THE VIEWS OF PHYSICIANS ON HEALTH CARE QUALITY

A Thesis

Submitted to the College of Graduate Studies and Research

in Partial Fulfillment of the Requirements

for the Degree of Doctor of Philosophy

in the Interdisciplinary PhD Program

University of Saskatchewan

Saskatoon

By

Wallace Stewart Lockhart

PERMISSION TO USE

In presenting this thesis in partial fulfilment of the requirements for a Postgraduate degree from the University of Saskatchewan, I agree that the Libraries of this University may make it freely available for inspection. I further agree that permission for copying of this thesis in any manner, in whole or in part, for scholarly purposes may be granted by the professor or professors who supervised my thesis work or, in their absence, by the Head of the Department or the Dean of the College in which my thesis work was done. It is understood that any copying or publication or use of this thesis or parts thereof for financial gain shall not be allowed without my written permission. It is also understood that due recognition shall be given to me and to the University of Saskatchewan in any scholarly use which may be made of any material in my thesis.

Requests for permission to copy or to make other use of material in this thesis in whole or part should be addressed to:

Chair of the Interdisciplinary PhD Committee
College of Graduate Studies and Research
University of Saskatchewan
Saskatoon, Saskatchewan S7N 5A4

ABSTRACT

Objectives: There are four primary goals for this research project:

1) To develop an objective index of health care quality which represents, in the best practical way, a comprehensive range of services provided at the health region level.
2) To develop a comparable measure representing physician assessments of health care quality, and compare this measure with the objective index.
3) To develop an understanding of the relationships between physician ratings on the workplace issues of professional autonomy, stress, sense of equity and satisfaction and their views on health care quality.
4) Based on the understanding of this research, provide recommendations to health care policy makers about the use of both physician viewpoints and objective measures of quality.

Background: Health care in Canada has grown and evolved from a relatively simple offering of services, provided primarily by doctors and hospitals, to a complex conglomeration of programs and services, provided by a loose network of both public and private providers. As a result, physicians are under pressure to adapt to these changes and a power struggle which has always pitted physicians against policy makers. In dealing with changes to the health care system the use of statistics and evidence is gaining prominence as the basis for policy decisions, in addition to the less formal tools of rhetoric and politics.

Design: Data from the 2004 Canada-wide survey "Emerging Issues in the Work of Physicians" is compared to a single index score of health care quality based on objective data from the annual Health Indicators Report published by Canadian Institute of Health Information and Statistics Canada (2005). These reports include a number of measures of quality and access to health care by health region and by province, using mandatory standardized data collection and reporting procedures.

Measures: Nine reliable measures of health care quality were selected from the Health Indicators Reports for inclusion in the index: 30 day AMI risk; 30 day stroke risk; AMI readmission risk; asthma readmission risk; ACSC rate; hysterectomy readmission rate; prostatectomy rate; in-hospital hip fracture rate; and C-section rate. Index scores were developed for each of the measures, which were then assigned weights based on importance, resulting in a single overall index of health care quality. These scores are compared to a similar index score which is based on physician views on quality, as collected in the national survey.

Results: Physician views on health care quality are aligned with the objective data when examined on an aggregate basis. However, there is a high degree of variability in physician responses which results in differences when examining the data on regional or individual bases. In addition, physician views on quality are influenced by factors in their work lives including autonomy, stress, equity and satisfaction. On each of these factors, those reporting high and low levels will generally over and under-rate health care quality as compared to those reporting moderate levels.

Discussion: As policy makers make decisions on how to shape the future of health care, they must grapple with conflicting viewpoints of different stakeholder groups, and they must decide on the degree to which they rely on evidence (in the form of objective data) versus influence (as exerted by physicians and/or other stakeholder groups). This research shows that, while physician views on how well the health care system is performing are generally aligned with the objective data, those opinions vary greatly between individuals, and are influenced by work related factors including autonomy, stress, equity and satisfaction.

ACKNOWLEDGEMENTS

To begin, a journey such as this could not be completed without the support of family and friends. I have the good fortune of a large family – brothers, sisters, and a whole clan who through the years have remained close-knit and supportive of each other. Furthermore, I have two wonderful daughters, Laura and Wendy, who have each been doing their own post-secondary programs while dad does his. As I've travelled down this path, my family has been my rock, with unconditional love and support.

Through the years of study, many hundreds of hours were spent in "the swamp" – reading, crunching data, composing reports, listening to Van Morrison, and sometimes wandering off the path into philosophical discussions about almost anything with my friend and colleague, Danton Danielson. Thank you Danton.

I would like to acknowledge and thank each of my committee members:

Dr. Joseph Garcea, who was more than generous in taking the time to develop a special topics course to suit my needs and who always seemed to be a step ahead in understanding what I needed to do, or to learn, at each stage along the process.

Dr. Allen Backman, who in addition to being a member of the committee was also my teacher, a colleague in teaching, and who was always able to give me new perspectives and insights into the health care system.

Dr. Roy Dobson, whose knowledge of research and statistical methods were important in shaping and verifying the study, and who was diligent in reviewing the work and providing advice along the way.

Dr. David Keegan, whose knowledge of the medical profession was important in expanding my understanding, and whose support was always provided in a kind and patient manner.

Dr. Marvin Painter and Dr. Brooke Dobni, who served as committee co-chairs. I appreciate your efforts in bringing the team together for meetings, providing my valued advice, and ensuring the many necessary reports are finished and filed on time.

Finally, and most importantly, I want to thank Dr. Rein Lepnurm, who agreed to take me on as a student four years ago, and who has patiently guided me through my studies. Rein, I truly appreciate the way you stood by a student who is independent minded – or is it better phrased as stubborn, or perhaps obstinate – through years of difficult and stressful challenges of course work and research, as well as personal and professional challenges. I could not have made it to the finish line without your guidance and support, occasional scolding when it was needed, praise and encouragement when it was needed as well, and most importantly, the fact that you stood by me through some very difficult times. I will be forever grateful.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

1.0 INTRODUCTION

1.1 Background and Purpose of the Research Project

Health care in Canada has grown and evolved from a relatively simple offering of services, provided primarily by doctors and hospitals, to a complex conglomeration of programs and services provided by a loose network of both public and private providers (Tomblin, 2001; Fierlbeck, 2001; Rathwell & Persaud, 2002; Lewis & Kouri, 2004). Where once health care was controlled by a large number of independent, institutionally based organizations, it is now managed by regional authorities (Lewis & Kouri, 2004). Between provinces there are differences in health region mandates, autonomies and governance mechanisms (Denis, 2002; Green, 2003; Rathwell & Persaud, 2002).

Physicians are under pressure to adapt to these changes. Their roles in the delivery of care have changed, and their ability to exert influence may also be evolving. A power struggle which has traditionally pitted physicians against policy makers faces new issues and new players. As well, the use of statistics and evidence is gaining prominence as the basis for policy decisions, in addition to the less formal tools of rhetoric and politics (Thomas, 2004; Walter, 2004; Freeman, 2002, Biller-Andorno, 2004; Persaud & Nestman, 2002).

Physicians are also affected by changes in the health care system. Changes in the working lives of physicians may result in a perceived loss of professional autonomy, increased stress, a diminished sense of equity, and a decline in satisfaction (Konrad, 1999; Landon, 2004; Lepnurm, Dobson & Backman, 2004; Williams E., 2002; Hirsch, 1996; Lepnurm, Dobson, Backman & Keegan, 2005).

Mays, Pope and Popay (2005) said of evidence: "Policy-makers and managers have always used a wide range of sources of evidence in making decisions about policy and the organization of services. However, they are under increasing pressure to adopt a more systematic approach to the utilization of the complex evidence base."

1.2 Goals for This Research Project

There are four primary goals for this research project:

1) To develop an objective index of health care quality which represents, in the best practical way, a comprehensive range of services provided at the health region level.
2) To develop a comparable measure representing physician assessments of health care quality, and compare this measure with the objective index.
3) To develop an understanding of the relationships between physician ratings on the workplace issues of professional autonomy, stress, sense of equity and satisfaction and their views on health care quality.
4) Based on the understanding of this research, provide recommendations to health care policy makers about the use of both physician viewpoints and objective measures of quality.

1.3 What is the Scope – Health Care, or Health?

Murray and Evans (2003) developed a three-tiered model of health systems for use by the World Health Organization (WHO) when assessing of health systems performance (Figure 1.1). The narrowest definition includes only activities under the direct control of the Minister of Health – often a relatively limited set of personal curative services. The second, broader definition is more inclusive: personal medical and non-personal health services, but not intersectoral actions designed specifically to improve health. The final, broadest definition prescribes that all actors, institutions and resources that undertake health actions – where the primary intent of a health action is to improve health. "The stewards of the health system take responsibility to advocate for health improvements in areas outside their direct control" (Murray & Evans, 2003).

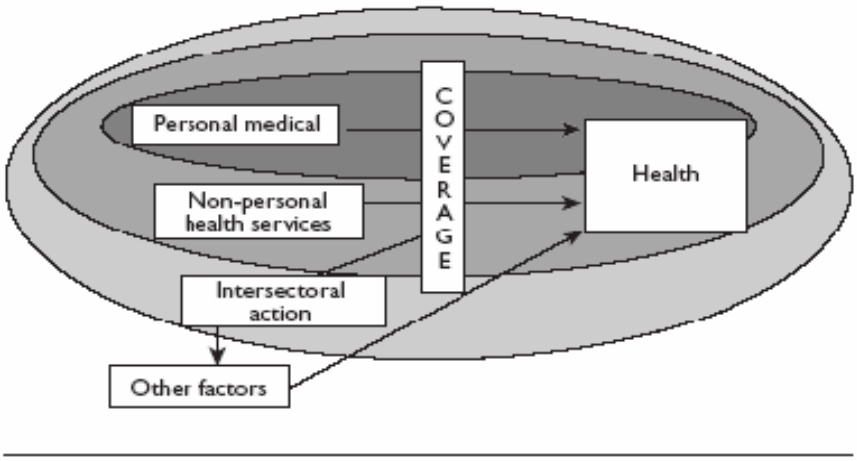


Figure 1.1 Boundaries of the health system (WHO)

Murray and Evans' first definition may reasonably describe the role of the health care system in Canada a generation ago – primarily clinical and hospital services. The second generally describes the additional programs and services which have been added

to the mandate of regional health authorities over the past decade. In Canada, regional health authorities have different degrees of responsibility and autonomy within this second level – varying between Ontario's limited regionalization of health care services focusing on hospitals, to Newfoundland and Labrador's new regional mandates which include health care, community health and family support services formerly under the mandate of Social Services. The third level, of intersectoral action, may be beginning to take hold as a normal role of health authority managers and Boards (Fyke, 2001, Romanow, 2002).

For this study, the examination of health care services and performance measures will be limited to those which generally fit into Murray and Evans' first definition – personal medical services. Though the mandate of most regional health authorities goes well beyond the scope of personal medical services, this is the only level at which meaningful, comparable data is available across the country.

2.0 LITERATURE REVIEW

Canada's health care system continues to evolve in scope of services, as well as complexity of organizations and interrelationships between services and providers; necessitating a shift in the policy making process away from political influence and power of providers, toward evidence based on objective performance measures.

Within the health care policy arena (Figure 2.1), physicians hold power and influence as power elites (Arrow, 1963; Torrance, 1987; Tuohy, 1999; Lavis, 2001) which is used to compete against technocrats' use of evidence and objective data to sway policy makers' decisions. Major changes in the Canadian health care system have an effect on the working lives of physicians (Konrad, 1999; Landon, 2004; Williams, E, 2002), which in turn shape physician views on the quality of health care (Lepnurm, Dobson and Backman, 2005).

There has always been a power struggle between physicians and other stakeholders in the health care system (Torrance, 1987; Williams, 1995). The emergence of new information technologies and measurement tools have ushered in an era of evidence based policy making (Mercer, 1985; Mays, Pope and Popay 2005). However, these tools and methods have yet to realize their potential in the health care policy arena (Murray and Evans, 2003).

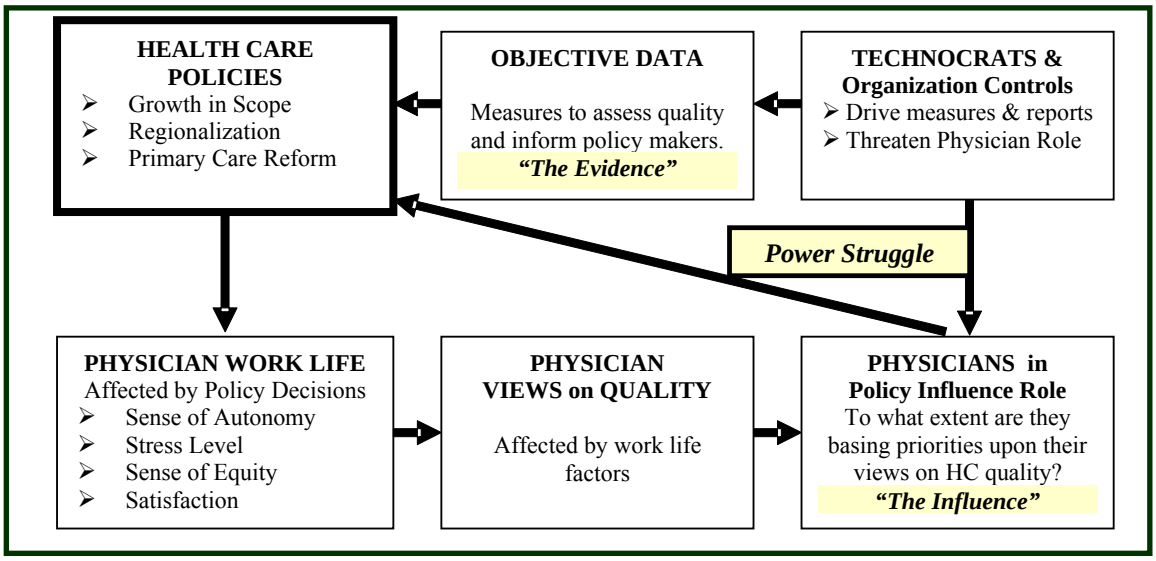


FIGURE 2.1 Health Care Policy Arena

2.1 HEALTH CARE POLICY

Within the Canadian health care policy arena, the major issues in recent decades have centred around growth in scope of services, organizational restructuring toward regional models of governance, and attempts to reform the ways health care services are delivered at the front line (primary care reform) (Fyke, 2001, Romanow, 2002).

Policy makers have traditionally looked to physicians as centres of knowledge and influence. However, the emergence of new information technologies, combined with organizational restructuring, have led to the emergence of a new group of technocrats armed with objective data, attempting to sway policy makers toward evidence based policy making (Thomas, 2004; Persaud & Nestman, 2002).

2.1.1 Rapid Growth in Scope of Health Care Services

Since the inception of medicare in the 1960's, Canada's health care system has seen an almost continuous period of growth and expansion. The only exception to this growth came in the early to mid 1990's, when federal and provincial governments were dealing with deficit reduction. From 1992 to 1996, real growth in spending on health care in Canada was almost flat at an average annual rate of 0.5%. However, in the nine years since then, the rate of real growth has been the highest ever. Real growth in health care spending over the past thirty years has averaged about 3.8% per year. There are three distinct periods – of growth, a levelling off, then fast growth (CIHI, Health Expenditures, 2005).

Period of Growth	Average Annual Rate
1975 – 1991	3.8%
1992 – 1996	0.5%
1997 – 2005	5.1%

The most important period of growth is the current one – with real spending growth of over 5% per year for nearly a decade, health care expenditures have grown to their highest historical levels – in terms of absolute dollars or percentage of GDP.

The growth in spending is more pronounced when examining provincial expenditures. For example, Saskatchewan government spending on health care, in absolute dollars, has grown more than one hundred fold since 1960 – from about $27 per capita to nearly $3,000. Allowing for inflation, the growth in real spending is about 19 fold (Government of Saskatchewan, 2004).

While growth in health care spending has reached into all areas, the largest percentage increases have not been in the traditional core areas of medical and hospital services. Together, these two categories have declined in terms of percentage of public health care spending in Canada from 74.7% in 1975 to 57.4% in 2005 (CIHI, Health Expenditures, 2005). The reduction in proportionate spending on these two core areas is explained by the growth in areas such areas as pharmaceuticals, home care, public health and diagnostic services.

Of significance to this study is the fact that many of these growth areas fall outside the normal control or direction of front-line physicians – other health care professionals such as nurses, physiotherapists, pharmacists and others have come to the forefront (Tuohy, 1999).

2.1.2 Organization Change – Regionalization

The growth in scope and complexity of health care has been a catalyst for a restructuring of the organization of health care services throughout the country. The local hospital boards which were once the hallmark of governance throughout the country are no longer sufficient to oversee health care services which are increasingly delivered outside the hospital system (Tuohy, 1999). Every province has established regional health authorities, beginning with Saskatchewan's first attempt at health districts in 1992, and most recently the introduction of Local Health Integration Networks in Ontario. The structure of regional organizations is evolving over time in most provinces.

Regional health organizations were created to manage and integrate health care services (Rathwell & Persaud, 2002). However, the creation of these organizations has had two other effects which are of importance to this study, illustrated in Figure 2.2.

1) A new set of organizational players have become involved in governance, administration and control over health care services. Now, in addition to macro-level (federal and provincial) and micro-level (facility and service based) players, there are new meso-level (regional) organizational structures in place (World Health Organization, 2006).

2) The new level of governance and policy making affects the sphere of influence of physicians in the new regional policy forum.

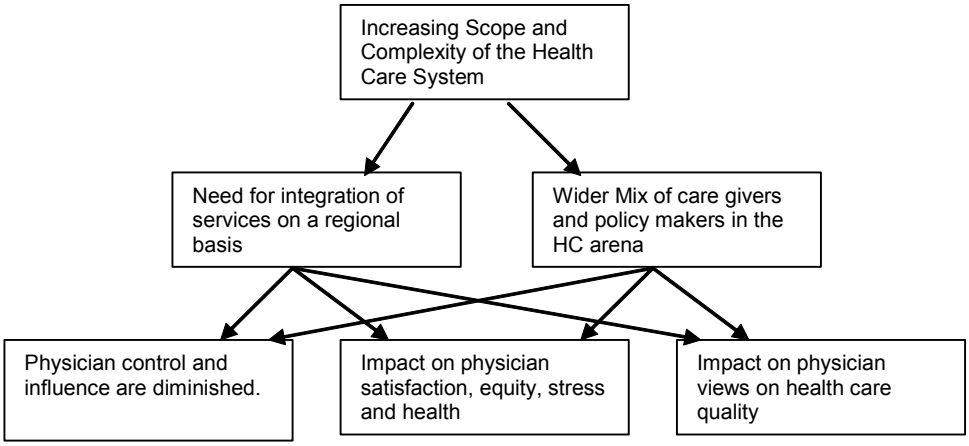


Figure 2.2 Scope of Service, Regionalization and Physician Influence

The Organisation for Economic Co-operation and Development (OECD,2004) examined health care systems around the world, and made the following observations about

organization and coordination of health care: "Today's health-care delivery systems are not organised in ways that promote best quality. Service delivery is largely uncoordinated, requiring steps and patient "hand-offs" that slow down care and decrease rather than improve safety. These transitions in care waste resources, lead to loss of information, and fail to build on the strengths of all health professionals involved to ensure that care is appropriate, timely, and safe. Organisational problems are particularly apparent regarding chronic conditions. The prevalence of patients afflicted with multiple chronic conditions strongly suggests the potential value of more sophisticated mechanisms to co-ordinate care. Yet health-care organisations, hospitals, and physicians typically operate as separate "silos", acting without the benefit of complete information about the patient's condition, medical history, services provided in other settings, or medications prescribed by other clinicians."(OECD, 2004)

Rundall (2001) discussed integration of health services for the WHO. He described a number of potential benefits of integrated delivery systems:

- Reducing fragmentation
- Improve coordination of care
- Improve quality of care
- Improve outcomes
- Distribute risk across providers
- Reduce administration redundancy
- Reduce production costs
- Reduce transaction cost

Rundall went on to describe the possible pitfalls of organizational integration:

"Organization leaders trying to develop integrated delivery systems may feel that just as they are about to achieve their goal, some aspect of their complicated set of arrangements comes apart, leaving them back where they started." (Rundall, 2001)

So is regionalization achieving its desired goals? Rathwell and Persaud (2002) examined regionalization of health care services in Canada, and described three major problems which have commonly arisen:

1) It is difficult for government officials to hand over responsibility to another agency.
2) Regionalization is generally based on a belief that economies of scale are achieved. However, it is not realistic to expect that small regions in Canada will realize economies.
3) There is also a belief that integration of services will happen. But once again, evidence suggest that integration is difficult to achieve, and there is little evidence that it works. (Rathwell and Persaud, 2002)

Have efforts at integration of health care services been successful in the United States? Lake et al (2003) suggest not: "Interest in forming integrated delivery systems has waned. The potential for quality improvement through these organizations systems – by emphasizing primary care and coordinating hospital and physician services – has not been realized."

In an examination of health systems performance assessment done for the WHO, Murray and Evans observed: "In many countries, health systems are fragmented and actors consider only pieces of the puzzle at one time. Decision makers may feel accountable only for the resources and activity in their direct day-to-day managerial control. … It is important to create an accountability framework that encourages decision-makers to consider the big picture." (Murray and Evans, 2003)

Two main themes arise from the review of literature on regionalization. First, regionalization of health care services has been driven by the need for coordination and

integration of an increasingly broad and complex system of services. This new level of control has also created a new level of accountability, a new set of organizational players with responsibilities for health care, including the reporting of health care performance on a regional basis. These new regional organizations are still finding their way in terms of developing organization systems, controls or reporting mechanisms. Second, the shift of responsibility for health care services into the hands of regional managers may affect the role and influence of physicians in health care policy.

2.1.3 Primary Care Reform

Primary Care Reform is one of the most widely discussed issues in health care today – in Canada, and throughout the world (Lamarche, 2003). It may also be the most important policy issue facing physicians, as proposed reforms threaten to diminish their control over both their own clinical care practices and the care provided to their patients. As a result, proposals for reforms are a major point of contention in discussions, debates and public discourse.

In a global meeting on the direction of primary health care, Paul Lamarche stated "There is no consensus on neither the vision nor the organisation model of PHC to be used to guide (its) development. Two visions are being advocated. They are respectively referred to as the professional and the community visions: in essence, the professional vision advocates that the main responsibility of PHC is the provision of medical services which falls mainly on physicians. Physicians retain control with the professional vision. The community vision advocates that the responsibility of PHC is to improve the health

of a population and to meet its health care needs whether they be related to medical, health, social and community services. That responsibility falls within health care centres governed by representatives of the population served." (Lamarche, 2003)

Though the professional model is currently dominant in Canada, Lamarche (2003) recommends a community contact model "as a benchmark for changing primary healthcare in Canada". He goes on to specify "A strong focus should be placed on multidisciplinary work, and sufficient funding should be awarded to interdisciplinary training projects in order to enhance long-term sustainability." If this model becomes dominant in primary care reform, it may have an impact on physician influence.

Lamarche's recommended model for primary care contradicts the position that is consistently taken by medical associations. For example, Dr. Elliot Halparin of the Ontario Medical Association described the principles adopted by both the OMA council and the section of general and family practice in negotiating with the Ontario Health Ministry on primary health care reforms:

- The process had to be voluntary for all.
- Rostering had to be to physicians only.
- We should support collaborative relations with allied health care providers.
- The family doctor should remain the gatekeeper to the system. (Halparin, 2004)

Halparin's (2004) paper demonstrates how the discourse in the debate over primary care reform is vital to understanding different stakeholders' perspectives. Despite what would seem a very supportive position based on the title, Halparin is clearly supporting a medical profession view which does not relinquish control over patient care.

Is primary care reform viewed as a threat to physicians' roles in the health care system? CMA president Dr. Albert Schumacher (2004) described five principles that should underlie any primary care reform model:

- Maintaining the primacy of the patient-physician relationship (including both clinical autonomy and advocacy on behalf of patients);
- Keeping family physicians as the preferred point of entry into the primary care system;
- Encouraging collaborative arrangements between family physicians and other health care providers
- Ensuring that funding for physician services is allocated directly to physicians
- Recognizing that only one primary care model can serve all needs in primary health care delivery

Schumacher concluded: "we remain adamant that any fundamental changes in the primary care delivery system in Canada must respect the first principles enunciated above". (Schumacher, 2004)

While physician organizations are attempting to influence policy decisions on the direction of primary care, it is not yet clear what direction the reforms will ultimately take. Regardless of how the reforms proceed, physicians are significantly affected by the direction or model chosen for primary care reform in Canada.

As Canadian policy makers continue to pursue primary care reforms, how will the changes impact upon physicians views – either directly, or indirectly? Proposed primary care reforms have created a collision course between physicians and policy makers. The fundamental question of who should be the patient's first point of contact with the health care system is a point of contention, and many physicians are not happy with the proposed direction of change.

2.1.4 How Policy Changes Affect Physicians

While the major policy issues facing policy makers are important in terms of shaping the future of health care, these same issues may also have an impact on the working lives of physicians. The importance of these issues to physicians are summarized in terms of their effects on physicians in Table 2.1.

Table 2.1 Health Care System Issues and their effects on Physicians

Health Care System Issue	**How Physicians are Affected**
Rapid Growth in Scope of Services: new technologies and tools, more players with professional status	More physicians, more physician visits per patient. Much of growth is outside physicians' realm - physicians are no longer the only key player.
Regionalization: new players in administration and control	Sphere of influence is now shared with other players. Physicians and other stakeholders are stressed and struggling to achieve the desired benefits of integration.
Primary Care Reform: clash between professional and community visions.	Threat to clinical autonomy and gatekeeper role.
Technocrats and Organizational Controls	A new power elite threatens physicians' corporate autonomy and influence over policy decisions.
Performance Measurement & Reporting: new tools and technologies are available.	Central patient index threatens physician control over patient information. Benchmarking and reporting best practices threaten physician autonomy and role as knowledge brokers.

2.1.5 Physicians' Power and Influence in Policy Development

Historically, physicians have been successful in exerting significant influence over health policy decisions at all levels – from the front line of care delivery through to

broad federal policies. Their ability to influence policy is at the core of this research project, therefore a close examination of this topic is appropriate. Key factors affecting physician influence include information asymmetry (Arrow, 1963), the ability of medical organizations to create influence in political circles (Tuohy, 1999), and the independence afforded the profession through self-regulation legislation (Tomblin, 2002).

In his 1963 paper on uncertainty and the welfare economics of medical care, Arrow described the importance of information asymmetry in the relationships between physicians and patients: "Because medical knowledge is so complicated, the information possessed by the physician as to the consequences and possibilities of treatment is necessarily very much greater than that of the patient, or at least so it is believed by both parties. Further, both parties are aware of this information inequality, and their relation is colored by this knowledge." (Arrow, 1963)

Tuohy (1999) describes power of physicians as arising from two sources: "Physicians are granted authority (power) from two forms of agency relationship: where consumers delegate authority to them because of information asymmetry, and where the state grants agency authority to physicians to decide on the appropriate care in individual cases." While this information asymmetry has been a sustainable source of power for physicians, it is a source which may be eroded by the rise of the technocrat, as well as the trend toward patients seeing themselves as consumers, able to gather information and an understanding of their health care services.

Physicians' power lies not only in policy development, but in its underlying democratic principles. In a report prepared for the Romanow Commission, Tomblin (2002) discusses how existing structures make it difficult to increase public involvement in policy making: "It is hard to restructure anything given power of biomedical monopoly, ideological divisions among reformers, problems of communication and coalition building."

In the USA, as in Canada, physicians have significant influence over health care policy. Giordano (1996) described "Health professionals, particularly the medical community, have a significant role in determining / affecting health care policies and practices. They are largely self-regulated, and are able to influence the legislation which determines the limitations on their control."

Hafferty and Light (1995) suggest there may be a trend toward weakening influence of physicians in the American policy arena: "While no one is suggesting that organized medicine has become an insignificant player, its ability to exert its influence in an increasingly crowded policy environment appears greatly diminished. … As medicine continues to experience internal tensions, and particularly as these differentiations are reflected in strains between a governing elite and a clinically based rank-and-file, we anticipate that the basic overall thrust of professionalism is toward a loss and not a continuation or strengthening of medicine's control over its own work."

There are a number of factors which have contributed to physicians and their organizations holding power and influence over the policy making process; however many of those factors have been eroded, and may not be sustainable.

2.1.6 Power Struggle Between Physicians and Other Stakeholders

Throughout the development of universal publicly funded medicare in Canada, there has been a struggle for power between physicians and public sector policy decision makers (Torrance, 1987). The relationship between the two sides has been described in many different ways, ranging from Williams' (1995) characterization of a relationship of accommodation to Lewis' (2005) description of the history of medicare as "a clash between the state's goals of equity, order and efficiency with medicine's goals of autonomy, growth and control."

Torrance (1987) described three phases in the development of Canada's health care system: The emergence of medical dominance between 1818 and 1912; a period of developing access to effective medical care for the lower social strata after the Canada Medical Act was passed in 1912; and finally a current period of unrest characterized by rising costs, and the emergence of a new powerful group of technocrats, planners and efficiency experts who seek to impose organization controls.

In the first phase, the emergence of medical dominance during the period in which Canada was being formed into a nation is characterized by power relationships between physicians and other stakeholders. On one front, the relationship between physicians

and other health care groups, is one in which the medical profession managed to restrict competing occupations by absorbing them, or by forcing subordination, limitation and exclusion. On another front, Canadian governments served to aid the growing power of physicians through the provision of both legal and social legitimacy to their dominant position.

During the second phase of making effective medical care accessible to wider and lower social strata, Canada lagged behind others in social-welfare legislation. While many countries had established social welfare in the first half of the century, it was not until 1968 that Canada was able to build its complete publicly sponsored health care system. The main reason for the delay was uneven industrialization – manufacturing in Central Canada, along with rural family farms elsewhere. There was no political alliance between farmers & industrial workers, therefore slow development of social welfare legislation. The main actors in health policy were the organized medical profession (led by the Canadian Medical Association), societal elites; working class, labour movements, political parties, bureaucrats, and the state. The key factor in the delays in public health care was the existence of a powerful profession preceding public demand for access.

Finally, the current era in the evolution of Canadian health care is characterized by rapid growth – in new technologies, pharmaceutical capabilities, skills and abilities of health care professionals, and demand for publicly funded health care services by a public who sees these services as a public good and a right of citizenship. (Torrance, 1987)

This most recent phase in the evolution of health care may be pivotal – both in eroding physicians' influence over the policy development process, and in forcing their organizations to re-focus their communications from a discourse of clinical and professional expertise to one that uses the technocrats' evidence based measurement tools as a primary vehicle for influencing policy.

The history of the Canadian Medical Association (CMA) reflects the broader account of physician influence in Canadian health care. There have been recurring themes of conflict and influence, and throughout its evolution the CMA has become a significant centre of influence over health care policy. The CMA and its provincial counterparts have a long history as a voice for lobbying and political influence for physicians throughout the country. Torrance described the history of the CMA, with a number of milestones, summarized below:

- Though the CMA came into existence at the same time Canada was born 1867, it was relatively weak and divided until major structural changes in the 1920s.
- Close connections to government and bureaucratic elites served to increase CMA's power.
- In 1934, the organization produced a report setting out their proposed principles for development of health insurance. This clearly shows an attempt to directly influence public policy which would influence the business of medicine.
- In 1949, the CMA took a stand against a strong government role in health insurance (because private health insurance was working for them).
- Through the late 50's and early 60s, the CMA continued its resistance to the introduction of public health insurance. The main arena for battle became Saskatchewan, where physicians responded to the introduction of health insurance reforms with a strike. (Torrance, 1987)

Through the CMA, physicians have also played a strong lobbying role in public health insurance. In his examination of the evolution of public health insurance in Canada, Torrance examined the power and influence of physicians in protecting their own

interests: "The main impact of the Canadian health insurance program was to institutionalize the status quo and hence increase the difficulty of structural changes needed to make healthcare more responsive to society. Despite their resistance to the programs, some of the main beneficiaries, at least initially, were the provider groups themselves." (Torrance, 1987)

Finally, in recent years the CMA appears to have adopted a new priority in its efforts to influence public policy – one which may be in response to the expanding role of evidence based policy making. CMA President Ruth Collins-Nakai spoke to the Empire Club of Canada in October, 2005 about the need for wait time measurement and reporting. Highlighted from her speech was: "Provinces each want to establish their own wait times for health care services. That is not good enough. Canadian citizenship means getting the care you need, when you need it, wherever you live." (Collins-Nakai, 2005)

While the Collins-Nakai speech of 2005 reiterates the oft-stated desire of the CMA to play a major role in policy development, it also clearly demonstrates a new priority for the organization, promoting the use of evidence in policy making.

2.1.7 Threats to Physician Influence: Technocrats and Organizational Controls

Physician influence in the policy arena is being threatened by the emergence of new organizational players. In his description of the history of the relationship between the medical profession and the state, Torrance (1987) describes the emergence of a new power elite – the technocrats, planners & efficiency experts who seek to impose organization controls. Pressure for change comes chiefly from economic elites who object to the effects on capital accumulation of increased social spending on "non-productive" services. Technocrats seek to impose organizational controls on the system, frequently through the instrument of state bureaucracies. (Torrance, 1987)

The desires of the medical profession to maintain control over their turf in the health care arena are well described by Williams: "Relations between the organized medical profession and governments in Canada have been characterized by regular political conflict since the genesis of universal government health insurance. This conflict has centred on the profession's defence of its corporate autonomy in the face of what it has seen as unwarranted intrusions by government into areas of medical control and dominance." (Williams, A, 1995)

Threats to physician influence result from several factors, including expanding roles of other care providers, the creation of new governance structures, proposed changes to primary care systems and the gatekeeper role, and finally as a result of the emerging importance of measured performance and the technocrats who control the measurement and reporting systems.

2.1.8 Evidence Based Policy Development

The use of measured, objective data is emerging as a platform for policy decisions – often referred to as evidence-based or results-based methods. Mays, Pope and Popay (2005) examined evidence based policy development in the health care field, and concluded: "There is now widespread recognition that a review of evidence aiming to support the complex and often messy decision-making that policy-makers and managers are involved in will, of necessity, have to address a wider range of questions at different points in the decision-making process."

Murray and Evans (2003) discussed the weakness of expert opinion in health policy decisions world-wide and raised the question: "Often, if a decision-maker has sought advice on an issue of the design or reform of a health system, the answer has depended substantially on which consultant or expert is asked. When health system reforms have the potential to affect millions, why is the evidence-base relatively weak, leaving room for ideology and personal opinion to be among the main inputs into health policy debates?"

In an examination of results-based management in the Canadian public sector, Schacter (2002) of the Institute of Governance raised a concern about shortfalls in the use of tangible evidence in policy development: "Although RBM (results based management) is on its way to becoming embedded in the management culture of the Canadian public service, a significant gap remains. Policy practitioners who are hesitant to apply performance measurement to their work will sometimes argue that policy work is unique

(on three premises): policy is intangible; policy-making is highly subjective; and understanding the impact of policies is a complicated and messy business." However, quoting from Treasury Board of Canada's C*anada's Performance 2001*, Schacter observes "Canadians have a right to know what governments are trying to achieve, why governments believe certain activities contribute to their objectives, and how governments plan to measure whether they are achieving the objectives."

The Government of Canada's Treasury Board Secretariat (2000) set out its expectations for results based policy making throughout all areas of federal government programs and funding areas: "The challenge for the future is to apply results-based management to all major activities, functions, services and programs of the Government of Canada, whether they are delivered directly to Canadians or are part of internal administration. This will continue to advance sound management practice and strengthen accountability throughout departments and agencies. Over time, managers should implement results-based management on a more "borderless" basis: across departmental boundaries or in partnership with other governments, business or the not-for-profit sector."

The literature also illustrates those who guard against over-use of measures and evidence in health policy making. For example, Smith, Ebrahim and Frankel (2001) raise a concern that evidence based thinking can lead to debased policy making, especially when macro and micro-level data are inappropriately mis-used: "The sort of evidence gathered on the benefits of interventions aimed at individuals may not help in guiding policies directed towards reducing health inequalities. Focusing on individual

level determinants of health while ignoring more important macro level determinants is tantamount to obtaining the right answer to the wrong question."

Canada's medical profession is also guarded in its endorsement of evidence based policy making. The CMA's Wait Time Alliance (2005) promotes use of wait list information, but guards against over-use of data: "The alliance believes that research evidence is an important factor in determining benchmarks, but we must avoid becoming "evidence-bound." Clinical judgement based on interaction between clinicians and their patients is an equally important component. In many circumstances, little research evidence exists, yet key resource allocation decisions must still be made."

In the same realm as evidence-based policy development, evidence-based medicine generates controversy within the medical community. In a recent Medscape roundtable on evidence based medicine, Dr. Roy M. Poses (2007) highlighted the conflict generated by the evidence-based movement: "Some emotionally negative responses to EBM may arise from misunderstandings and a tendency to support physicians' traditional roles" … "Teaching people to distinguish evidence from propaganda and advertisement could offend the vested interests that increasingly dominate healthcare." (Poses, 2007).

Evidence based policy development is gaining a foothold in Canada, however the medical profession is, at best, guarded in its acceptance of quantitative data as a replacement for physician influence through their unique power base of knowledge and clinical judgement.

2.2 QUALITY: WHAT DO WE MEASURE, AND WHY?

Health policy decisions are increasingly based on measured evidence, produced through performance management systems. Developing performance management systems in health care has been a significant challenge over the past two decades of expansion, growth and organizational change. In 1985, Mercer described how the transformation in funding and organization of healthcare has led to an increase in the importance of evaluation. Mercer (1985) also pointed out a source of conflict which remains problematic even today: "With medical dominance a well-established feature, performance evaluation of the health services brings public interest and accountability face-to-face with professional autonomy."

The main issues in evaluating health care quality are:

- the need for linking policy making, goal setting and performance measurement;
- whether performance measures should focus on process or outcomes;
- selecting specific measures of quality;
- tools used by health authorities – dashboards, scorecards and composite measures;
- benchmarking between organizations.

2.2.1 Policy, Goals and Performance Measurement

The need to integrate policy and strategy with specific, measurable goals is a basic building block of management theory. This concept applies equally to both business and the public sector.

The Government of Canada's Treasury Board Secretariat (2000) developed tools for management of federal government organizations: "Managing for results requires

attention from the beginning of an initiative to its end. It means clearly defining the results to be achieved, delivering the program or service, measuring and evaluating performance and making adjustments to improve both efficiency and effectiveness. It also means reporting on performance in ways that make sense to Canadians."

In "Thinking Government", Johnson (2002) states: "Clearly, an important requirement in accountability is that government officials, from public servants to political leaders, must be subject to a set of formal, objective expectations by which their performance can be monitored and, if need be, controlled."

However, in the context of health care, this basic premise is not simple or easy to follow. Mercer (1985) pointed out: "The division of responsibilities between the federal and provincial governments has provided ample opportunities for power struggles over their respective evaluations of health service performance. As a consequence, fundamental disagreements have arisen over the objectives of the health services (except at the most general level), as well as in the proper criteria for measuring the extent to which these objectives have been achieved."

Murray and Evans (2003) reached a similar conclusion when examining health systems worldwide: "National and international discourse on the often complicated issue of health system design or reform is hampered by the lack of clarity about the nature of the fundamental or intrinsic goals for health systems."

Despite the organizational awareness of the need for specific goal setting, Canadian policy makers at the federal and provincial levels have balked at setting specific, measurable goals for which they may later be held accountable. Recently, federal and provincial leaders agreed for the first time to develop both consistent measures and targets for wait times in five key areas: cancer, heart, diagnostic imaging, joint replacements and sight restoration. These five benchmarks may not be traceable to any defined goals for the health system as a whole, but they are consistent with then Prime Minister Martin's description of a barometer for the health system: "Wait times are the canary in the coal mine, they are the way in which one can determine whether reforms are required" (Bueckert, 2005).

While the wait time benchmarks provide a mechanism to tie federal policy objectives to specific measures relating to health care access, there is not yet a consensus on either policy objectives or appropriate measures of health care quality in Canada.

2.2.2 Performance Measures: Process vs Outcome

Experts disagree on whether performance measures should be process or outcome oriented. The difference in views depends on the author's orientation: whether they focus on broad, societal responsibilities, which is an outcomes orientation, or specifically at the roles and responsibilities of players within the health care system, which is a process orientation.

Donabedian has been a leader in defining health care quality over the past four decades. In 1966, he classified quality into three categories: structure, process and outcome.

- Structure: education and training of care givers, adequacy of facility staff and equipment, and overall organization. Example: Percent of board-certified physicians in a group practice.
- Process: What takes place during delivery of care. Example: Percent of AMI patients prescribed beta blockers on discharge.
- Outcomes: Whether the goals of care were achieved. Example: Percent of diabetes patients with blood pressure at or below a target rate. (Donabedian, 1980)

Murray and Evans (2003) suggest that policy dialogue can often lose sight of the primary goal of the health system, improving population health. They recommend that the health system must be outcome-focused, and therefore the performance system should measure progress toward them.

However, there is a contradictory view presented by a number of authors. Reinhardt (2001), in a presentation to the National Conference on Quality and Safety in Health care, asked: "What do we mean by quality?" He finds the answer in what might be called the production process that manufactures health care. "Health care produces only 10% of health outcome. Other factors such as lifestyle, genetics, stress, and environment are responsible for the other 90%, so what should providers be held accountable for, in delivery of health care? It is difficult to be responsible for quality of life when providers control only a very small part of the quality of life process."

With respect for these two conflicting perspectives, this research study will focus on process and outcome measures which can be attributed directly to health care

interventions. Although health policy makers ranging from Health Canada to regional health authorities are broadening their scope of services and working toward a population health approach, our health care services do not exert significant influence on most of the determinants of health, as described by Health Canada (2005): "Our understanding of what makes and keeps people healthy continues to evolve and further refine. A population health approach reflects the evidence that factors outside the health care system or sector significantly affect health. It considers the entire range of individual and collective factors and conditions - and their interactions - that have been shown to be correlated with health status. Commonly referred to as the "determinants of health," these factors currently include:

1) income and social status
2) social support networks
3) education
4) employment and working conditions
5) social environments
6) physical environments
7) biology and genetic endowment
8) personal health practices and coping skills
9) healthy child development
10) health services
11) gender
12) culture

While the health care system has been expanding its efforts to influence peoples' choices in a number of these areas, the core of health care services remain near the bottom of the list of the determinants of health. Therefore, process measures and short-term outcomes which relate directly to health care interventions are the main focus of this research.

2.2.3 Measures of Health Care Quality

In recent years there have been a number of new initiatives to develop measures of quality in health care performance.

Wyszewianski (2005) describes two fundamental parameters for consideration in quality measurement: What are we measuring, and from whose perspective? First, in terms of what is being measured, seven "definitionable attributes", are presented. They include technical performance, management of the interpersonal relationship, amenities of care, responsiveness, efficiency, and cost effectiveness. Next, Wyszewianski asks: Quality as seen by whom? Four perspectives are presented: clinician, patient, payer and society. Depending on whose perspective health care services are viewed from, quality may be defined in different ways.

Tasa, Baker and Murray (1996) examine patient feedback as a performance measure. In their study, they identified eight barriers to the use of patient feedback in health care, including: data not user centred, data not linked to processes, large organizational size and complex structures; lack of time; scepticism; fear; staff awareness; and lack of physician interest. On the last item, they cited a study participant's views: "Many physicians still think that patient feedback is ludicrous. Not the term but the concept."

There is controversy regarding the use of patient surveys as indicators of health system performance. On one hand, patients are the ultimate recipients of care. On the other

hand, they do not possess the knowledge to know whether, technically, a quality service has been provided.

In a recent conference on health care quality sponsored by the Institute for Health Improvement, Donald M. Berwick (2005) reminded participants of the importance of the patient's opinion: "I don't care what you know, until I know that you care".

In Canada, the only nationally comparable measures of patient satisfaction with health care services are provided by Statistics Canada, in the Health Services Access Survey, a sub-set of the Canadian Community Health Survey. The data collected for this survey is intended for provincial aggregation only, and is not available on a regional or local basis (Ledroux, 2005) Therefore, for this research study, which focuses on regional health care quality indicators, there are no comparable patient survey data available.

A variety of measures have been proposed for evaluating quality in health care. However, only a limited number of measures have been adopted on a universal basis throughout Canada. Therefore, there are a limited number of health care quality measures available for this research study.

2.2.4 Regional Health Authorities and Health Care Quality Reporting

In Canada, performance measurement systems and standards have neither kept up with the growth in scope of health services, nor with the evolution to regional organizations. Most of the performance measures reported in the Canadian Health Indicators reports (CIHI, 2005) relate to hospital and physician services. Consistent, comparable measures are not yet developed or available for newer, emerging health services. Green (2003) examined performance management systems in Canadian regional health authorities, and concluded "Performance evaluation frameworks designed for hospitals and the for-profit sector are ill-suited for vertically integrated health care systems in many but not all aspects."

Mannion, Goddard and Smith (2001) reported on an expansion in the tools used for performance evaluation in UK health care Trusts:

> "The NHS Performance Assessment Framework consists of six areas of activity and outcome: health improvement, fair access, effectiveness, efficiency, patient / care experience, health outcomes of NHS care. For ease of exposition in presenting our findings we make a rather crude distinction between hard, quantitative information emanating from official channels and soft, qualitative information transmitted via a variety of informal channels and professional networks. A clear and dominant theme arising from our study is that hard information, used in isolation, is seen as an inadequate and sometimes misleading indicator of Trust performance."

The authors of the above study also sounded a warning about the effect that use of quantitative data alone might have on physicians:

> "Judgements on Trust performance are also influenced by assessments of the quality of clinician-management relationships. Whilst some hard data exist around clinical process and outcome measures, the burden of the evidence

> suggests that regional offices and health authority staff are more concerned with the nature of clinical – managerial relationships within Trusts. NHS Trusts viewed as having 'cracked' the involvement of clinicians in management, were without exception classed as being good performers." (Mannion, Goddard & Smith 2001).

Public report cards have gained popularity for reporting quality in health care. Werner (2005) suggested that public reporting of quality motivates quality improvement through two mechanisms: it allows stakeholders to select high quality physicians, and it motivates physicians to compete on quality. However, he also warned about possible pitfalls of public reporting:

> "Despite these plausible mechanisms of quality improvement the value of publicly reporting quality information is largely undemonstrated and public reporting may have unintended and negative consequences on health care. These unintended consequences include causing physicians to avoid sick patients in an attempt to improve their quality ranking, encouraging physicians to achieve "target rates" for health care interventions even when it may be inappropriate among some patients, and discounting patient preferences and clinical judgment."

Just as regional health organizations are relatively new and evolving, so are their systems for measuring and reporting on the quality of health care services they provide. Their ultimate application in the management of health care quality is yet to be seen. One of the keys to achieving comparable quality reports in the future will be the development of a complete range of consistent, comparable indicators which truly reflect operational performance within the control of health care managers.

2.2.5 Benchmarking: Using Composite Measures

Composite measures based on a weighted aggregation of performance scores in a number of specific areas could simplify the process of providing an overall evaluation of a health care system. They could also be used for benchmarking between facilities, regions and/or provinces. While such measures are not practical for management of internal operations, they can serve a purpose in providing a single, comparable score.

Composite measures have been developed for global benchmarking in other areas. The United Nations' annual Development Programme Report includes a Human Development Index (HDI) score by nation. The HDI is a single composite index score based on an average of three indices: a life expectancy index, an education index, and a per capita GDP index. With a theoretical perfect score of 1.000, each country is assigned a HDI score based on their most recent performance in the three areas. For example, Norway scores the highest in 2005 with an HDI score of 0.963. Canada falls close behind in fifth place with an HDI score of 0.949 (United Nations Development Programme, 2007). One of the benefits of the HDI is that performance is reflected in a single numerical indicator.

While no single index score has yet been developed specifically for health care delivery systems, a number of attempts have been made at developing tools for assessing the overall performance of health and health care systems. In February, 2006, the Conference Board of Canada issued a report comparing the performance of provincial health systems based on seventy comparable health indicators developed under a federal

– provincial – territorial agreement of 2002. The report's introduction made reference to what might be concerns about past comparisons: "This paper is intended to focus attention on performance – on facts and data, not on misconceptions and rhetoric." The report highlighted best and worst provincial statistics in the various health indicators. Many of the measures used in this study would fall into WHO's second or third realm of health - many health outcomes which are outside the direct influence of the health care delivery system. While this report did not develop composite measures of performance, it did attempt to rate overall health performance on a provincial basis.

In 2001, the US based Institute of Medicine developed recommendations for a national health care quality report. Among their recommendations: "The AHRQ (American Health Report on Quality) should consider combining related individual measures into summary measures of specific aspects of quality." (Hurtado, 2001)

The Tinbergen Institute in Rotterdam suggested the use of combinatorial assessment methodologies for complex policy analysis. It is described as "An integrated evaluation methodology which serves to alleviate the limitations of a single evaluation approach by combining different assessment and policy analysis methods." (Tinbergen, 1999) However, the problem with complex evaluation methodologies may lie in the capacity of users to work with the tools.

Brewer and Coelman (2000) studied performance reporting: "Organizational performance is a socially constructed phenomenon that is subjective, complex, and particularly hard to measure in the public sector … public agencies have multiple

constituencies that demand different performance emphases, but public administration scholars tend to focus narrowly on performance, selecting a single standard or consolidated index. Such narrow measures of performance can produce misleading conclusions about organizational effectiveness."

The literature on complex and composite performance reporting suggest that there may be challenges in developing a composite measure of health care performance; however they may be overcome by covering a broad range of performance measures which are representative of the full range of health care services offered by the organization.

2.2.6 Introducing a Composite Index of Quality: The Lockhart Index

The Lockhart Index of health care quality is a composite index which incorporates nine comparable quality measures which are nationally mandated for reporting by regional health authorities in Canada. The measures included in the index are:

- 30 day in-hospital AMI survival rate;
- 30 day in-hospital stroke survival rate;
- AMI readmission rate;
- Asthma readmission rate;
- Hysterectomy readmission rate;
- Prostatectomy readmission rate;
- In-hospital hip fracture rate;
- Caesarean section rate.
- Rate of hospitalization for ambulatory care sensitive conditions;

For each of the nine measures listed above, a region's index score is based on its performance rating compared to the overall Canadian average. For example, each region which reports performance on 30 day in-hospital AMI survival rate is assigned an

index score based on a comparison between its performance compared to the overall Canadian average. If its AMI survival rate is better than the Canadian average, its index score on AMI survival would be greater than 100 (the average index rating). A region's nine index scores are then weighted and averaged to determine its overall health care quality index score. Regions with a score of 100 would be on par with the Canadian average performance for 2005. Scores above 100 represent a better than average performance, and those below 100 represent a less than average performance.

2.3 PHYSICIAN VIEWS ON QUALITY: WORK LIFE INFLUENCE

A number of major health policy changes have been discussed in the context of this research, including growth in scope of health care services, regionalization and primary care reform. Each of these policy changes, in addition to differences and conflicts within the ranks of physicians, may have an influence on the working lives of physicians in the areas of autonomy, satisfaction, stress and equity. These factors subsequently affect the views of physicians on the quality of health care provided in their communities.

2.3.1 Physician Perspectives on Quality - The Physician Index

The Physician Index (PI) , developed for this study, is based on physician ratings of quality. It is comparable in nature to the Lockhart Index (Objective Index) of quality, as it is based on a comparison of quality ratings by a particular group of physicians to the overall average quality ratings obtained in a national physician survey. Thus, the overall average PI score is, by definition, 100. PI scores for any sub-group of physicians surveyed will be higher or lower depending on their ratings of health care quality in their own communities compared to the overall average of the entire survey.

The PI Index can be calculated by health region (where sufficient survey responses were received), and/or by other sub-groupings. For this study, PI scores were calculated first by health region, and then for sub-groupings of physicians within each region based on physicians' reported levels of autonomy, satisfaction, stress and equity.

2.3.2 Physicians Are Not A Homogenous Group

Physicians are not a homogeneous group, and their differences are reflected in histories of conflict and differences within their own ranks. In his examination of the history of the Canadian medical profession, Torrance (1987) suggests that the division among the ranks of physicians dates back to the formative years of medicine in Canada: "medicine was still a loose conglomeration of conflicting segments until well into the twentieth century".

More recently, Tuohy (1999) describes a split within the ranks of Canadian physicians, which was accelerated in the 1990s: "The medical profession becomes split on whether to support public funding only or to promote private finance and other market mechanisms."

Tuohy's observations were brought to light in a 2005 example of conflicting messages from stakeholders within the Canadian Medical Association about private health care insurance. In response to a controversial resolution passed at the 2005 AGM regarding private health insurance, representatives of different physician groups show major divisions within the ranks. A resolution at the 2005 CMA Annual General Meeting from the Canadian Association of Internes and Residents calling for the CMA to "reject the development of a parallel private health care insurance system" as a solution to lengthy wait lists was rejected by two-thirds of voters. Delegates then voted for the principle that when timely access cannot be provided within the public system, patients should be allowed to use private insurance to cover the costs of care obtained in the private sector (Sullivan, 2005). What is most telling is the split among the ranks:

- Quebec Medical Association (QMA) President Robert Ouellet, who proposed the motion, said "the well-being of the patient has to be our main concern, and we have to make all possible solutions available to them."
- Dr. Ben Hoyt, president of the Canadian Association of Internes and residents, disagreed. "This motion endorses a private system in which 'haves' can buy their way to the front of the line, and this goes against CMA principles."
- Dr. Atul Kapur of Ottawa agreed. "This will help the insurance companies, not our patients" he said. (Sullivan, 2005).

In a special report by the Canadian Medical Association on primary care reform, Ravalia (2004) states: "A multitude of factors are responsible for stalling any attempt at

constructive renewal in the provision of primary health care". Among the list of factors was: "The ongoing "silo" mentality and hierarchical boundaries that do not lend themselves to an integrated approach to providing health care — Our present system does not constructively engage health professionals from a variety of backgrounds and skill sets to work together." Among Ravalia's suggested solutions was: "Having the courage to introduce legislation that allows health professionals the ability to practise in a collaborative fashion and not be hindered by limited scopes of practice."

In describing the role of accommodation in the Canadian relationships between the state and the medical profession, Williams et al (1995) describe how the differences within the profession play a role: "it is important to stress once again our observation that the medical profession is not monolithic and that professional opposition to government is not universal. A more developed appreciation of diversity and change within the profession is important not only to inform the actions of medical association leaders who in Canada have been more strident than other physicians in their defense of professional autonomy (Stevenson et al. 1988), but as well to balance a tendency on the part of governments to anticipate professional intransigence and to act unilaterally or not at all. Both tendencies have in the past supported a cycle of political conflict around issues of public or private control of the health system, and drawn attention away from issues of how the health system should be reformed."

Hafferty and Light (1995) describe a similar split within and between clinical groups of physicians in the USA – in this case on the topic of scope of practice: "A conflict has been drawn between generalists and specialists over who should function as a legitimate

source of primary care services. As managed cared and related "gatekeeper" systems stress a stepwise delivery model that restricts "front door" access to subspecialists. Providers such as rheumatologists, oncologists, and cardiologists are attempting to reposition themselves as primary providers for their chronically ill patients, and thus to tap into the primary care as well as the subspecialty revenue streams." (Hafferty and Light, 1995).

Pitterman and Koritsas (2005) also examined the relationships between general practitioners and specialists. They found that the relationship is based on power, and that there is division and friction between the two groups. Finally, Hafferty and Light (1995) suggest an opportunity for policy makers to capitalize on the split of opinions within the medical profession: "Clearly, it is in the interests of capital and the state to persuade these elites to adopt points of view other than those that resonate within hospital corridors and clinic hallways." These conflicts and power struggles within the medical community clearly indicate that physicians are not a homogeneous group. This logically leads to the question: Do sub-groups of physicians hold similar views on the quality of health care?

2.3.3 Autonomy and Career Satisfaction

Physicians have historically had a great deal of autonomy in their work, both in terms of self-regulation and freedom to control their work lives and decisions over patient care. Workplace autonomy is also an important determinant of physician satisfaction.

Konrad et al (1999) drew a clear link between physician autonomy and satisfaction. In an examination of physician satisfaction on clinical performance, they concluded: "Better measurement might help to ameliorate conditions linked to medical disaffection, possibly improving health care. … Recent changes in health care financing, organization, and delivery have reduced the autonomy of physicians as purchasers, employers and consumers exercising countervailing power."

Konrad (1999) also identified a total of seven factors affecting physician satisfaction: (1) autonomy, (2) relationships with colleagues, (3) relationships with staff, (4) relationships with patients, (5) pay, (6) resources, and (7) status. "The examination of text from focus groups revealed the salience of two factors: day-to-day administration (i.e., having a sense of control of administrative issues within the practice setting) and a "hassle factor" viewed as stemming from economic and regulatory forces external to the practice organization (eg, insurance authorizations and gatekeeping requirements). Some described relationships with administrative personnel in their own practice setting as sources of gratification or frustration."

Landon (2004) reached a similar conclusion: "We found that both primary care physicians and specialists who rated their autonomy lower and those that reported more difficulty obtaining high-quality outpatient services and inpatient services were more likely to report decreased satisfaction with their careers. Whereas physicians once practiced primarily alone or in small autonomous groups, they now are more likely to be employed in large groups and are increasingly subjected to profiling, administrative requirements, and preapproval for procedures and treatments. … Among the most

important changes related to this area of practice are control over work and personal time." (Landon, 2004)

Williams et al (1995) reported: "The vast majority of Canadian physicians continue to work in private, fee-for-service practice, and with the exception of voluntary guidelines issued by provincial medical associations, there are currently few restrictions on clinical decision-making and little monitoring of what physicians do." (Williams, A, 1995).

Steven Lewis takes a somewhat negative view of physicians autonomy, and its impact on diminished accountability: "They are not held accountable in any meaningful way for performance. They are indifferent, apparently, to the clinical practice guidelines produced by their own colleagues. There are huge variations in their practices that go unchecked, despite the obvious implications for quality and access." (Lewis, 2005).

Burdi and Baker (1999) linked career satisfaction to autonomy of American physicians: "We find it quite plausible that declining autonomy in a profession that has historically enjoyed a high degree of it may have reduced satisfaction. Marketplace transitions in most places seem to happen in similar patterns: increased managed care activity, increasing pressure on physicians and physician organizations through both direct oversight and financial incentives, and declining physician payment. These results suggest that ongoing reforms throughout the country could lead to significant reductions in physicians' autonomy and satisfaction."

Finally, Lepnurm, Dobson, and Backman (2004) studied predictors of physician satisfaction in both small communities and cities, and among different specialties: "focussing on innovations in managing medical practices is likely to be far more effective over time, and cost less than relying on traditional incentives, in enhancing the career satisfaction of physicians. Both innovative practice models and greater teamwork by health care providers, will be necessary in order to meet the increasing complexities of health problems and the expectations of the population."

While physician autonomy plays an important role in physician satisfaction levels, both of these factors must be examined in a broader context, including related factors of stress and sense of equity.

2.3.4 Stress

There is a strong relationship between stress and career satisfaction, and between stress and health. Williams et al (Williams, E, 2002) studied the impact that physician, practice and patient characteristics have on physician stress, satisfaction and health, and found close inter-relationships between all of these factors: "Practice and, to a lesser extent, physician characteristics influenced job satisfaction, whereas only practice characteristics influenced job stress. Patient characteristics exerted little influence. Job stress powerfully influenced job satisfaction and physical and mental health among physicians." In addition, Williams noted: "These findings are particularly important as physicians are more tightly integrated into the health care system that may be less clearly under their exclusive control."

The Williams paper also linked control to stress and satisfaction: "Having a sense of control over clinical issues is important in sustaining and enhancing job satisfaction, whereas having control over the resources and decisions in the workplace affects both job satisfaction and stress. Finally, the paper dealt with the performance measures of productivity and quality: "An organizational emphasis on productivity seems to reduce the satisfaction of its physicians, whereas an organizational emphasis on quality of care seems to enhance satisfaction. (Williams, E, 2002)

Bergman, Ahmad and Stewart (2003) studied personal and work related factors contributing to physician health and stress in physicians in a university hospital. Similar to the other studies which linked stress, satisfaction and health of physicians, the report stated "men and women who were not satisfied had lower mental health and less work satisfaction than their satisfied counterparts." Excessive workload was found to be a significant factor in stress and satisfaction: "One of the most striking findings was, that despite gender differences in some predictors of somatic symptoms, the majority of physicians of both sexes reported an excessive workload."

Hirsch (1996) studied the effects of health care reform on physician stress. One of his key findings was "many (stresses) arise from the poor operational structures, roles, and relationships that rule our daily lives in organizational settings. Structural redesign of systems to enhance efficiency and effectiveness, reduce malpractice risk, and strengthen collegial alliances is an essential, yet often neglected component of physician well-being and stress management programs." Hirsch concluded "Organizations that respond to change by reshaping their operational structures and support systems with an eye to

physicians' needs will have a competitive advantage in the marketplace in terms of recruitment, retention, organizational morale, and patient satisfaction."

The impact of health care reforms in the USA was noted in 1992 by Eubanks, who sought solutions from managers in the health care system: "As ongoing reimbursement, regulatory and medical practice changes create greater stress for physicians, hospital executives are finding that it's in their interest to help their medical staff members cope with rising levels of stress, frustration and anxiety." However, Eubanks (1992) noted there are also limitations to the role a hospital executive can, or should play, including physicians' desire for both privacy and independence, and physicians' possible lack of affinity with the hospital.

The importance of Hirsch and Eubanks' findings are emphasized by Karasek and Theorell's (1990) study of health implications of work life. They examined the relationship between the job characteristics of decision latitude and psychological demands on psychological stress, and subsequently on the prevalence of heart disease. An examination of their data which might relate closely to physicians' working conditions shows that jobs with high psychological demands and low decision latitude were found to have a 20% prevalence of heart disease, whereas jobs with similarly high psychological demands but a high level of decision latitude had only 2.8% prevalence of heart disease. Similarly, the jobs with high psychological demands and low decision latitude had higher systolic blood pressure at work than those who rated medium to low on either category. More specifically, the researchers concluded that the primary work-related risk factor (for coronary heart disease) appears to be lack of control over how

one meets job demands and one uses one's skills (Karasek & Theorell, 1990). Their findings raise a question relating to this research project: Does the current trend toward a reduction in physician influence correlate with higher levels of stress and illness?

The interrelationships of autonomy, satisfaction, stress and health have been clearly illustrated. While the linkage between these elements is important to understanding physician perspectives, these are not the only factors at play. The final factor introduced to the mix is sense of equity, including recognition, reward and intrinsic factors (Dobson & Lepnurm, 2005).

2.3.5 Equity

Lepnurm, Dobson, Backman and Keegan (2005) illustrate the relationships between equity and career satisfaction. "Physicians are required to carry out many activities within the Canadian health care system. On top of fundamental responsibilities to provide care to patients and to maintain clinical skills, recent health care reforms have caused physicians to become more involved in administrative functions and to increase their commitments to teaching and research. As well, the roles of many physicians extend beyond professional roles to include a variety of non-professional activities within their communities and neighbourhoods. While the motivation to carry out these activities may be complex, the quality of the performance of both professional and non-professional activities can be affected by the physician's level of career satisfaction. It would seem beneficial, both to the health care system and to the physicians themselves, to identify and promote factors associated with greater career satisfaction." " Many

factors contribute to career satisfaction, including workplace stress and the ability to cope with that stress, participation in social and leisure activities; and the fair distribution of rewards."

Two findings of the study are of particular interest:

- Excessive stress negatively affects the career satisfaction of both psychiatrists and surgeons.
- Both psychiatrists and surgeons considered input equity to be an important contributor to career satisfaction, and both felt they had contributed more than they had received in exchange for their efforts.

Understanding how the interrelationships of stress, equity, satisfaction and health may affect physicians' perspectives on quality (Figure 2.2). This underscores the need to collect objective measures of quality, even though such efforts are fraught with technical and organizational difficulties.

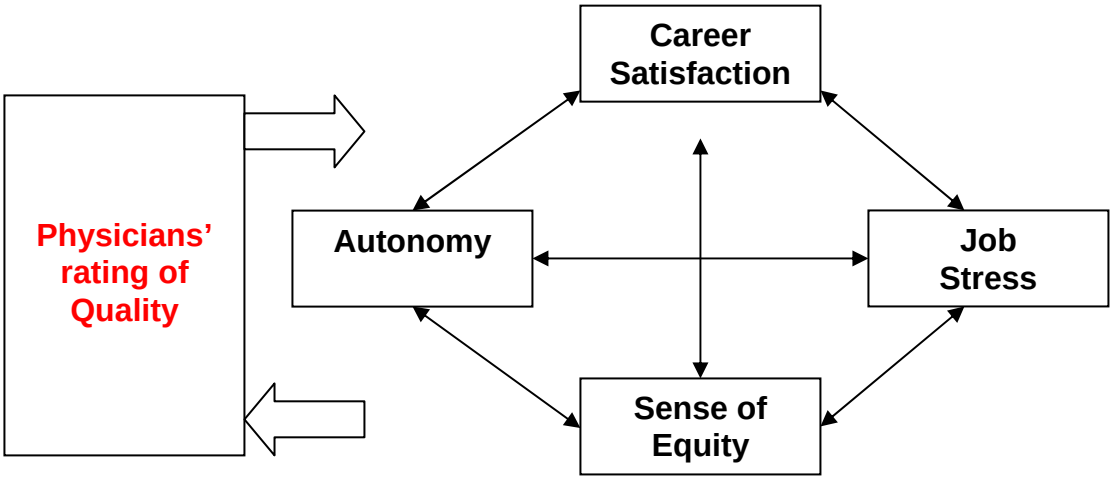


Figure 2.3 Inter-relationships of Autonomy, Equity, Satisfaction and Stress

2.4 WHAT HAVE WE LEARNED FROM THE LITERATURE?

The examination of literature has shown that physicians have exerted significant influence over health policy issues, both in Canada and elsewhere. It has also shown that the factors which give rise to influence (information asymmetry, political influence, control gained through self-regulation legislation and a position as the central focus of health care delivery) have been eroded, leaving some question as to whether physicians and their organizations will be able to maintain their current level of power and influence in the health care policy arena.

As the organization of health care has shifted toward regional structures, a new group of managers and technocrats are shifting the locus of power in policy making. They are also introducing a new and expanding set of evidence-based decision support tools. Recent initiatives from the Canadian Medical Association suggest that physicians may begin to climb aboard the evidence bandwagon, in order to use performance data to recapture their locus of power. Changes in the health care field may also have a negative effect on the working lives of many physicians – including their sense of satisfaction, equity, stress, and ultimately, their health.

3.0 HYPOTHESES

This study tests two basic propositions: 1) Whether physicians' assessments of quality are aligned with objective measures of quality; and 2) Whether physicians' assessments of quality are affected by levels of stress, sense of equity and career satisfaction.

Two hypotheses are presented to examine the first proposition – first by examining all physicians, and then with a closer look at possible differences between general practitioners and specialists. The second proposition is then studied by testing hypotheses related to levels of stress, sense of equity and career satisfaction.

3.1 General Proposition #1: Physician Views on Quality Will Be Closely Aligned With Objective Data

The first set of hypotheses to be tested in this research rest upon the following general proposition: ***In the health regions selected for analysis, physicians' views on quality of health care in their communities will be closely aligned with the objective data from CIHI indicators.***

3.2 Hypothesis #1 and #2 – Broad Comparisons

H1: There will be no significant differences between the Objective Index and Physician Index.

H2: There will be no significant differences between PI scores for GP/FPs and specialists.

3.3 General Proposition #2: Physician Ratings of Quality Will Be Affected by Autonomy, Stress, Equity and Satisfaction

The second set of hypotheses to be tested in this research rests upon the following general proposition: ***The ratings of quality provided by physicians across Canada will be affected by: the levels of stress that they experience in their work; their sense of professional equity; their sense of autonomy; and their career satisfaction.***

3.4 Hypothesis #3 - #6: No Effect From Workplace Factors

H3: There will be no significant difference in PI scores between physicians who rate autonomy at high, medium and low levels.

H4: There will be no significant difference in PI scores between physicians who rate stress at high, medium and low levels.

H5: There will be no significant difference in PI scores between physicians who rate professional equity at high, medium and low levels.

H6: There will be no significant difference in PI scores between physicians who rate satisfaction at high, medium and low levels.

4.0 RESEARCH METHODS

4.1 Overview

Data from the 2004 Canada-wide survey "Emerging Issues in the Work of Physicians" is compared to objective data from the annual Health Indicators Report published by Canadian Institute of Health Information and Statistics Canada (2005). These reports include a number of measures of quality and access to health care by health region and by province, using mandatory standardized data collection and reporting procedures. The published reports include data only from 71 health regions with populations over 75,000. These 71 regions represent about 95% of Canada's population.

4.2 Research Question

Are the views of Canadian physicians surveyed regarding their perspectives on quality of health care in their communities consistent with the objective data?

4.3 Study Population

A stratified random sample of 5300 physicians was drawn from a comprehensive commercial database listing all 60, 859 physicians actively practicing in Canada as of January, 2002. The purpose of the stratification was to ensure that sufficient numbers of physicians would be available for analysis of important sub-groups of physicians in each province, notably female specialists in the smaller provinces. Four levels of strata were used: 1) provincial stratification was used to over-sample the less populous provinces and to under-sample the more populous provinces; 2) gender stratification within general practitioners was used to under-sample the male population and over-sample the female population; 3) gender stratification within specialists was done separately, because the proportion of female specialists is less than the proportion of general practitioners; and 4) community size was used to under-represent the large metropolitan centers of Toronto, Montreal and Vancouver and to over-sample smaller communities and rural areas.

All survey responses from each region are included in this study. The question of whether all should be included merits discussion, as there is a question regarding whether all respondents would have sufficient knowledge about the performance indicators included in the objective index. The measures included in the Objective Index are focused primarily in acute care services. Not all physicians work directly in or with acute care services, therefore there is a question whether those physicians' views are valid or relevant for answering the research questions. In deciding which physician

respondents should be included in the sample for this study, the following factors were taken into consideration:

- Physicians who self-identified as 100% administrative were excluded from the original study.
- Most or all physicians who actively deal with patients, regardless of their specialty or duties, spend at least part of their time working with a broad scope of health care services. They should, therefore, be reasonably informed about the quality of health services in general.
- The study is, by nature, inclusive of all physicians, rather than a select or targeted group.
- In addition, only regions with sufficient numbers of physicians were included. Eight regions were excluded because they had less than 45 responding physicians, even though the physicians were actively involved in patient care.

The physicians identified as possibly having roles which would exclude them from having valid opinions on health care quality as it relates to this study include those who self identify as having primary roles in administration, research, and community / population. Of the study total response of 2,810 there were 171 respondents who fit into these categories. Response rates in the 12 regions selected for the study are not significantly impacted by exclusion of the three groups of physicians. Respondents in these three categories rated quality higher than any other sub-group of respondents in the survey (see Section 6.2.3 and Table 6.6 for a more detailed analysis).

4.4 Data Collection

Data were collected from two sources:

1) A national survey of 5300 physicians carried out by the MERCURi Group in 2004;

2) CIHI / STATSCAN quality measures routinely collected and available upon request from Canadian Institute for Health Information.

The Mercuri Survey: Data were collected between January and April of 2004 through a mail-in questionnaire according to methods established by Dillman (2000) . The questionnaire (Appendix 1) was previously validated by studies in 1998 and 2002 and consists of a 12 page booklet containing sections pertaining to: quality of local health care and health care financing (Lepnurm, 2003, Dobson, 2005), professional equity; time allocation; workplace stress and support; managing stress; the role of the physician in the community; career satisfaction; practice characteristics, and practice management. To check for response bias, all non-responding physicians were sent a one page survey containing key items, with a cover letter and pre-stamped envelope (Churchill, 1991).

CIHI / STATSCAN data: These reports include a number of measures of quality and access to health care by health region and by province, using mandatory standardized data collection and reporting procedures. The published reports include data only from health regions with populations over 75,000.

4.5 Definitions for Baseline Measures

The first measure which must be defined in terms of this study is **quality of health care**. For the physician survey, respondents were asked to rate the quality of health care in their communities without any definitions or clarification of what is meant by the term.

A review of the literature yields many definitions, measures, indicators and solutions. A Pubmed search on the terms "health care quality" netted nearly 2.4 million results, indicating how far-reaching and important quality is.

The Health Quality Council of Saskatchewan (HQC) describes several perspectives: "Quality is in the eye of the beholder. For the user of health services, quality can mean experiencing a positive outcome, being treated with respect, or being well informed. For health providers, quality may mean using the latest technology or having enough time to assess, and communicate with, patients. For managers, quality might be about receiving three-year accreditation." (HQC, 2003).

Outcome measures are often cited as an appropriate measure of health care quality, as well as a criterion for priority setting when limited resources must be allocated among competing health service needs. Rosenheck and Leslie (2001) debate the merits of measuring and forecasting Quality Adjusted Life Years (QALY) to determine the relative efficacy (and preference) of various health interventions. Though controversial in application, this quality-of-outcomes measure may become a necessary component of future healthcare policy decisions.

Juthi et al (2002) explored a number of definitions, including Donabedian's "High quality health care is that kind of care which is expected to maximize an inclusive measure of patient welfare, after one has taken account of the balance of expected gains and losses that attend the process of care in all its parts."

Perhaps the most widely cited definition was developed by the US based Institute of Medicine in 1999: "Quality consists of the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge." (AHRQ, 2002)

Regardless of whose definitions are used, possibly the most important dimensions of quality lie in the intangible, caring attitudes of health care workers, and the values they portray in their interaction with patients. The Catholic Health Association of Canada's Health Ethics Guide includes a call to respect dignity, promote justice, foster trust, and support the well being of co-workers. A few key points are listed below (CHAC, 2004):

- Healing occurs best when people experience that they belong to communities of compassion.
- Health, fully considered, necessarily includes physiological, psychological, spiritual, social, economic, and ecological dimensions. The promotion of justice includes attending to all these dimensions of health.
- Organizations devoted to care in the community are to embody a trust rooted in dialogue and mutual respect. Those in need of care must be able to trust that decision-makers at all levels are committed to their well-being.
- Attentiveness to the well-being of co-workers adds to the quality of care they provide to others; this requires a special effort to develop structures that foster co-responsibility, accountability, and communication.

Definitions for survey data:

The definitions below describe the measures used in Hypotheses #3-6 as well as the post-hoc tests used in those hypotheses.

Autonomy: For this study, autonomy is defined in terms of physician response to three physician survey questions regarding autonomy to get clinical decisions carried out, ability to access treatment programs for patients and ability to access resources for patients. The composite measure derived from the three is similar, though perhaps not as comprehensive as the autonomy measure developed by Burdi and Baker (1999) whose measure was based on eight questions about perceived autonomy in medical care delivery used in a survey of California physicians.

Stress: Lepnurm, Dobson, Backman and Keegan (2006) used a measure of stress labelled as "distress" in order to isolate perceived stress from other stress-related factors including job strain and burnout. This perceived stress measure was used in the Mercuri Group physician survey, based on a five-point scale for self-rating stress level.

Professional Equity: Dobson, Lepnurm and Struening (2005) developed a summative measure of professional equity with three components: financial (reward), recognition and intrinsic (fulfillment). These measures were used as a basis for this study, with reward equity expanded to include both financial rewards and a separate measure of overall rewards as rated by survey respondents

Career Satisfaction: Lepnurm, Dobson, Backman and Keegan (2006) developed a full spectrum measure of career satisfaction based on sixteen items. Two specific dimensions were prioritized for this study: satisfaction with performance and overall career satisfaction. The 2004 Mercuri Group physician survey included both dimensions.

Control: For this study, the measure of control is based on physician response to three survey questions regarding choice you have over the activities: control of day-to-day working activities, and satisfaction with ability to control your work schedule.

Health: For this study, a physician's self-rating of health is based on a single self-reported survey question: "How would you rate your level of health?", scored on a five point scale.

4.6 Derived Measures – Quality Indices

Two sets of indices were developed for comparison in this study. The first, the Health Care Quality Index, is based on objective measures of health care quality published in the annual CIHI / Statscan Health Indicators Report. The second index is the Physician Index, which is based on physician ratings of quality in their communities.

4.6.1 Objective Data – the Health Care Quality Index (OI)

To compare quality of health care services between regions, a composite index of quality was developed. The index is based on a broad cross-section of health care services offered by regional health organizations throughout the country.

A fundamental question in the development of the composite measure is: Should scores assign absolute ratings (i.e. poor to excellent), or should they be based on a comparative index? For most measures, there is currently no objective basis for assigning a score of "good" or "poor"; therefore, it would be somewhat arbitrary to assign such a rating.

Instead of a rating scale, it is possible to develop a performance index based on comparison of performance on each chosen measure against the overall Canadian average, which is available for each variable. Using such an index, a score of 100 on any given measure indicates a performance which is on-par with the national average. A score above 100 indicates better performance, and a score less than 100 indicates a weaker performance.

AMI readmission rate are presented as an example. In the CIHI / Statscan health indicators reporting, AMI readmission rate is defined as "The risk adjusted rate of unplanned readmission following discharge for Acute Myocardial Infarction (AMI). A case is counted as a readmission if it is for a relevant diagnosis and occurs within 28 days after the index AMI episode of care. An episode of care refers to all contiguous in-patient hospitalizations and same-day surgery visits."

"To enable comparison across regions, a statistical model was used to adjust for differences in age, sex and co-morbidities. The risk of readmission following an AMI may be related to the type of drugs prescribed at discharge, patient compliance with post-discharge therapy, the quality of follow-up care in the community, or the availability of appropriate diagnostic or therapeutic technologies during the initial hospital stay. Although readmission for medical conditions can involve factors outside the direct control of the hospital, high rates of readmission act as a signal to hospitals to look more carefully at their practices, including the risk of discharging patients too early and the relationship with community physicians and community-based care. These rates should be interpreted with caution due to potential differences in the coding of co-morbid conditions across provinces and territories." (Statistics Canada, 2006)

AMI Readmission Index scores for two health regions are calculated in Figure 4.1.

Region	Rate	Index	Calculation
Overall Canadian AMI Readmission Rate	6.9	100	= 100 (National Average Performance)
Health Region #4822	4.0	173	= 1 / (4.0/6.9) *100
Health Region #1303	14.0	49	= 1 / (14.0/6.9) *100

Figure 4.1 Sample Calculation of OI Index – AMI Readmission Rate

4.6.2 Weighting the Measures in the Objective Index (OI)

In order to develop a basis for weighting the health care quality variables, a short survey was distributed to a panel of experts consisting of regional and provincial health care officials. Two questions were asked: to rate the importance of sixteen measures, and to recommend other important measures of quality. The sixteen measures listed in the survey include each of the nine measures bolded in Table 4.1, as well as four measures of patient satisfaction and three additional measures of readmissions.

On the first question, of rating importance, respondents were asked to rate each measure on the following scale:

[1] – Very Important [2] – Important [3] – Somewhat Important [4] – Not Important

Surveys were emailed to thirty-five individuals, in management roles with regional or provincial health organizations. A total of sixteen responses were received, from six provinces. The results of the first question are summarized in Table 4.1, along with a Derived Rating (a score of 1-3) which was used for weighting each of the variables. On the second question, to identify additional measures, the most common responses fall into the areas of adverse events and community / public health services.

In the table, there are six measures with a derived weighting of 2 which are not used in this study due to limitations in the availability of data. The nine measures selected for use in this study are bolded in Table 4.1.

Table 4.1 Weighting and Selection of Measures for the Objective Index

Measure	Average Score	Derived Weighting	Use in Study (Y/N)
30 Day AMI Mortality	**1.47**	**1**	**Y**
30 Day Stroke Mortality	**1.47**	**1**	**Y**
AMI Readmission	**1.60**	**1**	**Y**
Asthma Readmission	**1.80**	**2**	**Y**
Pneumonia Readmission	1.80	2	N
Pneumonia / Flu Hospitalization	1.87	2	N
In-Hospital Hip Fracture	**1.87**	**2**	**Y**
Patient Satisfaction - Any Services	1.93	2	N
Patient Satisfaction - Hospital	1.93	2	N
Patient Satisfaction - Physician	1.93	2	N
Patient Satisfaction - Community Based	1.93	2	N
Prostatectomy Readmission	**2.13**	**3**	**Y**
ACSC Hospitalization	**2.13**	**3**	**Y**
Hysterectomy Readmission	**2.20**	**3**	**Y**
C-Section Rate	**2.47**	**3**	**Y**
VBAC Rate	2.47	3	N

A region's composite health care performance index was then developed by incorporating their index scores on all nine measures, weighted by importance. Importance ratings were developed based on a small survey of sixteen health region officials throughout the country. Relative weighting of each of the nine measures was developed based on a responses to this survey, with three exceptions: in-hospital hip fracture was weighted lower than the survey would suggest due to its relatively infrequent occurrence, and both ACSC hospitalization and C-Section rate was weighted heavier due to their relatively frequent occurrence. Figure 4.2 shows the final weighting used for each of the nine indicators.

Performance Measure	Weighting
30 Day AMI Risk	15
30 Day Stroke Risk	15
AMI Readmission Risk	15
Asthma Readmission Risk	15
ACSC Rate	10
Hysterectomy Readmission Risk	10
Prostatectomy Readmission Risk	10
In-hospital Hip Fracture	5
C-section Rate	5
WEIGHTED QUALITY INDEX	**100**

Figure 4.2 Weighting of Measures in Objective Index

Descriptions of each of these performance measures are included in the attached Appendix B.

4.6.3 Calculation of Objective Index Scores (OI)

For the 12 regions selected, the overall average quality index is **104.1**. This indicates that, based on the weighting factors above, the 12 regions included in the sample have scores that are 4.1% better than the overall Canadian averages for the data reported on the nine performance measures by CIHI / Statscan.

Table 4.2 outlines the derivation of objective index scores for a health region (#4706). The data for each region is reported in the 2005 CIHI / Statscan Health Indicators report. The objective index scores are calculated based on index ratings calculated for each of the nine components, weighted as indicated above.

Table 4.2 Calculation of Objective Index Scores – Region #4706

Derivation of Objective Index - Region #4706			
	Canada	Region 4706	
	Rate	Rate	Index
30 Day AMI Risk	11.4	11.3	101
30 Day Stroke Risk	18.6	18.7	99
AMI Readm Risk	6.9	7.5	92
Asthma Readm Risk	4.7	4.9	96
ACSC Rate	416.0	411.0	101
Hyst Readm Risk	1.0	1.8	56
Prost Readm Risk	2.2	3.0	73
In-hosp Hip Frac	0.8	1.1	73
C-sec Rate	23.7	21.1	112
INDEX	100.0	91.0	

4.6.4 Physicians' Views On Quality – The Physician Index (PI)

Data on physician views is drawn from the study entitled "Emerging Issues in the Work of Physicians" conducted by the MERCURI Group at the University of Saskatchewan in early 2004. Comprehensive questionnaires containing sections on: quality of health services; health policy issues; professional equity; time spent on activities; stress and management of stress; organization of practice; career satisfaction (including satisfaction with performance) and demographics, were sent to a stratified sample of 5300 physicians across Canada.

The sample was stratified to over-represent physicians practicing in smaller communities, in less populous provinces, and female specialists. Of these, 149 were ineligible for a variety of reasons (retirement or limited to part-time practice, maternity leaves, return to medical school, not involved in clinical care, serious illness and 3 had

died) and 193 had moved, for an eligible study population of 4958. Of these, 2810 returned questionnaires with very few missing values (56.7% response).

One page surveys containing key items from the original questionnaire were sent out to all 2148 non-responders. Subsequently, 686 were returned by mail or fax. Non-response bias was not detected on the basis of: 1) support for the Canadian health system; 2) authority to make clinical decisions; 3) location; 4) specialty; 5) language; or 6) gender. Non-responding physicians were very slightly more satisfied with their career than responding physicians. Adjustments for bias were not necessary.

The first group of questions presented in the physician survey are under the heading:

"1. The state of the health care system <u>in your community</u>. "

Under this heading, the first question in the survey is:

The QUALITY of the health care system in your community is:					
Very Poor	Poor	Adequate	Good	Very Good	Excellent
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

This question was used as the measure of physicians' views of quality for developing the Physician Index (PI.).

Numerical scores were assigned to each of the possible ratings as follows:

Very Poor	Poor	Adequate	Good	Very Good	Excellent
1	2	3	4	5	6

The overall mean score from the 2,810 physician surveys received was **3.816.** This score was used as the baseline score for developing the index.

Table 4.3 Survey Responses – Quality Ratings from Very Poor to Excellent

Rating	Score	# Responses
Very Poor	1	9
Poor	2	262
Adequate	3	829
Good	4	923
Very Good	5	710
Excellent	6	77
Total		**2,810**

There was variability in physician responses to this question, with an overall standard deviation of 1.01. This variability is prevalent in all cross-sections of the data examined. The variance in responses is consistent with what was discovered in the literature review – that physicians are not a homogeneous group in their thoughts or opinions. It is also important to recognize in the research design that, while examining mean scores from the survey is useful for an overall indicator, there are many physicians whose ratings were higher or lower than the average.

There is also skewness and kurtosis to the data, as follows:

Skewness = -0.081. The mean score is 3.816, and the median is 4.00. This represents a negative skewness. The test for significance of skewness is as follows (Hair, 2006):

$$Z_{skewness} = \frac{Skewness}{\sqrt{6/N}} = \frac{-0.8140}{\sqrt{6/2{,}810}} = \underline{\underline{\mathbf{-17.6}}} \qquad (4.1)$$

With an error level of 0.05, the control limits for $Z_{skewness}$ is +/- 1.96. Therefore, the distribution of physician responses cannot be considered to be normal, and data transformation is required.

Kurtosis = -.065. The physician response data is platykurtic. The distribution is flatter than the normal distribution, as shown in the SPSS histogram in Figure 4.3, where the normal curve distribution is included on the chart. The test for significance of kurtosis is as follows:

$$Z_{kurtosis} = \frac{\text{kurtosis}}{\sqrt{24/N}} = \frac{-0.65277}{\sqrt{24/2{,}810}} = \underline{\mathbf{-7.06}} \qquad (4.2)$$

With an error level of 0.05, the control limits for $Z_{kurtosis}$ is +/- 1.96. Therefore, the distribution of physician responses could not be considered to be normal, and data transformation was required.

The method of transformation to be used to deal with both skewness and kurtosis is to square the value of scores derived from physician responses, which also brings the physician index scores in line with the range of scores derived from the objective index.

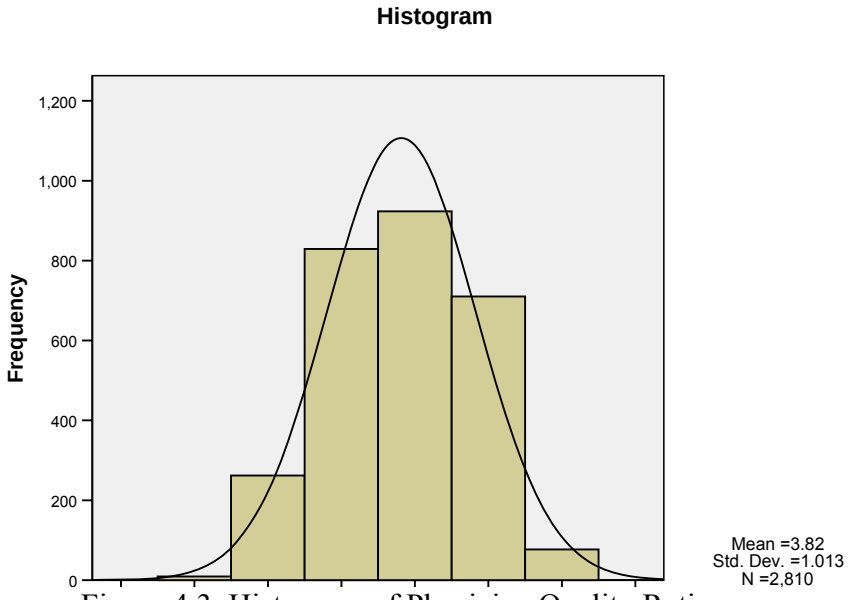


Figure 4.3 Histogram of Physician Quality Ratings

4.6.5 Calculation of Physician Index Scores (PI)

When the raw scores on quality (individual ratings or grouped by region) are compared to the overall mean, the distribution is leptokurtic and tightly distributed. To compensate for this and to create an index whose scores more closely match the distribution of the objective index scores, the values are transformed by squaring the values of both sub-group and overall scores to calculate the physician index score, as follows:

$$\textbf{Physician Index (OI) Score} = \frac{\textbf{(Mean score of sample sub-group)}^2}{\textbf{(Overall mean score of 3.816)}^2} \qquad (4.3)$$

For the 12 regions selected, average PI. based on the 1,060 physician ratings in those regions is 104.3, somewhat higher than the overall PI of 100.0 for all 2,810 physicians surveyed.

As an example of the calculation of PI, the mean score for quality rating among 185 physician responses in Region #1206 was 3.741. Te PI score for this region is:

$$\textbf{P.I.\#1206} = \frac{3.741^2}{3.816^2} \times 100 = \underline{\textbf{96}} \qquad (4.4)$$

4.7 Control Variables

For appropriate comparison of performance between jurisdictions, it is important to have data adjusted to reflect differences between regions. For measures of quality used in this index, the CIHI / Statscan measures have been adjusted "for differences in age, sex and

co-morbidities". It is not necessary to further adjust the data for other control variables such as income levels, dependency ratio or self rated health.

4.8 Health Regions as a Basis for Measurement

The quality of a health care system could be evaluated at a macro level (overall national or provincial performance), a meso level (such as by health region), and/or a micro level (performance within a specific hospital, ward or management unit). The meso level was selected for this project, based on the evaluation presented in the following sections.

4.8.1 Data Comparisons: Health Region vs Community

Data is summarized by health region for comparison between physician views and the CIHI / Statistics Canada composite measures, which are also reported by region. The questions posed to physicians asked explicitly about health care services "in your community", not "in your health region". However, it is presumed that physicians are best positioned to express their views about health care services in their own local community rather than for their entire health region. When physician responses are grouped for a complete health region, it will provide a reasonable composite average of physician views for the region. Physician responses are therefore summarized for each health region studied, thus providing a mean score for physician views in each health region.

4.8.2 Selection Of Quality Measures and Regions – Data Availability

Statistics Canada and CIHI routinely report Health Indicators for health regions with populations over 75,000. There are a total of 71 regions included in this group, with a total population (2002) of 30.07 million people, or about 95.5% of Canada's population. Not included in these published reports are an additional 39 health regions, each having less than the 75,000 CIHI threshold, for a collective population of 1.47 million people.

Nine key health system performance measures were selected as being best representations of quality of health care services.

Of the 71 regions included in the Health Indicators reports, not all have data available on all nine indicators. For example, Quebec uses different measuring and reporting processes than the CIHI / Statistics Canada standards on most health system performance measures. As a result, only two of the key measures are available for Quebec health regions, and four for Manitoba regions.

Twenty-four of the 71 regions have data reported in the 2005 Health Indicators Report for all nine key indicators. By province, there are:

- Ontario 14 regions
- Alberta 4 regions
- New Brunswick 3 regions
- Saskatchewan 2 regions
- Nova Scotia 1 region

It is also important to have sufficient numbers of responses from the Mercuri Group's physician survey in order to have both representative sampling and sufficient data for

cross-tabulation analysis. Regions with at least 45 physician surveys are included in the study in order to allow cross-tabulation of results in groups of high, medium, and low range ratings of autonomy, stress, professional equity and satisfaction. Data testing showed that regions where a smaller sample of physicians was received, cross-tabulation of data resulted in sub-sample sizes below five per group.

When compared to the above list of regions with all nine Health Indicators variables, there are twelve regions which fulfil both criteria, as follows:

- Ontario 5 regions
- Alberta 2 regions
- New Brunswick 2 regions
- Saskatchewan 2 regions
- Nova Scotia 1 region

The 12 health regions included in the above cross-section represent a total population of 9.1 million (29% of Canada's population), and 1,060 physician surveys (37.7% of the total). There are limitations to this selection:

- All regions with less than 75,000 population are excluded. This problem cannot be resolved – there are no quality measures publicly available from CIHI / Statistics Canada for the smaller regions.
- Five provinces are excluded from the data.
- Urban-rural differences are not well represented, as regions with a high percentage of rural population are not included in the sample.

4.8.3 Regions Selected for the Study

The criteria for selecting both health regions and measures of quality are:

- Physician Survey: There must be sufficient number of responses within each region to allow for data to be analyzed using cross-tabulation into three groupings (high, medium and low rankings). Testing of the data resulted in a minimum level of 45 responses per region. There are twelve regions in which at least 45 responses were obtained.
- Measures of Quality: There must be measures available for all nine common measures selected for this study as reported by Statscan / CIHI.

Table 4.4 shows summary statistics on twelve health regions, each of which have Statscan / CIHI measures available. Five provinces are represented in this group. Maps showing health region territories are included in Appendix C.

Table 4.4 Regions Selected and Derivation of Objective Index Scores

Regions Selected for Study and Derivation of Objective Index Scores										
RHA	30 Day AMI Risk	30 Day Stroke Risk	AMI Readm Risk	Asthma Readm Risk	ACSC Rate	Hyst Readm Risk	Prost Readm Risk	In-hosp Hip Frac	C-sec Rate	OBJ INDEX
Canada	**11.4**	**18.6**	**6.9**	**4.7**	**416**	**1.0**	**2.2**	**0.8**	**23.7**	**100**
1206	11.7	27.3	9.1	5.0	374	1.5	2.7	1.4	28.1	**83**
1301	10.3	18.4	8.3	3.3	563	0.9	1.7	0.7	25.9	**107**
1302	12.0	18.7	5.2	3.7	531	1.2	2.4	1.4	25.6	**101**
3502	11.5	16.5	7.1	4.3	416	1.1	1.9	0.7	20.2	**105**
3504	10.7	18.5	7.2	3.7	463	0.9	1.7	0.7	24.4	**108**
3507	11.5	17.0	6.1	4.8	268	1.3	2.1	0.7	26.2	**107**
3508	11.5	17.6	6.5	3.8	260	0.8	2.7	0.6	24.6	**113**
3511	10.0	17.6	7.1	4.3	328	1.2	1.6	0.8	24.0	**109**
4704	10.1	15.1	4.3	5.0	683	1.3	3.3	0.8	17.6	**106**
4706	11.3	18.7	7.5	4.9	411	1.8	3.0	1.1	21.1	**91**
4822	9.1	15.1	4.0	3.8	306	1.2	2.1	1.1	24.7	**123**
4825	9.9	14.6	3.8	3.4	268	0.7	1.4	0.8	22.8	**140**
Note: Data from Statscan / CIHI Health Indicators 2005.										

4.9 Methods for Testing the Hypotheses

Each of the hypotheses was tested using comparative analysis and tests of statistical significance. There are two phenomena which appear to reduce the statistical significance of differences in the analysis: large variances in physician responses, and small sample sizes in the sub-groups selected for analysis. Therefore, both comparative analysis of raw data and tests for statistical significance are incorporated into the testing methodology. In many cases, the comparative analyses show differences, whereas tests for statistical significance show relatively few significant differences.

With large variances in the quality ratings provided by physicians, there are overlaps in responses between sub-groups, and therefore a lesser likelihood of significant differences between groups than would be the case if responses were less varied. Within most groups, and in the overall sample of physicians, the standard deviation in quality ranking scores is generally about 1.0 on a six point scale. As a result, there are overlaps between groups. Consequently, the difference between mean scores must be substantial in order to be of statistical significance.

This variation in physician views is typical of what is found in the literature. For example, Saturno, Palmer and Gascon (1999) studied physician attitudes and compliance with quality evaluation criteria in Spain. They found "a great variation" in agreement about whether the evaluation criteria were scientifically sound, as well as in compliance with the criteria. The study revealed high standard deviations in physician

views, “revealing the lack of consensus even more”. Overall, the study found a “lack of general agreement was the rule.”

Secondly, the sub-grouping methodology used in the analysis, where each region’s responses are broken down into three groups for cross-tabulation study, results in relatively small sample sizes in many cases. The small sub-group sizes necessitated a reduction in the number of regions included in this study from an original number of twenty regions (based on a minimum of twenty physician responses in each region) to twelve regions (based on a minimum of fourty-five physician responses in each region). Nonetheless, in a number of cases the sub-grouping sample sizes within regions are less than ten, and in one case a sub-group sample size is only four, which is less than the desired minimum of five for cross-tabulation analysis. With relatively small sample sizes in some cases, the variation in response scores required for statistical significance is higher than it would be with a larger sample size.

Larger sample sizes could have been achieved by limiting the sub-grouping of responses into only two groups (high and low); however the data and analysis would not be as comprehensive as when including high, medium and low ranges.

4.9.1 Hypothesis #1: Comparative Analysis and Z-Tests

Hypothesis #1 states: There will be no significant differences between the Objective Index and Physician Index. The first test for Hypothesis #1 is a comparative analysis: For regions with OI >100, is the PI also >100? If so, then the null hypothesis cannot be

rejected. Conversely, in regions with OI <100, is the PI also <100? If so, the null hypothesis must not be rejected.

The second test for Hypothesis #1 is a test for statistical significance between OI and PI scores, using a Z-Test. A Z-Test is chosen because the analysis compares data from two different populations.

4.9.2 Hypothesis #2: Comparative Analysis and t-tests

Hypothesis #2 states: There will be no significant differences between PI scores for GP/FPs and specialists. The first test for hypothesis #2 is a comparative analysis, where PI scores for GP/FPs are measured against those for specialists to identify which is higher. This test will determine the number of cases where one group's PI scores are higher than the other.

The second test for hypothesis #2 is a pooled variance t-test to identify whether there is a significant difference in PI scores between GP/FPs and specialists, both within each region and on an overall basis. In cases where there is a significant difference between the PI scores, the null hypothesis should be rejected.

4.9.3 Hypothesis #3-6: Comparative Analysis and Pooled Variance t-tests

Hypothesis #3-6 each examine the differences in physician quality ratings based on different levels of predictor variables. The method for testing these hypotheses is to calculate individual PI scores for each survey respondent in the twelve selected regions, and compare the averages of those PI scores.

Three tests were performed for each variable used in hypothesis #3-6. A summary table of data is presented for each of the eight variables (sample and description below).

1) Compare regional PI scores between high medium and low ratings, using comparative analysis. Measure the difference in PI scores by region, and count how many cases one rating is higher than the other, based on raw scores.

2) Comparing difference in regional PI scores using pooled variance t-tests: Test the significance of variance between high and low ratings, then between high and medium ratings. Count how many cases the regional PI score derived for one rating is significantly greater than the PI score for the other rating.

3) Compare differences in overall average PI scores using both tests above.

- Is the overall average PI score at the high rating greater than that at the low rating? At the medium rating?
- Using a pooled variance t-test, are there significant differences between overall average PI scores between high, medium and low ratings?

Table 4.5 Sample Table – Measures for Evaluating Hypothesis #3-6

STRESS												
	HIGH vs LOW				HIGH vs MED				MED vs LOW			
RHA	PI-H	PI-L	t	H<L	PI-H	PI-M	t	H<M	PI-M	PI-L	t	M<L
1206	93	101	-0.77		93	97	-0.43		97	101	-0.45	
1301	96	118	-1.01		96	125	-1.77		125	118	0.31	
1302	98	109	-0.66		98	101	-0.16		101	109	-0.49	
3502	104	119	-0.57		104	116	-0.79		116	119	-0.09	
3504	101	102	-0.04		101	91	0.60		91	102	-0.52	
3507	112	146	-1.65		112	122	-0.65		122	146	-1.09	
3508	75	152	-3.95	*	75	98	-1.53		98	152	-2.10	*
3511	89	121	-2.40	*	89	91	-0.22		91	121	-2.26	*
4704	71	102	-2.05		71	79	-0.76		79	102	-1.49	
4706	85	98	-0.86		85	113	-2.60	*	113	98	1.17	
4822	108	124	-1.28		108	107	0.06		107	124	-1.46	
4825	114	137	-1.80		114	128	-1.24		128	137	-0.77	
MEAN	97	118	-4.39	*	97	105	-2.32	*	105	118	-2.65	*
Note: * Indicates a significant difference based on t-test at 0.05												

4.10 Verification: Other Survey Questions

Verification of the Physician Index measure is done by developing similar indices based on physician ratings of the quality of community and hospital services. In the survey, another group of questions in the survey asks about physicians' assessment of quality of specific health care services:

"Please indicate your assessment of QUALITY of specific services in your community, *using the following scales (circle the appropriate response 0 = worst; 100 = best):*

Community-based services	**Not Applicable**	**0**	**10**	**20**	**30**	**40**	**50**	**60**	**70**	**80**	**90**	**100**
Mental Health Services	Not Applicable	0	10	20	30	40	50	60	70	80	90	100
Hospital Services	**Not Applicable**	**0**	**10**	**20**	**30**	**40**	**50**	**60**	**70**	**80**	**90**	**100**
Rehabilitation Services	Not Applicable	0	10	20	30	40	50	60	70	80	90	100
Nursing Home Services	Not Applicable	0	10	20	30	40	50	60	70	80	90	100

The ratings on Community-based services and hospital services relate most closely to the performance measures selected for the objective index. Therefore, these two

questions were used for comparison and validation of the ratings provided in the first question above. The two new indices are developed using the same methodology as the Physician Index (formula 4.6). The Community Service Index and the Hospital Service Index were compared to the Physician Index for closeness of fit.

$$\left(\frac{\text{Mean physician rating in the region}}{\text{Overall mean physician rating}}\right)^{\text{squared}} \times 100 \qquad (4.6)$$

4.11 Methods for assessing whose views most closely match the objective data

For each of the eight predictor variables, a summary table of data is provided with information to conduct two tests: one to compare aggregated average scores for all twelve regions, and the next for comparing fit of OI vs PI scores within each region.

1) Comparing overall average scores for the twelve regions: for each of the eight predictor variables, PI scores are calculated at the high, medium and low levels of the predictor variable. The average PI scores for the twelve regions are compared to the average OI score for the twelve regions to find best overall fit.

2) Comparing fit within individual regions: The variance between OI and PI scores at each level of the predictor variable are summed to find best fit. In addition, a z-test is performed in each case to determine whether there is a significant difference between OI and PI at that level of the predictor variable.

5.0 DATA ANALYSIS

The methods of data analysis vary depending on the type of question asked in each hypothesis, and on the nature of the data being studied. Data analysis methodologies for each hypothesis are presented below.

5.1 Hypothesis #1: Comparing Objective Index And Physician Index

Hypothesis #1 states: There will be no significant differences between the Objective Index and Physician Index. Data analysis will therefore test whether, in the health regions selected for analysis, the Physician Index based on all physicians surveyed varies significantly from the Objective Index for that region.

Hypothesis – Technical Terms

Ho: $PI_i = OI_i$

Ha: $PI_i \neq OI_i$

Where:

PI = Physician Index

OI = Objective Index

$_i$ = Each of 12 regions studied

The test compares the PI calculated for each region with the OI calculated for that region.

Statistical Methods

Two index ratings were calculated for each health region:

1) Objective Index OI: The index score based on weighted average scores of the nine performance measures; and
2) Physician Index PI: The index score based on the average rating of health care quality provide by physicians surveyed in the same region.

A z-test was performed on the two scores for each region to see if there is a statistically significant difference between the physician rating (which is treated as a sample mean) and the objective data (which is treated as the target value). The test statistic therefore is:

$$Z_i = \frac{X_i - \mu_i}{\alpha_i / \sqrt{n_i}} \qquad (5.1)$$

Where; X_i = sample mean (mean score of physician responses) for the region

μ_i = objective index score for the region

α = standard deviation of the objective index scores for all regions

n_i = number of physician responses in the region.

With a significance level of 0.05, the critical value of Z is +/- 1.96. Any z score which is more than +1.96 or less than -1.96 falls outside the region of non-rejection, representing a significant difference between the two index scores.

As an example, in Region #1302 the physician survey netted 66 responses, and the PI based on their responses is calculated at 101.69. The OI for this region, calculated from the Health Indicators report, is 100.95. The Z test for this example is then:

$$Z_{1303} = \frac{X_{1302i} - \mu_{1302}}{\alpha / \sqrt{n_{1302}}} \qquad (5.2)$$

$$= \frac{101.69 - 100.95}{15.45 / \sqrt{66}} = \mathbf{-0.42}$$

Because -1.96 < Z <1.96, the score falls within the region of non-rejection. Therefore, we fail to reject the null hypothesis in this case. We can conclude that, in Region #1302, physicians' views on quality of health care in their communities do not vary significantly from the objective data. The same test was repeated for each region.

Measures – CIHI/Statistics Canada Data

The OI scores by region presented above were used for comparison in each of the tests for Hypothesis #1.

5.2 Hypothesis #2: Comparing GP/FPs and Specialists

Hypothesis #2 states: There will be no significant differences between PI scores for GP/FPs and specialists. Data analysis will therefore test whether, in the health regions selected for analysis, the Physician Index calculated for GP/FPs surveyed varies significantly from the Physician Index for specialists surveyed in that region.

Hypothesis – Technical Terms

Ho: $PI_{GPi} = PI_{SPi}$

Ha: $PI_{GPi} \neq PI_{SPi}$

Where:

PI_{GP} = Physician Index for general practitioners / family physicians

PI_{SP} = Physician Index for specialists

$_i$ = Each of 12 regions studied

PI scores based on the responses of general practitioners in a region were compared with the PI based on the responses of specialists in that region. Two groups of tests were performed to test the hypothesis: comparative analysis and t-tests.

$$t_i = \frac{(PI_{GP}i - PI_{SPi})}{\sqrt{(\text{Pooled Variance}^* (1/n_{GPi} + 1/n_{SPi}))}} \qquad (5.3)$$

Where:

$PI_{GP}i$ = PI score for GP/FPs in Region i

PI_{SPi} = PI score for specialists in Region i

n_{GPi} = Sample size n for GP/FPs in Region i

n_{SPi} = Sample size n for specialists in Region i

i = Each of 12 regions studied.

5.3 Hypothesis #3: Comparing PI Scores at Different Autonomy Levels

Hypothesis #3 states: There will be no significant difference in PI scores between physicians who rate autonomy at high, medium and low levels. Data analysis will therefore test whether, in the health regions selected for analysis, there is a significant

difference in Physician Index scores calculated for survey respondents rating autonomy in the highest, medium and lowest levels.

Hypothesis – Technical Terms

Ho: $PI_{autonomy} > PI_{\mu}$

Ha: $PI_{autonomy} \leq PI_{\mu}$

Where:

$PI_{autonomy}$ = Physician Index score for physicians reporting a high sense of autonomy;

PI_{μ} = Overall Average Physician Index Score (= 100).

Pooled variance t-tests were performed for each of hypotheses 3-6 to compare differences between high, medium and low raters of quality. A sample formula is presented below for a t-test comparing high to low ratings of a predictor variable.

$$t_i = \frac{(PI_{Hi} - PI_{Li})}{\sqrt{(\text{Pooled Variance}^* (1/n_{Hi} + 1/n_{Li}))}} \quad (5.4)$$

Where:

$PI_{H}i$ =PI score for High raters of the predictor variable in Region i

PI_{Li} = PI score for Low raters of the predictor variable in Region i

n_{Hi} = Sample size n for High raters of the predictor variable in Region i

n_{Li} = Sample size n for Low raters of the predictor variable in Region i

i = Each of 12 regions studied.

Three questions were selected from the survey to develop a composite measure of autonomy, asking about satisfaction with:

- Your ability to access resources needed to treat your patients?
- Your role in organizing treatment programs for patients in your community?
- Your authority to get your clinical decisions carried out?

Correlations of the three component variables are summarized in Table 5.1. The Cronbach's α score for the three variables is 0.70.

Table 5.1 Correlations Among Variables used in Autonomy Composite Measure

Correlations			
	-your ability to access resources needed to treat your patients	-your role in organizing treatment programs for patients in your comm.	-your authority to get your clinical decisions carried out
-your ability to access resources needed to treat your patients	1.000	.477	.415
-your role in organizing treatment programs for patients in your comm.	.477	1.000	.417
-your authority to get your clinical decisions carried out	.415	.417	1.000

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.698	.699	3

5.4 Hypothesis #4: Comparing PI Scores at Different Stress Levels

Hypothesis #4 states: There will be no significant difference in PI scores between physicians who rate stress at high, medium and low levels. Data analysis will therefore test whether, in the health regions selected for analysis, there is a significant difference in Physician Index scores calculated for survey respondents rating stress in the highest, medium and lowest levels.

The physician survey included one general question about stress level, plus a section entitled "Please indicate how you manage stress in your work." The general question on stress level is the main focus for this study:

"How would you rate your level of stress?				
Very Low	Low	Moderate	High	Very High
[ ]	[ ]	[ ]	[ ]	[ ]

Hypothesis – Technical Terms

Ho: $PI_{stressed} < PI_{\mu}$

Ha: $PI_{stressed} \geq PI_{\mu}$

Where $PI_{stressed}$ = Physician Index score for physicians reporting high levels of stress;

And PI_{μ} = Overall Average Physician Index Score (= 100)

Three post-hoc tests were performed to fully explore the factors relating to stress. They include:

- Compare stress levels of physicians in the regions with the highest OI scores to those with the lowest. The question to be addressed is: Is the stress level of physicians in higher performing regions higher than in the others?
- Compare stress levels among physicians reporting different levels of control over their work. The question is: Do physicians with a higher sense of control over their work have lower stress levels than those with less control?
- Compare the self-rated health status of physicians reporting different levels of stress. The question is: Do lower stress levels correlate with better health status?

To examine the relationship between sense of control to stress levels, a composite measure of control was developed based on three questions:

- Amount of choice you have over the activities you carry out or participate in?
- How satisfied are you with your control over day-to-day work activities?
- How satisfied are you with your ability to control your work schedule?

Comparison of the variables was done to determine inter-item correlations and Cronbach's α test of reliability. These are summarized in Table 5.2. The Cronbach score for the three variables is 0.68.

Table 5.2 Correlations and Reliability Tests: Control vs Stress Level

	Amount of choice you have over the activities you carry out or participate in	Control Day to Day Activities Reversed	-your ability to control your work schedule
Amount of choice you have over the activities you carry out or participate in	1.000	.358	.383
Control Day to Day Activities Reversed	.358	1.000	.510
-your ability to control your work schedule	.383	.510	1.000

Cronbach's α	Cronbach's α Based on Standardized Items	N of Items
.656	.682	3

5.5 Hypothesis #5: Comparing PI Scores at Different Equity Levels

Hypothesis #5 states: There will be no significant difference in PI scores between physicians who rate professional equity at high, medium and low levels. Data analysis will therefore test whether, in the health regions selected for analysis, there is a significant difference in Physician Index scores calculated for survey respondents rating equity in the highest, medium and lowest levels.

The survey included an extensive section on professional equity. Three types of equity are examined in the analysis: fulfillment, recognition and financial rewards. Survey items chosen for examination in this study are:

"Overall, the full range of rewards you receive for all the contributions you make are:"

Very Unfavourable	Unfavourable	Somewhat Unfavourable	Fair	Somewhat Favourable	Favourable	Very Favourable
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

"At the present time, your sense of fulfillment for the contributions you make is:"

Very Low	Low	Moderately Low	Adequate	Moderately High	High	Very High
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

"At the present time, the recognition you receive for the contributions you make are: "

Very Disappointing	Disappointing	Somewhat Disappointing	Reassuring	Somewhat Gratifying	Gratifying	Very Gratifying
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

"At the present time, the financial compensation you receive for the contributions you make is:"

Very Stingy	Stingy	Somewhat Stingy	Acceptable	Somewhat generous	Generous	Very Generous
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

Hypothesis – Technical Terms

Ho: $PI_{equity} > PI_{\mu}$

Ha: $PI_{equity} \leq PI_{\mu}$

Where PI_{equity} = Physician Index score for physicians reporting a high sense of equity;

And PI_{μ} = Overall Average Physician Index Score (= 100)

The four variables relating to equity have a strong Cronbach's α score of 0.81.

Correlations between the variables are summarized in Table 5.3.

Table 5.3 Correlations and Reliability Statistics – Recognition and Rewards

	Level of fulfillment	The recognition you receives is	The financial rewards you receive are	REWARDS full range
Level of fulfillment	1.000	.531	.258	.523
The recognition you receives is	.531	1.000	.407	.750
The financial rewards you receive are	.258	.407	1.000	.607
REWARDS full range	.523	.750	.607	1.000

Cronbach's α	Cronbach's α Based on Standardized Items	N of Items
.813	.808	4

5.6 Hypothesis #6: Comparing PI Scores at Different Satisfaction Levels

Hypothesis #6 states: There will be no significant difference in PI scores between physicians who rate satisfaction at high, medium and low levels. Data analysis will therefore test whether, in the health regions selected for analysis, there is a significant difference in Physician Index scores calculated for survey respondents rating satisfaction in the highest, medium and lowest levels.

The physician survey included a section on Career Satisfaction, with 18 questions relating to satisfaction with specific issues. Two measures of satisfaction were selected for analysis: satisfaction with performance, and satisfaction with career. The question regarding satisfaction with career satisfaction is as follows:

How satisfied are you with your medical career, considering your various roles and responsibilities?

Very Dissatisfied	Dissatisfied	Somewhat Dissatisfied	Somewhat Satisfied	Satisfied	Very Satisfied
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

Satisfaction with performance is a composite measure based on four items:

How satisfied are you with:

- Your success in meeting the needs of your patients;
- Your capacity to keep up with advances in your clinical specialty;
- Your ability to access resources needed to treat your patients;
- Your role in organizing treatment programs for patients in your community.

The four variables relating to satisfaction with performance have a Cronbach's α score of 0.75. Inter-item correlations and Cronbach's α are summarized in Table 5.4.

Table 5.4 Correlations and Reliability Statistics – Satisfaction with Performance

	-your role in organizing treatment programs for patients in your community	-your success in meeting the needs of your patients	-your capacity to keep up with advances in your clinical specialty	-your ability to access resources needed to treat your patients
-your role in organizing treatment programs for patients in your comm.	1.000	.389	.383	.477
-your success in meeting the needs of your patients	.389	1.000	.408	.532
-your capacity to keep up with advances in your clinical specialty	.383	.408	1.000	.402
-your ability to access resources needed to treat your patients	.477	.532	.402	1.000

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.751	.752	4

Hypothesis – Technical Terms

Ho: $PI_{satisfied} > PI_{\mu}$

Ha: $PI_{satisfied} \leq PI_{\mu}$

Where $PI_{satisfied}$ = Physician Index score for physicians reporting high levels of satisfaction,

And PI_{μ} = Overall Average Physician Index Score (= 100)

5.7 Data Correlations – Verification Tests

Physician survey questions regarding quality ratings of community services and acute care services are used as comparative ratings to verify the results of the core survey question on overall ratings of health care quality.

Correlations among the three variables are reasonably strong. Table 5.5 shows the correlations between physician ratings of quality overall, quality of community services and quality of hospital services which range between 0.389 to 0.549. In addition, the Cronbach's α score for the three variables is 0.73.

Table 5.5 Correlations and Reliability Statistics – Physician Ratings of Quality

	QUALITY	Quality of Community Services	Quality of Hospital Services
QUALITY	1.000	.389	.481
Quality of Community Services	.389	1.000	.549
Quality of Hospital Services	.481	.549	1.000

Cronbach's α	Cronbach's α Based on Standardized Items	N of Items
.561	.729	3

5.8 Limitations

The following limitations have been identified for this study:

Differing scope of responsibility between regions: Regionalization of health care is at various stages of development throughout the country. For example, Ontario is only just beginning to establish integrated regional health care organizations, whereas Saskatchewan has been going through an evolution of regional organizations since 1993. Therefore, comparison of various measures between geographic areas may or may not be representative of services managed and coordinated by a single entity.

Health regions are frequently changing boundaries: Nationally reported data may not be updated in a timely basis to reflect the new boundaries. For example, key Statscan measures are reported by health regions in place in 2001 or 2003 (which, for example, do not include the 14 new Ontario LHINs). Therefore, even data which has been collected and reported may not be comparable. This is particularly true in the provinces of Ontario, British Columbia and Newfoundland and Labrador, each of which has undergone regional restructuring within the past two years.

Availability of comparable data: There are a number of issues which create limitations in the availability of comparable data, including:

- The performance measures included in the CIHI-Statscan Health Indicators reports are quite narrowly focused on certain interventions, generally within the realm of

acute care. Other significant components of the health care system are simply not included in any nationally comparable data.

- Personal interviews with health region officials in Saskatchewan, Nova Scotia, New Brunswick and Newfoundland and Labrador in 2005 revealed that the only data which are collected and reported on a consistent, comparable basis are those which are mandated by federal mandate (Statscan, CIHI and MIS reporting requirements).
- Even the standard national data measures are not reported universally throughout the country. For example, Manitoba reports only four of the nine indicators used in this index. Quebec reports only two.
- CIHI reports on performance of health regions with less than 75,000 population are not available for comparison. Though the 39 regions not included in these reports make up only 1.5 million population or 4.7% of Canada's total, they represent a segment of the country which should be included in a national study of health care system performance. In addition, the scope of services available from regions with a smaller population base are not likely comparable to regions with major metropolitan centres and tertiary care centres.

Physician Survey – Self Reporting: Physicians report their views based on a self-administered questionnaire survey. There are not the same controls over process and understanding that there would be under a survey administered by a trained surveyor.

Number of Survey Responses by Region: For regions with less than 45 physician survey responses, it is generally not possible to split responses into categories any further than high/low. By splitting into three groups (high, medium and lowest ratings),

there is often insufficient number of responses to allow a minimum of 5 responses per group per region for cross-tabulation analysis. Therefore, the analysis is restricted to those 12 regions with more than 45 responses so that it is possible to break down responses into the three groups.

6.0 RESULTS

6.1 Results - Hypothesis #1

Hypothesis #1 states: There will be no significant differences between the Objective Index and Physician Index. The hypothesis was tested using two methods: comparative analysis and Z-Tests.

6.1.1 Comparative Analysis

The basis for testing Hypothesis #1 is to compare Objective Index vs Physician Index scores for each region. Each indicator is based on an overall average index score of 100. Figure 6.1 compares OI to PI for each region:

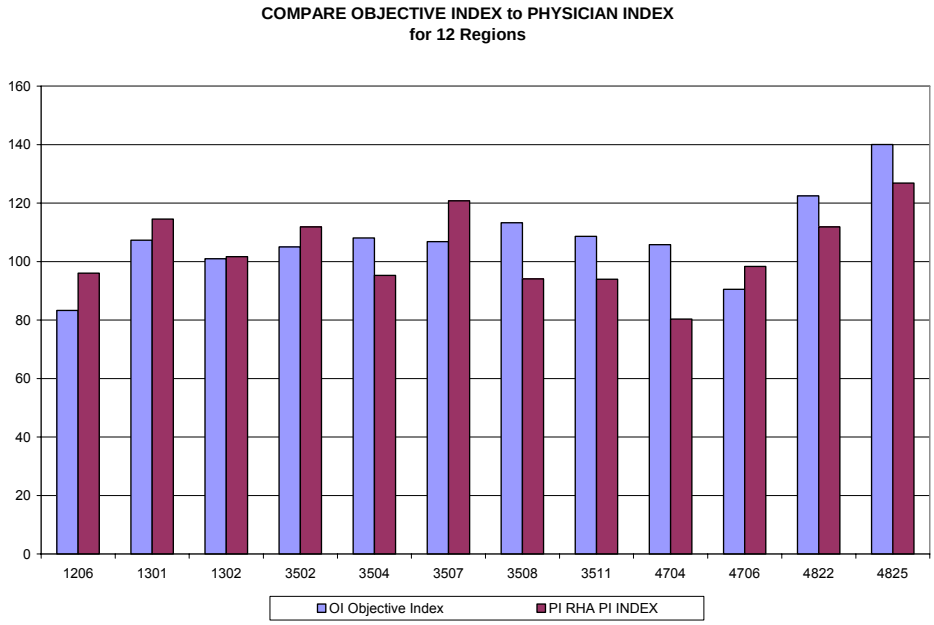


Figure 6.1 Compare Objective Index to Physician Index

The first test for Hypothesis #1 is a comparative analysis of the data. The test questions to be examined are:

- For regions where the Objective Index is greater than 100, is the Physician Index also greater than 100?
- For regions where the Objective Index is less than 100, is the Physician Index also less than 100?

The data, summarized in Table 6.1, indicates that for the ten regions with O.I. >100, six also have P.I. >100 and four have P.I. <100. Therefore, the null hypothesis is rejected in four of ten cases. For the two regions with O.I. <100, both have P.I. < 100. Therefore the null hypothesis is not rejected in either case. In total, the null hypothesis is rejected in four of twelve cases.

Table 6.1 Testing Hypothesis #1 By Region – Comparative Analysis

Hypothesis #1: Regions with O.I. >100 Is P.I. for the Region also > 100?					
RHA	OI Objective Index	PI Physician Index	O.I. vs 100	P.I. vs 100	Reject Ho?
4825	140	127	**>**	>	Do Not Reject
4822	123	112	**>**	>	Do Not Reject
3508	113	94	**>**	<	Reject
3511	109	94	**>**	<	Reject
3504	108	95	**>**	<	Reject
1301	107	115	**>**	>	Do Not Reject
3507	107	121	**>**	>	Do Not Reject
4704	106	80	**>**	<	Reject
3502	105	112	**>**	>	Do Not Reject
1302	101	102	**>**	>	Do Not Reject
4706	91	98	**<**	<	Do Not Reject
1206	83	96	**<**	<	Do Not Reject
Total	**107**	**104**	**>**	**>**	**Do Not Reject**

6.1.2 Z-Tests for Differences

An alternative method of testing the general proposition (that physicians' views on quality of health care in their communities will be closely aligned with the objective data from CIHI indicators) is to test for differences between O.I. and P.I. for each region. This is done using a Z-Test, as illustrated in Table 6.2.

Table 6.2 Comparison of Means & Z-Tests for Difference

Z-Score Tests - Variance between PI and OI by Region							
RHA	Sample n	OI Objective Index	PI RHA PI INDEX	Variance	Variance - Abs Value	Z-Score	Z-Score Absolute
1206	185	83.32	96.07	12.74	12.74	-12.12	12.12
1301	59	107.33	114.56	7.23	7.23	-3.88	3.88
1302	66	100.95	101.69	0.74	0.74	-0.42	0.42
3502	54	105.00	111.90	6.90	6.90	-3.54	3.54
3504	62	108.10	95.31	-12.79	12.79	7.04	7.04
3507	72	106.86	120.79	13.93	13.93	-8.27	8.27
3508	47	113.33	94.10	-19.23	19.23	9.22	9.22
3511	100	108.63	93.99	-14.63	14.63	10.24	10.24
4704	57	105.76	80.36	-25.40	25.40	13.42	13.42
4706	107	90.50	98.37	7.86	7.86	-5.69	5.69
4822	137	122.53	111.87	-10.67	10.67	8.73	8.73
4825	114	140.05	126.85	-13.20	13.20	9.86	9.86
Total	**1060**	**106.73**	**104.35**		**145.33**		
Mean				**-3.88**	**12.11**		**7.70**

The Z-tests indicate that, of the 12 regions, only one region (#3502) has a Z-Score of less than +/-1.96, the hurdle rate for differences between scores. Therefore, the OI and PI scores are statistically significantly different in eleven of the twelve regions. The PI score is significantly higher in five of the regions, and the OI score is significantly higher in six regions.

6.2 Results – Hypothesis #2

Hypothesis #2 States: There will be no significant differences between PI scores for GP/FPs and specialists. The hypothesis is tested using two methods: comparative analysis and pooled variance t-tests.

6.2.1 Comparative Analysis

Figure 6.2 compares of PI ratings between GP/FPs and specialists for each region, and Table 6.3 provides PI scores for GP/FPs and specialists in each of the twelve regions.

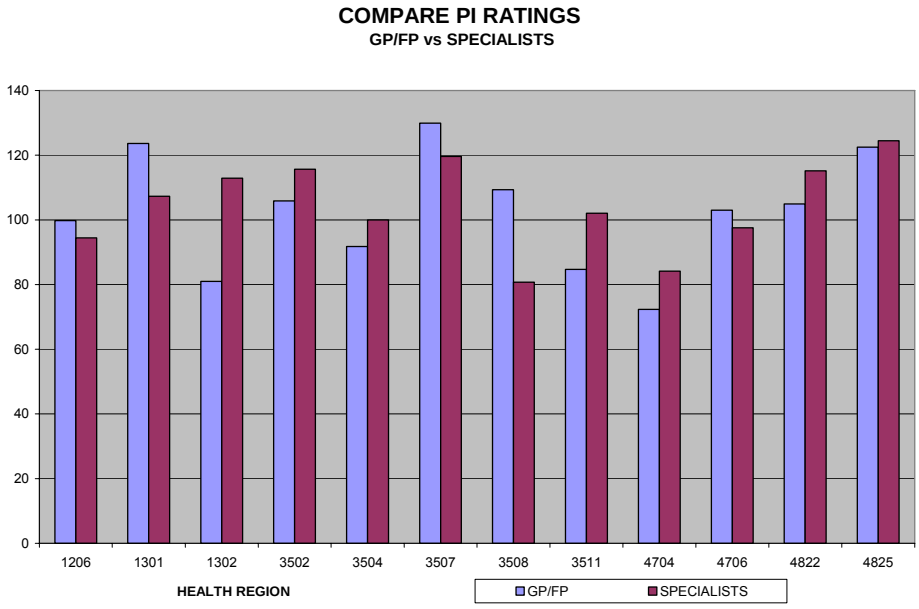


Figure 6.2 Compare GP/FP to Specialist PI Scores

Table 6.3 Compare GP/FP to Specialist Quality Ratings

MEAN PI RATINGS - GP/FP vs SPECIALISTS				
RHA	**GP/FP**	**SPECIALISTS**	**> <**	**Diff**
1206	100	94	>	5
1301	124	107	>	16
1302	81	113	<	-32
3502	106	116	<	-10
3504	92	100	<	-8
3507	130	120	>	10
3508	109	81	>	29
3511	85	102	<	-17
4704	72	84	<	-12
4706	103	98	>	5
4822	105	115	<	-10
4825	123	124	<	-2
AVG	**102**	**105**	**<**	**-4**

The data above indicates PI scores provided by specialists are, on average, higher than PI scores provided by GP/FPs in seven of the twelve regions.

6.2.2 T-Tests for Differences

Table #6.4 shows the derivation of t-scores testing for significance of the differences in PI scores between GP/FPs and specialists in each of the twelve regions. The scores indicate no significant difference between GP/FP and specialist ratings in eleven of the twelve regions. With a t-score of 2.72, region #1302 indicates a significant difference between GP/FP and specialist PI ratings of 81 and 113 respectively. Based on these results, the null hypothesis should not be rejected in eleven of the twelve cases, but should be rejected for region # 1302.

Table 6.4: T-tests comparing GP/FP vs Specialist PI Scores By Region

COMPARE PI RATINGS: GP/FP vs SPECIALISTS				
RHA	**GP/FP**	**SPEC**	**POOLED VAR**	**t-score**
1206	100	94	2,326	0.69
1301	124	107	2,832	1.14
1302	81	113	2,102	**-2.72**
3502	106	116	3,078	-0.64
3504	92	100	3,284	-0.55
3507	130	120	3,931	0.58
3508	109	81	2,616	1.92
3511	85	102	2,121	-1.87
4704	72	84	1,385	-1.17
4706	103	98	2,658	0.51
4822	105	115	2,791	-1.10
4825	123	124	2,443	-0.20
Total	102	105	2,719	-1.11

6.2.3 Post-Hoc Test: Exclude Non-Acute Care Physicians

A post-hoc test was performed to determine whether there is a significant difference in quality ratings provided by physicians whose work is centred in acute care settings (which is the main focus of the quality measures used in the objective index) and those whose responsibilities fall generally outside this area. The latter group includes physicians whose primary roles are in the areas of administration, research, and community / population health services.

The hypotheses for this post-hoc test are:

Ho: Quality ratings provided by acute care physicians will not differ from those provided by non-acute care physicians.
Ha: Quality ratings provided by acute care physicians will differ from those provided by non-acute care physicians.

Comparative Analysis: Table 6.5 shoes PI scores by region comparing acute to non-acute physicians. Note that it is not possible to run statistical tests using comparisons of PI scores by region for the non-acute care group (administration, research and population / community) because sample size by region is less than 5 in six of the twelve regions (zero in region #3508). Comparing aggregated average data, the overall average PI scores are 103 for the acute care physicians, and 117 for the non-acute care physicians.

Table 6.5 Compare PI Scores – Acute vs Non-Acute Physicians

Compare PI Scores: Acute Care Physicians vs Non		
RHA	**Acute**	**Non-Acute**
1206	96	97
1301	113	* 131
1302	101	* 115
3502	108	138
3504	99	69
3507	121	132
3508	95	* N/A
3511	91	123
4704	79	* 91
4706	98	* 131
4822	111	* 106
4825	123	138
Total	103	117
*: N<5. In RHA3508, N=0.		

Using comparative analysis, PI scores for the non-acute care physicians are higher than the non-acute care physicians in ten of twelve cases. However, the limited sample size of the non-acute physicians limits the reliability of this comparison.

Further comparisons of PI scores by physician group are summarized in Table 6.6. The data shows that each of the three groups of non-acute physicians provide higher quality ratings than any of the other physician groups.

Table 6.6 PI Scores Comparison - Physicians by Category

PI Scores by Specialty Group			
Specialty Category	**PI Score**	**N**	**STDEV**
Admin	109	30	48.38
Research	124	38	56.59
Community/Pop	108	103	48.83
General Practice	101	1,006	49.07
General Plus SP	105	112	54.02
Clinical	93	59	52.28
Chronic Care	101	112	46.71
Pediatrics	97	160	45.58
Ob / Gyn	103	71	48.61
Internal Spec	94	176	51.17
Psychiatrists	94	231	48.55
Anaesthetists	103	152	49.69
Radiology/Imaging	98	99	46.31
Laboratory Spec	95	98	51.43
Procedural Spec	102	119	50.98
Emergency Med	101	97	51.67
Surgeons	98	147	51.77
Total	**100**	**2,810**	**49.64**

6.3 Results - Hypothesis #3 - Autonomy

Hypothesis #3 states: There will be no significant difference in PI scores between physicians who rate autonomy at high, medium and low levels.

Table 6.7 shows comparison of PI scores by region between physicians whose reported levels of autonomy are among the highest, medium and lowest ranges.

Table 6.7 Compare PI Ratings based on Autonomy

AUTONOMY												
	HIGH vs LOW				HIGH vs MED				MED vs LOW			
RHA	PI-H	PI-L	t	H<L	PI-H	PI-M	t	H<M	PI-M	PI-L	t	M<L
1206	117	84	4.38	*	117	85	3.49	*	85	84	0.18	
1301	119	76	2.23	*	119	125	-0.47		125	76	2.40	*
1302	103	96	0.43		103	104	-0.10		104	96	0.52	
3502	122	102	1.11		122	107	0.78		107	102	0.25	
3504	121	75	2.59	*	121	100	1.34		100	75	1.38	
3507	141	89	2.95	*	141	119	1.36		119	89	1.56	
3508	100	88	0.55		100	94	0.31		94	88	0.31	
3511	108	87	1.93		108	94	1.14		94	87	0.64	
4704	93	59	2.98	*	93	84	0.78		84	59	2.29	*
4706	109	84	2.29	*	109	104	0.42		104	84	1.56	
4822	125	88	3.45	*	125	118	0.66		118	88	2.94	*
4825	134	108	2.47	*	134	125	0.75		125	108	1.35	
MEAN	**118**	**87**	**8.38**	*	**118**	**105**	**3.51**	*	**105**	**87**	**4.58**	*
Note: * Indicates a significant difference based on t-test at 0.05												

Raw Scores By Region:

- In all twelve regions, physicians reporting the highest levels of autonomy report a higher average quality rating than those reporting the lowest levels.
- In ten of the twelve regions, physicians reporting the highest levels of autonomy report a higher average quality rating than those reporting the medium levels.
- In all twelve regions, physicians who rate autonomy in the medium range report a higher average quality rating than those reporting the lowest levels

T-Tests of Difference in Means by Region:

- In eight of twelve regions, the quality ratings provided by physicians reporting the highest levels of autonomy are significantly higher than those provided by physicians reporting the lowest levels. The difference in quality ratings is not significant in the other four regions.

- In one of twelve regions, the quality ratings provided by physicians reporting the highest levels of autonomy are significantly higher than those provided by physicians reporting the medium range. The difference in quality ratings is not significant in the other eleven regions.
- In three of twelve regions, the quality ratings provided by physicians who fall into the medium range of autonomy levels are significantly higher than those reporting the lowest levels. The difference in quality ratings is not significant in the other nine regions.

Overall Average Ratings of Twelve Regions

- When the overall average PI scores of twelve regions are compared, the quality ratings provided by physicians reporting the highest levels of autonomy are significantly higher than those provided by physicians reporting medium and low levels.

6.3.1 Post-Hoc Test: Relationship between Autonomy and Satisfaction

A post-hoc test was done to examine the relationship between autonomy and satisfaction. The hypotheses for this test are:

Ho: There is no relationship between autonomy ratings and level of satisfaction with medical career as rated by physicians.

Ha: Physicians who provide higher autonomy ratings will provide higher ratings of satisfaction with their medical careers.

The findings are summarized in Table 6.8 and Figure 6.3. Those providing the lowest scores on autonomy rate satisfaction with their medical career as dissatisfied to somewhat dissatisfied, whereas those providing the highest autonomy ratings rate their satisfaction level at the top of the range, very satisfied. The trend line shown in Figure 6.3 suggests a strong relationship between these two factors.

Table 6.8 Compare Autonomy Rating Scores to Satisfaction with Medical Career

Compare Autonomy Rating to Satisfaction with Medical Career		
Autonomy	**Satisfaction**	**N**
1.00	2.89	9
1.33	2.86	22
1.67	2.77	30
2.00	3.53	51
2.33	3.49	121
2.67	3.86	155
3.00	3.90	260
3.33	4.09	307
3.67	4.35	392
4.00	4.47	413
4.33	4.67	390
4.67	4.98	286
5.00	5.04	258
5.33	5.48	63
5.67	5.45	38
6.00	5.87	15
Total	**4.40**	**2810**

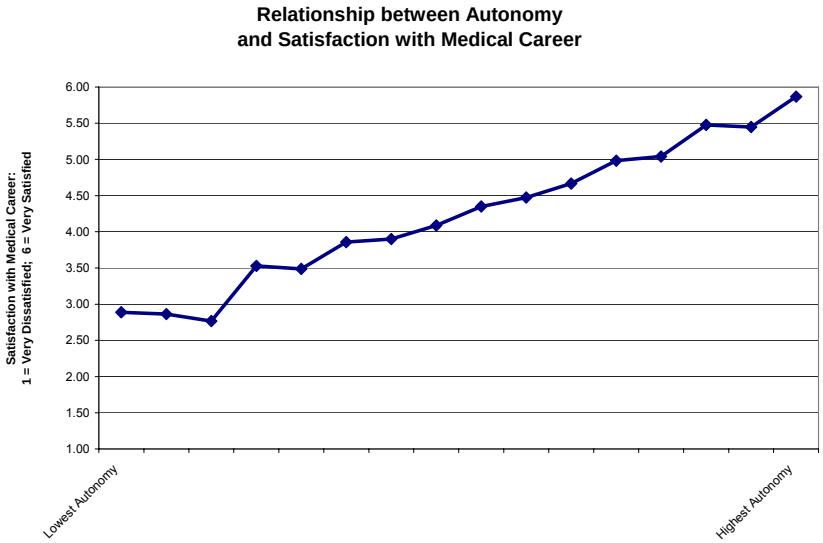


Figure 6.3 Relationship between Autonomy and Satisfaction with Medical Career

6.4 Results - Hypothesis #4: Stress

Hypothesis #4 states: There will be no significant difference in PI scores between physicians who rate stress at high, medium and low levels.

Table 6.9 shows comparison of PI scores by region between physicians whose self-reported stress levels are among the highest, medium and lowest ranges.

Table 6.9 Compare PI Ratings Based on Stress Level

STRESS												
	HIGH vs LOW				HIGH vs MED				MED vs LOW			
RHA	PI-H	PI-L	t	H<L	PI-H	PI-M	t	H<M	PI-M	PI-L	t	M<L
1206	93	101	-0.77		93	97	-0.43		97	101	-0.45	
1301	96	118	-1.01		96	125	-1.77		125	118	0.31	
1302	98	109	-0.66		98	101	-0.16		101	109	-0.49	
3502	104	119	-0.57		104	116	-0.79		116	119	-0.09	
3504	101	102	-0.04		101	91	0.60		91	102	-0.52	
3507	112	146	-1.65		112	122	-0.65		122	146	-1.09	
3508	75	152	-3.95	*	75	98	-1.53		98	152	-2.10	*
3511	89	121	-2.40	*	89	91	-0.22		91	121	-2.26	*
4704	71	102	-2.05		71	79	-0.76		79	102	-1.49	
4706	85	98	-0.86		85	113	-2.60	*	113	98	1.17	
4822	108	124	-1.28		108	107	0.06		107	124	-1.46	
4825	114	137	-1.80		114	128	-1.24		128	137	-0.77	
MEAN	97	118	-4.39	*	97	105	-2.32	*	105	118	-2.65	*
Note: * Indicates a significant difference based on t-test at 0.05												

Raw Scores By Region:

- In all twelve regions, physicians reporting the highest stress levels report lower quality ratings than those with the lowest stress levels.
- In ten of the twelve regions, physicians reporting the highest stress levels report lower quality ratings than those reporting in the medium range of stress levels.
- In ten of the twelve regions, physicians reporting the medium range of stress levels report lower quality ratings than those reporting the lowest stress levels.

T-Tests of Difference in Means by Region:

- In two of twelve regions, the quality ratings provided by physicians reporting the highest stress levels are significantly lower than those provided by physicians reporting the lowest stress levels. The difference in quality ratings is not significant in the other ten regions.
- In one of twelve regions, the quality ratings provided by physicians reporting the highest stress levels are significantly lower than those provided by physicians reporting the medium range of stress levels. The difference in quality ratings is not significant in the other eleven regions.
- In two of twelve regions, the quality ratings provided by physicians reporting the medium range of stress levels are significantly lower than those provided by physicians reporting the lowest stress levels. The difference in quality ratings is not significant in the other ten regions.

Overall Average Ratings of Twelve Regions

- When the overall average PI scores of twelve regions are compared, the quality ratings provided by physicians reporting the highest stress levels are significantly lower than those provided by physicians reporting medium and low stress levels.

6.4.1 Post-Hoc Test: Relationship Between OI Rating and Average Stress Levels

A post-hoc test was performed to determine whether there may be a significant relationship between the actual quality of care in a region, as measured by the Objective

Index, and the average stress levels of physicians working in the region. The hypotheses for this post-hoc test are:

Ho: Stress levels reported by physicians in the six regions where the OI scores are the highest will not differ significantly from those reported by physicians in those six regions where the OI scores are the lowest.

Ha: Stress levels reported by physicians in the six regions where the OI scores are the highest will be higher than those reported by physicians in those six regions where the OI scores are the lowest.

Results of the post-hoc test - Comparative Analysis:

- Average stress levels reported by physicians in the six regions with the highest OI scores at 3.33 is higher than the average for the six regions with the lowest OI scores at 3.24.
- The results are not consistent within groups: In the six regions with the highest OI scores, three have stress levels higher than the average, and three are lower. In the six regions with the lowest OI scores, four have stress levels lower than the average, one is higher and one is equal to the average.

Testing for statistical significance: t-tests

- Comparing stress levels in each region to the overall mean rating of 3.28, there was a significant difference from the mean score in only one region (#3504).
- Comparing average stress levels for each group (highest OI scores and lowest OI scores), there was not a significant difference in stress levels from the overall mean rating of 3.28 in either case.

Table 6.10 Compare Stress Levels – Regions with High versus Low OI Scores

REGION	OI	STRESS	Avg	><	Var	N	t	Sig?
4825	140	3.26	3.28	<	0.80	114	-0.23	N
4822	123	3.22	3.28	<	0.78	137	-0.92	N
3508	113	3.45	3.28	<	0.90	47	1.26	N
3511	109	3.32	3.28	>	0.93	100	0.43	N
3504	108	3.47	3.28	>	0.65	62	2.29	Y
1301	107	3.27	3.28	<	0.58	59	-0.12	N
Avg	**117**	**3.33**	**3.28**	**>**	**0.78**	**519**	**1.49**	**N**
3507	107	3.26	3.28	<	0.79	72	-0.17	N
4704	106	3.18	3.28	<	0.72	57	-1.10	N
3502	105	3.33	3.28	>	0.64	54	0.61	N
1302	101	3.14	3.28	<	0.64	66	-1.82	N
4706	91	3.28	3.28	=	0.75	107	0.01	N
1206	83	3.26	3.28	<	0.75	185	-0.37	N
Avg	**99**	**3.24**	**3.28**	**>**	**0.72**	**541**	**-1.24**	**N**

6.4.2 Post-Hoc Test: Relationship between Control and Stress Levels

A second post-hoc test was done to examine the relationship between the level of control perceived by a physician and their rating of stress levels. The test uses a composite control measure which includes physician ratings on control over day to day activities, amount of choice in their work, and control over their work schedule.

Hypotheses for this test are:

Ho: There is no relationship between level of control perceived by physicians and their ratings of stress levels.

Ha: Physicians who provide lower ratings of control will report higher levels of stress.

Figure 6.4 illustrates the relationship between these two variables. At one extreme of very low control over work, stress levels are between high and very high, compared to

stress levels between low and moderate for those providing the highest ratings of control over their work.

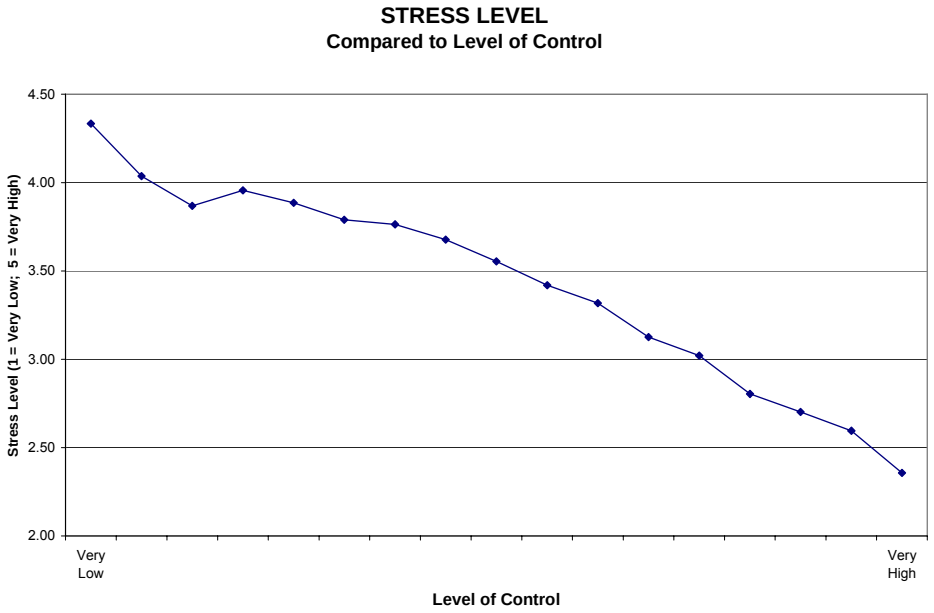


Figure 6.4 Control Composite Measure compared to Stress Level

Two additional comparisons were done between factors relating to control over work and physician stress levels. Figure 6.5 demonstrates the relationship between influence over practice decisions and stress levels. Figure 6.6 shows the relationship between control over work schedule and stress level.

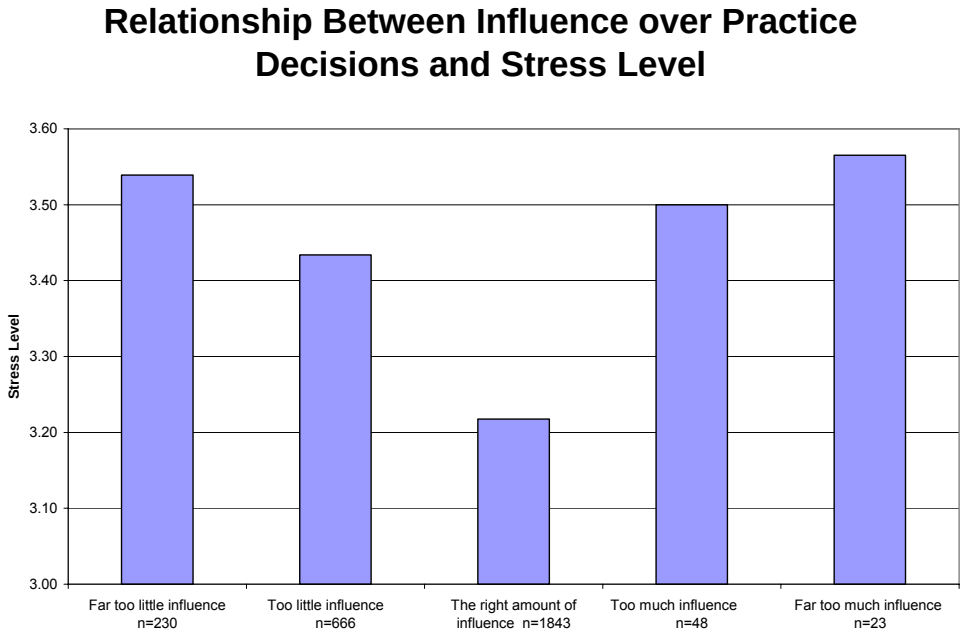


Figure 6.5 Relationship between Amount of Influence and Stress Level

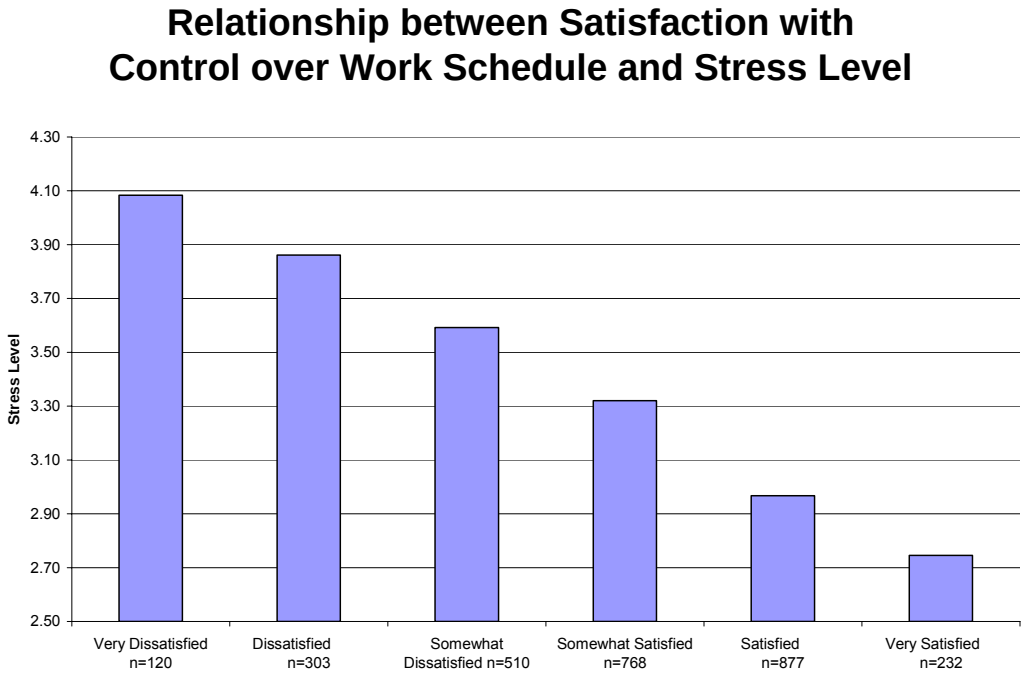


Figure 6.6 Relationship between Satisfaction with Control over Work Schedule and Stress Level

6.4.3 Post-Hoc Test: Relationship between Stress and Health

A third post-hoc test was done to examine the relationship between stress level and health. Karasek and Theorell's research showed a relationship between control over work and stress, which subsequently impacts on health. Hypotheses for this test are:

Ho: There is no relationship between stress level and level of health reported by physicians.

Ha: Physicians reporting a higher level of stress will report lower health levels.

The test results show there is a relationship between the two variables. Physicians reporting very high stress levels provided an average health rating score of 3.63 (between fair and good); whereas physicians reporting very low stress levels provided an average health rating score of 4.53 (between good and very good). The results of this post-hoc test are summarized in Figure 6.7.

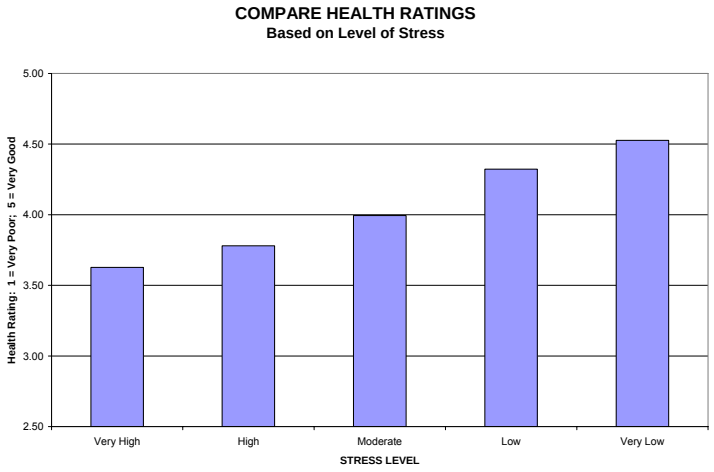


Figure 6.7 Compare Health Ratings Based on Level of Stress

6.5 Results - Hypothesis #5: Equity

Hypothesis #5 states: There will be no significant difference in PI scores between physicians who rate professional equity at high, medium and low levels.

Four sets of analysis were performed for Hypothesis #4:

- Overall Reward Equity (full range of rewards)
- Financial Reward Equity
- Recognition Equity
- Fulfillment Equity

The first item on the list, overall reward equity, is a composite of the other three components. Financial, recognition and fulfillment equity are the three core components of equity developed for the national survey (Lepnurm et al, 2004).

6.5.1 Test #1: Overall Reward Equity

Table 6.11 shows comparison of PI scores by region between physicians whose rating of overall rewards are among the highest, medium and lowest ranges.

Table 6.11 Compare PI Ratings based on Rewards Overall

REWARDS - OVERALL												
	HIGH vs LOW				HIGH vs MED				MED vs LOW			
RHA	PI-H	PI-L	t	H>L	PI-H	PI-M	t	H>M	PI-M	PI-L	t	M>L
1206	108	79	3.03	*	108	92	2.01	*	92	79	1.45	
1301	118	91	1.65		118	132	-0.90		132	91	2.12	*
1302	121	90	2.16	*	121	90	2.33	*	90	90	-0.04	
3502	130	91	2.12	*	130	102	1.69		102	91	0.59	
3504	112	81	1.62		112	111	0.04		111	81	1.88	
3507	151	111	2.07	*	151	115	1.89		115	111	0.28	
3508	80	92	-0.59		80	108	-1.43		108	92	0.88	
3511	97	88	0.75		97	100	-0.27		100	88	1.10	
4704	104	61	3.83	*	104	68	3.37	*	68	61	0.70	
4706	114	74	3.10	*	114	105	0.85		105	74	2.47	*
4822	126	87	3.50	*	126	128	-0.19		128	87	4.31	*
4825	141	111	2.63	*	141	111	2.97	*	111	111	-0.05	
MEAN	**118**	**88**	**7.63**	*	**118**	**104**	**3.69**	*	**104**	**88**	**4.35**	*
Note: * Indicates a significant difference based on t-test at 0.05												

Raw Scores By Region:

- In eleven of twelve regions, physicians providing the highest rating of rewards overall report a higher average quality rating than those providing the lowest ratings.
- In eight of twelve regions, physicians reporting the highest rating of rewards overall report a higher average quality rating than those whose ratings of rewards overall fall into the medium range
- In ten of twelve regions, physicians who fall into the medium range of rewards overall report a higher average quality rating than those reporting the lowest range.

T-Tests of Difference in Means by Region:

- In eight of twelve regions, the quality ratings provided by physicians providing the highest ratings of rewards overall are significantly higher than those provided by physicians providing the lowest ratings. The difference in ratings is not significant in the other four regions.
- In four of twelve regions, the quality ratings provided by physicians providing the highest ratings of rewards overall are significantly higher than those provided by physicians whose ratings of rewards overall fall into the medium range. The difference in ratings is not significant in the other nine regions.
- In three of twelve regions, the quality ratings provided by physicians who fall into the medium range of rewards overall are significantly higher than those who fall into the lowest range.

Overall Average Ratings of Twelve Regions

- When the overall average PI scores of twelve regions are compared, the quality ratings provided by physicians providing the highest ratings of rewards overall are significantly higher than those provided by those who fall into the medium and low ranges.

6.5.2 Test #2: Financial Reward Equity

Table 6.12 shows comparison of PI scores by region between physicians whose rating of financial rewards are among the highest, medium and lowest ranges.

Table 6.12 Compare PI Ratings based on Financial Rewards

FINANCIAL REWARDS												
	HIGH vs LOW				HIGH vs MED				MED vs LOW			
RHA	PI-H	PI-L	t	H>L	PI-H	PI-M	t	H>M	PI-M	PI-L	t	M>L
1206	99	83	1.66		99	96	0.40		96	83	1.12	
1301	124	77	2.04	*	124	101	1.59		101	77	0.83	
1302	108	77	1.75		108	98	0.77		98	77	1.00	
3502	145	100	2.61	*	145	91	2.79	*	91	100	-0.59	
3504	113	73	2.11	*	113	104	0.52		104	73	1.94	
3507	136	112	1.40		136	121	0.77		121	112	0.51	
3508	79	106	-1.55		79	89	-0.42		89	106	-0.97	
3511	105	74	3.04	*	105	103	0.17		103	74	2.61	*
4704	84	80	0.19		84	67	1.40		67	80	-0.79	
4706	112	74	2.75	*	112	86	2.42	*	86	74	0.71	
4822	130	100	2.90	*	130	92	3.67	*	92	100	-0.70	
4825	126	93	2.23	*	126	132	-0.46		132	93	2.03	
MEAN	**113**	**90**	**5.92**	*	**113**	**99**	**3.83**	*	**99**	**90**	**1.98**	*

Note: * Indicates a significant difference based on t-test at 0.05

****** Note** that in the case of Region #4704, there were only four respondents grouped in the "low" financial rewards category. This is the only case where less than five responses were received in any grouping of respondents.

Raw Scores By Region:

- In eleven of twelve regions, physicians providing the highest rating of financial rewards report a higher average quality rating than those providing the lowest ratings of financial rewards.

- In ten of twelve regions, physicians providing the rating of financial rewards report a higher average quality rating than those whose ratings of financial rewards fall into the medium range
- In eight of twelve regions, physicians who fall into the medium range of financial rewards provide a higher average quality rating than those providing the lowest average rating of financial rewards.

T-Tests of Difference in Means by Region:

- In seven of twelve regions, the quality ratings provided by physicians providing the highest ratings of financial rewards are significantly higher than those provided by physicians providing the lowest ratings. The difference in ratings is not significant in the other five regions.
- In three of twelve regions, the quality ratings provided by physicians providing the highest ratings of financial rewards are significantly higher than those provided by physicians whose ratings of financial rewards fall into the medium range. The difference in ratings is not significant in the other nine regions.
- In one of twelve regions, the quality ratings provided by physicians who fall into the medium range of financial rewards is significantly higher than those who provide the lowest rating of financial rewards. The Difference in quality ratings is not significantly different in the other eleven regions.

Overall Average Ratings of Twelve Regions

- When the overall average PI scores of twelve regions are compared, the quality ratings provided by physicians providing the highest ratings of financial rewards are significantly higher than those provided by those who fall into the medium and low ranges.

6.5.3 Test #3: Recognition Equity

Table 6.13 shows comparison of PI scores by region between physicians whose rating of recognition equity are among the highest, medium and lowest ranges.

Table 6.13 Compare PI Ratings based on Recognition Equity

RECOGNITION EQUITY												
	HIGH vs LOW				HIGH vs MED				MED vs LOW			
RHA	PI-H	PI-L	t	H>L	PI-H	PI-M	t	H>M	PI-M	PI-L	t	M>L
1206	107	84	2.69	*	107	92	1.65		92	84	0.88	
1301	133	95	2.33	*	133	112	1.32		112	95	1.01	
1302	111	100	0.94		111	83	1.76		83	100	-0.94	
3502	125	101	1.36		125	97	1.51		97	101	-0.23	
3504	99	84	0.75		99	128	-1.52		128	84	2.52	*
3507	138	105	1.96		138	133	0.26		133	105	1.53	
3508	96	99	-0.23		96	80	0.64		80	99	-0.84	
3511	95	89	0.55		95	106	-0.84		106	89	1.33	
4704	112	66	4.57	*	112	71	3.40	*	71	66	0.42	
4706	115	85	2.62	*	115	96	1.58		96	85	0.94	
4822	124	100	2.48	*	124	118	0.40		118	100	1.47	
4825	135	117	1.85		135	112	1.99		112	117	-0.39	
MEAN	116	93	6.38	*	116	102	3.32	*	102	93	2.17	*
Note: * Indicates a significant difference based on t-test at 0.05												

Raw Scores By Region:

- In eleven of twelve regions, physicians providing the highest rating of recognition equity report a higher average quality rating than those providing the lowest ratings of recognition equity.

- In ten of twelve regions, physicians providing the highest rating of recognition equity report a higher average quality rating than those whose ratings of recognition equity fall into the medium range.
- In eight of twelve regions, physicians whose rating of recognition equity falls into the medium range report a higher average quality rating than those providing the lowest range of recognition equity.

T-Tests of Difference in Means by Region:

- In five of twelve regions, the quality ratings provided by physicians providing the highest ratings of recognition equity are significantly higher than those provided by physicians providing the lowest ratings. The difference in ratings is not significant in the other seven regions.
- In one of twelve regions, the quality ratings provided by physicians providing the highest ratings of recognition equity are significantly higher than those provided by physicians whose ratings of recognition equity fall into the medium range. The difference in ratings is not significant in the other eleven regions.
- In one of twelve regions, the quality ratings provided by physicians who fall into the medium range of recognition equity are significantly higher than those providing the lowest ratings. The difference in ratings is not significant in the other eleven regions.

Overall Average Ratings of Twelve Regions

- When the overall average PI scores of twelve regions are compared, the quality ratings provided by physicians providing the highest ratings of recognition

equity are significantly higher than those provided by those who fall into the medium and low ranges.

6.5.4 Test #4: Fulfillment Equity

Table 6.14 shows a comparison of PI scores by region between physicians whose rating of fulfillment equity are among the highest, medium and lowest ranges.

Table 6.14 Compare PI Ratings based on Fulfillment Equity

FULFILLMENT EQUITY												
	HIGH vs LOW				HIGH vs MED				MED vs LOW			
RHA	PI-H	PI-L	t	H>L	PI-H	PI-M	t	H>M	PI-M	PI-L	t	M>L
1206	99	91	0.95		99	98	0.11		98	91	0.89	
1301	154	107	2.10	*	154	109	2.07	*	109	107	0.09	
1302	127	88	3.21	*	127	88	2.47	*	88	88	-0.02	
3502	121	115	0.29		121	97	1.20		97	115	-1.05	
3504	100	89	0.62		100	107	-0.39		107	89	1.06	
3507	143	105	1.94		143	126	0.89		126	105	1.28	
3508	104	97	0.41		104	83	1.05		83	97	-0.77	
3511	115	81	3.37	*	115	97	1.43		97	81	1.45	
4704	104	57	3.89	*	104	89	1.30		89	57	3.72	*
4706	109	93	1.40		109	96	1.13		96	93	0.23	
4822	124	98	2.55	*	124	114	0.82		114	98	1.45	
4825	142	119	2.18	*	142	117	1.93		117	119	-0.22	
MEAN	**117**	**95**	**5.60**	*	**117**	**103**	**3.22**	*	**103**	**95**	**2.11**	*
Note: * Indicates a significant difference based on t-test at 0.05												

Raw Scores By Region:

- In all twelve regions, physicians providing the highest rating of fulfillment equity report a higher average quality rating than those providing the lowest ratings of fulfillment equity.
- In eleven of twelve regions, physicians providing the rating of fulfillment equity report a higher average quality rating than those whose ratings of fulfillment equity fall into the medium range.

- In eight of twelve regions, physicians who fall into the medium range of fulfillment equity provide a higher average quality rating than those providing the lowest ratings of fulfillment equity.

T-Tests of Difference in Means by Region:

- In six of twelve regions, the quality ratings provided by physicians providing the highest ratings of fulfillment equity are significantly higher than those provided by physicians providing the lowest ratings. The difference in ratings is not significant in the other six regions.
- In two of twelve regions, the quality ratings provided by physicians providing the highest ratings of fulfillment equity are significantly higher than those provided by physicians whose ratings of fulfillment equity fall into the medium range. The difference in ratings is not significant in the other ten regions.
- In one of twelve regions, the quality ratings provided by physicians who fall into the medium range of fulfillment equity are higher than those providing the lowest ratings. The difference in quality ratings is not significant in the other eleven regions.

Overall Average Ratings of Twelve Regions

- When the overall average PI scores of twelve regions are compared, the quality ratings provided by physicians providing the highest ratings of fulfillment equity are significantly higher than those provided by those who fall into the medium and low ranges.

6.6 Results - Hypothesis #6: Satisfaction

Hypothesis #6 states: There will be no significant difference in PI scores between physicians who rate satisfaction at high, medium and low levels.. Two sets of comparisons were done for Hypothesis #4: *satisfaction with performance* and *overall career satisfaction.*

6.6.1 Test #1 – Satisfaction with Performance

Table 6.15 shows the comparison of PI scores by region between physicians whose self-reported levels of satisfaction with performance are among the highest, medium and lowest ranges.

Table 6.15 Compare PI Ratings based on Satisfaction with Performance

SATISFACTION WITH PERFORMANCE												
	HIGH vs LOW				HIGH vs MED				MED vs LOW			
RHA	PI-H	PI-L	t	H>L	PI-H	PI-M	t	H>M	PI-M	PI-L	t	M>L
1206	116	82	4.17	*	116	90	3.00	*	90	82	0.96	
1301	119	98	1.16		119	124	-0.34		124	98	1.47	
1302	109	99	0.67		109	98	0.74		98	99	-0.08	
3502	126	102	1.20		126	111	0.72		111	102	0.52	
3504	120	74	2.34	*	120	111	0.55		111	74	2.38	*
3507	147	107	2.29	*	147	103	2.49	*	103	107	-0.20	
3508	96	100	-0.22		96	86	0.54		86	100	-0.79	
3511	109	81	2.39	*	109	102	0.48		102	81	2.09	*
4704	91	65	1.78		91	81	0.89		81	65	1.37	
4706	107	80	2.43	*	107	108	-0.05		108	80	2.17	*
4822	125	96	2.35	*	125	114	0.96		114	96	1.76	
4825	135	108	2.56	*	135	125	0.95		125	108	1.45	
MEAN	**119**	**90**	**7.44**	*	**119**	**105**	**3.59**	*	**105**	**90**	**4.06**	*
Note: * Indicates a significant difference based on t-test at 0.05												

Raw Scores By Region:

- In eleven of twelve regions, physicians reporting the highest levels of satisfaction with performance report a higher average quality rating than those with the lowest levels of satisfaction with performance.
- In ten of twelve regions, physicians reporting the highest levels of satisfaction with performance report a higher average quality rating than those with the medium range of satisfaction with performance.
- In nine of twelve regions, physicians reporting the medium range of satisfaction with performance report a higher average quality rating than those with the lowest levels of satisfaction with performance.

T-Tests of Difference in Means by Region:

- In seven of twelve regions, the quality ratings provided by physicians reporting the highest levels of satisfaction with performance are significantly higher than those provided by physicians reporting the lowest levels of satisfaction with performance. The difference in ratings is not significant in the other five regions.
- In two of twelve regions, the quality ratings provided by physicians reporting the highest levels of satisfaction with performance are significantly higher than those provided by physicians who fall into in the medium range of satisfaction with performance. The difference in ratings is not significant in the other ten regions.
- In three of twelve regions, the quality ratings provided by physicians reporting the medium range of satisfaction with performance are significantly higher than those provided by physicians reporting the lowest levels of satisfaction with

performance. The difference in ratings is not significant in the other nine regions.

Overall Average Ratings of Twelve Regions

- When the overall average PI scores of twelve regions are compared, the quality ratings provided by physicians reporting the highest levels of satisfaction with performance are significantly higher than those provided by those who fall into the medium and low ranges.

6.6.2 Test #2 – Overall Career Satisfaction

Table 6.16 shows a comparison of PI scores by region between physicians whose overall career satisfaction are among the highest, medium and lowest ranges of those surveyed.

Table 6.16 Compare PI Ratings based on Overall Career Satisfaction

OVERALL CAREER SATISFACTION												
	HIGH vs LOW				HIGH vs MED				MED vs LOW			
RHA	PI-H	PI-L	t	H>L	PI-H	PI-M	t	H>M	PI-M	PI-L	t	M>L
1206	101	75	2.57	*	101	99	0.23		99	75	2.15	*
1301	129	95	1.89		129	90	2.30	*	90	95	-0.26	
1302	110	83	1.40		110	96	1.11		96	83	0.69	
3502	119	81	1.46		119	104	0.91		104	81	0.80	
3504	109	82	1.36		109	95	0.90		95	82	0.66	
3507	140	87	2.65	*	140	115	1.55		115	87	1.43	
3508	103	79	1.09		103	91	0.64		91	79	0.70	
3511	103	85	1.54		103	91	1.07		91	85	0.51	
4704	87	66	1.39		87	66	1.75		66	66	0.00	
4706	117	60	3.95	*	117	86	3.27	*	86	60	1.66	
4822	119	100	1.42		119	103	1.48		103	100	0.23	
4825	133	111	1.71		133	113	1.97		113	111	0.15	
MEAN	**114**	**85**	**6.49**	*	**114**	**97**	**4.64**	*	**97**	**85**	**2.66**	*
Note: * Indicates a significant difference based on t-test at 0.05												

Raw Scores By Region:

- In all twelve regions, physicians reporting the highest overall career satisfaction report a higher average quality rating than those among the lowest overall career satisfaction.
- In all twelve regions, physicians reporting the highest overall career satisfaction report a higher average quality rating than those with the medium range of overall career satisfaction.
- In eleven of twelve regions, physicians who fall into the medium range of overall career satisfaction provided higher average quality ratings than those in the lowest range.

T-Tests of Difference in Means by Region:

- In three of twelve regions, the quality ratings provided by physicians reporting the highest overall career satisfaction are significantly higher than those provided by physicians reporting the lowest levels of satisfaction with performance.
- In two of twelve regions, the quality ratings provided by physicians reporting the highest overall career satisfaction are significantly higher than those provided by physicians who fall into in the medium range of overall career satisfaction. The difference in ratings is not significant in the other ten regions.
- In one of twelve regions, physicians who fall into the medium range of overall career satisfaction report a provide quality ratings which are significantly higher than those in the lowest satisfaction range. The differences are not significant in the other eleven regions.

Overall Average Ratings of Twelve Regions

- When the overall average PI scores of twelve regions are compared, the quality ratings provided by physicians reporting the highest overall career satisfaction are significantly higher than those provided by those who fall into the medium and low ranges.

6.7 Verifying the Data – PI Scores on Hospital and Community Services

In addition to asking physician views on health care quality overall, specific questions from the survey asked physician ratings on specific health care services including community services and hospital services. PI Index scores were developed for physician responses to these questions, using the same methodology as the original PI index score. Results of the PI Indices on Hospital Services and Community Services are compared to the overall PI Quality Index in Figure 6.8. Subsequently, the raw PI scores are presented in Table 6.17. In this table, data for the PI Community Services Index and PI Hospital Services Index are highlighted in cases where these scores respectively differ by more than ten points from the PI score for that region.

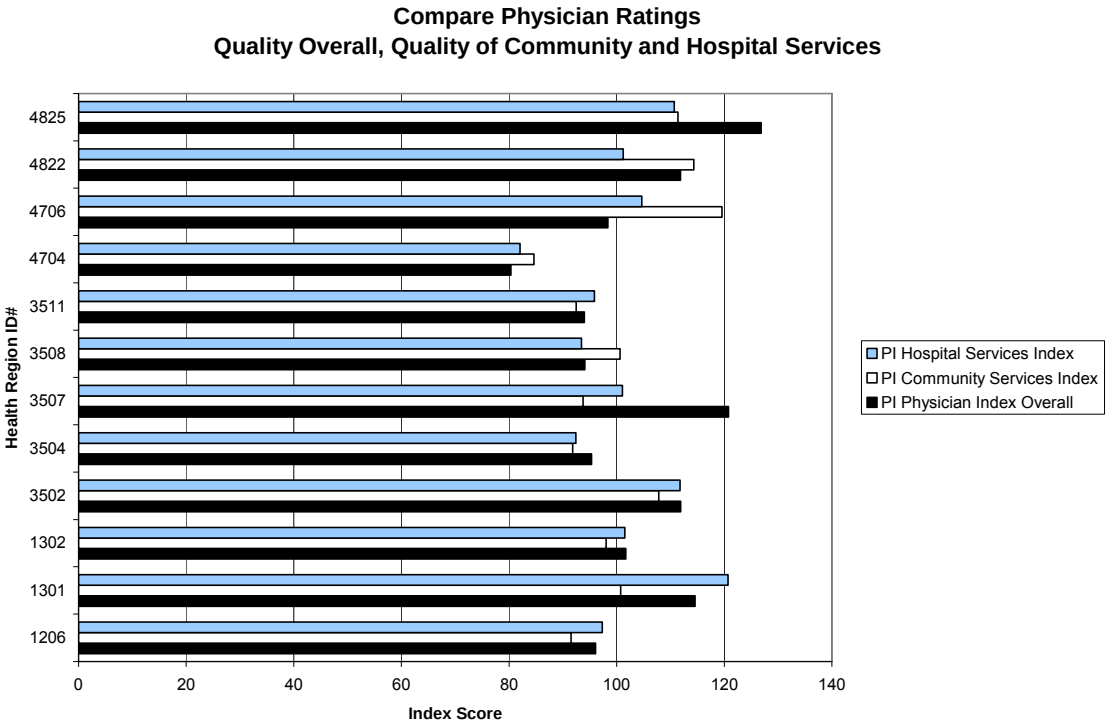


Figure 6.8 Compare PI Scores to Indices for Community and Hospital Services

Table 6.17 Compare PI Scores to Community and Hospital Service Indices

Compare Indices: PHYSICIAN INDEX to Indices for Community and Hospital Services			
RHA	PI Physician Index Overall	PI Community Services Index	PI Hospital Services Index
1206	96	92	97
1301	115	101	121
1302	102	98	102
3502	112	108	112
3504	95	92	92
3507	121	94	101
3508	94	101	93
3511	94	92	96
4704	80	85	82
4706	98	120	105
4822	112	114	101
4825	127	111	111
Total	**104**	**101**	**101**
Hilited Cells: Scores vary by 10 or more from PI score.			

A comparative analysis of the Community Services (CI) and Hospital Services (HI) Indices compared to the OI Index score by region is presented in Table 6.18. Comparing OI scores to Community Services Index, the OI score is higher in ten regions and lower in two. The goodness of fit test shows the sum of absolute values of difference between OI and Community Services Indices for the twelve regions at 166.

Comparing OI scores to the Hospital Services Index, the OI score is higher in seven regions and lower in five. The goodness of fit test shows the sum of absolute values of difference between OI and Hospital Services Indices for the twelve regions at 177.

Overall, the two new indices have slightly lower average scores for these twelve regions than the composite PI quality index. The goodness of fit test shows that, while the differences are not great, the PI scores have a better fit with the Objective Index scores than do the Community Services and Hospital Services indices.

Table 6.18 Compare OI Score fit with PI, Community and Hospital Services Indices

Compare Variances to Objective Index:										
PI Score, Community Services and Hospital Services Indices										
		PI Physician Index			Community Services			Hospital Services		
RHA	OI Score	Index	Var	Var Abs	Index	Var	Var Abs	Index	Var	Var Abs
1206	83	96	-13	13	92	-8	8	97	-14	14
1301	107	115	-7	7	101	7	7	121	-13	13
1302	101	102	-1	1	98	3	3	102	-1	1
3502	105	112	-7	7	108	-3	3	112	-7	7
3504	108	95	13	13	92	16	16	92	16	16
3507	107	121	-14	14	94	13	13	101	6	6
3508	113	94	19	19	101	13	13	93	20	20
3511	109	94	15	15	92	16	16	96	13	13
4704	106	80	25	25	85	21	21	82	24	24
4706	91	98	-8	8	120	-29	29	105	-14	14
4822	123	112	11	11	114	8	8	101	21	21
4825	140	127	13	13	111	29	29	111	29	29
Total	107	104		145	101		166	101		177

6.8 Whose Views Most Closely Match the Objective Data?

A key question which arises out of this research is whether the data indicates there is a group or category of physicians whose views on health care quality match the objective data more closely than others. To address this question, physician PI scores were compared to the OI scores for all eight measures used in testing Hypotheses # 3-6.

For each of the eight predictor variables, there are two levels of analysis: comparisons by individual region, and comparisons of overall aggregated scores. The results are presented in the following sections, summarized in Section 6.8.9.

6.8.1 Autonomy

1) Comparing overall average scores for twelve regions:
   - Average PI scores at the medium level of autonomy are closest to the average OI score with an overall variance from the mean OI score of 2.5.
2) Comparing fit within individual regions:
   - Regional PI scores at the medium level of autonomy have the best fit with OI scores by region. Absolute value of variance between PI and OI scores is 135.
   - Z-scores are less than 1.96 in four regions at the medium level of autonomy, indicating no statistically significant difference between OI and PI scores in those cases.

Table 6.19 Evaluating Closest Match - Autonomy

AUTONOMY										
	INDEX SCORES				ABS (PI - OI)			Z-SCORE - ABS		
RHA	O.I.	PI-H	PI-M	PI-L	H	M	L	H	M	L
1206	83	117	85	84	33	2	1	19.04	0.97	0.30
1301	107	119	125	76	12	18	31	4.34	5.74	7.18
1302	101	103	104	96	2	3	4	0.60	1.22	1.49
3502	105	122	107	102	17	2	3	5.63	0.52	0.79
3504	108	121	100	75	12	8	33	3.79	2.61	11.10
3507	107	141	119	89	34	13	18	13.84	4.03	5.27
3508	113	100	94	88	14	20	25	4.25	4.94	6.52
3511	109	108	94	87	1	15	22	0.20	5.80	10.07
4704	106	93	84	59	13	22	47	4.41	5.52	14.33
4706	91	109	104	84	18	13	7	8.06	5.33	2.78
4822	123	125	118	88	3	4	34	1.43	1.91	15.93
4825	140	134	125	108	6	15	32	3.17	5.20	13.47
MEAN	108	118	105	87	166	135	257	68.76	43.78	89.24
Overall Var		-10.7	2.5	20.6						

6.8.2 Stress Level

1) Comparing overall average scores for twelve regions:
   - Average PI scores at the medium stress level are closest to the average OI score with an overall variance from the mean OI score of 2.3.
2) Comparing fit within individual regions:
   - Regional PI scores at the low stress level have the best fit with OI scores by region. Absolute value of variance between PI and OI scores is 163.
   - Z-scores are less than 1.96 in five regions at low stress level, indicating no statistically significant difference between OI and PI scores in those cases.

Table 6.20 Evaluating Closest Match – Stress Level

STRESS										
	INDEX SCORES				ABS (PI - OI)			Z-SCORE - ABS		
RHA	O.I.	PI-H	PI-M	PI-L	H	M	L	H	M	L
1206	83	93	97	101	10	13	18	5.52	8.75	6.69
1301	107	96	125	118	11	18	11	3.65	6.72	2.01
1302	101	98	101	109	3	0	8	0.88	0.14	1.88
3502	105	104	116	119	1	11	14	0.20	3.99	2.34
3504	108	101	91	102	7	17	6	2.85	6.00	1.18
3507	107	112	122	146	5	15	39	1.74	5.94	9.47
3508	113	75	98	152	38	15	38	12.24	4.75	6.59
3511	109	89	91	121	20	18	12	9.09	8.16	3.36
4704	106	71	79	102	35	27	4	9.85	10.94	0.78
4706	91	85	113	98	5	23	7	2.44	10.78	2.12
4822	123	108	107	124	14	15	2	7.18	8.01	0.69
4825	140	114	128	137	26	12	3	12.47	5.90	0.92
MEAN	108	97	105	118	176	185	163	68.11	80.07	38.02
Overall Var		10.7	2.3	-9.9						

6.8.3 Overall Rewards

1) Comparing overall average scores for twelve regions:
   - Average PI scores at the medium level of overall rewards are closest to the average OI score with an overall variance from the mean OI score of 3.2.
2) Comparing fit within individual regions:
   - Regional PI scores at the medium level of overall rewards have the best fit with OI scores by region. Absolute value of variance between PI and OI scores is 160.
   - Z-scores are less than 1.96 in four regions at the high level of overall rewards, indicating no statistically significant difference between OI and PI scores in those cases.

Table 6.21 Evaluating Closest Match – Overall Rewards

OVERALL REWARDS										
	INDEX SCORES				ABS (PI - OI)			Z-SCORE - ABS		
RHA	O.I.	PI-H	PI-M	PI-L	H	M	L	H	M	L
1206	83	108	92	79	25	9	4	14.46	5.12	1.79
1301	107	118	132	91	11	24	17	3.61	6.60	5.04
1302	101	121	90	90	20	11	11	6.99	3.75	3.39
3502	105	130	102	91	25	3	14	7.72	1.05	3.46
3504	108	112	111	81	4	3	27	1.07	0.93	10.29
3507	107	151	115	111	44	8	4	12.71	3.07	1.31
3508	113	80	108	92	34	5	21	7.47	1.54	6.86
3511	109	97	100	88	11	8	21	3.68	3.12	9.97
4704	106	104	68	61	2	38	45	0.65	12.51	12.08
4706	91	114	105	74	23	14	16	9.88	6.23	6.17
4822	123	126	128	87	3	5	35	1.29	2.50	18.17
4825	140	141	111	111	1	29	29	0.48	12.65	10.41
MEAN	108	118	104	88	204	160	242	70.02	59.06	88.92
Overall Var		-10.7	3.2	19.6						

6.8.4 Financial Rewards

1) Comparing overall average scores for twelve regions:
   - Average PI scores at the highest level of financial rewards are closest to the average OI score with an overall variance from the mean OI score of -5.5.
2) Comparing fit within individual regions:
   - Regional PI scores at the medium level of financial rewards have the best fit with OI scores by region. Absolute value of variance between PI and OI scores is 167.
   - Z-scores are less than 1.96 in four regions at the medium level of financial rewards, indicating no statistically significant difference between OI and PI scores in those cases.

Table 6.22 Evaluating Closest Match – Financial Rewards

FINANCIAL REWARDS										
	INDEX SCORES				ABS (PI - OI)			Z-SCORE - ABS		
RHA	O.I.	PI-H	PI-M	PI-L	H	M	L	H	M	L
1206	83	99	96	83	16	13	0	11.86	5.92	0.03
1301	107	124	101	77	17	6	30	7.14	1.62	5.20
1302	101	108	98	77	7	3	24	3.16	0.82	5.03
3502	105	145	91	100	40	14	5	11.39	3.77	1.54
3504	108	113	104	73	5	4	35	1.50	1.56	10.62
3507	107	136	121	112	29	14	5	9.22	4.89	1.75
3508	113	79	89	106	34	25	7	7.18	7.11	2.25
3511	109	105	103	74	4	6	34	1.47	2.33	13.64
4704	106	84	67	80	22	39	26	9.49	10.17	3.58
4706	91	112	86	74	21	5	16	11.93	1.81	4.66
4822	123	130	92	100	7	31	23	4.10	14.01	8.91
4825	140	126	132	93	14	8	47	8.67	2.70	11.40
MEAN	108	113	99	90	216	167	252	87.10	56.70	68.61
Overall Var		-5.5	8.8	17.9						

6.8.5 Recognition Equity

1) Comparing overall average scores for twelve regions:
   - Average PI scores at the medium level of recognition equity are closest to the average OI score with an overall variance from the mean OI score of 5.3.
2) Comparing fit within individual regions:
   - Regional PI scores at the lowest level of recognition equity have the best fit with OI scores by region, with absolute value of variance between PI and OI scores of 169. This result is counter-intuitive, and considered an anomaly.
   - Z-scores are less than 1.96 in four regions at the lowest level of recognition equity, indicating no statistically significant difference between OI and PI scores in those cases.

Table 6.23 Evaluating Closest Match – Recognition Equity

RECOGNITION EQUITY										
	INDEX SCORES				ABS (PI - OI)			Z-SCORE - ABS		
RHA	O.I.	PI-H	PI-M	PI-L	H	M	L	H	M	L
1206	83	107	92	84	24	8	1	15.01	3.67	0.44
1301	107	133	112	95	26	5	13	8.28	1.37	4.05
1302	101	111	83	100	10	18	1	3.72	4.38	0.51
3502	105	125	97	101	20	8	4	7.25	2.18	0.98
3504	108	99	128	84	9	20	24	2.79	4.89	9.46
3507	107	138	133	105	32	27	2	10.82	7.19	0.92
3508	113	96	80	99	17	33	14	5.18	6.56	4.51
3511	109	95	106	89	13	2	19	5.31	0.70	9.47
4704	106	112	71	66	6	35	39	1.70	9.85	14.05
4706	91	115	96	85	25	6	6	10.90	2.14	2.46
4822	123	124	118	100	1	4	22	0.63	1.42	12.84
4825	140	135	112	117	5	29	23	2.65	10.19	9.81
MEAN	108	116	102	93	189	195	169	74.24	54.54	69.50
Overall Var		-8.7	5.3	14.3						

6.8.6 Fulfillment Equity

1) Comparing overall average scores for twelve regions:
   - Average PI scores at the medium level of fulfillment equity are closest to the average OI score with an overall variance from the mean OI score of 4.6.
2) Comparing fit within individual regions:
   - Regional PI scores at the medium level of recognition equity have the best fit with OI scores by region, with absolute value of variance between PI and OI scores of 152.
   - Z-scores are less than 1.96 in three regions at both the highest and lowest levels of fulfillment equity, indicating no statistically significant difference between OI and PI scores in those cases.

Table 6.24 Evaluating Closest Match – Fulfillment Equity

FULFILLMENT EQUITY										
	INDEX SCORES				ABS (PI - OI)			Z-SCORE - ABS		
RHA	O.I.	PI-H	PI-M	PI-L	H	M	L	H	M	L
1206	83	99	98	91	16	15	7	8.74	8.08	4.00
1301	107	154	109	107	47	1	0	8.63	0.45	0.02
1302	101	127	88	88	26	13	13	8.59	3.57	4.63
3502	105	121	97	115	16	8	10	5.45	2.29	2.29
3504	108	100	107	89	8	1	20	2.63	0.21	6.97
3507	107	143	126	105	36	19	1	10.96	6.44	0.56
3508	113	104	83	97	9	30	17	2.43	8.23	4.83
3511	109	115	97	81	7	11	28	2.48	3.98	13.33
4704	106	104	89	57	2	17	49	0.50	4.95	16.64
4706	91	109	96	93	19	5	2	7.93	2.14	0.98
4822	123	124	114	98	1	9	24	0.65	3.61	12.49
4825	140	142	117	119	2	23	21	0.64	9.81	10.29
MEAN	108	117	103	95	188	152	191	59.64	53.75	77.02
Overall Var		-8.8	4.6	12.5						

6.8.7 Satisfaction with Performance

1) Comparing overall average scores for twelve regions:
   - Average PI scores at the medium level of satisfaction with performance are closest to the average OI score with an overall variance from the mean OI score of 2.7.
2) Comparing fit within individual regions:
   - Regional PI scores at the medium level of satisfaction with performance have the best fit with OI scores by region, with absolute value of variance between PI and OI scores of 139.
   - Z-scores are less than 1.96 in four regions at the medium level of satisfaction with performance, indicating no statistically significant difference between OI and PI scores in those cases.

Table 6.25 Evaluating Closest Match – Satisfaction with Performance

SATISFACTION WITH PERFORMANCE										
	INDEX SCORES				ABS (PI - OI)			Z-SCORE - ABS		
RHA	O.I.	PI-H	PI-M	PI-L	H	M	L	H	M	L
1206	83	116	90	82	33	7	1	18.18	3.46	0.66
1301	107	119	124	98	11	17	9	3.55	5.05	2.87
1302	101	109	98	99	8	3	2	2.34	1.03	0.61
3502	105	126	111	102	21	6	3	5.37	1.88	0.83
3504	108	120	111	74	12	3	35	2.95	0.87	12.33
3507	107	147	103	107	40	3	0	15.15	1.21	0.01
3508	113	96	86	100	17	28	13	5.32	6.74	3.67
3511	109	109	102	81	0	6	27	0.04	2.56	12.73
4704	106	91	81	65	15	25	40	4.38	8.81	10.93
4706	91	107	108	80	17	17	10	7.19	7.37	4.08
4822	123	125	114	96	2	9	27	0.86	4.78	11.93
4825	140	135	125	108	5	16	32	2.25	6.04	13.47
MEAN	108	119	105	90	181	139	199	67.59	49.81	74.12
Overall Var		-11.1	2.8	17.9						

6.8.8 Overall Career Satisfaction

1) Comparing overall average scores for twelve regions:
   - Average PI scores at the high level of overall career satisfaction are closest to the average OI score with an overall variance from the mean OI score of -6.2.
2) Comparing fit within individual regions:
   - Regional PI scores at the high level of overall career satisfaction have the best fit with OI scores by region, with absolute value of variance between PI and OI scores of 167.
   - Z-scores are less than 1.96 in three regions at the medium level of overall career satisfaction, indicating no statistically significant difference between OI and PI scores in those cases.

Table 6.26 Evaluating Closest Match – Overall Career Satisfaction

OVERALL CAREER SATISFACTION										
	INDEX SCORES				ABS (PI - OI)			Z-SCORE - ABS		
RHA	O.I.	PI-H	PI-M	PI-L	H	M	L	H	M	L
1206	83	101	99	75	17	15	8	12.68	7.25	3.12
1301	107	129	90	95	22	17	12	8.78	4.47	2.85
1302	101	110	96	83	9	5	18	3.64	1.72	3.47
3502	105	119	104	81	14	1	24	5.92	0.38	3.78
3504	108	109	95	82	0	13	26	0.14	4.28	7.25
3507	107	140	115	87	33	8	20	13.70	2.72	5.18
3508	113	103	91	79	10	22	34	3.40	6.03	7.18
3511	109	103	91	85	6	18	24	2.78	6.80	8.56
4704	106	87	66	66	18	40	40	7.67	10.41	7.36
4706	91	117	86	60	27	5	30	14.12	1.96	7.98
4822	123	119	103	100	4	19	22	2.42	8.56	7.16
4825	140	133	113	111	7	27	29	3.83	10.91	8.68
MEAN	108	114	97	85	167	191	288	79.08	65.50	72.58
Overall Var		-6.2	10.4	22.7						

6.8.9 Overall Comparisons – All Eight Predictor Variables

By analyzing the eight sets of comparative analysis, it is possible to determine the closest fit between OI and PI scores, both at the individual region level and at the overall average level.

1) Comparing overall average scores for twelve regions:
   - Average PI scores at the medium stress level are the closest overall fit with the average OI score with an overall variance from the mean OI score of 2.3.
2) Comparing fit within individual regions:
   - Regional PI scores at the medium level of autonomy have the best overall fit with OI scores by region, with absolute value of variance between PI and OI scores of 135.
   - Z-scores are less than 1.96 in five regions at the lowest stress level, indicating no statistically significant difference between OI and PI scores in those cases. This is the greatest number of regions with no significant variance between scores. Absolute value of z-scores is also lowest for the lowest health level, which is an indicator of best-fit of z-scores.

6.9 Inter-Item Correlations – Hypothesis #3-6 Independent Variables

Hypothesis #3-6 are all related as they examine the relationships between the four factors (autonomy, stress, professional equity and satisfaction) and physician views on quality. In section 5.8, the inter-item correlations and Cronbach's α scores were presented for the variables used in examining Hypothesis #3-6. Strong correlations were noted. The literature also shows strong relationships between autonomy, equity, stress and satisfaction – none of these factors operate independently of the others.

The variables are also related in terms of their relationships with physician quality ratings. Figures 6.9 to 6.12 demonstrate a clear consistency in trends: when both predictor variables are low, so are the quality ratings (and vice-versa).

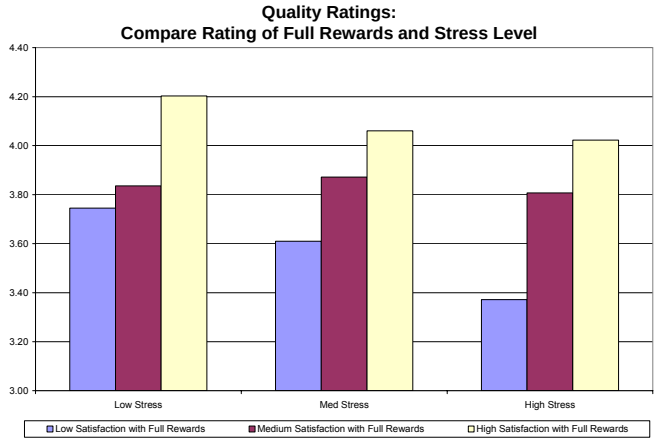


Figure 6.9 Compare Quality Ratings: Full Rewards vs Stress Level

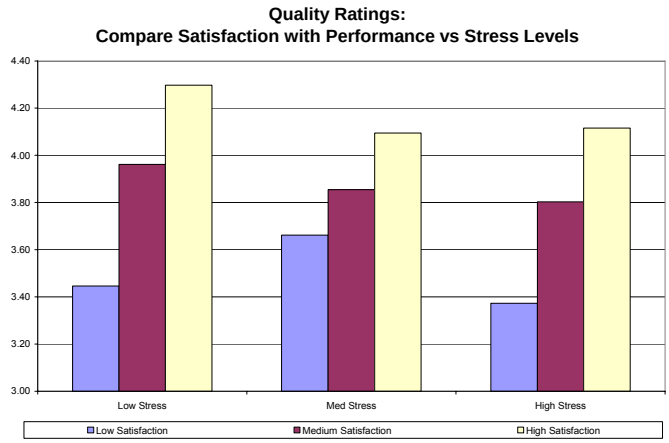


Figure 6.10 Compare Quality Ratings: Satisfaction With Performance vs Stress Levels

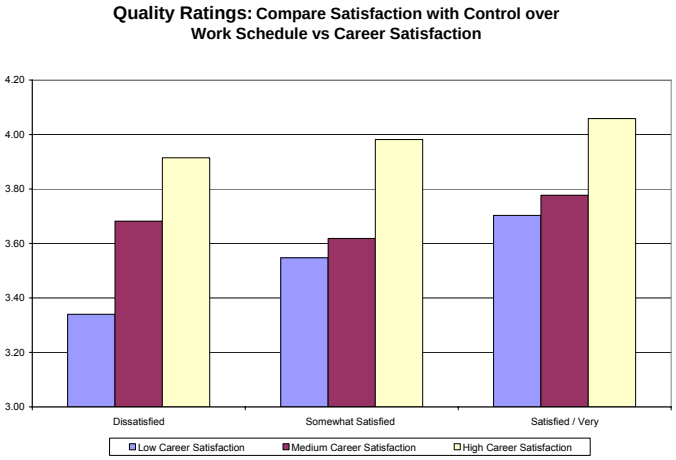


Figure 6.11 Compare Quality Ratings: Satisfaction with Control over Work Schedule vs Career Satisfaction

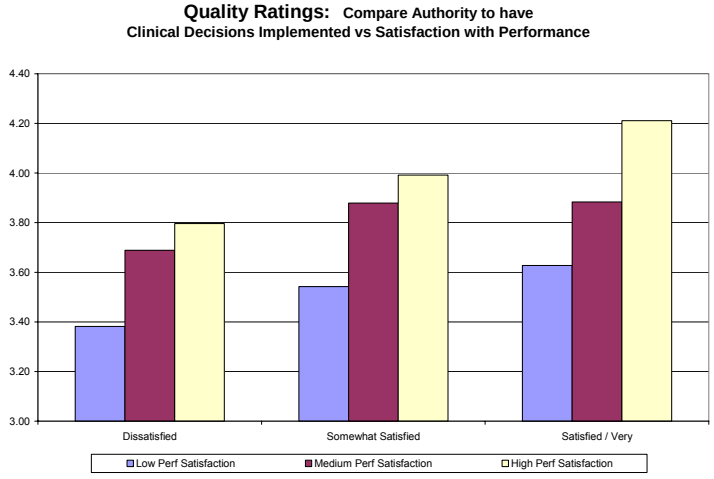


Figure 6.12 Comparison of Quality Ratings Among Predictor Variables

6.10 Summary of Results

Table 6.27 summarizes the results of each hypothesis, in terms of whether the null hypothesis should be rejected or not, on a region-by-region basis and when comparing aggregate data.

Table 6.27 Summary of Results – Hypothesis #1-6

Hypothesis	By Region	Aggregate	Discussion
H1: There will be no significant differences between the Objective Index and Physician Index.	R 11/12	DNR	Reject in 11 of 12 Cases. DNR for Aggregate Data
H2: There will be no significant differences between PI scores for GP/FPs and specialists in the twelve regions studied.	DNR 11/12	DNR	DNR in 11 of 12 Cases. DNR for Aggregate Data
H3: There will be no significant differences in PI scores between physicians who rate autonomy at high, medium and low levels.	R 8/12	R	Reject in 8 of 12 cases for H vs L Reject for Aggregate Data.
H4: There will be no significant differences in PI scores between physicians who rate stress at high, medium and low levels.	DNR 10/12	R	DNR in 10 of 12 cases for H vs L Reject for Aggregate Data.
H5: There will be no significant differences in PI scores between physicians who rate professional equity at high, medium and low levels.	R Mixed Results	R	Overall Rewards: Reject in 8 of 12 HvsL Overall Rewards: Reject for Aggregate Financial Rewards: Reject in 7 of 12 HvsL Financial Rewards: Reject for Aggregate Recognition Equity: DNR in 7 of 12 HvsL Recognition Equity: Reject for Aggregate Fulfillment Equity: Reject in 6 of 12 HvsL Fulfillment Equity: Reject for Aggregate
H6: There will be no significant differences in PI scores between physicians who rate satisfaction at high, medium and low levels.	Mixed Results	R	Satperf: Reject in 7 of 12 HvsL Satperf: Reject for Aggregate Overall Career Sat: DNR in 9 of 12 (!!!) Overall Career Sat: Reject for Aggregate

NOTE: "R" = Reject; "DNR" = Do Not Reject

7.0 DISCUSSION

Both propositions tested in this study are borne out by the results. Physician views of health care quality in their communities are generally aligned with the objective data; and physician assessments of quality are affected by factors including autonomy, stress, equity and satisfaction.

A wide degree of variability in physician responses manifests itself throughout the research - limiting the statistical significance of differences, and presenting anomalies in the results of several sub-groups or individual regions when examined closely. When examining aggregate data, the overall trends are consistent. The results are generally consistent even when examining individual regions and sub-groups of physicians.

There are weaknesses in the objective evidence available to policy makers for their decision making processes. The quality measures included in the index are limited in the scope of health care services covered, and are biased toward traditional acute care services.

7.1 Despite Variability, Physician Ratings of Quality are Aligned with Objective Data

The basic proposition of this research, that physicians' assessments of quality will be aligned with the objective measures of quality, is generally borne out by the results.

This research breaks new ground in comparing physician views on health care quality to objective data, while expanding on past research examining physician views on quality evaluation. In 1999, Saturno, Palmer and Gascon studied physician attitudes and compliance with quality evaluation criteria in Spain. The study revealed high standard deviations in physician views, "revealing the lack of consensus even more". The current study reinforces the Saturno's research in terms of variability in physician views.

The results suggest that there is a close match between the views of physicians and the objective data when viewed on an aggregate basis. However, when examining regional statistics and sub-groups of physicians, there are some unexplained differences between PI and OI scores.

Similar conclusions were reached by Mannion, Goddard and Smith (2001), who in reference to performance measurement systems in the NHS, raised concerns about biased or distorted views held particularly by GPs, largely because their views were influenced by soft information, collected from conversations.

7.2 GPs and Specialists Provide Similar Quality Ratings

Despite oft-cited differences within the ranks of physician groups, the average health care quality ratings provided by general practitioners and specialists are closely aligned. The results are confirmed in eleven of twelve regions, as well as the aggregate scores. Both groups are subject to similar variability in viewpoints, meaning that any individual respondent may provide quality ratings that are not aligned with the average ratings provided by all physicians.

There have long been differences and divisions within the ranks of the medical profession. Torrance (1987) described a history of division within the ranks of physicians in Canada. More recently, Tuohy (1999) describes a split within the ranks of Canadian physicians, which was accelerated in the 1990s. The present debate over the direction of the Canadian Medical Association on the future of medicare, private insurance and private care delivery highlights the fact that significant differences remain within the ranks of physicians on fundamental policy issues.

In the United States health system, Hafferty and Light (1995) reported on a conflict between generalists and specialists over the role of gatekeeper, one of the key policy issues in the reform of the Canadian health care system.

While the literature describes a number of sources of conflict between physician groups, the author is not aware of any published research which has focused on differences in viewpoints on health care quality between groups of physicians.

A further breakdown of sub-groups can provide more insights into differences in physician viewpoints. For example, physicians who work in administration provided quality ratings (PI = 110) which were higher than the overall average. It appears that physicians who are involved in administrative functions rate health care quality higher than others.

The results suggest that the views of physicians on health care quality do not differ significantly between different groups or specializations. Therefore, although any one physician's views may vary from the typical response, physicians representing specialist groups appear to have similar views on quality overall to those of general practitioners.

Hafferty and Light (1995) suggest there is an opportunity for policy makers to capitalize on the split of opinions within the American medical profession as a basis for pursuing policy directions which may not suit the majority of the medical profession. Canadian policy makers historically have not used such a "divide-and-conquer" strategy, but rather have relied on compromise and accommodation in their negotiations and struggles with physician organizations (Williams et al, 1995).

7.3 Autonomy is a Factor in Higher Quality Ratings

Physician viewpoints on autonomy are an important factor in determining their viewpoints on quality of health care. PI ratings between high and low autonomy raters varied by 31 points, a wider gap than any of the four factors examined in this research. This trend was evident between high and medium raters of autonomy, as well as between medium and low raters. These results indicate that, among the variables under study, the relationship between autonomy and quality rating is the strongest.

This result is consistent with the data presented by Konrad (1999), who found physician autonomy to be the primary factor in determining satisfaction. There are further linkages to be drawn between satisfaction level and other factors. For example, a physician's sense of autonomy is linked to their overall satisfaction with their medical career, with higher satisfaction reported by those who rate autonomy higher.

However, Williams (1995) noted that medical association leaders who in Canada have been more strident than other physicians in their defense of professional autonomy. While Williams' findings might suggest that autonomy is not as important to individual physicians as it is to their associations, this research indicates that autonomy is in fact important to individual physicians, at least in terms of how they view quality.

These results lead to a question of how policy makers should respond to physician needs for autonomy. Hirsch (1996) suggested organizations change by reshaping their operational structures and support systems with an eye to physicians needs. Such a

focus would be generally consistent with the provider-oriented organization systems generally in place today; however it would conflict with proposals to reform health care to a more patient-oriented model. Patient-centred care is most frequently advocated among the nursing profession. For example, Dawood (2005) concluded that patients who are actively involved in their own health care have fewer symptoms and less pain, and are happier and more satisfied; however paternal attitudes among care-givers could stifle active patient participation.

There are case studies in Canada where physicians are working closely with other players in the health system. The Health Quality Council (Saskatchewan) published a progress report on the Saskatchewan Chronic Disease Management Collaborative. Under the collaborative, 128 physicians work together with over 400 other health care professionals including nurse practitioners, pharmacists, dieticians and diabetes educators in a systematic program to improve care and outcomes for patients with diabetes (Health Quality Council, 2007). This form of collaborative may indicate a willingness among physicians to relinquish some autonomy and control in favour of working with a team to improve the quality of care.

Physicians are generally in favour of a patient centred model, though not to the same degree as other health care professionals. A survey conducted by Medscape (October 2006) asked "Would you rather your patients' families were 'involved in' (asking questions, pointing out changes in status) or 'accepting' (rarely asking questions, assuming the clinician knows best) the care their relatives receive?" The results showed that, although a slim majority of physicians (58%) prefer family involvement, a

higher percentage of nurses (77%) hold the same views (see Table 7.1 and Figure 7.1). The results of this survey suggest that, among individual physicians, there may be more of a willingness to accept and adapt to change than the literature might suggest.

Table 7.1 Medscape Poll Results – Involved or Accepting?

Medscape Poll Results: Involved or Accepting?		
	Physicians	Nurses
Involved	58	77
Accepting	5	1
Depends on Individual Case	35	21

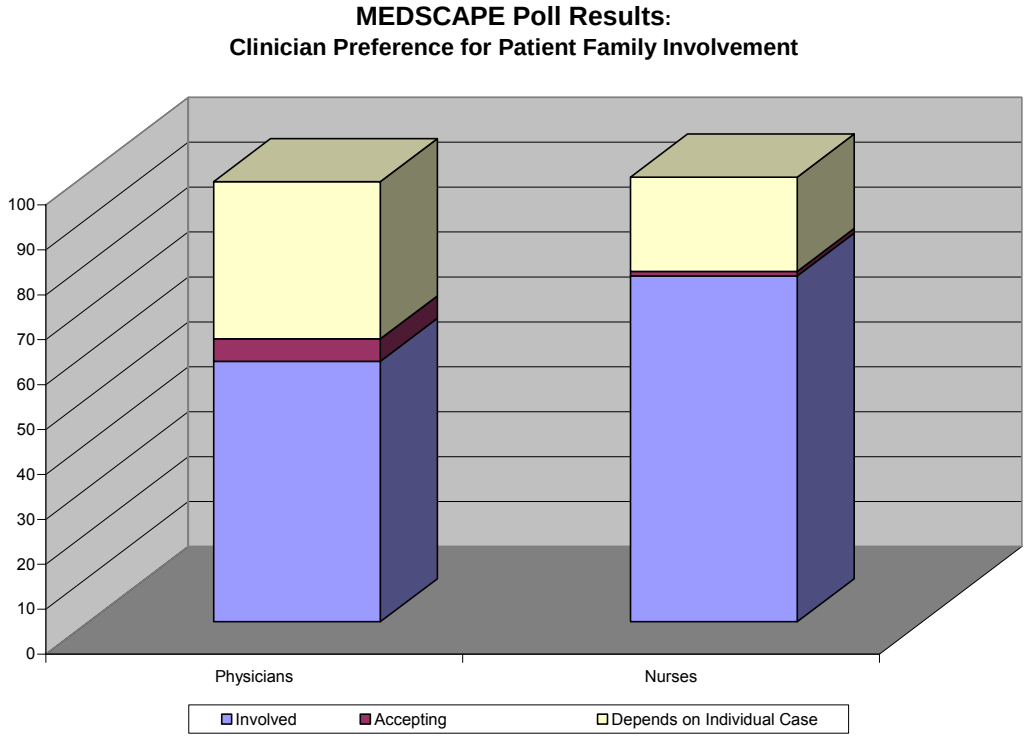


Figure 7.1 Medscape Poll Results – Physicians vs Nurses

A question arises therefore as to whether organizational systems designed to suit the needs of physicians may be in conflict with those designed to suit the needs of patients – and therefore with the overall quality of health care services provided. Policy decisions around organization, structure and the role of physicians relative to other care providers will influence autonomy levels, and subsequently physician satisfaction and their assessment of the quality of health care in their communities.

7.4 High Stress Gives Rise to Lower Ratings of Quality

The data shows a clear trend that, as stress levels rise from low to medium to high, physician quality ratings (PI scores) drop. The trend lines are consistent in the comparative analysis, however the differences are not strong enough to show statistically significant differences. Nonetheless, the results suggest that there is a relationship between self-reported stress levels and physician views on quality.

There appears to be a relationship between the actual quality of health care provided in a region (as represented by the OI scores) and physician stress levels. Physicians in regions achieving the highest OI scores are generally under more stress than those in lesser performing regions, however the strength of the relationship is not significant.

The tests examining the relationship between control and stress demonstrated a much stronger relationship, with higher levels of control aligning with much lower stress levels. These results are reinforced by a comparison of influence over practice decisions and stress, where stress levels are lowest for those reporting the right amount of influence and higher for those with too little or too much influence. Finally, the comparison of physician control over work schedule and stress levels showed a strong relationship, where respondents who are least satisfied with control over work schedule reported high stress levels, compared to those most satisfied with control reporting low to moderate stress.

Williams (1995) found that job stress powerfully influenced job satisfaction and health, both of which were found in this study to have a relationship with quality ratings. He also described a current state of health care where physicians have few restrictions on their clinical decisions and little monitoring of what they do. He suggested that control over both clinical decisions and workplace resources have an impact on both job satisfaction and stress.

Applying Williams' observations to current trends away from traditional structures toward regional management control and new primary care models (where the physician may not have as strong an influence over their work and/or their patients' care), it is reasonable to expect that the current trends in health care policy will lead to increased stress and decreased satisfaction among physicians.

Karasek and Theorell (1990) reported on relationships between control over work activities and stress, and subsequently on health. They found the key to low stress, and low rates of heart disease, is in decision latitude. Data from this study showed there is a moderate relationship between the two, where physicians reporting very high stress levels described their health as fair to good, whereas those in the lowest stress bracket reported their health as high to very high on average.

Several authors have offered recommendations for policy makers regarding stress and workplace control. Arnetz (2001) suggested a systems approach to dealing with the stressors which are intrinsic to medicine. Management of health care organizations, he suggests, should provide opportunities to develop coping strategies and to attenuate the

impact of occupational stressors (Arnetz, 2001). Hirsch (1996) suggested that physician stresses arise from poor operational structures, roles and relationships, and recommended structural design to strengthen collegial alliances while at the same time enhancing efficiency and effectiveness. Eubanks (1992) recommended that hospital executives find ways to help their physicians cope with stress, but also noted that physicians' desire for independence could be a limiting factor in the ability of policy makers to help reduce physician stress. Finally, Karasek and Theorell (1990) found that a primary cause of stress is lack of decision latitude in the work place.

These stress-related factors may cause a great deal of concern for policy makers: Is it best to leave significant control over health care in the hands of physicians who are independent contractors, or should more control be shifted to health organization managers and / or other health care professionals?

7.5 Physicians With a High Sense of Equity Provide Higher Quality Ratings

Professional equity issues are important factors in physician views on quality. Furthermore, the components of equity are also all important. Physicians who provide the highest ratings of equity also rate health care quality to be higher. However, there are interesting differences of magnitude between the components.

Reward equity was examined from two perspectives: rewards overall, and a specific focus on financial rewards. Interestingly, the greatest differences in quality ratings were

based on overall rewards, where the difference in mean PI scores between high and low raters was 30 points – the second highest range in the eight sets of tests.

Comparatively, the difference in PI scores between those who rate financial rewards highest and lowest was 23 points and there were significant differences in PI ratings in only six of twelve regions. In a country where there is much public discourse about fee-for-service payment and its importance in physician motivation, this result suggests that financial rewards are not more important than other elements of equity in determining physician views on quality.

Recognition equity and fulfillment equity test results were similar to the financial reward equity results, with differences in mean PI scores of 23 and 22 points respectively, and significant differences between high and low raters in about half of the regions examined.

The results suggest that there are relationships between all three forms of equity and physician quality ratings. The strongest relationship pertains to overall reward equity. The results may serve to dispel some of the more cynical views about physician motivations such as those put forth by Lewis (2005), while at the same time reinforcing the findings of Konrad (1999), as well as Lepnurm, Dobson, Backman and Keegan (2004) – that pay is not the most important factor in determining satisfaction levels. Clearly physician views about the health care system are influenced by their sense of equity, but pay is only one of many factors, and not the most important one.

Recognition and fulfilment equity rate equally to pay equity, and overall reward equity is a more important determinant of physician views on quality.

7.6 Physicians With High Satisfaction Provide Higher Quality Ratings

Two measures of satisfaction were analyzed in the research: satisfaction with performance, and overall career satisfaction. In both cases, there is a clear relationship with quality ratings. Aggregate data shows significant differences in quality ratings between high, medium and low satisfaction levels, while the level of significance is not as pronounced when examining individual region data, where variability in individual responses reduces the overall effect.

The data showed strong and significant trends when comparing satisfaction with performance and quality ratings, with those rating satisfaction higher providing higher quality ratings. The analysis of physician responses regarding overall career satisfaction resulted in similar results. Comparative analysis showed that physicians in the highest satisfaction category reported higher quality ratings than those in the medium and lowest groups in all cases. These results suggest that satisfaction is an important factor of influence in physician quality ratings.

In the literature, discussion focuses on the relationship between autonomy and satisfaction. Konrad (1999) drew a link between physician autonomy and satisfaction. This is supported by the work of Williams (1995), and Burdi and Baker (1999). Landon

(2004) also ties satisfaction to a physician's ability to obtain high quality services for their patients, which is consistent with the results of this research.

As is the case with other factors examined above, policy makers should be aware of factors which influence physician satisfaction, and of the relationship between physician satisfaction and their views on how well the health system is performing. They should also be aware that there are interrelationships between all four of the factors, and that none should be examined in isolation of the others.

7.7 Relationships Among Autonomy, Stress, Equity and Satisfaction

An examination of the literature showed close relationships between autonomy, stress, equity and satisfaction. Similarly, the examinations of these four factors show consistent patterns in their relationships with physician views on health care quality. Figure 7.2 and Table 7.2 show physician PI scores for each of the eight predictor variables used in Hypothesis #3-6, each at high, medium and low levels. The results are similar across the board – each of these factors has an important relationship with physician views on quality.

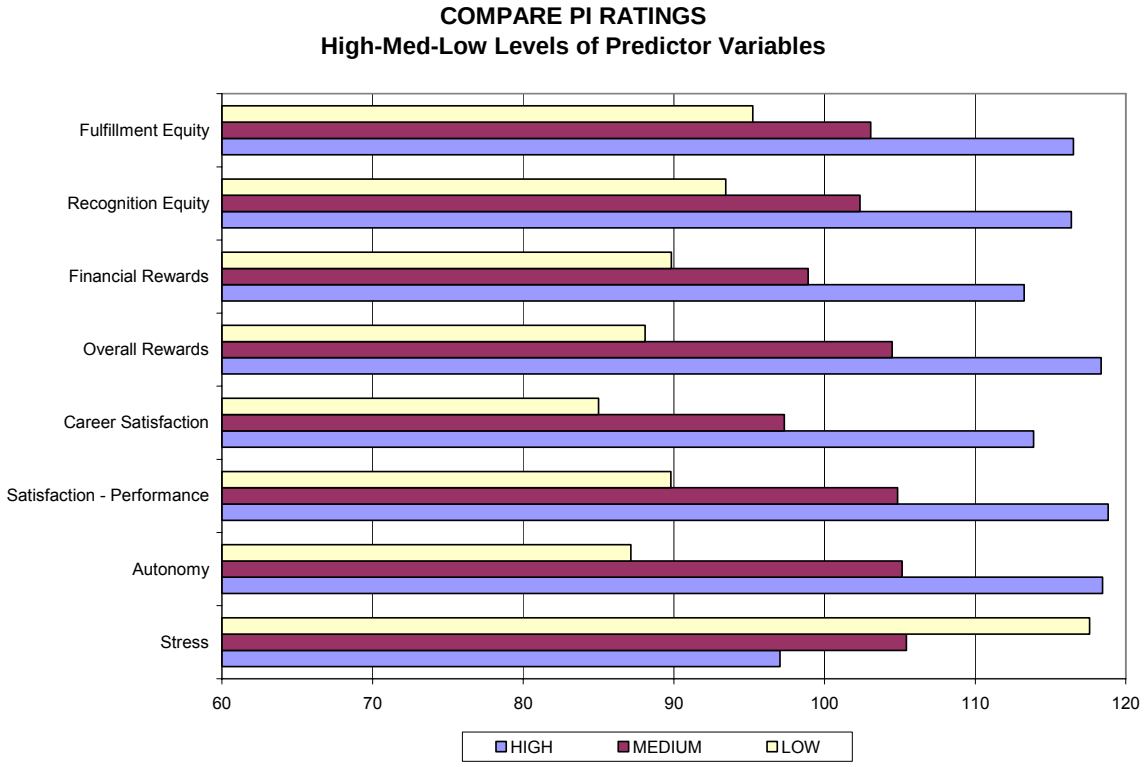


Figure 7.2 Comparison of PI Ratings for Hypothesis #3-6

Table 7.2 Comparison of PI Ratings – Hypothesis #3-6

Comparison of Mean PI Scores			
	HIGH	MEDIUM	LOW
Stress	97	105	118
Autonomy	118	105	87
Satisfaction - Performance	119	105	90
Career Satisfaction	114	97	85
Overall Rewards	118	104	88
Financial Rewards	113	99	90
Recognition Equity	116	102	93
Fulfillment Equity	117	103	95

Policy makers should be aware that each of these four factors may also be influenced by the changes to Canadian health care which were examined earlier – expanding scope of health care services, regionalization, primary care reform and the emergence of a new group of technocrats and organizational control systems. In addition, they may be influenced by the emergence of new performance reporting tools and systems, which are

only beginning to be implemented by health care organizations. As health reforms in the scope of services, regionalization, primary care reform, technocratic controls and performance reporting proceed, they are likely to affect physician views on autonomy, stress, equity and satisfaction – which in turn have a major influence on physician ratings of health care quality (Table 7.3).

Table 7.3 Factors Affecting Health Care and Factors Affecting Physician Views

	Growth in Scope	**Regionalization**	**Primary Care Reform**	**Technocrats & Controls**	**Performance Reporting**
Autonomy	Physicians are no longer the only professionals on the playing field (but still control the gate).	A new level of managers threatens independence of physicians.	Gatekeeper role threatened by PC teams concept.	Physicians lose autonomy under organization controls and rules. Private clinics – less so.	Independent clinical opinions challenged by use of tools for evidence based medicine.
Stress (Control, Health)	Increased workload and complexity of care → stress.	Autonomy / control reduced impacting stress.	Autonomy / control reduced impacting stress.	Bureaucrats press rationing, which impacts both autonomy and stress.	Physicians spend more time recording and reporting on performance.
Equity: Reward Recognition Fulfillment	Recognition equity may drop as other players become more prominent.	Rural physicians may feel left out as regions focus service in urban, tertiary centres.	Fulfillment may improve when on PC care team. Rewards may drop.	Sense of equity may drop as technocrats intervene in patient care.	Rewards may become based on new performance measures / goals.
Satisfaction	Work-related factors which influence autonomy, stress and sense of equity will also influence satisfaction levels.				
Physician Views on Quality	The research shows that views on quality are influenced by their sense of autonomy, stress level, sense of equity and satisfaction levels. Therefore, as health reforms in the five areas proceed, they are likely to influence those four factors, which in turn will result in changes to physicians' views on quality of health care.				Physicians' expert / clinical opinion is challenged by a new set of objective data.

Growth in scope: The average growth rate for Canadian health care services has exceeded five percent for a decade. Physicians have been affected both positively and negatively – with more patient visits per capita than ever in the past, but also with new stresses and challenges relating to workload and the introduction of other health care

professionals onto the policy scene. Whether this rate of growth is sustainable, even in the short-term, is questionable (MacKinnon, 2004; Rode & Rushton, 2002).

Regionalization has placed new stresses on physicians and other health care organizational players. Efforts to combine a complex array of facilities, services and workers into well integrated units have met with difficult challenges. They have also met with varying levels of success – both in Canada (Rathwell and Persaud, 2002) and in the USA (Lake, 2003). In addition, a trend toward centralization of services and administration in major urban centres has left rural communities and care-givers feeling left out in the cold (Mathews & Edwards, 2004; Larsen Soles, 2005).

Primary care reform is discussed and debated extensively, with as many visions for reform as there are players in the health care system. To some, it means a complete change in the vision of what the health system does with a focus on improving health and health determinants for all people. For others, it is more focused on how point-of-first-contact health care services are delivered, and by whom. Lamarche's discussion about the conflicting goals of professional and community visions for primary health care highlights the current point of contention: physicians are threatened by the possibilities of losing their role as gatekeepers, as well as their clinical autonomy in deciding patient care plans. While Lamarche recommends a community vision, the OMA's Halparin, as well as the CMA's 2006 publication "It's About Access", both focus on the desire of physicians to maintain their role as gatekeepers. In a report to the Alberta government on health care reform, Mazankowski (2001) described essentially a

status-quo situation, where primary care groups are practices composed of several physicians, who could also incorporate other health care professionals.

Technocrats and Controls: Along with regionalization have come a new generation of technocrats, both within the regional authorities and in the provincial health departments. These new players, with their rules and tools for overseeing the health care system, represent a new threat to physician autonomy, as well as their influence over health care policy. Torrance described technocrats as the new power elite, of efficiency experts seeking to impose organization controls.

Performance Reporting: Physicians are also influenced by the introduction of new information technologies for data collection, storage and reporting. Performance reports on both physician services and other health care services add a new level of scrutiny over physician activities, and a new set of evidence based tools for improving performance and supporting the policy process. These advancements may affect physicians' sense of autonomy and control. Physicians in higher performing organizations have slightly higher stress levels, which may be in part due to an increased emphasis on measurement and reporting.

In addition, the development of new, provincially controlled patient data systems are a threat to each primary care physician's practice, as other health care professionals could access a patient's file without consulting the family physician

All of these changes have the potential to influence physicians in many ways – their clinical and professional autonomy, their working conditions and stress, their sense of equity and satisfaction, and ultimately, their health. Therefore, the changes also

influence the viewpoints of physicians about the health care system, their roles in the system, and about how well the system is performing.

7.8 Whose Views Most Closely Match the Objective Data?

Comparing the four work-related predictor variables, the physicians rating medium stress levels were closest to the mark when comparing aggregate scores, and those in the medium range of autonomy came closest to the OI scores when comparing results by region.

These results do not point conclusively toward one identifiable group of physicians whose views are most closely aligned with the objective data. They do, however, raise two important points for consideration:

1. There appears to be a strong and consistent relationship between ratings of autonomy, stress, equity and satisfaction and ratings of health care quality; and
2. Generally, physicians at the high and low margins of each of the four predictor variables will over or under-rate quality as compared to those with more moderate points of view.

The results should be viewed in consideration of the fact that the Objective Index is limited in scope, and may not be representative of the qualities of a full range of health care services. In addition, physician views on quality may be based on each individual's own criteria, priorities and personal experiences which may or may not be in line with those composite measures which are used in the Objective Index.

7.9 Improving the Lockhart Index of Quality: Scope of Coverage

The Lockhart Index is the first such tool known to the author for presenting a composite measure of health care quality on a regional basis. It may serve as a valuable tool for benchmarking the performance of regional health authorities over time, between regions, and between provincial jurisdictions. However, it is limited in its scope of coverage because few measures of health care performance are captured and reported on a consistent basis for health regions throughout the country.

If it is to be utilized as a barometer of the performance of the full range of services provided by regional health authorities, the Lockhart Index should be expanded in scope. Priority areas should include measures of quality in primary / ambulatory care, public health & prevention, and quality ratings provided by patients.

The measures of quality available for inclusion in the index are limited by the number and type of quality measures mandated by federal authorities. Health care quality reporting is mandatory in Canada, the USA and UK. In the USA, public reporting of health care quality is required under the Healthcare Research and Quality Act. The Agency for Healthcare Research and Quality (AHRQ) is required to develop reporting protocols, and have to-date developed more than 1,200 performance measures in their quality measurement system (AHRQ, 2004). In Canada, national standards are maintained by CIHI in their MIS reporting requirements (CIHI, 2003). Only the information publicly reported by Statistics Canada and the Canadian Institute of Health Information (Health Indicators measures) are reported on a consistent basis by health

regions throughout Canada, and even these measures are often not captured in many provinces. For example, in Quebec only two of the nine measures used in the Index are reported, while four other provinces do not report all nine measures.

In order to become widely accepted and effective as a tool for evaluating the overall performance of regional health authorities, the Lockhart Index must be expanded in scope and modified to reflect a broad-based set of goals and measures which are representative of Canada's health care systems. This will only be possible when two conditions are met:

1) A national consensus is reached on health care system goals and indicators of performance; and
2) Those measures become part of the mandatory recording and reporting systems for health care organizations throughout the country.

The Institute for Clinical Evaluative Sciences in Ontario issued a report in April 2006 outlining a strategy for improving the health data system for Ontario (Iron, 2006). Two of the primary issues flagged in relation to performance reporting are primary care reform and reorganization of health care into local health integration networks (LHINs), both of which require extensive new data systems which are currently not available. The report stated is first priority as developing an electronic system to track all uses of Ontario's health care system. Recognizing the challenges in undertaking such a system, the report recommended a centralized agency with legislative authority to assemble, link and maintain health data, to evaluate and report on data quality, and to improve its usefulness for system performance measurement.

The problems with data limitations and consistency are not unique to Canada. In its report on high performing health systems, the OECD reported significant problems with quality reporting. "Datasets such as OECD Health Data that provide comparable information on health system characteristics and performance currently lack information on the technical quality of care furnished under those systems. National activities do not lead to internationally comparable quality indicators, except by accident." (OECD, 2004).

Hussey et al (2004) compared the quality of care in five countries, including Canada. Their greatest challenges were to select measurement indicators which were feasible (information availability), scientifically sound, interpretable, actionable, and important.

The search for the ultimate health care quality measures has consumed the time and resources of many analysts throughout the world, at times seemingly with a lack of purpose, direction or understanding. Uwe Reinhardt, in a presentation to the National Conference on Quality and Safety in Health Care, mused "People like to be measured, but the key issue is, what do you measure and what do you do with it? We wallow in data, and become DRIPS – data rich and information poor." (Torpy & Goldsmith, 2002). In a WHO bulletin on evaluating physician competence, Donabedian raised concerns about articulating specific criteria or indicators of quality: "I believe that lists of explicit criteria threaten to lead us down a blind alley. It is not true that "I have greater quality than thou because my criteria lists are longer than thine". The criteria serve a useful function in sounding an alert that something may be wrong. It would be

tragic to accept them as representations of quality, except in the crudest sense." (Donabedian, 2000).

The Lockhart Index should also remain focused on ***quality*** of health care services (process and outcome measures). ***Access*** to health services, which is also an issue of vital importance and scrutiny throughout Canada, should remain as a separate issue and focus of priorities, with its own measures and reporting tools. Similarly, reporting on ***efficiency*** may be appropriate for evaluating use of scarce financial and human resources in health care.

Another limitation of the Lockhart Index is that a single index cannot realistically be used to compare the performance of large urban health authorities with tertiary care, medical schools and significant inflow of patients against the performance of smaller rural health regions with only limited scope of services. Presently, the index is only applied to regions with over 75,000 population based on Statistics Canada reporting standards. While it is important to include all health authorities in evaluation systems, it would be most appropriate to develop separate measures and benchmarking standards for regions with lower populations and/or smaller scope of services. This may be achieved through the creation of a sub-index, which includes measures of only those services which are commonly provided by smaller regions which do not have tertiary care centres..

In a survey of health officials conducted for this project, concerns were expressed about the limited scope of measures included, and a number of suggestions were provided by respondents for improving the Lockhart Quality Index. They include:

- Patient surveys focused on specific questions – avoid overall satisfaction rates
- Infection rates – such as nosocomial, surgical, ventilator acquired
- Health promotion and prevention programs – availability and utilization
- Expand use of pre-acute primary and secondary prevention efforts
- Public confidence rates
- Staff satisfaction measures
- Re-admission rates (expand scope of measures)

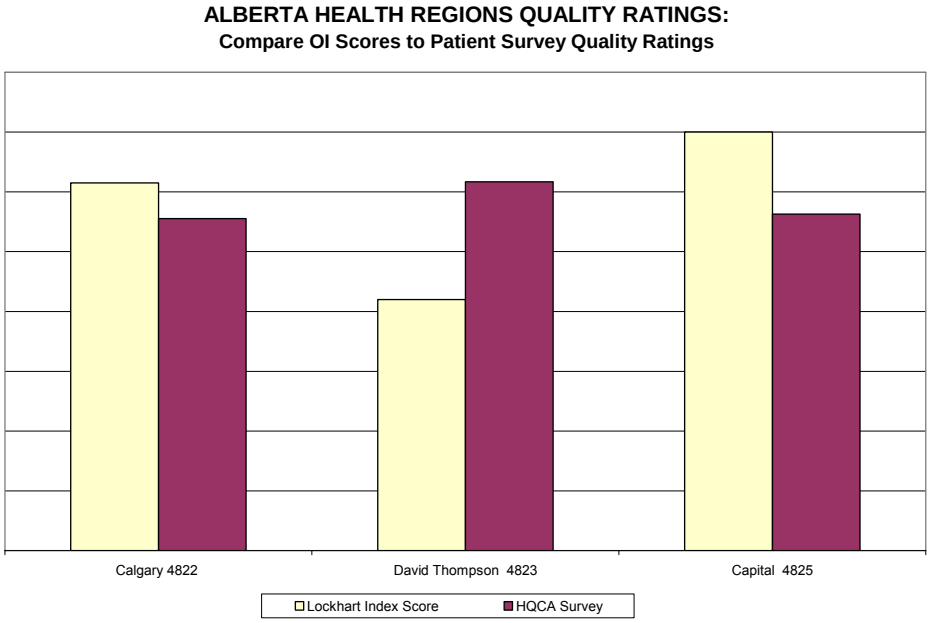
One of the key items in the recommendations above is the use of patient survey instruments, which have proven to be controversial in the literature. Rider and Perrin (2002) studied physician use of patient satisfaction data in Massachusetts. They found that less than one quarter of physicians find patient survey data useful for improving patient care and even fewer used the survey profiles to change practice. They concluded "profiles likely have limited influence on behaviour changes".

Statistics Canada presently conducts patient satisfaction surveys as part of the Canadian Community Health Survey. Respondents are asked to rate satisfaction with health care services in general, as well as satisfaction with specific services relating to hospital, physician, community-based and telephone health-line services. However, the scope of the survey is limited, and although data is collected by health region it is only possible to report the results summarized by province (Statistics Canada, 2006). Therefore, patient survey data is not presently available on a regional basis. More in-depth patient surveys

are conducted in some provincial and regional jurisdictions, including Alberta's health regions and Ontario's hospitals.

Therefore, patient survey data should be viewed with caution. There is limited evidence suggesting patient views on quality may not match with the Lockhart Index. Table 7.4 compares OI scores for three Alberta health regions, along with comparable ratings of quality as collected in the annual patient survey conducted by the Health Quality Council of Alberta (HQCA, 2006). As the table shows, patient surveys show the highest quality ratings going to David Thompson Region #4825 (Red Deer), with relatively lower ratings for the two major urban regions. In contrast, the OI scores for Calgary and Edmonton Capital regions are significantly higher than that measured for David Thompson region. More study of patient survey data is needed to determine the appropriate method of inclusion in a composite index of quality.

Table 7.4 Compare OI Score to Patient Survey Ratings in Alberta



Regional health authorities have developed a number of different measurement, reporting and evaluation tools for their own management purposes. Examples of management performance reporting tools include:

- Kelowna (Interior Health Region) – Publicly reports thirty-seven performance measures relating to quality (both process and outcome), access, organizational development and financial outcomes (Interior Health, 2004).
- Saskatoon Health Region and the Halifax Capital Health Region use similar scorecard tools, based on management priorities and strategic goals.
- Calgary health region reports on access and quality of services, wellness and healthy living, workforce goals, collaboration, as well as performance in a variety of service areas. Performance management is supported by an extensive organizational group (Quality, Safety and Health Improvement) which utilizes the Institute for Health Improvement's quality improvement systems.
- Ontario's newly formed local health integration networks (LHINs) are not yet at the point of organization development to be managing performance. Therefore, management reporting and performance tools in Ontario are based primarily at the institutional level. For example, Ontario Hospital performance is reported annually in a joint Ontario Hospitals Association – CIHI report, based on balanced scorecard methodologies (Ontario Hospitals Association, 2006).

If a composite index of health care quality is introduced to regions already using their own tools, it may meet with resistance if the new measurement and reporting requirements are not compatible with established systems.

The Institute for Health Improvement (IHI), based in Cambridge, Massachusetts, has become a world leader in quality improvement programs, including measurement and reporting tools. Their initiatives are aimed at improving quality in six areas: safety, effectiveness, patient-centeredness, timeliness, efficiency, and equity (IHI, 2006). As more health jurisdictions begin working with IHI tools, the reporting tools used for their programs may become a new standard for benchmarking between regions.

The USA Based Agency for Research in Healthcare Quality (ARHQ) has developed a single composite measure for health care quality at the state level called "State Snapshots". While the data is more aggregated than the regional-level Objective Index developed in this project, it serves as a comparison in the use of composite scores. A sample performance meter is shown in figure 7.3, including both current and baseline year performance.

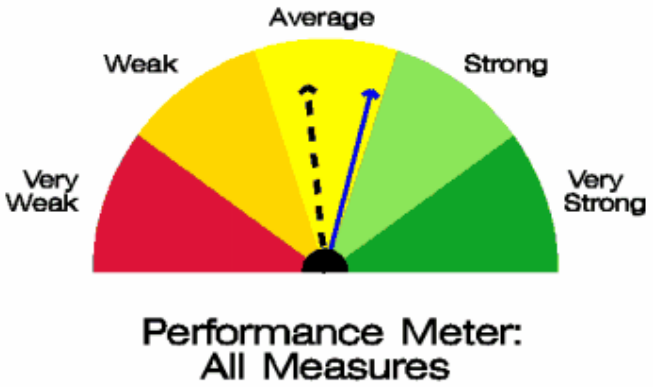


Figure 7.3 Sample of US ARHQ State Healthcare Performance Meter

The ARHQ "State Snapshots" are developed based on type of care (preventive, acute and chronic), as well as location (hospital, ambulatory, nursing home or home). Scoring is based on standardized measures, and include both current year and a baseline year for benchmarking.

Different quality measures, indicators and protocols have been proposed by different organizations. Some noteworthy examples are presented in Table 7.5.

Table 7.5 Health Care Quality Measurement and Reporting Systems

Organization	Measures / Criteria
Canada – FTP Health Ministers Accord (2002)	67 measures of health status and health care delivery performance. All provinces agree to annual reporting on the 67 measures.
CIHI – Health Indicators (CIHI, 2003)	Health system performance and indicators in four groups: health status, non-medical determinants, health system performance, and community & health system.
Ontario Hospitals Balanced Scorecard (Pink et al, 2001)	Hospital performance measured in four categories: clinical utilization & outcomes, patient satisfaction, system integration & change, financial performance & condition.
Switzerland (Luthi et al, 2002)	21 performance indicators grouped into structure, process and outcome.
USA National Healthcare Quality Report (AHRQ, 2004)	A broad range of measures for mandatory public reporting of health care quality. Categories: effectiveness of care, safety, timeliness, patient centeredness, resource consumption, and overall measures.
Five Country Comparison (Hussey, 2004)	21 indicators based on feasibility, scientific soundness, actionability, interpretability, and performance. Categories: outcomes – survival of treatments, outcomes – avoidable events (community health initiatives), and process indicators – screening and vaccination.
Vertically Integrated Health Care Systems in Canada (Green, 2002)	New criteria proposed to suit the evolution from stand-alone acute care hospitals to vertically integrated health care systems in Canada. Eight categories: clinical outcomes/effectiveness; accessibility; customer/stakeholder satisfaction; coordination; financial efficiency; quality; innovation and learning; and internal business / production.
Canadian Council on Health Services Accreditation (2004)	Four dimensions of quality used in accreditation of health care services in Canada: responsiveness, system competency, client/community focus, and work life.
Baldrige's Six Sigma (TUV, 2003)	Quality improvements based on measurement of number of errors per million opportunities. Ratings: 6 (3-4 errors per million), 5 (230 errors per million), etc.
Saskatchewan Health Services Utilization and Research Commission (HSURC, 2000)	System Performance Indicators – "system wide, outcome-focused, and intrinsic to the mission and long-term goals of the health system." Report card with indicators in the areas of effectiveness, efficiency, equity, acceptability, relevance and efficiency.
Quality and Outcomes Framework (QOF), UK NHS (Ashworth and Armstrong, 2005)	Primary care performance indicators with 147 measures in the areas of chronic disease management, practice organization, patient experience, and additional services.
Mercuri Group: Lockhart Index of Health Care Quality	A composite measure of nine widely reported health care quality measures. In its present form, the index focuses on acute care services. To be more representative of the breadth of services offered in health regions, the index should be expanded to include primary care, public health and patient survey data.

The Lockhart Index of Health Care Quality, based on nine commonly reported measures, is a new concept providing a single, composite index for benchmarking health care quality between regional health authorities in Canada. There is a need for

improvement, both in terms of comprehensiveness and suitability to regions of different size and scope of services. However, it is a new measure and method for evaluating the quality of health care in regions, and should serve as a basis for further debate, discussion and building toward a comprehensive and comparable index of quality.

8.0 CONCLUSIONS

8.1 The Lockhart Index is a Useful Tool, But It Needs Refinement

The Lockhart Index of Health Care Quality will serve as a useful tool for the new regional organizations which now manage health care services throughout Canada. However, just as the scope of health care services has grown, so must the scope of measures incorporated into the index.

Three areas of focus are recommended for expansion of the Lockhart Index: primary and ambulatory care, population health and prevention, and patient survey.

A number of new initiatives have been undertaken for reporting on quality of primary care services. The UK's National Health Service is a leader in developing performance indicators for primary care services. The Quality and Outcomes Framework (QOF), introduced in 2004, presents a comprehensive list of 147 performance indicators for general medical practices (Ashworth and Armstrong, 2006). However, a 2006 survey of UK physicians showed that "they were generally unconfident that the data would reflect accurately their practice" (Mayor, 2006). Further insights into reporting on quality of primary care may be gained from Schoen et al studied primary care physicians' office

systems in seven countries. In this study, a number of common areas of care priorities, targets and tracking systems were identified. (Schoen et al, 2006).

Reporting on the quality of public health and prevention services may be a greater challenge. Many of the services and activities are directed toward broad populations, and it is at best difficult to link those initiatives to short-term outcomes. Process measures are, therefore, the most viable for reporting on quality of services. However, there are examples of well established measurement and reporting systems. The US based Centers for Disease Control and Prevention (CDC) are leaders in a coalition of organizations which have joined together to develop a set of National Public Health Performance Standards (Public Health Foundation, 2007).

Patient survey is the third and final area recommended for inclusion in the Lockhart Index. Statistics Canada's Canadian Community Health Survey collects patient views on quality of care in five categories: health care services in general, hospital services, physician services, community based care, and telephone health line services. While this data is collected by health region, with a sample size of over 35,000 nation-wide, the sampling methodology is not intended for reporting on a region-by-region basis (Ledroux, 2005). In order to make regional reporting possible for inclusion in the index, expansion of this already established measurement and reporting system would likely be the best approach.

8.2 Physician Views Are Generally Aligned, But There Is Much Variance

While this project was successful in developing an index representing physician views on quality which could be compared to the objective data, application of the PI indicator is limited due to the variability in physician viewpoints which was evident throughout the survey. This variability in response is important both in developing an assessment of physician viewpoints, and in utilizing the Physician Index as a benchmark for policy decisions.

8.3 Physician Views Are Influenced By Workplace Factors

Physician views on quality were shown to be significantly influenced by all four workplace factors studied – autonomy, stress, equity and satisfaction. Generally, the viewpoints of those who self-rated in the moderate levels of each of these factors were most closely aligned with the objective data. However, a wide degree of variability in quality ratings within each of these sub-groups was also evident. Therefore, it is difficult to make any more than broad-brush conclusions based on this data.

There is a strong linkage between each of the four workplace factors and the major health care policy issues examined in this study. Therefore, it is important to consider the interrelationships between these factors and policy decisions.

8.4 What Does This Research Mean to Policy Makers?

Many aspects of this research are of value to Canadian health policy makers operating at the macro, meso and micro levels of policy decision making. The most important findings from this research which are of interest to policy makers are:

- The Lockhart Index of health care quality is a new, composite, single-score indicator of the performance of regional health authorities in delivering quality health care services.
- The research has shown that, while the overall average ratings of physicians on health care quality are closely aligned with the objective data, there is much variability in the perspectives of individual physicians.
- Finally, physician ratings of quality are significantly influenced by workplace factors including autonomy, stress, sense of equity and satisfaction.

Policy makers should consider the implications of this study in the context of the health care policy arena (see Figure 8.1). There are important correlations between policy decisions and physician work place factors, and between those workplace factors and physician viewpoints on how well the health care system is performing. And while physicians and their representative organizations continue to be important players in the health care policy arena, their influence may be on the wane due to the introduction of technocrats and a broadening array of objective measures of quality.

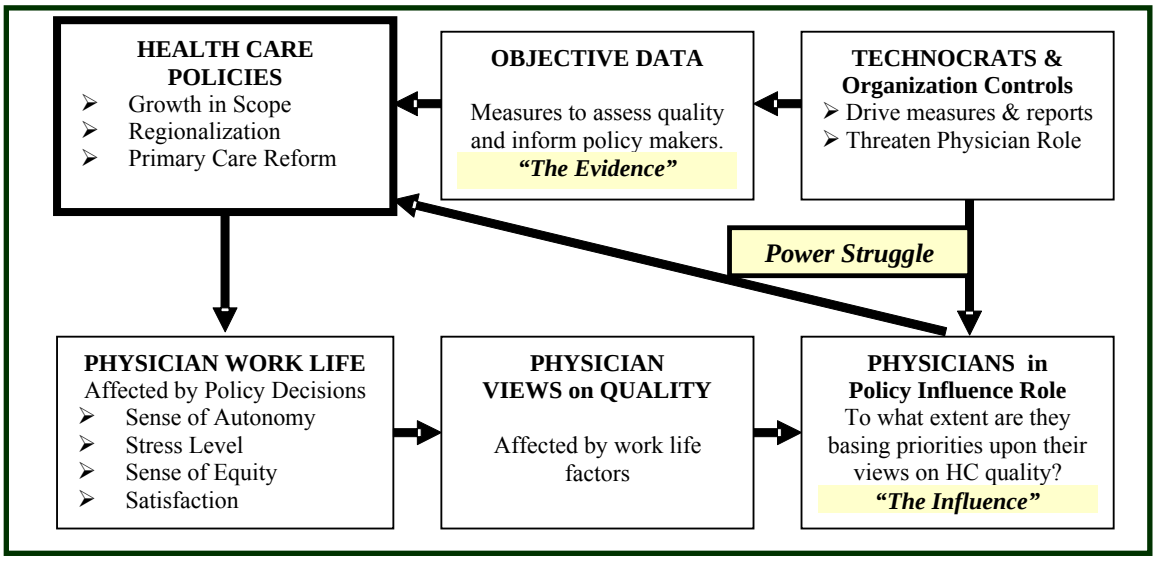


FIGURE 8.1 Health Care Policy Arena

This research delves into the core question about the role and influence of physicians in health care policy decisions. Policy makers should be aware of the fact that *aggregated* physician views on health care quality are well matched to the objective data, variability in *individual* physician views is evident when breaking down the data on a regional basis. Differences in ratings are much more evident when examining individual viewpoints, where there are substantial variances. Therefore, caution must be exercised when examining views expressed only by individual physicians.

The validity of individual physician views on quality of health care may also be questionable, based solely on the variability of views demonstrated in the physician survey. However, caution must be taken in judging the validity of physician views based solely on the difference between individual PI scores and the OI scores for their region. The scope of OI scores are limited by data availability, and it is possible that physicians have insight into a broader range of quality performance issues than those represented in the OI composite measure. It is also possible that an individual physician

may base their assessment on the quality of health care services within their immediate work environment, which may or may not reflect the quality of health care provided in the region overall.

Murray and Evans (2002), in examining health systems for the World Health Organization, found that decision-makers often rely on consultants and expert opinions to help shape major health policy decisions because of a relative vacuum of evidence. As a result, ideology and personal opinion become influential inputs into policy debates, rather than substantive data. Closer to home, in a paper prepared for the Commission on the Future of Health Care in Canada, Lavis (2001) referred to those experts as "political elites", including physicians, hospital associations and government officials.

To make the best use of this research, federal, provincial and regional policy makers should attempt to assess the degree to which physicians exert influence over decisions, and then consider the degree to which the views of physicians should be offset by evidence and objective measures of quality. Mays, Pope and Popay (2005) recognized the fact that decision makers will use a variety of sources to inform their decisions, but also suggested systematic utilization of the evidence base.

Policy makers must also understand that hard evidence is not the only basis for decision making. Reeder (2004) suggests that, in addition to evidence, nine other factors come into play: lobbying, politics, non-health benefits, scale of health benefit, scale of potential harm, anecdote, logic, ease of implementation, and economic factors.

The Canadian Medical Association's Wait Time Alliance (2005) concurred with Murray and Evans' (2003) concerns about a lack of evidence for decision makers, but also warned against becoming "evidence bound" – a physician's clinical judgement should be considered equally important.

Nonetheless, physicians' views on health care are important to policy makers, as physicians and their organizations wield significant power. In Tomblin's report to the Romanow Commission (2002), he suggested "It is hard to restructure anything given the power of the medical monopoly".

Williams et al (1995) characterized relations between the organized medical professional and governments in Canada as one of regular political conflict centred on the profession's defence of it's professional autonomy. If autonomy continues to be a key factor in the relationships and conflicts between governments and physicians, then the changes occurring in the health care system are likely to raise the level of conflict and difficulty.

Policy makers have attempted to reform the health system in Canada, through various initiatives such as regionalization, primary care reform, introduction of organizational controls and technocrats, and more recently with initiatives to improve access by focusing on wait lists. However, the appropriateness and success of these initiatives is frequently questioned both in Canada and the USA.

Tuohy (1999) suggests that major changes or "policy episodes" are rare, and possible only when there are clear demands for change among all of government, public, and the health professions. The question for policy makers is therefore: What changes are being demanded by the public, which are supportable by both governments and health care professionals, when the goals of the two are so often in conflict? If consensus cannot be reached between governments and physician organizations on needed policy initiatives, will governments resort to coercion to force the types of reforms they desire? Will they be willing to live with the consequences in terms of increased stress and reduced satisfaction among physicians?

Debates over future directions for Canadian health policy are presented with discursive viewpoints of various stakeholders and power brokers, including physicians and their representative organizations. The discussions now have a growing arsenal of performance data, including the Lockhart Index of health care quality. As physicians and other political elites begin to agree upon and embrace evidence-based performance data, the policy debates should become more refined.

Clearly, objective data is not the only source of information or factor which influences the policy making process. As health care performance information capabilities expand, there is potential for evidence based policy methods to increase the emphasis on objective data.

This research project examined both physician views on health care quality, and the impact of several factors on those views, as well as objective measures of quality. Evidence-based policy development, which would rely more heavily on the latter than the former, is emerging as an important and valuable tool for public sector decision making.

The findings of this research may have important connotations to future policy decisions. Policy makers should recognize the fact that many of today's issues have an influence on physicians – on their daily work lives, their roles in the policy arena, their stress levels, and their sense of equity and satisfaction. In addition, this research has pointed out the fact that physician their views on how well the health care system is performing are influenced by all of these factors. Therefore, when considering the opinions of physicians in policy debates, policy makers should also examine the discourse and consider what factors may have influenced both physician views and preferences for policy direction.

Policy makers should also consider the potential impact on physicians as they move forward with decisions in the areas of managing growth, reforms to primary care, reorganization, organization control systems and tools for performance management.

In the future, physicians will continue to be influential players in the health care policy arenas – nationally, provincially, and within regional health care organizations. There are wide variations in physician viewpoints, and physician attitudes seem to be influenced by other factors besides sound scientific evidence. Therefore, it may be

appropriate for policy makers to consider the context specific discourse of physician viewpoints when deciding how to incorporate them into the policy analysis and decision making process.

9.0 APPENDICES

Appendix A: Physician Survey

Emerging Issues in the Work of Physicians

2004

The objectives of this survey are to seek the views of physicians across Canada regarding: 1) quality of health care; 2) roles of physicians in their communities; 3) professional equity and stress; 4) organization of medical practices; 5) career satisfaction; and 6) demographic factors.

1. The state of the health care system <u>in your community</u>.

The QUALITY of the health care system in your community is:

Very Poor	Poor	Adequate	Good	Very Good	Excellent
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

The EFFICIENCY of the health care system in your community is:

Very Poor	Poor	Adequate	Good	Very Good	Excellent
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

ACCESS to the health care system in your community is:

Very Poor	Poor	Adequate	Good	Very Good	Excellent
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

Please indicate your assessment of ACCESS to specific services in your community, *using the following scales (circle the appropriate response 0 = worst; 100 = best):*

Community-based services	(Not Applicable	0	10	20	30	40	50	60	70	80	90	100)
Mental Health services	(Not Applicable	0	10	20	30	40	50	60	70	80	90	100)
Hospital services	(Not Applicable	0	10	20	30	40	50	60	70	80	90	100)
Rehabilitation services	(Not Applicable	0	10	20	30	40	50	60	70	80	90	100)
Nursing Home services	(Not Applicable	0	10	20	30	40	50	60	70	80	90	100)

COORDINATION between the different health care services in your community is:

Very Poor	Poor	Adequate	Good	Very Good	Excellent
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

COLLABORATION among the different health professionals in your community is:

Very Poor	Poor	Adequate	Good	Very Good	Excellent
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

Please indicate your assessment of QUALITY of specific services in your community, *using the following scales (circle the appropriate response 0 = worst; 100 = best):*

Community-based services	(Not Applicable	0	10	20	30	40	50	60	70	80	90	100)
Mental Health services	(Not Applicable	0	10	20	30	40	50	60	70	80	90	100)
Hospital services	(Not Applicable	0	10	20	30	40	50	60	70	80	90	100)
Rehabilitation services	(Not Applicable	0	10	20	30	40	50	60	70	80	90	100)
Nursing Home services	(Not Applicable	0	10	20	30	40	50	60	70	80	90	100)

Which of the following health policies do you think is best for Canada? *(Please rank the policies using 1 to indicate the best; 2 for the 2nd best; and so on, to 5 for the worst health policy):*

[ ] A national health service with government owned health facilities, salaried physicians and staff
[ ] A single universal and comprehensive insurance plan with no user fees or extra billing
[ ] Universal & comprehensive insurance combined with extra charges for people not on social assistance
[ ] Competing public & private insurance plans with an adequate level of benefits in the least costly plan
[ ] Government plans limited to covering expenses which would cause financial hardship for the patient

2. Role in the Community: Physicians are typically active in a variety of roles in the community. Please indicate the roles that you are active in.

What is your involvement in:	Please check ALL that apply					
	Attend or participate	Volunteer	Provide medical expertise	Coach or Instruct	Fund-raiser	Leadership role
Sporting & Recreational Activities?	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Cultural Activities/ Art / Music / Drama?	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Religious Activities?	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Charities/Community Service Activities?	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Health Care Organizations?	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Other Professional Organizations?	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

About how much time do you spend on all your community activities in an average week?

Not Applicable [ ] | Up to 4 hours [ ] | 5 – 8 hours [ ] | 9 – 12 hours [ ] | 13 – 16 hours [ ] | 17 – 20 hours [ ] | 20 + hours [ ]

Does participation in your community activities relieve the pressures of your job?

Not Applicable [ ] | Always [ ] | Most of the time [ ] | Sometimes [ ] | Rarely [ ] | Never [ ]

Please indicate whether you wish to increase or decrease your commitments. It is possible to indicate a desire to become active in areas that you are not currently active in, *using increase or greatly increase.*

What changes would you like to make in your involvement in:	Greatly reduce	Reduce	No change	Increase	Greatly increase
Sporting & Recreational Activities?	[ ]	[ ]	[ ]	[ ]	[ ]
Cultural Activities/ Art / Music / Drama?	[ ]	[ ]	[ ]	[ ]	[ ]
Religious Activities?	[ ]	[ ]	[ ]	[ ]	[ ]
Charities / Community Service Activities?	[ ]	[ ]	[ ]	[ ]	[ ]
Health Care Organizations?	[ ]	[ ]	[ ]	[ ]	[ ]
Other Professional Organizations?	[ ]	[ ]	[ ]	[ ]	[ ]

Would you like to change the level of your leadership in community activities?

Greatly Decrease Leadership activities [ ] | Decrease Leadership activities [ ] | No change [ ] | Increase Leadership activities [ ] | Greatly Increase Leadership activities [ ] | *Not applicable* [ ]

3. PROFESSIONAL EQUITY

Professional equity is defined as the balance between the contributions of physicians and the rewards they receive. Each physician fulfills obligations: to society; to patients; and to their profession, in their own unique way as an independent practitioner. Your responses to the following statements will allow you to assess the contributions you make, the rewards you receive, and whether equity has been achieved or not achieved.

Contributions in maintaining your practice

Nature of contribution	*not applicable*	Very Low	Low	Moderately Low	Moderately High	High	Very High
The physical effort you make to keep up with your various duties as a physician is:							
The intellectual effort you make in maintaining your clinical knowledge is:							
The mental effort you make to be empathetic in the care of your patients is:							
The effort you make to complete paperwork, return phone calls and other administrative duties is:							
The investment you make for clinical equipment to maintain your practice is:							
The investment you make in qualified staff to maintain your practice is:							

Your sense of personal gratification derived from providing care to patients is:

Very Low [ ] Low [ ] Moderately Low [ ] Moderately High [ ] High [ ] Very High [ ]

Your sense of contributing to society in your various roles as a physician is:

Very Low [ ] Low [ ] Moderately Low [ ] Moderately High [ ] High [ ] Very High [ ]

The proportion of uninteresting work in your daily activities is:

Very Low [ ] Low [ ] Moderately Low [ ] Moderately High [ ] High [ ] Very High [ ]

The opportunities to use your most advanced clinical skills are:

Very Low [ ] Low [ ] Moderately Low [ ] Moderately High [ ] High [ ] Very High [ ]

The amount of choice you have over the activities you carry out or participate in is:

Very Low [ ] Low [ ] Moderately Low [ ] Moderately High [ ] High [ ] Very High [ ]

The level of your contributions to the general well-being of your community is:

Very Low [ ] Low [ ] Moderately Low [ ] Moderately High [ ] High [ ] Very High [ ]

Your sense of accomplishment from your work as a physician is:

Very Low [ ] Low [ ] Moderately Low [ ] Moderately High [ ] High [ ] Very High [ ]

At the present time, your *sense of fulfillment* for the contributions you make is:

Very Low [ ] Low [ ] Moderately low [ ] Adequate [ ] Moderately High [ ] High [ ] Very High [ ]

Financial Rewards

How well does your income reflect:	Not at all	Slightly	Partially	Moderately	Mostly	Perfectly
The time you spend on your duties?						
Your qualifications and training?						
Your responsibilities?						
The stresses of making risky decisions?						
Your years of experience?						

Your practice expenses are adequately reflected in your income.

Strongly disagree [ ] Disagree [ ] Disagree slightly [ ] Agree slightly [ ] Agree [ ] Strongly agree [ ]

The process used to determine rates of reimbursement in your province/territory is fair to you.

Strongly disagree [ ] Disagree [ ] Disagree slightly [ ] Agree slightly [ ] Agree [ ] Strongly agree [ ]

At the present time, the *financial compensation* you receive for the contributions you make is:

Very stingy [ ] Stingy [ ] Somewhat stingy [ ] Acceptable [ ] Somewhat generous [ ] Generous [ ] Very Generous [ ]

Your patients often express appreciation for the clinical care that you provide to them.

Strongly disagree [ ] Disagree [ ] Disagree slightly [ ] Agree slightly [ ] Agree [ ] Strongly agree [ ]

Your contributions to the general well-being of your community are recognized.

Strongly disagree [ ] Disagree [ ] Disagree slightly [ ] Agree slightly [ ] Agree [ ] Strongly agree [ ]

When you make an extra effort you receive recognition from your peers.

Strongly disagree [ ] Disagree [ ] Disagree slightly [ ] Agree slightly [ ] Agree [ ] Strongly agree [ ]

Nurses you work with show respect for you as a physician.

Strongly disagree [ ] Disagree [ ] Disagree slightly [ ] Agree slightly [ ] Agree [ ] Strongly agree [ ]

Administrators you work with understand the stresses you experience as a physician.

Strongly disagree [ ] Disagree [ ] Disagree slightly [ ] Agree slightly [ ] Agree [ ] Strongly agree [ ]

At the present time, the *recognition* you receive for the contributions you make is:

Very Disappointing [ ] Disappointing [ ] Somewhat Disappointing [ ] Reassuring [ ] Somewhat Gratifying [ ] Gratifying [ ] Very Gratifying [ ]

Overall, the full range of rewards you receive for all the contributions you make are:

Very Unfavourable [ ] Unfavourable [ ] Somewhat Unfavourable [ ] Fair [ ] Somewhat Favourable [ ] Favourable [ ] Very Favourable [ ]

4. Regular Working Hours per Week (excluding On Call)

Please indicate whether you would like to spend *more* or *less time* devoted to specific activities. Also, you may wish to spend time on activities that you are not currently doing (eg. teaching or research); this can be indicated by checking '*more*' or '*much more*'.

Direct Patient Care	Much less	Less	No change	More	Much more
Assessment & treatment by you alone	[ ]	[ ]	[ ]	[ ]	[ ]
Assessment & treatment in a group with you in charge	[ ]	[ ]	[ ]	[ ]	[ ]
Assessment & treatment in a group with someone else in charge	[ ]	[ ]	[ ]	[ ]	[ ]
Advising patients about their conditions	[ ]	[ ]	[ ]	[ ]	[ ]
Indirect Patient Care	Much less	Less	No change	More	Much more
Communicating care plans to other health professionals	[ ]	[ ]	[ ]	[ ]	[ ]
Charting, telephone calls & other patient related duties	[ ]	[ ]	[ ]	[ ]	[ ]
Teaching and Research	Much less	Less	No change	More	Much more
Supervising students and residents	[ ]	[ ]	[ ]	[ ]	[ ]
Lecturing and demonstrating clinical techniques	[ ]	[ ]	[ ]	[ ]	[ ]
Participating in research projects	[ ]	[ ]	[ ]	[ ]	[ ]
Maintaining Knowledge	Much less	Less	No change	More	Much more
Participating in patient care conferences/rounds	[ ]	[ ]	[ ]	[ ]	[ ]
Attending meetings/conferences related to quality	[ ]	[ ]	[ ]	[ ]	[ ]
Obtaining CME credits and/or keeping up with medical literature	[ ]	[ ]	[ ]	[ ]	[ ]
Administrative Duties	Much less	Less	No change	More	Much more
Administrative tasks associated with your practice	[ ]	[ ]	[ ]	[ ]	[ ]
Time developing or evaluating clinical programs	[ ]	[ ]	[ ]	[ ]	[ ]
Other service, organizational, or administrative duties	[ ]	[ ]	[ ]	[ ]	[ ]

Please indicate the approximate percentage of time you now spend on these activities.		
	Direct Patient Care	%
	Indirect Patient Care	%
	Teaching and Research	%
	Maintaining Knowledge	%
	Administrative Duties	%
		100 %

Approximately how many hours do you work per week (excluding on call)?	

5. On-Call & Call Backs

	None	1-2 per month	3-4 per month	5-6 per month	7-8/ month	9-12/ month	13-17/ month	18+ / month
How many WEEKDAY evenings (Mon-Fri) are you On-Call in an average month?	☐	☐	☐	☐	☐	☐	☐	☐

	None	one	two	3 or 4	5 or 6	7 or 8
How many SATURDAYS OR SUNDAYS in an average month are you On-Call?	☐	☐	☐	☐	☐	☐

Of the evenings you are On-Call what % do you **not get called at all?**	%	Of the evenings you are On-Call what % do you handle by phone?	%	Of the evenings you are On-Call what % do you **Attend in person?**	%

6. Stress and support in your work

How frequently do you:	Never	A few times a year	Once a month	2 –3 times a month	Once a week	2 – 3 times a week	Every day
Feel really good because a patient has recovered from a serious illness?	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Have workdays when you can devote enough time to all of your patients?	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Experience frustration dealing with demanding patients?	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Get relief from another physician?	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Have workdays which are so busy that you are physically exhausted at the end of the day?	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Have a break that relieves the pressures of your workday?	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Feel frustrated accessing facilities/services for patients?	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Sleep soundly at night without worrying about your job responsibilities?	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Feel that your work has desensitized your feelings/ emotions?	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Feel depressed because of the death or serious illness of a patient?	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Have such demanding workdays that you are emotionally drained at the end of the day?	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Feel excited about the work that you do?	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Experience conflict between responsibilities at work and at home?	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Feel that you are in control of your day-to-day working activities?	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

How would you rate your level of stress?	Very low ❑	Low ❑	Moderate ❑	High ❑	Very High ❑
How would you rate your level of health?	Very poor ❑	Poor ❑	Fair ❑	Good ❑	Very Good ❑

7. Please indicate how you manage stress in your work

How frequently do you:	Never	A few times a year	Once a month	2 –3 times a month	Once a week	2 – 3 times a week	Every day
Take time to review the tasks of your day and plan accordingly?	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Set aside some time for specific activities of professional interest?	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Maintain an optimistic attitude, throughout the workday?	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Discuss issues and problems with staff?	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Express impatience when people do not respond to requests as quickly as they should have?	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Pause for a relaxing break during the workday?	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Eat a nutritious lunch sometime during the workday?	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Take time to pursue professional activities of special interest?	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Engage in physical exercise?	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Cancel a personal or social activity in order to meet work commitments?	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Express anger when people at work make mistakes?	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Approach *difficult tasks* as opportunities to learn and develop skills?	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Spend time keeping up or advancing your clinical knowledge or skills?	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

When you need to talk about a problem there are colleagues available who can give you sound advice.

Strongly Disagree	Disagree	Disagree slightly	Agree slightly	Agree	Strongly Agree
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

A colleague is willing to take on extra work so that you can take time for special training or CME.

Strongly Disagree	Disagree	Disagree slightly	Agree slightly	Agree	Strongly Agree
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

If you needed a week off to attend to special needs a colleague would fill in for you.

Strongly Disagree	Disagree	Disagree slightly	Agree slightly	Agree	Strongly Agree
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

How would you rate your ability to cope with stress?	Very poor	Poor	Fair	Good	Very Good
	❑	❑	❑	❑	❑

8. Please describe your practice arrangements

Indicate the location of your office(s), *using 1 for main & 2 for a secondary office*

- [ ] Home-based practice
- [ ] Converted residence
- [ ] Office Building/Tower
- [ ] Shopping Centre/Strip Mall
- [ ] Hospital Office
- [ ] Rehabilitation Centre
- [ ] Nursing Home
- [ ] Health Centre/Community Clinic
- [ ] Government office or Other_____

How many physicians are in your main practice setting?_____

How many years have you been practicing medicine? [ ]

Main Setting *Check more than one, if applicable)*	**Secondary Setting** *Check more than one, if applicable)*
[ ] Solo Practice	[ ] Solo Practice
[ ] Physician Group	[ ] Physician Group
[ ] University Group	[ ] University Group
[ ] Hospital-based	[ ] Hospital-based
[ ] Local Community Group	[ ] Local Community Group
[ ] Health Region/District	[ ] Health Region/District
[ ] Other_____	[ ] Other_____
Main Arrangement	**Secondary Arrangement**
[ ] Solo Practice	[ ] Solo Practice
[ ] Individual revenues & expenses	[ ] Individual revenues & expenses
[ ] Share expenses	[ ] Share expenses
[ ] Share revenues & expenses	[ ] Share revenues & expenses
[ ] On contract	[ ] On contract
[ ] Salaried	[ ] Salaried
[ ] Locum	[ ] Locum
[ ] Other_____	[ ] Other_____

How many patients do you see in an average week?

Regular Hours [ ]
On Call [ ]

Of ALL the patients you see in an average week, approximately what percent have:

ROUTINE conditions, given your specialty	%
COMPLEX conditions, given your specialty	%
SERIOUS personal/family problems (drug abuse, battering etc)	%
BOTH complex medical conditions & serious personal/family problems	%
	100 %

What percentage of your remuneration comes from the following methods?

Fee-for-service	%
Salary	%
Capitated rate per patient	%
Sessional	%
Other_____	%
	100 %

9. Managing your practice

Please indicate how each of the following functions are handled in your practice.

Does your main practice:	*Not applicable in my practice*	Not done	Yes, informally	Yes, using a formal process	Yes, in a hospital, chronic care, or regional facility
Conduct meetings to discuss administrative issues?	[ ]	[ ]	[ ]	[ ]	[ ]
Review or establish a strategic plan at least once a year?	[ ]	[ ]	[ ]	[ ]	[ ]
Review and establish a budget for your practice at least once a year?	[ ]	[ ]	[ ]	[ ]	[ ]
Evaluate the performance of employees at least annually?	[ ]	[ ]	[ ]	[ ]	[ ]
Evaluate the efficiency of operations on least once a year?	[ ]	[ ]	[ ]	[ ]	[ ]
Conduct meetings to discuss clinical issues?	[ ]	[ ]	[ ]	[ ]	[ ]
Evaluate the quality of services to patients at least once a year?	[ ]	[ ]	[ ]	[ ]	[ ]

Would you like the management in your main practice to become more or less formal?

Much more formal	More formal	No changes	Less formal	Much less formal	*Not Applicable*
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

Please indicate who makes the following decisions in your practice.

Who makes the decisions in your main practice with respect to:	A receptionist with administrative duties	A nurse	A physician	Physicians as a group	An Office Manager	*Hospital , chronic care or regional administrator*
Taking on new physicians?	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Hiring non-medical staff?	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Setting the pay rates of staff?	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Purchasing office supplies?	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Purchasing medical equipment?	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Selecting clinical services (i.e. lab services, x-rays, etc.)?	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Facility financing decisions (i.e. renewing lease or mortgage)?	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

Do you have sufficient influence over decisions made in your main practice setting?

Not Applicable	Far too little influence	Too little influence	The right amount of influence	Too much influence	Far too much influence
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

10. Career Satisfaction

Please indicate your level of satisfaction with the following aspects of your medical career

How satisfied are you with:	Very Dissatisfied	Dissatisfied	Somewhat Dissatisfied	Somewhat Satisfied	Satisfied	Very Satisfied
Your interactions and relationships with other physicians?	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
The doctor-patient relationships derived from providing patient care?	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
The diversity of patients you see (age, types of clinical conditions, etc)?	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Your success in meeting the needs of your patients?	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Your ability to access resources needed to treat your patients?	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Your capacity to keep up with advances in your clinical speciality?	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Your role in organizing treatment programs for patients in your community?	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Your interactions and relationships with nurses?	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Your interactions and relationships with health care administrators?	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Your authority to get your clinical decisions carried out?	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Your ability to control your work schedule?	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Your ability to keep responsibilities at work from intruding on your personal life?	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Your ability to maintain satisfying activities in the community (service, culture, church, etc.)?	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Your career advancement in medicine?	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Your earnings as a physician during your medical career?	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
The way your medical practice is managed?	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Your social and leisure activities?	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Your medical career, considering your various roles and responsibilities**?**	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

How do you feel about your life as a physician?

Terrible	Unhappy	Mostly Dissatisfied	Equally satisfied & dissatisfied	Mostly Satisfied	Pleased	Delighted
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

11. Health Policy

Should health care continue to be funded by **publicly administered comprehensive** health insurance plans provided to all residents in each province and territory of Canada?

[ ] Definitely, the current system functions well
[ ] Probably, however, there are some problems in the current system that must be fixed
[ ] Maybe the problems in the current system are so great that other systems might be better
[ ] Probably not, other systems are likely to be superior to the current system
[ ] Definitely not, other systems are superior to the current system

To ensure accountability to their local region, **regional health boards/authorities** should exercise **greater financial control** over the funding of health care services.

Strongly agree	Agree	Agree slightly	Disagree slightly	Disagree	Strongly disagree	*Don't know*
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

To ensure national health care standards, the **Federal government** should exercise **greater financial control** over the funding of health care services.

Strongly agree	Agree	Agree slightly	Disagree slightly	Disagree	Strongly disagree	*Don't know*
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

2. Demographics

Main area of specialization

What is your age? ☐

☐ Female ☐ Male

Marital Status

☐ Single
☐ Married/Common Law
☐ Separated/Divorced
☐ Widowed
☐ Other_____

If living with a partner, how many days a week does that person work outside the home?

☐ On a full-time basis
☐ 3 or 4 days per week
☐ 1 or 2 days per week
☐ Less than 1 day per week

Do any dependent children live with you?

No ☐ Yes ☐

List the ages of ALL your dependent children

___,___,___,___,___,___,___,___

Do any dependent adults, excluding partner, live with you? ☐ *No* ☐ *Yes*

Ages of dependent adults

____,____,____,____

What issues should be covered in follow-up surveys?

Thank you for taking the time and effort to complete this survey. The results will be analysed and reported in broad groups. Your identity will be held in strictest confidence.

Appendix B: Descriptions of Performance Measures – Objective Index

30 day Acute Myocardial Infarction (AMI) in-hospital mortality rate: The risk adjusted rate of all cause in-hospital death occurring within 30 days of first admission to an acute care hospital with a diagnosis of AMI. Rates for Newfoundland, British Columbia and Quebec regions are not available due to differences in coding of AMI (Newfoundland), Emergency Room admissions (BC), and diagnosis type (Quebec).

30 day Stroke in-hospital mortality rate: The risk adjusted rate of all cause in-hospital death occurring within 30 days of first admission to an acute care hospital with a diagnosis of stroke. Rates for British Columbia and Quebec are not available due to differences in coding of Emergency Room admissions (BC) and diagnosis type (Quebec).

Ambulatory care sensitive conditions: Age-standardized acute care hospitalization rate for conditions where appropriate ambulatory care prevents or reduces the need for admission to hospital, per 100,000 population. While not all admissions for ambulatory care sensitive conditions are avoidable, it is assumed that appropriate prior ambulatory care could prevent the onset of this type of illness or condition, control an acute episodic illness or condition, or manage a chronic disease or condition. The "right" level of utilization is not known although a disproportionately high rate is presumed to reflect problems in obtaining access to primary care.

Acute Myocardial Infarction (AMI) readmission rate: The risk adjusted rate of unplanned readmission following discharge for Acute Myocardial Infarction (AMI). A

case is counted as a readmission if it is for a relevant diagnosis and occurs within 28 days after the index AMI episode of care. An episode of care refers to all contiguous in-patient hospitalizations and same-day surgery visits. Rates for Newfoundland are not available due to differences in coding of AMI admissions. Rates for Quebec and Manitoba are not available due to differences in data collection. Rate for Nunavut is not available due to incomplete data submission.

Asthma readmission rate: The risk adjusted rate of unplanned readmission following discharge for Asthma. A case is counted as a readmission if it is for a relevant diagnosis and occurs within 28 days after the index episode of care. An episode of care refers to all contiguous in-patient hospitalizations and same-day surgery visits. Rates for Quebec and Manitoba are not available due to differences in data collection.

In-hospital Hip fracture: Risk-adjusted rate of in-hospital hip fracture among acute care inpatients age 65 years and older, per 1,000 medical and surgical discharges. Proposed by the Agency for Healthcare Research and Quality (AHRQ) and based on the Complications Screening Program, this indicator represents a potentially preventable complication resulting from an inpatient stay in an acute care facility. Variation in the rates may be attributed to numerous factors, including hospital processes, environmental safety, and availability of nursing care. High rates may prompt investigation of potential quality of care deficiencies.

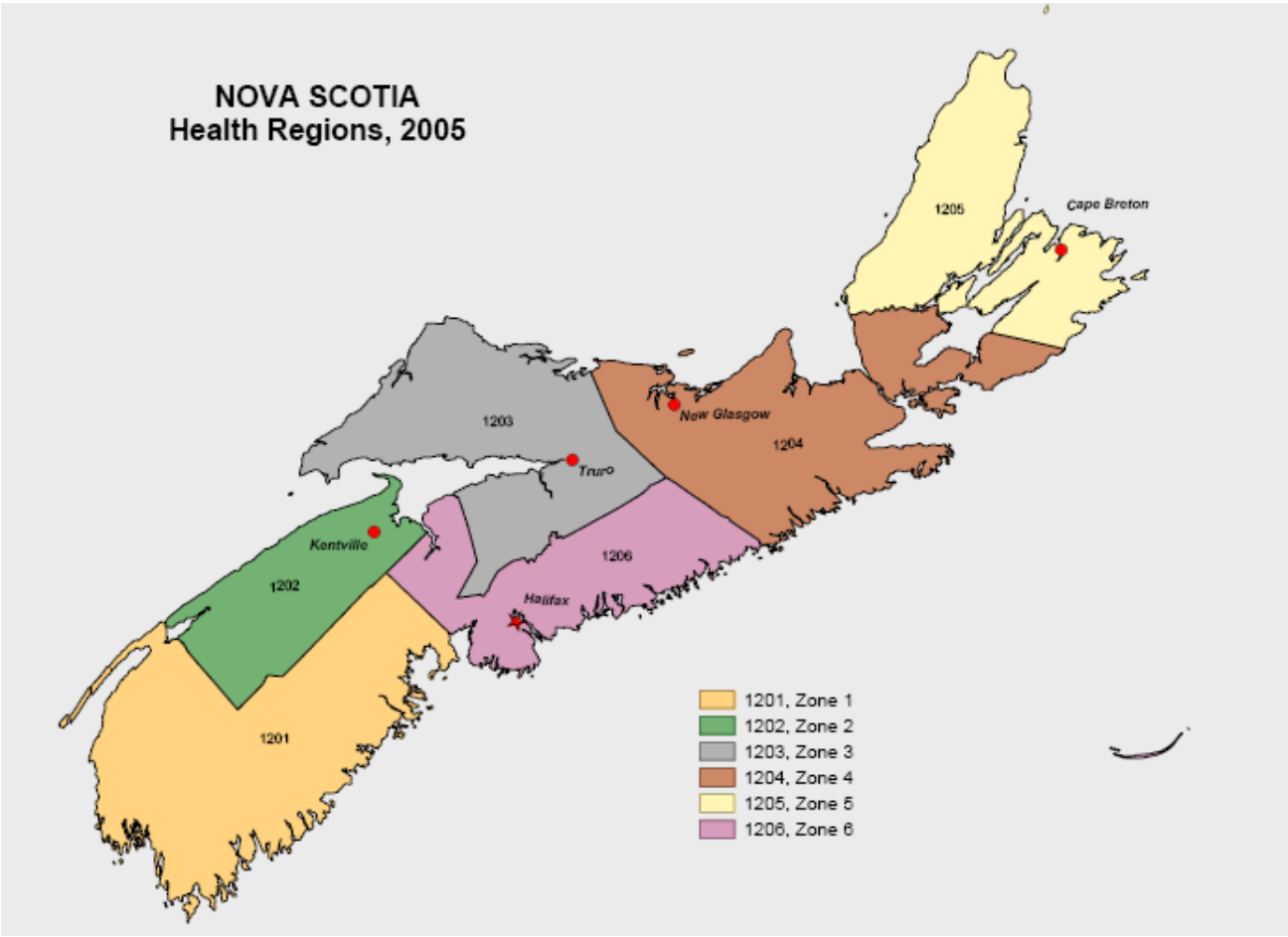
Caesarean sections Proportion of women delivering babies in acute care hospital by caesarean section. Due to characteristics of the database, stillbirths are excluded from the denominator.

Hysterectomy readmission rate: The risk adjusted rate of unplanned readmission following discharge for Hysterectomy. A case is counted as a readmission if it is for a relevant diagnosis and occurs within 7 or 28 days after the index episode of care. An episode of care refers to all contiguous in-patient hospitalizations and same-day surgery visits. Rates for Quebec and Manitoba are not available due to differences in data collection.

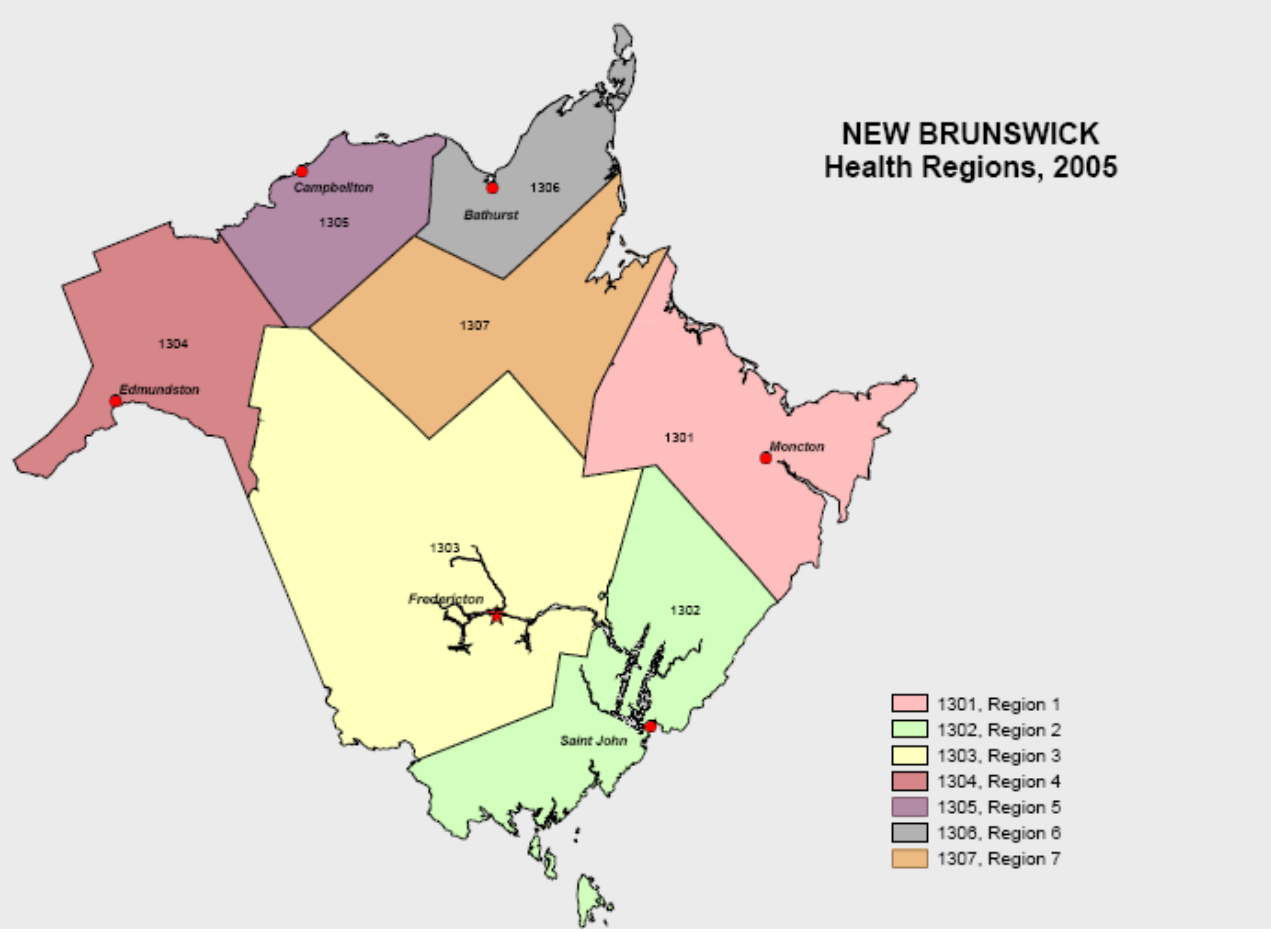
Prostatectomy readmission rate: The risk adjusted rate of unplanned readmission following discharge for Prostatectomy. A case is counted as a readmission if it is for a relevant diagnosis or procedure and occurs within 28 days after the index episode of care. An episode of care refers to all contiguous in-patient hospitalizations and same-day surgery visits. Rates for Quebec and Manitoba are not available due to differences in data collection.

Appendix C: Health Region Maps

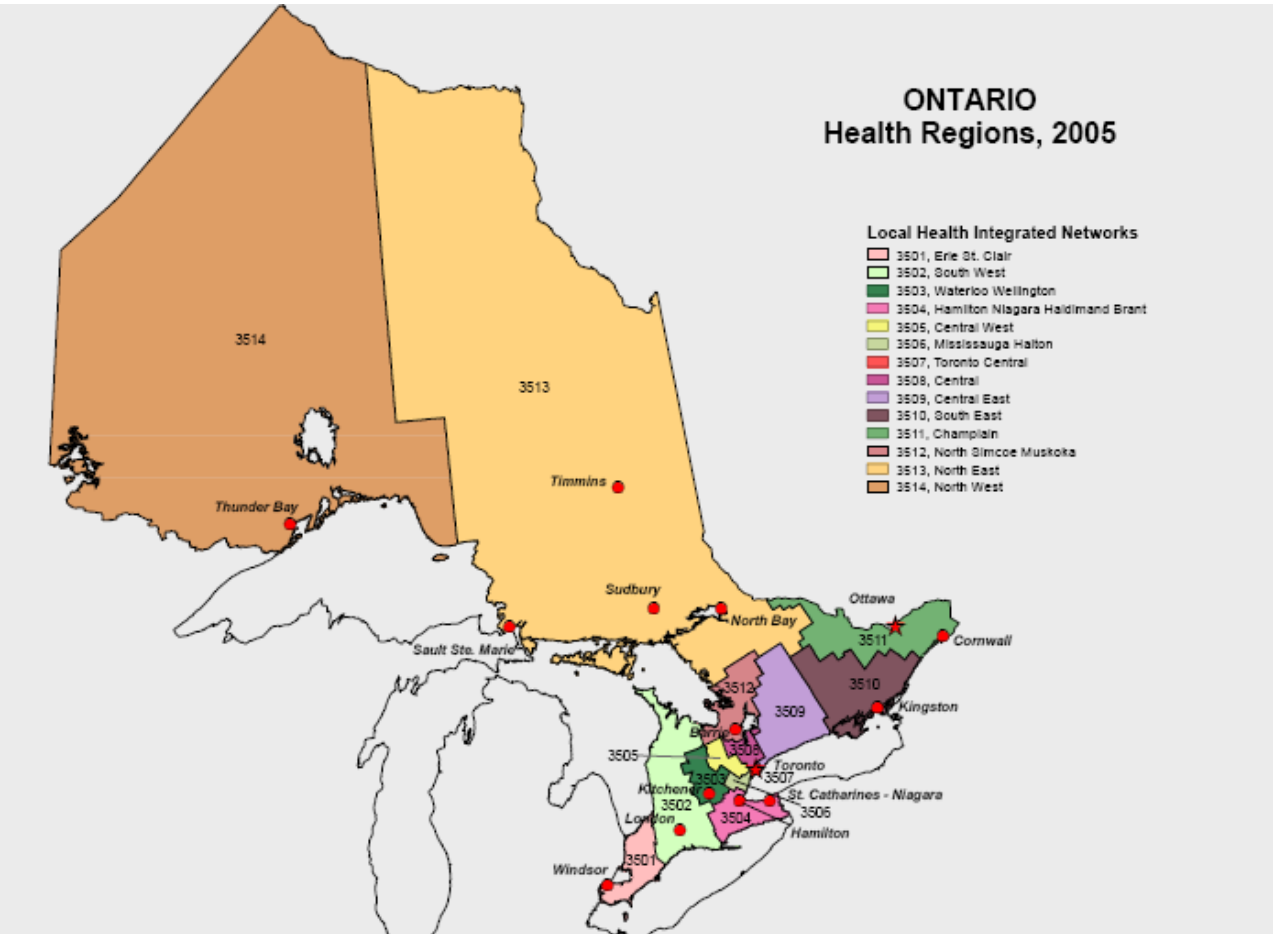
Map #1: Nova Scotia Health Regions



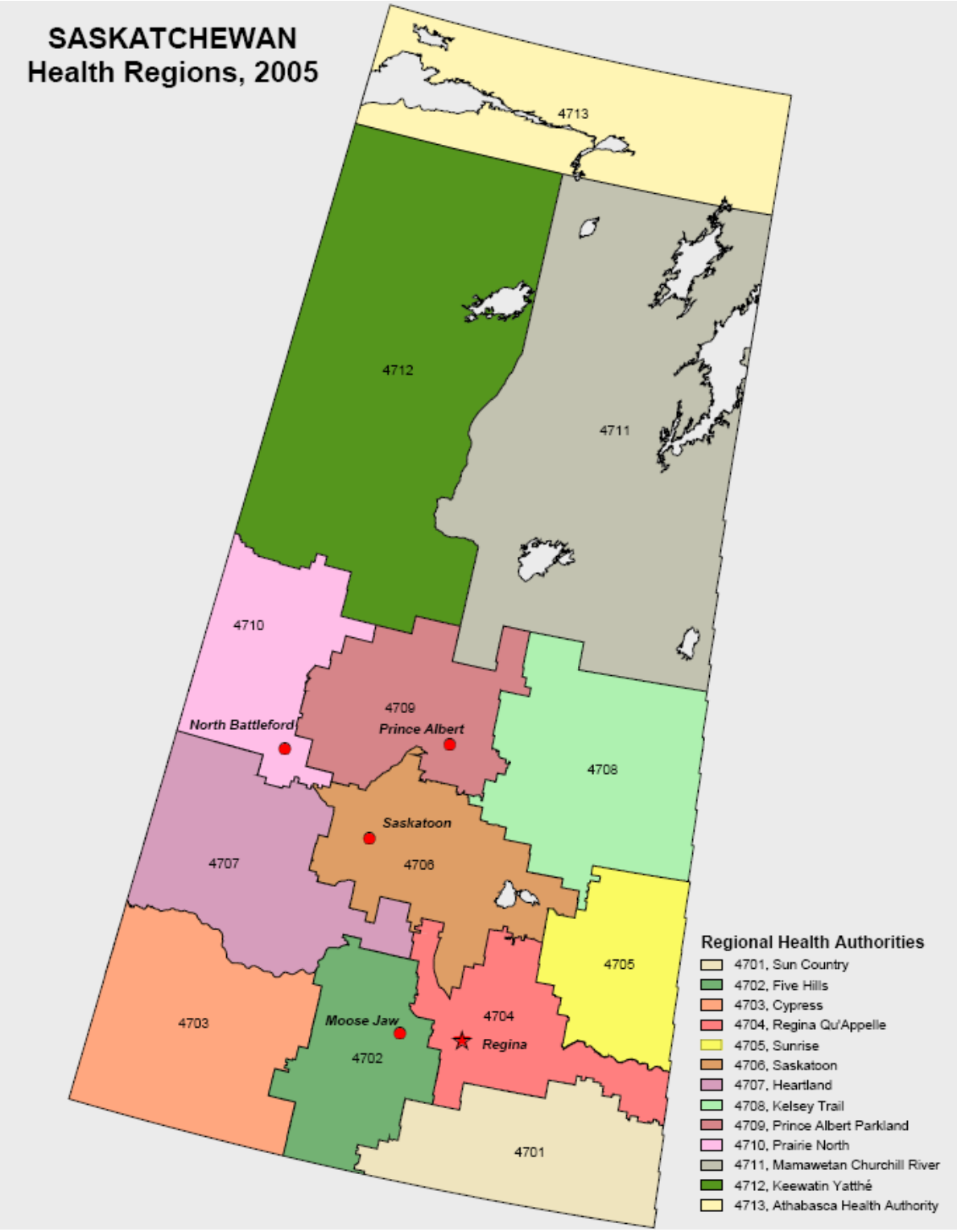
Map #2: New Brunswick Health Regions



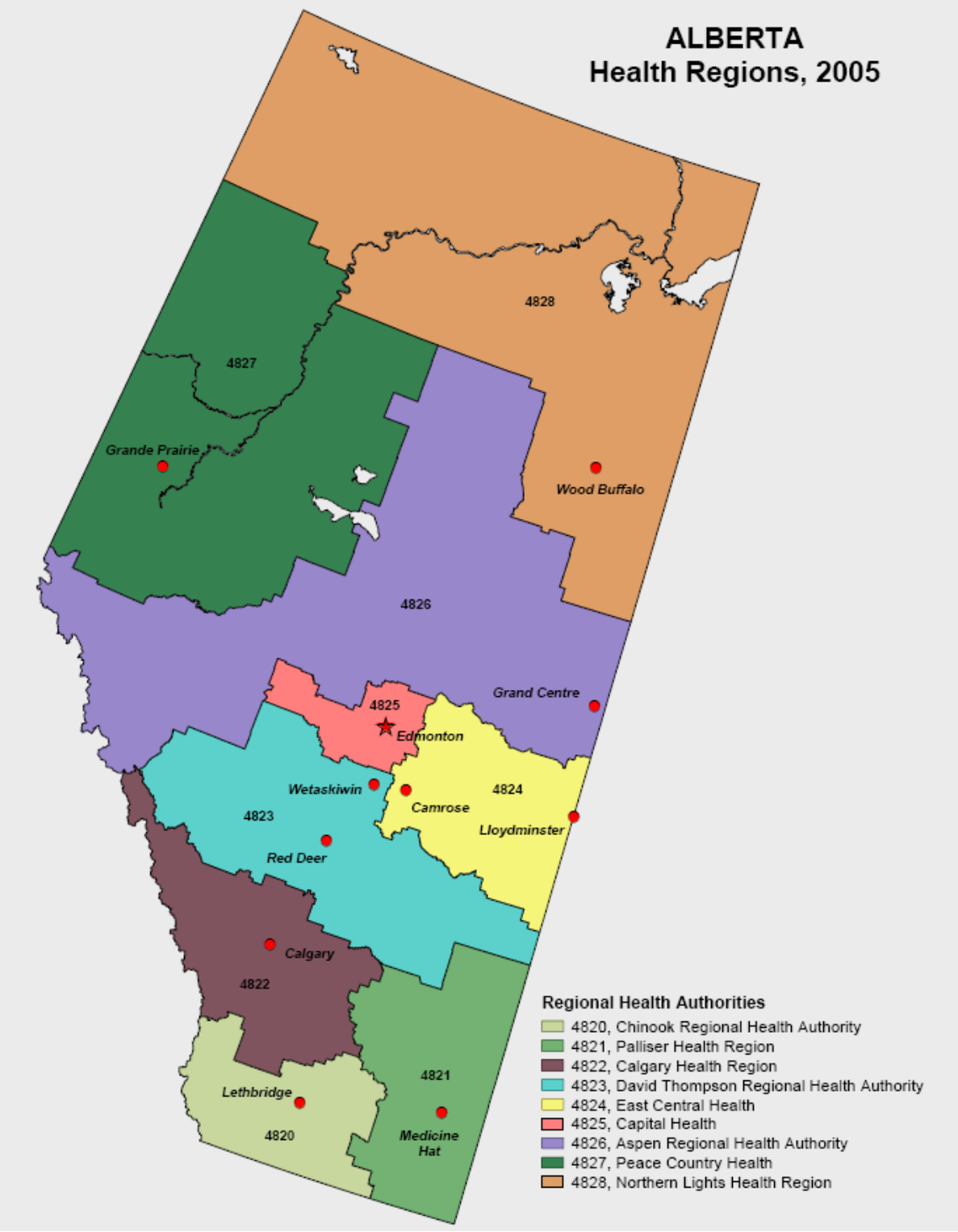
Map #3: Ontario Health Regions



Map #4: Saskatchewan Health Regions



Map #5: Alberta Health Regions



10.0 Works Cited

Arnetz, B. "Psychosocial challenges facing physicians of today" Social Science and Medicine 52 (2001) 203-213

Arrow, K. "Uncertainty and the Welfare Economics of Medical Care" The American Economic Review V53, #5, December 1963 p941-973.

Agency for Healthcare Research and Quality (AHRQ), web site http://www.ahcpr.gov/qual/nhqr02/premeasures.htm Viewed July 29, 2004

Agency for Healthcare Research and Quality (AHRQ), "State Snapshots 2005, from the National Healthcare Quality Report" March 2006, Rockville, MD http://www.qualitytools.ahrq.gov/qualityreport/2005/state Viewed July, 2006

Ashworth, M., Armstrong, D. "The relationship between general practice characteristics and quality of care: a national survey of quality indicators used in the UK Quality and Outcomes Framework, 2004-05" BMC Family Practice, 2006, 7:68 viewed at http://www.biomedcentral.com/1471-2296/7/68 December 12, 2006.

Bergman, B., F. Ahmad and D. E. Stewart, "Physician health, stress and gender at a university hospital" Women's Health Program, University Health Network, Toronto, ON, Canada b University of Toronto, Toronto, Canada Journal of Psychosomatic Research Volume 54, Issue 2 , February 2003, Pages 171-178

Berwick, D. Presentation to the 17th Annual Forum on Quality Improvement in Health Care, Institute for Health Improvement December 12, 2005, Orlando Fla

Biller-Andorno, N., Lenk, C., Leititis, J., "Ethics, EBM, and hospital management" Journal of Medical Ethics 2004;30:136-140

Bradley, E., Herrin, J., Elbel, B., McNamara, R., Magid, D., Nallamothu, B., Wang, Y., Normand, S., Spertus, J., Krumholz, H. "Hospital Quality for Acute Myocardial Infarction: Correlation Among Process Measures and Relationship With Short-term Mortality" Journal of the American Medical Association Vol 296, #1 July 5, 2006

Brewer, G., Coelman Selden, S. "Why Elephants Gallop: Assessing and Predicting Organizational Performance in Federal Agencies" Journal of Public Administration Research and Theory Oct 2000 v10 i4 p685

Bueckert, D. "Where's the fix? health providers ask a year after the health accord signed" Saskatoon Star Phoenix September 15, 2005

Burdi, M., Baker, L. "Physicians' perceptions of autonomy and satisfaction in California" Health Affairs. Chevy Chase Jul/Aug 1999 V 18 Issue 4 p134

Burke, M; Stevenson, H "Fiscal Crisis and Restructuring in Medicare: The Politics of Health in Canada" Health and Canadian Society Vol 1 No 1 1993

Canadian Institute for Health Information: Health Expenditures 1975 – 2005 Ottawa, 2005. http://secure.cihi.ca/cihiweb/dispPage.jsp?cw_page=media_07dec2005_e

Canadian Institute for Health Information Health Indicators 2005 Canadian Institute for Health Information and Statistics Canada, Ottawa, 2005

Churchill, G., Jr. Marketing Research: Methodological Foundations (5th) edition 1991; Dryden Press Chicago: Chapter 12, Collecting the Data & Field Procedures-Nonsampling Error, pages 622-626.

Collins-Nakai, R. Address To The Empire Club Of Canada "Better Health - Better Canada" Dr. Ruth Collins-Nakai, President Canadian Medical Association CMA Website: http://www.cma.ca/index.cfm/ci_id/45751/la_id/1.htm Toronto, October 6, 2005

Conference Board of Canada Healthy Provinces, Healthy Canadians: A Provincial Benchmarking Report Ottawa, February 2006.

Cunningham, L. The Quality Connection in Health Care: integrating Patient Satisfaction and risk Management Jossey-Bass, San Fransisco, 1991

Dawood, M., "Patient centred care: lessons from the medical profession: emergency nurse practitioners can learn valuable lessons from the medical profession's experience of patient centred care" Emergency Nurse, April 2005 v13 i1 p22(6)

De Greene, K. ed. A Systems-Based Approach to Policymaking Boston: Dordrech, London: Kluwer Academic Publishers, 1993.

Denis, J. "Governance and Management of Change in Canada's Health System" Commission on the Future of Health Care in Canada, DP#36, 2002.

Dillman, D. Telephone, Internet & Mail Surveys 2nd edition 2000;Wiley & Sons, New York.

Dobson, R., Lepnurm, R., & Struening, E. "Developing a scale for measuring professional equity among physicians" Social Science and Medicine 2005; 61(3):263-266

Donabedian, A. Explorations in quality assessment and monitoring. Vol 1. The definition of quality and approaches to its assessment Health Administration Press, Ann Arbor, Mich, 1980

Eubanks, P. "CEOs help physicians cope with growing professional stress" Hospitals August 20, 1992 v66 n16 p40.

Flood, C., Lewis, S. "Courting Trouble: The Supreme Court's Embrace of Private Health Insurance" Healthcare Policy V1 # 1 September 2005 Longwoods Publishing

Freeman, T. "Using performance indicators to improve health care quality in the public sector: a review of the literature" Health Services Management Research, 2002, V15 p126-137

Freshman, B., Rubino, L. "Emotional intelligence: a core competency for health care administrators" The Health Care Manager, June 2002 v20 i4 p1(9)

Fyke, K. "Caring for Medicare: Sustaining a Quality System" Commission on Medicare, Saskatchewan, April 2001

Giordano, B. "Pew Health Professions Commission task force releases policy considerations for reforming health care workforce regulation" AORN Journal Feb 1996 v63 n2 p343(4)

Government of Canada, Treasury Board Secretariat Results for Canadians: A Management Framework for the Government of Canada Ottawa, 2000

Government of Saskatchewan, Department of Finance: Public Accounts 1960 – 2004.

Green, M. "Performance Evaluation Frameworks for vertically integrated health care systems: Shifting paradigms in Canada" . UVIC School of Health Information Science, Victoria, 2003

Grit, K., Dolfsma, W. "The dynamics of the Dutch health care system – a discourse analysis" Review of Social Economy, Sept 2002 v60 i3 p377

Hafferty, F., Light, D. "Professional Dynamics and the Changing Nature of Medical Work" Journal of Health and Social Behaviour V35 1995 p132

Hair, J., Black, W., Babin, B., Anderson, R., Tathan, R. Multivariate Data Analysis: Sixth Edition pp 80-81 Pearson – Prentice Hall, Upper Saddle River, New Jersey, 2006.

Halparin, E. Dr. "IMAGINE: how a dyed-in-the-wool, previously opted-out, no benefits, fee-for-service physician came to understand the value of primary care reform" Primary Care Reform - Reshaping Health Care in Canada Canadian Medical Association 2004

Health Canada, "Population Health Approach" December 15, 2005 http://www.phac-aspc.gc.ca/ph-sp/phdd/case_studies/appendix_1/analysis.html

Health Quality Council of Saskatchewan Room For Improvement: Setting Priorities for Making Saskatchewan Health Care Better March 2003

Health Quality Council of Saskatchewan, "The Headlines Can Be Alarming … But Here's Some Good News" Saskatchewan Chronic Disease Management Collaborative, March 2007

Hirsch, G. "Health Care Reform and Physician Stress" Physician Executive Feb 1996 v22 n2 p31.

Hurtado, M., Swift, E., Corrigan, J. Editors, Envisioning the National Health care Quality Report Institute of Medicine, Washington, 2001. pp12

Iron, K. "Moving toward a better health data system for Ontario" April, 2006 Institute for Clinical Evaluative Sciences, Ontario. Viewed at http://www.ices.on.ca/file/Moving_towards_a_better_health_care_system_apr06.pdf

Institute for Health Improvement, Website viewed at http://www.ihi.org/ihi/about

Interior Health Authority (British Columbia) "Status at a Glance – Performance Measures and Expectations" October 21, 2004 viewed at http://www.interiorhealth.ca/NR/rdonlyres/C64B1633-DC83-4926-A2B8-EF1101691980/1863/PerformanceMeasuresExpectations_2003_04preliminary.pdf

Jha, A., Li, S., Orav, E. Epstein, A. "Care in U.S. Hospitals – The Hospital Quality Alliance Program" New England Journal of Medicine 353:3 July 21, 2005 www.nejm.org

Johnson, D. Thinking government: public-sector management in Canada 2002 Broadview Press Peterborough, Ontario p596

Karasek, R., Theorell, T. Healthy Work: Stress, Productivity, and the Reconstruction of Working Life Basic Books, Inc, New York, 1990 pp2-7 &142-4.

Konrad, T., Williams, E., Linzer, M., McMurary, J., Pathman, D., Gerrity, M., Schwartz, M., Scheckler, W., Van Kirk, J., Rhodes, E., Douglas, J., "Measuring Physician Job Satisfaction in a Changing Workplace and a Challenging Environment" Medical Care 37(11) p1174-1182 November 1999

Lake, T., Devers, K., Brewster, L., Casalino, L. "Something old, something new: recent developments in hospital-physician relationships" Health Services Research February 2003 V38 i1 p477

Lamarche, P. "Choices for Change: The Path for Restructuring Primary Healthcare Services in Canada" Canadian Health Services Research Foundation, 2003

Lamarche, P. Presentation to Global Meeting On Future Strategic Directions For Primary Health Care Madrid, Spain (27-29 October 2003)

Landon, B. "Career Satisfaction Among Physicians" Journal of the American Medical Association 291(5) p634 4 February 2004

Larsen Soles, T., "A Strategic Plan for Eliminating Rural Hospital Services Through the Process of Regionalization" Canadian Journal of Rural Medicine, Spring 2005 10(2):107-8

Lavis, J. "Political Elites and Their Influence on Health-Care Reform in Canada" Commission on the Future of Health Care in Canada, Discussion Paper No. 26, 2001

Ledrou, I. Personal Correspondence. Statistics Canada Project Leader, Data Access Unit, Population Health Surveys, Health Statistics Division, December 20, 2005.

Lepnurm, R., Dobson, R., & Backman, A. "If the Pillars are Shaky, Does Faith in Medicare Crumble?" HealthCare Management Forum 2003;16(1):11-16.

Lepnurm, R., Dobson, R., Backman, A. "Predictors of career and performance satisfaction for physicians in Canada" Presented to Canadian Association for Health Services Policy Research Inaugural Conference, May 26, 2004

Lepnurm, R., Dobson, R., Backman, A., Keegan, D. "Factors explaining career satisfaction among psychiatrists and surgeons in Canada" Canadian Journal of Psychiatry, Vol 51(4):63-75 2006.

Lepnurm, R., Dobson, R., Backman, A., Keegan, D. "Factors Associated with Career Satisfaction among GPs in Canada" Canadian Journal of Rural Medicine (under review, 2006)

Lewis, S. "Physicians: It's in Your Court Now" Canadian Medical Association Journal August 2, 2005 173(3): 275-77

http://www.longwoods.com/product.php?productid=17616&page=1

Lewis, S., Kouri, D. "Regionalization: Making Sense of the Canadian Experience" in Healthcare Papers: New Models for the New Healthcare Longwoods Publishing, 2004

Mackinnon, J. "The Arithmetic of Health Care" Policy Matters 5, no.3. Montreal: Institute for Research on Public Policy

Mannion, R., Goddard, M., Smith, P. "On the Limitations and Pitfalls of Performance Measurement Systems in Health Care" Quality in Health Care: Strategic issues in health care management Editors: Davies, H. Tavakoli, M. Malek, M. 2001 Ashgate Publishing, Burlington Vt.

Maor, S. "NHS data are not good enough to gauge doctors' performance" BMJ 2006:333;937. Viewed Nov 3, 2006 at http:///bmj.com/cgi/content/full/333/7575/937-b

Mathews, M., Edwards, A., "Having a Regular Doctor: Rural, Semi-Urban and Urban Differences in Newfoundland" Canadian Journal of Rural Medicine, Summer 2004 9(3):166-72

Mays, N., Pope, C., Popay, J. "Systematically reviewing qualitative and quantitative evidence to inform management and policy-making in the health field" Journal of

Health Services Research and Policy Special Edition: Synthesizing evidence for management and policy-making V10 #3 Supplement July 2005

Mazankowski, D. A Framework for Reform: Report of the Premier's Advisory Council on Health Alberta Health, 2001

Mercer, G. "Health Services in Canada" Health Services Performance: Effectiveness and Efficiency Long, A., Harrison, S. Editors Croom Helm, Dover NH, 1985.

Murray, C., D. Evans "Health Systems Performance Assessment: Goals, Framework and Overview" Health Systems Performance Assessment: Debates, Methods and Empiricism Murray, C. and Evans, D. Editors, World Health Organization, Geneva, 2003.

National Primary Health Care Conference: "A Thousand Points Of Light? Moving Forward On Primary Health Care: A Synthesis of the key themes and ideas from the National Primary Health Care Conference" Winnipeg, Manitoba May 16-19, 2004

Organization for Economic Co-operation and Development: The OECD Health Project: Towards High-Performing Health Systems 2004

Ontario Hospitals Association and Canadian Institute for Health Information, "Hospital Report 2006" viewed at http://www.hospitalreport.ca/downloads/2006/AC/acute_report_2006.pdf

Persaud, D., Nestman, L. "Opening Up the Black Box of Performance Measurement" Healthcare Management Forum 2002 15(4):29-31.

Pitterman, L., Koritsas, S., "General Practitioner – Specialist Relationship" Internal Medicine Journal 2005, Volume 35 Page 430-434.

Poses, Dr. Roy M. "Better Than Traditional "Eminence" – Based Medicine" in the Medscape Roundtable Discussion: "Does Evidence-Based Medicine Diminish the Physician's Role?" Medscape Med Students, 2007; 9(1) January 5, 2007.

Priest, L. "Ruling opens door for hip operations in US" Globe and Mail Monday, October 3, 2005 Posted at 7:13 AM EDT http://www.theglobeandmail.com/servlet/story/RTGAM.20051003.wxhip04a/BNStory/specialScienceandHealth/

Pugh, D. "Dashboards and Scorecards: Tools for Creating Alignment" The Healthcare Quality Book: Vision, Strategy and Tools Ramson, Joshi and Nash, Editors. AUPHA Health Administration Press, Chicago, 2005

Rathwell, T., Persaud, D. "Running To Stand Still: Change and Management in Canadian Healthcare" Healthcare Management Forum 2002, 15(3):10-17.

Ravalia, M. "Whither Primary Health Care?" Primary Care Reform Canadian Medical Association 2004

Reeder, B. "Efforts to Provide Evidence for Health Policy Decisions" Presentation to MBA867 Class, University of Saskatchewan, March 4, 2004

Reinhardt, U. Presentation to the National Conference on Quality and Safety in Health Care, November 2001. Quoted in Torpy, J. Goldsmith, M "Raising health care quality: Process, measures and system failure" Medical News & Perspectives, Journal of the American Medical Association Jan 9 2002 v287 i2 p177

Rider, E., Perrin, J. "Performance profiles: the influence of patient satisfaction data on physicians' practice" Pediatrics May 2002 V109 i5 p752

Rode, M., Rushton, M. "Options for Raising Revenue for Health Care" Commission on the Future of Health Care in Canada, Discussion Paper No. 9, 2002

Romanow, R. "Building on Values: The Future of Health Care in Canada" Commission on the Future of Health Care in Canada, 2002

Rundall, T. "The Sisyphean Challenge: Health Services Integration" Quality in Health Care: Strategic issues in health care management Editors: Davies, H. Tavakoli, M. Malek, M. Burlington Vt : Ashgate Publishing 2001

Saturno, P., Palmer, R., Gascon, J., "Physician attitudes, self-estimated performance and actual compliance with locally peer-defined quality evaluation criteria" International Journal for Quality in Health Care Volume 11, Number 6, 1999 p487-496.

Schacter, M. "What Will Be, Will Be The Challenge of Applying Results-based Thinking to Policy" Institute On Governance Ottawa, Canada 2002 www.iog.ca

Schoen, C., Osborn, R., Huynh, P., Doty, M., Peugh, J., Zapert, K. "On The Front Lines Of Care: Primary Care Doctors' Office Systems, Experiences, And Views In Seven Countries" Health Affairs, Web Exclusive, November 2, 2006 p 555–571.

Schumacher, A. Dr. "Family Physicians must remain focal point of primary care" Primary Care Reform – Reshaping Health Care in Canada Canadian Medical Association 2004

Sibbald, B. , Enzer, I., Cooper, C., Rout, U., Sutherland, V. "GP job satisfaction in 1987, 1990 and 1998: lessons for the future?" Family Practice Vol. 17, No. 5, 364-371

Smith, G., Ebrahim, S. Frankel, S. "How Policy Informs the Evidence" British Medical Journal Volume 322 January 27 2001 bmj.com

Stark, A. "Political Discourse Analysis and the Debate Over Canada's Lobbying Legislation" Canadian Journal of Political Science XXV:3 September 1992

Statistics Canada Health Indicators – Data Definitions
http://www.statcan.ca/english/freepub/82-221-XIE/2004002/definitions.htm

Statistics Canada Health Region Maps, http://www.statcan.ca/english/freepub/82-221-XIE/2006001/maps/18alb05.pdf Viewed October 20, 2006

Sullivan, P. "Privatization if necessary, not necessarily privatization: CMA" Canadian Medical Association, 2005.

Tasa, K., Baker, G., Murray, M. "Using Patient Feedback for Quality Improvement" Quality Management in Health Care, 1996 4(2) p55-67

Thomas, P. "Performance Measurement, Reporting and Accountability: Recent Trends and Future Directions" Saskatchewan Institute of Public Policy, Public Policy Paper No. 23, February 2004 St John's College, University of Manitoba

Tinbergen Institute A Combinatorial Assessment Methodology for Complex Policy Analysis Rotterdam: Tinbergen Institute 1999

Tomblin, S. "Democratic Health System: A Critical Review of Constraints and a New Approach to Health Restructuring" Commission on the Future of Health Care in Canada, Discussion Paper No.3 2002

Torrance, G. "Socio-Historical Overview: The Development of the Canadian Health System" . Health and Canadian Society: Sociological Perspectives 2nd Edition Toronto, Fitzhenry & Whiteside, 1987.

Tuohy, C. Accidental Logics: The Dynamics of Change in the Health Care Arena in the United States, Britain, and Canada Oxford University Press, New York, 1999

United Nations Development Programme, "Human Development Reports" 2007 Viewed at http://hdr.undp.org/hd/ February 7, 2007

Wait Time Alliance: No More Time To Wait: Toward benchmarks and best practices in wait time management Interim Report of the Wait Time Alliance Canadian Medical Association March 2005

Walter, L., Davidowitz, N., Heineken, P., Covinsky, K. "Pitfalls of Converting Practice Guidelines Into Quality Measures: Lessons Learned From a VA Performance Measure" JAMA. 2004;291:2466-2470 http://jama.ama-assn.org/cgi/content/abstract/291/20/2466

Werner, R., Asch, D. "The Unintended Consequences of Publicly Reporting Quality Information" Journal of the American Medical Association, Special Communication December, 2005 http://jama.ama-assn.org/cgi/content/abstract/293/10/1239

Williams, A., Vayda, E., Cohen, M., Woodward, C., Ferrier, B. "Medicine and the Canadian State: From the Politics of Conflict to the Politics of Accommodation" Journal of Health and Social Behaviour 1995 Vol 36 December p303-321

Williams, E.; Thomas R. Konrad; Mark Linzer; Julia McMurray; Donald E. Pathman; Martha Gerrity; Mark D. Schwartz; William E. Scheckler; Jeff Douglas "Physician,

practice, and patient characteristics related to primary care physician physical and mental health: Results from the physician worklife study" Health Services Research Feb 2002 v37 i1 p121(23)

World Health Organization: "Meso-level of care: building blocks for the health-care organization" 2006, World Health Organization http://www.who.int/diabetesactiononline/healthcare/en/

Wyszewianski, L. "Basic Concepts of Healthcare Quality" The Healthcare Quality Book: Vision, Strategy and Tools Ramson, Joshi and Nash, Editors. AUPHA Health Administration Press, Chicago, 2005