm-Totl Correl.	Alpha if deleted
SAT55_1	7.145902	6.393467	2.528531	0.708902	0.900008
SAT55_2	6.785246	5.283389	2.298562	0.85832	0.846597
SAT55_3	7.040984	6.360615	2.522026	0.79197	0.874836
SAT55_4	6.755738	5.669844	2.381143	0.790543	0.872485

Factor 3 - Personal Time

Summary for scale: Mean=9.24262 Std.Dv.=3.19742 Valid N:610

Cronbach alpha: .903041 Standardized alpha: .904394

Average inter-item corr.: .709066

	Mean if deleted	Var. if deleted	StDv. if deleted	Itm-Totl Correl.	Alpha if deleted
SAT55_1	7.145902	6.393467	2.528531	0.708902	0.900008
SAT55_2	6.785246	5.283389	2.298562	0.85832	0.846597
SAT55_3	7.040984	6.360615	2.522026	0.79197	0.874836
SAT55_4	6.755738	5.669844	2.381143	0.790543	0.872485

5.6 Relationship with patients

SAT56_1

SAT56_2

Factor 11 community

SAT57_1

SAT57_2

5.7 Community

SAT57_1

SAT57_2

5.8 Pay

Summary for scale: Mean=8.91225 Std.Dv.=2.30233 Valid N:604

Cronbach alpha: .883406 Standardized alpha: .883630

Average inter-item corr.: .717116

	Mean if deleted	Var. if deleted	StDv. if deleted	Itm-Totl Correl.	Alpha if deleted
SAT58_1	6.147351	2.443519	1.563176	0.766878	0.84099
SAT58_2	5.915563	2.580619	1.60643	0.764743	0.842742
SAT58_3	5.76159	2.443161	1.563061	0.789688	0.820048

Factor 5 - Pay

Summary for scale: Mean=8.91225 Std.Dv.=2.30233 Valid N:604

Cronbach alpha: .883406 Standardized alpha: .883630

Average inter-item corr.: .717116

	Mean if deleted	Var. if deleted	StDv. if deleted	Itm-Totl Correl.	Alpha if deleted
SAT58_1	6.147351	2.443519	1.563176	0.766878	0.84099
SAT58_2	5.915563	2.580619	1.60643	0.764743	0.842742
SAT58_3	5.76159	2.443161	1.563061	0.789688	0.820048

5.9 Administration

Summary for scale: Mean=8.61258 Std.Dv.=1.99475 Valid N:604

Cronbach alpha: .766793 Standardized alpha: .771343

Average inter-item corr.: .547261

	Mean if deleted	Var. if deleted	StDv. if deleted	Itm-Totl Correl.	Alpha if deleted
SAT59_1	5.478477	2.014437	1.419309	0.61803	0.667444
SAT59_2	5.635762	1.804416	1.343286	0.733195	0.533518
SAT59_3	6.110927	2.095311	1.447519	0.46847	0.837181

Factor 10 - Administration

Summary for scale: Mean=8.61258 Std.Dv.=1.99475 Valid N:604

Cronbach alpha: .766793 Standardized alpha: .771343

Average inter-item corr.: .547261

	Mean if deleted	Var. if deleted	StDv. if deleted	Itm-Totl Correl.	Alpha if deleted
SAT59_1	5.478477	2.014437	1.419309	0.61803	0.667444
SAT59_2	5.635762	1.804416	1.343286	0.733195	0.533518
SAT59_3	6.110927	2.095311	1.447519	0.46847	0.837181

5.10 Resources

Summary for scale: Mean=9.21710 Std.Dv.=2.43646 Valid N:608

Cronbach alpha: .783155 Standardized alpha: .784842

Average inter-item corr.: .424690

	Mean if deleted	Var. if deleted	Stdv. if deleted	Itm-Totl Correl.	Alpha if deleted
SAT510_1	7.202302	3.967298	1.991808	0.540507	0.749118
SAT510_2	7.307566	3.870864	1.967451	0.61456	0.723889
SAT510_3	7.483552	3.99315	1.998287	0.538623	0.749588
SAT510_4	7.294408	4.125495	2.031132	0.493135	0.764345
SAT510_5	7.580592	4.036268	2.009047	0.614477	0.726395

5.11 Current practice environment

Summary for scale: Mean=15.1450 Std.Dv.=3.00983 Valid N:600

Cronbach alpha: .835603 Standardized alpha: .838542

Average inter-item corr.: .514833

	Mean if deleted	Var. if deleted	Stdv. if deleted	Itm-Totl Correl.	Alpha if deleted
SAT511_1	12.15	6.000833	2.44966	0.667211	0.794165
SAT511_2	11.97667	6.199455	2.489871	0.604988	0.811086
SAT511_3	11.99833	5.811664	2.410739	0.748401	0.772068
SAT511_4	12.41	6.128567	2.475594	0.525719	0.836543
SAT511_5	12.045	5.989641	2.447374	0.655455	0.797244

Factor 8 - Resources

Summary for scale: Mean=7.29064 Std.Dv.=2.03326 Valid N:609

Cronbach alpha: .764299 Standardized alpha: .766144

Average inter-item corr.: .453559

	Mean if deleted	Var. if deleted	Stdv. if deleted	Itm-Totl Correl.	Alpha if deleted
SAT510_1	5.277504	2.525619	1.58922	0.513337	0.736561
SAT510_2	5.382595	2.390567	1.546146	0.626525	0.67381
SAT510_3	5.55665	2.506232	1.583108	0.535946	0.723788
SAT510_5	5.655172	2.593737	1.610508	0.585917	0.698855

Factor 2 - Current practice environment

Summary for scale: Mean=15.1450 Std.Dv.=3.00983 Valid N:600

Cronbach alpha: .835603 Standardized alpha: .838542

Average inter-item corr.: .514833

	Mean if deleted	Var. if deleted	Stdv. if deleted	Itm-Totl Correl.	Alpha if deleted
SAT511_1	12.15	6.000833	2.44966	0.667211	0.794165
SAT511_2	11.97667	6.199455	2.489871	0.604988	0.811086
SAT511_3	11.99833	5.811664	2.410739	0.748401	0.772068
SAT511_4	12.41	6.128567	2.475594	0.525719	0.836543
SAT511_5	12.045	5.989641	2.447374	0.655455	0.797244

5.12 Overall/My career

Summary for scale: Mean=11.2442 Std.Dv.=3.48025 Valid N:606

Cronbach alpha: .874315 Standardized alpha: .878955

Average inter-item corr.: .600114

	Mean if deleted	Var. if deleted	Stdv. if deleted	Itm-Totl Correl.	Alpha if deleted
SAT512_1	9.348185	8.266556	2.875162	0.662947	0.856929
SAT512_2	9.110561	8.250152	2.872308	0.744614	0.839907
SAT512_3	8.983499	7.907319	2.811996	0.803445	0.825367
SAT512_4	9.125413	7.443018	2.728189	0.740275	0.838802
SAT512_5	8.409241	8.043742	2.836149	0.596998	0.876296

Factor 9 - Overall/My career

Summary for scale: Mean=6.27348 Std.Dv.=2.21925 Valid N:607

Cronbach alpha: .836804 Standardized alpha: .839338

Average inter-item corr.: .636787

	Mean if deleted	Var. if deleted	Stdv. if deleted	Itm-Totl Correl.	Alpha if deleted
SAT512_1	4.378912	2.505519	1.582883	0.662546	0.808123
SAT512_3	4.01318	2.49406	1.579259	0.724063	0.754587
SAT512_4	4.15486	2.09134	1.446146	0.723139	0.755163

APPENDIX F

- 1. Chi square analysis and contingency tables**
- 2. Analysis of variance worksheets**

University of Cape Town

1.Chi square and contingency tables

Relationship between categorical variables

Gender x Practice type

2-Way Summary Table: Observed Frequencies (raw.sta)

	PRAC2_1B				Row
	GP	IPA	DC	NOA	Totals
Male	138	167	65	95	465
Female	39	24	14	23	100
Totals	177	191	79	118	565

2-Way Summary Table: Expected Frequencies (raw.sta)

	PRAC2_1B				Row
	GP	IPA	DC	NOA	Totals
Male	145.67	157.19	65.02	97.12	465
Female	31.33	33.81	13.98	20.88	100
Totals	177	191	79	118	565

Statistics: BIO1_1(2) x PRAC2_1B(4) (raw.sta)

	Chi-square	df	p
Pearson Chi-square	5.999203	df=3	p=.11166

Gender x Practice size

2-Way Summary Table: Observed Frequencies (raw.sta)

	PRAC2_2B				Row
	one	2-3	4-5	>6	Totals
Male	267	137	53	31	488
Female	49	45	2	11	107
Totals	316	182	55	42	595

2-Way Summary Table: Expected Frequencies (raw.sta)

	PRAC2_2B				Row
	one	2-3	4-5	>6	Totals
Male	259.17	149.27	45.11	34.45	488
Female	56.83	32.73	9.89	7.55	107
Totals	316	182	55	42	595

Statistics: BIO1_1(2) x PRAC2_2B(4) (raw.sta)

	Chi-square	df	p
Pearson Chi-square	16.51704	df=3	p=.00089

Age x Practice type

2-Way Summary Table: Observed Frequencies (raw.sta)

PRAC2_1B						Row
		GP	IPA	DC	NOA	Totals
	27-31	20	9	3	11	43
	32-36	23	28	9	12	72
	37-41	29	44	11	16	100
	42-46	34	46	18	16	114
	>47	71	64	39	60	234
	Totals	177	191	80	115	563

2-Way Summary Table: Expected Frequencies (raw.sta)

PRAC2_1B						Row
		GP	IPA	DC	NOA	Totals
	27-31	13.52	14.59	6.11	8.78	43
	32-36	22.64	24.43	10.23	14.71	72
	37-41	31.44	33.93	14.21	20.43	100
	42-46	35.84	38.67	16.20	23.29	114
	>47	73.57	79.39	33.25	47.80	234
	Totals	177	191	80	115	563

Statistics: B|O1_2B(5) x PRAC2_1B(4) (raw.sta)

	Chi-square	df	p
Pearson Chi-square	24.5731	df=12	p=.01699

Age x Practice size

2-Way Summary Table: Observed Frequencies (raw.sta)

PRAC2_2C				Row	
		one	2-3	4+	Totals
	27-31	24	19	7	50
	32-36	36	29	12	77
	37-41	64	26	15	105
	42-46	57	42	18	117
	>47	133	67	45	245
	Totals	314	183	97	594

2-Way Summary Table: Expected Frequencies (raw.sta)

	PRAC2_2C				Row
		one	2-3	4+	Totals
	27-31	26.43	15.40	8.16	50
	32-36	40.70	23.72	12.57	77
	37-41	55.51	32.35	17.15	105
	42-46	61.85	36.05	19.11	117
	>47	129.51	75.48	40.01	245
	Totals	314	183	97	594

Statistics: B|O1_2B(5) x PRAC2_2C(3) (raw.sta)

	Chi-square	df	p
Pearson Chi-square	8.885151	df=8	p=.35209

Population group x Practice type

2-Way Summary Table: Observed Frequencies (raw.sta)

Marked cells have counts > 10

	PRAC2_1B				Row
	GP	IPA	DC	NOA	Totals
White	143	103	43	68	357
Indian	25	50	19	31	125
African	7	26	12	10	55
Coloured	2	8	4	6	20
Totals	177	187	78	115	557

2-Way Summary Table: Expected Frequencies (raw.sta)

Marked cells have counts > 10

	PRAC2_1B				Row
	GP	IPA	DC	NOA	Totals
White	113.45	119.85	49.99	73.71	357.00
Indian	39.72	41.97	17.50	25.81	125.00
African	17.48	18.46	7.70	11.36	55.00
Coloured	6.36	6.71	2.80	4.13	20.00
Totals	177	187	78	115	557

Statistics: BIO1_3(4) x PRAC2_1B(4) (raw.sta)

Chi-square df p
 Pearson Chi-square 36.1647 df=9 p=.00004

Population group x Practice size

2-Way Summary Table: Observed Frequencies (raw.sta)

	PRAC2_2C			Row
	one	2-3	4+	Totals
White	158	137	85	380
Indian	90	32	6	128
African	42	10	5	57
Coloured	17	4	1	22
Totals	307	183	97	587

2-Way Summary Table: Expected Frequencies (raw.sta)

	PRAC2_2C			Row
	one	2-3	4+	Totals
White	198.74	118.47	62.79	380
Indian	66.94	39.90	21.15	128
African	29.81	17.77	9.42	57
Coloured	11.51	6.86	3.64	22
Totals	307	183	97	587

Statistics: BIO1_3(4) x PRAC2_2C(3) (raw.sta)

Chi-square df p
 Pearson Chi-square 55.64356 df=6 p=.00000

Years since graduation x Practice type

2-Way Summary Table: Observed Frequencies (raw.sta)

	PRAC2_1B				Row
	GP	IPA	DC	NOA	Totals
0-9	35	30	9	17	91
10-19	55	77	27	32	191
20-29	56	60	29	36	181
30+	31	23	16	33	103
Totals	177	190	81	118	566

2-Way Summary Table: Expected Frequencies (raw.sta)

	PRAC2_1B				Row
	GP	IPA	DC	NOA	Totals
0-9	28.46	30.55	13.02	18.97	91
10-19	59.73	64.12	27.33	39.82	191
20-29	56.60	60.76	25.90	37.73	181
30+	32.21	34.58	14.74	21.47	103
Totals	177	190	81	118	566

Statistics: BIO1_4C(4) x PRAC2_1B(4) (raw.sta)

Pearson Chi-square Chi-square df p
 18.14651 df=9 p=.03352

Years since graduation x Practice size

2-Way Summary Table: Observed Frequencies (raw.sta)

	PRAC2_2B				Row
	one	2-3	4-5	>6	Totals
0-9	51	31	7	12	101
10-19	108	66	17	10	201
20-29	100	58	17	14	189
30+	58	28	14	6	106
Totals	317	183	55	42	597

2-Way Summary Table: Expected Frequencies (raw.sta)

	PRAC2_2B				Row
	one	2-3	4-5	>6	Totals
0-9	53.63	30.96	9.30	7.10552	101
10-19	106.73	61.61	18.52	14.14	201
20-29	100.36	57.93	17.41	13.30	189
30+	56.28	32.49	9.77	7.46	106
Totals	317	183	55	42	597

Statistics: BIO1_4C(4) x PRAC2_2C(3) (raw.sta)

Pearson Chi-square Chi-square df p
 8.578399 df=9 p=.47707

Percent of patients in managed care x Hours per week in patient care

2-Way Summary Table: Observed Frequencies (raw.sta)

	BIO1_6C				Row
	<40	40-59	60-70	>80	Totals
0-25	44	106	57	24	231
26-50	19	48	32	17	116
51-75	17	88	34	19	158
76-100	18	41	23	6	88
Totals	98	283	146	66	593

2-Way Summary Table: Expected Frequencies (raw.sta)

	BIO1_6C				Row
	<40	40-59	60-70	>80	Totals
0-25	38.18	110.24	56.87	25.71	231
26-50	19.17	55.36	28.56	12.91	
51-75	26.11	75.40	38.90	17.59	
76-100	14.54	42.00	21.67	9.79	
Totals	98	283	146	66	593

Statistics: BIO1_9B(4) x BIO1_6C(4) (raw.sta)

	Chi-square	df	p
Pearson Chi-square	12.26771	df=9	p=.19865

Percent of patients in managed care x Practice size

2-Way Summary Table: Observed Frequencies (raw.sta)

Marked cells have counts > 10

	PRAC2_2B				Row
	one	2-3	4-5	>6	Totals
0-25	136	62	17	13	228
26-50	68	32	10	2	112
51-75	70	57	18	13	158
76-100	40	25	8	13	86
Totals	314	176	53	41	584

2-Way Summary Table: Expected Frequencies (raw.sta)

Marked cells have counts > 10

	PRAC2_2B				Row
	one	2-3	4-5	>6	Totals
0-25	122.59	68.71	20.69	16.01	228
26-50	60.22	33.75	10.16	7.86	112
51-75	84.95	47.62	14.34	11.09	158
76-100	46.24	25.92	7.80	6.04	86
Totals	314	176	53	41	584

Statistics: BIO1_9B(4) x PRAC2_2B(4) (raw.sta)

	Chi-square	df	p
Pearson Chi-square	23.4687	df=9	p=.00523

Gender vs Payment Method

2-Way Summary Table: Observed Frequencies (raw.sta)

	Capitati	FFS	DFFS	Salary	Totals
Male	50	325	101	14	490
Female	11	74	16	4	105
Totals	61	399	117	18	595

2-Way Summary Table: Expected Frequencies (raw.sta)

	Capitati	FFS	DFFS	Salary	Totals
Male	50.24	328.59	96.35	14.82	490
Female	10.76	70.41	20.65	3.18	105
Totals	61	399	117	18	595

Pearson Chi-square 1.757592 df=3 p=.62421

Gender vs Payment withheld

2-Way Summary Table: Observed Frequencies (raw.sta)

	None	1-10	11-20	21-30	>30	Totals
Male	98	101	147	67	57	470
Female	20	21	29	19	9	98
Totals	118	122	176	86	66	568

2-Way Summary Table: Expected Frequencies (raw.sta)

	None	1-10	11-20	21-30	>30	Totals
Male	97.64	100.95	145.63	71.16	54.61	470
Female	20.36	21.05	30.37	14.84	11.39	98
Totals	118	122	176	86	66	568

Pearson Chi-square 2.097757 df=4 p=.71778

Gender vs Incentive

2-Way Summary Table: Observed Frequencies (raw.sta)

	No	Yes	Totals
Male	434	59	493
Female	97	8	105
Totals	531	67	598

2-Way Summary Table: Expected Frequencies (raw.sta)

	No	Yes	Totals
Male	437.76	55.24	493
Female	93.24	11.76	105
Totals	531	67	598

Pearson Chi-square 1.645306 df=1 p=.19960

Age vs Payment Method

2-Way Summary Table: Observed Frequencies (raw.sta)

	Capitati	FFS	DFFS	Totals
27-31	3	37	6	46
32-36	13	47	15	75
37-41	14	62	30	106
42-46	13	76	27	116
>47	18	177	39	234
Totals	61	399	117	577

2-Way Summary Table: Expected Frequencies (raw.sta)

	Capitati	FFS	DFFS	Totals
27-31	4.86	31.81	9.33	46
32-36	7.93	51.86	15.21	75
37-41	11.21	73.30	21.49	106
42-46	12.26	80.21	23.52	116
>47	24.74	161.81	47.45	234
Totals	61	399	117	577

Pearson Chi-square 17.79997 df=8 p=.02279

Age vs Payment withheld

2-Way Summary Table: Observed Frequencies (raw.sta)

	None	1-10	11-20	21-30	>30	Totals
27-31	8	9	16	9	5	47
32-36	15	11	25	11	11	73
37-41	26	21	26	23	7	103
42-46	22	25	39	15	12	113
>47	47	55	71	28	29	230
Totals	118	121	177	86	64	566

2-Way Summary Table: Expected Frequencies (raw.sta)

	None	1-10	11-20	21-30	>30	Totals
27-31	9.80	10.05	14.70	7.14	5.31	47
32-36	15.22	15.61	22.83	11.09	8.25	73
37-41	21.47	22.02	32.21	15.65	11.65	103
42-46	23.56	24.16	35.34	17.17	12.78	113
>47	47.95	49.17	71.93	34.95	26.01	230
Totals	118	121	177	86	64	566

Pearson Chi-square 14.32556 df=16 p=.57448

Age vs Incentive

2-Way Summary Table: Observed Frequencies (raw.sta)

	No	Yes	Totals
27-31	47	2	49
32-36	68	9	77
37-41	91	14	105
42-46	99	19	118
>47	225	23	248
Totals	530	67	597

2-Way Summary Table: Expected Frequencies (raw.sta)

	No	Yes	Totals
27-31	43.50	5.50	49
32-36	68.36	8.64	77
37-41	93.22	11.78	105
42-46	104.76	13.24	118
>47	220.17	27.83	248
Totals	530	67	597

Pearson Chi-square 6.758532 df=4 p=.14922

Years since graduation vs Payment Method

2-Way Summary Table: Observed Frequencies (raw.sta)

	Capitati	FFS	DFFS	Totals
0-9	14	64	18	96
10-19	22	123	52	197
20-29	16	135	37	188
30+	8	79	10	97
Totals	60	401	117	578

2-Way Summary Table: Expected Frequencies (raw.sta)

	Capitati	FFS	DFFS	Totals
0-9	9.97	66.60	19.43	96
10-19	20.45	136.67	39.88	197
20-29	19.52	130.43	38.06	188
30+	10.07	67.30	19.63	97
Totals	60	401	117	578

Pearson Chi-square 15.02298 df=6 p=.02009

Years since graduation vs Payment withheld

2-Way Summary Table: Observed Frequencies (raw.sta)

	None	1-10	11-20	21-30	>30	Totals
0-9	16	14	29	19	18	96
10-19	43	35	63	33	18	192
20-29	39	52	53	22	20	186
30+	21	21	32	12	10	96
Totals	119	122	177	86	66	570

2-Way Summary Table: Expected Frequencies (raw.sta)

	None	1-10	11-20	21-30	>30	Totals
0-9	20.04	20.55	29.81	14.48	11.12	96
10-19	40.08	41.09	59.62	28.97	22.23	192
20-29	38.83	39.81	57.76	28.06	21.54	186
30+	20.04	20.55	29.81	14.48	11.12	96
Totals	119	122	177	86	66	570

Pearson Chi-square 17.5682 df=12 p=.12947

Years since graduation vs Incentive

2-Way Summary Table: Observed Frequencies (raw.sta)

	No	Yes	Totals
0-9	91	9	100
10-19	175	24	199
20-29	171	23	194
30+	96	11	107
Totals	533	67	600

2-Way Summary Table: Expected Frequencies (raw.sta)

	No	Yes	Totals
0-9	88.83	11.17	100
10-19	176.78	22.22	199
20-29	172.34	21.66	194
30+	95.05	11.95	107
Totals	533	67	600

Pearson Chi-square 0.81102 df=3 p=.84683

Hours per week vs Payment method

2-Way Summary Table: Observed Frequencies (raw.sta)

	Capitati	FFS	DFFS	Totals
<40	9	62	19	90
40-59	25	193	60	278
60-70	20	93	28	141
>80	6	48	9	63
Totals	60	396	116	572

2-Way Summary Table: Expected Frequencies (raw.sta)

	Capitati	FFS	DFFS	Totals
<40	9.44	62.31	18.25	90
40-59	29.16	192.46	56.38	278
60-70	14.79	97.62	28.59	141
>80	6.61	43.62	12.78	63
Totals	60	396	116	572

Pearson Chi-square 4.559321 df=6 p=.60144

Hours per week vs Payment withheld

2-Way Summary Table: Observed Frequencies (raw.sta)

	None	1-10	11-20	21-30	>30	Totals
<40	16	22	27	16	10	91
40-59	59	57	86	39	29	270
60-70	32	27	41	20	17	137
>80	11	14	20	10	10	65
Totals	118	120	174	85	66	563

2-Way Summary Table: Expected Frequencies (raw.sta)

	None	1-10	11-20	21-30	>30	Totals
<40	19.07	19.40	28.12	13.74	10.67	91
40-59	56.59	57.55	83.45	40.76	31.65	270
60-70	28.71	29.20	42.34	20.68	16.06	137
>80	13.62	13.85	20.09	9.81	7.62	65
Totals	118	120	174	85	66	563

Pearson Chi-square 3.704133 df=12 p=.98820

Hours per week vs Incentive

2-Way Summary Table: Observed Frequencies (raw.sta)

	No	Yes	Totals
<40	87	9	96
40-59	250	36	286
60-70	128	18	146
>80	62	4	66
Totals	527	67	594

2-Way Summary Table: Expected Frequencies (raw.sta)

	No	Yes	Totals
<40	85.17	10.83	96
40-59	253.74	32.26	286
60-70	129.53	16.47	146
>80	58.56	7.44	66
Totals	527	67	594

Pearson Chi-square 2.793807 df=3 p=.42452

Patients in managed health care vs Payment method

2-Way Summary Table: Observed Frequencies (raw.sta)

	Capitati	FFS	DFFS	Totals
0-25	33	134	46	213
26-50	10	79	25	114
51-75	11	118	28	157
76-100	4	62	17	83
Totals	58	393	116	567

2-Way Summary Table: Expected Frequencies (raw.sta)

	Capitati	FFS	DFFS	Totals
0-25	21.79	147.63	43.58	213
26-50	11.66	79.02	23.32	114
51-75	16.06	108.82	32.12	157
76-100	8.49	57.53	16.98	83
Totals	58	393	116	567

Pearson Chi-square 13.13987 df=6 p=.04088

Patients in managed health care vs Payment withheld

2-Way Summary Table: Observed Frequencies (raw.sta)

	None	1-10	11-20	21-30	>30	Totals
0-25	58	43	63	31	19	214
26-50	18	29	36	14	11	108
51-75	21	30	56	27	19	153
76-100	17	18	21	14	16	86
Totals	114	120	176	86	65	561

2-Way Summary Table: Expected Frequencies (raw.sta)

	None	1-10	11-20	21-30	>30	Totals
0-25	43.49	45.78	67.14	32.81	24.80	214
26-50	21.95	23.10	33.88	16.56	12.51	108
51-75	31.09	32.73	48.00	23.45	17.73	153
76-100	17.48	18.40	26.98	13.18	9.96	86
Totals	114	120	176	86	65	561

Pearson Chi-square 20.16307 df=12 p=.06408

Patients in managed health care vs Incentive

2-Way Summary Table: Observed Frequencies (raw.sta)

	No	Yes	Totals
0-25	200	24	224
26-50	104	12	116
51-75	140	19	159
76-100	77	12	89
Totals	521	67	588

2-Way Summary Table: Expected Frequencies (raw.sta)

	No	Yes	Totals
0-25	198.48	25.52	224
26-50	102.78	13.22	116
51-75	140.88	18.12	159
76-100	78.86	10.14	89
Totals	521	67	588

Pearson Chi-square 0.662348 df=3 p=.88202

Practice type vs Payment method

2-Way Summary Table: Observed Frequencies (raw.sta)

	Capitati	FFS	DFFS	Totals
GP	19	122	30	171
IPA	28	122	39	189
DC	5	51	19	75
NOA	4	87	21	112
Totals	56	382	109	547

2-Way Summary Table: Expected Frequencies (raw.sta)

	Capitati	FFS	DFFS	Totals
GP	17.51	119.42	34.07	171
IPA	19.35	131.99	37.66	189
DC	7.68	52.38	14.95	75
NOA	11.47	78.22	22.32	112
Totals	56	382	109	547

Pearson Chi-square 13.33827 df=6 p=.03798

Practice type vs Payment withheld

2-Way Summary Table: Observed Frequencies (raw.sta)

	None	1-10	11-20	21-30	>30	Totals
GP	32	31	58	24	16	161
IPA	42	40	51	30	22	185
DC	14	11	26	11	12	74
NOA	21	29	37	14	7	108
Totals	109	111	172	79	57	528

2-Way Summary Table: Expected Frequencies (raw.sta)

	None	1-10	11-20	21-30	>30	Totals
GP	33.24	33.85	52.45	24.09	17.38	161
IPA	38.19	38.89	60.27	27.68	19.97	185
DC	15.28	15.56	24.11	11.07	7.99	74
NOA	22.30	22.70	35.18	16.16	11.66	108
Totals	109	111	172	79	57	528

Pearson Chi-square 10.88974 df=12 p=.53840

Practice type vs Incentive

2-Way Summary Table: Observed Frequencies (raw.sta)

	No	Yes	Totals
GP	149	25	174
IPA	163	28	191
DC	72	6	78
NOA	111	2	113
Totals	495	61	556

2-Way Summary Table: Expected Frequencies (raw.sta)

	No	Yes	Totals
GP	154.91	19.09	174
IPA	170.04	20.96	191
DC	69.44	8.56	78
NOA	100.60	12.40	113
Totals	495	61	556

Pearson Chi-square 15.36882 df=3 p=.00153

Practice size vs Payment method

2-Way Summary Table: Observed Frequencies (raw.sta)

	Capitati	FFS	DFFS	Salary	Totals
one	29	214	62	7	312
2-3	18	117	37	6	178
4+	14	59	16	6	95
Totals	61	390	115	19	585

2-Way Summary Table: Expected Frequencies (raw.sta)

	Capitati	FFS	DFFS	Salary	Totals
one	32.53	208.00	61.33	10.13	312
2-3	18.56	118.67	34.99	5.78	178
4+	9.91	63.33	18.68	3.09	95
Totals	61	390	115	19	585

Pearson Chi-square 6.821625 df=6 p=.33767

Practice size vs Payment withheld

2-Way Summary Table: Observed Frequencies (raw.sta)

	None	1-10	11-20	21-30	>30	Totals
one	67	67	88	43	33	298
2-3	34	27	65	29	17	172
4+	16	22	20	13	15	86
Totals	117	116	173	85	65	556

2-Way Summary Table: Expected Frequencies (raw.sta)

	None	1-10	11-20	21-30	>30	Totals
one	62.71	62.17	92.72	45.56	34.84	298
2-3	36.19	35.88	53.52	26.29	20.11	172
4+	18.10	17.94	26.76	13.15	10.05	86
Totals	117	116	173	85	65	556

Pearson Chi-square 12.00725 df=8 p=.15090

Practice size vs Incentive

2-Way Summary Table: Observed Frequencies (raw.sta)

	No	Yes	Totals
one	282	29	311
2-3	161	19	180
4+	77	19	96
Totals	520	67	587

2-Way Summary Table: Expected Frequencies (raw.sta)

	No	Yes	Totals
one	275.50	35.50	311
2-3	159.45	20.55	180
4+	85.04	10.96	96
Totals	520	67	587

Pearson Chi-square 8.137454 df=2 p=.01710

Race vs Payment method

2-Way Summary Table: Observed Frequencies (raw.sta)

	Capitati	FFS	DFFS	Totals
White	32	272	57	361
Indian	14	76	38	128
African	9	35	15	59
Coloured	5	14	2	21
Totals	60	397	112	569

2-Way Summary Table: Expected Frequencies (raw.sta)

	Capitati	FFS	DFFS	Totals
White	38.07	251.88	71.06	361.00
Indian	13.50	89.31	25.20	128.00
African	6.22	41.17	11.61	59.00
Coloured	2.21	14.65	4.13	21.00
Totals	60	397	112	569

Pearson Chi-square 21.65181 df=6 p=.00140

Race vs Payment withheld

2-Way Summary Table: Observed Frequencies (raw.sta)

	None	1-10	11-20	21-30	>30	Totals
White	93	72	106	50	33	354
Indian	16	35	42	21	13	127
African	5	9	17	13	13	57
Coloured	4	3	10	2	2	21
Totals	118	119	175	86	61	559

2-Way Summary Table: Expected Frequencies (raw.sta)

	None	1-10	11-20	21-30	>30	Totals
White	74.73	75.36	110.82	54.46	38.63	354
Indian	26.81	27.04	39.76	19.54	13.86	127
African	12.03	12.13	17.84	8.77	6.22	57
Coloured	4.43	4.47	6.57	3.23	2.29	21
Totals	118	119	175	86	61	559

Pearson Chi-square 30.21502 df=12 p=.00259

Race vs Incentive

2-Way Summary Table: Observed Frequencies (raw.sta)

	No	Yes	Totals
White	341	35	376
Indian	108	25	133
African	55	4	59
Coloured	19	3	22
Totals	523	67	590

2-Way Summary Table: Expected Frequencies (raw.sta)

	No	Yes	Totals
White	333.30	42.70	376
Indian	117.90	15.10	133
African	52.30	6.70	59
Coloured	19.50	2.50	22
Totals	523	67	590

Pearson Chi-square

10.22246 df=3 p=.01677

Practice type x Preferred mode of reimbursement

2-Way Summary Table: Observed Frequencies (raw.sta)

	FFS	Capitati	Salary	Totals
GP	156	11	7	174
IPA	161	14	11	186
DC	67	1	11	79
NOA	97	4	12	113
Totals	481	30	41	552

2-Way Summary Table: Expected Frequencies (raw.sta)

	FFS	Capitati	Salary	Totals
GP	151.62	9.46	12.92	174
IPA	162.08	10.11	13.82	186
DC	68.84	4.29	5.87	79
NOA	98.47	6.14	8.39	113
Totals	481	30	41	552

Pearson Chi-square

14.55548

df=6

p=.02402

Practice size x Preferred mode of reimbursement

2-Way Summary Table: Observed Frequencies (raw.sta)

	FFS	Capitati	Salary	Totals
one	251	14	25	290
2-3	149	8	12	169
4+	71	6	3	80
Totals	471	28	40	539

2-Way Summary Table: Expected Frequencies (raw.sta)

	FFS	Capitati	Salary	Totals
one	253.41	15.06	21.52	290
2-3	147.68	8.78	12.54	169
4+	69.91	4.16	5.94	80
Totals	471	28	40	539

Pearson Chi-square

3.053216

df=4

p=.54896

Gender x Preferred mode of reimbursement

2-Way Summary Table: Observed Frequencies (jemsrubin2.sta)

	FFS	Capitati	Salary	DFFS	Totals
Male	414	32	40	6	492
Female	92	3	11	1	107
Totals	506	35	51	7	599

2-Way Summary Table: Expected Frequencies (jemsrubin2.sta)

	FFS	Capitati	Salary	DFFS	Totals
Male	415.61	28.75	41.89	5.75	492
Female	90.39	6.25	9.11	1.25	107
Totals	506	35	51	7	599

Pearson Chi-square 2.632865 df=3 p=.45176

Age vs Preferred mode of reimbursement (DFFS excluded due to low numbers)

2-Way Summary Table: Observed Frequencies (jemsrubin2.sta)

	FFS	Capitati	Salary	Totals
27-31	38	3	7	48
32-36	63	1	12	76
37-41	89	10	8	107
42-46	108	6	3	117
>47	209	15	19	243
Totals	507	35	49	591

2-Way Summary Table: Expected Frequencies (jemsrubin2.sta)

	FFS	Capitati	Salary	Totals
27-31	41.18	2.84	3.98	48
32-36	65.20	4.50	6.30	76
37-41	91.79	6.34	8.87	107
42-46	100.37	6.93	9.70	117
>47	208.46	14.39	20.15	243
Totals	507	35	49	591

Pearson Chi-square 18.21081 df=8 p=.01971

Population group vs Preferred mode of reimbursement (DFFS, FW, FO excluded due to low numbers)

2-Way Summary Table: Observed Frequencies (jemsrubin2.sta)

	FFS	Capitati	Salary	Totals
White	324	22	27	373
Indian	113	4	14	131
African	47	5	7	59
Coloured	18	2	2	22
Totals	502	33	50	585

2-Way Summary Table: Expected Frequencies (jemsrubin2.sta)

	FFS	Capitati	Salary	Totals
White	320.08	21.04	31.88	373
Indian	112.41	7.39	11.20	131
African	50.63	3.33	5.04	59
Coloured	18.88	1.24	1.88	22
Totals	502	33	50	585

Pearson Chi-square 5.470984 df=6 p=.48498

**Years since graduation vs Preferred mode of reimbursement
(DFFS excluded due to low numbers)**

2-Way Summary Table: Observed Frequencies (jemsrubin2.sta)

	FFS	Capitati	Salary	Totals
0-9	75	7	16	98
10-19	175	13	14	202
20-29	168	8	11	187
30+	92	6	9	107
Totals	510	34	50	594

2-Way Summary Table: Expected Frequencies (jemsrubin2.sta)

	FFS	Capitati	Salary	Totals
0-9	84.14	5.61	8.25	98
10-19	173.43	11.56	17.00	202
20-29	160.56	10.70	15.74	187
30+	91.87	6.12	9.01	107
Totals	510	34	50	594

Pearson Chi-square 11.80255 df=6 p=.06653

Percent of patients in managed health care vs Preferred mode of reimbursement

(DFFS excluded due to low numbers)

2-Way Summary Table: Observed Frequencies (jemsrubin2.sta)

	FFS	Capitati	Salary	Totals
0-25	186	14	23	223
26-50	103	7	6	116
51-75	134	8	12	154
76-100	72	6	10	88
Totals	495	35	51	581

2-Way Summary Table: Expected Frequencies (jemsrubin2.sta)

	FFS	Capitati	Salary	Totals
0-25	189.99	13.43	19.57	223
26-50	98.83	6.99	10.18	116
51-75	131.20	9.28	13.52	154
76-100	74.97	5.30	7.72	88
Totals	495	35	51	581

Pearson Chi-square 3.887161 df=6 p=.69194

2. Analysis of variance

Comparisons of Management Strategy scores for different groups

Gender

Summary Table of Means (raw.sta)

Smallest N for any variable: 567

		Male	Female	All Grps
EDFACT1	Means	12.52	12.44	12.50
EDFACT1	N	489	104	593
EDFACT1	Variance	6.91	8.15	7.11
EDFACT4	Means	4.98	5.05	4.99
EDFACT4	N	496	106	602
EDFACT4	Variance	1.05	1.05	1.05
EDFACT2	Means	5.51	5.15	5.45
EDFACT2	N	499	106	605
EDFACT2	Variance	2.27	2.57	2.33
EDFACT3	Means	3.90	3.70	3.87
EDFACT3	N	500	107	607
EDFACT3	Variance	1.21	1.38	1.24
EDFACT6	Means	4.72	4.73	4.72
EDFACT6	N	485	102	587
EDFACT6	Variance	0.98	0.95	0.98
EDFACT5	Means	8.51	8.20	8.46
EDFACT5	N	498	108	606
EDFACT5	Variance	2.31	3.12	2.46
FDBFACT1	Means	5.34	4.97	5.27
FDBFACT1	N	495	107	602
FDBFACT1	Variance	2.13	2.05	2.13
ADMFACT5	Means	8.65	8.73	8.67
ADMFACT5	N	489	104	593
ADMFACT5	Variance	4.01	3.77	3.96
ADMFACT3	Means	5.10	5.24	5.13
ADMFACT3	N	490	105	595
ADMFACT3	Variance	1.22	1.26	1.22
ADMFACT1	Means	9.21	9.27	9.22
ADMFACT1	N	495	106	601
ADMFACT1	Variance	4.14	4.05	4.12
ADMFACT7	Means	4.05	4.22	4.08
ADMFACT7	N	477	101	578
ADMFACT7	Variance	1.01	0.89	0.99
ADMFACT2	Means	4.42	4.34	4.41
ADMFACT2	N	497	107	604
ADMFACT2	Variance	1.31	1.68	1.38
ADMFACT4	Means	5.18	5.19	5.18
ADMFACT4	N	489	106	595
ADMFACT4	Variance	1.64	2.36	1.77
ADMFACT6	Means	4.82	4.57	4.77
ADMFACT6	N	495	107	602
ADMFACT6	Variance	1.32	1.38	1.33
PMFACT2	Means	4.55	4.09	4.47
PMFACT2	N	494	107	601

PMFACT2	Variance	2.71	2.37	2.68
PMFACT1	Means	14.87	15.36	14.96
PMFACT1	N	468	99	567
PMFACT1	Variance	49.19	52.32	49.68

University of Cape Town

Analysis of Variance (raw.sta)

Marked effects are significant at $p < .05000$

	SS	df	MS	SS	df	MS	F	p
	Effect	Effect	Effect	Error	Error	Error		
EDFACT1	0.48	1	0.48	4209.76	591	7.12	0.07	0.79
EDFACT4	0.44	1	0.44	628.47	600	1.05	0.42	0.51
EDFACT2	11.21	1	11.21	1398.29	603	2.32	4.83	0.03
EDFACT3	3.63	1	3.63	749.82	605	1.24	2.93	0.09
EDFACT6	0.00	1	0.00	572.18	585	0.98	0.00	0.96
EDFACT5	8.55	1	8.55	1479.92	604	2.45	3.49	0.06
FDBFACT1	11.62	1	11.62	1267.25	600	2.11	5.50	0.02
ADMFACT5	0.53	1	0.53	2343.36	591	3.97	0.13	0.72
ADMFACT3	1.60	1	1.60	725.95	593	1.22	1.31	0.25
ADMFACT1	0.37	1	0.37	2470.63	599	4.12	0.09	0.76
ADMFACT7	2.22	1	2.22	567.79	576	0.99	2.26	0.13
ADMFACT2	0.62	1	0.62	829.00	602	1.38	0.45	0.50
ADMFACT4	0.00	1	0.00	1049.66	593	1.77	0.00	0.97
ADMFACT6	5.42	1	5.42	795.86	600	1.33	4.08	0.04
PMFACT2	18.71	1	18.71	1587.09	599	2.65	7.06	0.01
PMFACT1	19.60	1	19.60	28100.47	565	49.74	0.39	0.53

Levene Test of Homogeneity of Variances (raw.sta)

Marked effects are significant at $p < .05000$

	SS	df	MS	SS	df	MS	F	p
	Effect	Effect	Effect	Error	Error	Error		
EDFACT1	3.89	1	3.89	1273.30	591	2.15	1.81	0.18
EDFACT4	0.00	1	0.00	282.05	600	0.47	0.00	0.99
EDFACT2	1.17	1	1.17	554.79	603	0.92	1.28	0.26
EDFACT3	2.62	1	2.62	459.45	605	0.76	3.45	0.06
EDFACT6	0.10	1	0.10	204.85	585	0.35	0.30	0.58
EDFACT5	0.79	1	0.79	723.77	604	1.20	0.66	0.42
FDBFACT1	1.45	1	1.45	393.82	600	0.66	2.21	0.14
ADMFACT5	1.46	1	1.46	837.72	591	1.42	1.03	0.31
ADMFACT3	0.03	1	0.03	267.77	593	0.45	0.07	0.79
ADMFACT1	0.19	1	0.19	901.50	599	1.51	0.13	0.72
ADMFACT7	0.00	1	0.00	277.07	576	0.48	0.00	1.00
ADMFACT2	0.24	1	0.24	336.82	602	0.56	0.42	0.52
ADMFACT4	4.38	1	4.38	346.82	593	0.58	7.49	0.01
ADMFACT6	0.01	1	0.01	290.22	600	0.48	0.02	0.89
PMFACT2	3.69	1	3.69	502.89	599	0.84	4.39	0.04
PMFACT1	5.08	1	5.08	7243.87	565	12.82	0.40	0.53

Non-parametric ANOVA results for scores with significantly different variances

EDFACT3 Kruskal-Wallis test: $H(1, N=607) = 3.924585$ $p = .0476$

ADMFACT4 Kruskal-Wallis test: $H(1, N=595) = .0250203$ $p = .8743$

PMFACT2 Kruskal-Wallis test: $H(1, N=601) = 7.661315$ $p = .0056$

Age

Summary Table of Means (raw.sta)

Smallest N for any variable: 565

		27-31	32-36	37-41	42-46	>47	All Grps
EDFACT1	Means	12.17	12.13	12.65	12.49	12.63	12.50
EDFACT1	N	48	76	106	119	243	592
EDFACT1	Variance	6.52	6.01	7.87	6.25	7.70	7.12
EDFACT4	Means	4.66	4.75	5.01	4.92	5.15	4.99
EDFACT4	N	50	77	105	119	250	601
EDFACT4	Variance	0.80	1.37	0.82	0.86	1.13	1.05
EDFACT2	Means	5.06	5.31	5.08	5.65	5.64	5.45
EDFACT2	N	49	75	106	120	254	604
EDFACT2	Variance	1.73	2.51	2.20	2.03	2.49	2.34
EDFACT3	Means	3.82	3.89	3.58	3.73	4.06	3.87
EDFACT3	N	50	76	107	119	254	606
EDFACT3	Variance	0.60	2.07	1.04	0.93	1.32	1.25
EDFACT6	Means	4.74	4.67	4.80	4.73	4.70	4.72
EDFACT6	N	50	76	104	113	243	586
EDFACT6	Variance	0.97	1.16	0.94	0.71	1.06	0.97
EDFACT5	Means	8.18	8.61	8.35	8.47	8.53	8.47
EDFACT5	N	50	76	107	118	253	604
EDFACT5	Variance	2.27	2.24	3.04	1.98	2.54	2.46
FDBFACT1	Means	5.16	5.23	5.28	5.25	5.31	5.27
FDBFACT1	N	50	77	107	119	248	601
FDBFACT1	Variance	2.30	1.89	2.39	1.82	2.23	2.13
ADMFACT5	Means	8.38	8.65	8.68	8.67	8.74	8.68
ADMFACT5	N	50	75	107	118	242	592
ADMFACT5	Variance	3.06	3.39	4.41	3.76	4.29	3.97
ADMFACT3	Means	5.10	5.20	5.13	5.17	5.10	5.13
ADMFACT3	N	50	75	107	117	245	594
ADMFACT3	Variance	1.40	0.92	1.45	1.45	1.10	1.23
ADMFACT1	Means	8.78	9.26	9.20	9.34	9.23	9.21
ADMFACT1	N	50	77	107	118	248	600
ADMFACT1	Variance	3.85	4.59	3.95	4.52	3.98	4.14
ADMFACT7	Means	4.38	4.11	3.94	3.99	4.14	4.09
ADMFACT7	N	50	74	106	113	234	577
ADMFACT7	Variance	0.89	0.67	1.01	1.03	1.08	1.00
ADMFACT2	Means	4.18	4.21	4.38	4.21	4.59	4.39
ADMFACT2	N	50	77	107	119	251	604
ADMFACT2	Variance	1.21	1.19	1.60	1.05	1.44	1.36
ADMFACT4	Means	4.84	5.25	5.16	5.26	5.21	5.18
ADMFACT4	N	50	75	106	117	246	594
ADMFACT4	Variance	2.01	1.87	2.12	1.85	1.54	1.78
ADMFACT6	Means	4.58	4.80	4.86	4.68	4.80	4.77
ADMFACT6	N	50	76	106	119	250	601
ADMFACT6	Variance	1.35	0.99	1.51	1.17	1.44	1.33
PMFACT2	Means	3.94	4.25	4.64	4.40	4.61	4.47
PMFACT2	N	50	77	105	118	251	601
PMFACT2	Variance	2.30	2.19	2.44	2.43	3.05	2.68
PMFACT1	Means	13.53	13.25	15.32	14.22	15.99	14.96
PMFACT1	N	47	73	100	113	232	565
PMFACT1	Variance	43.30	47.02	51.76	43.21	51.69	49.49

Analysis of Variance (raw.sta)

Marked effects are significant at $p < .05000$

	SS	df	MS	SS	df	MS		
	Effect	Effect	Effect	Error	Error	Error	F	p
EDFACT1	22.16	4	5.54	4183.83	587	7.13	0.78	0.54
EDFACT4	16.69	4	4.17	611.21	596	1.03	4.07	0.00
EDFACT2	37.57	4	9.39	1372.14	599	2.29	4.10	0.00
EDFACT3	20.20	4	5.05	737.24	601	1.23	4.12	0.00
EDFACT6	0.95	4	0.24	568.26	581	0.98	0.24	0.91
EDFACT5	8.13	4	2.03	1474.14	599	2.46	0.83	0.51
FDBFACT1	1.16	4	0.29	1275.63	596	2.14	0.14	0.97
ADMFACT5	5.54	4	1.39	2342.19	587	3.99	0.35	0.85
ADMFACT3	0.79	4	0.20	727.70	589	1.24	0.16	0.96
ADMFACT1	11.51	4	2.88	2466.60	595	4.15	0.69	0.60
ADMFACT7	8.12	4	2.03	565.19	572	0.99	2.06	0.09
ADMFACT2	18.22	4	4.55	804.00	599	1.34	3.39	0.01
ADMFACT4	7.08	4	1.77	1049.91	589	1.78	0.99	0.41
ADMFACT6	3.95	4	0.99	794.36	596	1.33	0.74	0.56
PMFACT2	26.34	4	6.59	1579.40	596	2.65	2.49	0.04
PMFACT1	629.53	4	157.38	27281.45	560	48.72	3.23	0.01

Levene Test of Homogeneity of Variances (raw.sta)

Marked effects are significant at $p < .05000$

	SS	df	MS	SS	df	MS		
	Effect	Effect	Effect	Error	Error	Error	F	p
EDFACT1	6.20	4	1.55	1264.33	587	2.15	0.72	0.58
EDFACT4	5.00	4	1.25	243.83	596	0.41	3.06	0.02
EDFACT2	4.14	4	1.03	549.06	599	0.92	1.13	0.34
EDFACT3	6.56	4	1.64	424.47	601	0.71	2.32	0.06
EDFACT6	1.64	4	0.41	205.18	581	0.35	1.16	0.33
EDFACT5	6.66	4	1.66	706.45	599	1.18	1.41	0.23
FDBFACT1	2.73	4	0.68	389.35	596	0.65	1.05	0.38
ADMFACT5	5.69	4	1.42	831.49	587	1.42	1.01	0.40
ADMFACT3	3.20	4	0.80	263.13	589	0.45	1.79	0.13
ADMFACT1	5.72	4	1.43	879.92	595	1.48	0.97	0.43
ADMFACT7	1.46	4	0.36	267.24	572	0.47	0.78	0.54
ADMFACT2	6.67	4	1.67	331.62	599	0.55	3.01	0.02
ADMFACT4	2.94	4	0.74	345.62	589	0.59	1.25	0.29
ADMFACT6	2.84	4	0.71	291.08	596	0.49	1.46	0.21
PMFACT2	9.96	4	2.49	500.53	596	0.84	2.96	0.02
PMFACT1	62.88	4	15.72	7226.88	560	12.91	1.22	0.30

Non-parametric ANOVA results for scores with significantly different variances

EDFACT4	Kruskal-Wallis test: $H(4, N=601) = 17.39010$ $p = .0016$
EDFACT3	Kruskal-Wallis test: $H(4, N=606) = 13.34671$ $p = .0097$
ADMFACT2	Kruskal-Wallis test: $H(4, N=604) = 11.57636$ $p = .0208$
PMFACT2	Kruskal-Wallis test: $H(4, N=601) = 9.497765$ $p = .0498$

(FW and FO excluded due to low numbers)

Population group

Summary Table of Means (raw.sta)

Smallest N for any variable: 559

		White	Indian	African	Coloured	All Grps
EDFACT1	Means	12.80	11.82	12.02	12.27	12.49
EDFACT1	N	376	129	58	22	585
EDFACT1	Variance	7.05	7.26	6.23	6.68	7.15
EDFACT4	Means	5.07	5.00	4.51	5.14	5.00
EDFACT4	N	377	133	61	22	593
EDFACT4	Variance	0.94	1.05	1.29	1.08	1.03
EDFACT2	Means	5.65	5.23	4.53	5.50	5.44
EDFACT2	N	382	132	60	22	596
EDFACT2	Variance	2.38	1.93	1.74	2.17	2.32
EDFACT3	Means	3.90	3.90	3.57	3.82	3.86
EDFACT3	N	382	133	61	22	598
EDFACT3	Variance	1.27	1.18	1.08	1.01	1.23
EDFACT6	Means	4.80	4.59	4.60	4.55	4.72
EDFACT6	N	366	130	60	22	578
EDFACT6	Variance	0.94	0.99	1.13	0.35	0.95
EDFACT5	Means	8.47	8.51	8.21	8.05	8.44
EDFACT5	N	382	132	61	22	597
EDFACT5	Variance	2.41	2.16	3.04	2.05	2.40
FDBFACT1	Means	5.26	5.30	5.27	5.27	5.27
FDBFACT1	N	378	133	60	22	593
FDBFACT1	Variance	2.06	1.88	2.98	2.02	2.10
ADMFACT5	Means	8.77	8.48	8.60	8.27	8.67
ADMFACT5	N	371	132	60	22	585
ADMFACT5	Variance	4.19	3.05	4.18	4.21	3.93
ADMFACT3	Means	5.26	4.82	4.83	5.50	5.13
ADMFACT3	N	373	133	60	22	588
ADMFACT3	Variance	1.22	1.03	1.36	1.31	1.24
ADMFACT1	Means	9.41	8.65	9.43	8.86	9.22
ADMFACT1	N	376	133	61	22	592
ADMFACT1	Variance	4.06	3.74	3.98	4.69	4.09
ADMFACT7	Means	4.08	4.18	3.84	4.35	4.09
ADMFACT7	N	359	133	58	20	570
ADMFACT7	Variance	0.80	1.27	1.40	0.98	0.98
ADMFACT2	Means	4.49	4.43	3.84	4.64	4.41
ADMFACT2	N	378	134	61	22	595
ADMFACT2	Variance	1.30	1.24	1.67	2.05	1.38
ADMFACT4	Means	5.22	5.18	4.83	5.36	5.18
ADMFACT4	N	372	133	60	22	587
ADMFACT4	Variance	1.67	1.71	2.18	1.86	1.74
ADMFACT6	Means	4.80	4.92	4.38	4.50	4.77
ADMFACT6	N	378	132	61	22	593
ADMFACT6	Variance	1.30	1.20	1.31	1.98	1.32
PMFACT2	Means	4.27	4.88	4.95	4.05	4.47
PMFACT2	N	377	134	60	22	593
PMFACT2	Variance	2.62	2.42	2.83	1.66	2.64
PMFACT1	Means	13.83	17.11	16.85	17.36	14.98
PMFACT1	N	361	122	54	22	559
PMFACT1	Variance	46.51	47.80	49.90	49.58	49.40

Analysis of Variance (raw.sta)

Marked effects are significant at $p < .05000$

	SS	df	MS	SS	df	MS		
	Effect	Effect	Effect	Error	Error	Error	F	p
EDFACT1	107.87	3	35.96	4066.29	581	7.00	5.14	0.00
EDFACT4	17.10	3	5.70	590.90	589	1.00	5.68	0.00
EDFACT2	71.67	3	23.89	1306.91	592	2.21	10.82	0.00
EDFACT3	5.75	3	1.92	725.73	594	1.22	1.57	0.20
EDFACT6	5.72	3	1.91	542.88	574	0.95	2.01	0.11
EDFACT5	7.53	3	2.51	1425.36	593	2.40	1.04	0.37
FDBFACT1	0.19	3	0.06	1244.18	589	2.11	0.03	0.99
ADMFACT5	12.65	3	4.22	2284.68	581	3.93	1.07	0.36
ADMFACT3	27.68	3	9.23	697.75	584	1.19	7.72	0.00
ADMFACT1	61.86	3	20.62	2352.70	588	4.00	5.15	0.00
ADMFACT7	5.96	3	1.99	552.48	566	0.98	2.03	0.11
ADMFACT2	23.63	3	7.88	798.66	591	1.35	5.83	0.00
ADMFACT4	8.56	3	2.85	1011.02	583	1.73	1.64	0.18
ADMFACT6	14.48	3	4.83	767.79	589	1.30	3.70	0.01
PMFACT2	55.38	3	18.46	1508.30	589	2.56	7.21	0.00
PMFACT1	1349.05	3	449.68	26213.65	555	47.23	9.52	0.00

Levene Test of Homogeneity of Variances (raw.sta)

Marked effects are significant at $p < .05000$

	SS	df	MS	SS	df	MS		
	Effect	Effect	Effect	Error	Error	Error	F	p
EDFACT1	3.65	3	1.22	1239.20	581	2.13	0.57	0.63
EDFACT4	1.95	3	0.65	249.01	589	0.42	1.54	0.20
EDFACT2	0.22	3	0.07	529.74	592	0.89	0.08	0.97
EDFACT3	1.80	3	0.60	440.20	594	0.74	0.81	0.49
EDFACT6	1.81	3	0.60	198.62	574	0.35	1.75	0.16
EDFACT5	0.53	3	0.18	695.05	593	1.17	0.15	0.93
FDBFACT1	3.69	3	1.23	377.63	589	0.64	1.92	0.12
ADMFACT5	8.14	3	2.71	800.63	581	1.38	1.97	0.12
ADMFACT3	0.32	3	0.11	235.46	584	0.40	0.27	0.85
ADMFACT1	4.63	3	1.54	798.05	588	1.36	1.14	0.33
ADMFACT7	5.62	3	1.87	256.22	566	0.45	4.14	0.01
ADMFACT2	2.40	3	0.80	307.31	591	0.52	1.54	0.20
ADMFACT4	1.18	3	0.39	333.31	583	0.57	0.69	0.56
ADMFACT6	1.35	3	0.45	284.92	589	0.48	0.93	0.43
PMFACT2	4.68	3	1.56	504.26	589	0.86	1.82	0.14
PMFACT1	11.32	3	3.77	6899.61	555	12.43	0.30	0.82

Non-parametric ANOVA results for scores with significantly different variances

ADMFACT7 Kruskal-Wallis test: $H(5, N=576) = 10.00592$ $p = .0751$

Years since graduation

(30-39, 40-49 and >50 combined in 30+ due to low numbers)

Summary Table of Means (raw.sta)

Smallest N for any variable: 569

		0-9	10-19	20-29	30+	All Grps
EDFACT1	Means	12.11	12.58	12.67	12.39	12.50
EDFACT1	N	99	201	192	103	595
EDFACT1	Variance	5.83	7.47	7.76	6.44	7.12
EDFACT4	Means	4.70	4.95	5.08	5.20	4.99
EDFACT4	N	101	201	194	108	604
EDFACT4	Variance	1.03	0.92	1.14	0.97	1.04
EDFACT2	Means	5.18	5.28	5.59	5.80	5.46
EDFACT2	N	99	202	194	112	607
EDFACT2	Variance	2.23	2.10	2.54	2.14	2.31
EDFACT3	Means	3.85	3.73	3.89	4.09	3.87
EDFACT3	N	100	204	193	112	609
EDFACT3	Variance	1.22	1.21	1.32	1.15	1.24
EDFACT6	Means	4.74	4.73	4.73	4.67	4.72
EDFACT6	N	99	200	187	103	589
EDFACT6	Variance	1.15	0.78	1.13	0.89	0.97
EDFACT5	Means	8.36	8.50	8.57	8.30	8.46
EDFACT5	N	101	202	194	111	608
EDFACT5	Variance	2.55	2.53	2.60	1.97	2.45
FDBFACT1	Means	5.10	5.26	5.38	5.23	5.27
FDBFACT1	N	101	203	193	107	604
FDBFACT1	Variance	2.07	2.04	2.14	2.31	2.12
ADMFACT5	Means	8.48	8.64	8.78	8.71	8.67
ADMFACT5	N	100	201	192	102	595
ADMFACT5	Variance	3.75	3.85	4.25	3.91	3.96
ADMFACT3	Means	5.19	5.11	5.20	5.01	5.13
ADMFACT3	N	100	200	193	105	598
ADMFACT3	Variance	1.27	1.36	1.18	1.03	1.23
ADMFACT1	Means	8.99	9.14	9.45	9.17	9.22
ADMFACT1	N	101	203	193	106	603
ADMFACT1	Variance	4.03	4.49	4.19	3.34	4.12
ADMFACT7	Means	4.19	3.98	4.08	4.25	4.09
ADMFACT7	N	98	198	185	99	580
ADMFACT7	Variance	0.88	0.98	1.15	0.76	0.98
ADMFACT2	Means	4.17	4.34	4.54	4.52	4.41
ADMFACT2	N	101	202	195	108	606
ADMFACT2	Variance	1.14	1.50	1.40	1.19	1.37
ADMFACT4	Means	4.93	5.25	5.21	5.25	5.18
ADMFACT4	N	101	200	192	104	597
ADMFACT4	Variance	2.05	1.94	1.66	1.32	1.76
ADMFACT6	Means	4.67	4.80	4.84	4.71	4.77
ADMFACT6	N	101	201	195	107	604
ADMFACT6	Variance	1.12	1.28	1.66	1.02	1.33
PMFACT2	Means	4.07	4.56	4.57	4.51	4.47
PMFACT2	N	101	201	194	107	603
PMFACT2	Variance	2.21	2.64	2.73	2.93	2.67
PMFACT1	Means	13.38	14.59	15.35	16.71	15.00
PMFACT1	N	97	189	183	100	569
PMFACT1	Variance	44.55	50.75	46.92	53.50	49.74

Analysis of Variance (raw.sta)

Marked effects are significant at $p < .05000$

	SS	df	MS	SS	df	MS		
	Effect	Effect	Effect	Error	Error	Error	F	p
EDFACT1	23.28	3	7.76	4205.47	591	7.12	1.09	0.35
EDFACT4	15.13	3	5.04	610.85	600	1.02	4.95	0.00
EDFACT2	31.05	3	10.35	1369.71	603	2.27	4.56	0.00
EDFACT3	9.76	3	3.25	747.20	605	1.24	2.63	0.05
EDFACT6	0.32	3	0.11	570.46	585	0.98	0.11	0.95
EDFACT5	6.71	3	2.24	1482.34	604	2.45	0.91	0.44
FDBFACT1	5.36	3	1.79	1274.72	600	2.12	0.84	0.47
ADMFACT5	6.12	3	2.04	2347.99	591	3.97	0.51	0.67
ADMFACT3	2.87	3	0.96	729.69	594	1.23	0.78	0.51
ADMFACT1	17.25	3	5.75	2463.85	599	4.11	1.40	0.24
ADMFACT7	5.89	3	1.96	563.90	576	0.98	2.00	0.11
ADMFACT2	11.74	3	3.91	814.59	602	1.35	2.89	0.03
ADMFACT4	7.97	3	2.66	1041.76	593	1.76	1.51	0.21
ADMFACT6	2.43	3	0.81	798.95	600	1.33	0.61	0.61
PMFACT2	20.15	3	6.72	1586.21	599	2.65	2.54	0.06
PMFACT1	600.27	3	200.09	27654.72	565	48.95	4.09	0.01

Levene Test of Homogeneity of Variances (raw.sta)

Marked effects are significant at $p < .05000$

	SS	df	MS	SS	df	MS		
	Effect	Effect	Effect	Error	Error	Error	F	p
EDFACT1	11.81	3.00	3.94	1271.20	591.00	2.15	1.83	0.14
EDFACT4	0.75	3.00	0.25	250.78	600.00	0.42	0.60	0.62
EDFACT2	0.89	3.00	0.30	541.38	603.00	0.90	0.33	0.80
EDFACT3	2.35	3.00	0.78	438.51	605.00	0.72	1.08	0.36
EDFACT6	2.54	3.00	0.85	203.47	585.00	0.35	2.44	0.06
EDFACT5	1.50	3.00	0.50	714.32	604.00	1.18	0.42	0.74
FDBFACT1	1.25	3.00	0.42	400.32	600.00	0.67	0.63	0.60
ADMFACT5	1.00	3.00	0.33	843.69	591.00	1.43	0.23	0.87
ADMFACT3	2.03	3.00	0.68	267.74	594.00	0.45	1.50	0.21
ADMFACT1	11.23	3.00	3.74	897.65	599.00	1.50	2.50	0.06
ADMFACT7	0.77	3.00	0.26	269.98	576.00	0.47	0.55	0.65
ADMFACT2	3.26	3.00	1.09	333.32	602.00	0.55	1.96	0.12
ADMFACT4	2.81	3.00	0.94	348.31	593.00	0.59	1.60	0.19
ADMFACT6	4.63	3.00	1.54	287.33	600.00	0.48	3.22	0.02
PMFACT2	5.20	3.00	1.73	500.87	599.00	0.84	2.07	0.10
PMFACT1	38.57	3.00	12.86	7091.41	565.00	12.55	1.02	0.38

Non-parametric ANOVA results for scores with significantly different variances

EDFACT6 Kruskal-Wallis test: $H(3, N=589) = .6770083$ $p = .8786$

ADMFACT1 Kruskal-Wallis test: $H(3, N=603) = 4.132180$ $p = .2476$

ADMFACT6 Kruskal-Wallis test: $H(3, N=604) = 1.610654$ $p = .6570$

(PP, SMHMO and NW excluded due to low numbers)

Practice Type

Summary Table of Means (raw.sta)

Smallest N for any variable: 526

		GP	IPA	DC	NOA	All Grps
EDFACT1	Means	12.29	12.68	12.33	12.56	12.48
EDFACT1	N	173	189	80	113	555
EDFACT1	Variance	6.44	7.59	6.88	7.68	7.14
EDFACT4	Means	5.03	4.81	4.96	5.18	4.98
EDFACT4	N	175	190	80	116	561
EDFACT4	Variance	0.86	1.12	1.15	1.11	1.05
EDFACT2	Means	5.53	5.27	5.53	5.55	5.44
EDFACT2	N	175	190	81	116	562
EDFACT2	Variance	1.88	2.65	2.15	2.70	2.35
EDFACT3	Means	3.74	3.86	3.93	3.99	3.86
EDFACT3	N	175	191	81	117	564
EDFACT3	Variance	0.82	1.60	1.27	1.37	1.26
EDFACT6	Means	4.72	4.72	4.55	4.89	4.73
EDFACT6	N	168	191	77	111	547
EDFACT6	Variance	0.96	0.81	1.20	1.13	0.98
EDFACT5	Means	8.23	8.55	8.74	8.44	8.45
EDFACT5	N	175	190	81	116	562
EDFACT5	Variance	1.74	2.55	2.94	2.87	2.44
FDBFACT1	Means	5.23	5.51	5.20	5.09	5.29
FDBFACT1	N	175	190	80	115	560
FDBFACT1	Variance	1.98	2.18	2.09	2.31	2.15
ADMFACT5	Means	8.61	8.81	8.77	8.60	8.70
ADMFACT5	N	173	187	79	113	552
ADMFACT5	Variance	4.00	3.72	4.18	3.81	3.88
ADMFACT3	Means	5.14	5.03	5.19	5.28	5.14
ADMFACT3	N	175	188	78	113	554
ADMFACT3	Variance	1.22	1.21	1.27	1.22	1.23
ADMFACT1	Means	9.05	9.29	9.54	9.18	9.23
ADMFACT1	N	174	190	80	115	559
ADMFACT1	Variance	3.88	4.16	4.78	3.78	4.09
ADMFACT7	Means	4.11	3.91	4.09	4.38	4.10
ADMFACT7	N	170	183	74	110	537
ADMFACT7	Variance	0.95	0.97	1.24	0.90	1.01
ADMFACT2	Means	4.38	4.50	4.26	4.33	4.39
ADMFACT2	N	175	191	81	115	562
ADMFACT2	Variance	1.24	1.41	1.52	1.28	1.34
ADMFACT4	Means	5.02	5.37	5.23	5.16	5.20
ADMFACT4	N	171	190	81	113	555
ADMFACT4	Variance	1.37	1.98	1.76	1.67	1.71
ADMFACT6	Means	4.75	4.94	4.68	4.71	4.80
ADMFACT6	N	175	190	81	114	560
ADMFACT6	Variance	1.18	1.39	1.72	1.11	1.32
PMFACT2	Means	4.36	4.64	4.24	4.46	4.46
PMFACT2	N	177	192	78	112	559
PMFACT2	Variance	2.53	2.49	3.07	2.56	2.60
PMFACT1	Means	12.65	15.60	16.06	15.61	14.71
PMFACT1	N	171	175	72	108	526
PMFACT1	Variance	36.37	48.84	62.22	52.00	49.03

Analysis of Variance (raw.sta)

Marked effects are significant at $p < .05000$

	SS	df	MS	SS	df	MS		
	Effect	Effect	Effect	Error	Error	Error	F	p
EDFACT1	16.28	3	5.43	3938.34	551	7.15	0.76	0.52
EDFACT4	10.58	3	3.53	578.12	557	1.04	3.40	0.02
EDFACT2	8.98	3	2.99	1311.81	558	2.35	1.27	0.28
EDFACT3	5.02	3	1.67	706.92	560	1.26	1.33	0.27
EDFACT6	5.58	3	1.86	530.38	543	0.98	1.90	0.13
EDFACT5	17.23	3	5.74	1350.06	558	2.42	2.37	0.07
FDBFACT1	14.85	3	4.95	1184.28	556	2.13	2.32	0.07
ADMFACT5	5.16	3	1.72	2131.32	548	3.89	0.44	0.72
ADMFACT3	4.73	3	1.58	673.57	550	1.22	1.29	0.28
ADMFACT1	14.51	3	4.84	2266.18	555	4.08	1.18	0.31
ADMFACT7	15.19	3	5.06	525.78	533	0.99	5.13	0.00
ADMFACT2	4.00	3	1.33	750.10	558	1.34	0.99	0.40
ADMFACT4	11.36	3	3.79	934.83	551	1.70	2.23	0.08
ADMFACT6	6.39	3	2.13	730.40	556	1.31	1.62	0.18
PMFACT2	11.84	3	3.95	1441.01	555	2.60	1.52	0.21
PMFACT1	1078.82	3	359.61	24662.09	522	47.25	7.61	0.00

Levene Test of Homogeneity of Variances (raw.sta)

Marked effects are significant at $p < .05000$

	SS	df	MS	SS	df	MS		
	Effect	Effect	Effect	Error	Error	Error	F	p
EDFACT1	3.06	3	1.02	1225.06	551	2.22	0.46	0.71
EDFACT4	4.51	3	1.50	235.52	557	0.42	3.55	0.01
EDFACT2	8.47	3	2.82	496.97	558	0.89	3.17	0.02
EDFACT3	3.42	3	1.14	425.80	560	0.76	1.50	0.21
EDFACT6	1.90	3	0.63	197.72	543	0.36	1.74	0.16
EDFACT5	6.76	3	2.25	663.57	558	1.19	1.89	0.13
FDBFACT1	0.50	3	0.17	367.86	556	0.66	0.25	0.86
ADMFACT5	1.87	3	0.62	774.88	548	1.41	0.44	0.72
ADMFACT3	0.33	3	0.11	244.93	550	0.45	0.25	0.86
ADMFACT1	11.24	3	3.75	821.19	555	1.48	2.53	0.06
ADMFACT7	0.22	3	0.07	236.81	533	0.44	0.17	0.92
ADMFACT2	1.05	3	0.35	309.41	558	0.55	0.63	0.60
ADMFACT4	4.22	3	1.41	319.13	551	0.58	2.43	0.06
ADMFACT6	1.23	3	0.41	272.02	556	0.49	0.84	0.47
PMFACT2	1.86	3	0.62	462.13	555	0.83	0.75	0.52
PMFACT1	256.95	3	85.65	6553.74	522	12.56	6.82	0.00

Non-parametric ANOVA results for scores with significantly different variances

EDFACT4	Kruskal-Wallis test: $H(6, N=601) = 11.50940$ $p = .0739$
EDFACT2	Kruskal-Wallis test: $H(6, N=604) = 3.846549$ $p = .6974$
ADMFACT4	Kruskal-Wallis test: $H(6, N=595) = 11.15868$ $p = .0836$
PMFACT1	Kruskal-Wallis test: $H(6, N=566) = 27.91612$ $p = .0001$

Practice size

Summary Table of Means (raw.sta)

Smallest N for any variable: 555

		one	2-3	4-5	>6	All Grps
EDFACT1	Means	12.59	12.48	12.06	12.63	12.51
EDFACT1	N	309	178	53	41	581
EDFACT1	Variance	7.57	7.18	4.25	7.94	7.16
EDFACT4	Means	5.02	5.04	4.94	4.90	5.01
EDFACT4	N	314	182	52	42	590
EDFACT4	Variance	1.20	0.89	0.57	0.97	1.03
EDFACT2	Means	5.41	5.52	5.71	5.26	5.46
EDFACT2	N	315	181	55	42	593
EDFACT2	Variance	2.55	2.15	1.91	1.86	2.32
EDFACT3	Means	3.94	3.79	3.98	3.48	3.86
EDFACT3	N	317	181	55	42	595
EDFACT3	Variance	1.53	0.93	0.80	0.99	1.25
EDFACT6	Means	4.73	4.68	4.78	4.71	4.72
EDFACT6	N	308	176	51	41	576
EDFACT6	Variance	1.04	0.89	0.61	1.06	0.96
EDFACT5	Means	8.53	8.39	8.43	8.10	8.45
EDFACT5	N	316	181	54	42	593
EDFACT5	Variance	2.75	2.22	1.23	2.82	2.46
FDBFACT1	Means	5.30	5.12	5.55	5.24	5.26
FDBFACT1	N	313	182	53	42	590
FDBFACT1	Variance	2.31	1.89	1.91	1.80	2.11
ADMFACT5	Means	8.79	8.51	8.88	8.39	8.68
ADMFACT5	N	308	181	52	41	582
ADMFACT5	Variance	3.83	3.70	4.42	5.19	3.94
ADMFACT3	Means	5.16	5.14	5.07	5.10	5.14
ADMFACT3	N	308	181	54	41	584
ADMFACT3	Variance	1.28	1.08	1.32	1.44	1.22
ADMFACT1	Means	9.30	9.02	9.74	8.95	9.23
ADMFACT1	N	314	180	54	42	590
ADMFACT1	Variance	4.09	4.14	3.67	4.29	4.10
ADMFACT7	Means	4.04	4.13	4.09	4.13	4.08
ADMFACT7	N	300	175	53	39	567
ADMFACT7	Variance	1.00	0.94	0.97	0.80	0.96
ADMFACT2	Means	4.44	4.32	4.62	4.26	4.41
ADMFACT2	N	315	180	55	42	592
ADMFACT2	Variance	1.50	1.00	1.54	1.61	1.36
ADMFACT4	Means	5.25	5.15	5.00	5.02	5.18
ADMFACT4	N	310	180	53	41	584
ADMFACT4	Variance	1.94	1.49	1.12	2.52	1.77
ADMFACT6	Means	4.81	4.65	4.85	4.86	4.77
ADMFACT6	N	313	181	54	42	590
ADMFACT6	Variance	1.48	1.14	1.34	1.15	1.34
PMFACT2	Means	4.49	4.50	4.02	4.60	4.46
PMFACT2	N	311	181	55	42	589
PMFACT2	Variance	2.79	2.60	2.65	1.81	2.66
PMFACT1	Means	16.05	13.83	12.77	14.86	14.94
PMFACT1	N	284	176	53	42	555
PMFACT1	Variance	54.32	42.47	39.10	44.17	49.57

Analysis of Variance (raw.sta)

Marked effects are significant at $p < .05000$

	SS	df	MS	SS	df	MS		
	Effect	Effect	Effect	Error	Error	Error	F	p
EDFACT1	13.64	3	4.55	4141.56	577	7.18	0.63	0.59
EDFACT4	0.88	3	0.29	605.06	586	1.03	0.28	0.84
EDFACT2	6.73	3	2.24	1366.59	589	2.32	0.97	0.41
EDFACT3	9.75	3	3.25	734.22	591	1.24	2.62	0.05
EDFACT6	0.61	3	0.20	549.82	572	0.96	0.21	0.89
EDFACT5	8.19	3	2.73	1446.59	589	2.46	1.11	0.34
FDBFACT1	8.42	3	2.81	1235.86	586	2.11	1.33	0.26
ADMFACT5	14.61	3	4.87	2273.58	578	3.93	1.24	0.30
ADMFACT3	0.46	3	0.15	712.74	580	1.23	0.12	0.95
ADMFACT1	26.89	3	8.96	2390.68	586	4.08	2.20	0.09
ADMFACT7	0.87	3	0.29	544.56	563	0.97	0.30	0.83
ADMFACT2	5.25	3	1.75	799.83	588	1.36	1.29	0.28
ADMFACT4	4.46	3	1.49	1026.30	580	1.77	0.84	0.47
ADMFACT6	3.66	3	1.22	783.53	586	1.34	0.91	0.43
PMFACT2	12.02	3	4.01	1550.03	585	2.65	1.51	0.21
PMFACT1	813.32	3	271.11	26649.72	551	48.37	5.61	0.00

Levene Test of Homogeneity of Variances (raw.sta)

Marked effects are significant at $p < .05000$

	SS	df	MS	SS	df	MS		
	Effect	Effect	Effect	Error	Error	Error	F	p
EDFACT1	16.56	3	5.52	1255.92	577	2.18	2.54	0.06
EDFACT4	4.47	3	1.49	265.22	586	0.45	3.29	0.02
EDFACT2	3.71	3	1.24	544.10	589	0.92	1.34	0.26
EDFACT3	7.33	3	2.44	444.97	591	0.75	3.24	0.02
EDFACT6	1.16	3	0.39	196.83	572	0.34	1.12	0.34
EDFACT5	6.58	3	2.19	702.96	589	1.19	1.84	0.14
FDBFACT1	2.55	3	0.85	382.61	586	0.65	1.30	0.27
ADMFACT5	6.41	3	2.14	820.55	578	1.42	1.51	0.21
ADMFACT3	1.16	3	0.39	258.05	580	0.44	0.87	0.46
ADMFACT1	0.60	3	0.20	883.90	586	1.51	0.13	0.94
ADMFACT7	0.29	3	0.10	264.35	563	0.47	0.20	0.89
ADMFACT2	4.99	3	1.66	322.70	588	0.55	3.03	0.03
ADMFACT4	6.14	3	2.05	342.50	580	0.59	3.47	0.02
ADMFACT6	1.54	3	0.51	287.72	586	0.49	1.04	0.37
PMFACT2	5.81	3	1.94	492.88	585	0.84	2.30	0.08
PMFACT1	106.40	3	35.47	7025.78	551	12.75	2.78	0.04

Non-parametric ANOVA results for scores with significantly different variances

EDFACT1	Kruskal-Wallis test: $H(3, N=581) = 1.788225$ $p = .6175$
EDFACT4	Kruskal-Wallis test: $H(3, N=590) = 1.114370$ $p = .7736$
EDFACT3	Kruskal-Wallis test: $H(3, N=595) = 7.649683$ $p = .0539$
ADMFACT2	Kruskal-Wallis test: $H(3, N=592) = 2.910694$ $p = .4056$
ADMFACT4	Kruskal-Wallis test: $H(3, N=584) = 2.337336$ $p = .5054$
PMFACT2	Kruskal-Wallis test: $H(3, N=589) = 5.497477$ $p = .1388$
PMFACT1	Kruskal-Wallis test: $H(3, N=555) = 14.45815$ $p = .0023$

APPENDIX G

Regression analysis worksheets

University of Cape Town

Series 1 – Independent variables on Intermediary (or moderating) variables

Independent variables (1-29) vs Total for 3 Clinical Freedom factors

N=502	Regression Summary for Dependent Variable: FreedomTotal (Ra R= .28633333 R ² = .08198678 Adjusted R ² = .07273261 F(5,496)=8.8594 p<.00000 Std.Error of estimate: 3.3388					
	Beta	Std.Err. of Beta	B	Std.Err. of B	t(496)	p-level
Intercept			13.51160	0.888575	15.20591	0.000000
PMFACT1	0.203636	0.043401	0.10216	0.021774	4.69192	0.000004
DFFS	0.115813	0.043135	1.03689	0.386191	2.68492	0.007498
B+ size	-0.10787	0.043183	-1.4301	0.572462	-2.49818	0.012806
EDFACT5	0.099069	0.043201	0.21983	0.095860	2.29322	0.022253
51-75%	0.083678	0.043418	0.66332	0.344176	1.92727	0.054517

Independent variables (1-29) vs Clinical Freedom factor 1 subtotal

N=502	Regression Summary for Dependent Variable: FREFACT1 (Ra R= .33761768 R ² = .11398570 Adjusted R ² = .09960818 F(8,493)=7.9281 p<.00000 Std.Error of estimate: 2.3873					
	Beta	Std.Err. of Beta	B	Std.Err. of B	t(493)	p-level
Intercept			6.4003	0.76365	8.3811	0.00000
B+ size	-0.14132	0.04295	-1.3594	0.41319	-3.2900	0.00107
ADMFACT6	0.10098	0.04625	0.2185	0.10008	2.1834	0.02947
DFFS	0.11600	0.04289	0.7536	0.27869	2.7041	0.00708
PMFACT1	0.13939	0.04287	0.0507	0.01560	3.2515	0.00122
51-75%	0.10446	0.04432	0.6008	0.25492	2.3571	0.01880
EDFACT5	0.09492	0.04403	0.1528	0.07090	2.1553	0.03161
76-100%	-0.08715	0.04459	-0.5984	0.30625	-1.9541	0.05124
ADMFACT5	0.08893	0.04630	0.1110	0.05781	1.9205	0.05536

Series 2 – Independent variables on Dependent (or response) variables

Independent variables (1-29) vs Total for 11 Job Satisfaction factors

N=465	Regression Summary for Dependent Variable: SatisTotal (RawVe R= .49578278 R ² = .24580057 Adjusted R ² = .22406089 F(13,451)=11.307 p<0.0000 Std.Error of estimate: 12.992					
	Beta	Std.Err. of Beta	B	Std.Err. of B	t(451)	p-level
Intercept			47.24336	5.193953	9.09584	0.00000
ADMFACT5	0.127634	0.057974	0.93490	0.424651	2.20157	0.02820
DFFS	0.171977	0.041740	6.49703	1.576887	4.12016	0.00004
ADMFACT6	0.127885	0.045814	1.60739	0.575838	2.79139	0.00547
ADMFACT1	0.143951	0.050929	1.01957	0.360716	2.82653	0.00491
ADMFACT7	0.109810	0.042858	1.60604	0.626824	2.56218	0.01072
FDBFACT1	0.140375	0.051891	1.43177	0.529264	2.70520	0.00708
B+ size	-0.088410	0.041427	-4.93722	2.313468	-2.13412	0.03337
> 19 yrs	-0.151225	0.044397	-5.27625	1.549022	-3.40618	0.00071
Female	-0.128217	0.043168	-4.95666	1.668809	-2.97018	0.00313
PMFACT1	0.122255	0.043240	0.26211	0.092705	2.82734	0.00490
Incentive	-0.088564	0.041553	-4.00916	1.881022	-2.13137	0.03359
GP	0.077606	0.042529	2.47771	1.357806	1.82479	0.06869
Age 37-41	-0.076334	0.042738	-2.88379	1.614589	-1.78609	0.07475

Independent variables (1-29) vs Job Satisfaction factor subtotals

N=500	Regression Summary for Dependent Variable: SATFACT1 (Raw R= .33617997 R ² = .11301697 Adjusted R ² = .09672545 F(9,490)=6.9372 p<.00000 Std.Error of estimate: 1.7478					
	Beta	Std.Err. of Beta	B	Std.Err. of B	t(490)	p-level
Intercept			5.67757	0.71817	7.9056	0.00000
FFS	-0.17553	0.04321	-0.69247	0.17047	-4.0619	0.00005
ADMFACT7	0.19895	0.04525	0.36645	0.08336	4.3960	0.00001
FDBFACT1	0.10450	0.04737	0.13343	0.06049	2.2058	0.02785
EDFACT6	-0.11229	0.04379	-0.20777	0.08103	-2.5638	0.01064
PMFACT1	0.12156	0.04371	0.03243	0.01166	2.7807	0.00563
Age 42-46	0.09403	0.04281	0.43030	0.19592	2.1962	0.02854
ADMFACT1	0.09589	0.04670	0.08550	0.04164	2.0531	0.04058
51-75%	0.08354	0.04330	0.34906	0.18093	1.9291	0.05428
Female	-0.08044	0.04294	-0.38809	0.20716	-1.8733	0.06161

N=502	Regression Summary for Dependent Variable: SATFACT2 (Raw R= .56097634 R ² = .31469445 Adjusted R ² = .29931004 F(11,490)=20.455 p<0.0000 Std.Error of estimate: 2.5471					
	Beta	Std.Err. of Beta	B	Std.Err. of B	t(490)	p-level
Intercept			5.5049	0.94087	5.8509	0.00000
ADMFACT5	0.23314	0.05256	0.3519	0.07935	4.4353	0.00001
ADMFACT1	0.15918	0.04602	0.2350	0.06796	3.4587	0.00059
FDBFACT1	0.14760	0.04652	0.3093	0.09751	3.1723	0.00160
EDFACT6	0.11167	0.03838	0.3422	0.11763	2.9095	0.00378
EDFACT1	0.10520	0.04091	0.1177	0.04580	2.5712	0.01042
SMHMO	-0.09334	0.03763	-2.1384	0.86225	-2.4800	0.01347
26-50%	-0.10903	0.03784	-0.8361	0.29020	-2.8813	0.00413
5-9 yrs	-0.08753	0.03769	-0.6293	0.27102	-2.3222	0.02063
DFFS	0.10767	0.03830	0.8424	0.29973	2.8107	0.00514
NW	-0.08523	0.03850	-2.3842	1.07713	-2.2135	0.02732
Incentive	-0.07478	0.03813	-0.6958	0.35478	-1.9612	0.05041

N=505	Regression Summary for Dependent Variable: SATFACT3 (Ra R= .28412754 R ² = .08072846 Adjusted R ² = .06965290 F(6,498)=7.2889 p<.00000 Std.Error of estimate: 3.1346					
	Beta	Std.Err. of Beta	B	Std.Err. of B	t(498)	p-level
Intercept			8.0037	0.77604	10.3134	0.00000
ADMFACT1	0.14427	0.04357	0.2274	0.06869	3.3113	0.00099
> 19 yrs	-0.16134	0.04441	-1.2415	0.34176	-3.6327	0.00030
Female	-0.15485	0.04425	-1.3313	0.38051	-3.4989	0.00050
GP	0.08760	0.04433	0.6189	0.31319	1.9762	0.04867
26-50%	0.08163	0.04311	0.6676	0.35261	1.8933	0.05889
PMFACT1	-0.07868	0.04474	-0.0370	0.02107	-1.7583	0.07930

N=504	Regression Summary for Dependent Variable: SATFACT4 (Ra R= .33889988 R ² = .11485313 Adjusted R ² = .10596611 F(5,498)=12.924 p<.00000 Std.Error of estimate: 2.1288					
	Beta	Std.Err. of Beta	B	Std.Err. of B	t(498)	p-level
Intercept			3.9403	0.51164	7.7013	0.00000
PMFACT1	0.27175	0.04271	0.0885	0.01391	6.3618	0.00000
DFFS	0.14606	0.04248	0.8504	0.24735	3.4382	0.00063
2-3 size	0.10201	0.04258	0.4980	0.20791	2.3956	0.01696
EDFACT1	0.08572	0.04242	0.0709	0.03512	2.0203	0.04388
PP	-0.08543	0.04237	-1.0960	0.54362	-2.0161	0.04432

N=500	Regression Summary for Dependent Variable: SATFACT5 (Ra R= .36038705 R ² = .12987883 Adjusted R ² = .11570170 F(8,491)=9.1612 p<.00000 Std.Error of estimate: 2.1085					
	Beta	Std.Err. of Beta	B	Std.Err. of B	t(491)	p-level
Intercept			6.1871	0.53695	11.5227	0.00000
ADMFACT1	0.18248	0.04355	0.1986	0.04739	4.1902	0.00003
6+ size	-0.09968	0.04371	-0.8637	0.37879	-2.2803	0.02301
ADMFACT6	0.12773	0.04396	0.2464	0.08482	2.9055	0.00383
NW	-0.13534	0.04345	-2.7841	0.89391	-3.1146	0.00195
Age 32-36	-0.10009	0.04231	-0.6623	0.28003	-2.3652	0.01840
SMHMO	-0.08855	0.04358	-1.3522	0.66554	-2.0318	0.04270
IPA	-0.09345	0.04279	-0.4487	0.20548	-2.1837	0.02945
DFFS	0.08145	0.04310	0.4689	0.24814	1.8896	0.05939

N=502	Regression Summary for Dependent Variable: SATFACT6 (Raw R= .36402351 R ² = .13251311 Adjusted R ² = .11664445 F(9,492)=8.3506 p<.00000 Std.Error of estimate: 1.9523					
	Beta	Std.Err. of Beta	B	Std.Err. of B	t(492)	p-level
Intercept			2.6879	0.61370	4.3798	0.00001
EDFACT5	0.18754	0.04284	0.2467	0.05636	4.3773	0.00001
> 19 yrs	-0.13447	0.04261	-0.6620	0.20980	-3.1554	0.00170
4-5 size	-0.12451	0.04356	-0.8786	0.30741	-2.8583	0.00444
ADMFACT6	0.09117	0.04301	0.1620	0.07643	2.1197	0.03453
Salary	-0.14097	0.04375	-1.7767	0.55141	-3.2221	0.00135
FFS	-0.11955	0.04429	-0.5315	0.19691	-2.6992	0.00719
2-3 size	-0.11096	0.04377	-0.4984	0.19662	-2.5349	0.01155
NW	-0.09831	0.04282	-1.8773	0.81772	-2.2958	0.02210
PMFACT1	0.08166	0.04333	0.0246	0.01306	1.8844	0.06009

N=496	Regression Summary for Dependent Variable: SATFACT7 (Ra R= .48229325 R ² = .23260678 Adjusted R ² = .21839579 F(9,486)=16.368 p<0.0000 Std.Error of estimate: 2.5460					
	Beta	Std.Err. of Beta	B	Std.Err. of B	t(486)	p-level
Intercept			2.2781	0.81233	2.8044	0.00524
ADMFACT5	0.11940	0.05225	0.1701	0.07445	2.2851	0.02273
EDFACT1	0.16770	0.04273	0.1782	0.04540	3.9244	0.00009
DFFS	0.16265	0.04037	1.2089	0.30010	4.0285	0.00006
ADMFACT6	0.14593	0.04297	0.3561	0.10488	3.3960	0.00074
ADMFACT1	0.16123	0.04885	0.2249	0.06815	3.3001	0.00103
76-100%	-0.11906	0.04044	-0.9313	0.31634	-2.9440	0.00339
PMFACT1	0.11212	0.04039	0.0467	0.01684	2.7755	0.00572
6+ size	-0.10304	0.04030	-1.1283	0.44133	-2.5566	0.01087
NOA	-0.07701	0.04038	-0.5724	0.30019	-1.9069	0.05711

Regression Summary for Dependent Variable: SATFACT8 (Raw R= .33922829 R ² = .11507583 Adjusted R ² = .10266207 F(7,499)=9.2700 p<.00000 Std.Error of estimate: 1.9327						
N=507	Beta	Std.Err. of Beta	B	Std.Err. of B	t(499)	p-level
Intercept			4.68938	0.58356	8.0357	0.00000
PMFACT1	0.21598	0.04254	0.06388	0.01258	5.0768	0.00000
ADMFACT7	0.16520	0.04379	0.33859	0.08976	3.7721	0.00018
FFS	-0.11207	0.04295	-0.48909	0.18746	-2.6089	0.00935
FDBFACT1	0.09671	0.04371	0.13622	0.06157	2.2122	0.02740
SMHMO	0.12211	0.04403	1.70841	0.61611	2.7728	0.00576
76-100%	-0.08760	0.04296	-0.49235	0.24146	-2.0390	0.04197
6+ size	-0.08776	0.04334	-0.68778	0.33967	-2.0248	0.04341

Regression Summary for Dependent Variable: SATFACT9 (Raw R= .33277906 R ² = .11074191 Adjusted R ² = .09266755 F(10,492)=6.1270 p<.00000 Std.Error of estimate: 2.0911						
N=503	Beta	Std.Err. of Beta	B	Std.Err. of B	t(492)	p-level
Intercept			4.33255	0.84010	5.1571	0.00000
ADMFACT5	0.16011	0.04710	0.17382	0.05114	3.3988	0.00073
Female	-0.12854	0.04438	-0.74539	0.25734	-2.8964	0.00394
> 19 yrs	-0.12236	0.04551	-0.63144	0.23486	-2.6886	0.00741
76-100%	-0.09368	0.04277	-0.56467	0.25780	-2.1902	0.02897
ADMFACT6	0.10068	0.04671	0.18809	0.08726	2.1554	0.03160
DFFS	0.08032	0.04337	0.45569	0.24607	1.8518	0.06464
EDFACT6	-0.10297	0.04416	-0.22880	0.09814	-2.3313	0.02013
ADMFACT7	0.09484	0.04487	0.20946	0.09910	2.1136	0.03505
Incentive	-0.08345	0.04341	-0.56470	0.29375	-1.9223	0.05513
Age 42-46	0.08238	0.04428	0.45620	0.24519	1.8605	0.06339

Regression Summary for Dependent Variable: SATFAC10 (Raw R= .37628331 R ² = .14158913 Adjusted R ² = .13118415 F(6,495)=13.608 p<.00000 Std.Error of estimate: 1.8646						
N=502	Beta	Std.Err. of Beta	B	Std.Err. of B	t(495)	p-level
Intercept			4.14635	0.64620	6.4164	0.00000
ADMFACT5	0.14357	0.05273	0.14200	0.05215	2.7227	0.00670
DFFS	0.13626	0.04211	0.70091	0.21661	3.2357	0.00129
ADMFACT6	0.14904	0.04510	0.25405	0.07688	3.3042	0.00102
ADMFACT1	0.13592	0.05090	0.13142	0.04922	2.6702	0.00783
EDFACT6	0.08158	0.04222	0.16469	0.08523	1.9321	0.05391
PP	-0.07417	0.04178	-0.84386	0.47539	-1.7750	0.07649

Series 3 – Independent and Intermediary variables on Dependent variables

Independent variables 1-29 + 3 Clinical Freedom factors vs Total for 11 Job Satisfaction factors

N=460	Regression Summary for Dependent Variable: SatisTotal (Raw R= .55649013 R ² = .30968127 Adjusted R ² = .28955987 F(13,446)=15.391 p<0.0000 Std.Error of estimate: 12.448					
	Beta	Std.Err. of Beta	B	Std.Err. of B	t(446)	p-level
Intercept			32.3755	5.54098	5.8429	0.00000
FREFACT1	0.23855	0.04236	1.4329	0.25448	5.6307	0.00000
ADMFACT5	0.12349	0.05632	0.9079	0.41412	2.1925	0.02885
DFFS	0.13783	0.04048	5.1924	1.52525	3.4043	0.00072
ADMFACT6	0.10644	0.04419	1.3424	0.55732	2.4088	0.01641
ADMFACT1	0.13547	0.04858	0.9621	0.34508	2.7881	0.00552
FREFACT3	0.09807	0.04050	1.4747	0.60908	2.4212	0.01586
ADMFACT7	0.10376	0.04150	1.5470	0.61881	2.5000	0.01277
FDBFACT1	0.11894	0.05010	1.2195	0.51375	2.3737	0.01803
FREFACT2	0.08085	0.04153	0.8891	0.45682	1.9464	0.05223
Female	-0.11100	0.04118	-4.2994	1.59520	-2.6952	0.00729
> 19 yrs	-0.10877	0.04277	-3.8234	1.50343	-2.5431	0.01132
Age 37-41	-0.08079	0.04105	-3.0571	1.55359	-1.9677	0.04971
Incentive	-0.07297	0.04009	-3.3443	1.83759	-1.8199	0.06943

Independent variables 1-29 + 3 Clinical Freedom factors vs Job Satisfaction factor subtotals

N=494	Regression Summary for Dependent Variable: SATFACT1 (Raw R= .44633468 R ² = .19921464 Adjusted R ² = .18600581 F(8,485)=15.082 p<0.0000 Std.Error of estimate: 1.6636					
	Beta	Std.Err. of Beta	B	Std.Err. of B	t(485)	p-level
Intercept			3.29009	0.74804	4.3982	0.00001
FREFACT1	0.20637	0.04316	0.15063	0.03150	4.7814	0.00000
FREFACT2	0.19221	0.04256	0.26360	0.05837	4.5155	0.00000
FFS	-0.14203	0.04163	-0.56188	0.16469	-3.4117	0.00069
ADMFACT7	0.17777	0.04320	0.33353	0.08105	4.1150	0.00004
FDBFACT1	0.09009	0.04530	0.11606	0.05836	1.9887	0.04729
EDFACT6	-0.10667	0.04186	-0.19714	0.07736	-2.5483	0.01113
FREFACT3	0.09884	0.04213	0.18387	0.07837	2.3462	0.01936
ADMFACT1	0.08653	0.04473	0.07740	0.04001	1.9341	0.05367

Regression Summary for Dependent Variable: SATFACT2 (Ra R= .56684931 R ² = .32131814 Adjusted R ² = .30445648 F(12,483)=19.056 p<0.0000 Std.Error of estimate: 2.5103						
N=496	Beta	Std.Err. of Beta	B	Std.Err. of B	t(483)	p-level
Intercept			5.5078	1.07209	5.1374	0.00000
ADMFACT5	0.23656	0.05294	0.3541	0.07926	4.4680	0.00001
ADMFACT1	0.16074	0.04594	0.2349	0.06714	3.4990	0.00051
EDFACT1	0.09139	0.04118	0.1012	0.04562	2.2189	0.02695
Salary	-0.07832	0.03865	-1.5329	0.75651	-2.0262	0.04328
FREFACT1	0.09774	0.03912	0.1169	0.04682	2.4984	0.01280
EDFACT6	0.09623	0.03872	0.2906	0.11696	2.4850	0.01329
FDBFACT1	0.12690	0.04743	0.2647	0.09894	2.6752	0.00772
26-50%	-0.09563	0.03797	-0.7250	0.28786	-2.5187	0.01210
5-9 yrs	-0.07898	0.03791	-0.5627	0.27016	-2.0830	0.03777
DFFS	0.08653	0.03823	0.6694	0.29577	2.2634	0.02405
Incentive	-0.08514	0.03829	-0.7909	0.35573	-2.2232	0.02666
FREFACT3	-0.08045	0.03972	-0.2462	0.12157	-2.0250	0.04340

Regression Summary for Dependent Variable: SATFACT3 (Ra R= .26979114 R ² = .07278726 Adjusted R ² = .06526424 F(4,493)=9.6753 p<.00000 Std.Error of estimate: 3.1444						
N=498	Beta	Std.Err. of Beta	B	Std.Err. of B	t(493)	p-level
Intercept			7.4439	0.66186	11.2467	0.00000
ADMFACT1	0.15212	0.04348	0.2399	0.06859	3.4981	0.00051
> 19 yrs	-0.17408	0.04453	-1.3504	0.34544	-3.9094	0.00010
Female	-0.16693	0.04448	-1.4349	0.38240	-3.7524	0.00019
GP	0.11112	0.04356	0.7826	0.30679	2.5509	0.01104

Regression Summary for Dependent Variable: SATFACT4 (Ra R= .40867246 R ² = .16701318 Adjusted R ² = .15161917 F(9,487)=10.849 p<.00000 Std.Error of estimate: 2.0728						
N=497	Beta	Std.Err. of Beta	B	Std.Err. of B	t(487)	p-level
Intercept			1.6004	0.66253	2.4155	0.01607
PMFACT1	0.21490	0.04382	0.0699	0.01426	4.9033	0.00000
FREFACT1	0.10078	0.04419	0.0900	0.03947	2.2805	0.02300
DFFS	0.11659	0.04197	0.6777	0.24399	2.7778	0.00568
FREFACT2	0.12422	0.04323	0.2079	0.07237	2.8730	0.00424
2-3 size	0.08447	0.04201	0.4106	0.20425	2.0106	0.04491
FREFACT3	0.11734	0.04469	0.2667	0.10160	2.6254	0.00892
EDFACT1	0.09881	0.04209	0.0817	0.03480	2.3475	0.01929
PP	-0.08970	0.04233	-1.1425	0.53915	-2.1191	0.03458
26-50%	0.07846	0.04169	0.4433	0.23557	1.8819	0.06044

N=493	Regression Summary for Dependent Variable: SATFACT5 (Ra R= .36794304 R ² = .13538208 Adjusted R ² = .12109087 F(8,484)=9.4731 p<.00000 Std.Error of estimate: 2.1088					
	Beta	Std.Err. of Beta	B	Std.Err. of B	t(484)	p-level
Intercept			6.1491	0.53997	11.3877	0.00000
ADMFACT1	0.17620	0.04389	0.1923	0.04790	4.0146	0.00006
NW	-0.14453	0.04354	-3.2415	0.97666	-3.3190	0.00097
ADMFACT6	0.13700	0.04429	0.2673	0.08643	3.0931	0.00209
6+ size	-0.09721	0.04395	-0.8395	0.37964	-2.2115	0.02746
Age 32-36	-0.09695	0.04252	-0.6398	0.28059	-2.2802	0.02302
IPA	-0.10429	0.04296	-0.5030	0.20723	-2.4274	0.01556
SMHMO	-0.08928	0.04376	-1.3583	0.66588	-2.0399	0.04189
DFFS	0.08329	0.04311	0.4803	0.24866	1.9318	0.05396

N=496	Regression Summary for Dependent Variable: SATFACT6 (Ra R= .40801712 R ² = .16647797 Adjusted R ² = .14929195 F(10,485)=9.6868 p<.00000 Std.Error of estimate: 1.9222					
	Beta	Std.Err. of Beta	B	Std.Err. of B	t(485)	p-level
Intercept			1.5457	0.66042	2.3404	0.01966
EDFACT5	0.16995	0.04268	0.2262	0.05681	3.9814	0.00007
FREFACT1	0.11349	0.04330	0.0939	0.03583	2.6208	0.00904
FREFACT3	0.15643	0.04395	0.3288	0.09241	3.5586	0.00040
Salary	-0.15582	0.04392	-1.9588	0.55223	-3.5471	0.00042
4-5 size	-0.14766	0.04272	-1.0398	0.30083	-3.4566	0.00059
2-3 size	-0.13794	0.04290	-0.6196	0.19271	-3.2151	0.00139
> 19 yrs	-0.11645	0.04210	-0.5780	0.20898	-2.7660	0.00589
ADMFACT6	0.08344	0.04297	0.1489	0.07673	1.9416	0.05276
FFS	-0.10153	0.04395	-0.4529	0.19610	-2.3098	0.02131
NW	-0.08918	0.04212	-1.8588	0.87798	-2.1171	0.03475

N=490	Regression Summary for Dependent Variable: SATFACT7 (Ra R= .63954409 R ² = .40901665 Adjusted R ² = .39667879 F(10,479)=33.151 p<0.0000 Std.Error of estimate: 2.2319					
	Beta	Std.Err. of Beta	B	Std.Err. of B	t(479)	p-level
Intercept			-2.7186	0.83286	-3.2642	0.00117
FREFACT1	0.37850	0.03819	0.4353	0.04392	9.9104	0.00000
EDFACT1	0.17250	0.03794	0.1827	0.04020	4.5462	0.00000
FREFACT3	0.13850	0.03607	0.4024	0.10483	3.8391	0.00014
ADMFACT1	0.16166	0.04271	0.2251	0.05948	3.7852	0.00017
DFFS	0.11086	0.03588	0.8183	0.26485	3.0898	0.00211
ADMFACT6	0.09965	0.03857	0.2447	0.09472	2.5834	0.01007
FREFACT2	0.08431	0.03701	0.1803	0.07915	2.2781	0.02315
76-100%	-0.08395	0.03569	-0.6520	0.27720	-2.3521	0.01906
ADMFACT5	0.09151	0.04646	0.1303	0.06616	1.9694	0.04948
10-14 yrs	0.06422	0.03540	0.4557	0.25123	1.8141	0.07027

Regression Summary for Dependent Variable: SATFACT8 (Raw R= .40984536 R ² = .16797322 Adjusted R ² = .15613544 F(7,492)=14.190 p<.00000 Std.Error of estimate: 1.8788						
N=500	Beta	Std.Err. of Beta	B	Std.Err. of B	t(492)	p-level
Intercept			2.94361	0.53512	5.5007	0.00000
FREFACT1	0.21078	0.04269	0.17117	0.03467	4.9372	0.00000
PMFACT1	0.15607	0.04324	0.04623	0.01281	3.6091	0.00033
ADMFACT7	0.15078	0.04138	0.31438	0.08627	3.6438	0.00029
FREFACT3	0.11526	0.04420	0.23760	0.09112	2.6073	0.00940
SMHMO	0.11908	0.04268	1.65872	0.59455	2.7898	0.00547
DFFS	0.08866	0.04153	0.46951	0.21993	2.1347	0.03327
76-100%	-0.07308	0.04191	-0.40940	0.23478	-1.7437	0.08182

Regression Summary for Dependent Variable: SATFACT9 (Ra R= .33870458 R ² = .11472079 Adjusted R ² = .10202211 F(7,488)=9.0341 p<.00000 Std.Error of estimate: 2.0887						
N=496	Beta	Std.Err. of Beta	B	Std.Err. of B	t(488)	p-level
Intercept			4.7419	0.72441	6.5459	0.00000
FREFACT1	0.17384	0.04325	0.1526	0.03798	4.0191	0.00006
ADMFACT5	0.14254	0.04336	0.1556	0.04734	3.2870	0.00108
> 19 yrs	-0.15780	0.04392	-0.8233	0.22921	-3.5922	0.00036
Female	-0.14623	0.04369	-0.8505	0.25417	-3.3464	0.00088
EDFACT6	-0.09653	0.04314	-0.2144	0.09584	-2.2375	0.02570
Incentive	-0.08568	0.04311	-0.5871	0.29545	-1.9871	0.04746
Salary	-0.08209	0.04302	-1.1314	0.59296	-1.9081	0.05695

Regression Summary for Dependent Variable: SATFAC10 (Ra R= .39670252 R ² = .15737289 Adjusted R ² = .14526120 F(7,487)=12.993 p<.00000 Std.Error of estimate: 1.8486						
N=495	Beta	Std.Err. of Beta	B	Std.Err. of B	t(487)	p-level
Intercept			3.31137	0.71013	4.66302	0.00000
ADMFACT5	0.14261	0.05289	0.14122	0.05237	2.69630	0.00725
DFFS	0.13637	0.04239	0.70030	0.21769	3.21682	0.00138
ADMFACT6	0.13462	0.04566	0.23120	0.07841	2.94832	0.00334
ADMFACT1	0.14647	0.05071	0.14151	0.04899	2.88812	0.00404
FREFACT1	0.08869	0.04278	0.07154	0.03451	2.07272	0.03872
EDFACT6	0.08236	0.04223	0.16548	0.08486	1.95012	0.05173
51-75%	0.07643	0.04190	0.34783	0.19068	1.82412	0.06874