

PRIMARY CARE ECONOMICS

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PRIMARY CARE ECONOMICS

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SUMMARY

Primary care is a patient's first and continuing contact with the health care system, with clinical providers, who are usually family doctors. In 2008, Alberta spent \$975 million on primary care for its residents, which amounts to about \$277 per resident. Primary care, as a substantial driver of health care costs, is routinely highlighted as an area which has the potential to greatly improve the health of the population while promoting cost containment. It also has recently been highlighted as an area in need of reorganization, both in Alberta and across Canada. Reforms are underway in many provinces. In Alberta, reforms costing hundreds of millions of dollars – almost half of what we spend – have been proposed or initiated, but whose ultimate achievement, – as in other emerging areas of healthcare, – is encountering fiscal challenges.

Reforms of primary care hold promise in influencing health outcomes, especially among the chronically ill, but there is little supporting evidence about what these initiatives will cost. This paper addresses how our primary care resources are currently utilized and what they cost, what are the current funding systems established to support these resources, and what are the economic aspects of suggested reforms. Despite the widespread attention given to primary care, the primary care discussion can benefit from a clearer demarcation between the goals of primary care and the *alternative* means that can be used to achieve them. The paper builds upon a workshop on primary care economics held at the Institute for Health Economics in June, 2010, which brought together key leaders, experts, and policy makers in primary care.

ABBREVIATIONS

ARP	Alternative Relationship Plan
CIHI	Canadian Institute for Health Information
EHR	Electronic Health Records
EMR	Electronic Medical Records
FTE	Full Time Equivalent
IMPACT	Integrating Family Medicine and Pharmacy to Advance primary Care Therapeutics
OECD	Organization for Economics Co-operation and Development
PCI	Primary Care Initiative
PCN	Primary Care Network
PDI	Performance and Diligence Indicator Program
PHCTF	Primary Health Care Transition Fund
POSP	Physician Office System Program
QALYs	Quality Adjusted Life Years

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INTRODUCTION

Primary care, the topic of this paper, refers to a patient's first and continuing direct contact with medical practitioners. As primary care is usually the patient's first interaction with the healthcare system, primary caregivers are the gatekeepers to the Canadian health system. A key component of primary care is that it is meant to be continuing rather than episodic, which implies an attachment to a physician or group of primary caregivers. Further, it is not care focused on a specific disease or body system; and it is not community care, where there may be no direct contact with a physician or practitioner. According to Health Canada (2006), primary care can include some aspects of health promotion, illness, and injury prevention, as well as the diagnosis and treatment of illness and injury. Other types of health care, such as public health, may be included in primary care and so there can be an overlap of functions.

The recent interest in primary care has its origins in economics as well as epidemiology. Governments are concerned over the rising disease burden and costs arising from increases in chronic diseases, such as diabetes and chronic obstructive pulmonary disease, which often accompany an aging population, and whose incidence may also be related to income levels.

Primary care has an economic importance which potentially can help address these problems. It can have a significant impact on the health of the patients; it can result in considerable reductions in the use of resources in the higher cost, more specialized areas of medicine, influencing the health producing activities of its patients. Put simply, benefits of primary care include its potential to help maintain a healthier population better than alternative models (Starfield, Shi & Macinko, 2005).

One of the most widely promoted benefits of primary care is its potential to manage patients with chronic diseases (Schoen et al., 2009). Under the new team-based chronic disease management model, patients can receive diagnoses and disease management plans from family physicians as well as specialists, and primary care often takes on the routine management of these cases. Proponents have claimed that there are potential savings from this model. The employment of such a model requires that family practitioners spend a good deal more time managing chronic diseases than they would when working by themselves. To be effective, chronic disease management may require more monitoring and counseling from nurses or

other health care providers, and this would require a different configuration of resources in primary care than seen in the traditional fee for service model.

A series of federal and provincial documents have identified the potential benefits of primary care, the shortcomings with primary care as it has been traditionally organized, and have recommended widespread reforms. Health Canada has identified key areas of concern in primary care. These include a lack of emphasis on health promotion and disease prevention; a lack of continuity between primary and specialist care; problems of access, especially in the rural areas; and long work hours for many practitioners (www.hc-sc.gc.ca/hcs-sss/about-apropos-eng.php).

Under the federal Primary Health Care Transition Fund (PHCTF), it was agreed that "improvements to primary health care are crucial to the renewal of health services" (<http://www.hc-sc.gc.ca/hcs-sss/prim/phctf-fassp/index-eng.php>). In recognition of the change needed, the PHCTF established five common objectives. These are:

1. to increase the proportion of the population with access to primary health care organizations which are accountable for the planned provision of comprehensive services to a defined population;
2. to increase the emphasis on health promotion, disease and injury prevention, and chronic disease management;
3. to expand 24/7 access to essential services;
4. to establish multi-disciplinary teams, so that the most appropriate care is provided by the most appropriate provider; and
5. to facilitate coordination with other health services (such as specialists and hospitals).

Following the initiation of the PHCTF, both the Romanow Report (2002) and Alberta's Mazankowski Report (2002) also identified primary care reform as a key policy area. The health ministers stated in the First Ministers Health Accord (2003) that "the ultimate goal of primary health care reform is to provide all Canadians, wherever they live, with access to an appropriate health care provider, 24 hours a day, 7 days a week." The achievement of such a goal would require substantial resources, in addition to a substantial reorganization of primary care.

In Alberta, the policy response to the national initiative took place through the Primary Care Initiative. The Primary Care Initiative (PCI) is a collaboration between Alberta Health and Wellness, the Alberta Medical Association, and Alberta Health Services. The program was established in 2003 in conjunction with the tripartite Primary Care Master Agreement to improve access and quality of primary care within the province. Under this initiative, the three bodies have standardized a provincial approach to primary care across the province. Goals of the PCI include increasing access, managing round the clock primary care, coordination with services beyond primary care, and fostering multidisciplinary care. Examples of programs born through the PCI include provincial Primary Care Networks (PCN), the Physician Office System Program (POSP), and the Performance and Diligence Indicator Program (PDI). All have required substantial resources.

Economics is a science about the alternative ways that scarce resources are used, and about the *comparative* implications of how they are used. We have choices – there are a number of different ways of organizing and funding primary care in Alberta and Canada, and the choices that we make impact considerably on equity, quality, costs, and health outcomes. The purpose of this paper is to outline the resource problem, providing an overview of the choices we make and resources we have at hand.

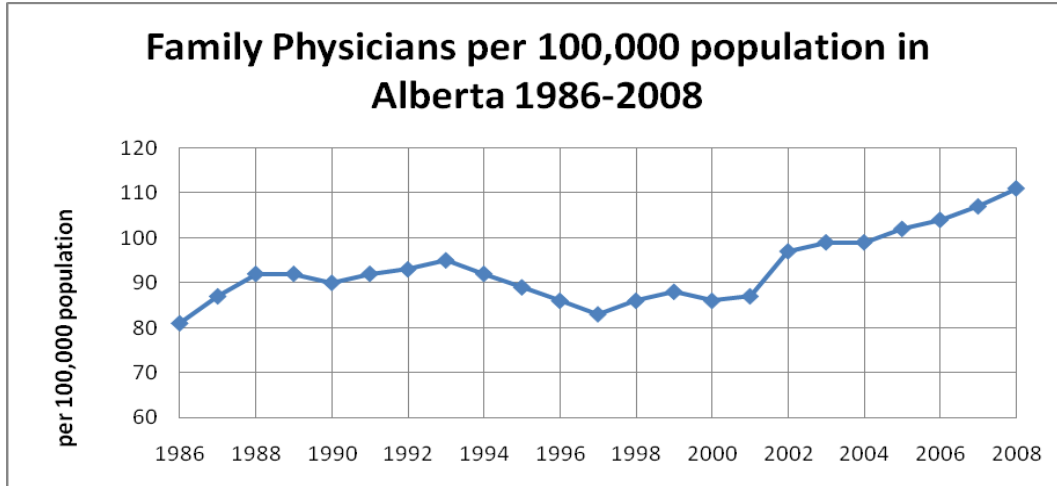
Economic information, often absent from the primary care debate, can help us prioritize the research that is needed to better inform policy alternatives. This document was informed by a workshop on primary care economics held at the Institute for Health Economics in June, 2010, which brought together key leaders, experts, and policy makers in primary care. It reflects the opinions of the report authors.

Resources in primary care

Within Canada, family doctors are the main source of primary care delivery. According to the College of Physicians and Surgeons of Alberta, there were 3,628 registered family doctors practicing in Alberta during 2010, which is one doctor per 968 persons (College of Physicians and Surgeons of Canada, 2010). The ratio over time of family doctors per 100,000 population in Alberta is shown in **Figure 1**. Following a steady increase between 1986 and 1992, there was a reduction until 2002, when an upswing began, and by 2008 the number was 110 per 100,000, well above the rates in earlier years. Not all family physicians exclusively practice primary care; over half also work in hospitals, emergency departments, or non-

physician office settings, although they may also spend much of their time practicing traditional family medicine.

Figure 1: Family physicians per 100,000 population in Alberta, 1986-2008

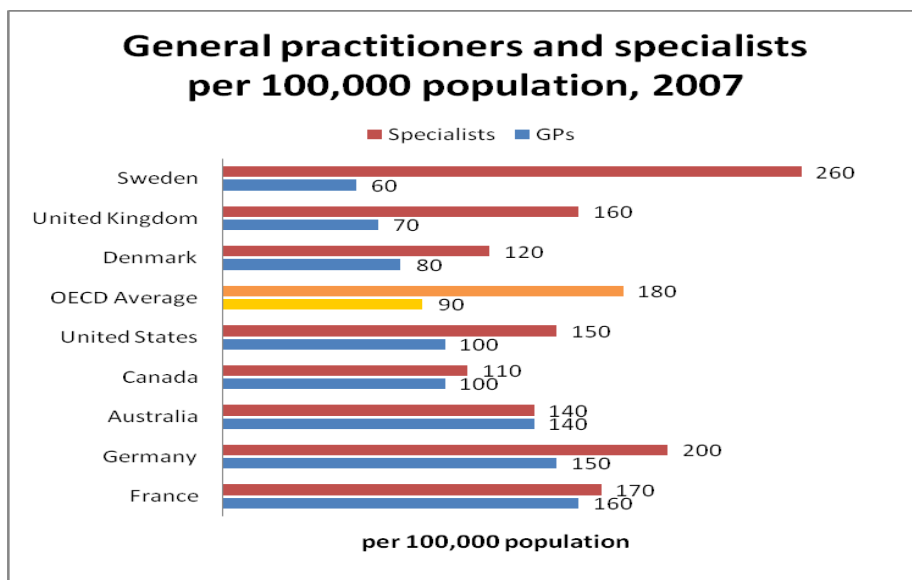


Source: Supply, Distribution and Migration of Canadian Physicians, 1986-2004; Southam Medical Database, Canadian Institute for Health Information (www.cihi.ca). Supply, Distribution and Migration of Canadian Physicians, 2005-2008; Scott's Medical Database, Canadian Institute for Health Information (www.cihi.ca)

The raw number of physicians enrolled is not a complete picture of the health care system's capacity to produce primary care, as there is a wide distribution of physician practice patterns. Using data for 2004/5, the Canadian Institute for Health Information (CIHI) identified that there were 3,200 family doctors who were registered in Alberta; when this number is adjusted for CIHI's Full Time Equivalent (FTE) ratio, there were actually 2,528 "full time equivalent" physicians. The adjustment for hours worked and number of patient visits (not all physicians see patients 5 days/week and different patients may need differing amounts or kinds of care) meant that on average, family doctors were seeing patients for about 80 per cent of the CIHI FTE measure. We should also point out that in 2007 family doctors were working 49 hours/week, of which 33 (about 2/3rds) of these hours were dedicated for direct patient care. This indicates that an FTE is a convenient, though arbitrary and controversial measure, of the supply of physician care. As well, for family doctors, hours spend providing patient care trended down slightly from 2004 to 2007, while non-patient care hours increased slightly, resulting in a reduction in hours of direct patient care time provided by the family doctor. (Source: National Physician Survey, 2004 and 2007).

In most OECD countries, other specialists outnumber family physicians. Per 100,000 population, Canada reports 101 other specialists and 95 family physicians and Alberta reports a ratio of 111:90 (Commonwealth Fund, 2009). Canada, similar to a small number of OECD countries (Australia, Belgium, France, New Zealand, and Portugal), has maintained a balance between other specialists and family practitioners; however the gap between other specialists and family practitioners is predicted to widen as, in recent years, more medical graduates are choosing other medical specialties. The rate of family and other doctors per 100,000 population for a selection of OECD countries is shown in **Figure 2**. The overall OECD average is 180:90. Sweden reports a ratio of 260 family physicians to 60 other specialists, while Australia has an equal balance of 140:140 (OECD, 2009). In general, the total number of physicians in Canada is low.

Figure 2: General practitioners and specialists per 100,000 population, 2007



Source: OECD Health at a Glance, 2009

Family doctors are not equally distributed in urban and rural areas, which is a situation that exists in most countries. The majority of family physicians in Alberta are located in either Edmonton or Calgary, with rural areas of the province having considerably lower patient volumes and visitation rates. Rates published in 2008 (divided into nine regions which were operating in that year) by the Canadian Institute of Health Information are shown in **Table 1**. For example, the Calgary Health Region and Capital Health

had ratios of 118 and 121 family physicians per 100,000 population, while the Northern Lights Health Region had a ratio of 76 per 100,00 population.

Table 1: Primary care physicians by regions, Alberta 2008

Health Region	Total Number	Physicians per 100,000 population	Average Age	Percent Female	Percent Canadian Trained
Chinook Regional Health Authority	173	102	47.0	30.1%	67.4%
Palliser Health Region	102	91	47.1	21.6%	45.5
Calgary Health Region	1,571	118	46.4	44.6%	67.4%
David Thompson Regional Health Authority	290	88	48.8	22.1%	47.2%
East Central Health	105	85	47.0	21.9%	25.2%
Capital Health	1,374	121	47.0	37.1%	65.8%
Aspen Regional Health Authority	174	90	44.6	28.7%	33.5%
Peace Country Health	132	86	46.5	28.0%	36.2%
Northern Lights Health Region	62	76	46.8	29.5%	23.0%

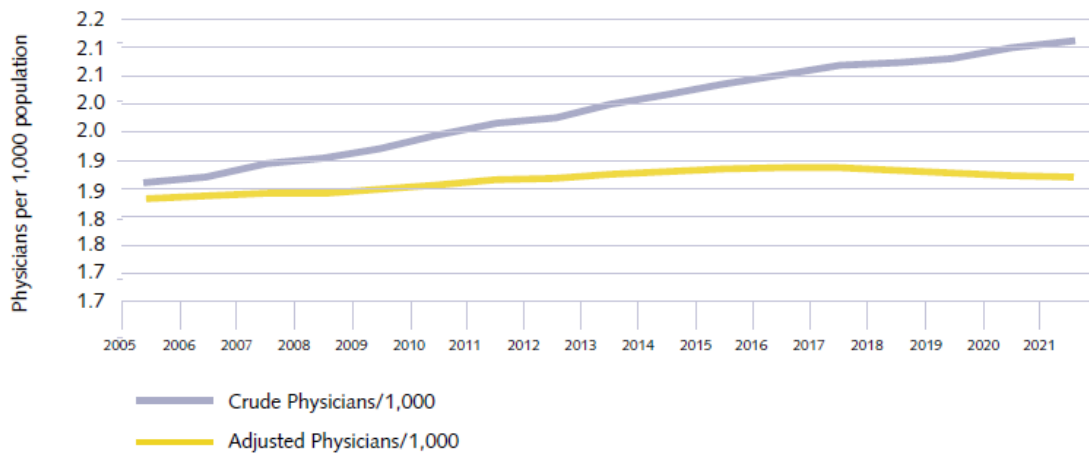
Source: Canadian Institute for Health Information (CIHI) (2008). Supply, Distribution and Migration of Canadian Physicians, Health Human Resources, Accessed on July 30th, 2010 from http://secure.cihi.ca/cihiweb/dispPage.jsp?cw_page=download_form_e&cw_sku=SDMCP2008EPDF&cw_ctt=1&cw_dform=N

The number and rate of family practitioners is only part of the supply picture. There are trends which have had a contrary impact on supply. From 1997 to 2007, the average age of primary care doctors in Canada increased from 45 to 49, and a number (6% as opposed to 4% in 2007) are considering retirement. Within Alberta, the average age of a family doctor was 46.7, which is slightly younger than the Canadian average (Canadian Institute for Health Information, 2008). The number of women in family medicine is increasing. Between 1999 and 2009, the percentage of family doctors in Canada who are women increased from 50% to 57%. In Alberta, there were 1,489 family physicians who were women (37% of total family doctors) in 2008, which is lower than the national average (Canadian Institute for Health

Information, 2008). Many female doctors take time off time from work during their child bearing ages and work a few less hours/week (45 per week versus 52 for males) (Grava-Gubins, 2010). More family doctors are adopting a special focus, such as sports medicine and hospitalist practice, which also reduces the number who are providing full service primary care, which is the focus of primary care. Doctors in general are changing the allocation of their time between work and leisure. Between 2000 and 2007, the average weekly hours worked by physicians decreased from 52 to 50 hours (Grava-Gubins, 2010).

The family doctor to population ratio is not an adequate indicator of the overall demand / supply situation in primary care. As we have just shown, the supply of “primary care” depends on the types of practitioners (e.g., male, female; old / young) and the types of practice they choose (e.g., specialty clinics, hospitalists, generalists). On the other hand, health care needs have been increasing because of an aging population and an increase in chronic disease. According to the Canadian Medical Association, in the coming years in Canada, the demand, adjusted for population characteristics and need, will increase so that a supply to demand ratio will fall, despite an increase in the number of family doctors in Canada that we noted earlier (**Figure 3**).

Figure 3: Crude and adjusted rates of physicians/1,000 population, 2005-2021



**Adjusted physician/1,000 population takes into consideration Canada's aging population and intensity at which physician services are used.*

Source: Candian Medical Association Physician Resource Evaluation Template.

Dynamic considerations of supply

According to the Alberta Medical Association, in 2006, there was a supply deficit of 610 family physicians, which would be required to meet the demands for primary care services within Alberta (Physician Resource Planning Committee, 2006). The supply of new family doctors comes from two sources: from new residency graduates and from foreign sources. The residency normally takes two years following medical school. Foreign medical school graduates often require additional training before starting they start Canadian residency training. Between 2004 and 2008, the number of Canadian-trained family doctors increased in Alberta by 14.2% and the number of international medical graduates increased by 44.7% (Canadian Institute for Health Information, 2008). Overall during 2010, there was an inflow of 40 new family physicians into Alberta, of which 22 are classified as foreign, resulting in a net increase of 26 family physicians (College of Family Physicians and Surgeons, 2010a).

In terms of the total physician supply, an increasing number of new graduates are choosing to specialize rather than enter general full service family practices. Throughout 1999-2004, Alberta saw an overall physician increase of 20.3%; other specialists increased by 23.4%, while the family physician supply increased by 17.5%. (Physician Resource Planning Committee, 2006). We should note that post graduate training to a degree is regulated, and so new supply is influenced by educational arrangements. Within Alberta, the average family physician (not FTE) reports a gross income of \$233,036, while the average other specialist reports an income of \$374,909 (Alberta Health and Wellness, 2010), a factor which may influence the ratio of family physicians to specialists. These figures, we should point out, do not adjust for office overhead expenses.

Other resources

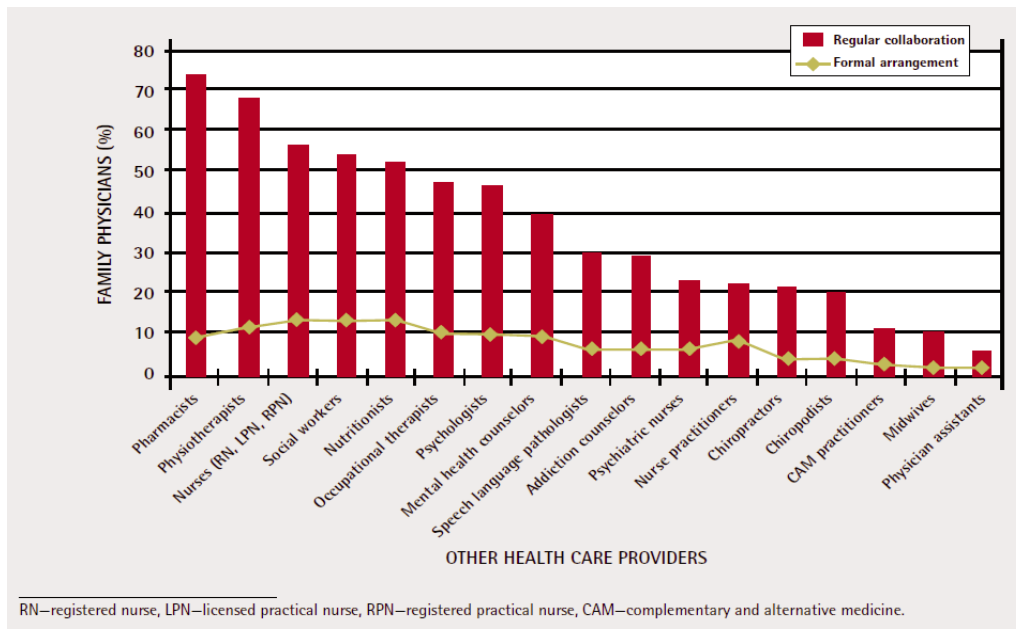
There has been an increasing focus on non-physician resources in primary care, both as a productivity support and as a substitute service; these include allied health professionals such as nurses, pharmacists, and mental health workers working in family practices. These professionals work directly with patients under the supervision of doctors, and together they form a primary care team. An example of this can be seen in the creation of the Canadian Nurse Practitioner Initiative, which was developed to improve access to primary care. As of 2008, there were 1,669 nurse practitioners employed across the country, with 217 of these practitioners working in Alberta (CIHI, 2009). However, some of these were working in settings

other than primary care and we do not have an accurate count of how many were involved in primary care.

In addition, across Canada there were 2,239 full time and 3,086 part time registered nurses employed in physician offices or primary care practices throughout 2008 (CIHI, 2008). With a national number of 33,712 family physicians employed across Canada in 2008, this produces a rate of 6.65 full-time office nurses per 100 family physicians. Of course, there is great variability as the number of office nurses varies significantly with the model of primary health care being used.

Other types of health care team members are spread relatively thin among primary care. For example, approximately 250 pharmacists are employed within primary care in Canada, with the majority of these individuals working in Ontario, Alberta, and Saskatchewan (IMPACT, 2010). To further integrate pharmacists into the primary care environment, Alberta Health and Wellness has provided \$4 million dollars over three years to support this initiative (Alberta Health & Wellness, 2010). Although a substantial percentage of Canadian family physicians report regular collaboration with other health care professionals, most of this teamwork is informal in nature (Figure 4).

Figure 4: Percentage of Canadian general practitioners collaborating with other health care providers on a regular and formal basis, 2009



Source: National Physician Database

<http://www.nationalphysiciansurvey.ca/nps/news/PDF-e/Fast%20Fact%20Apr%202009%20Interprofessional%20teams.pdf>

Information systems are increasingly utilized within primary care practices in the hopes of increasing efficiency and improving the quality and speed of information. Electronic medical records (EMRs) are implemented within individual physician's offices to replace paper charts with electronic charts and document the patient's history within that specific clinic. Approximately 37% of Canadian primary care clinics utilize EMRs, which is a substantially lower number than other OECD countries. For example, Netherlands, New Zealand, Norway, and the United Kingdom report over 95% of their primary care clinics have adopted EMRs (Commonwealth Fund, 2009). Out of the 322 million office-based physician visits occurring every year across Canada, 94% result in handwritten paper records (Canada Health Infoway, 2007), indicating the substantial progress needed before the adoption of EMRs can be deemed a success.

In an effort to promote EMR uptake and support, Alberta allocated \$29.3 million in 2008 towards the Physician Office System Program (POSP). The program, which reimburses primary care practices up to 70% of EMR implementation costs, currently supports 2,500 physicians ((POSP, 2010). Physicians are provided best practice templates, technological support, and hardware needed to successfully utilize EMR technology. Physicians who transition from their current EMR to a POSP EMR may be eligible for additional funding.

Electronic health records (EHR) provide cumulative patient information and history to physicians on the Internet. Unlike EMRs, EHRs are not specific to any one clinic; rather multiple sites can contribute to patient history creating a web of patient information sharing. Alberta Netcare, which is Alberta's EHR system, was developed in 2005. With a total budget of \$25.4 million, Netcare is used province wide by more than 14,000 health professionals (mainly family physicians, specialists, and pharmacists) (Alberta Netcare, 2010). This system has been met with success, positioning Alberta nationally as one of the leaders in EHR implementation.

Telemedicine is becoming more widespread within Canada. This technology promises more equitable health care to all Canadians, especially for remote or isolated populations. Alberta's HealthLink is a call-in information line that provides around the clock health information, primarily employing nurses, and other non-physician professionals. Approximately 215 FTEs provide telephone information services to Albertans, with a total budget of \$25.4 million (Alberta Health Services, 2010b). In the absence of an

adequate supply of practitioners, call-in lines such as Health Link link the government's response to meet the 24/7 goals that have been set by the Primary Care Initiative.

The former nine health regions (now amalgamated into Alberta Health Services) in Alberta have contributed to the provision of primary care. In the past, some regions provided family doctors with office space and support staff. These arrangements are varied and not well documented; therefore there is no formal data to indicate the extent of this practice. However, some alternative funding agreements included support from the regions.

Cost of primary care

The overall cost of primary care in Alberta in 2008 is shown in **Table 2**. In total, the amount of funding for primary care was about \$975 million. The largest programs are for fee for service payments and funding for PCNs. On average, primary care costs amount to about \$277 per person, and \$269,000 per doctor.

Table 2: Costs for primary care in Alberta

Remuneration	Total Physicians Participating (approximate)	Total Cost (\$)
Fee for service (FFS)	3,492	\$814,000,000.00
Alternative relationship plan (ARP)	N/A	\$22,000,000.00
Physician office system program (POSP)*	3,300	\$29,000,000.00
Performance & diligence indicator program (PDI)**	1,400	\$14,650,000.00
Primary care networks (PCN)	1,761	\$96,000,000.00
Total		\$975,650,000.00
<p>Note:</p> <p>*An approximate value: In an effort to support EMR utilization, physicians pay out of pocket 100% of EMR implementation costs but are then reimbursed <i>up to</i> 70% (to a maximum of \$740/month)</p> <p>**2009/10 data: Physicians are provided additional compensation, up to \$7/per patient, based on ability to meet performance and/or diligence indicators; Total expenditure reflects established money for 2009/10</p>		

The organization of primary care practice

The organization of primary care practice should be distinguished from the funding of the practices. Organizational structure refers to the type of ownership and governance, size, location and service delivery model of the practice. An Alberta Health Services discussion paper (2010) has characterized different organizational structures, which include stand alone doctor clinics, walk-in practices, specialist practices which offer primary care services, and primary care networks. The Alberta Health Services document also includes commissioning as a model, which refers to the entrustment of health service funds for specialist services by the practices (called primary care trusts in England). Trust – holding is a form of financing health care and will be discussed below.

One factor that economists have identified as influencing primary care practice behavior is economies of scale. This concept refers to the cost per patient or visit of operating a practice. The economies of scale hypothesis states that as the scale of the practice increases, the unit costs will fall. It is hypothesized that a larger practice, in terms of number of doctors, will operate more efficiently than a smaller one. Sarma (2010) found in an analysis of a sample of Canadian physicians that group – practice doctors produce 11% more visits per week than those in solo practice. Currently about 15% of family doctors in Alberta are in solo practice.

A second economic factor is related to the scope of the practice. Scope refers to how many different functions the practice includes. For example, a practice might include public health functions (vaccinations), as well as traditional primary care medicine. Scope, which refers to services, differs from case mix, which refers to patient disease types. There is less research to indicate which combinations of services yield favorable economic results. A primary care organization can be entrusted to provide only primary medical care, or it can be given wider responsibilities, such as some public health functions and home care. There is very little information available to assess the appropriate scope of a primary care provider.

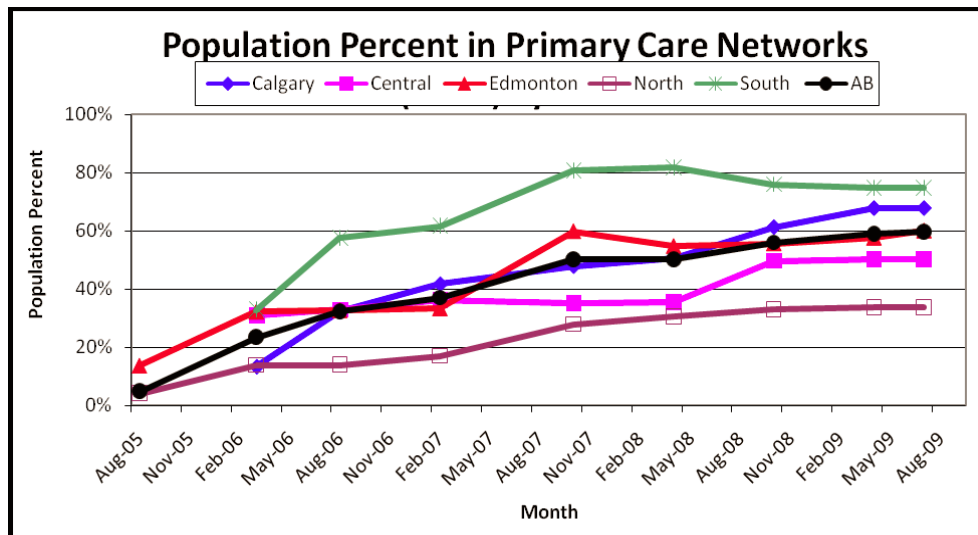
Another factor which affects the economic behavior of practices is the concept of the primary care team. The team is an especially important concept, given the shortages of family doctors now and anticipated for the future. Doctors can use nurses, pharmacists, and mental health workers to provide a greater degree of counseling and thus extend their supply. The team concept seems particularly well suited to chronic

disease management, where patients derive benefit from counseling, which is time consuming. Patients who receive this counseling are more likely to follow a disease management routine, and hence they do better (College of Family Physicians of Canada, 2007). There is very little evidence on the cost of teams in relation to their health benefits.

A related organizational issue is the walk – in clinic. These are primarily clinics that are open extra hours and take patients on a non appointment basis. Walk in clinics take minor emergencies as well as a variety of other patients. However they do not achieve continuity, which is an important feature of the primary care practice.

Alberta has developed a form of physician organization called the Primary Care Network (PCNs). PCNs are defined as multidisciplinary collaborations which are formed to improve patient care and appropriate resource allocation (Drew, Jones & Norton, 2010). Family doctors join PCNs which are given funding according to the number of patients who are deemed to be linked to each doctor who joins the PCN. The PCNs are overseen by boards, whose membership is comprised of government persons, medical association representatives, and members from the health regions. The PCNs develop programs such as after hour clinics and chronic disease models, and hire personnel such as nurses and mental health workers to help operate these programs, which are shared by the family physician – members of the PCN. By 2008/9 Alberta had 1,761 physicians, to whom 1.9 million patients were attached, enrolled in a PCN (Alberta Health & Wellness, 2010). Enrolment in the PCN is defacto, determined by the number of visits to the patient's most visited family doctor. In total there were 33 PCNs across the province, totaling \$94 million in payment financing (Primary Care Initiative, 2010). Family physicians who are also PCN members are remunerated primarily through mixed payments, where the PCN receive a capitation payment of approximately \$50 per patient prior to the 2010 agreement, plus additional funding through sources such as grants or other incentive programs (Alberta Health Services, 2010a). Since 2005 the percentage of Albertans enrolled in a PCN has substantially increased in most regions, with the exception of Edmonton and South region which experienced a slight decrease in enrollment during 2007 (Figure 5).

Figure 5: Population percentage in primary care networks, Alberta 2005-9



Source: Alberta Health Services Performance Report Version 4- 44. Percentage of Family Physicians Collaborating with other health care providers, 2009

PCNs are a relatively new phenomenon and little is known about the economics of a team. Costs change when resources are combined as a team; however the direction is not yet clear. Doctors may be able to see more patients, but they need to hire more professional staff and this increases costs. Outcomes may be better because of the improved counseling. Even if a team costs more than care without a team, the benefits in terms of better patient care may be worth while. More empirical investigation can provide evidence about the cost implications of teams.

The primary care market

Family physicians and patients form a market. Payments in this market come from a third party, where phenomena such as visits, waiting times, and doctor incomes all respond to demand and supply. In addition, the primary care market interacts with other health care markets, notably the markets for specialists and hospital services and to a lesser degree the public health services market.

Important dimensions of any market include the number of firms and the geographic size of the market. Because of the nature of the services provided, a primary care market will almost always be a local market. Patients must be able to travel easily to the primary care site to access services. In the case of need for urgent care or for patient convenience services must be available outside of usual business hours, which is a role mainly filled by emergency departments. Many reform proposals make 24/7 access a goal

for primary care, possibly substituting for emergency room care. In the case of Alberta, which has many rural areas and great distances between population centers, maintenance of geographic easy access is a costly endeavor.

Financing primary care

The method of finance of physician care is a key policy tool that can be used to affect the system's performance. There are a variety of ways to pay family doctors, and the method chosen will impact the way doctors provide care for their patients. Under fee for service, the payer gives the doctor a fee for each service provided. The doctor has an incentive to provide more services to patients, more quickly. If an unhealthy patient requires more services, the doctor is not penalized for providing them. However, the configuration of the fee schedule may discourage long visits, needed for less healthy patients as these detract from the physician's revenue. If doctors want to economize on time, then they can cut visits short, which may militate against those patients who need longer visits. At the same time, the payer, the provincial government, is less able to predict total costs.

Other payment systems have different incentives. Per capita systems encourage doctors to enroll more patients, and probably to provide enough care so as not to lose them. But such a system may also encourage doctors to avoid sicker patients, as they will be more costly to the doctor. This drawback can be dealt with, to some degree, by risk-adjusting the capitation rate to the health status of the patient, thus providing an incentive for the doctor to see less healthy patients. Sessional (e.g., per hour or per day) and salary payment forms will not encourage patient flows, but they will also not penalize doctors for spending more time with their less healthy patients.

Each system, then, has its virtues and drawbacks, and no system is "neutral". This has led many analysts and some countries to experiment with mixed systems, such as paying per capitation rates to encourage enrolment and fee for services for those items that the payer deems especially important. The combined Alberta FFS/PCN capitation model is in essence a mixed payment model, encouraging enrolment, and targeted services at the same time. However, the distribution of income within the PCN will have an effect of what services are provided, and little is known about this.

The most common means to finance primary care services in Canada is through a fee schedule covering routine visits and procedures. In 2004/5 in Alberta consultations and visits accounted for 85.9% of payments to family physicians (CIHI, 2007).

Alternative Relationship Plans (ARP), such as capitation, salary, or sessional compensation, utilization continue to increase across Canada. Under these schemes the fee schedule is removed and compensation is based on the population being served, the expected hours worked, or on an hourly or sessional basis. ARPs therefore decrease the possibility that the physician will provide unnecessary services (Devlin, Sarma & Hogg, 2006). There is no clear incentive to provide more services or see more patients.

Empirical evidence supports the economic theory that suggests physicians remunerated through capitation provide fewer services than those utilizing a fee-for-service schedule (Devlin, Sarma & Hogg, 2006). Without fee for service remuneration, it is possible the quantity of patients who receive care may decrease, worsening a shortage of care.

The government can also subsidize the practice directly for targets met. An example of this can be seen in the very new Alberta Diligence Indicator Program (PDI), where additional compensation is provided to family physicians based on patient enrolment. To date, approximately 1,400 physicians have taken advantage of this program. Clinics which successfully achieve the targets related to enrolling patients in the practice are awarded up to \$7 per patient. Under the Trilateral Master Agreement, \$14.65 million has been directed towards PDI for 2009/10, with a further established \$22.48 million for 2010/11 (Alberta Health Services, 2010).

As an example of the potential impact of funding arrangements, in 2003 the British Columbia Ministry of Health instituted a primary care practice incentive program called Majority Source of Care (MSOC); the purpose of the program was to provide an incentive for patients with certain chronic conditions to increase their attachment to family doctors (BC GP Services Committee, 2010). According to this incentive program, the BC Ministry paid a disease management bonus to family doctors in order for them to provide a more comprehensive set of services to patients with heart failure, diabetes, hypertension, and chronic obstructive pulmonary disease. Doctors are paid bonuses in order to provide a complete annual exam with prescribed components and a care plan and, additionally, for telephone follow-up. For example, if they perform a complete exam along prescribed lines and a care plan for a diabetes patient,

family doctors would receive a bonus of \$125; they would also receive a fee of \$15 for each telephone or email follow up, for up to four contacts a year.

Hollander (2009) conducted an analysis of the MSOC incentive program. The results were striking, especially for patients in high risk groups, where the need and effectiveness is greatest. Throughout the duration of the program, there has been a steady increase in the number of bonus – related services, resulting in more patients receiving comprehensive care. These results can be coupled with Hollander's (2009) companion research on the implications of attachment to primary care practice. In that report Hollander demonstrated the impact on health care costs for high risk persons. A 1% increase in attachment to family physicians was associated with a reduction in costs of \$124 for moderately high risk patients, and of \$323 for very high – risk patients. Much of these cost reductions came from fewer hospitalizations. These findings demonstrating the influence of incentives are important, but they do not directly address the full picture of the cost of achieving attachment in relation to health benefits.

Health system performance

Economic performance is a measure of the system's produced health outcomes in relation to the resources and costs used in achieving these ends. It is especially important to distinguish the desired outcomes (ends) from the resources (means) that are used to achieve them. If such a distinction is not made, we may end up identifying the resources, and methods of using such resources, as ends in themselves. The achievement of resource-based goals would then result in a sense of achievement just because more money was spent, regardless of health outcomes.

The ends of primary care within the Canadian health care system should include the health outcomes of the population. Health outcomes that are used in economics are often measures such as quality adjusted life years (QALYs), which are amalgamated indexes of longevity and health status. There are a number of different QALY measures available for use. These include the EUROQUOL (<http://www.euroqol.org/>), a widely used measure, and the 15-D (<http://www.15d-instrument.net/15d>), a fifteen dimension measure that has been successfully used in preliminary studies in primary care clinics in Finland. Currently, there is very little information about the impact of primary care on health outcomes, although studies such as Hollander's (above) do provide indirect evidence of the health and economic benefits of patient attachment.

Health outcomes are not the only goals of our primary care system, as implied in the various stated listings of primary care objectives. Access to care is an important intermediate outcome. A lack of access to primary care is currently the most prominent feature of primary care in Canada. In a survey of studies by Katz et al (2009) it was reported that about 20% of Canadians are not attached to a family doctor and that Canadians have more difficulties in getting quick access to primary care when they need it. The 2010 Canadian Medical Association annual national report card also indicates that access is a problem. According to the Association's 10th Annual Report Card on Health Care (Canadian Medical Association, 2010), 16% of respondents graded access to a family doctor as "F", and 22% graded it as "C". Equity, a related concept, reflects the deliberate priorities given to specific groups, such as persons in rural areas, the very poor, or the very sick. There are considerable differences in access between various groups in Canada (Katz et al, 2009), especially between rural and urban residents.

Related to access, patient convenience, such as travel or waiting time, is also stated as having importance; the public system deliberately devotes resources to increasing convenience, even when the *health* impacts of increasing this goal are negligible or unknown (Mooney, 1994). This implies that convenience is an important consideration to the public and policy makers when allocating resources to health care. Finally, quality of care is an important consideration, related to satisfaction. Despite the problems of access in Canada, quality seems high for the care that is available. According to the CMA report card 39% of persons with regular family physicians graded the overall quality of care with an "A". For many, the system is working.

Economic performance also depends on cost. The true measure of cost is "opportunity cost" a much used but confusing concept. Opportunity cost refers to the foregone benefits of a course of action. This, of course, implies that resources do have an alternative use, that is, that the resources are scarce. The opportunity cost of any activity is very difficult to measure or even identify, because it is a counter – factual. That is, the foregone activity never did occur, since the resources were used instead in the current activity. The opportunity cost is potentially measured at the point that a decision is made to use resources one way, rather than another. For example, if a decision is made by the health region to operate a 24/7 health advice phone line rather than to operate a heart transplant centre, then it is the lost benefits from the transplant centre that would be the opportunity cost.

Usually, economic studies do not identify the lost opportunities. Most of the time, these are unknown to the analyst. Instead, we identify the physical resources used in the activity under consideration, and assign a money cost to these. These monetized costs would form our approximate measure for “opportunity cost”. Although we have adopted this convenient way to measure costs, we should always remember that when we chose to operate the 24/7 phone line, we will have lost benefits somewhere else in the other public or private sectors. Whenever we use resources, there is always an unidentified loser.

In addition to ignoring relevant alternative, policy documents do not always clearly distinguish ends from means. A failure to make such a distinction may result in an inflexibility in the use of health care resources. An example can be seen in the five clearly articulated “objectives” of primary care as stated in the Primary Care Health Transition Fund. Though clearly of importance, these are not all related to consumer welfare and their pursuit can lead to a failure to search for alternative courses of action, leading to policy inflexibility and system inefficiencies. The establishment of multi-disciplinary teams and the provision of 24/7 services for the population are likely to be beneficial, but at what cost? That is, what resources are displaced by such an initiative and what benefits have been given up? By viewing means as ends in themselves, we give up the approach of looking at alternative ways of using the resources to achieve our actual ends.

Another example of the mixing of ends with means can be seen in the six “pillars of a medical home,” found in the *Patient Centred Primary Care in Canada: Bring it on Home (2009)* document of the College of Family Physicians of Canada. These pillars are:

- A personal family physician for every patient
- Access to a patient – centred team
- Timely access to patient – centred care
- Coordination of care
- Supports for patient – centred medical homes (electronic information and funding)
- Quality improvement and evaluation

These foundational requirements all deserve serious consideration, but some represent a specific use of resources. In any policy proposal each strategy deserves scrutiny as *an* alternative way to use resources, not *the* way to use them. For example, pillar 1 indicates that all persons should have their own family

doctor. This is a laudable goal, but in a multi-physician practice, this may be costly or inconvenient and it may not lead to better health as the end in itself. Pillar 5 calls for an electronic medical record. Again, this calls for a specific way to use resources. Most importantly, in the likely event that all of the resources that are recommended will *not* be available, the dogged pursuit of these goals will result in forgoing some strategies that could have been achieved, such as providing attached care for those who would benefit most.

The cost of achieving some of these abovementioned objectives are substantial. In **Table 3** we identify the additional costs needed to achieve some of the key “resource oriented” goals. The achievement of a personal family doctor for each of the 19% of unattached Albertans would be \$214 million (Health Quality Council, 2009). Of course, some of these persons who are unattached are low risk, but some are not. Given the proven benefits of attachment for the high risk persons, would it not be better to focus on identifying and enrolling high risk persons who would most benefit, rather than trying to attain the unachievable goal of enrolling everyone?

Table 3: Cost associated with achieving pillars of a medical home

Objective	Additional cost to Alberta health care system	Calculations
A personal primary care doctor per Alberta resident	\$214 million	Currently 19% of the Alberta population of 2.9 million are unattached (Health Quality Council of Alberta, 2009). The cost per attached person per family doctor is \$389 (see text). This calculation is the cost of providing attached care for the 19%.
A health care team	\$144 million	One nurse (\$38 per hour, 40 hours per week, 52 weeks per year, no overtime, Source: United Nurses of Alberta) for two family doctors (3,600 family doctors, see text).
Electronic medical record systems for all family doctors	\$56 million	The cost to integrate and EMR into a practice if \$50,000 (\$56 million spent for 2,500 physicians adoptors). There are 1,128 physicians who are non-adoptors.
Total costs for initiatives	\$414 million	

With regard to team based care, we estimate the cost of achieving this goal universally and province-wide is \$144 million if we allocated one nurse for two family doctors, well below the 1:1 ratio proposed by Every (2007). Given the low rate for such an endeavor, would it not be better again to focus more on certain practices which enroll high risk patients, who would most benefit?

Finally the roughly estimated cost to provide electronic records for all family doctors who do not have them is \$56 million. In total, the cost of all of these reforms is over \$400 million, about 40% of what we now spend for all primary care in Alberta. There is scant evidence of the benefits for such an endeavor. Perhaps in the near future this large amount of money will be forthcoming. But if the allocation for primary care is considerably less, we will have to prioritize. We should not proceed as if all the stated goals must be achieved. If they can't be achieved then we will need more specific instructions as to how we will allocate our resources.

In addition to choosing how to spend resources, we should also ask whether funding and organizational arrangements are optimal, but to do this we need to know how the current mechanisms are affecting resource use, including higher, complex, and downstream care. Alberta Health Services provided a document entitled *A discussion paper on primary care models* in February, 2010 which addressed this issue. The document covers a wide range of assessment criteria: access, accountability, continuity, coordination, integration, effectiveness, quality, provincial alignment, administration, and implementation. Some of these – access, effectiveness, quality – are health system outcomes. Others – continuity, coordination, accountability – are intermediate or operational goals. Very few of these other goals are economic, though they might impact on economic performance.

The document also covers a range of means of organizing primary care, from individual solo practice to specialist only care, to primary care networks to enhanced primary care networks. Each organizational form is judged in light of the stated criteria. Primary care networks were judged to have a greater influence on other, non-primary care, areas of the health care system, in that they could provide more comprehensive, team – based care, which might result in better health for chronic disease patients. However, the report is slight on economics, though economic variables will be affected by the type of organization.

Although PCNs seem to hold out a great potential, the manner in which they are funded will significantly, one might even say overwhelmingly, affect the intermediate behaviour and the eventual outcomes – economic and health related – of the PCNs. In England, the famous purchaser/provider split resulted in GP fundholding with GPs having the ability to affect other areas of the system. However, GPs did not pay themselves the surpluses they generated; rather these surpluses could be used to enhance the organization. The outcomes would be very different if the GPs could have secured for themselves a portion of the surplus. There is very little public information available on how PCNs currently allocate money. As the Alberta Health Services report states, *“Perhaps the greatest challenge with Alberta’s PCNs model has been the lack of explicit direction, and accountabilities for identified parties.”* In order to predict how PCNs will allocate resources and money, the financial rules of the game need to be specified.

In the enhanced PCN, which the report identifies as being similar to a medical home, the primary care practice is given a wider range of responsibilities, including public health and home care. That is, the PCN would be responsible for what the World Health Organization (2008) and Health Canada (2006) call “primary health care”. Primary health care encompasses a good deal of public health activities, including health promotion and immunizations as well as home care. Currently family medicine practices, even PCNs, are not equipped with the knowledge or resources to deliver these additional critical services. The concept of “economies of scope” recognizes the potential for benefits of amalgamating different types of services within a single practice. Not all services can be economically integrated into one “home.” Even if the extended PCN were given the budget to purchase the additional services, rather than provide them, this would result in a major change in direction. If Alberta Health Services is proposing that this be done, a broader discussion including economic aspects should precede such an action. Economics may not hold all the answers, but it can contribute to the debate.

CONCLUSION

In this report we have provided an economic overview of primary care economics. We have focused on the resources that are used in primary care in Alberta and the goals (health status, access, equity, and patient satisfaction) that their use is supposed to achieve. In order to reach these ends, there are a variety of different ways that primary care can be organized and financed. We have some notion on how organizational designs and financing arrangements affect outcomes, but there is little evidence to support

these hypotheses. In spite of this, a number of policy recommendations have been firmly proposed to reform primary care in Alberta, and the rest of Canada. These recommendations have been geared towards reorienting care towards teams and increasing capacity by introducing more non-physician resources (for example, nurses and information systems) into family practices. In most of the reform proposals the means of enhancing primary care are mixed in with the ends and, in some cases, they even overshadow the ends. Given our limited resources, in all likelihood the resources to achieve the proposed goals will never be fully available. We will then need to make choices on how to prioritize the use of these limited resources, to achieve our ends as best as we can. The formulation of payment schemes and the expression of means 27/7, (information systems, health care teams) as ends in themselves, without having some evidence on their impacts on patient wellbeing, only detracts from our ability to make deliberate choices. And it may well detract from patient well being despite the best of intentions.

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There have been numerous criticisms of family medicine in recent years and many suggestions for more spending and for reform of organization and finance. Despite the attention paid, there is no overview on the current economic situation in terms of costs and outcomes and little economic evidence. We provide an analysis of the economic landscape of primary care in Alberta and a discussion of the proposed reforms in terms of ends and means.



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