

HEALTH OUTCOMES IN CHRONIC DISEASE MANAGEMENT:

(This paper derives much of its data and specific text about the management of diabetes in Canada from the Health Council of Canada's 2007 "Health Outcomes Report – Curbing Chronic Disease Together, The Case of Diabetes". Dr. Ian Bowmer is a member of the Health Council of Canada and chairs the Council's Health Outcomes Working Group)

Canada is a federation in which health care is the primary responsibility of provinces and territories. In September, 2000 a discussion among federal, provincial and territorial government led first ministers to acknowledge that improvements to primary health care and the use of multi-professional teams were crucial to the renewal of health services. The Government of Canada established an \$800 million Primary Health Care Transition Fund which, over a six-year period, was designed to help reform the primary health care system and to support transitional costs for new approaches to delivery. Funding was made available to provinces and territories to accomplish five primary objectives:

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).

In 2003, the Prime Minister and all Premiers (i.e. First Ministers) made further investments to increase multi-professional primary health care; included the goal of 24 hours a day, 7 days a week access to an appropriate health care provider; and agreed there was a need for better information on needs and outcomes. The federal government

pledged \$70 billion in transfer payments to jurisdictions over eight years to focus on primary health care, home care and catastrophic drugs along with initiatives for Aboriginal peoples, diagnostic equipment, information technology including a linked electronic health record and research. In 2004 the First Ministers' 10-Year Plan to Strengthen Health Care committed governments to increase the supply of health professionals based on their assessment of the gaps. The federal government agreed to expand the assessment of internationally trained graduates, to target efforts in Aboriginal peoples' communities, to reduce the financial burden on students, and to participate in health human resources planning with interested governments. In its 2006 report, the Health Council of Canada (established by First Ministers in 2003 to monitor the results of the federal government's investments resulting from the Accords) identified a significant problem and came to a disturbing conclusion.

“By focusing on access as the principal objective, health care renewal efforts are not forcefully addressing the increasing evidence that our more deep-rooted problem is quality. Rather than ask only whether there is enough access to services, we should also ask: access to what? Are we providing the safest, most appropriate care? Are we investing enough in prevention? Are we reducing inequalities in health? The answer to these questions is no, not yet.”

In this paper we will report on some outcomes of the recent investments including changes in the physician workforce, an overview of chronic disease management in Canada, a review of the latest data for one chronic disease – type 2 diabetes and an examination of Canadian successes and opportunities for improvement.

Health Outcomes as the Impact of Transformation Initiatives on the Health of the Population, Communities and the Individual:

Health outcomes are the result of services, programs and policies that influence health. Measurement must not only include how specific illnesses of individuals are managed better but must also show how individuals and populations change behaviors after the

implementation of policies or programs. By international standards and gross measurements such as life expectancy and maternal / fetal mortality, Canadians are quite healthy. However, not all groups within the country share in good health. One in three Canadian adults have at least one of the seven most common chronic health conditions and the trends in the risk factors for these conditions suggest that the numbers will continue to grow.

In its soon-to-be-published report on health outcomes the Health Council of Canada raised a number of questions:

- Does care match expert-recommended guidelines?
- Is care efficient and coordinated over time?
- Is care safe?
- How do people experience care?
- How successfully does care prevent avoidable health problems?
- Does care provide good value for money?

The State of Chronic Illness Care in Canada - using type 2 diabetes as an example

Diabetes Mellitus can be used to look at some of these questions. This disease also acts as a marker for the disparities in health status that occur among Canadians, especially those of lower socio-economic status and those who are among Canada's Aboriginal peoples.

Approximately 5% of the population in Canada has diabetes an increase of 2% over ten years ago. While it is recognized that type 2 has genetic links, up to 90% of cases could be prevented through individuals maintaining a healthy diet, regular physical exercise and ideal body weight (WHO). The prevalence of diabetes varies from province to province. It is lowest in Alberta (3.8%) and highest in Newfoundland and Labrador (7%).

Most people with diabetes have other chronic diseases and the inequalities in health outcomes become more obvious when the number of chronic diseases is compared across

socioeconomic groups. Nearly twenty percent of those Canadians in the lowest income group have two or more chronic health conditions whereas less than five percent of the highest income-Canadians have two or more chronic diseases. (HCC, 2007). The amount of physical activity varies from province to province and territory. The provinces of Newfoundland and Labrador and Prince Edward Island have the highest percentage of people (53% and 55%) who are inactive. British Columbia and Alberta have the lowest percentage (40% and 45%) of inactivity. Dietary access to fruits and vegetables is a problem with significant variation across the country. Access is problematic in Northern Canada. Newfoundland and Labrador has 73% of people reporting they eat less than five servings of fruit and vegetables per day compared to Quebec who report only 45% of the people in the same category. (HCC, 2007)

Aboriginal peoples have higher rates of diabetes than the average Canadian. An estimated 20% of First Nations' people living on reserve have diabetes. In the age group 55-64 the prevalence of diabetes among First Nations' men has doubled in five years from 18 – 36%. First Nations' women have remained high (>36%) during the same time frame. Of all Aboriginal peoples the Inuit report the lowest rates but these are still higher than for the average Canadian. (reference)

The current evidence is that Canadians with diabetes do not get the recommended follow-up laboratory procedures as often as they should. Less than half of Canadians with diabetes undergo all the lab tests and procedures that experts recommend. Whether results are measured at the national by Statistics Canada, provincial in British Columbia or Saskatchewan or regional level in eastern Ontario – the results were consistent. In an international 2005 survey, small samples of adults with diabetes in six countries were asked about whether they received various tests and service to monitor their health (Table XX). Canada had a significantly lower proportion of people who received all four of the recommended tests and procedures covered in this survey than did other countries. Less than 40% of Canadians with diabetes all four recommended tests (reference).

Select Tests and Procedures among People with Diabetes in Four Countries 2005

Test/Procedure	Canada	Australia	United States	United Kingdom
A1C checked in six months	90%	86%	90%	85%
Feet examined in past year	52%	57%	70%	75%
Eye exam in past year	73%	73%	69%	83%
Cholesterol checked in past year	91%	93%	92%	92%
Percent who received all four	38%	41%	56%	58%

Source: Commonwealth Fund International Health Policy Survey of Sicker Adults , 2005 (adapted from Health Affairs; 3 Nov, W5-509 – 525 as reported in Health Council of Canada – Health Outcomes Report)

Other conclusions from various sources include the following:

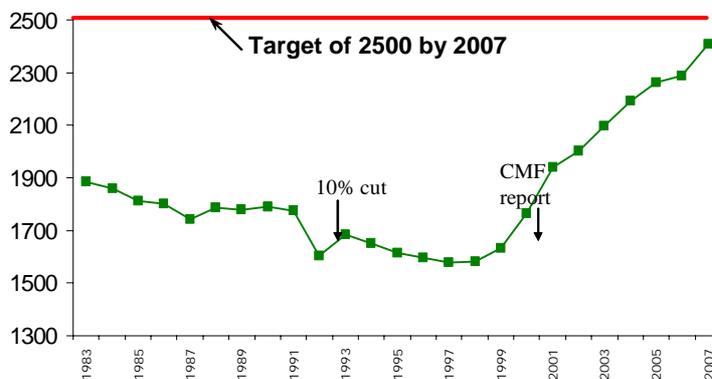
- More than half of Canadians with diabetes have poor cardiovascular health and half do not achieve the recommended levels of blood sugar. [Harris et al. 2005 results of Diabetes in Canada Evaluation Study –DICE *Diabetes Research and Clinical Practice*; 7090-97]
- Too few Canadians get the help they need to avoid diabetes complications. While many (79%) had treatment plans that included lifestyle changes, only 57% had aggressive plans that included medication or referral.
- Health care providers need to do more to help patients with diabetes manage their conditions. In patients with symptomatic atherosclerosis and type-2 diabetes, only 22% were receiving medications to reduce death from heart attack or stroke. [Brown et al (2004) *Canadian Medical Association Journal* 171;1189-1192]
- Primary health care in Canada is not organized for the best possible care of chronic conditions. For example, only 55% of surveyed primary care physicians in Canada felt their practices were well prepared to provide optimal care. Thirty two percent routinely used multi-disciplinary teams to deliver chronic care and

only 14% routinely provided written instructions to manage chronic diseases at home. At the time of the survey, 23% were using electronic medical records in practice and 27% had access to patient test results. [Schoen C, et al. (2006) *Health Affairs* Web Exclusive November 2, 2006]

Increasing Physician Human Resources - Initiatives and their Outcomes

It is clear that governments have invested in increasing physician human resources. Enrolments in medical schools have increased by nearly 50% from their lowest level reached in 1997 (figure 1). This has been accomplished through expansion of each medical school, primarily by utilizing clinical learning centers distributed away from the main campus. The Province of Ontario also created a new medical school located in the north, with a mission to provide rural medical care including care to Aboriginal peoples.

First Year Enrolment in Canadian Medical Schools:
actual for 1983-2005 and projected for 2006-7
(including 40-50 Visa students)



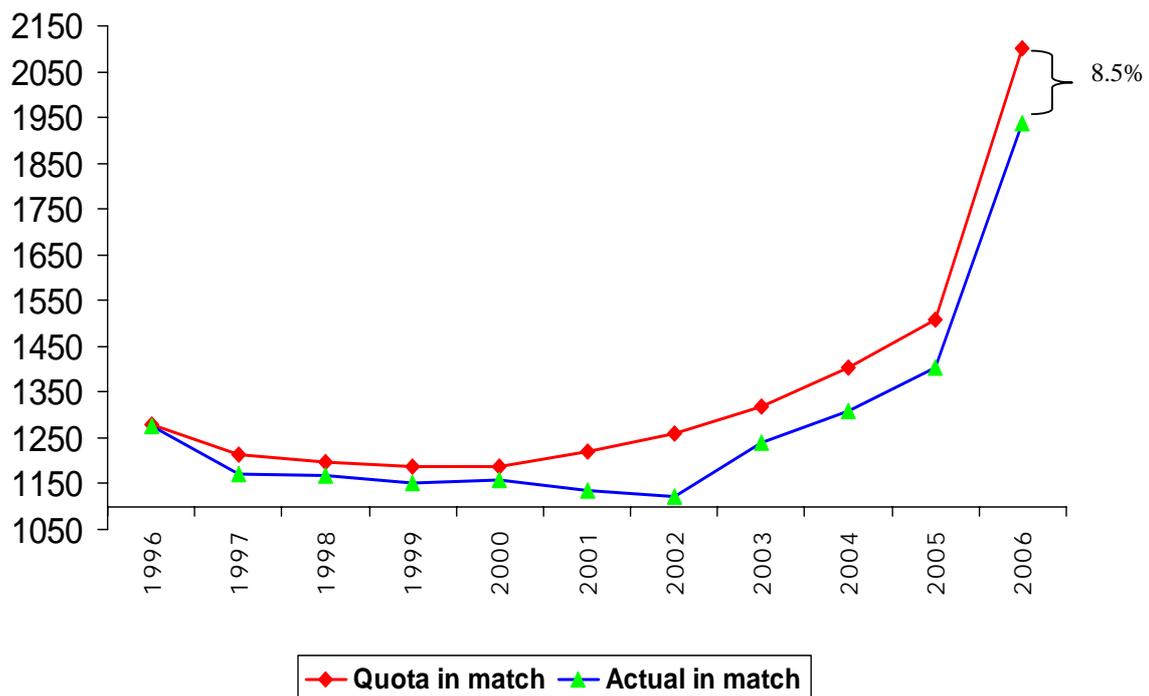
Source: Medical Education Statistics, AFMC

Note: Figure for 2005 is estimated

Canadian postgraduate education is structured through formal accreditation systems of the College of Family Physicians of Canada (CFPC) and the Royal College of Physicians

and Surgeons of Canada RCPSC). Postgraduate specialty education requires from two years for primary family medicine residency to up to six years for some of the surgical specialties. Subspecialty education such as family medicine, emergency medicine and RCPSC subspecialties such as cardiology require from one to three additional years. Data from the Canadian Resident Matching Service (CaRMS) annual report (figure 2) demonstrates that provincial governments have increased the number of postgraduate education positions in anticipation of the positions required to accommodate the increased undergraduate enrolment.

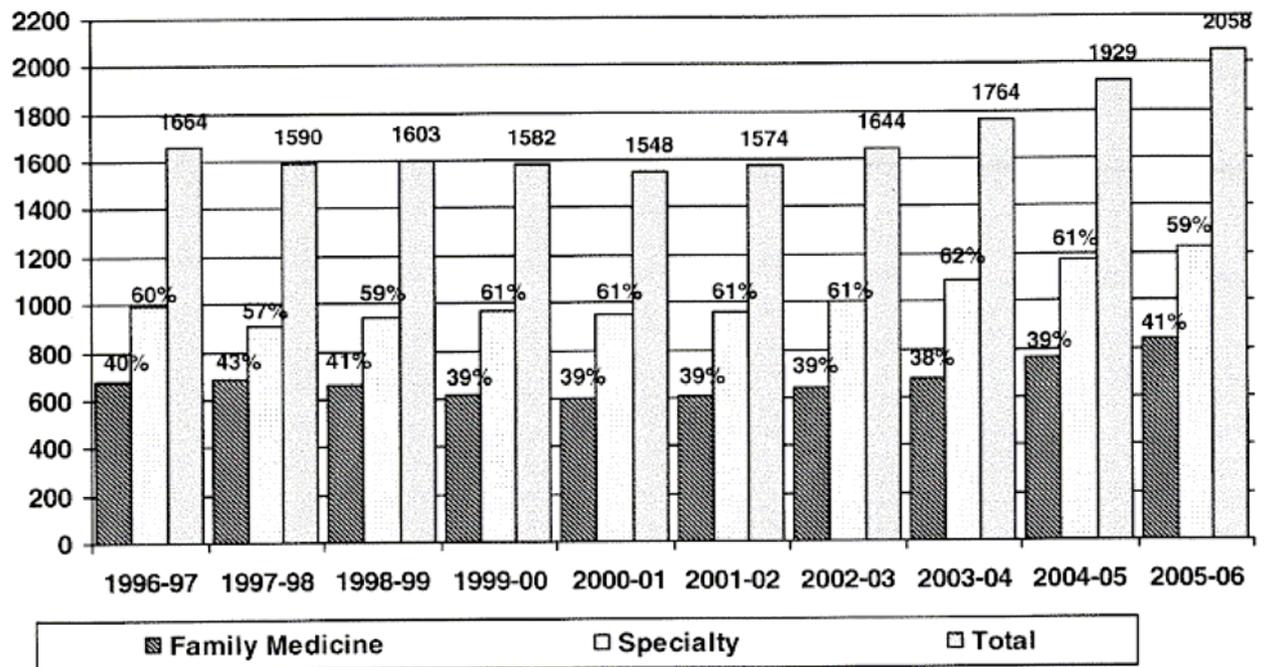
Trends: First Year Postgraduate Residency positions available in the CaRMS Match



Canadian Resident Matching Service Annual Report 2005 + personal communication

The Canadian Postgraduate Education Registry (CAPER) data show that both CFPC family medicine entry positions and RCPSC specialty entry positions have increased and the ratio of family medicine to other specialties remains about 60/40 (figure 3)

1. Canadian Citizens and Permanent Residents: Comparison of the Proportions of First Year Trainees in Family Medicine and Specialty Training Programs



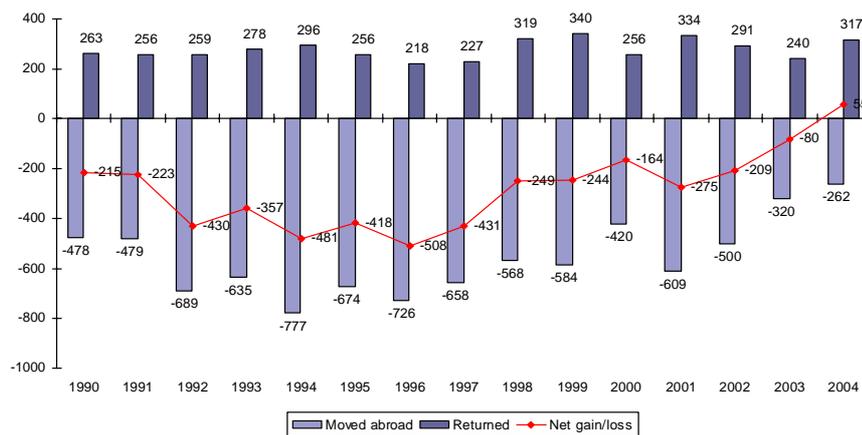
From a low of 1548 in 2000, we have seen an increase in the number of Canadian citizen/permanent resident physicians entering training. This number has risen to 2058 in 2005. Also the proportion of those in Family medicine has increased in the last year to 41% (n = 835). 59% of first year trainees (n = 1223) entered specialty training. These 2058 men and women will be the new physicians for Canada in 2 to 5 years from now,

In addition to general funding for postgraduate positions in Canada, governments have increased funding for international medical graduates (IMG) (CAPER figure 4). Funded residency positions for IMG now total 933 compared to 291 in 1999, an increase of 220%. Through federal government funding, the Medical Council of Canada has been collaborating with provincial or regional programs to better assess the knowledge, skills and behaviors required by regulatory authorities to enable the international medical graduate to enter independent full or limited practice or to determine whether further

training is required. All of these efforts have successfully increased the pool of Canadian physicians.

Recent evidence from CIHI demonstrates that the ratio of the number of physicians returning to the country compared to the number of physicians leaving has reversed and as of 2004 is in positive balance. (Figure 4)

Migration of Canadian Physicians: 1990-2004



Source: Supply, Distribution and Migration of Canadian Physicians, CIHI

Government initiatives include specific programs for recruitment of Canadians studying or practicing outside the country as well as promotional activities for each of the disciplines. For example, Federal Government funding has assisted College of Family Physicians to develop programs such as the family medicine interest groups in all medical schools. These are actively promoting the value and need for family physicians in primary health care among the Faculties of Medicine. However, these initiatives have yet to be evaluated over the long term. Data from the Canadian Resident Matching Service do show that in 2005 and 2006 more graduates from Canadian medical schools

are choosing Family Medicine residency programs than in the previous five years. The Primary Health Care Transition Fund also has assisted provinces in remodeling the delivery of primary health care, and provinces have been changing remuneration options for family physicians. Different payment models are being tested in different jurisdictions: these include salary, blended models of capitation and fee-for-service, sessional fees for specific services, pay for performance, supplemental fees for working in multi-professional teams, and supplemental programs for the introduction of the electronic health records. Most jurisdictions are using more than one model to effect change.

The Government of Canada through Health Canada has funded initiatives to promote inter-professional education. All universities with medical schools have had the opportunity to compete for over \$20 million to develop educational programs that involve nursing and at least one other health discipline. Three-year grants have been awarded to promote the development of new faculty and new curriculum for inter-professional education at the undergraduate, postgraduate and continuing professional development levels.

Directed funding such as the Inter-Professional Initiative has resulted in the adoption of inter-professional curricula in all medical schools in Canada. It is less clear for that the other funding initiatives track to specific outcomes. However, it is clear that there are increases in medical school enrolment, new curriculum planning, the development of alternative pathways to licensure, increased access to postgraduate education, and the recruitment of students into primary health care. Throughout the country there is a measurable increase in students and physicians needing further education in the educational system.

Will increases in supply improve quality of care and health outcomes?

Expected increases in supply of physicians in Canada is seen as part of the solution to improving health of Canadians and among special populations such as individuals with

diabetes. But, getting the appropriate lab tests and procedures to monitor and improve health among people with diabetes does not necessarily mean that people should simply see their doctor more often. Research into the care of 20,000 patients with diabetes in British Columbia found that, regardless of how many times people saw their doctor, no more than 50 per cent received the recommended tests for blood sugar, kidney function and eye health – and that quality of care reached a plateau at about five visits.

We may need more health care providers – or more of the right kind of providers – for a number of reasons, but that alone will not improve health outcomes. It’s what takes place during those health care visits that matters more. This evidence underlines the importance of changing how we deliver care – by changing some of the roles of care providers (for example, the use of interprofessional teams with case managers) and the way care is organized and measured (for example, the creation of collaboratives) (Krueger, 2006).

Multidisciplinary Teams and Policies to Increase Access of the Canadian Public to Primary Health Care Providers

The goal of the Primary Health Care Transition Fund was to catalyze the transformation of primary health care in Canada. In the 2003 Accord, First Ministers set out specific objectives concerning access to care and the 2004 First Ministers’ Accord refined these objectives, added the requirement to monitor health outcomes, and developed a ten-year multi-billion dollar investment plan.

In 2006 the Health Council of Canada’s report surveyed all jurisdictions and came to the following conclusion;

Access to needed health care will continue to be an issue for Canadians as long as our services are not well integrated, coverage for services is not equitable across the

country, and individuals experience long waits for necessary care. Pockets of the country have achieved real improvement but change needs to be more widespread and comprehensive

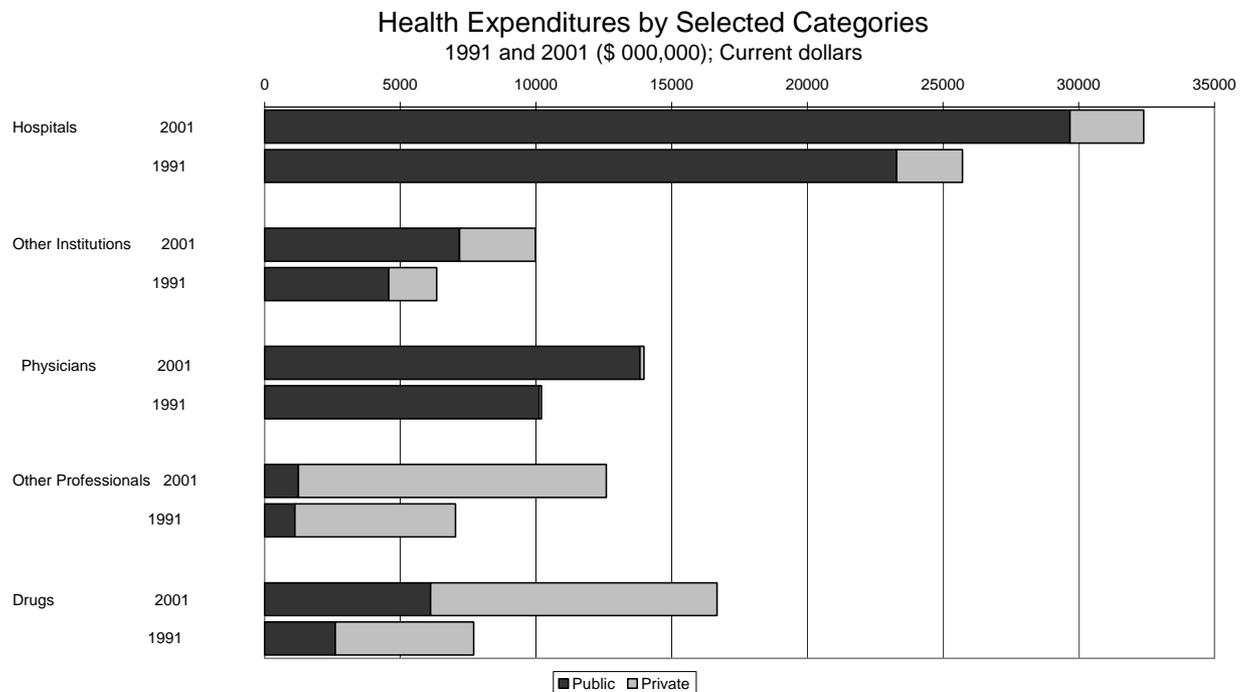
(http://www.healthcouncilcanada.ca/en/index.php?option=com_content&task=view&id=81&Itemid=82) accessed January 7, 2007

In its report the Council observed a wide variation among multi/inter- professional team development across the country, noting that few jurisdictions had developed other than pilot models. Implementation across the primary health care system was slow, due partly to differing definitions of what constitutes a multi- or inter- professional team, issues concerning scopes of practice for the members, and issues involving remuneration for those who were either privately paid for their services (some social workers, clinical psychologists etc.) or were paid fee-for-service from provincial ministries of health (physicians).

Analysis of national health expenditure trends¹ (Figure 5) suggests that:

- There have been real increases in expenditures on physicians and allied health care providers (i.e., dentists, chiropractors, massage therapists, physiotherapists and psychologists). These relate to increases in both the number of these providers and their incomes.
- Real increases in expenditures on allied health care providers have occurred through private, rather than public, sources. Allied health care providers have been, and continue to be, predominantly financed through private sources. By 2001, private financing accounted for 84 per cent of expenditures on allied health providers. Of the 16 per cent financed by governments, the number and type of allied health providers who deliver publicly funded PHC is unknown.
- Public investment in allied health care providers has remained stable over the period.¹
- Physicians have been, and continue to be, predominantly financed through public sources.

Figure 5. Data Source: Canadian Institute for Health Information (CIHI). National health expenditure trends: 1975–2003. Ottawa: CIHI, 2003



¹. Between 1991 and 2001, the size of the allied health care workforce increased primarily due to government investments in publicly funded education but, the incomes of this expanded workforce have increasingly been financed through the private sector. Arguably, only those people who have private insurance or are able to afford to pay for health services have realized the benefits of a publicly financed expansion of the allied health workforce.

These temporal trends reflect historic policy commitments to financially support a mix of different types of PHC providers through public versus private funds. It is important to acknowledge, however, that the current financing situation and the latitude for public policy decision-making in this area are heavily influenced by legislative legacies in Canada. Consider that, in 1966, the *Medical Care Act* enshrined public payment for private medical practice,ⁱⁱ and in 1984, the *Canada Health Act* required public investments in medically necessary hospital and physician services. This legislative focus on medical need and physician services may explain why interprofessional teams are not the predominant model of PHC in Canada and why physicians are almost exclusively the

providers of primary medical care. No corresponding legislation exists to commit governments to invest in an interdisciplinary mix of primary health care providers.

In conclusion, despite both federal and provincial initiatives beginning in 2000 and despite significant investments in the transformation process, the transformation of the Canadian primary health care delivery system to increase access has been slow.

Suggestions made by the Health Council to improve the transformation process include:

- *faster implementation of multi- /inter-professional primary health care teams;*
- *immediate efforts to enable each health care professional to practice to his or her full potential so that health human resources strategies can make the best use of skill sets;*
- *significant investments in information management systems to support quality care*

http://www.healthcouncilcanada.ca/en/index.php?option=com_content&task=view&id=81&Itemid=82

Two Canadian Models of Care which are Deemed Successes and Value for Money:

In all areas of health care delivery, there is increasing evidence that systemic change can provide positive results that a team approach can be effective and that prevention strategies, when implemented, make a difference. Funding to the Canadian health care system has resulted in a number of pilot projects that provide such evidence though unfortunately they have not necessarily been widely implemented. This section will concentrate on a two examples which can be considered successes including demonstrating value for money.

One is the development of collaboratives. A collaborative is a virtual group of health care providers who are supporting one another through quality improvement and the adoption of best practice guidelines. Physicians are integrated with other health care professionals

to ensure all providers have the right information about their patients and have identified the best treatment options for them. The goal is also to enable patients to manage their own chronic health conditions. At least three Canadian provinces; British Columbia, Saskatchewan and Newfoundland and Labrador have adopted the collaborative model of care as their primary health care reform approach in the management of chronic disease.

British Columbia (BC) developed a Chronic Disease Management Toolkit and introduced the model in 2003. It has some of the most complete outcome data. For example, since the Vancouver Island Health Authority introduced a collaborative, the rates of appropriate testing for patients with diabetes have doubled, the appropriate prescribing to manage congestive heart failure tripled, and depression among patients with chronic health conditions is now more often recognized and brought into the care plan. BC is already reporting a drop in diabetes-related complications. This has been documented in fewer emergency visits and hospitalizations for health problems typically related to diabetes. The incentive paid to primary care physicians is \$125 per patient per year. The province estimates that the cost per diabetes patient has dropped from an average of \$4,400 in 2001/2002 to \$3,966 in 2005/2006. The province is moving to have the majority of physicians practicing in a collaborative model within two years.

(www.heartbc.ca/pro/collaboratives/dm/dmindex.htm)

Saskatchewan is in its first year of operation and there, the system has demonstrated a 30% improvement in screening for kidney disease, a 22% improvement in appropriate medication to prevent myocardial infarction and stroke and a 5% improvement in the percentage of patients with A1C levels under the acceptable level as per expert guidelines.

An example of a diabetes prevention program that is working is in the Mohawk First Nation community of Kahnawake, Quebec. The Kahnawake Schools Diabetes Prevention Project (KSDPP) has been working on prevention of diabetes since 1994. It focuses on about 600 children and uses a locally-designed curriculum, school policies

and community activities to improve key risk factors such as eating habits, body weight, and physical activity among the children, their families and their extended families.

The program not only calls for a health curriculum at school but includes a school nutrition policy to ban “junk” food, a partnership with the local grocery stores to promote healthy choices, a water-side recreational development for exercise and community events, a race event and a training centre. Now, as the program reaches its second generation of children, the incidence rates for diabetes in Kahnawake are approaching the Canadian average, compared to the only other Aboriginal peoples’ incidence study from Manitoba where the rate of new cases was several times the Canadian average.

[Horn, OK et al. *Incidence and prevalence of type 2 diabetes among Kanien’kehahe of Kahnawake, Quebec 1986 – 2003* Presentation to the NA Primary Care Research Group, Quebec City, October 2005 and Paradis, G et al (2005) *Impact of a diabetes prevention program on body size, physical activity and diet among Mohawk Children 6-11 years old: 8-yr results fro the Kahnawake Schools Diabetes Prevention Project* Pediatrics 115:333-339]

Summary

Health care in Canada is in the midst of major change. A series of accords by the federal, provincial and territorial governments have laid out the direction of that change: towards primary health care delivered by teams made up of a range of health care professionals; towards information technology to streamline the flow of vital information for patients and their care providers; and towards preventing chronic health conditions and helping patients with chronic disease have the best possible quality of life.

There have been significant financial investments in supply and dramatic increases in multiple sectors to increase the number of physicians as well as nurses and other health care professionals. The Faculties of Medicine have increased their enrolments by more than 30% and there has been a concomitant increase in the number of postgraduate

training positions. Governments have also increased the number of positions to enable international medical graduates to receive additional education to enter the Canadian health system. It is recognized that despite the investments and additional educational opportunities there remains a need to develop clinical training capacity to accommodate all these increases. Retention of physicians in Canada has improved with evidence to show that the traditional cross border migration between Canada and the US has had a net gain in the past two years. A federal funding initiative has resulted in the introduction of inter-professional education into all universities with faculties of medicine. The introduction of multi-disciplinary/inter-professional teams across the country has been sporadic and the definition of team structure is variable.

Therefore, it is not surprising that when one major chronic disease (type 2 diabetes) is scrutinized, it is clear that a number of issues remain unresolved.

- There is a breakdown between expert recommendations on lab tests and procedures and the actual number that are performed and there is a breakdown between poor test results and the action on that information. Not surprisingly, only half of family physicians in Canada feel their practice is well-prepared to handle patients with multiple chronic health conditions.
- National, provincial and regional studies in Canada consistently reveal that fewer than half of Canadians with diabetes get all the lab tests and procedures that experts recommend to monitor blood sugar, blood pressure, cholesterol, kidney health, vision, and foot health. More than half of Canadians with diabetes do not have good cardiovascular health and half do not receive recommended levels of blood sugars.

Several provinces have established a process called *collaboratives* to improve the quality of care for people with chronic health conditions. A collaborative brings together health care providers and health care system managers to set goals and make changes to bring patient care closer to the standard set by expert guidelines (for example, the percentage of people with diabetes who achieve recommended blood sugar levels and cardiovascular health). They are given access to learning sessions and quality improvement tools such as

electronic systems that help to trigger appropriate steps in care and that also allow them to track how their patients are doing as a group. Financial incentives, to reward health care providers for changing the way they work, can be an effective part of this process. Yet only 44 per cent of Canadian family physicians have been trained in tools and methods to improve quality of care, and far fewer receive financial incentives to manage care for patients with chronic health conditions.

Despite these problems, which at least are now being identified, improvement in outcomes is possible. This paper describes one program that successfully reaches high-risk people and breaks down the barriers to prevention and care, the Kahnawake Schools Diabetes Prevention Program.

The critical next step for Canada will be whether we can a shift from pilot projects to system transformation, as these projects are shown to work.

ⁱ Canadian Institute for Health Information, *National Health Expenditures Trends: 1975–2003* (Ottawa, Author, 2003).

ⁱⁱ C. David Naylor, *Private Practice, Public Payment: Canadian Medicine and the Politics of Health Insurance, 1911–1966* (Kingston: McGill–Queen's University Press, 1986).