

Physician Retirement in Canada: What Is Known and What Needs to be Done

Raymond W. Pong, PhD

Centre for Rural and Northern Health Research
Laurentian University

Francine Lemire, MD, CCFP, FCFP

College of Family Physicians of Canada

Joshua Tepper, MD, CCFP

Ontario Ministry of Health and Long-Term Care

Paper prepared for the 10th International Medical Workforce Conference
Vancouver, British Columbia, Canada
March 20 - 24, 2007

Acknowledgements

The authors gratefully acknowledge the help kindly provided by Mr. Luke Jones of Health Canada, Ms. Lynda Buske of the Canadian Medical Association, and Ms. Chrissy Willemse of the Canadian Institute for Health Information. Without their support, the timely completion of this study would not have been possible.

We also would like to thank the Canadian Institute for Health Information and the Canadian Medical Association for giving us permission to use data from the Scott's Medical Database, the 2004 National Physician Survey, and the Canadian Medical Association Masterfile.

Finally, we would like to thank Dr. Bernard Marlow for the College of Family Physicians of Canada, Dr. Francois Goulet of the Collège des médecins du Québec, Ms. Elizabeth Wenghofer and Dr. Brian Gamble of the College of Physicians and Surgeons of Ontario, Dr. Robert Young of College of Physicians and Surgeons of Newfoundland and Labrador, and Dr. Douglas Blackman of the College of Physicians and Surgeons of British Columbia for providing information about programs to ensure competence.

Abstract

Physician retirement is receiving increasing attention as more and more physicians are nearing the traditional retirement age of 65 and as there is a growing concern about physician shortages in Canada. This study examines what we know about physician retirement and what the implications are for physician workforce planning and the Canadian health care system.

Depending on which source of data is used, one gets somewhat different estimates of the extent of physician retirement. This may be because various databases define retirement differently and collect data in different ways. Thus, there are no authoritative estimates of physician retirement in Canada at this time. Also, it is necessary to distinguish between retirement intentions and retirement behaviors. Using the former to predict physician retirement may over-estimate the number of retirees.

Although the number of physicians retiring will inevitably increase due to the aging of the medical workforce in Canada, available evidence suggests that physicians tend to quit work later than the average Canadian worker. Also, instead of dropping out of the medical workforce completely at age 65, many older physicians choose to remain in practice, though not necessarily maintaining the same activity level or doing the same kind of work.

If retirement is understood to mean complete cessation of medical practice, it should be seen as the end point of a continuum of changes in medical practice as a physician ages. But prior to full retirement, many other changes in medical practice may have occurred, such as reduction in workload and narrowing of the scope of practice, which also have implications for medical care provision and physician workforce planning. Thus, the potential impact of the aging of the medical workforce should be examined from the broader perspective of changing medical practice patterns, rather than from the narrow focus of retirement.

It appears that many older physicians still want to make a contribution. Strategies should be developed to accommodate those who still wish to work. Possibilities other than full-time clinical practice need to be made available in order to keep older physicians in the medical workforce and make the best use of their experience and expertise. For those who wish to continue clinical practice, but on a part-time basis, it is necessary to ensure that their knowledge is kept up to date and their clinical skills are maintained. Although there is a lot of talk about possible shortages of physicians in Canada, not much has been done to date to encourage older physicians to remain in practice.

1 Background

Concerns about large numbers of physicians reaching retirement age and leaving the medical workforce in the coming years appear to be a recent phenomenon in Canada, at least insofar as federal and provincial ministries of health are concerned. As a matter of fact, throughout the 1980s and up to the mid-1990s, there were worries about an over-supply of physicians and various measures were taken to regulate their numbers. While many of these measures targeted medical students and new graduates, some were designed to reduce the number of older doctors as well. Some provinces such as Nova Scotia and Quebec implemented retirement buyout packages for older physicians, and British Columbia introduced mandatory retirement for physicians at age 75 (Chan et al.1998).

Recent unease about physician retirement may have emerged as a result of the convergence of several demographic and labor market trends. The Canadian population as a whole is getting older as a result of the baby-boom generation approaching the traditional retirement age of 65, growing life expectancy, and sharp reduction in fertility rates over the last several decades. Some observers have pointed out that the health and medical care needs of the aging baby-boomers will place great stress on the health care system. For example, Tyrrell and Dauphinee (1999) have noted that in 1999, approximately 12.5% of the Canadian population was over 65. By 2015, it is forecast to increase to 16.5%, and to more than 25% by 2030. They have also pointed out that patients over 65 account for about 70% of the entire health care budget, implying that the aging population will require more health care. As a result, population aging will have implications for the health workforce in general and physician supply in particular.

It is increasingly recognized that the physician workforce is also getting older and that the aging trend will accelerate. This has led to predictions that many physicians belonging to the post-World War II baby-boom generation will exit the medical workforce in the coming years, possibly creating a physician-shortage situation.

Another factor that has raised the anxiety level about mass physician retirement is physician shortages that are predicted to get worse. This is a departure from the view, commonly found in the 1980s and early 1990s, that Canada had a surfeit of physicians. Since the early years of the current decade, there has been a reversal of official position regarding physician supply, as can be seen by the substantial expansion of medical school enrolment and the introduction of programs to enable more foreign-trained physicians to practice medicine in Canada.

Concerns over physician retirement reflect the belief that current efforts to boost physician supply may not be enough to replace the physicians who will retire. For instance, Maguiness and associates (2004) have projected that twice as many dermatologists in Canada will retire over the next five years than will graduate from residency programs. Such concerns may have been reinforced by the belief that increasingly, Canadian workers, including doctors, wish to take early retirement. Research has actually documented the gradual decline in the median retirement age of Canadian workers in recent decades: from 64.9 years between 1976 and 1980, to 62.2 years between 1991 and 1995, to 61.0 years between 1996 and 2000 (Duchesne 2002).

All this has prompted various medical organizations to sound the alarm bell about the impending medical workforce “crisis” resulting from a surge in physician retirement. In releasing the results of the 2004 National Physician Survey, the Royal College of Physicians and Surgeons of Canada, the College of Family Physicians of Canada, and the Canadian Medical Association (2004) warned in a joint press release:

“The NPS (National Physician Survey) identified two other significant shifts in the physician population that are changing the face of medicine in the country. First, a large number of physicians are reaching retirement. If the survey data is translated to the physician population as a whole, as many as 3,800 doctors plan to retire entirely in the next two years alone. This is more than double the current rate of retirement....” (Ottawa; October 27, 2004)

2 Objectives, Methods, and Data Sources

One of the objectives of this study is to see if concerns about physician retirement are justified. More specifically, this paper examines the issue of physician retirement from several angles. First, it seeks to uncover what is known about physician retirement from the existing literature. It then examines the extent of physician retirement, using different sources of data. This is followed by a discussion about physician retirement from a medical workforce perspective. In particular, it examines the policy responses that have been or should be put in place to address the retirement issue. The concluding section revisits the major findings and salient issues.

This study relies extensively on culling information concerning physician retirement from available studies, though the body of relevant literature is rather meagre. Supplementing the findings from other studies are results based on analyses of secondary data from various sources, which show the retirement intentions and behaviors of Canadian physicians.

Two types of data are typically used to shed light on physician retirement: data on retirement intentions based on surveys of physicians and data on physicians exiting the medical workforce from administrative databases such as registration data and fee-for-service billing data. The former include such sources as the 2004 National Physician Survey jointly conducted by the Royal College of Physicians and Surgeons of Canada, the College of Family Physicians of Canada, and the Canadian Medical Association. The latter include the Scott's Medical Database (SMDB), National Physician Database, and Canadian Medical Association Masterfile (CMA Mf).¹

Other sources of data that are not exclusively about physicians may also be used to study some aspects of physician retirement, such as the Canadian census, which has some information about occupations and labor-force activities of all Canadians, including physicians.

In addition to analyzing secondary data, selected regulatory and licensing bodies at the national and provincial levels, as well as the Canadian Medical Protective Association,² were contacted by the research team. The purpose of this informal survey was to find out what measures were in place to ensure the competence of older physicians who continue to engage in clinical practice.

3 Physician Retirement: What Do We Know from the Literature?

The short answer to this question is that we don't know very much. To be more specific, we know quite a bit about the aging of the physician workforce, but not much about physician retirement. Much of the discussion about physician retirement is inference based on the aging of the physician population. Part of the problem may be because there is not a clear-cut definition of retirement.

Canada is blessed with reasonably comprehensive and reliable data on physician demographics, which make physician workforce analysis and projections, based strictly on demographic factors, feasible. Chan (2002), for example, has pointed out that the physician workforce was at its most youthful point in 1988, when 22% of all physicians were under the age of 35. There was a gradual decline in the proportion of physicians under 35 from 1988 to 1993 and a steeper decline from 1993 onwards. By 2000, only 13% of the workforce was under age 35 (Chan 2002). Conversely, the number of physicians aged 60 years or older continued to increase from 2000 to 2004. The average age of all

¹ More detailed information about these databases can be obtained from a number of websites. 2004 National Physician Survey: <http://www.nationalphysiciansurvey.ca/nps>; Scott's Medical Database: http://www.secure.cihi.ca/cihiweb/dispPage.jsp?cw_page=hhrdata_smdb_e; National Physician Database: http://www.secure.cihi.ca/cihiweb/dispPage.jsp?cw_page=hhrdata_npdb_e; CMA Masterfile: <http://www.cma.ca>

² CMPA is a "mutual defence" organization for and by Canadian physicians in relation to medico-legal issues.

physicians grew slightly from 47.5 to 48.6 in the same 5-year period (Canadian Institute for Health Information 2005).

The provinces follow the national demographic trends. In the case of Ontario, the average age of all practicing physicians was 51.7 years of age in 2005, up from 49.0 years of age in 2000. More than half of the physicians in Ontario are now over 51, and it is projected that by the year 2009, 44.8% of all physicians in the province will be over 55 years of age, 30.1% will be over 60, and 18.2% will be over 65 (College of Physicians and Surgeons of Ontario 2006). Similar aging patterns can be found in other provinces.

Studies that focus on individual specialties have reported similar trends. For example, a study of Canadian anesthesiologists has shown that in 1999 the mean and median ages of anesthesiologists were 47.6 and 46 years of age, respectively, with 27% of all anesthesiologists over the age of 55 (Donen et al. 1999). A study of dermatologists has likewise found that the average age of Canadian dermatologists was 52 years in 2004, and 35% of practicing dermatologists were older than 55 (Maguiness et al. 2004).

But the literature on physician retirement in Canada is sparse. To date, there are very few studies devoted to examining the retirement issue *per se*. Studies about physician retirement exist (e.g., Gillies and Ross 1984; Gilmore 1987; Robb 1997; Trent 1993), but they tend to focus on the legal aspects of mandatory retirement rules as applied to physicians or the practical aspects of preparing for retirement.

Other studies that touch on the topic of retirement are those that describe the age-sex structure of the medical workforce or those that examine the present or future medical workforce in Canada. For instance, Tyrrell and Dauphinee (1999) have predicted that retirement of Canadian physicians will accelerate over the coming years because the number of physicians over the age of 55 is expected to increase from about 26% in 1999 to about 43% by 2021. But many of these studies mention physician retirement in passing, without focusing their analysis on retirement. Some studies (e.g., Donen et al. 1999; Yang et al. 2000) make the assumption that physicians will retire at the age of 65, with little or no supporting evidence. Others - mostly based on survey findings - report the retirement intentions of physicians. An example is a study by Maguiness and associates (2004). On the basis of a survey of Canadian dermatologists, they have reported that the average dermatologist plans to retire at the age of 64 and that 13% of the dermatologists plan to retire within five years.

4 Retirement and Practice Characteristics of Older Physicians

4.1 Understanding retirement

Before presenting data on physician retirement in Canada and discussing the implications, it is worth noting how physician retirement is commonly understood. First, as Foot and colleagues (2000) have pointed out, “because there is no rule that physicians retire at a certain age, such as 65, it is always difficult to project retirements” (p. 1079). This observation may have even more salience as laws and practices governing mandatory retirement at age of 65 have been rescinded or are being challenged in several provinces in Canada.³

Second, consistent with the observation by Foot et al. (2000), there is no uniform understanding of what retirement refers to, such as when retirement takes place. For instance, some authors assume that physicians retire at the age of 65. In his analysis, Chan (2002) considers physicians as retired in the year after they were last active. But only physicians over age 60 are included in his definition and physician deaths are also counted as retirement. On the other hand, in projecting future physician supply, the Canadian Medical Association considers any physician who exits the medical workforce as “retired,” regardless of age and cause (Newton and Buske 1998).

Third, some studies and databases (e.g., the SMDB) include the notion of “semi-retired.” But what separates working from semi-retirement is even harder to ascertain. Fourth, much of the inconsistencies could be due to the fact that most databases do not allow researchers to differentiate between retirement, death, part-time practice, and departure from the medical workforce for other reasons.

4.2 Extent of physician retirement

More physicians are likely to exit the medical workforce in the foreseeable future since close to two-thirds of all physicians in Canada were aged 45 or older in 2006 (see Table 1). Surgical and medical specialists were slightly older than those in family or general practice. According to Chan (2002), the number of physicians retiring in Canada has almost tripled, from 295 in 1981 to 832 in 2000. The increase has occurred in a linear fashion, though with considerable variability from year to year. According to Chan, the crude retirement rate (number of retired physicians divided by number of practicing physicians) has almost doubled, from 0.8% in 1981 to 1.4% in 2000.

³ Manitoba, Ontario, and Quebec have abolished mandatory retirement, and Saskatchewan is expected to follow suit.

Table 1
Percentage Distribution of Physicians by Broad Specialty and Age Group,
Canada, 2006

Specialty	<35	35-44	45-54	55-64	65+	Age Unknown	Total
Family / General Practice	7.7%	26.8%	32.2%	22.3%	9.1%	1.9%	100%
Medical specialists	6.4%	25.0%	30.9%	22.7%	13.7%	1.3%	100%
Surgical specialists	5.7%	27.2%	26.8%	21.3%	17.6%	1.3%	100%
Medical scientists	-	-	-	28.9%	71.1%	-	100%
All physicians	7.0%	26.2%	31.0%	22.3%	11.9%	1.6%	100%

Source: CMA Masterfile, January 2006, Canadian Medical Association

But do physicians typically retire at the age of 65? Are more physicians taking early retirement? Evidence from the literature suggests that physicians tend to retire later than the general working population in Canada. There were indications as early as the mid-1960s that many physicians delayed their retirement. Studies conducted on behalf of the Royal Commission on Health Services suggested that the average age of retirement among Canadian physicians at that time was close to 70. It was further suggested that the delay of retirement by some physicians might be due to inadequate savings and pension (cited by Grauer and Campbell 1983).

In her study on seniors at work in Canada, using data from the 1996 population census, Duchesne (2002) found that 20 occupations accounted for half of the total employment among workers aged 65 or over. Farmers and farm managers alone made up 17.7% of this total, with 45,205 employed seniors in 1996. The second most common category was the sales occupations. Family physicians and general practitioners (FPs/GPs) were among the 20 occupations, accounting for 1.1% of all seniors at work in 1996. Also, there were 22 occupations with at least 6% of workers aged 65 or over in each of the occupations. Judges topped the list – one in five was at least 65 years old. In 1996, there were 1,625 specialist physicians aged 65 or over, accounting for 7.6% of all specialists in the physician workforce; and there were 2,820 FPs/GPs aged 65 or older, accounting for 7.5% of all FPs/GPs in Canada.

Other studies using different sources of data reveal a similar situation: Many physicians are working beyond the traditional retirement age of 65. In a study of the work patterns of older physicians in Ontario, Trent (1993) reported that older physicians represented a sizeable portion of the medical workforce. According to

Trent, 2,050 doctors over the age of 65 billed the Ontario Health Insurance Plan (OHIP) for about \$225 million in professional fees each year. About 1,100 physicians between the ages of 65 to 69 billed a total of \$150 million; the 600 physicians aged 70 to 74 billed another \$50 million; and the 350 doctors aged 75 or over billed OHIP for about \$25 million annually.

A study of fee-for-service (FFS) physicians in Ontario by Chan (1998) shows that in 1995/96, there were 20,149 FFS physicians in Ontario, of whom 2,055 (or about 10%) were aged 65 or above. The number of full-time equivalent (FTE) doctors was 18,841, of whom 1,321 (or 7.0%) were aged 65 or more. These figures suggest that many older physicians were still practicing, though they tended to take on a lighter workload (as reflected by the fact that 2,055 FFS physicians translated into 1,321 FTEs). Not surprisingly, the annual attrition rate increased with increasing age, from 2.8% at age 60 to 11.1% at age 75. But, on the basis of a life table constructed from these attrition statistics, Chan (1998) calculated that for physicians practicing at age 75, one-half would still be practicing in six years' time. According to another study by Chan (2002), the average retirement age of physicians in Canada was 70.8 years and the retirement age remained relatively constant during the period from 1981 to 2000. It is worth noting that the average retirement age of physicians, based on Chan's calculation, is similar to that estimated by the studies conducted for the Royal Commission on Health Services in the 1960s, as mentioned earlier.⁴

Thus, it appears that while more physicians are expected to give up medical practice in the coming years as a result of the aging of the Canadian medical workforce, unless there are major shifts in practice behavior, there is no reason to believe that all or most physicians will retire at the age of 65 or will take early retirement. On the contrary, the studies reviewed suggest that many physicians will continue to work beyond the age of 65, though they may take on a less demanding workload.

4.3 Retirement intentions and behaviors

All this suggests that concerns about a retirement "stampede" by physicians in the coming years may be due to inconsistencies between physicians' retirement intentions and their retirement behaviors. As pointed out earlier, information about retirement intentions is typically obtained by means of surveys of physicians. Retirement behaviors, on the other hand, are typically inferred from registration, administrative, or fee-for-service billing data.

⁴ It appears that many physicians in the United States also delay their retirement. Citing findings from other studies, Grauer and Campbell (1983) reported that at age 70, the life expectancy of US physicians was 10.4 years, which was almost identical to the life expectancy of other American males of that age. However, at the age of 70, the working life expectancy of American physicians was 7.3 years, compared with the average working life expectancy of 2.4 years. Conversely, the expected length of retirement was 3.1 years for physicians, compared with the average of 7.8 years for American men.

The following presents findings about retirement intentions and behaviors using different sources of data. The former relies on the 2004 National Physician Survey. The latter are based on data from the CMA Mf and the SMDB.

Data from Table 2 show that about 4% and 20% of physicians aged 50-59 and 60-65, respectively, indicated that they planned to retire within two years following the 2004 National Physician Survey. In sum, these data suggest that 6.3% of all physicians (i.e., about 4,000 physicians) would have retired by the end of 2006, if the survey results are generalized to the entire Canadian physician population and if retirement intentions translate into action.

Table 2
Percentage of Physicians Planning to Retire in the Next Two Years by Age Group and Sex

Age Group	Male	Female	Total
Less than 30	0.0%	0.7%	0.5%
30-39	0.1%	0.0%	0.1%
40-49	0.2%	0.3%	0.3%
50-59	3.8%	4.2%	3.9%
60-65	19.3%	22.4%	19.7%
66-70	35.3%	41.7%	36.2%
71 or over	37.0%	33.3%	36.7%
Total	8.2%	3.0%	6.3%

Source: 2004 National Physician Survey, Canadian Institute for Health Information (results based on responses from 21,296 survey respondents)

The above is self-reported information indicating intention to retire in the near future. The following tables (Tables 3 and 4), on the other hand, present data on “actual” retirement based on information culled from the CMA Mf and the SMDB. Table 3 shows that in the 6-year period from 2000 to 2005, the overall annual retirement rate, based on data from the CMA Mf, varied from a low of 0.5% in 2005 to a high of 1.5% in 2001 and 2004.

**Table 3
Number of Physicians Retired and Retirement Rate by Age Group, Canada,
2000 to 2005**

Age Group	30 or less	31-40	41-50	51-60	61-65	66-70	71 or older	Total
Retired in 2000	1	22	32	83	123	194	129	584
Supply in January 2000	1143	13730	18695	13070	4140	2958	2066	55802
Retirement rate, 2000	0.1%	0.2%	0.2%	0.6%	3.0%	6.6%	6.2%	1.0%
Retired in 2001	0	37	36	66	85	203	424	851
Supply in January 2001	1222	13857	19008	13611	4205	2979	2276	57158
Retirement rate, 2001	0.0%	0.27%	0.19%	0.5%	2.0%	6.8%	18.6%	1.5%
Retired in 2002	2	26	25	57	76	144	125	455
Supply in January 2002	1219	13986	19144	14408	4271	3109	2175	58312
Retirement rate, 2002	0.2%	0.2%	0.1%	0.4%	1.8%	4.6%	5.7%	0.8%
Retired in 2003	1	18	31	67	77	112	85	391
Supply in January 2003	1152	13755	19440	15011	4522	3181	2505	59566
Retirement rate, 2003	0.1%	0.1%	0.2%	0.4%	1.7%	3.5%	3.4%	0.7%
Retired in 2004	3	33	27	87	121	259	386	916
Supply in January 2004	1108	13390	19386	15745	4768	3334	2793	60524
Retirement rate, 2004	0.3%	0.2%	0.1%	0.6%	2.5%	7.8%	13.8%	1.5%
Retired in 2005	2	38	31	71	56	107	20	325
Supply in January 2005	755	12919	19197	16484	5103	3291	2735	60484
Retirement rate, 2005	0.3%	0.3%	0.2%	0.4%	1.1%	3.3%	0.7%	0.5%

Source: Canadian Medical Association Masterfile

Table 4
Number of Active Physicians in 1997, 2000, and 2004 with Their Activity Status in 1998, 2001, and 2005, Respectively, by Age Group, Canada

	Active	Semi-active	Retired	Deceased	Total *
<i>Active in 1997 / Activity Status in 1998</i>					
< 30	834	-	-	-	868
30 – 39	13404	-	-	7	13813
40 – 49	18128	-	4 (0.0%)	15	18415
50 – 59	12274	8 (0.1%)	31 (0.2%)	34	12499
60 – 65	4698	26 (0.5%)	97 (2.0%)	21	4906
66 – 70	2490	44 (1.6%)	143 (5.2%)	18	2744
71 or over	1694	27 (1.4%)	135 (6.9%)	44	1953
Total	53523	105 (0.2%)	410 (0.7%)	139	55199
<i>Active in 2000 / Activity Status in 2001</i>					
< 30	720	-	-	1	743
30 – 39	12999	-	-	2	13429
40 – 49	18687	1 (0.0%)	6 (0.0%)	13	19004
50 – 59	14146	7 (0.0%)	49 (0.3%)	25	14416
60 – 65	4791	42 (0.8%)	133 (2.6%)	18	5059
66 – 70	2504	47 (1.6%)	267 (9.3%)	18	2883
71 or over	1857	53 (2.2%)	327 (14.1%)	38	2325
Total	55706	150 (0.3%)	782 (1.4%)	115	57861
<i>Active in 2004 / Activity Status in 2005</i>					
< 30	549	-	-	-	567
30 – 39	11999	-	-	3	12304
40 – 49	18520	1 (0.0%)	5 (0.0%)	11	18782
50 – 59	16901	7 (0.0%)	22 (0.1%)	24	17137
60 – 65	6040	16 (0.3%)	46 (0.7%)	15	6225
66 – 70	2886	28 (0.9%)	57 (1.9%)	17	3061
71 or over	2300	31 (1.2%)	78 (3.1%)	26	2519
Total	59209	83 (0.1%)	208 (0.3%)	96	60609

Source: Scott's Physician Database, Canadian Institute for Health Information.

* Not reported in this table are numbers of physicians who were abroad, "removed" (i.e., those without addresses), in the military, or of unknown sex. Thus, the numbers in a row or a column may not add up to the total.

But retirement rate is a function of the number of retired physicians captured by the CMA Mf and the number of physicians in the overall supply. The inclusion

and exclusion criteria used in calculating the overall supply may affect the retirement rates, as can be seen in the following illustration. The number of physicians in the 61-65 age cohort in 2000 (i.e., 4,140) and the number of physicians in the 66-70 age cohort in 2005 (i.e., 3,291) do not match even after taking into consideration those who retired between 2000 and 2004 (i.e., $123 + 85 + 76 + 77 + 121 = 482$). This suggests that some of the 4,140 physicians included in the 2000 overall supply might have died, left the country, exited the medical workforce, or left out of the CMA Mf during the 5-year period without being counted as “retired.” Thus, it is worth asking who were counted as “retired” and who were not and why. This harks back to the earlier comment about the lack of clarity or precision in understanding or defining physician retirement.

Table 4 provides another set of estimates of physician retirement in Canada. The data are from the SMDB and were provided by the Canadian Institute for Health Information. The data show the activity status in a selected year of physicians who were active in the previous year. Activity status refers to “active,” “semi-active,” and “retired.” Three periods are shown in Table 4: between 1997 and 1998, between 2000 and 2001, and between 2004 and 2005. In other words, the data show the changes in activity status during a 1-year period. The numbers of physicians who died during the three 1-year periods are also shown, but they are not included in the “retired” category.

4.4 What do the data say?

What do the data in these three tables tell us about physician retirement?

First of all, different sources of data show slightly different retirement rates, depending on how retirement is defined, how retirees are counted, and who are included in or excluded from the overall supply of physicians. Take 2001 as an example. In that year, the overall retirement rate according to the CMA Mf is 1.5%, compared to 1.4% according to the SMDB. If those who were “semi-active” (0.3%) were included in the “retired” category, the SMDB retirement rates would be slightly higher at 1.7%. In 2005, the overall retirement rate is 0.5% according to the CMA Mf, and 0.3% (or 0.4%, if “semi-active” is counted as “retired”) according to the SMDB.

Second, it is interesting to note that the retirement rates fluctuate considerably from year to year. For instance, the CMA Mf data show that the overall retirement rate dropped from 1.5% in 2001 to 0.8% in 2002, and from 1.4% in 2004 to 0.5% in 2005. The SMDB data offer other surprises. Even though the total number of physicians in 2005 was almost 10% larger than that in 1998, there were fewer retirements in 2005 than in 1998, and much less than in 2001. It is possible that such apparent anomalies are artifacts of the ways data were gathered.⁵

⁵ Officials in charge of the CMA Mf at the Canadian Medical Association and the SMDB at the Canadian Institute for Health Information were contacted in relation to such apparent anomalies.

Third, data from the CMA Mf and the SMDB, assuming that they reflect the true retirement situation, show that the actual retirement rate is considerably lower than the percentage of physicians indicating their intention to retire within two years (i.e., 6.3% from Table 2). None of the annual retirement rates among older physicians (i.e., those aged 51 or over) is even close to the percentages of physicians indicating in the 2004 National Physician Survey that they would retire in the next two years.

The discrepancy between retirement intention and actual retirement has also been noted by other researchers. For instance, by comparing data on American physicians' retirement intentions and data from the American Medical Association Physician Masterfile and physicians' self-reported work status, Konrad and Dall (2004) came to the conclusion that many American physicians intending to retire might have changed their mind later on, and that physicians' expressions of intent to retire were not good predictions of future behaviors. Another American study by Rittenhouse and colleagues (2004) has come to similar conclusions. This does not necessarily mean that physicians do not tell the truth when they respond to survey questions about retirement plans. As noted earlier, retirement may mean different things to different people (e.g., retiring from clinical practice but maintaining a licence). Also, plans may alter as situations change. Lastly, retirement intention could be seen as a wish, whereas actual retirement represents a decision that is made after many factors such as financial wherewithal have been taken into consideration.

Fourth, among physicians aged 60 or over who are still active, many wish to continue practicing. Data from the CMA Mf show that among those physicians aged 61 to 65, the retirement rates varied from a low of 1.1% to a high of 3.0%; and among those aged 66 to 70, the retirement rates varied between 3.3% and 7.8%. Data from the SMDB show similar patterns. Even the intention to retire is relatively low among older physicians. Only about 20% of the physicians in the 60-65 age group indicated that they would retire in the two years following the 2004 National Physician Survey; and slightly more than one-third of the physicians aged 66 to 70 indicated that they would retire in the next two years. In

It has been suggested that the number of retired physicians in the CMA Mf may be under-reported, possibly because some provincial/territorial licensing bodies were unable to provide data directly to outside organizations due to concerns about privacy protection. The CMA is currently examining ways to improve their counts of retired physicians through the use of public information provided on websites of provincial/territorial licensing bodies (Buske 2006). In the case of the SMDB, it has been pointed out that the Scott's Directories relies on, among other things, a questionnaire, which is sent to each physician on an annual basis, to track his/her activity status. "Semi-active" and "retired" status is self-reported by physicians and is, therefore, somewhat subjective in nature. It has also been noted that some physicians hold onto their licenses or registration for a period of time even though they have ceased practicing medicine. The SMDB counts such physicians as "active," if they have not reported otherwise on the questionnaire (Willemsse 2006).

other words, the majority of older physicians who were practicing at the time of the survey still preferred to continue working.

Lastly, as pointed out earlier (see Table 1), specialists are somewhat older than FPs/GPs. Thus, it is not surprising that the 1-year retirement rates of medical specialists (1.4%) and surgical specialists (2.2%) are higher than the retirement rate of FPs/GPs (1.1%) in 2000, according to the SMDB. Similarly, 5.0% of FPs/GPs, compared with 7.5% of medical specialists and 8.2% of surgical specialists, reported in the 2004 National Physician Survey that they planned to retire in the next two years. Because the average age of female physicians is considerably lower than that of their male counterparts, the retirement rate of female physicians (0.5%) is much lower than that of male physicians (1.7%) in 2000, according to the SMDB. Similarly, while 8.2% of male physicians indicated in the 2004 National Physician Survey that they planned to retire within two years, only 3.2% of female physicians were planning an imminent retirement.

Because of the lack of information, it is not possible to explain why many physicians aged 65 or over continue to work. A few speculations can be offered. It may be because most physicians are self-employed, they tend to be in a more flexible employment situation. As a result, they may have more options about whether or not to retire and the timing of retirement than those working in bureaucracies, corporations, or unionized workplaces. Also, as suggested earlier, the delay of retirement by some physicians could be due to insufficient savings or pension. Lastly, the education and training process prior to becoming full-fledged physicians, especially specialists, is a long one. Thus, most doctors start medical practice relatively late, compared to workers in many other occupations. Deferred retirement by some physicians may be a way to compensate for getting a late start in gainful employment.

5 Actions in Relation to Aging of the Medical Workforce

From the perspective of physician workforce planning, what needs to be done in light of the aging of the physician workforce and projected increase in physician retirement? It is suggested that at least two types of actions are needed. The first is measures to retain more older physicians as a way to stem the trend of rapid attrition. The second is measures to ensure that older physicians who continue to practice remain clinically competent.

5.1 Actions to retain older physicians

There have been relatively little policy or program activities by governments to retain older physicians.⁶ In January 2006, Health Canada hosted a national conference on recruitment and retention of health care practitioners. Discussions indicated that recent efforts focused mostly on:

- X Increased supply by making use of internationally educated practitioners and expanding enrolment in Canadian schools;
- X Distribution of health care personnel to rural and remote regions;
- X More training opportunities for Aboriginal and First Nations people; and
- X Retention of new graduates.

Participants at this conference did not anticipate major shifts in policies to reflect concerns about physician retirement. Interestingly, some of the more innovative strategies mentioned were in relation to the retention of older non-physician providers. They included opportunities for career redirection and enhancement, leadership development opportunities, additional training, and new roles. Anecdotal evidence from Ontario has indicated that the opportunity for registered nurses to become nurse practitioners after additional training has been successful in retaining older nurses in the workforce. Similarly, Ontario has started a Late Career Initiative for front-line nurses older than 55, where 20% of their time is protected for mentorship, administration, and teaching, with a view to reducing the physical demands of nursing while providing new opportunities for skills acquisition. It would be interesting to see if similar approaches would be effective in the retention of older physicians.

An important policy lever used to shape physician behaviors is compensation levels and modes. Financial incentives have been used to encourage physician participation in government priorities such as primary care reform, health promotion, and increased access to services with long waiting lists. But there is less experience in using financial incentives to enhance physician retention. Some provinces have allowed doctors to incorporate. Although physician incorporation is mostly done for financial reasons since it offers tax advantages to those who incorporate, it may have some unintended effects on physician retention. This is because a significant investment in time and money is needed at the beginning of the incorporation process. It is generally believed that a physician needs to be in practice for at least five years following incorporation to really benefit from it. Some have interpreted the intention by some provinces to allow physicians to incorporate as part of a physician retention strategy. But the extent to which this is true and the magnitude of the impact are unknown.

Several provinces have introduced pension programs, but these are exclusively for physicians on salary, rather than for fee-for-service physicians. It is also not

⁶ According to a study that has catalogued health human resources programs and initiatives in rural and northern Ontario in the last two decades (Tepper et al. 2006), only one - the Northern Physician Retention Initiative - specifically rewarded physicians for increasing length of commitment to the community.

clear whether pensions will help retain doctors or encourage them to exit sooner. However, it might be possible to structure pension plans in a manner that encourages more time in practice.

As noted earlier, several provinces have introduced legislation to abolish compulsory retirement at age 65. These efforts are aimed at the labor force as a whole and do not target physicians *per se*. However, the abolition of compulsory retirement may have some indirect impact on older physicians who wish to remain active in clinical practice. For instance, hospitals may find it more difficult to deny admitting privileges to doctors who are 65 or older without justifiable cause (Gillies and Ross 1984; Gilmore 1987).

All in all, there is a lot more governments can do to support retention efforts. For instance, agreements between government and the medical profession could include incentives to keep older physicians in the workforce longer. Current efforts are mostly aimed at increasing physician supply and recruitment. But for most communities, their best chance of having a doctor tomorrow is to keep the one they have today.

5.2 Actions to ensure competence

There are concerns that as a physician ages, his/her clinical competence may decline. While there are indications of a negative correlation between age and performance (Norman et al. 1993), the evidence is not entirely consistent and can be subject to different interpretations (Eva 2002). Nonetheless, performance by older physicians is clearly an issue that needs to be addressed. Some provincial regulatory authorities have introduced physician-assessment and physician-enhancement programs (Page et al. 1995). The following are some examples of measures that have been put in place. The information was obtained from a survey of selected regulatory and licensing bodies and the Canadian Medical Protective Association (CMPA).

Both the College of Family Physicians of Canada (CFPC) and the Royal College of Physicians and Surgeons of Canada have made participation in their accredited continuing professional development (CPD) programs mandatory for the maintenance of special designations. For instance, CFPC has a Sustaining Member category for family physician members who are involved in medicine but not providing clinical care. Sustaining Members must participate in CFPC's accredited CPD program - Maintenance of Proficiency or Mainpro. It also has a Life Member category for those who have reached age 70. Life Members are exempt from paying membership dues, but must acquire CPD credits if they are in clinical practice.

According to the British Columbia College of Physicians and Surgeons, about half of its peer review assessments are aimed at doctors over 55 years of age. Another one of its concerns relates to scope of practice. Scope-of-practice

changes are permitted only on the basis of demonstrated competency. For example, an older general surgeon cannot simply decide to do family medicine without being able to demonstrate to the licensing authority that he/she has the qualifications to do so. If necessary, the physician may have to take CPD courses, spend time in a family medicine residency program, etc.

In Ontario, the College of Physicians and Surgeons of Ontario (CPSO) conducts peer review on all physicians who are older than 70. This is done every five years. If deficiencies in practice are found, specific educational recommendations are made, along with a mentoring program and a targeted peer review subsequently.

In Quebec, if an older physician is found to have significant deficiencies during peer review, he/she is offered additional training in an accredited family medicine residency program and has the opportunity to obtain additional support from a mentor.

The College of Physicians and Surgeons of Newfoundland and Labrador takes actions similar to those of CPSO in conducting targeted peer reviews of physicians older than 70. It also helps to coordinate additional training, if deemed necessary.

There is limited information about the clinical competence and performance of older physicians. According to the CMPA, internal studies done a few years ago show that older physicians were not more at risk of malpractice litigation than younger ones. Additionally, according to the CPSO, deficiencies in clinical performance are caused as much by structural or organizational factors as by personal factors. For instance, solo practice, lack of hospital affiliation and inadequate training of support staff are just as important as age in contributing to performance problems.

6 Discussion: Future Directions

Several aspects in relation to future directions are discussed in the following paragraphs.

First, in view of the aging of the physician workforce, as well as the aging of the general population, there is a need to examine implications of personnel attrition due to retirement and other reasons on the future supply of physicians in Canada, if dramatic shifts in policies and manpower shortages or oversupply are to be avoided. Most physician supply projections have taken retirement into account, but it is not known how accurate such assumptions about retirement are. But, in fairness, it should be pointed out that there are as yet no estimates of physician retirement that are considered authoritative. This may be because there is no agreement on what constitutes retirement, insofar as physicians are

concerned. Chan and associates (1998), as well as data reported in Section 4, have shown that physician retirement is not as clear cut as it is commonly assumed. Many physicians aged 65 or older continue to work, albeit at a lower level, instead of complete retirement. Some give up clinical work completely but continue to work in a related field such as research and administration. Future physician supply projections and planning need to take this into account because the numbers of older physicians will become much larger in the coming years and, thus, the way they practice and the kind of work they do will assume greater significance from the perspective of physician workforce planning.

Second, because there is no consensus on what “retirement” means in relation to medical practice and owing to limitations of existing sources of data, it may be more meaningful for future studies to use the notion of labor force activity, which may include fully active, temporarily absent from the labor force, semi-active (with the possibility of varying levels of “activeness”), active but engaging in non-clinical activities, and complete withdrawal from the physician workforce due to aging, health, or other reasons. Some workforce planning and projections have shifted to using full-time equivalents (FTEs), instead of head counts, since the former takes into consideration different levels of activities, as reflected by FFS billing volume.

Changing FTE values in different stages of physicians’ medical career reflect changing levels of labor force activity as physicians age. According to research by Pong and Pitblado (2005), the average FTE value for FFS physicians in 2002 was 0.83. The lowest average FTE values are associated with physicians who are less than 35 years of age, and the next lowest average FTE values are associated with physicians aged 65 or over. Male physicians tend to generate their highest average FTE value (0.98) in the 45-49, 50-54, and 55-59 age groups; and the average FTE value declines after age 60. Female physicians, on the other hand, generate their highest average FTE (0.79) slightly later, in the 55-59 age group.

Third, and as a corollary of the first two points, it is not enough to focus solely on physician retirement, even if there is accurate information about retirement. It is equally important to understand changes in the way older physicians practice medicine. Retirement should be seen as just one aspect in a continuum of changes in medical practice as old age sets in. Retirement, or complete cessation of medical practice, represents the end point of this continuum. But prior to full retirement, many other changes may have occurred, which may also have implications for medical care delivery and physician workforce planning.

Table 5
Percentage of Physicians Planning Changes to Their Practice in the Next Two Years by Age Group, 2004

Age Group	Yes	Age Group	Yes
<i>Plan to Reduce Weekly Work Hours</i>		<i>Plan to Increase Weekly Work Hours</i>	
29 or less	19.2%	29 or less	10.0%
30 – 39	21.3%	30 – 39	7.2%
40 – 49	22.6%	40 – 49	3.9%
50 – 59	29.9 %	50 – 59	2.3%
60 – 65	37.1%	60 – 65	1.3%
66 – 70	35.2%	66 – 70	0.9%
71 or older	23.3%	71 or older	0.9%
Total	25.7%	Total	3.5%
<i>Plan to Reduce On-call Hours</i>		<i>Plan to Increase On-call Hours</i>	
29 or less	14.6%	29 or less	4.1%
30 – 39	14.6%	30 – 39	3.6%
40 – 49	15.3%	40 – 49	2.7%
50 – 59	17.3%	50 – 59	1.6%
60 – 65	19.6%	60 – 65	0.6%
66 – 70	13.4%	66 – 70	0.6%
71 or older	7.8%	71 or older	0.1%
Total	15.2%	Total	2.1%
<i>Plan to Reduce Scope of Practice</i>		<i>Plan to Expand Scope of Practice</i>	
29 or less	8.7%	29 or less	11.0%
30 – 39	7.0%	30 – 39	8.1%
40 – 49	10.4%	40 – 49	6.2%
50 – 59	16.8%	50 – 59	2.9%
60 – 65	25.2%	60 – 65	2.6%
66 – 70	28.1%	66 – 70	0.7%
71 or older	22.3%	71 or older	0.4%
Total	13.9%	Total	4.7%

Source: 2004 National Physician Survey, Canadian Institute for Health Information.

In addition to asking physicians whether they planned to retire within the next two years, the 2004 National Physician Survey asked physicians what other changes to their practice they were contemplating within the next two years. Examples include plans to reduce or expand scope of practice, plans to reduce or increase weekly work hours, plans to reduce or increase on-call hours, plans to increase or reduce other responsibilities (e.g., teaching, research, and administration), and plans to change from solo to group practice. Table 5 provides a few examples of intended changes in medical practice by physicians in various age groups.

While some physicians planned to retire in the near future, others planned to change other aspects of their medical practice. For example, whereas only 3.5% of all physicians planned to increase their weekly hours of work, slightly more than a quarter of all physicians planned to work less hours per week. The older the physician, the more likely he/she planned to reduce weekly work hours, with the exception of those in the two oldest age groups (i.e., 66-70 and 71+). The same patterns emerge with respect to plans to increase or reduce on-call hours. The data show that the aging of the physician workforce may result in not just more physicians retiring, but also a substantial reduction in workload. All this is likely to have an impact on the provision of medical care.

Scope of practice is another important aspect that needs to be taken into consideration. When examining the effects of the aging of the physician workforce, it is not enough to just consider the number of physicians retiring. It is equally important to understand changes in the way aging physicians practice medicine. Data from the 2004 National Physician Survey show that as physicians get older, they are more likely to want to reduce their scope of practice (see Table 5).

Although one should not take self-reported intentions to change scope of practice at their face value, just as one should not take self-reported plans to retire for granted, there is considerable empirical evidence to show that changes in scope of practice are taking place. Using other sources of data such as physician billing data, both Chan (2002) and Tepper (2004) have documented a trend of declining comprehensiveness of services provided by Canadian physicians, particularly among FPs/GPs, over time. In addition, Chan and associates (1998) have found that FPs/GPs aged 65 or over are less likely than those under 65 to perform obstetric deliveries (4.6% vs. 16.9%), house calls (38.7% vs. 60.4%), minor procedures (38.7% vs. 62.3%), and emergency department services (1.1% vs. 14.8%).

Increased physician retirement, reduction in workload, and narrowing of scope of practice may affect different regions differently because of unequal geographic distribution of physicians. For instance, rural Canadians are likely to feel the impact much more since there are already severe shortages of physicians in many rural communities. Also, as Pong and Pitblado (2005) have found, rural FPs/GPs tend to have a broader scope of practice than their urban counterparts because they have to fill some of the service gaps created by the critical lack of specialists in many rural areas.⁷ If many rural physicians retire or reduce their work hours and practice scope as a result of aging, the effects on medical care provision in rural Canada could be severe and, thus, need to be monitored.

Fourth, to date, there does not appear to have any concerted effort nationally to encourage older physicians to remain in the medical workforce, even though

⁷ According to Pong and Pitblado (2005), of all physicians working in rural Canada, 87.5% were FPs/GPs. Only 2.4% of all specialists practiced in rural communities.

expressions of concern about present or future physician shortages are getting louder. If policies, strategies, or programs are to be developed to encourage older physicians to remain in medical practice, it would appear that they should target the 4% of physicians aged 50-59 and the 20% of physicians aged 60-65 who indicated that they were planning to retire in two years' time (see Table 2). Additionally, strategies should be developed to accommodate older physicians who still have a desire to work. It appears that many older physicians still want to make a contribution, but they may not want to continue to do the same kind or same amount of work. Possibilities other than full-time clinical practice need to be made available to older physicians in order to keep them in the medical workforce and make the best use of their experience and expertise.

A survey was conducted by Hall (2005) to explore the extent to which senior academic pediatricians wished to carry on working. The survey, conducted in both the United States and Canada, found that many of the respondents - members of the American Pediatric Society - wanted to continue to use their skills and experience after the usual age of retirement. The respondents also identified several areas of work that they were interested in pursuing, such as editing and writing, international health, working with research networks or collaborations, teaching, and working as consultants to business. It would be useful to conduct similar surveys of older physicians in Canada to find out what activities they would like to engage in or what roles they would like to play during the transition phase from full-time practice to eventual retirement.

Fifth, for those older physicians who wish to continue to do clinical work, but on a part-time basis, it is necessary to ensure that their knowledge is kept up to date and their clinical skills are maintained. It is reasonable to ask whether and how older physicians working intermittently or at a low activity level have a sufficient volume of practice needed to maintain clinical competence. If governments or medical organizations wish to keep as many older physicians in the medical workforce as possible, it behooves them to design and offer programs to help older physicians to remain competent and effective practitioners. The survey conducted for this study shows that while the problems have been recognized by various regulatory and licensing bodies, actions taken to address the problems tend to be limited in scope and piecemeal in nature. A broader and more coordinated strategy is urgently needed in light of the rapidly growing number of older physicians.

Sixth, since retirement intentions are often taken to mean actual retirement, there is a need to examine the extent to which retirement intention translates into retirement behavior. It would be helpful to conduct studies in Canada similar to those by Konrad and Dall (2004) and Rittenhouse and associates (2004) in the United States. Their findings show that self-reported intentions to quit clinical practice and actual behaviors do not necessarily correspond. Studies of a similar nature in Canada would help health workforce planners more accurately interpret survey data about retirement intentions. As Rittenhouse and associates (2004)

have warned, “(i)ncreasing reliance on proxy variables for physician attrition such as intention-to-quit is equally concerning in light of research that suggests that ‘intention to...’ variables are not strongly correlated with actual behavior. The possibility that current measures of physician attrition are not valid has important policy implications, particularly if these data are used in forecasting models that inform policy decisions regarding physician supply” (p. 1574).

Lastly, although Canada is fortunate in having robust health workforce data gathering systems and fairly comprehensive and accurate data on physicians, this study has revealed that there is not a definitive answer to such an important and seemingly simple question: How many physicians retire each year? Different databases yield different retirement rates, depending on how retirement is understood and how physicians are counted. Given the apparent data anomalies noted earlier, “official” physician retirement figures and rates from such databases as the CMA Mf and the SMDB should be used with caution at this time. There is still considerable work to be done by researchers and data gathering agencies to clarify concepts, standardize data collection procedures, and design appropriate methodologies.

7 Summary and Conclusion

Many policy-makers and health workforce planners have identified aging of the physician workforce as an important issue and have recognized its implications for the Canadian health care system. As more and more physicians approach the traditional retirement age of 65, it is expected that the number of physicians retiring will grow rapidly. But does this mean that all or most physicians will retire at age 65? Available evidence suggests that Canadian physicians tend to quit work later than the average Canadian worker. Also, insofar as physicians are concerned, retirement is anything but an either-or issue. Instead of dropping out of the medical workforce completely at age 65, many older physicians choose to remain in practice, though not necessarily maintaining the same activity level or doing the same kind of work.

Depending on which source of data is used, one gets somewhat different estimates of the extent of physician retirement. This may be due to the fact that various databases define retirement differently, count the number of retirees differently, and/or have different ways of including or excluding physicians in the overall supply of physicians. There is as yet no consensus on what physician retirement means and no authoritative estimates of physician retirement in Canada. Thus, existing data on retirement should be used with caution. Much work by researchers and data gathering agencies is still needed to standardize concepts, definitions, methodologies, and data gathering procedures.

It is necessary to distinguish retirement intentions from retirement behaviors. The former should be seen as a preference or desire to give up medical practice. But

the proportions of physicians indicating their desire to retire in surveys - such as the 2004 National Physician Survey - do not match retirement rates based on CMA Mf or SMDB data. The extent to which retirement intention translates into retirement behavior is uncertain at this time and further research is encouraged.

If retirement is understood to mean complete cessation of medical practice, it should be seen as the end point of a continuum of changes in medical practice as a physician gets older. But prior to full retirement, many other changes in medical practice may have occurred, such as reduction in workload and narrowing of scope of practice, which also have implications for medical care provision and physician workforce planning. In other words, the potential impact of the aging of the medical workforce should be examined from the broader perspective of changing medical practice patterns, rather than from the narrow focus of retirement.

Consistent with this broader perspective, it seems that strategies to keep as many older physicians as possible in the medical workforce should aim at not just encouraging older physicians to continue practicing, but also creating practice opportunities other than clinical work. There are different ways for older physicians to make valuable contributions to the health care system. For those who wish to continue clinical work but on a limited basis, it is necessary to ensure that there are ways to help them maintain their competence and keep their knowledge current. Various regulatory and licensing bodies are aware of the situation and have introduced peer review and CPD programs. But such efforts seem to be fragmentary in nature. National programs may be needed to address this issue in light of the rapidly increasing number of older physicians.

Although there is a lot of talk about possible shortages of physicians to meet future medical care needs, attention has, thus far, focused mostly on supply issues. For instance, expanding medical school enrolments and making it possible for more international medical graduates to practice are measures to augment physician supply. But not much has been done about retention. To date, there are few concerted efforts nationally to encourage older physicians to remain in practice.

The present study has focused on physicians. But physicians do not practice in isolation. They work with and are supported by other health care providers, many of whom may face similar population-aging and workforce-attrition challenges. For instance, the average age of registered nurses in Canada is increasing, reaching an average age of 44.6 years in 2004 (Canadian Institute for Health Information 2006). Registered nurses also tend to exit the nursing workforce at a younger age and large numbers of nurses are expected to retire in the coming years, potentially creating personnel shortages (O'Brien-Pallas et al. 2003; O'Brien-Pallas et al. 2005). Thus, it is essential to examine the future supply and practice patterns of physicians in the broader context of the aging of the Canadian health workforce in general.

References

Buske, Lynda. (2006). Personal communications.

Canadian Institute for Health Information (2005). *Supply, Distribution and Migration of Canadian Physicians, 2004*. Ottawa, Ontario: Canadian Institute for Health Information.

Canadian Institute for Health Information (2006). *Measuring the Retention of Registered Nurses in Canada: A Study of 2000-2004 Registered Data: Analysis in Brief*. www.cihi.ca

Chan, Ben, GM Anderson, and M-E Thériault (1998). Patterns of practice among older physicians in Ontario. *Canadian Medical Association Journal* 159(9): 1101-1106.

Chan, Benjamin TB (2002). *From Perceived Surplus to Perceived Shortage: What Happened to Canada's Physician Workforce in the 1990s?* Ottawa, Ontario: Canadian Institute for Health Information.

College of Physicians and Surgeons of Ontario (2006). "2005 Survey of Ontario's Physicians: Access Challenges Ahead." Unpublished document released by the College of Physicians and Surgeons of Ontario, June 2006.

Donen, Neil, F King, D Reid, and D Blackstock (1999). Canadian anesthesia Physician resources: 1996 and beyond. *Canadian Journal of Anesthesia* 46(10): 962-969.

Duchesne, Doreen (2002). Seniors at work. *Perspectives* (May 2002): 5-16.

Eva, Kevin W (2002). The aging physician: Changes in cognitive processing and their impact on medical practice. *Academic Medicine* 77(10): S1-S6.

Foot, David K, RP Lewis, TA Pearson, and GA Beller (2000). Demographics and cardiology, 1950-2050. *Journal of the American College of Cardiology* 35(4): 1067-1081.

Gillies, John H. and L.C. Ross (1984). Physician retirement: A case for concern in Canadian hospitals. *Canadian Medical Association Journal* 131:297-299.

Gilmore, Anne (1987). Should mandatory retirement rules apply to doctors? *Canadian Medical Association Journal* 137: 229-231.

Grauer, H and NM Campbell (1983). The aging physician and retirement. *Canadian Journal of Psychiatry* 28: 552-554.

Hall, Judith G (2005). The challenge of developing career pathways for senior academic pediatricians. *Pediatric Research* 57(6): 914-919.

Konrad, Thomas R and T Dall (2004). "Physician retirement intentions and trends: Implications for supply." AcademyHealth Poster Presentation, June 8, 2004; San Diego, California.

Maguiness, Sheilagh, GE Searles, L From, and S Swiggum (2004). The Canadian dermatology workforce survey: Implications for the future of Canadian dermatology – who will be your skin expert? *Journal of Cutaneous Medicine and Surgery* 8(3): 141-147.

Newton, Sheri and L Buske (1998). Physician Resource Evaluation Template: A model for estimating future supply in Canada. *Annals RCPSC* 31(3).

Norman, GR, DA Davis, S Lamb, E Hanna, P Caulford, and T Kaigas (1993). Competency assessment of primary care physicians as part of a peer-review program. *Journal of the American Medical Association* 270: 1046-51.

O'Brien-Pallas, C Alksnis, and S Wang (2003). *Bringing the Future into Focus: Projecting RN Retirement in Canada*. Ottawa, Ontario: Canadian Institute for Health Information.

O'Brien-Pallas, Linda, C Alksnis, S Wang, S Birch, GT Murphy, FA Roy, and P Sajan (2005). Early retirement among RNs: Estimating the size of the problem in Canada. *Longwoods Review* 1(4): 2-9.

Page, Gordon G, J Bates, SM Dyer, DR Vincent, G Bordage, A Jacques, A Sindon, T Kaigas, GR Norman, M Kopelow, and J Moran (1995). Physician-assessment and physician-enhancement programs in Canada. *Canadian Medical Association Journal* 153(12): 1723-1728.

Pong, Raymond W and JR Pitblado (2005). *Geographic Distribution of Physicians in Canada: Beyond How Many and Where*. Ottawa, Ontario: Canadian Institute for Health Information.

Rittenhouse, Diane R., E. Mertz, D. Keane, and K. Grumbach (2004). No exit: an evaluation of measures of physician attrition. *Health Services Research* 39(5): 1571-1588.

Robb, Nancy (1997). Interest in physician-buyout packages grows as more doctors contemplate retirement. *Canadian Medical Association Journal* 156(6): 882-888.

Royal College of Physicians and Surgeons of Canada, College of Family Physicians of Canada, and Canadian Medical Association (2004). "National

Physician Survey: Changing physician population pressuring healthcare system” (Media Release). Ottawa, Ontario; October 27, 2004.

Tepper, Joshua (2004). *The Evolving Role of Canada’s Family Physicians, 1992-2001*. Ottawa, Ontario: Canadian Institute for Health Information.

Tepper, Joshua D, SE Schultz, DM Rothwell, and BTB Chan (2006). *Physician Services in Rural and Northern Ontario*. Toronto, Ontario: Institute for Clinical Evaluative Sciences.

Trent, Bill (1993). Mandatory retirement: Should older MDs be forced to retire to make way for the new? *Canadian Medical Association Journal* 149(11): 1696-1699.

Tyrrell, Lorne and Dauphinee, D (1999). “Task Force on Physician Supply in Canada.” Ottawa, Ontario: Canadian Medical Forum Task Force on Physician Supply in Canada.

Willemse, Chrissy (2006). Personal communications.

Yang, Homer, R Byrick, and N Donen (2000). Analysis of anesthesia physician resources: Projected Ontario deficit in 2005. *Canadian Journal of Anesthesia* 47(2): 179-184.