Projections of Physician Supply in Canada

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Abstract
In the late 1990s the CMA developed the Physician Resource Evaluation Template (PRET) for estimating future physician supply and full-time equivalents using data from CMA, CIHI, AFMC and CAPER. PRET national projections have been updated on a yearly basis and models have also been developed on a requested basis for various specialties and provinces. The most recent projections have incorporated adjustments for the age/sex of the future population.

Since the early 1990s, there has been a leveling out (and in some years a decrease) of physician supply relative to the population for many reasons other than the most often quoted medical school enrolment cuts implemented by governments in response to the Barer/Stoddart report. Canada has seen significant improvements in gains to physician supply through increased undergraduate enrolment and more international medical graduates being able to access postgraduate education. As well, attrition has decreased due to fewer physicians emigrating to the U.S. and a slow down in retirement.

The purpose of this paper is to examine the trends in projected supply of 1999 compared to estimates of future supply made in 2007. It then discusses the impact of feminization and changes in work/home life balance on the effective supply and the extra physician resources that may be needed to tend to an aging population with increasingly greater volumes of chronic conditions.
Projections of Physician Supply in Canada

Background

During the 1980s the governments of Canada were concerned that the number of physicians was growing at a much more accelerated rate than the general population. Despite the fact there did not appear to be either unemployed or underemployed physicians in Canada, their concerns led to the commissioning of a report to the Deputy Ministers of Health. In the Barer/Stoddart report, the authors, based on data available at the time, recommended a 10% cut to undergraduate enrolment to curb the growth of physician supply. The change was implemented swiftly, affecting first year enrolment in most provinces by 1993.

What Barer/Stoddart had not foreseen was that in an unfavourable working environment of clawbacks, income caps, restricted mobility, etc. physicians would emigrate and retire in much higher volumes than normal. In fact, some provinces were offering retirement enticements. As well, enrolment was already on a decline from its peak in 1983/84, in part due to cuts that had already been implemented in Quebec. Some double counting was occurring in the data base most commonly used to count physicians and this was corrected in the early 1990s.

Productivity data as measured by reported hours worked, was already showing a decline by the mid-1980s and early 1990s as illustrated by data collected in Quebec and at by the CMA. This suggested that previous physician-population ratios were perhaps not going to be adequate to meet the same needs. As well, an aging population was clearly going to be a factor in the future as the baby-boomers began reaching middle age.

The 1992 elimination of the one-year rotating internship and the implementation of the minimum two year prelicensure requirement for family medicine resulted in a need for extra postgraduate positions. These positions, for the most part, were taken from flexibility already available in the system for those wishing to re-enter to become Royal College certified specialists. In the past, those physicians who were planning to become specialists often went into the community to practice after their rotating internship and re-entered postgraduate training at a later date. According to a CIHI report, in the early 1990s, almost 80% of physicians started practice as GP/FPs. By 2000, this percentage had fallen to 45%. This shift in how and for how long physicians trained was the most significant factor in the drop of physicians entering practice between 1993 and 2000.

So well before any enrolment cuts could be felt, the number of physicians per 1000 population peaked at around 1.91 and then actually declined to a low of 1.83 during the mid to late 1990s (see graph 1).
A physician supply projection model, developed by the CMA in the late 1990s, showed clearly that if changes were not made soon, Canada was headed towards a significant worsening of the physician to population ratio from 1.8 to 1.4 physicians per 1000 population by 2021 (or a population: physician ratio of 540 to 718). (See graph 2). These projections were used to lobby governments to increase undergraduate enrolment.

In 1999, the Canadian Medical Forum (CMF) predicted an impending shortage in physician supply unless system changes were made soon. Recommendations included an increase of undergraduate enrolment by approximately 25% to 2000 positions by the year 2000. Increased flexibility in the postgraduate training system was also recommended to allow for such things as re-entry of practising physicians and the training of IMGs already living in Canada.

**What has happened since 1999?**

In late 1999, provincial governments began responding to physician supply reports such as the CMF’s and Dr. Robert McKendry’s Fact Finder report in Ontario. In rapid fashion, provinces began announcing increases to both postgraduate and undergraduate positions. Even the federal government, via Heritage Canada, funded a few Francophone medical positions for students living outside of Quebec. Some of the postgraduate increases were aimed at taking advantage of the pool of IMGs who were already living in Canada and had passed the necessary MCC examinations.

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1 Membership consists of the AFMC, ACAHO, CAIR, CFMS, CFPC, CMA, FMRAC, MCC, RCPSC, and SRPC. The CMF meets twice a year to discuss future directions in coordinating approaches and activities among these ten national medical organizations. It is a forum for consultation, consensus building, strategy development and joint action.
As a consequence of all this, the number of first year places has increased by almost 900 positions since 1997 (a greater than 50% increase), including the creation of the first new medical school (Northern Ontario School of Medicine) in almost 40 years.

Since the projections of 1999, emigration has slowed down considerably from losing around 500-600 each year to around 200. The number of physicians returning to Canada has remained steady around 300 meaning that for the last few years, Canada has benefited from a net gain of some 50 doctors.

Another phenomenon that has occurred since 1999 has been the fewer than expected number of physicians retiring. Based on comments attached to survey questionnaires, it appears that many wish to retire but for financial reasons cannot. Others are finding it almost impossible to find a replacement and do not want to see their patients left stranded.

Since 1999, there has been more than a three-fold increase in the number of international medical graduates in Ministry funded postgraduate training positions from almost 300 to over 1000. This caused an increase in the number of postgraduate exits sooner than the increase that would come about as a result of greater undergraduate enrolment.

These factors alone would have been enough to drastically improve the supply of physicians during the post 1999 period but in addition, Statistics Canada released revised population projections which were significantly lower than the previous iteration. This had a denominator affect, meaning the ratio would improve even if the number of physicians had remained static.

Graph 2: Projected Physician Supply per 1000 population – Status quo scenario

Source: Physician Resource Evaluation Template, CMA
Future projections of supply using PRET

The CMA Physician Resource Evaluation Template is a spreadsheet-based stock and flow model that incorporates the key parameters in estimating physician supply over the next two decades and enables planners to create various scenarios to test the effects on future supply. Physicians are removed from the model each year to account for retirement, death, and emigration. New physicians are added each year based on the number of physicians who will have completed postgraduate training, those that return from abroad to active practice and those that are actively recruited for permanent employment from overseas. Additions and deletions to supply are done on an age, sex and specialty specific basis. For each projection year, the model details the demographic characteristics of the physician pool such as the number of females, age distribution, etc.

Physician to population ratios, while useful, are limited in terms of describing either the provider or patient population. The Canadian Institute for Health Information creates an full time equivalent (FTE) value based on billings for physician which can then be aggregated into average FTE values by age/sex/specialty cohorts. For example, an average FTE value for 46-50 year old female FPs is 0.7. The CMA projection model applies this ratio by taking 70% of projected FPs in this age/sex group to calculate a projected total number of FTEs. In essence, the FTE values for the age/sex of physicians. There are 7700 licensed physicians in Canada who are 65 years or older; obviously not all are working full-time.

The model can also adjust for an aging population as a proxy for demand and/or need. We know that with respect to physician services, an 80 year old patient costs, on average, more per year than a 25 year old patient. The model adjusts for this by artificially inflating the projected populations for Canada based on patient age/sex specific expenditures for physician services.

In addition to replicating today’s need against an older population, there are other factors that can increase demand such as new diseases, increased technological ability to do more, increased chronicity of diseases such as cancer, shifts in societal perspectives in terms of appropriate treatment ages, etc. At the same time, in some areas, such as cardiac surgery, need may be diminished for some procedures with greater use of medical treatments.

2007 Projection Results

Status quo scenario

The status quo scenario assumes that attrition and gain variables will remain relatively steady either in absolute figures (such as emigration and returns to Canada) or that the age/sex specific rates will remain stable (such as with retirement and death). Postgraduate exits are estimated based not only on the current numbers in training programs but also knowing what is in the system at the undergraduate medical education level.
Future projections of physician supply at a national level are now looking much more positive and if the various attrition and gain rates continue at the status quo level, it is projected the crude physician to population ratio will increase from 1.9 to 2.5 per 1000 population by 2030. (See graph 3)

Things can however, be hidden at the national level. There are still certain provinces that will continue to face challenges in recruiting Canadian graduates (such as Saskatchewan and Newfoundland & Labrador) while at the same time facing international pressure not to recruit from offshore as has traditionally been their solution to physician shortages. In 2005, Ontario actually lost more doctors from interprovincial migration than they gained and they will continue to face physician resource challenges, in part because of a population that is growing at a faster rate than other provinces due to popularity of Ontario centres for new immigrants.

Certain specialties that are already over-represented by older physicians will continue to face decreasing supply relative to the population until such time as they can be replaced by a younger cohort. For example, over 40% of general surgeons are over the age of 55.

Recruiting rural physicians will also remain a challenge although comprehensive incentive packages, addressing locum and on-call issues, and the establishment of a rural medical school in Ontario have the potential to lessen the problem.

When the aging population is factored in (as per the above methodology), the slope of the line representing physicians per 1000 population is flattened somewhat and the ratio climbs from 1.9 to 2.1 by 2030 rather than to 2.5 that it reaches using unadjusted population figures. (see graph 3)

In most western countries, female physicians work fewer hours than male physicians and in Canada this difference is about 7-8 hours per week (or about 15%). While this raises issues of full-time equivalents in an increasingly female profession, the effect will be gradual.

The national projections indicate that half the physicians in practice will be female by about 2027. In the case of family medicine, this proportion will be probably reached about 5 years sooner. This represents the status quo situation of about 60% females in training. Even if the graduating class grew to 100% female, it would take more than a decade to see any drastic effect in the practising pool. The number of FTEs/1000 population will continue to improve in the future although at a lesser rate than head counts (18% vs. 28%). FTEs per 1000 population start at 1.6 per 1000 population and increase to 1.9 by 2030. (see graph 3)
Reduced FTE Scenario

We see evidence that it is not just females that are working fewer hours. Both males and females less than 55 years of age are reporting fewer hours worked than they did almost 20 years ago.45 A recent study of family physicians has shown this to be the case using either self-reported survey data or service utilization data. 6

The standard FTE calculation in the model assumes that the same level of work intensity in each age/sex group will occur in the future as is true today. Given what we know about trends in workload, this may not be true. In other words, those that will reach the 45-54 year age group in 10 years may not work any more hours then than they do now despite an historical pattern of increased productivity among middle aged physicians. For this reason, a reduced FTE scenario has been created which lowers the FTE values in each age/sex group by 10% (see graph 4).

This reduced FTE scenario leaves us with a lower ratio in 2007 (assuming the 10% reduction starts immediately) of 1.4 and improves to 1.7 per 1000 population by 2030 compared to a head count ratio starting point of 1.9 per 1000 population and reaching 2.5 in the same time period.

If the reduced FTE scenario is adjusted for the aging population, we still see a slight improvement to the ratio until around 2020 when it begins to worsen and returns close to the 2007 ratio.
Further Considerations

Even though the future looks brighter, various provincial reports indicate that Canada is short at least 4,000 physicians (or 6%) and 5 million Canadians say that they do not have a family physician. All this begs the question as to whether or not we are starting the projections from a ratio that represents a shortage and is therefore inappropriate.

The biggest challenge of today is trying to address the real needs of an aging and well-informed population and how it affects both the current and future need for physicians. Technology continues to both increase efficiency of the medical treatment as well as make possible an even greater array of diagnostic and therapeutic techniques. People with diseases such as AIDS are living longer and requiring more years of medical treatment. The number of cancer survivors is increasing but with that goes an increased number of people who require relatively intensive use of the medical system for their "chronic" condition.

Projection models for estimating future requirements for physicians should address the needs of the population in a much more comprehensive fashion than what has been presented here. The model ideally should also be able to test the effects of using alternative providers in certain circumstances.

The worldwide shortage of health professionals is continuing to grow. The WHO has underscored the need for concerted action in a report that identified 57 countries as facing
severe health-sector. Global competition for well trained physicians means that Canadian medical graduates will always have ample opportunity to pursue challenges and opportunities in other countries. The 2005 report of the U.S. Council on Graduate Medical Education has projected that the U.S. could be short some 96,000 physicians in 2020. This will almost certainly increase the recruiting pressure on Canada. Even on the home front, the medical profession needs to remain competitive in attracting and retaining young people to the profession.

Canada’s physician supply relative to the population is well below the OECD average and the gap has widened during the past decade (see graph 5). While Canada’s figures have plateaued at around 2.1 to 2.2 per 1000 population (including residents), the 30-country OECD average has increased from 2.1 in 1990 to 3.0 in 2005. Canada’s ratio is expected to improve but it is difficult to say if it will ever catch up to the OECD average.

Graph 5: Canada versus OECD Average Physicians per 1000 Population

The UK has seen enormous increases in the production of physicians and some feel they may have “overshot the mark”. European Working Time Directive which legislates a maximum work hours to 48 hours a week for both residents and practising physicians who are employed by the NHS may however necessitate some extra capacity. While independent consultants are free to work the hours they wish, it is believed by some that residents who have been accustomed to 48 hours per week will have little interest in working the more traditional 60 hour week once they become a consultant. If a maximum 48 hour work week was adopted by all physicians in Canada, we would see an immediate shortage of almost 9,000 physicians.

In summary, there are many forces that will seemingly reduce our effective supply of physicians in what appears to be a relatively bountiful future scenario. To what extent
this will be felt and to what extent we are still in catch-up mode warrants constant further investigation and constant monitoring.

3 CIHI. Full-time equivalent physicians (FTE) report, Canada. 2006.
5 CFPC, CMA, RCPSC. 2004 National Physician Survey.