New Brunswick Department of Health and Wellness

Setting a New Direction for Planning the New Brunswick Physician Workforce

FINAL REPORT

September 19, 2003

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1.1 Overview

The Canadian health care system is under the microscope and continues to undergo change in an effort to respond to the health needs of the population in a manner that is both affordable and sustainable. The health care workforce both impacts, and is impacted by, fiscal and systemic reform initiatives. While health care is under provincial jurisdiction, the health care workforce can be considered a national resource as it is highly mobile, especially in the current environment, which is exceedingly competitive.

There are a number of key drivers of change that impact the demand for and supply of many health professions, including physician resources. These include the changing demographics of the population comprised of both providers and the recipients of health services; the health status of the population, public expectations relative to preventative, as well as curative health care services; technology, in its broadest sense; and the availability of public sector funding for health care.

This report, *Setting a New Direction for Planning the New Brunswick Physician Workforce*, represents the second phase of a two phase Health Human Resources Supply and Demand Analysis undertaken by Fujitsu Consulting for the New Brunswick Department of Health and Wellness. The final report for the first phase of this work (Phase IIA) was completed in November 2002, representing an analysis and 5-year forecast of supply of and demand for 27 health occupations, exclusive of physicians. The findings and recommendations in the Phase IIA report are material to the findings contained in this Phase IIB report, which focuses on physician supply and demand. This current phase of the study involved a comprehensive analysis of the supply of and demand for physicians in New Brunswick and recommendations for ongoing physician resource planning and management. The results of this phase of the study provide a solid baseline for the development of a new physician resource plan, to enable New Brunswick to achieve and maintain an optimal and stable physician workforce, responsive to the changing health needs of the population. Collectively, these two reports and their respective accompanying databases and forecast models provide the foundation for integrated health human resources planning in New Brunswick.

The results of this phase of the HHR study provide a current profile of New Brunswick physicians by 37 different practice groups. The deliverables include an electronic physician database, a detailed profile of the current physician workforce, analysis of demand for physician services, and a 10-year forecast of the available supply of physicians, in relation to predicted demand for their services.

It is important to recognize that the purpose of health workforce planning and management is to identify and achieve the optimal number, mix, and distribution of health human resources, at a cost the province is able to afford; the efficient use of resources in the public interest. The supply, distribution, quality, deployment, organization and utilization of health human resources are of interest to multiple stakeholders in New Brunswick: Governments, Regional Health Authorities, more than 30 health professional associations and regulatory bodies, many unions, training institutions and educational authorities, health providers and the general public. It is evident therefore, that in an effort to address systemic problems, planning and policy cannot be narrowly focused for a single profession.

Traditionally, physician resource planning models have not acknowledged the interrelationship between/among health providers, and have been supply side driven. The market for health human resources in general and physician resources, in particular, does not operate purely on the principle of a free labour market. Significant public sector regulation of the health industry, professional licensure/regulation, and negotiated salary/fees structures are all factors that create price inflexibility in response to changing physician demand and/or supply. The need exists therefore to undertake rational planning as a mechanism for matching supply and demand.

Fujitsu Consulting provided additional value to this study in two ways; by incorporating demand for physician services into the forecast modeling, and by providing a more integrated planning approach, supported by a comprehensive health human resources database with common data elements across 27 allied health occupations and 37 physician practice groups.

1.2 Approach

Involvement of the physician community was critically important throughout the course of this study, to maintain transparency of the process and to obtain input/feedback from both grass roots and organized medicine in New Brunswick. A Steering Committee, comprised of representatives of the Department and the physician community, was integral to the overall management structure of this project. In addition, a Physician Working Group, comprised of 11 physicians and 2 Department staff, provided valuable input and feedback to Fujitsu consultants. Both committees provided significant guidance to Fujitsu consultants throughout the project and also served as key communication links to the general physician population throughout the province. In addition, while the scope of the study did not involve extensive regional consultation, the Vice Presidents of Medicine of each of the Regional Health Authorities served as a communication channel and also provided assistance to Fujitsu Consulting during the course of the study.

A detailed environmental scan was conducted over the course of the project involving an extensive review of pertinent literature; recent reports and studies focusing on factors influencing the supply and demand of physicians. In addition, fifteen key informant interviews were also held with a number of stakeholders. The scan focused on the potential impacts of several factors including: forecast changes in the provincial demography and subsequent impacts on utilization patterns, changes in the health status of the New Brunswick population, the linguistic profile of the province, government workforce policies influencing recruitment and retention, and strategic directions for the health system. In addition factors impacting the future effective supply of physicians were studied including: issues germane to the labour supply including specialty mix, growing consumer demand, technology, trends toward changing practice patterns, the new workforce's preferences for collaborative practice models and alternative forms of compensation other than Fee for Service, and an indication of an emerging trend for family practitioners to practice in environments other than the traditional office-based community practice.

Primary and secondary data collection methods were used during this study to gather the requisite data for the supply and demand analysis. Multiple data sources and methodologies were required to create a comprehensive physician database, comprised of 2 subsystems; supply and education. The main source of secondary data for the supply subsystem was the New Brunswick Medicare System. The data sources for the education subsystem consisted of the Canadian Post-M.D. Education Registry (CAPER), Association of Canadian Medical Colleges (ACMC), Canadian Resident Matching System (CaRMS), Royal College of Physicians and Surgeons of Canada (RCPSC), Canadian Medical Association as well as the web sites of individual Universities. Hospital Utilization data (Discharge Abstract Data) and Medicare Billings data from the Department of Health and Wellness formed the basis of demand side analysis.

A census survey of the New Brunswick physician population was conducted, to provide a more comprehensive picture of the current workforce. The survey collected data and information that was not currently available through any other secondary source and was deemed as critical in order to create an accurate profile on how New Brunswick physicians are actually working in their practices. Survey data, from responding physicians representing 55% of the current workforce, was combined with secondary data on the New Brunswick physician workforce, downloaded from the New Brunswick Department of Health and Wellness Medicare Decision Support System (MDSS). Collectively these data were used to populate a new physician planning database, complementing the data previously generated for 27 other health occupation groups during Phase IIA of this study, which now collectively comprise the new integrated New Brunswick Health Human Resources database.

The physician component of this new database contains 1239 active physicians; 881 (71%) are male and 358 (29%) are female. By broad practice group, the largest group, General/Family Practice has 228 female physicians (37%) out of 612 in total. Of the 627 Specialty physicians, the majority are male, 497 (79%), and 130 (21%) are female. Within the Medical Specialties (a sub set of all specialty physicians), there are 112 female physicians (26%) out of 431 physicians in total, whereas in the Surgical Specialty group there are 19 female physicians (9%) out of 210 physicians in total. These data serve to demonstrate the relative distribution of females across the current physician workforce.

Conducting comprehensive physician workforce planning requires an analytical separation of the 2 parts of the supply/demand equation: 1) how much service is required over the planning period (demand), and, 2) who will deliver the services (supply). This recognizes that the demand/need/requirements for physician services exist independently of the people who may or may not deliver the services.

Acknowledging this requirement, a supply-side analysis of this current workforce was based on the minimum data set elements prescribed by the Department, which were analyzed for the total physician workforce in the province, as well as for each physician practice group. In addition to a demographic analysis of the workforce, 3 kinds of data analyses were undertaken on survey data, based on the kind of variable to be analyzed; contingency table or cross-tab analysis was most commonly used; statistical Chi-squared tests were performed to test the statistical strength of the relationship between any 2 variables; one-way Analysis of Variance (ANOVA) or T-test approach was also used.

Based on available data, a demand-side analysis was conducted by practice grouping, that considered the correlation between Medicare billing data and Discharge Abstract Data (DAD) for various specialist types, the degree of activity captured by Medicare billing data, the degree to which Medicare billing data or DAD may or may not have adequately captured activity information, and the degree of heterogeneity among providers of a given type.

A New Brunswick Physician Forecast Model was designed to provide information to support integrated physician workforce planning, by providing a range of scenario outcomes with respect to the supply of and demand for physicians in New Brunswick. The model incorporates a made-in New Brunswick approach to physician counting. This approach to determining requirements for physicians was derived from complete workload/activity level data from which physicians are given a weighting, instead of the typical Full Time Equivalent (FTE) measurement tool. The forecast model provides a means by which to identify and characterize the effective supply of physicians (actual amount and type of physician services available to meet society's health care needs) by looking at physician numbers, demographics, migration patterns, and workload. It also provides information on the demand for services, based on current utilization of physician services, by age and gender, and taking into consideration population changes over a 10-year forecast horizon. Where the numbers within a practice group were adequate, a provincial level forecast was conducted for all physicians, in addition to a regional level forecast for family physicians.

Planning decisions deal with the number of physicians that will conform with the needs of the population; how many, of what type, and where are they located. A gap analysis was subsequently performed which presents ranges of physician requirements as opposed to point forecasts, in order to accommodate for various possible scenarios that could impact the supply of and/or demand for physician services over the 10-year planning period.

The model is dynamic in nature and must continue to evolve as the health care environment changes into the future enabling incorporation of the most recent data, policies, and planning details, and most importantly, different combinations of these inputs, depending on health care delivery changes and new health care developments anticipated in the future in New Brunswick.

Forecasting Limitations and Considerations

Inherently there are limitations to forecast models in predicting an uncertain future and the reader should be aware of these in the context of this study. A forecast model is a tool that provides information, given a cause and effect hypothesis. For example, if under a certain set of circumstances, without intervention, then the future is predicted to turn out in a particular way. If this outcome is not desirable, the goal is to take the necessary steps to avoid this predicted future and move closer to the desired future outcome.

Forecasting is not an exact science. Therefore, the demand forecasts in this study should be interpreted with caution, as many confounding factors influence growth in demand, many of which were beyond the scope of this study. Projecting the need for health care services is as much a social policy exercise as a technical analysis. Any projection of need implies a level of care that will ultimately be determined, as much by health care funding and access to care, as by the prevalence of disease. Service demand will also be affected by how the care is delivered. These considerations should be overlaid on the forecasts where possible, based on available data, information, and expert opinion.

Forecasting the requirements for physician resources in this study was dependant on a wide variety of clearly stated factors and assumptions, both quantitative and qualitative, and as such, results must be viewed within the context presented and used only as one input in the physician planning equation. In particular, forecasting physician requirements for small areas, such as health regions poses challenges, as historical statistics are kept on a provincial, not a regional basis. Inputs such as retirements, deaths, PGME entries, etc. have therefore been apportioned to each region, based on size of physician population in the region. This equates to a larger margin for error and lower level of statistical confidence. The health region forecasts, for family physician requirements, must therefore be interpreted carefully and used only, as one input for planning.

1.3 Findings

Findings from the Physician Supply and Demand Analysis provide compelling evidence of a reduction in effective supply of physicians, of varying magnitudes by practice groups, over the 10-year forecast period. This is being driven, primarily, by a physician workforce that is aging, a significant trend toward increased feminization of the workforce, and physicians who are practicing differently than historical patterns. New Brunswick has a workforce that is not necessarily contracting in numbers, but is working differently and with reduced patient volumes.

Historical workforce composition and practice patterns can no longer be used as a predictor of future physician resource requirements. In light of this fact, physician resource planning must be dynamic and be actively managed, with close attention paid to succession planning within the respective practice groups.

The ability of physicians to deliver services to meet linguistic needs of the New Brunswick population was an area of inquiry for this study. Currently the Medicare data captured relative to physician language fluency was determined not to be a reliable indicator. Language fluency of the current workforce was therefore derived based on the written and verbal proficiency of physicians, as self reported in the physician survey. Based on survey responses (55% of the current workforce), one quarter of these physicians consider themselves proficient in both English and French; 70% are proficient only in English, and 5% only in French. About 85% of the bilingual physicians in the province have French as their mother tongue; 10% of these bilingual physicians have an English mother tongue. Age also correlated with language fluency, with an inverse relationship demonstrated between age and the level of bilingualism; a greater percentage of the new workforce being bilingual. This is a positive factor in future recruitment of a bilingual workforce.

Family Practitioners

A current analysis of New Brunswick's Family Practitioner (FP) workforce clearly indicates a trend toward a reduction in effective supply over the 10-year forecast period with subsequent reduced access to primary care for New Brunswickers, under the current service delivery model. The major factors contributing to this reduction in effective supply are:

- A national reduction in the number of medical residents choosing family medicine as a career stream
- The current female workforce, at all age groups, has lower patient volumes and works fewer hours per week, as compared with their male counterparts. There is a predicted steady increase in the relative proportion of women in family practice residency programs, who, on average are predicted to continue to have this practice profile throughout their career.
- A general trend toward the new workforce having smaller practice sizes and working less hours (a gender neutral phenomenon)
- A move away from traditional comprehensive community based family medicine practice into other primary/secondary programs such as Emergency Medicine, Hospitalist, OR Assist etc. In large measure, the current Family Practice model is incongruent with how family physicians want to practice.

- Retiring family practitioners leaving large practices that will require more than one new replacement physician

Over the 10-year forecast period (2003-2013), New Brunswick will see both an increased feminization and an aging of this FP workforce with upwards to 30% in the retirement zone. Coupled with how workforce practice patterns and workload activity levels are changing, as demonstrated by the data and forecast scenarios, there is a high probability that more FP physicians will be required over the next 10 years to meet the same level of primary care as is required by New Brunswickers today**.** The nature of this requirement is 40 family physicians on average per year over the next decade to cover replacement for retiring/exiting physicians and meet new demand. This is in addition to the 13-18 new PGME family medicine graduates that New Brunswick normally expects to attract each year. Retiring family physicians leaving large practices can be expected to require as many as 3 new replacement physicians, who on average want practices of 1500 patients. This will amplify the future requirement for family physicians considerably.

When looking at the practice profile of Family Practice survey respondents, generalized to the total Family Practice population in New Brunswick, it would seem that there is evidence of a significant number of physicians practicing other than "traditional" general family medicine, which speaks to reduced access to primary care. Analysis of the total FP workforce, on the basis of Medicare billings (2002-2003), reveals approximately 76 FPs work almost exclusively in other than an office-based setting, such as: the Emergency Room (ER), performing OR assists, Nursing Home duties, Medical Administration, Academic duties, or work in Industry and Government. The age profile of these physicians varies, representing both young and older physicians primarily. The vast majority (60%) of these FPs are spending their time in the ER, followed by OR Assists (35%), then Medical Administration, and a few in Nursing home roles, or working for private industry and government.

This finding is significant from a workforce and health services planning perspective. It demonstrates a trend that bears watching as the new workforce opt for alternative practice environments that provide a level of service required by the system while supporting a better work/life balance. Of the 55% of family physicians responding to the survey who have office based practices, more than 82% indicated they would consider their practices to be largely closed, which further exacerbates diminished access to primary care for New Brunswickers.

Specialty Practitioners

From a planning perspective, the specialty physician population is generally older, with as many as 50% eligible for retirement over the 10-year planning horizon. This is further punctuated by survey responses where 36% of specialists (n=127) indicated plans to reduce their practice within the next 5 years. An increased feminization in this workforce is also evident; the impact of which will be felt more in some specialties than others. Both age and gender impact a shift toward changing practice patterns in New Brunswick's specialty physician workforce; lower patient volumes and fewer hours of work per week.

In considering New Brunswickers access to specialists, only 23% of specialists who responded to the survey (representing 58% of the specialist workforce) indicated they would consider their practices closed to new patients/consults. Based on survey responses and respecting regional variations and type of specialty practice, about 40% of all New Brunswick patients waiting for an elective consult can expect to see their specialist physician within 2 months.

Shortages, as a result of the provincial forecast for replacement and new demand, reveal that the specialties which deserve the most attention (based on absolute numbers) from a planning perspective over the next 10 years are:

- General Surgery (up to 30)
- Diagnostic Radiology (up to 25)
- Urology (up to 17)
- Anesthesia (up to 15)
- Otolaryngology (up to 12)

However, across the spectrum of specialty practice groups, rigorous succession planning is required, due to either projected increases in service demand, or predicted physician retirements / reductions in practice activity within the next 10 years. In some of the smaller specialty groups, the relative impact of an untimely gap of even one physician could place service levels at risk.

It is acknowledged that overlapping scopes of practice are commonplace amongst certain specialists and between specialists and family practitioners and that a physician's functional practice may differ somewhat from the actual credential/certification that a physician may hold. Geographic realities (rural versus urban settings) and the critical mass of providers and/or service population are two factors influencing this phenomenon. Planners and policy makers need therefore to strive for a model of practice that utilizes the full complement of physician and allied health resources most optimally; leveraging specialty skill sets through labour substitution and investment in new technology where possible. Collectively these approaches may moderate the demand identified for certain of specialists.

Recruitment and Retention Challenges

Physicians are a highly mobile resource and, in the national context, demand appears to have outstripped supply creating a competitive environment for the resource. Being one of only 2 Canadian provinces without a medical school poses recruitment challenges for this province. Recruitment and retention of physicians in general, and family practitioners in particular, to rural communities in New Brunswick has also been an ongoing challenge. Contributing to this, with few exceptions, is the location of Canada's sixteen medical schools in large urban/metropolitan cities, which offer the infrastructure sought by many specialists and sub specialists, as well as providing more diversity of practice environments.

The extent to which the medical education cycle fosters exposure to rural practice may have an influence on future commitment to practice rural medicine. Research studies have indicated that exposure to rural medicine during training, and being a rural origin medical student, are factors that positively influence the choice to practice in rural settings. Currently however, the opportunities for New Brunswick students to receive their clinical training here in New Brunswick (rural or urban based), through any of the programs for which the province has agreements for New Brunswick student placements, varies widely both for undergraduate clerkships as well as post-graduate medical education (PGME) residency training.

New Brunswick has invested in physician recruitment and retention since 1999, employing a mix of strategies. The extent to which these strategies position New Brunswick positively in an increasingly competitive marketplace warrants reassessment.

1.4 Recommendations

The findings from this analysis suggest an immediate call-to-action is required to mitigate the forecast shortfall in effective physician resources within New Brunswick over the next decade.

Multiple interdependent strategies will be necessary over the short to longer term to provide for a stable physician workforce in New Brunswick. The overarching principles of flexibility, collaboration, and dynamic, integrated human resource planning, will be the key critical success factors in reaching the required numbers and distribution of the physician workforce to meet predicted demand in a fiscally responsible manner.

Recommendations are organized around three main themes:

- Physician resources planning infrastructure
- Physician workforce management
- Ensuring adequate supply

Physician Resources Planning Infrastructure

1. The Department adopt a planning framework within an organizational model that embraces and supports integrated health workforce planning, under the aegis of a provincial Health Human Resources Planning Unit (HHRU). Details for a Proposed Unit for Health Workforce Management in New Brunswick are provided in Appendix K. This recommendation recognizes the inherent interdependencies among health service providers.

   It is critical to ensure the HHRU is adequately resourced, with a combination of skills represented by the following disciplines: health economics, health policy analysis, programming/data analysis, epidemiology, statistical analysis, and access to researchers with various areas of expertise, who may be drawn upon, as required, to provide support to the Unit.

2. The Department adopt the New Brunswick Physician Database (NBPD) as the new baseline for physician resource planning in New Brunswick, and update the database minimum data set annually, as an integral component of business planning within the Department and Region Health Authorities.

   - To work towards a minimum dataset that can support the various activities of HHR management, data collection activities need to be coordinated and efficient. For example, repeated surveys of health professionals typically yield low response rates and incur high costs. To reduce the burden of surveys, information systems that draw on currently available data are preferable; adding selected new items of information, where needed, at marginal cost. The data required to populate the minimum data set fields in this database should therefore be generated from Medicare, Epidemiology, and from mandatory data captured by the College of Physicians and Surgeons of New Brunswick and/or the RHAs as appropriate. It will be necessary for all parties to reconcile their respective data collection responsibilities and these data be provided to the HHRU on an annual basis, at minimum, to ensure the database remains current and evolves to meet new trends.

3. The Provincial Epidemiology Service of the Department revisit the focus of its research activities, to ensure the necessary alignment with required population health demand data for effective physician resource planning.

4. The Department adopt the New Brunswick Physician Planning Model and methodology as one of the dynamic planning tools within the HHRU integrated planning toolkit. This Planning Model requires active management by knowledgeable users within the HHRU, in collaboration with key stakeholder groups, and should be regularly enhanced and refined to meet evolving requirements, to inform implementation strategies and policy directions.

5. The Department, in collaboration with RHAs, investigate the development of provincial wait list/wait time standards and protocols as an indicator of appropriate distribution of services, by practice type and in recognition of language of service requirements. This would provide a consistent and valuable future data source to be incorporated the demand-side of the forecast model.

Physician Workforce Management

6. Government overhaul the current physician workforce management policy structure, within the context of the Provincial Health Plan and changing workforce trends, with a view to creating a more flexible environment in relation to both the numbers of physicians, their distribution provincially and their remuneration, in order to:

   - Provide New Brunswick with greater competitive advantage in timely recruitment of physicians

   - Recognize and accommodate changing physician practice patterns and preferences/activity levels e.g. there is no one "typical physician practice"

   - Engage physicians and RHAs in active, short-to-longer term succession planning, to ensure access to service by an adequately resourced workforce

   - Incorporate adequate flexibility in the system by acknowledging the need to plan for ranges of physicians required for given programs/services as opposed to fixed targets, to accommodate a wide range of workload/activity levels, planned leaves of absence etc.

   - Be fiscally responsible in managing growth in physician supply, based on predicted population demand and utilization patterns

   The integration of health workforce management with strategic planning (services and finances) at the RHA level implies identification of the most appropriate and efficient mix of resources to provide the needed services in regions, congruent with the provincial health plan. This level of planning would enable RHA's to better plan and manage their health workforce and avoid interregional competition and ad hoc recruitment/crises management. It is therefore recommended that:

7. The HHRU support and coordinate active physician resource management by the RHAs, through such means as:

   - Providing a provincial forum for discussion of physician planning issues, through a *Medical Workforce Strategy Committee*, established as an operations committee of the HHRU, comprised of the key stakeholder groups necessary to plan a stable and predictable New Brunswick physician workforce. This committee should actively contribute to the development and analysis of policy options concerning changes to physician supply and demand, and factors impacting same, such as new service delivery models, changing practice patterns etc.

   - The development of planning tools such as a provincial HHR impact assessment template, deployed across Government and Region Health Authorities, to ensure HHR impact analyses are consistently integrated with strategic/business planning, proposed policy, program and service changes at provincial and RHA levels, e.g. RHA 3-year business plans should include associated HHR plans. This would better inform collaborative health workforce management decision-making at the provincial and RHA levels, fostering interregional cooperation for resources, as compared to competition.

   - Establishing an information systems infrastructure to support HHR data collection/information sharing.

   - Supporting a rational approach for HHR management within each RHA that follows a systematic approach for data collection/development and aligns with the provincial health plan

8. A review of physician compensation models should be undertaken in relation to effective physician resource management, in an effort to accommodate the diverse working preferences of the new physician workforce, remain competitive with other provinces and manage the growth rate in overall health system expenditures.

9. It is recommended that Government, in collaboration with NBMS and other key stakeholders, continue to collaborate in the design of a blueprint for physician remuneration that considers a range of compensation alternatives to accommodate physicians' diverse practice patterns, and serve to positively influence recruitment as well as retention.

Ensuring Adequate New Supply

10. Based on predicted supply shortages, and assuming historical recruitment rates from the national new supply pool remain constant, it is recommended that the number of New Brunswick funded medical education seats increase by 48% (26 seats), incrementally over each of the next 4 years, to ensure New Brunswick retains its historic 3.2 % of enrollments in the Canadian medical school system, as ACMC moves to increase enrollment numbers to 2,500 by 2007; and

11. Allocate this increased funding proportionate to the relative language distribution of the New Brunswick population; targeting 16 seats in Anglophone programs and 10 seats in Francophone programs (note, this contributes to meeting language of service requirements, however, bilingual Francophone students also opt to attend and graduate form Anglophone programs. No data is presently available to substantiate this).

Recommendations 9 and 10 are based on the following rationale:

- A steadily increasing percentage of female medical students enrolled in Canadian medical schools, whose practice profiles reveal lower patient volumes and fewer hours of work per week on average than male counterparts, and who take more leaves of absence for family leave during the first 10 years of practice.

- Predicted growth in available medical education seats to 2,200 by 2005 and 2,500 by 2007 (ACMC) of which, based on historical patterns, New Brunswick should expect to have 80 or 3.2% of those seats. Given New Brunswick currently funds 55 medical education seats, this results in a gap of approximately 25 seats.

- The Canadian Medical Forum Task Force recommendation to increase enrollments by 4-5% to adjust for the increased enrollment of women in medical schools, who, statistics demonstrate, do not complete residencies due to pregnancy/family commitments etc. This translates into an additional 1.2 seats/year.

It is relevant to note that the Canadian Medical Forum Task Force indicates there are approximately 4-5 highly qualified students interviewed by Canadian medical schools for each available position. Therefore there is no perceived lack of potential supply to meet increasing demands.

12. The Department of Health and Wellness and the Department of Education, Post Secondary Division, promote national dialogue on the development of a process, to ensure allocation of PGME seats in Canadian medical schools is aligned with the predicted service demands across the country, as identified through provincial/regional physician supply/demand forecasts.

13. Government review the current terms and conditions associated with funding seats in targeted Canadian Medical Education programs, to improve the level of confidence in receiving a return on this investment which will meet the forecast service requirements of the province.

14. Government revisit the current funding structure supporting medical education for both basic medical students and PGME residents to ensure adequate and sustained support throughout the medical education pathway, including adequate resource support for physician educators/preceptors.

15. The Department, in collaboration with ACMC and CAPER, establish and actively manage a provincial database of New Brunswick medical students/residents, enrolled in medical education programs across Canada, to track these students throughout their educational cycle, through their first 5 years of practice.

16. The Department, in collaboration with the New Brunswick Medical Education Coordinators, and with the cooperation of ACMC and CAPER, lead a direct marketing/recruiting strategy to actively identify, and target recruitment of all New Brunswick students enrolled in basic and PGME medical education programs across the country.

17. Government work in conjunction with those medical schools, for which New Brunswick funds seats for New Brunswick students, to improve opportunities for:

    - Increased focus on improving admission rates of qualified NB students from rural communities

    - New Brunswick based clerkships to expose medical students to a variety of practice environments/practice models in New Brunswick

    - New Brunswick student access to specialty residency seats that meet forecast service requirements; and

    - Future expansion of specialty residency programming within New Brunswick.

18. The Department, in conjunction with the health regions, provide medical and PGME students with active offers of summer employment /residency placements throughout their medical education cycle and to the extent possible expose trainees to alternate practice models/locations.

19. A formal evaluation of Government's 1999 *Physician Friendly New Brunswick* recruitment and retention strategy be undertaken to measure the impact of this strategy, in relation to its objectives, and refocus the strategy where required, to target planned new investments over the next 5 years, that position New Brunswick to successfully achieve stated health care renewal objectives.

20. Government continue to aggressively market New Brunswick as a *Physician Friendly* place to live and work, and proactively create the infrastructure to accommodate the preferred work practices of the new workforce.

    - Escalate the rollout of collaborative practice models across the province, commencing with hard-to-service / under-serviced areas, to improve New Brunswick's competitive position in attracting family practitioners and providing a stable cadre of primary care services.

    - Establish alternate compensation mechanisms to Fee for Service, to provide options which support practice preferences

    - Make active offers, with committed billing numbers, to residents early in their final years of residency

    - Reassess New Brunswick's competitive position, relative to location grants for hard to recruit to areas, and actively market as a debt-reduction incentive program: i.e. a 4 to 5 year debt pay down plan for newly graduated residents practicing in New Brunswick, with proportionate return-for-service agreements

- Investigate the cost benefit of contracting private companies to undertake management of locum replacements for New Brunswick physicians

21. Within the context of a review of continued investment in physician recruitment and retention (updating *Physician Friendly New Brunswick*), Government continue to commit funding over the next 5 years to supernumerary residency positions for Canadian and IMG physicians targeting the following practice groups in particular:

    - General Surgery
    - Diagnostic Radiology
    - Anesthesiology
    - Urology
    - Otolaryngology
    - Any other practice group for which a physician impact analysis has determined shortages will compromise realization of proposed new government policy directions (e.g. Provincial Health Plan, Primary Care Strategy, Provincial Cancer Control Strategy)

22. The College of Physicians and Surgeons of New Brunswick take immediate action to collaborate with the parties necessary, both provincially and nationally, in establishing a formal, standardized process to assess foreign trained medical graduates and accelerate their licensure to practice in New Brunswick, thereby bringing appropriately qualified foreign-trained doctors into the workforce in a timely fashion, as required to meet service demand.

23. Give priority attention to an assessment of New Brunswick's technology capacity within the health care system, with the development of a strategic investment plan for the acquisition, diffusion, and replacement of technology to optimize health care delivery to New Brunswickers. The use of enabling (e.g. permanent patient record) and health care technologies (e.g. new diagnostic/treatment technologies) has the potential to improve the recruitment/retention and effective utilization of scarce health provider resources.

Language Requirements

Demand for health care services, based on the recipients' language of service preferences, will be driven by a number of factors (population growth rates, epidemiologic data, the distribution of specific clinical programs, as directed under the Provincial Health Plan), and met through the execution of RHA guidelines for implementation of the Official Languages Act, as well as an ability to educate and recruit sufficient number of physicians to provide service in the recipient's language of choice. It is therefore recommended that:

24. To understand demand for service, based on New Brunswick's language demographic, the New Brunswick Medicare system be updated and kept current as to the following: language of recipient (card holder), preferred language of service, as well as language fluency (English/French/Bilingual)

25. Incorporate the language data described in Recommendation #23 into the Planning Model to ensure appropriate distribution of investment among English and French medical schools. It should be acknowledged; however, that the language of the program may not be the sole decision factor in choice of medical school, for bilingual students.

    The physician survey data demonstrated an increase in the percentage of bilingual physicians entering the marketplace, which may be as a result of increased focus on bilingualism within the general education system. Through the physician survey, 41% of the current New Brunswick physician workforce under 40 years of age self reported as being bilingual, as compared to about 19% of those physicians over 40 years of age. In an effort to monitor the language profile of physician supply it is recommended that:

26. Government, in collaboration with ACMC, promote the mandatory capture of data on language fluency on medical school application forms (English/French/Bilingual) for all students entering medical school, and this be incorporated in ACMC /CAPER reports. It will therefore be possible for New Brunswick to track the language proficiency of all students from New Brunswick enrolled in the respective medical school programs across Canada, which may aid recruitment efforts.

27. Modify the Department Physician Registry database (under Medicare) to incorporate language fluency as a mandatory field (English, French, Bilingual), populated through data generated from the CPSNB registration form and/or Physician Medicare registration form.

Succession Planning

The increasing feminization of the physician workforce presents unique HR planning challenges. Gender aside, generally the new physician workforce wants to work differently, with more work/life balance. Rational physician resource planning cannot ignore this phenomenon and succession planning/workforce adjustments must accommodate for this by building sufficient flexibility in the system to effectively manage the ebbs and flows of the physician labour force over the next decade. It is therefore recommended that:

28. The Department acknowledge the requirement for flexibility in the system, by establishing dynamic physician resource plans that account for not only the practice profile of each physician entering practice in New Brunswick, but also their predicted level of activity over a prescribed planning horizon. This requires the cooperative effort of physicians themselves, RHAs, Government and the College of Physicians and Surgeons, in ensuring data is captured on an annual basis that characterizes how physicians are practicing.

29. The Department explore means by which to capture activity levels/service utilization for physicians paid through other than FFS (salary/sessional/alternate payment plans), to provide a true picture of physician resources in New Brunswick.

30. Given the competitive environment, length of time-to-market for many specialists, and a possible 2.3 to 3 replacement factor required to fill vacancies created by retiring family physicians with large practices, it is recommended that:

- RHAs engage their respective physician communities in collaborative succession planning, based on longer term planning cycles, to prevent untimely gaps in access to service; and that administrative structures be put in place to assist RHAs to effectively meet their service obligations

- The Department and RHAs redouble efforts to work cooperatively with interested physicians in the retirement age group, to achieve mutually satisfactory retirement solutions including, but not limited to:

  - Actively brokering shared practice relationships between physicians wanting to reduce/exit their practices, and new physicians wanting to startup a practice in New Brunswick

  - Investigating practice buy-out options, where no replacements are recruited, with a view to replacing a traditional private practice with a collaborative practice model in those communities where it is determined to be a more effective alternative

  - Considering strategies for retaining older physicians in the workforce who wish to discontinue their private practice and work in other than a Fee for Service model.

2. PROJECT DESCRIPTION

The New Brunswick Department of Health and Wellness (Department) Health Human Resources (HHR) Supply and Demand Analysis Phase IIB project involved a comprehensive analysis of the supply of and demand for physicians in New Brunswick and recommendations for ongoing physician resource planning and management. The results of this study lays the groundwork for the development of a physician resource plan that will enable New Brunswick to achieve and maintain an optimal and stable physician workforce that is responsive to changing health needs of the population.

The results of this phase of the HHR study provides a current profile of New Brunswick physicians by 37 different practice groups, as outlined in Appendix A. The deliverables include an electronic physician database, a detailed profile of the current physician workforce, analysis of demand for physician services, and a 10-year forecast of the available supply of physicians in relation to predicted demand for their services.

3. General Approach and Methodology

Phase IIB of the HHR supply and demand analysis accomplished the following:

- Minimum Data Set (MDS) elements, used during Phase IIA for the other health occupations, was modified to better reflect the requirements for analysis unique to the medical profession. The MDS for Phase IIB is listed in Appendix B.

- The current HHR inventory database was modified, and populated with available data, and then, a profile of the current physician workforce in New Brunswick was constructed. This included an analysis of physicians (i.e. their demographics and how they work) as per the modified MDS elements.

- An assessment of the labour market and training programs throughout Canada (with special emphasis on Atlantic Region and Quebec) was conducted to determine supply of qualified family physicians and specialists during the 10-year forecast period. This included information on where training programs are located, number of graduates, as well as the origin of training for those physicians currently practicing in New Brunswick, as per the labour market Minimum Data Set as listed in Appendix B.

- Completion of the environmental scan commenced during Phase I and IIA of this study to identify the impact of federal/provincial initiatives, and/or strategies on supply of and demand for physicians.

- Forecast of the potential supply of and demand for physicians in New Brunswick for the next 10 years, and potential shortages/surpluses of physicians, for the 10-year planning horizon, by Family Practice/Specialty, based on available data and sufficient numbers within each specialty grouping. This process incorporated a variety of inputs, based on available data, such as:

  - Physician retirements, deaths, interprovincial migration and immigration, new entries from medical schools, health system utilization data and demand for increased service based on population demographics, changing population health needs, emerging trends and technologies, changing service delivery models, etc.

- Identification of major trends and issues impacting the supply, demand, recruitment, and retention of physicians, and policy recommendations to address these.

A Steering Committee comprised of representatives of the Department and the physician community was integral to the overall management structure of this project. In addition, a Physician Working Group composed of eleven physicians and two Department staff provided valuable input and feedback to Fujitsu Consultants. Both committees provided significant guidance to Fujitsu consultants throughout the project but also served as key communication links to the general physician population throughout the province. The membership of both the Steering Committee and Physician Working Group is outlined in Appendix C. The Vice Presidents of Medicine of each of the Regional Health Authorities also served as a communication channel and provided assistance to Fujitsu Consulting during the course of the study.

3.1 Environmental Scan

3.1.1 Literature/Document Review

An extensive review of pertinent documentation and literature was conducted, unique to this phase of the study as outlined in Appendix D. This review complements the environmental scan conducted in support of Phase IIA of the health human resources supply and demand analysis and targeted physician resources more specifically. The focus of this scan was to ensure awareness of factors influencing the supply and demand of physicians.

3.1.2 Interviews

Structured interviews were conducted with 15 key informants as part of the environmental scanning process. The individuals interviewed are detailed in Appendix E.

3.2 Data Collection

3.2.1 Primary Data Collection

A census survey was conducted with the New Brunswick physician population, with the intent of complementing current Medicare data, to create an accurate profile on how New Brunswick physicians are actually working in their practices. This type of data/information was currently not available and was deemed to be an essential missing ingredient in forecasting the demand for physician resources in New Brunswick. Fujitsu Consulting extracted a mailing list from the New Brunswick Medicare database that included all physicians who had active billing status. In total, 1269 physicians were eligible to respond to this survey. The census population was subcategorized by family practitioners/general practitioners and by specialists. Two distinct survey instruments were developed and distributed, tailored to the unique characteristics of these respective groups. Sample surveys are found in Appendix F. All documentation was distributed in both Official Languages.

The methodology included distribution of a pre-survey advisory notice, mailed directly to all New Brunswick Physicians (N=1269). This advisory, of the intent to survey the physician community, was also communicated to physicians through the New Brunswick Medical Society (NBMS) web site, as well as through a broadcast email to those physicians on the NBMS electronic membership list (approximately 660 physicians). The Vice Presidents of Medicine for each Regional Health Authority also received an advisory notice to post in key locations within each facility, and for distribution to the various Clinical Department Heads within their health region.

The survey instrument was mailed within 2 weeks of sending the advisory notice. A mailed reminder notice was sent 10 days following the survey mail out and targeted follow up of non-responders was undertaken by telephone and email during the final stages of data collection the end of April 2003. The Vice Presidents of Medicine in each Regional Health Authority were forwarded the names of those physicians in their region who had yet to respond to the survey and were asked to assist in encouraging these physicians to complete and return their surveys by mail or fax. The deadline for response was extended by 4 weeks to accommodate late responders.

3.2.1.1 Response Rates

There were 725 responses in total, of which 25 were deemed not to be a potential source of supply as they self reported being inactive and/or not returning to active practice, and therefore ineligible for the study. In total there were 700 valid responses, representing an overall response rate of 56%. The physician inventory database was populated with all survey data received, following a defined quality assurance protocol.

The following table provides an overview of the characteristics of respondents by practice type, gender, and language fluency. To be considered "fluent" in one or both official languages, respondents would have had to have self-reported both written and oral proficiency in English, French, or both French and English. A detailed regional breakdown of respondents by physician practice specialty type is found in Appendix G.

Table 1 – Characteristics of Survey Respondents

Family Medicine	Specialists	Gender	Language Fluency
339 (48%)	361 (52%)	Male 490 (70%) Female 210 (30%)	English 489 (70%) French 34 (5%) Bilingual 176 (25%)

When looking at the response rate within the two large practice groupings in the physician database, 55% (339/612) of all family practitioners responded, as compared with 58% (361/637) of all specialists.

Physician Survey data was entered directly into Access tables through an MS-Access Entry Form created for this purpose.

3.2.2 Database Abstractions

Secondary data on the New Brunswick physician workforce was also downloaded from the New Brunswick Department of Health and Wellness Medicare system, specifically, the Medicare Decision Support System (MDSS). Using a business intelligence tool from the Department, queries and reports were run to collect data from the Medicare databases. The reports were then saved in MS Excel format and imported into tables within the new physician portion of the New Brunswick Health Human Resource database.

3.2.3 Other Data Sources

The Education Sub-system information was collected from various sources including Canadian Post-M.D. Education Registry (CAPER), Association of Canadian Medical Colleges (ACMC), Canadian Resident Matching System (CaRMS), Royal College of Physicians and Surgeons of Canada (RCPSC), as well as the web sites of individual Universities.

Data from CAPER was received as an Access database while data from ACMC was received in Excel and was imported into an Access table. Data from the CaRMS, RCPSC, and the individual universities was taken from their web sites and entered into an Access table. The CAPER data is also contained in their yearly publication “Annual Census of Post-M.D. Trainees 2002 – 2003”.

Other data and analysis accessed for the purposes of the physician study was from the Hospital Services Division of the Department, specifically, the Hospital Discharge Abstract Data (DAD), which formed the basis of the demand side analysis for physician services.

3.2.4 Data Considerations and Limitations

It is important to note that the data collection process was a ‘snapshot in time’, and thus not reflective of the reality of a workforce, which is dynamic in nature and often changes on a daily basis, and as such, the following considerations need to be understood as limitations to the analysis contained in Section 6:

- Medicare system download taken as of end of March 2003
- Physician survey information spanned April to June 2003
- Full-time Equivalent data based on most recent full year of data 2002-2003

The span of time between these data sources mean that some physicians have retired, moved, become inactive for other reasons, taken maternity leave, etc. However, it is believed that such micro-movements in the physician workforce are roughly consistent over time, and thus the snapshots are reflective of the typical physician workforce at any point in time over this time period.

3.3 Database Development

The HHR Database is an integrated database containing the data, queries, and reports from Phase IIA and Phase IIB. It is organized into two subsystems: an inventory of 27 health occupations and 37 physician groups and an inventory of health/medical education programs that support the educational preparation of the respective groups. The portion of the database specific to physicians is outlined in the following subsections.

3.3.1 Physician Supply Subsystem

The data elements comprising the physician supply subsystem are detailed in the Minimum Data Set (MDS) found in Appendix B. The information used to populate the database came from data collected from Medicare and from the results of the Physician Survey. The content includes demographic information, practice location, health region, practice and activity information, using the physician Service Provider ID as the unique identifier. For the MDS variables primary and secondary specialties, Medicare data was considered the default for this information, except where there was a discrepancy with the self-reported survey data, in which case self-reported information replaced the Medicare default. All specialty groups were then rolled up into the 37 practice groups germane to this study. For privacy and confidentiality reasons, physician names have been stripped out of this database and saved in a separate, password protected database using the same privacy protocols as were used with Phase IIA data. The 2 physician databases may be linked for health human resources planning purposes by those individuals so authorized by the Minister of Health.

The Physician Information table in the database is comprised of the 1239 doctors considered as the "Base Group" for the study. This group is made up of all the "Active Physicians" at the time of the data extract from Medicare, as well as "Inactive Physicians" who indicated on their completed survey that they are planning to return to active practice in New Brunswick.

3.3.2 Education Subsystem

The Education subsection contains information relating to the 16 Canadian Medical Schools programs and information regarding the graduates of both the MD and PGME programs. The Minimum Dataset for the education subsystem can be found in Appendix B.

There were two primary data sources used to populate the education subsystem. The Canadian Post M.D. Education Registry (CAPER) 2002-2003 annual census data was used for post M.D. trainees enrolled in programs as residents or fellows. This data included only Canadian citizens and permanent residents of Canada. The other source was 2001-2002 data of undergraduate medical students enrolled in Canadian medical schools as supplied by the Association of Canadian Medical Colleges.

This subsystem contains information on Canadian medical educational programs - MD & PGME, the trainees currently in the programs, the number of graduates over the past 10+ years, as well as the working locations of the graduates after graduation. The program information includes the name, location, level of the program, admission requirements, accreditation, intake capacity, current number of trainees enrolled, the number of applications, language of the program, duration, and number of New Brunswick trainees.

3.3.3 Database Structure

Microsoft Access 2000 was used as the database tool for the HHR database. Tables, queries, forms, and reports are all components of the final product. There are 2 physical databases: HHR and HHR_Name. The HHR database contains all of the tables for the health inventory and education subsystems excluding the names of individuals. Individual's names are found in a single table in the password protected HHR_Name database. This table can be imported into the HHR database at a later time if updating is required for planning purposes and names are required to determine if duplicate individual records exist.

The database structure is described in detail in separate Technical Documentation deliverables. The deliverables describe all of the tables and fields being used to represent information on the health inventory and education aspects of the study. For a complete description of the database structure including a list of tables and fields, please refer to document "P210 Database Structure" for Phase IIA and "P210 Database Structure – Phase IIB" for Phase IIB.

The HHR databases created in Phase IIA were used as the databases to store the Phase IIB information.

Phase IIA and IIB information are contained in the one database with Phase IIA and IIB names in a separate database. Where applicable, existing tables from Phase IIA were used and added to, therefore, there is an overlap of tables between the 2 phases.

3.3.4 Database Reports

Reports were developed to present the collected information for the purpose of inputting into the forecasting model, as well as for the display of the information. In applicable cases, reports were developed to display the data by Region, Gender, and/or by Specialty group as per the RFP categories.

All queries and reports developed in Phase IIB have a B in the name to indicate belonging to the second phase, i.e. “qryB …” or “rptB …”. Refer to the report binder for a list of the available reports.

3.4 Supply-Side Analysis

The supply side analysis or analysis of the current physician workforce in New Brunswick was based on the minimum data set elements, which were analyzed for the total physician workforce in the province, as well as for each physician practice group as presented in Appendix A.

The methodology for the survey data analysis (performed by Collins Management Consulting) involved editing the data for consistency and completeness, and then importing the clean data file into JMP 5, a statistical analysis application from the SAS Corporation, a leader in business intelligence and analytics.

Three kinds of data analyses were undertaken based on the kind of variable to be analyzed. Contingency table or cross-tab analysis was most commonly used. The method calculates the relationship between a response variable and an explanatory variable. Both variables are category variables; the value of this kind of variable is a character description rather than a numeric value. Statistical Chi-squared tests were performed to test the statistical strength of the relationship between the 2 variables.

Numerical values were analyzed in a similar manner, although a one-way Analysis of Variance (ANOVA) or T-test approach was used rather than a contingency table. These tests are more complex than contingency table analysis and provide detailed estimates of the strength of the relationship between a numerical response variable, such as the average number of patients added to a practice, and categorical variables, such as gender and age group. It is also possible to generate confidence intervals for the response variable.

3.5 Demand-Side Analysis[1]

The demand-side of the physician equation is intended to determine the current and future demand for physician services, as based on the New Brunswick population’s utilization of health services, combined with available information on the health status of the population and any available information regarding changes to health services delivery in New Brunswick.

The demand-side analysis was based on two primary data sources:

[1] Demand side data and analysis provided by New Brunswick Department of Health and Wellness, Hospital Services Branch.

1. Hospital Services Data in the form of Discharge Abstract Data (DAD)

2. Medicare physician billing data

The following considerations have been factored into the demand-side analysis to allow for the most complete analysis possible, based on available data, by practice grouping:

- The correlation between Medicare billing data and DAD for various specialist types

- The degree of activity captured by Medicare billing data

- The degree to which Medicare billing data or DAD may or may not have adequately captured activity information

- The degree of heterogeneity among providers of a given type

4. Physician Forecast Model Methodology

4.1 Introduction

Conducting comprehensive physician workforce planning requires an analytical separation of the 2 parts of the supply/demand equation: 1) how much service is required over the planning period (demand), and, 2) who will deliver the services (supply). This recognizes that the demand/need/requirements for physician services exist independently of the people who may or may not deliver the services.

The Physician Forecast Model is therefore designed to support physician workforce planning by providing a range of scenario outcomes with respect to the supply of and demand for physicians in New Brunswick. As an overlay to the statistical inputs, it was intended that the model account for any inputs/factors that may impact supply of and demand for physicians over the next 10 years (e.g. service delivery changes, etc.). Information was not available at the time of this study to allow this overlay, however, the questions asked to generate these inputs are dynamic in nature and must continue to evolve as the health care environment changes into the future.

Overall Considerations

- Are the strategic objectives of the Government clear, known, and in alignment with regard to health care service delivery in New Brunswick?
- Will these strategic objectives change?

Supply Considerations

- What are the competencies of the current physician workforce?
- What are the products of the current physician workforce (i.e. what services do they deliver)?
- Will the size of the physician workforce increase? Decrease?
- What entries, attrition and retirement can be expected?

Demand Considerations

- Will the health care system change its current method of delivery of health care services?
- Will demand for physician services change due to changes in population health?
- What competencies will be needed in the future physician workforce?

Gap and Solution Analysis Considerations

- How is the physician workforce going to change?
- Which skills are current physicians able to contribute during the 10-year forecast period?
- What competencies will be needed that are not present in the current physician workforce?
- How can educational considerations help the transition?
- What are the sources feeding the new physician workforce?
- What kind of positions will need to be filled and how can physician specialties inter-relate to fill these?
- Are new physicians merely replacing retiring physicians or going into new types of jobs?

It is important to recognize the limitation of forecast models, in predicting an uncertain future. Thus, a forecast model is a tool that provides information given a cause and effect hypothesis, e.g. if under a certain set of circumstances [2], without intervention, then the future is predicted to turn out in a particular way.[3] If this outcome is not desirable, the goal is to take the necessary steps to avoid this predicted future and move closer to the desired future outcome.

4.2 Forecast Model Specification

The purpose of the New Brunswick Physician Forecast Model is to provide information to support integrated physician workforce planning over a ten-year planning horizon. The basic structure of the model is as follows:

1. **Supply-side / Physician Workforce Analysis** – forecast physician supply based on current stock, gains, and exits over a 10-year forecast horizon
2. **Demand-side / Needs Analysis** – based on current utilization of physician services, by age and gender, and taking into consideration population changes over a 10-year forecast horizon

[2] "If" medical school enrollments stay constant, "If" 50% of medical graduates are women, "If" the service delivery model remains constant, etc.

[3] Eva Ryten, Consultant to the Association of Canadian University Departments of Anesthesia. A Physician Workforce Planning Model for the Specialty of Anesthesia, 2000, Section 2.0.

3. **Gap Analysis / Identification of Imbalances and Physician Requirements** – comparison of present and future physician workforce compared against present and future needs/demand over a 10-year forecast horizon.

The model was created in Microsoft Excel for practicality, user-friendliness, and ease of manipulation and updating. The model incorporates a variety of input variables as described in the following sections. A ten-year forecast of supply of physicians and demand/need for physician services is generated, and a gap analysis performed identifying problem areas, i.e. estimated physician requirements.

In that workforce planning must be a dynamic process that facilitates planning for different scenarios; the physician forecast model has been designed to allow for scenario-based forecasting. This approach enables incorporation of the most recent data, policies, and planning details, and most importantly, different combinations of these inputs depending on health care delivery changes and new health care developments anticipated in the future in New Brunswick.

The following sections describe the challenges that are inherent in physician workforce modeling, and define the supply- and demand-side forecast models utilized in this study, for the physician specialties with sufficient numbers (>25 physicians) to allow the model to be applied with sufficient confidence.[4]

4.3 Supply-Side

Effective supply is the actual amount and type of physician services available to meet society's health care needs. It takes into account physician productivity by analyzing the collective work habits of individual physicians – how much do they work? And what kind of services do they provide? Thus, effective supply takes into account the nature of services provided and overall productivity (i.e. throughput). An ideal effective supply is the volume, type, and location of physician services to meet societal health care needs. As such, looking at physician numbers, demographics, migration patterns, and workload begins to tell the story of effective supply of physician services in New Brunswick.

As will be discussed in more detail in subsequent sections, we know that physicians do not all work the same number of hours per week or work the same number of weeks per year. As well, we know that men and women have different work patterns, and that older physicians have different work patterns than younger physicians. Thus in practice, this means that depending on the demographics of the physician population, a greater or lesser volume of services will be delivered. The forecast model attempts to account for these variations in practice in the future.

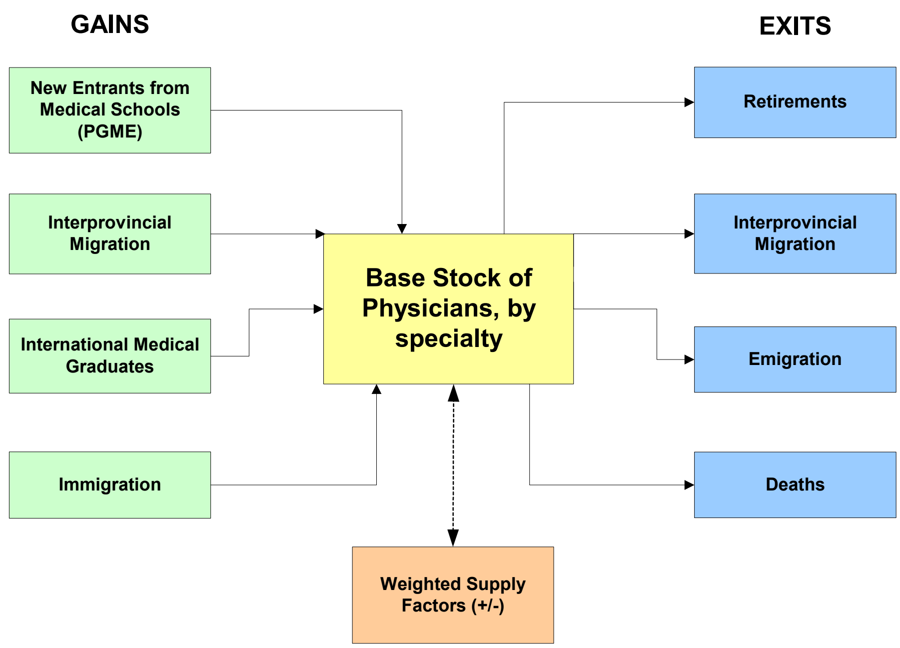
The supply side of the physician supply and demand equation involves a variety of inputs as depicted and discussed in the following sections.

[4] General Practice/Family Practice, Anaesthesia, Diagnostic Radiology, General Surgery, General Internal Medicine, Obstetrics/Gynecology, Ophthalmology, Orthopedic Surgery, Lab Medicine (General, Anatomical, Hematological Pathology and Medical Microbiology), Pediatrics, Psychiatry. As well, as broad groupings: Medical Specialties and Surgical Specialties.

4.3.1 Supply Model Schematic

The supply model schematic is presented in Figure 1.

Figure 1 - Supply Model Schematic



4.3.2 Supply Model Input Descriptions and Data Sources

This section provides detailed descriptions of the inputs that comprise the supply component of the forecast model. Where data is available, rates and other data utilized in the model are specific to each gender, age grouping, and broad physician grouping (family practice, medical specialties, and surgical specialties).

4.3.2.1 Base Stock of New Brunswick Physicians

The base stock of New Brunswick physicians is based on the New Brunswick Physician Database, a deliverable of this Physician Supply and Demand Analysis. This base stock is broken down by age and gender for broad practice groupings: GPs/FPs, Medical Specialties, and Surgical Specialties, and also for the following specialties that have more than 25 physicians in the group:

1. Anesthesia
2. Diagnostic Radiology
3. General Surgery
4. General Internal Medicine
5. Obstetrics/Gynecology
6. Ophthalmology
7. Orthopedic Surgery
8. Lab Medicine (includes Anatomical, General and Hematological Pathology and Medical Microbiology)
9. Pediatrics
10. Psychiatry

The supply of New Brunswick physicians is calculated for the end of each forecast year based on the stock at the beginning of that year plus total gains to the supply system, less total exits (attrition) from the supply system. In addition, for each year of the forecast period, the stock of physicians is aged one year, based on their age at time "t" (2003).

Workforce Temporary Exits and Re-entries

Temporary exits and re-entries are the temporary movement of New Brunswick physicians out of and back into the active medical workforce for various reasons, including maternity leave, education leave, medical leave, etc. This is a recognized input into a supply model, however, it has been determined in the development of the Canadian Medical Association's supply projection model that due to the temporary nature of short-term leaves, exits and re-entries will roughly equate over time and thus do not add value in the technical supply forecasting process.

However, the workforce planning around these short-term leaves needs to be considered, in that an active supply of locums and/or physicians willing to take on additional workload is required, so that the population requiring medical care does not realize a gap in service during a physician's leave.

4.3.2.2 Gains

New Entrants from Postgraduate Medical Education (PGME)

This input accounts for the PGME entrants, from a Canadian faculty, to the New Brunswick physician workforce.

Interprovincial Migration

This input accounts for the movement of Canadian physicians from one province or territory to New Brunswick, as based on the Southam Medical Database.

International Medical Graduates (IMGs) with Pre-arranged Employment

This input accounts for foreign physicians who did not do postgraduate training in Canada, but have pre-arranged employment in Canada, as based on Canadian Institute for Health Information's (CIHI) Southam Medical Database, special data request: physicians immigrating to Canada with pre-arranged employment.

Other Immigration - Returns from Abroad to Active Practice

This input accounts for those physicians returning to active practice in Canada from abroad, as based on the Canadian Institute for Health Information's (CIHI) Southam Medical Database, special data request: active civilian physicians who returned from abroad (excluding Internes and residents).

4.3.2.3 Exits

Retirements

This input accounts for New Brunswick physicians who retire each year of the 10-year forecast period, by utilizing the percentage who retire throughout the year in each age, sex, and broad physician grouping, as based on Canadian Medical Association historical data and yearly analyses (based on 4-year average of physicians who retired in 1998, 1999, 2000, and 2001). There were insufficient numbers of specialists retiring to calculate accurate rates for medical and surgical specialists, overall specialist rates were used for each of these groups. As well, there were too few females retiring during this period, so age/broad specialty specific male rates were used as a proxy.[5]

Interprovincial Migration

This input accounts for the total number of New Brunswick physicians expected to move to other Canadian provinces or territories in each year of the forecast period.

Emigration

This input accounts for the total number of New Brunswick physicians, by age, sex, and broad specialty grouping, expected to move abroad in each year of the forecast period, as based on CIHI data.

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[5] Canadian Medical Association, New Brunswick Projections Background Information, March 2003.

Deaths

This input accounts for New Brunswick physicians with active licenses that die each year before retirement, as based on Canadian Medical Association data, national age- and sex-specific death rates.

4.4 Demand-Side

The physician forecast model employs the following approach to demand side forecasting in order to, as closely as possible, determine future demand for physician services by family practice and specialty.

Population-based projection of demand uses current utilization of physician services (both in and out of hospital) as a proxy for patient demand, and an indicator of physician requirements, and estimates future demand using future population-adjusted utilization. This approach has been widely supported in recent health resource planning.[6] In addition, the methodology attempts to determine whether current utilization is an accurate representation of current demand, by assessing the impact of current vacant positions for physicians in New Brunswick as a proxy for unmet demand.

The demand side of the physician workforce equation attempts to predict the volume of health care services, by family practice and specialty, to be delivered over each year of the 10-year forecast period (based on available data). This will involve a variety of inputs and processes as depicted and discussed in the following sections.

The demand forecasts should be interpreted with caution, as many confounding factors influence growth in demand, many of which were beyond the scope of this study. Projecting the need for health care services is as much a social policy exercise as a technical analysis. Any projection of need implies a level of care that will ultimately be determined, as much by health care funding and access to care, as by the prevalence of disease. Service demand will also be affected by how the care is delivered. These considerations have been factored into the forecasts where possible, based on available data, information, and expert opinion.

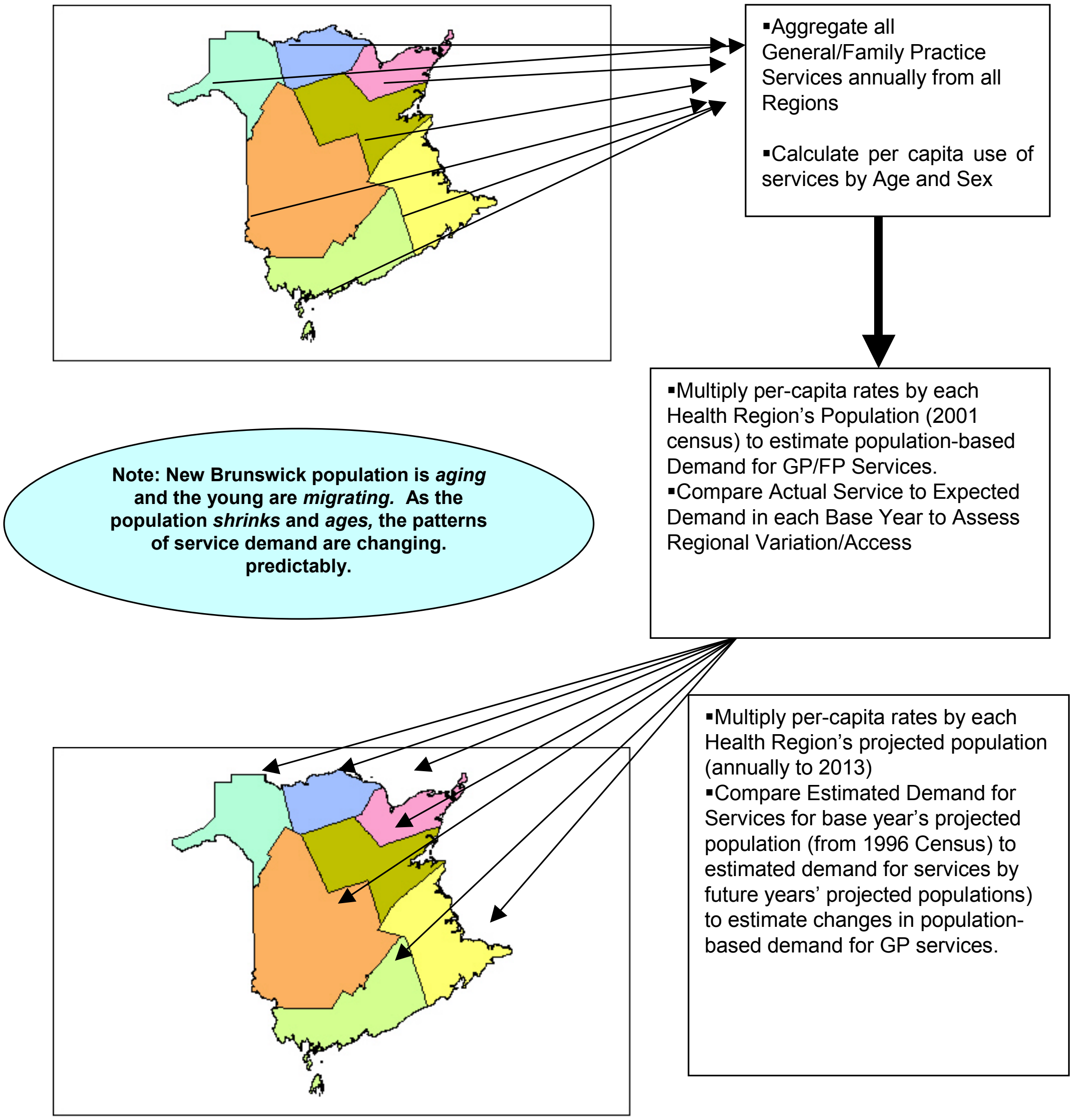
4.4.1 Demand Model Schematic and Input Descriptions[7]

The following schematic depicts the approach used in arriving at **population-based estimates for FP service need/demand.**

[6] Cardiac Care Network of Ontario, A Discussion Paper by the Consensus Panel on Cardiovascular Human Resources in Ontario. Final Report and Recommendations, June 2000.

[7] Stats in this section represent FFS physicians only and not physicians on salary or sessional payments.

Figure 2 - Demand Model Schematic



The follow schematic depicts the approach behind estimating the number of "active" FPs to all FPs in the province.

Define “Active Day” as ≥ 10 patients encountered with equivalent billings.

Count Number of Active Days in each Base Year.

Group FPs by 0, 1-49, 50-99, 100+ Active Days annually. (corresponds to no active days, less than 1 day per week, 1-2 days, and more than 2 active days per week).

Calculate relationship between billings and active days per year. Threshold value is expected billings (for “comprehensive” family practice services) for an MD with 1 “active” day per week (50/year).

“Average” billings for “active” physicians correspond to average comprehensive GP service billings for those billing greater than the 1 day a week lower threshold. This is the mean billings for an active GP.

Number of “Active” FPs required to meet population demand is:

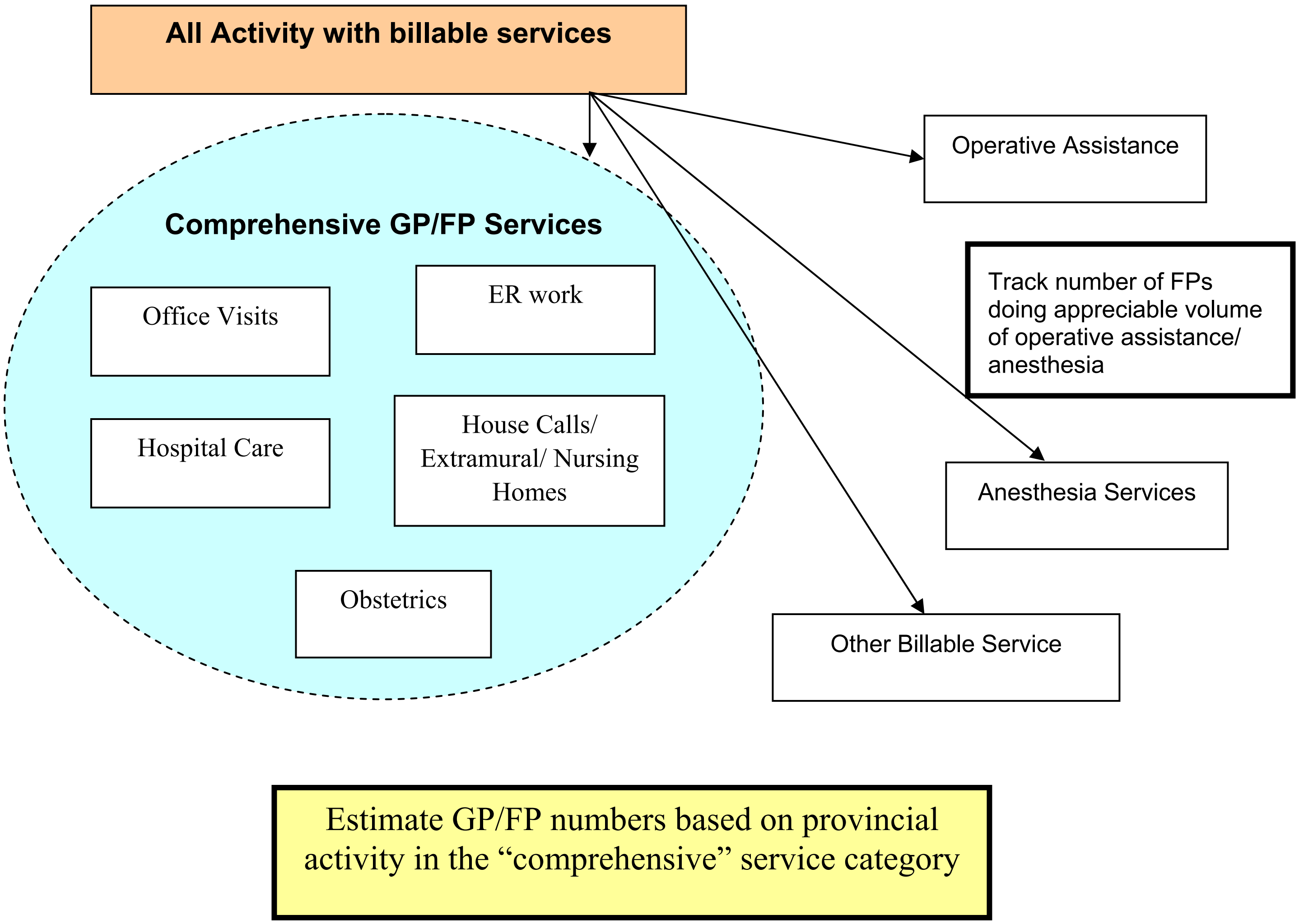
Total population demand (annual $ service)

Mean “active GP” billings (annual $

Compare to Physician/Population Ratios (IN LINE)

Differential Overall Activity Profiles of FPs by Age and Sex. Project Future Work Patterns

The following schematic depicts the **spectrum of FP/FP Clinical Practice.**



4.4.2 Additional Demand Model Considerations

4.4.2.1 Population Impact on Demand for Physician Services

Population changes are indisputably linked with changes in the demand for health care services, thus the methodology incorporates projected size, composition by age, and sex of the population over the forecast period. The consumption of health care services varies considerably by age and sex of the population, and over time, the age composition of the population changes.

In New Brunswick the demand for health services is also influenced by the official language preference of service recipients. Section 5.2.4 outlines the language profile by health region.

4.4.2.2 Service Delivery Changes

Over the 10-year forecast period, it can be expected that medical practice will change, thus trends and new developments in the way health care services are delivered will also be considered such as:

- Government plans for service delivery (e.g. increased screening for disease, changes to Hospital Master Plan, expanded or reduced service offerings, etc.)

- Dependencies on and collaborations with other health professionals in the system

Considering these impacts, in addition to estimating utilization from base year, will lead to a decrease in forecast demand for services in some cases, and an increase in demand for services in others. For some of these impacts, it will be feasible to quantify the magnitude, or at the very least the direction of change.

4.5 Gap Analysis / Physician Workforce Imbalances

Planning decisions deal with the number of physicians that will conform with the needs of the population how many, of what type, and where are they located. There are two types of imbalances (based on available data) that will be explored in this gap analysis:

1. Numerical Imbalances – the oversupply or undersupply of physicians relative to a designated/acceptable norm. The key issue is: what should be the norm for defining requirements and how it is defined?

2. Distributional Imbalances (where possible) – which includes geographic imbalances: rural/urban; and medical specialty imbalances: distribution between generalists and specialists and the distribution among specialties

The gap analysis will present ranges of physician requirements as opposed to point forecasts, in order to accommodate for various possible scenarios that could impact the supply of and/or demand for physician services over the 10-year period.

5. Trends and Issues Affecting Future Supply and Demand

The Canadian health care system is under the microscope and continues to undergo change in an effort to respond to the health needs of the population in a manner that is both affordable and sustainable. The health care workforce both impacts and is impacted by fiscal and systemic reform initiatives. While health care is under provincial jurisdiction, the health care workforce can be considered a national resource as it is highly mobile, especially in the current environment, which is exceedingly competitive.

There are number of key drivers of change that impact the demand for and supply of many health professions, including physician resources. These include the changing demographics of the population comprised of both providers and the recipients of health services; the health status of the population, public expectations relative to preventative, as well as curative health care services; technology, in its broadest sense; and the availability of public sector funding for health care.

5.1 New Brunswick Population Health Status

The health of the New Brunswick population and changes in health status over time undoubtedly drives demand for medical services in general, and physician services in particular. As such, health status must be tracked over time so as to determine when demand may increase or decrease for a particular type of physician. However, only long-term observations (>10 years) will permit application of this type of information, directly to the demand for specific types of service providers.

The 1999 Health Canada Report[8] compares a variety of indicators of health status and health determinants between New Brunswick and the other provinces and territories. The following list presents some of these comparisons:

Positives for New Brunswick

- Lowest rate of work injuries in Canada
- Second lowest rate of underweight births in Canada
- Low rates of infant mortality

Negatives for New Brunswick

- Most obese 20-64 aged population in Canada (42%)
- Highest breast cancer death rate in Canada

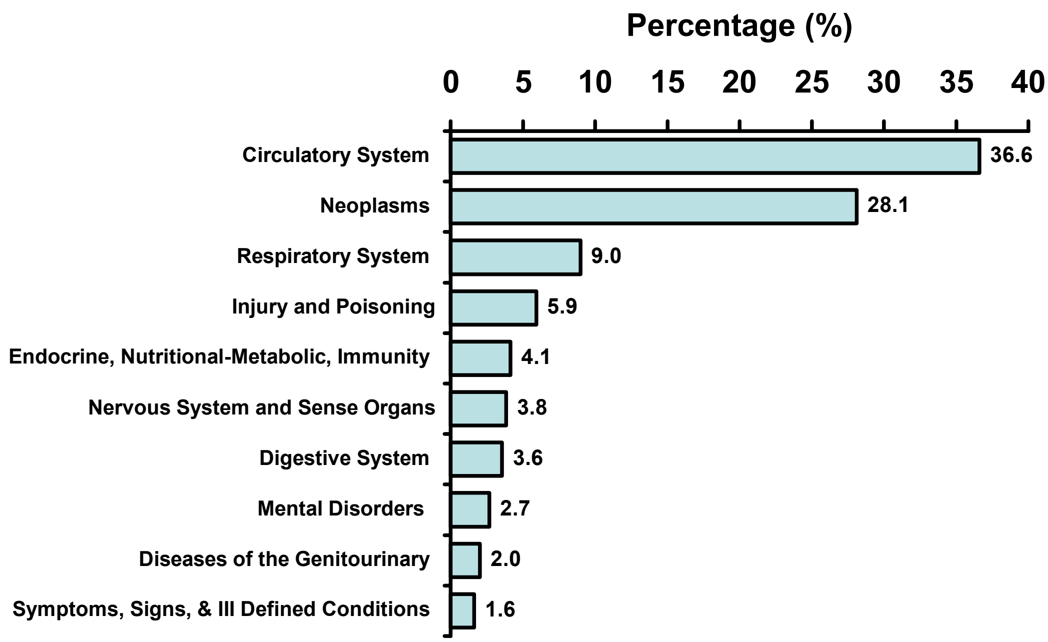
[8] Health Canada, Toward a Healthy Future: Second Report on the Health of Canadians, 1999.

- Third highest cancer death rate in Canada for women

In addition, the Provincial Epidemiology Service (PES) of the New Brunswick Department of Health and Wellness provides the following analyses of prevalence of disease in the New Brunswick population which may reflect the future needs for certain specialists in the province. More detailed analyses of diseases in the seven health regions are also undertaken by the Service.

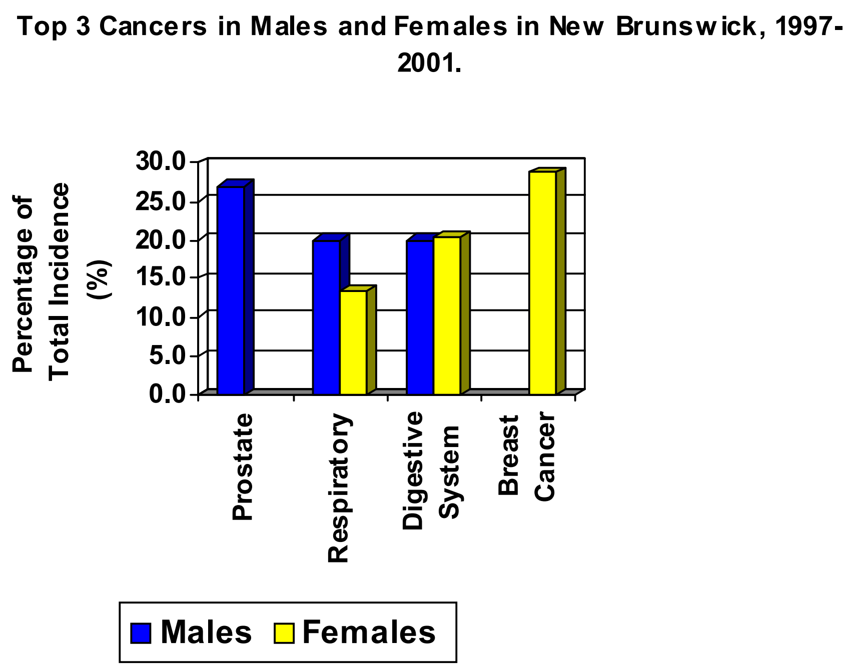
The following figure represents the leading causes of death in New Brunswick over a 5-year period. Diseases of the Circulatory System remain the leading cause of death in New Brunswick, followed by cancers. In the past two decades, mortality rates have steadily declined for Diseases of the Circulatory System, such as Ischemic Heart Disease, which is the major cause of death in the circulatory diseases category. Cerebrovascular disease, or stroke, is also a disease of the circulatory system with high prevalence. Hospital care days are highest for Diseases of the Circulatory System.

Figure 3 – Ten Leading Causes of Death of Residents of New Brunswick, 1997-2001



As presented in the figure below, the most frequently occurring cancers found in New Brunswick between 1997-2001 were prostate cancer, digestive and respiratory cancer in males and breast, digestive and lung cancers in females.

Figure 4 – Incidence of Leading Cancers in Males and Females in New Brunswick, 1997-2001



Through the Canadian Diabetes Strategy funding, the National Diabetes Surveillance System (NDSS) was founded. New Brunswick is active in this project and to date has been able to provide Health Canada with Prevalence and Mortality rates for diabetes in New Brunswick for the fiscal years 1997/98-1999/00.

The burden of illness associated with diabetes is increased by the fact that persons with diabetes are at greater risk of other diseases than persons without diabetes. Chronic high blood sugars can lead to heart disease and stroke, retinopathy, kidney disease, amputations and other complications.

As indicated in the following two figures, New Brunswick prevalence rates for diabetes are higher for females than the Canadian rate. However, to allow for a more accurate trend, longer term data are needed. This is an important disease to monitor closely over time to factor into physician resource planning.

Figure 5– Crude Prevalence of Rate of Diabetes for Females aged 20+ years in Canada and NB

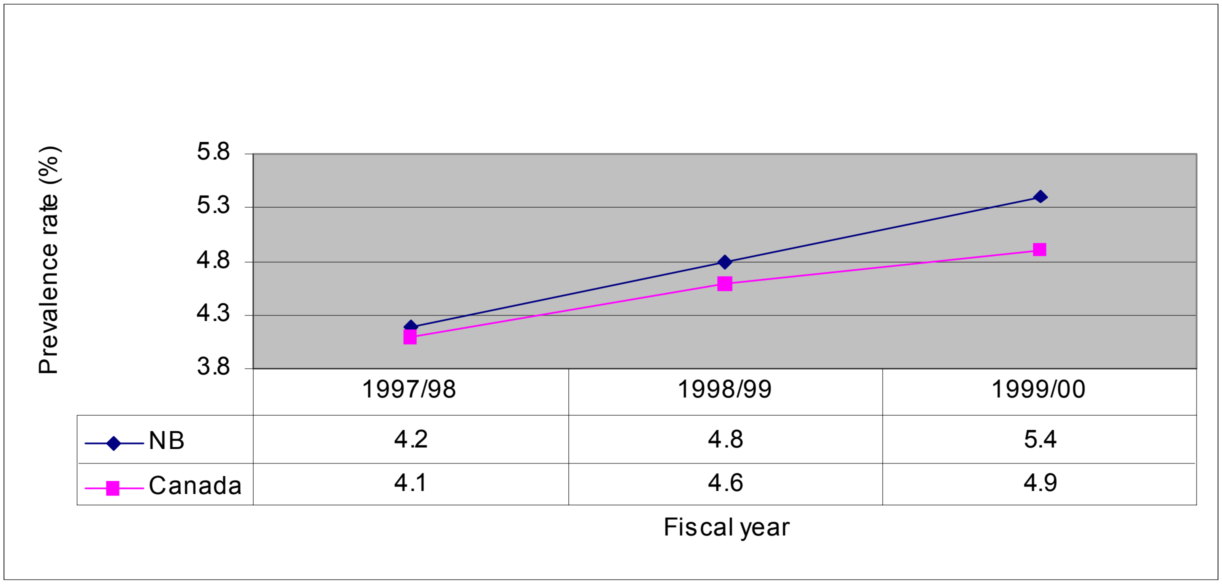
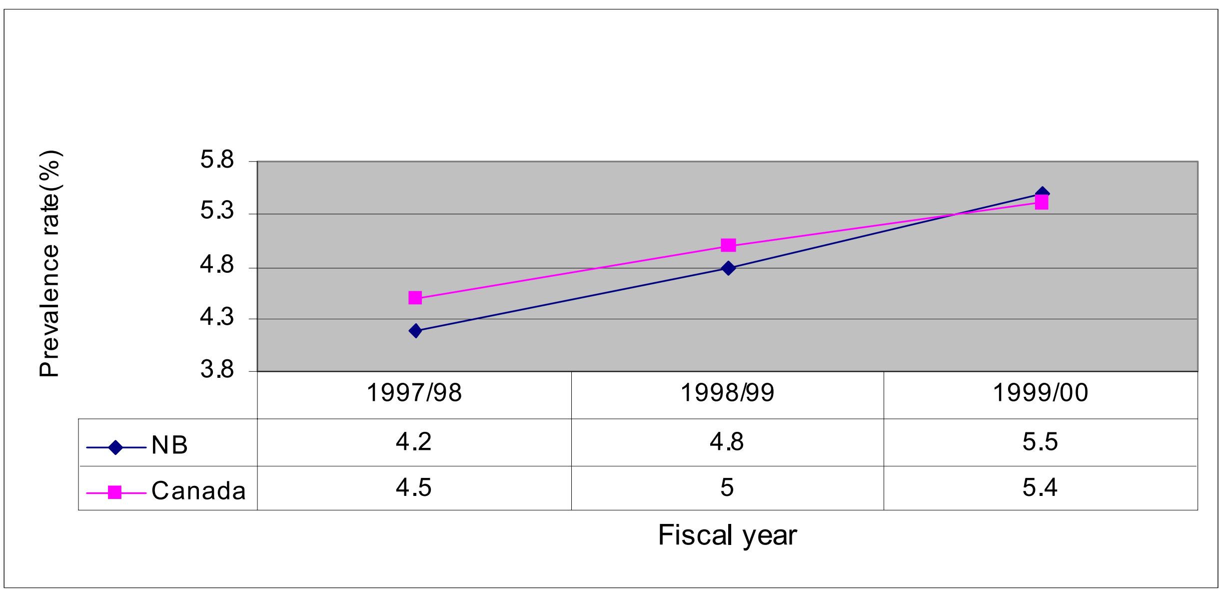


Figure 6- Crude Prevalence of Rate of Diabetes for Males aged 20+ years in Canada and NB

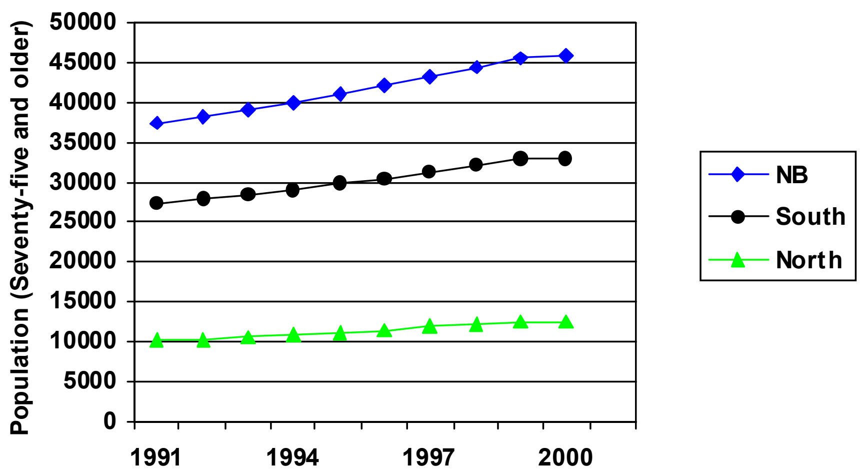


As depicted in the following figure, and discussed in more detail in Section 5.2.1, New Brunswick has an aging population, which may reflect future health care needs in the following areas:

- Alzheimer's Disease
- Parkinson Disease
- CJD (Creutzfeld Jacob Disease)
- Motor Neuron Disease
- Neurodegenerative Disease

- Macular Degeneration
- Cataract
- Glaucoma
- Huntington's Disease
- Dementia
- Dilated Cardiac Myopathy
- Diabetes Mellitus Type 2
- Osteoarthritis
- Prostate Cancer
- Atherosclerosis
- Breast Cancer
- Depression
- Coronary Artery Disease
- Osteoporosis
- Stroke
- Otorhinolaryngeal Disease
- Arteriosclerosis
- Hypertension
- Hyperlipidemia
- Hearing Impairment
- Orthopedic Impairment
- Tinnitus
- Chronic Obstructive Pulmonary Disease
- Urinary Incontinence Pressure Sores

Figure 7 – Change in the Number of Elderly New Brunswickers 1991-2000



It will be important to monitor these conditions over time to determine if demands are increasing for these types of services, in order that future physician requirements for certain specialties match health care needs/demands of the New Brunswick population.

In considering these and other key health determinants, health care providers acknowledge that access to quality health care is only one of the factors that contribute to the health of individuals and the communities in which they live. There is a need for a concerted, multi-sectoral, coordinated effort to address the range of factors impacting an individual's ability to attain and maintain good health.

There is an opportunity for Government to positively impact the health status of New Brunswickers through the design and effective execution of a healthy public policy model. This model might include such elements as a health impact assessment tool, to be used by all government departments in the formation of policy positions or to inform decision making on initiatives.

5.2 Population Demographic Factors

There is a wide range of demographic factors, which affect all levels of the health care and social services systems in New Brunswick. The provincial demography – population, age structure, density, vital statistics, etc. – plays an important role in indicating the population's demand for health care services, distribution of demand, and type of services demanded.

5.2.1 Changing Age Structure of Population

The aging of Canada's population may significantly impact the health care system, and hence the demand on physicians. Patients over the age of 65 years currently consume approximately 70% of the health care budget. In Canada in 1994, the total health expenditures by age in dollars per capita was less than $2000 for individuals less than 64 years of age, and greater than $8000 for individuals 65 years and older. In 1999, approximately 12.5% of Canada's population was over 65, and by 2015 it will increase to 16.5%, and by 2030 more than 25% of the population will be over 65.

In New Brunswick during the next 3 decades as the baby boomers age, the biggest demographic shift in history will occur. The proportion of the population aged 65 and over will increase from 13% today, to 18% in 2015, and 25% in 2025. This will have a significant impact on the provincial health system. As the baby boom generation ages, their expectations regarding health care and health service will be much higher than the existing generation. In addition to the availability of traditional health services, such as acute care and long-term care facilities, greater pressure will emerge to require expanded home care services and supports, early intervention, education, and community-based support strategies.

Between now and the year 2013, the total New Brunswick population is expected to remain roughly stable (increase by 0.2%). However, there are some dramatic shifts expected in the age structure of the population.

- The 0-4 age group is expected to drop by 17%
- The 5-14 age group is expected to decline by 21.5%

- The 15-24 age group is projected to drop by 8%
- The 25-44 age group is expected to decline by 13%
- The 45-64 age group is projected to increase by 27%
- The 65-74 age group is projected to increase by 21%
- The 75+ age group is expected to increase by 14%

The impact of the change age structure of the population is tangible in that, the aging population will put more pressure on some specialty services such as orthopedic surgery and ophthalmology, which have a high proportion of elderly patients.

5.2.2 Population Shift

The dispersion/distribution of the province's population is changing, which is an important consideration in future health care program and workforce planning. The population of New Brunswick and the Atlantic Provinces is now exhibiting a trend that has been happening in the rest of the country for some time – the population is shifting from rural to urban areas.[9] In 1991 the New Brunswick population was majority rural (52%) versus urban (48%), but according to the 2001 Census, New Brunswick has moved to a rough split between rural and urban. This trend was evident in the details of the census, as Fredericton and Moncton recorded population increases from 1996 of 2.3% and 2.9%, respectively, and fuelled by Dieppe's 19.6% growth, the population of the Greater Moncton census area jumped 3.7%. This tremendous growth in Dieppe's population illustrates another trend – the sub-urbanization of New Brunswick. This was further evidenced in the census data, as Fredericton's population grew by 2.3%, while the greater Fredericton area grew by 3.0%.

The impact of this phenomenon on the delivery of physician services in New Brunswick is that the critical mass (population) required to support different types of physician services in the non-urban parts of the province would need to be continually evaluated over time. This trend is already evident in New Brunswick and across the country as specialty services are continually being centralized, and community health centers are replacing hospitals in rural areas.

5.2.3 Socioeconomic Influences

The socioeconomic environment refers to the living and working conditions in both the economic and social realms. Key influences in this realm include income and income distribution, education, literacy, employment and working conditions, and levels of social support.

According to the 1999 Health Canada report[10], New Brunswick has the third lowest average individual income in the country, and the second lowest labour force participation rate.

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[9] Atlantic Institute of Market Studies.

[10] Health Canada, Toward a Healthy Future: Second Report on the Health of Canadians, 1999.

5.2.4 Linguistic Profile of New Brunswickers

The 2001 Population Census shows that, based on a 100% of the population, the language composition of New Brunswick is majority English only residents, at 406,995 (57%). The portion of New Brunswickers with knowledge of English and French is 245,870 (34%), and the French only population is 66,415 (9.2%). This information is not available on a regional basis. However, based on a 20% sample size, the following table represents Statistics Canada regional language profile of New Brunswickers, according to the first language learned at home in childhood, and still understood by the individual at the time of the census, as being either English only, French only, or English and French. These data do not infer language preference for healthcare services.

Table 2 – Linguistic Profile of New Brunswickers (Statistics Canada 2001 Census Data)

Region	English only	French only	English and French	Total –all persons[1]
1	99,300 (55%)	75,370 (42%)	1,895 (1%)	179,840 (98%) [2]
2	159,115 (94%)	6,675 (3.9%)	490 (.3%)	169,225 (98.2%)
3	146,775 (91%)	9,715 (6%)	595 (.4%)	161,675 (97.4%)
4	3,570 (7%)	46,650 (91%)	545 (1%)	51,005 (99%)
5	12,260 (42%)	16,315 (56%)	495 (1.7%)	29,325 (99.7%)
6	12,250 (15%)	68,445 (84%)	850 (1%)	81,760 (100%)
7	31,890 (68%)	13,505 (29%)	385 (.8%)	46,885 (97.8%)

Note[1]: The language category "other" is not included. Note[2] : Percentages have been rounded.

5.3 Economic Issues – Increasing Cost of Services

Health care costs continue to rise and there is a great risk that, without changes to the status quo, the sustainability of the system will be challenged, as demand for services continues to grow. Increasing health care costs will continue to be a major concern and have the potential to be magnified by an aging population. Furthermore, the current economic picture reveals that slower economic growth correlates positively with slower growth in government revenues. At the same time, the demand for public services continues to increase, particularly for health care.

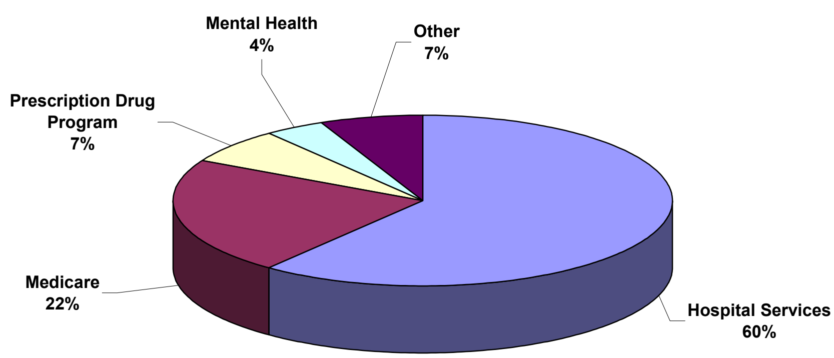
In New Brunswick, between 1995-96 and 2001-02, the health care budget increased by 40%, while the total provincial government budget has increased by 20%. This pace is clearly unsustainable. Assume, for example, that government revenues increase by 2% per year, and the health care budget continues to increase by 7.8% per year, in 20 years time the health care budget will consume well over 80% of the total provincial government budget.[11]

Expenditure growth in health care in New Brunswick, from April 1999 to 2002-2003, is 2.5 times Education, which is the next largest expenditure growth area. In the current fiscal year, (2002/03) health care represents more than half of all additional program expenditures by Government. However, New Brunswick's health care expenditure per capita is not high relative to other provinces, where provincial government spending per capita is actually among the lowest in Canada.[12]

The recently tabled Budget for 2002-2003[13] shows that health care (including nursing homes and family and community services) comprises roughly 34.5% of the total provincial government budget, similar to the 2001-2002 Fiscal Year. Excluding nursing home services and family and community services, this figure is 21%. The record $1.8 billion invested in health care this year, represents an additional $80.6 million from the previous year; a 4.7% increase.

The New Brunswick Department of Health and Wellness actual expenditures for the 2001-2002 Fiscal Year were $1386.2 million. The following Figure shows the expenditure breakdown within the health care budget in 2001-2002.[14]

Figure 8 - Expenditure Breakdown Within 2001-2002 Provincial Health Care Budget



[11] New Brunswick Department of Health and Wellness, 2002.

[12] Canadian Institute for Health Information. 2001.

[13] Budget 2002-2003, Choosing Prosperity: A Balanced Approach, March 2002.

[14] New Brunswick Department of Health and Wellness, Annual Report 2001-2002, p. 53.

5.4 Health System Issues

Health care is an issue of national importance and preoccupation, as is reflected in the plethora of reports and commissions released over the past number of years. All of these reports acknowledge the adequate supply and distribution of health human resources, including physicians, is one of the foremost challenges to sustaining the publicly funded health care system in Canada.

In November 2002, a comprehensive report, *The Future of Health Care in Canada*, was released by the Romanow Commission, following 18 months of study and consultation. Many of the findings contained in this report, reflect the sentiments that have been expressed by health care providers over the better part of the last decade: ability to ensure a sustainable system, better management practices, effective use of enabling technologies, better utilization and deployment of scarce human resources, more flexibility and collaboration within the system, and a stronger focus on prevention.

In relation to health human resources, the "Romanow" report calls for a number of changes to the training, deployment, utilization, and remuneration of the range of health care providers that the system relies on to deliver care and service, calling for fundamental changes to scopes and patterns of practice with a greater focus on collaborative models to provide the right mix of skills to deliver comprehensive health care. Willingness on the part of the parties to fundamental changes in relationships and the nature of work is called for, along with collaborative strategies to redress the current and impending shortages of some health providers. The sentiment reflected in this call-for-action is not new in Canada, and the political will, as well as the will of organizations representing health provider groups, must be present for any real change to occur.

From a demand perspective, the Commission's report underscored the extent to which public expectations relative to our Canadian Medicare system have grown considerably, and where a system, once organized to deliver care within hospitals by physicians, has now expanded to a much decentralized service delivery system. This has been one of the drivers of change to the practice of medicine, in addition to new developments in the range and nature of treatment options and modalities.

An international comparison of health human resources planning policies was recently commissioned by the Canadian Health Services Research Foundation.[15] The findings of this study acknowledges for most health care systems, workforce planning is driven by health care expenditure, with resources dictating the volume of services provided. The report underscores the need for greater emphasis on integrated planning that recognizes the impact of variations in practice, changes in productivity, skill mix and distribution, and that makes the management of human resources responsive to system needs and design.

5.4.1 Government Strategic Directions

The Government of New Brunswick announced a 2-stage health care renewal plan early on in their first mandate (1999-2003), based on a new vision for health care that embraces a patient-focused, community-based system. Successful achievement of Government's health care renewal plan will very much

[15] Canadian Health Services Research Foundation, Planning Human Resources in Health Care: Towards an Economic Approach. An international Comparative Review, March 2003.

influence and be influenced by physician resources here in New Brunswick. Specifically, the primary objectives government has set out to achieve, within available resources, include:

- Improving timely access to care for all New Brunswickers regardless of where they live.

- Implementing a more seamless and integrated system of care delivery enabled by an electronic patient record system.

- Ensuring a solid infrastructure of resources with the right mix of health professionals, equipment, and technology.

The first stage of this renewal focused on stabilization of the system through a multi-year plan for health funding and staged investment. This investment included the injection of approximately $15 million into strategies to improve the province's ability to recruit and retain health professionals. The 2003-2004 budget provides for a 4.4% increase in year over year funding.

The second stage for health renewal is focused on improving access to services. To date, this stage of the renewal plan has seen a broadening of the span of control of the Regional Hospital Corporations, the introduction of Nurse Practitioners, an expansion of the scope of practice of nurses, the introduction of new Official Languages legislation governing the delivery of health services, and beginning steps toward the implementation of an improved model for primary health care within the province, commencing with the introduction of Community Health Centers. A new comprehensive Provincial Health Plan, designed to provide a roadmap for the provision of comprehensive health services in New Brunswick, is under development by Government. The elements of this provincial health plan will need to be factored into the demand for physician, as well as other health care providers.

5.4.1.1 Regional Health Authorities

New legislation was introduced in December 2001, creating 8 new Regional Health Authorities (RHAs) throughout New Brunswick, which will have increasingly enlarged roles for a fuller spectrum of health care services, beyond those traditionally offered within the hospital services sector. The impact of this structural change, from a human resources planning perspective, will be the 3-year business plans that each RHA will be required to develop and implement. These business plans will establish the priorities for health services within the respective regions, consistent with the directions established in the Provincial Health Plan, and any future iterations of the current Hospital Services Master Plan (1997). There will be a critical requirement for these business plans to routinely incorporate the health human resources impact analysis of any proposed changes to service delivery, informed by the Department's long term supply/demand forecasts.

5.4.1.2 Official Languages Legislation

The new Official Languages Act came into effect in New Brunswick on August 5, 2002. This legislation will have a significant impact on the planning and management of health human resources within New Brunswick. Those providing health care services in this province must ensure the public is able to communicate with, and receive services in, the official language(s) of their choice (Bill 64, Article 28). Subject to this obligation, any hospital or health care facility has the ability to choose to use one official language in the course of daily operations (Bill 64, Article 34). The ability of the RHAs to meet their obligations of this legislation will be further defined through implementation guidelines.

From the perspective of physician services, Sections 6.2.3 indicates the current language profile of New Brunswick's physician workforce.

5.4.1.3 Collaborative Practice

The New Brunswick Government has expressed its intent to establish an environment conducive to more collaborative, interdisciplinary practice among health care providers, in an effort to maximize and leverage the composite of available skills and resources. Concrete steps being taken in this regard include:

- The development of a Primary Health Care Strategy as an integral component of the new provincial health plan.
- The introduction of legislation, in the Spring 2002, recognizing Nurse Practitioners (NP) as a regulated practitioner, with Government indicating its intent to introduce 15 primary health care NP positions into the system in 2002/2003. Associated changes have been made to other related Acts to accommodate the desired scope of practice of this new practitioner, as well as to maximize the utilization of the spectrum of nursing service providers in general. The classification and deployment of NPs is still under development by Government and stakeholder partners, and is expected to leverage the work of physicians - family practitioners in particular - as new approaches to primary health care are articulated within the Government's Primary Health Care Strategy. It should be noted however, that the local supply of Nurse Practitioners is presently low, due to candidates being enrolled in largely part-time studies, which slows their time to market.
- The introduction of a Community Health Centre (CHC) delivery model using interdisciplinary staffing, with initial rollout in select sites across the province commencing 2003-2004.
- A new collaborative practice clinic in Fredericton staffed with physicians, nurse practitioners, nurses and support staff.

The Fredericton collaborative practice clinic, predicted to begin operations Fall 2003, will be staffed to accommodate an anticipated demand of 10,000-13,000 patients in the Fredericton area who are without a family physician. This demand will be met through an interdisciplinary staffing model that assumes approximately 1,650-1,800 patients per physician, supported by the health care team. Recognizing this model differs from a CHC delivery model, it would seem; however, that this ratio is comparable to interdisciplinary staffing models that have successfully been deployed for several years within the Ontario CHC system, with the physician members of the team seeing an average of 1,600 patients per year.[16] This ratio assumes an average distribution of individual service events by provider type as follows: 32% physician, 43% nurse practitioner, 25% other health providers. This distribution was based on actual 2000-2001 utilization data amassed from 33 CHCs in the Ontario health system. This comparison is

[16] Association of Health Centres of Ontario, Community Health Centres-A Cost Effective Solution to Primary Health Care, April 2000.

offered as an example only for health human resource planning purposes, as the range of services, roles of team members, and remuneration models will undoubtedly impact the health provider to client ratio and therefore will influence actual practice settings as these become established in New Brunswick.

Experience in Ontario has been that the size of a collaborative practice within a CHC setting can be increased when a nurse practitioner is part of the interdisciplinary team. In Ontario, a ratio of 3 MDs to 1 NP has been recommended for urban setting CHCs, 1 MD to 3 NPs for remote locations, and one MD to one NP for rural settings.[17] It could be argued that New Brunswick does not have "remote" settings such as would be found in northern Ontario. The rationale cited for the differential in the urban/rural ratios is the reality of physician recruitment challenges for rural/remote settings.

As the New Brunswick CHC and collaborative practice models evolve, the relative staffing balance will be driven by such factors as the health care needs of the community, complexity of care requirements, scopes of practice among the health care team, on-call responsibilities, and accessible back up support services such as local ER coverage. The HHR impacts will need to be factored into planning accordingly.

5.4.2 Workforce Policies Impacting Physician Supply

The alignment of the private interests of physicians, as independent business people, with the goals of a public health care system, creates a number of challenges. Many in the physician community would argue that a purely market based system is effective in managing an adequate supply of physicians to meet the service requirements of New Brunswickers. The New Brunswick Government, as the primary payer of physician services, has assumed a more rigid position in the management of physician resources than most other provincial governments. The physician resource management policy infrastructure in New Brunswick consists of multiple strategies to ensure New Brunswickers have equitable and consistent access to quality health care. These include the following policies, by policy type:

- Regulatory/Administrative: A Physician Resource Management Plan, originally established by Government in 1992, was crafted in close collaboration with the physician community. It was last updated in 1999 and establishes targets to 2004.

- Education/Training: Non-financial based initiatives that include:

  - Recruiting students from rural communities into medical school.

  - Directing funded medical seats to medical schools with a curriculum focus on rural medicine.

  - Exposing medical undergraduate students to clinical training in rural practice settings.

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[17] Dr. Chandrakant P. Shah and Dr. Brent W. Moloughney, A Strategic Review of the Community Health Centre Program. Community and Health Promotion Branch, Ontario Ministry of Health and Long Term Care, May 2001.

– Encouraging and supporting Continuing Medical Education in rural medicine for practicing physicians.

These initiatives can be more fully exploited in New Brunswick in a more structured fashion to gain greater impact.

- Market Based: New Brunswick's Physician Friendly Recruitment Retention strategy, the details of which are highlighted in Section 5.4.4.

- Geographic Distribution: Policies aimed at correcting geographic misdistribution, which typically have included remuneration incentives/disincentives. Generally coercive in nature, such policies have been the subject of legal challenge across the country in relation to challenges to the Charter of Rights and Freedoms. In addition, physicians' general propensity to favour urban centers for personal, as well as professional reasons, continually challenges the medium to long term success of such policies.

Respecting the current competitive environment and the changing practice preferences of the new workforce, the effectiveness of this degree of resource management on the overall supply and distribution of physicians in this province, needs to be measured in comparison with the outcomes achieved by other provinces, which have less rigorous supply management practices.

5.4.3 Utilization Patterns

The New Brunswick Retrospective Review (January 2002) studied acute care bed utilization and showed that, comparable to other provinces in Canada that had conducted a similar study, there is substantial room for improving bed utilization.

During the August 2002 meeting of Canada's Premiers, access to health care services was acknowledged by, as the highest priority for Canadians. New Brunswick measures accessibility in 2 ways: the number of physicians who provide the service and their distribution throughout the province.[18] The number, mix, and distribution of physicians are determined by the Department of Health and Wellness in accordance with the current Physician Resource Management Plan.

Another measure of access is waiting time for diagnostic tests or for treatments/interventions. There are two wait time components to consider: the time between seeing a family physician and seeing a specialist (if referred) and the time between seeing a specialist for consultation and receiving the recommended intervention. Wait lists now exist in Canada not only for elective procedures, but also for urgent cases. It has been argued, by the CMA that, across Canada, waitlist management is an issue requiring improvement. The 2002 CIHI report on Health Care in Canada underscores that comparable data on wait times are scarce due the range of methods used across the country. The Fraser Institute Reports have been the subject of criticism due to their self- reporting methodology.

In New Brunswick, surgical waiting lists (the number of people waiting for a particular surgical service) are tracked and these have been demonstrated to be increasing, as is the average wait time (the average

[18] New Brunswick Department of Health and Wellness, Annual Report 2001-2002.

time people are on the wait list before they receive a service). From March 1998 to March 2001, the surgical waiting list in New Brunswick increased by over 12%, with regional variations. As is the trend generally in health care today, many people are now being treated successfully outside of hospital, earlier discharges are now the norm, and new technology is reducing the need for inpatient services. For example, day surgeries in New Brunswick hospitals increased by 20% between 1996-97 and 2000-01, and consequently, total length of stay (days) decreased slightly (1.3%) over that same time period.

At issue, is the current lack of standards and protocols relative to acceptable wait lists/wait times for various procedures, as relates to measuring timely, appropriate access to care. This issue requires attention in order to provide comprehensive, objective, and transparent wait list management and, to ensure equal access for all New Brunswickers, regardless of where in the province they live or in which official language they require services.

The impact of changes in health care utilization patterns on health human resources is currently difficult to measure. Some realignment of existing resources needs to occur, based on client care requirements. However, a move to collaborative practice models in New Brunswick is a critical requirement to ensure a sustainable system. Reconciling overlapping scopes of practice among professional groups is a quintessential first step toward achieving any new model of practice. This requires continued leadership on the part of the Government and willingness among the health professions to participate in shaping these new models of care for New Brunswick. Some changes have been made to existing legislation, and others may be required to authorize and/or legitimize subsequent changes in scope of practice across health professions/occupational groups to allow this to occur.

5.4.4 Human Resources Planning

New Brunswick is an active partner at the national level in the Advisory Committee on Health Delivery and Human Resources, and regionally on the Maritime Advisory Committee on Health Human Resources, providing policy advice to the Deputy Ministers of Health and Education aimed at improving the appropriateness and responsiveness of the health labour force. Such formal processes underscore the extent to which policies pertaining to the supply and demand of physicians have taken on prominence within governments across Canada; in particular, as relates to the education, regulation, and financial remuneration of physicians.

Several clear actions have been taken by New Brunswick in the past few years, which speak to a commitment to tackle the acute health human resources planning challenges in the province. Specific to physician resources, in fiscal 1999-2000, the Department of Health and Wellness introduced a $6.8 million Physician Recruitment and Retention Strategy, *Physician Friendly New Brunswick*, which was announced in November 1999.[19] This 12-point strategy is aimed at attracting newly licensed family physicians and specialists to the province. The elements of the strategy range from the appointment of a Physician Resource Advisor, increased financial support for students and foreign medical graduates, location incentives grants, establishment of a self-managed, on-line locum pool, and funding for an additional ten medical education seats at Memorial University.

[19] Communications New Brunswick, Online News Release, October 26, 2000.

5.4.5 Enabling Technology

Technological innovation is a double-edged sword. Not only does it provide promises of improved efficiency in the delivery of existing health care services, but it also threatens to increase costs by expanding the boundaries as to what is both technically feasible and accessible. Today's clinical trials have the potential of becoming tomorrow's mainstream practice and the range of services will thus continue to expand, as will public expectations. The need for a strategic plan for investment in the development, management and evaluation of New Brunswick's technology capacity is therefore, a critically important component of the Provincial Health Care Plan.

Specifically, as it relates to the demand for physician services in the province, it is important to consider the health human resource impact of the technologies. For example, a certain technology or advancement may mean additional physician services will be required to take advantage of the technology, if public demand increases or, alternatively, fewer physician services will be required if the technology replaces physician time, or allows some economies of scale in a physician's practice.

5.5 Physician Supply Issues

Nationally, physicians represent the second largest regulated health care profession after nursing.[20] While the absolute numbers of physicians is certainly important in understanding supply, it is only one of a number of equally important factors that characterize the *effective supply* of physicians. Effective physician supply refers to the actual amount and type of physician services available to meet the (clinical) health care needs of New Brunswickers. Awareness of effective supply requires data and information that paints the picture as to how physicians actually practice. In addition to clinical services, for example, many physicians provide services in the areas of administration, research, and education. They may practice full time or part time during some or all of their career, due to personal choice, age, gender, size of community, clinical demands, etc. Statistics cited by CIHI indicate, for example, that at any one time there may be 15-20% of Fee for Service (FFS) physicians who are "inactive" from provision of clinical services.[21] They may have a formal RCPSC/CMQ specialty credential that, in fact, is different from the type medicine they are actually practicing due to their geographic location, the demographics of their patient population, etc.

Another key factor impacting effective physician supply is the extent of collaborative practice with various other health care provider groups. Interdependencies among the various health professions continues to evolve, and, to some extent, are influenced by the ebbs and flows in supply/demand of respective professional groups. The traditional boundaries surrounding the scope of professional medical practice are being challenged and the demand for more collaboration with other professional health care providers is becoming an issue that is critical to the sustainability of the health care system. The recent report from the Commission on *The Future of Health Care in Canada* (November 2002), underscores the essential requirement for new models of service delivery that leverage the complementary skills of the health care team. The corresponding need for changes to future education and training programs will be

[20] Canadian Institute for Health Information, Health Care in Canada, 2002.

[21] Canadian Institute for Health Information, The Practicing Physician Community in Canada, 2001.

necessary to modify curricula, in response to the need to prepare a new workforce to deliver services within interdisciplinary care models.

From an integrated health human resources planning perspective, there are 3 factors that are inextricably linked: supply, distribution, and utilization of health professionals. A change in any one of these variables has a direct impact on the other two. It is utilization however, that can be argued to be the primary driver of this interdependent triad. There is a critical need to define what providers do, and how they work together in complementary roles in the various components of the service continuum, before one can determine how many of any category of profession is required (e.g. the role of the NP in complementary practice with physicians needs to be articulated through the provincial health care strategy).

In projecting New Brunswick's physician resource requirements, it is important to acknowledge and accommodate the need for a dynamic health care system to be responsive to fluctuations in demand. A certain amount of slack (flexibility) must therefore be built into the planning model to accommodate for this uncertainty.

5.5.1 Full-Time Equivalent Overview[22]

The current model of Physician Resource Management in New Brunswick is based upon a full-time equivalent (FTE) methodology, which is used as a national comparator across the country. In principle, this methodology has been determined by organized medicine in New Brunswick to have some merit. However, its implementation has been less than satisfactory to the physician community as a whole. The major issue cited by the New Brunswick Medical Society and the College of Physicians and Surgeons is lack of flexibility in the application of the methodology – fixed targets as opposed to ranges that allow for some needed slack in the system, and the inability to capitalize on succession planning/recruitment when the often scarce opportunity presents itself. This section presents an overview of this methodology from the national perspective.

5.5.1.1 Objectives

The CIHI methodology was originally developed by a Working Group on Medical Care Indicators, under the direction of Health Canada's Health Information Division in the late 1980s. Membership of the working group consisted of provincial government representatives (Nova Scotia, Ontario, and Saskatchewan), Health Canada staff, and two academic advisors. The objectives were as follows:

- To provide a consistent basis for comparisons across and within provinces
- To provide a consistent basis for measuring changes through time in physician supply
- To recognize workload differences among individual specialties

[22] Canadian Medical Association, March 2003.

In 1993, the report and the supporting databases were devolved to the Canadian Institute for Health Information to administer, but the objectives have remained unchanged.

5.5.1.2 Basic Methodology

The basic methodology uses a set of national specialty specific benchmarks, based on fee-for-service billings that have been adjusted for price differences among the provincial payment schedules. These base year benchmarks are updated each year for price increases only (not utilization changes), and therefore, can be used to measure changes in workload over time. The first set of benchmarks was established in 1985-86 and was not updated until 1995-96.

After the establishment of the benchmarks, each physician with at least one Fee for Service billing in the year is assigned an FTE value, based on their earnings compared to the benchmarks for their discipline. If their earnings fall below the 40th percentile, they are assigned a value equivalent to a fraction of the lower benchmark. If between the 40th and 60th percentile, they are assigned a value of 1.0, and if they are above the 60^{th} percentile, their FTE is calculated based on the log linear function of their earnings to the 60th percentile benchmark.

Whenever a range of percentiles is used to indicate 1.0 FTE, the argument can be made that those at the top end of the range (e.g. 59th percentile) are being undercounted at 1.0 FTE compared to those at the bottom end (e.g. 41st percentile). The Working Group also performed simulations within other benchmark values such as 30th and 70th percentiles, but found little difference in the overall results.

5.5.1.3 Log Linear Function

The log linear function for those over the upper benchmark was discussed at length by the Working Group. The log linear function does indeed heavily discount physicians at the top end of earnings. For example, a physician whose income is three times the upper benchmark will have an FTE value of 2.1; four times the upper benchmark will give an FTE value of 2.4. This kind of calculation can mask burnout issues because it does not present a true reflection of the workload in a community. However, even without the log linear function, a high proportion of physicians over the 60th percentile (compared to another province) may indicate workload problems with perhaps an accompanied risk of physicians migrating to a neighbouring province where a more balanced lifestyle may be achievable.

5.5.1.4 Limitations of the FTE Indicator

The FTE counts exclude physicians who make no fee-for-service billings in the year. As well, due to problems of inter-provincial incomparability, there are no national benchmarks for diagnostic radiology or laboratory medicine. Specialty specific benchmarks are based on RCPSC and CFPC certification, and therefore, any billings made by non-certified specialists are grouped with General Practice.

Given the sheer volume of physicians in Quebec and Ontario, the practice patterns of these physicians heavily influence the benchmarks, despite the adjustment for inter-provincial differences in price. However, for small provinces where there is simply insufficient volume of individual specialty disciplines, the benchmarks can provide a more homogenous measure of benchmarks to use over a period of time.

Because aggregated FTEs are very much an estimate, it is inappropriate to use them at the very low levels of planning where the individual practice patterns of physicians in a particular community should be considered. As well, an FTE (or a lower benchmark earning) does not necessarily represent a typical physician for financial planning purposes. For budgetary purposes, high-income levels representing high volumes of services should not be underestimated. The FTE methodology indicates a level of effective supply, not a global physician budget.

5.5.2 The Physician Workforce

5.5.2.1 Changing Practice Patterns

Collaborative Practice

The pattern of practice is changing for all physicians regardless of gender. Increasingly, physicians are recognizing the need to balance work with family and community needs. The long hours that physicians have traditionally worked are being questioned. These efforts have resulted in changes in employment contracts for Residents. Furthermore, the public is beginning to question the appropriateness of medical care being delivered by physicians working excessive hours. Australia, for example, recently enacted legislation to limit the number of continuous hours worked by physicians to 16 hours.

In a submission to the Commission on *The Future of Health Care in Canada*, the Canadian Association of Internes and Residents (CAIR) underscored the changing personal and professional value set of the new workforce, which plays a significant role in career and remuneration decisions. "New physicians tend to be more open to alternative methods of compensation and health care delivery than traditional fee-for-service or solo physician practice".[23] The CAIR paper underscores the new practitioner's openness to change in the way health care is delivered and how physicians are remunerated.

In support of the desire for more balance between work/life, there is a trend toward clinically active physicians seeking opportunities to work in collaborative practice models where they have more reasonable workloads and are remunerated through payment models other than Fee for Service (FFS). In the current competitive environment, the success of Region 3 Health Authority, in quickly being able to attract new Family Medicine graduates to work in the new Fredericton collaborative practice clinic on a salary basis, attests to this level of interest. Collaborative practice models, operating under the premise of changes to skill mix among physician and non-physician providers (as labour substitutes), have less chance of success however, where the physicians are remunerated on a FFS basis, which challenges the physician's potential income stream and results in a negative incentive.

Hospitalist

The doctor-patient relationship has long been held sacred by the medical profession and the "cradle to grave" model of care has been held up as a desirable practice, for the patient. However, these long held beliefs are being challenged with the drive to achieve better work/life balance. New service delivery

[23] Canadian Association of Internes and Residents, The New Face of Medicine: Sustaining and Enhancing Medicare, October 2001.

models and new roles such as the Hospitalist are emerging. Hospitalists are physicians (often primary care physicians) who work as the physician-of-record in the hospital setting, who may accept handoffs of hospitalized patients from primary care physicians, returning patients to these physicians upon discharge and/or care for “orphan patients”, while hospitalized.

The Hospitalist role has been evolving in Canada since 1997 driven by 2 primary trends. First, physicians are electing to focus on outpatient/community care in an effort to achieve better efficiency in their practices and a better lifestyle. The Fee for Service (FFS) payment schedule is a disincentive for family physicians to provide in-hospital care, not to mention the time management chaos that it can cause within their office practice. Second, a growing volume of patients coming to hospital with no family physician to admit them has created the demand for an alternative model of care. According to a recent article in the Medical Post, there are roughly 500 Hospitalists in Canada working in more than 30 programs.[24] This article cites the fact that currently, only 3 of Canada’s 16 hospitals associated with medical schools currently have family physicians admitting acute care patients.

An advantage to this new Hospitalist role is the potential to establish best practices and clinical practice guidelines based on evidenced-based medicine. A distinct disadvantage, associated with this movement is the risk of professional isolation for the physician, and the maintenance of skills/competence of physicians electing not to provide hospital care, and, therefore, deprived of the educational requirements and benefits associated with hospital privileges. Of equal concern, is the impact on access to primary care due to changes in the net number of primary care practitioners offering community-based care in office practice environments or Community Health Centres. This trend exemplifies the critical importance of understanding how physicians are practicing, not merely the numbers of practitioners in effective physician resource planning and management.

Locum Tenens

There is also an emerging trend toward younger physicians choosing to practice as a locum tenens physician for longer periods of time, as opposed to bearing the initial and ongoing costs of setting up a formal practice. The New Brunswick Physician Supply and Demand survey results showed that 17% of survey respondents relied on locum physicians to cover their practice when they had planned leaves of absence. There was considerable regional variation noted however, with Regions 4, 5, and 6 indicating a greater tendency to utilize locums (33%, 28%, and 27% respectively) as compared to only 9% of Region 2 and 11% of Region 3 physicians using locum physicians to cover their planned absences. The rationale for this variation cannot be explained from the available data; however, it may indicate a greater tendency toward group practices in Regions 2 and 3, and solo practices in Regions 4, 5, and 6.

A review of Medicare data on the prevalence and frequency of locum tenens practice indicates an increase in the overall number of days of attributed to locum tenens type of practice between 2000/01 and 2002/03, as indicated in the table below. Over this 3-year period, it is noteworthy that there has been a change in the distribution of locum physicians with a steady increase in the number of days locums filled vacant positions, as compared to the number of days reported replacing physicians already in practice. This phenomenon may illustrate a practice preference where, anecdotally, some Regional Health Authorities have indicated locum physicians, filling a vacant position, have opted to renew the locum “contract” in

[24] Celia Milne, The Hospitalist Revolution, The Medical Post, 2002.

deference to establishing a bonefide practice. It may also suggest hard-to-fill vacancies that rely on locum coverage, in the absence of a suitably qualified physician. Regardless, this practice suggests a lack of stability in service delivery.

Table 3 - Locum Tenens Practice Profile 2000-2003

Year	Filling Vacant Positions	Physician Replacements	Totals
2000-2001	1396 (28%)	3503 (72%)	4899
2001-2002	1569 (36%)	2784 (64%)	4353
2002-2003	2583 (44%)	3318 (56%)	5901
Total	5548 (37%)	9605 (63%)	15,153

As may be expected, 50% of all those physicians providing locum services during the 2000/01-2002/03 period were consistently in the under 40 years of age group. Of this 50%, there was an increasing trend toward filling vacant positions as opposed to replacement positions; 22% in 2000/01 increasing to 32% in 2002/03.

5.5.2.2 Retirement and Aging of the Physician Population

According to the *Task Force on Physician Supply in Canada*[25], it is predicted that the retirements of Canadian physicians will accelerate over the next 10 to 15 years. This is based on the bulge of International Medical Graduates (IMGs) and increased medical school enrollment in the 1960s and 1970s. That bulge is now reaching retirement age. **The net effect is that by the year 2008 there will be more retirees than medical school graduates.**

Another important factor to consider is the trend to an aging physician population. The prediction is that the number of physicians over the age of 55 will increase from approximately 26% in 1999 to approximately 43% by the year 2021. Therefore, not only will the patient population grow older, but the physicians supplying health care to this population will also be aging, which has implications in planning for the numbers and mix of medical practitioners required. There is also evidence that physicians in their 60s and 70s are having significant difficulty finding colleagues to take over their practices.

5.5.2.3 Increased Number of Women in the Physician Workforce[26]

Women are being increasingly represented in the physician workforce. In 1960, just over 9% of enrollments in medical schools were women. Since then, the proportion of women entering medical schools has increased steadily: by 1970, 17.8% of enrollments were women; 1980, 36% were women; 1990, 44% were women; and since 1995 more than 50% of the new medical students are women. By 2015, women will comprise more than 40% of the physician workforce in Canada, and by 2025 that figure will climb to 45%. Women have tended to enter Family Medicine (56%), Pediatrics (55%),

[25] Canadian Medical Forum Task Force, Task Force on Physician Supply in Canada, November 1999, p. 9.

[26] Ibid. p. 11.

Obstetrics and Gynecology (73%), and Laboratory Medicine (60%). They make up 43% of medical specialty trainees and 29% of surgical specialty trainees.

Data indicates that female physicians practice fewer hours on average than male physicians. Women physicians practice an average of 48.2 hours per week, whereas male physicians average 55.5 hours per week. Women frequently carry the major responsibilities of coordinating and providing home support and childcare. Given these facts, the Canadian Medical Forum Task Force has recommended, based on recent Canadian research in the field[27], that medical school enrollment should be increased 4-5% to adjust for the effects of increased enrollment of women in medical schools.

This recommendation is supported by the fact that given this increasing proportion of women in the medical workforce, the impact of childbearing cannot be underestimated. According to a survey of women physicians on issues related to pregnancy during a medical career[28], half of married female physicians become pregnant during their medical training. In addition, about 10% of Canadian women surgeons interrupted their training for at least 6 months in order to fulfill family responsibilities and about 60% of these found it difficult to resume training.[29]

5.5.3 Recruitment and Retention

There are a multitude of factors, which influence successful recruitment and retention of physicians to New Brunswick communities that are both personal and professional in nature. The personal factors range from having the social, cultural, and educational infrastructure that appeals to a physician and his/her family, as well as having employment opportunities for spouses, who may or may not themselves be physicians.

The model of physician education and training is one key factor influencing decisions on where to set up practice upon graduation. The literature would indicate there is a correlation between exposure to a particular geographic area during the education/training cycle, and the likelihood of setting up practice in that same area upon completion of residency. New Brunswick is somewhat disadvantaged in not having a medical school; however, does nonetheless have opportunities to provide basic and PGME training in numerous health care facilities throughout the province. Every opportunity should be taken to leverage this exposure at not only the PGME level, but also at the basic undergraduate level, capitalizing on the opportunity to nurture relationships early in the training cycle.

Timely presentation of active contract offers to residents in their last years of training is another factor that contributes to New Brunswick's being competitive in a market where demand exceeds current supply. This is coupled of course with competitive incentive packages and a practice infrastructure

[27] May Cohen, Women in Medicine: The Canadian Perspective, Fourth International Medical Workforce Conference, San Francisco, 1999.

[28] S. Sinal, P. Weavil and M.G. Camp, Survey of Women Physicians on Issues Relating to Pregnancy During a Medical Career, Journal of Medical Education, 1988, volume 63, pp. 531-538.

[29] Society of Obstetricians and Gynecologists of Canada (SOGC), Pregnancy in Residency, Journal of SOGC, 1995, volume 17, pp. 157-158.

supportive of the practice preferences of new physicians. It is becoming increasingly common for both provincial and municipal levels of government to collaborate in funding comprehensive incentive packages, offered as educational and/or location incentives.

Comments from those interviewed for this study indicated that the major deterrents to recruitment and retention include lack of competitive salaries in New Brunswick, a lack of infrastructure, and a lack of protected time and funding for research.

The opportunity to work as a locum tenens physician has benefits as both a recruitment tool, by exposing new practitioners to New Brunswick practice settings, many of them rural and/or under serviced areas, as well as a retention factor in providing relief for the current stock of New Brunswick practitioners. A trend appears to be emerging where new physicians are choosing this type of practice in the early stage of their career for 2 main reasons. It allows them to test out different practice settings and areas of practice before committing to a permanent location, plus it avoids both operating, as well as the capital costs associated with setting up a practice (the latter ranging between $30,000-$50,000 minimum) at a time when many new physicians are already burdened with a significant education related debt load.

When considering the location of medical training of the current workforce as a possible indication for targeted recruiting, 78% of these physicians graduated from Canadian medical schools. Of this number approximately 40% graduated from Dalhousie University, 10% from Université de Sherbrooke, 9% from Université de Montréal, 8% from Université Laval and 6% from Memorial University. University of Ottawa produced about 4%. The remaining 23% of Canadian graduates are widely dispersed among the other ten medical schools. The percentage of graduates from Memorial University can be expected to increase given Government's recent reinvestment in seats at this medical program. Of those educated out of country, the greatest percentage received their education in the United States (17%) followed by England (14%), France (13%) and India (8%). Pakistan and Scotland each represent about 5% of the training location of the current workforce.

5.5.3.1 Retention of NB Government - Funded PGME Graduates

CAPER collects data on the 2, 5, and 10-year retention rates of PGME graduates that have had their medical education seats funded by New Brunswick. In general, 35% of NB funded graduates are still working in New Brunswick 2 years after graduation and 34% are still residents in the province after 5 and 10 years respectively. There is no significant gender difference in those remaining in New Brunswick to work.

2003 CAPER data shows that two years after graduation, 30% of female Family Physicians (21/69) were still working in New Brunswick as compared to 23% of their male counterparts (15/64). There was no data available from the Department of Health and Wellness to indicate how many of those physicians on a return for service agreement remained in the province after completion of that agreement.

Variations exist in the retention rates among specialists, with apparent gender differences. 2003 CAPER data shows that New Brunswick has not successfully retained any funded physicians in the following specialties: Hematology (0/1), Nephrology (0/1), Neurology (0/2), Neurosurgery (0/1), Pediatrics (0/5), and Plastic Surgery (0/1). It is acknowledged that this is a moving target and needs careful monitoring, in conjunction with the Government's recruitment and retention policies, to inform decision-making in this area.

5.6 Analysis of Labour Supply

The issue of physician resource planning and research continues across the country. The supply, mix, and distribution of physicians, and other health care workers vary in the respective provincial jurisdictions. In New Brunswick, a Physician Resources Management Plan has been the model for physician resource management since 1992 and the current Plan defines physician resource requirements up to and including 2003-2004. The Plan measures insured physician services on the basis of a modified version of the National Full Time Equivalency (FTE) Methodology with established targets by specialty and family practice groups per health region in the province. Section 5.5.1 provides the details on this Methodology. The linguistic needs of a given region and the Provincial Hospital Services Master Plan (1997) also factor into achievement of established supply targets.

Key stakeholders have identified limitations to the implementation of the current Physician Resources Management Plan. The New Brunswick Medical Society (NBMS) has identified the FTE methodology as being "rigid and imprecise" as relates to both current stock and future supply requirements and that it does not accurately reflect how physicians are practicing. NBMS cited the need for greater flexibility in the application of any planning tool(s) adopted. The use of ranges as opposed to specific fixed targets for certain specialties per region were identified as an example of such flexibility that would account for the variations in how physicians practice. Specifically, practice patterns are different than even that of 10 years ago, with an increasing proportion of women in the profession and an aging physician population who wish to start to reduce their practices, in addition to a new workforce seeking greater balance between family, lifestyle, and career. These factors may contribute to a better quality of work life and better overall retention rates in the profession and in the province.

5.6.1 Supply of New Practitioners

There are numerous issues that need to be considered in planning the supply of new entrants to the physician workforce.

5.6.1.1 Medical Education

There are 16 Faculties of Medicine within the Canadian network of universities that provide both basic medical education resulting in a Doctor of Medicine (MD) undergraduate degree, as well as post-graduate medical education (PGME) programming in family medicine and/or specialty/subspecialty practice. The residency programs in the various specialties are regularly surveyed by the Accreditation Committee of the Royal College of Physicians and Surgeons of Canada. The College of Family Physicians of Canada performs the same function for those physicians pursuing a residency in family practice.

Undergraduate Medical Education

The publicized entry requirements into Canadian Medical Schools vary between 2 to 4 years of prescribed undergraduate education. In reality however, with the exception of Quebec who accept students after 2 years of "premed" education, most other universities are setting the bar at 4 years undergraduate education for admission. Currently, in New Brunswick, this preparation is available at both the University of New Brunswick and l'Université de Moncton. In response to increasing entry qualifications at many medical schools across Canada, these premed programs are being replaced with 4-year Bachelor programs or students are required to have an undergraduate degree with prescribed course requirements.

Université de Moncton in New Brunswick is in the process of developing a 4-year bachelor program under the aegis of their health sciences faculty. This trend means the pool of students entering medical school will most often be at least 2 years older. All medical schools, with the exception of those in Quebec and University of Ottawa, Ontario also require successful completion of the MCAT exams for admission.

New Brunswick is one of 2 provinces in Canada without a medical school. While New Brunswick students are free to apply to any Canadian medical school, the Province of New Brunswick has various funding arrangements with the following medical schools, for education of medical students who are residents of New Brunswick. These arrangements are designed to allow New Brunswick students to pursue their medical education in the official language of their choice. There is no means currently in place however, for New Brunswick to secure PGME seats in those specialties for which the province is predicting shortages of supply in the mid to longer term. Funding does not follow a student rather it is provided to a university. The province's return on investment under this current requires evaluation.

The following table outlines the universities with agreements for New Brunswick student placements.

Table 4 - Universities with Agreements for New Brunswick Student Placements

University	Number of seats - September 2002
Memorial University, Newfoundland	10
Dalhousie University, Nova Scotia	20*
Université Laval, Québec	2
Université de Montréal, Québec	3
Université de Sherbrooke, Québec	20
Total number of seats	**55**
**Admissions typically range between 18-22 per year*	

Data from the Association of Canadian Medical Colleges (ACMC) indicate that, effective 2002, the intake capacity for all 16 Canadian medical schools, for basic medical undergraduate programs, is 2065 students. This number exceeds the 2000, by year 2000, recommended by Task Force I on Medical Education. ACMC has indicated intentions of increasing the intake capacity across the Canadian medical education system to 2500 by the year 2007. Since 1993-1994, acceptance rates for New Brunswick students in these programs have been relatively consistent, representing, on average, 3.2% of all those Canadian residents who have received at least one offer of admission. Over this same period, there have been, on average, an equal number of male and female students from New Brunswick receiving offers of admission. Nationally, however, there is a trend toward a greater number of female students receiving offers for admission to Canadian medical schools. While females represented 50%, on average, of the total number of active offers for admission, between 1993-1998, this percentage grew to 53% in 1999-2000, 56% in 2000-2001, and 60% in 2001-2002. The impact of a potentially larger pool of female graduates entering the labour force within the next decade has an impact on future resource planning.

A review of ACMC data indicates that, on balance, there has been a gradual decline of approximately 10% in the number of MD graduates over the past 10 years in Canada, with 1446 graduates exiting medical schools in 2002. In response to national concerns regarding the adequacy of physician resources in Canada, there has been a subsequent increase in the number of seats in medical schools across the country over the past 2 years. Looking at a snapshot of actual 2002 undergraduate enrollments, the expected number of graduates from Canadian Medical Schools over the next 5 years is represented in the table below.[30] It should be noted that Université de Montreal has a 5-year program while McMaster and University of Calgary each have 3-year undergraduate medical programs (which accounts for the slight bulge in 2005) and all other programs are typically 4 years in length.

Table 5 - Expected MD Graduates from Canadian Medical Schools 2003-2007

Graduates/Year	2003	2004	2005	2006	2007*
Total	1677	1777	2010	1755	140
Male	809 (48%)	814 (46%)	797 (40%)	720 (41%)	41(29%)
Female	868 (52%)	963 (54%)	1213 (60%)	1035 (59%)	99 (71%)
NB total	50	58	65	49	4
% NB	3%	3.3%	3.2%	2.8%	2.8%
Université de Montreal has a five-year under graduate program.					

ACMC data indicates there are currently 226 students from New Brunswick enrolled in undergraduate medical education programs across Canada. The distribution of these New Brunswick students is presented in the table below.

[30] Association of Canadian Medical Colleges, 2002.

Table 6 - Distribution of NB MD Students Expected to Graduate from Canadian Medical Schools 2003-2007

University	Number enrolled across all years
Dalhousie University	77 (34%)
Université de Sherbrooke	62 (27%)
Memorial University	31 (14%)
University of Ottawa	14 (6.2%)
Université de Montréal	13 (5.7%)
Université Laval	10 (4.4%)
University of Toronto	5 (2.2%)
Queen's University	3 (1.3%)
University of Western Ontario	3 (1.3%)
University of Calgary	2 (< 1%)
McMaster University	2 (< 1%)
University of Saskatchewan	2 (< 1%)
University of Alberta	1 (< 1%)
Total	**226**

Interviews conducted with the Anglophone and Francophone Coordinators of Medical Education, as well as the Chair of the Provincial Medical Education Committee, indicate that there is a need for New Brunswick to build and strengthen the relationship with undergraduate medical students. Early direct contact, and nurturing a supportive relationship throughout the course of their medical education cycle, has the potential to pay dividends in recruiting and retaining graduates upon completion of their training cycle. This requires investment of both time and money on the part of the province, municipalities, and the medical community.

Post Graduate Medical Education

In addition to guaranteeing seats for MD graduates from Canadian medical schools seeking to complete the usual training for certification and licensure, the National Coordinating Committee on Post Graduate Medical Training (NCCPMT) has designated four categories of post-graduate positions, within the complement of residency positions. Residency openings should therefore be sufficient to also accommodate the requirements of the following.

- Licensed physicians wishing to re-enter training after a period in practice (re-entry), typically to pursue another practice field
- Graduates of foreign medical schools who are permanent residents of Canada and who have not achieved licensure in Canada
- Physicians receiving training in return for service in a specific discipline in a specific location
- Post graduate trainees who require longer training to meet skills needed due to career switch or remediation
- Seats to allow for program switching

There is some debate as to whether sufficient capacity exits within the PGME system to accommodate the needs of these other categories of training positions. The Canadian Association of Internes and Residents (CAIR) have stated that there are an insufficient number of seats allocated to accommodate program switching and re-entry training for established physicians wishing to pursue new specialty areas, particularly in areas of defined shortages.[31] Both the Canadian Medical Association (CMA) and the Canadian Medical Forum (Task Force I Report, November 1999) support a ratio of 120 residency positions for each 100 basic medical education graduates to accommodate the various demands on these positions, as opposed to the current 100, which are provincially funded.[32] This increase is deemed to provide the level of flexibility needed to accommodate changes to community health care requirements, access requirements of the consumer, and the professional/personal objectives of physicians.

The Canadian Resident Matching Service (CaRMS) provides matching services for medical students to the first year of postgraduate programs at 13 of the 16 medical schools in Canada. Université de Montreal, Université Laval, and Université de Sherbrooke do not participate in this service.

Analysis of Current PGME Enrollments

The current number of graduates from Canadian medical schools, who enter PGME training in Canada, has continued to decline to a new low of 1388 graduates in 2002, a reduction of 18.5 % from the 1646 graduates in 1995. The number of physicians already in practice, that are re-entering training, has increased slightly from 165 in 2001 to 176 in 2002. The Canadian Post MD Education Registry (CAPER) data, reported in this section of the report, represent those enrolled in post-graduate medical education within Canada's 16 medical schools.

In 2002-2003, there were a total of 7322 medical students enrolled across the PGME system in Canada. Of this number, 21% are pursuing family medicine residencies and 78% are pursuing specialty practice residencies. General upgrading accounts for less than 1% of all PGME enrollments. The data is exclusive of Visa Trainees who come to Canada to train, with the expectation that they will return home to their home country to practice.

Recognizing there are some variations that can be expected in the completion dates of those enrolled in Post Graduate Medical Education (PGME), the following assumptions were made in the analysis of the supply data from CAPER presented in this section of the report:

- All Fellows were considered in their final year of studies, entering the market in 2003.
- If an opportunity existed to take a concurrent year of study, it was assumed the trainee would select this option.

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[31] The New Face of Medicine: Sustaining and Enhancing Medicare, Canadian Association of Internes and Residents, October 2001.

[32] From Debate to Action: Message to the First Ministers….It's Time to Put the Health of Canadians First, All President's Forum, Canadian Medical Association, January 2003.

- Any trainee with a co-rank greater than the duration of the specialty was considered to be in their final year of study and entering the market in 2003.

Family Medicine residencies are 2 years in duration, with the option for graduates to pursue additional training typically of 3 months to 1 year in duration. This may focus on extra training in Anesthesia, Emergency Medicine, Obstetrics, Psychiatry, etc., particularly if the physician is interested in practicing rural family medicine. Alternatively, a third year of education is available in some universities leading to special competency in Emergency Medicine, Care of the Elderly, or Palliative Care. A web search of the various faculties of medicine across Canada revealed that a number of family medicine programs appear to be modifying their curricula to incorporate a rural medicine stream as an option. This is a positive initiative that will increase exposure to rural family practice and may have downstream recruitment benefits for traditional under serviced rural communities.

Currently, 96 or 1.3% of the total number of PGME students in Canada are New Brunswickers, in affiliation with one of the following 6 universities: Dalhousie University (69), Université de Sherbrooke (22), University of Western Ontario (2), University of Toronto (1), University of Alberta (1), and University of British Columbia (1). The expected completion dates for these residents, by specialty is outlined in the following table.

Table 7 - Expected NB PGME Graduates by Year, By Program

Specialty/University	2003	2004	2005	2006	2007	2008	Total
Anesthesia	2	1	0	3			6 (3 female, 3 male)
Anatomical Pathology	1	1	1				3 (1 female, 2 male)
Diagnostic Radiology		1	1	1	1		4 (2 female, 2 male)
Emergency Medicine				1	1		2 (female)
Family Medicine	19	21					40 (20 female, 20 male)
General Surgery			1	1	2	2	6 (2 female, 4 male)
Internal Medicine -Cardiology -Endocrinology -Gastroenterology -Respiratory Medicine	1 1 	2 2 1 1		1			4 (3 female, 1 male) 2 (male) 1 (female) 1 (female) 1 (male)
Neurology		1					1 (female)
Obstetrics/Gyn	1		1	1			3 (female)
Ophthalmology					1		1 (male)
Otolaryngology		1	2	1	1		5 (2 female, 3 male)
Orthopedic Surgery	1	1	1		1		4 (male)
Pediatrics	1	1	1	1			4 (female)
Plastic Surgery	1		1	2			4 (2 female, 2 male)
Physical Medicine & Rehab	1						1 (male)
Psychiatry		1					1 (female)
Urology			1		1		2 (1 female, 1 male)
Total							**96** (48 female, 48 male)

The distribution of New Brunswick students among Family Medicine and specialty residencies reveals that 40 (42%) New Brunswick PGME students are engaged in family practice residencies and 56 (58%) pursuing specialty practice residencies. There is an identical gender split for New Brunswick residents pursuing medicine both within Family Medicine, as well as in specialty residencies. Primary differences are evident in the distribution of the genders across the various specialties. Of those females in specialty residences (n=28), 22 or 78.5% are in the medical specialties as compared to 14 or 50% of the male residents. Only 6 (21%) females are pursuing surgical specialties as compared to 12 (42.8%) of the males in specialty residencies. This trend is fairly consistent with national statistics.

Discussions are underway between the Province of New Brunswick and Université de Sherbrooke to increase collaborative programming with this medical school by decentralizing a portion of the didactic program to New Brunswick, in addition to providing clinical training in New Brunswick.

As part of the seat purchase contract with Memorial University, New Brunswick students not only return to New Brunswick for their clinical training, but also are provided with a fixed travel allowance to offset their costs.

5.6.1.2 Medical Education Administrative Structure in New Brunswick

New Brunswick is one of two provinces in Canada without a medical school. There is, however, a structure in place in the province to ensure that, New Brunswick residents have access to medical training. This consists of a Provincial Medical Education Committee mandated to oversee medical education training programs for New Brunswick residents, in addition to 2 Coordinators for Medical Education, 1 for Anglophone sector and 1 for the Francophone sector. The current Anglophone Coordinator is also the Assistant Dean of Medical University Education for both Dalhousie University and Memorial University. The current Francophone Coordinator is Associate Vice Dean for Université de Sherbrooke. These Coordinators also have a responsibility to oversee New Brunswick's Affiliation Agreements with medical schools in Quebec, Nova Scotia, and Newfoundland.

There is currently a provincial database under development to capture New Brunswick students enrolled in basic medical education programs and the Department is working to augment this database by tracking students' PGME education as well. Presently, the Francophone Coordinator maintains a separate database which tracks students from admission to where they initially set up their practice. Those leading medical education in this program agree what is required is a provincial database that tracks New Brunswick medical students from program admission through PGME training through the first 10 years of practice location.

5.6.1.3 Specialty Mix

The specialty mix of the Canadian workforce is one factor that has significant implications when considering the ability to meet the demand-side of the equation.

The decision in the early 1990s to replace the former rotating internship model of PGME with the option of choosing between 2 residency streams (a 2-year residency in family practice leading to a CFPC certification or a specialty residency leading to Royal College Certification) has had implications. There are now reduced opportunities for graduates to delay career decisions, take breaks in training or extend the length of time in training, and 2 to 7 years before being able to do so.[33] The impact of this change has meant access to fewer generalist practitioners, many of whom provided locum relief to an already stretched physician workforce, prior to determining whether to pursue a specialty career.

As well, an attempt to bring the ratio of general/family practitioners to specialists in line at 50:50 resulted in an alteration in the allocation of post MD training seats. Commencing with the 1994-95 training cycle, 40% of the graduates from Canadian medical schools were allocated to generalist training and 60% to specialist training in an attempt to correct an imbalance weighted more heavily in the favour of generalists. This has resulted in a 30% reduction in the Family Medicine entry cohort (excluding those

[33] Eva Ryten, Dianne Thurber and Linda Buske, The Class of 1989 and Post-MD Training, CMAJ, March 24, 1998, volume 6, p. 158.

pursuing other specialty training following Family Medicine) between 1998 and 2002.[34] A longitudinal study of the class of 1994 demonstrates that, by 2001, of those graduates from Canadian medical schools who were still located in Canada, 43% were in family practice and 57% in specialty practice.[35]

On average 15-20% of all Canadian family practice physician graduates migrate to small/rural communities.[36] The trend toward a smaller overall pool of FP graduates has therefore exacerbated the challenges of recruitment/retention of practitioners to these communities and has created geographic distribution policy preoccupations within Ministries of Health.

5.6.1.4 Cost of Medical Education

The cost of preparing medical practitioners continues to grow. The percentage of costs borne by students has seen a considerable increase since 1997. Medical students have seen a 39% increase in the cost of their basic education since 1998/99 with the average annual tuition being $6,654 in Canada.[37] Similar increases are being reflected in the debt load of medical students/graduates. While not necessarily representative of the situation across all provinces, Ontario medical students enrolled in their first year in 2001 expected to have a median debt load of $80,000 at graduation as compared to $57,000 predicted by those in their fourth year of study in 2001.[38] This situation is largely due to the 1998 precedent setting move in Ontario to deregulate university tuition fees in those programs leading to professional careers. This resulted in the doubling of first year tuition fees for most Ontario medical schools in 1999/2000 as compared to those of 1997/1998.[39] Other Canadian universities have instituted similar increases. The cost of the premed undergraduate education required for admission by several medical schools, compounds this situation for medical students.

This magnitude of financial burden is influencing career choices of many medical students who opt for those disciplines and/or practice location which will maximize their earning potential, with priority being given to those provinces or States offering the best financial package. Similarly, this creates a conundrum when one looks at the trend toward decreased government funding to universities on the one hand and increasing financial incentive packages being offered by many provincial governments to recruit new

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[34] CAPER, Annual Census of Post –M.D. Trainees, 2002-2003, Table I-7i. p.116.

[35] Dianne Thurber and Linda Buske, The Class of '94: What has Changed in Post MD Training Since 1989?, ACMC Forum, 2002, Volume 35, No 3.

[36] Morris L. Barer and Greg L. Stoddart, Improving Access to Needed Medical Services in Rural and Remote Canadian Communities: Recruitment and Retention Revisited. Centre for Health Services and Policy Research UBC, June 1999, p.4.

[37] Ibid., p. 33.

[38] Ibid., p. 27.

[39] Tuition Fee Escalation and Deregulation in Undergraduate Programs in Medicine. Canadian Medical Association Position Paper, 2002.

physicians on the other hand, largely provided to defray educational costs or assist in after graduation debt reduction.

5.6.1.5 Distribution shifts

A 2001 CIHI report[40] indicates that, during the decade between 1989-1999, a number of trends are evident in the distribution of Fee for Service physicians practicing clinical medicine, who comprise the greatest percentage of the physician population including:

- An overall 4.4% decrease in the number of FFS physicians per population (7.8% fewer primary care and 1.3% fewer specialists).

- A shift within the three broad categories of primary care, surgical, and medical specialties toward a gradual reduction in the number of FFS physicians in both primary care and the surgical specialties and a corresponding increase in the medical specialties. During this 10-year period, New Brunswick experienced a steady increase in the numbers of primary care physicians and surgical specialists that exceeded the national average. New Brunswick also experienced an increase in medical specialists corresponding to that of other provinces.

- Steady growth in the relative number of women in medicine with the greatest concentration of female physicians being in primary care and lowest number in the surgical specialties.

- An aging physician workforce generally with less impact noted in the surgical specialties than either primary care or medical specialties.

- New Brunswick, Quebec, and Prince Edward Island had the highest percentage of FFS physicians who were graduates of Canadian Medical Schools. Within this complement, women represent the larger percent (80% as compared to about 70% among their male counterparts).

- A slight shift toward an increased concentration of physicians practicing in smaller communities as opposed to metropolitan urban centers.

- An increase in the activity ratios within all three broad categories of primary care, surgical, and medical specialties for both genders and across all age groups. This phenomenon is thought to be attributed both to a reduced number of physicians per population, as well as an increase demand for medical specialties in particular. Of note, nationally the activity ratios of female physicians is reported as 75-80% that of male counterparts, on average, with the greatest difference noted during peak activity years.

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[40] Canadian Institute for Health Information, The Practicing Physician Community in Canada 1989/90-1998/99, 2001.

5.7 Physician Demand Issues

Consumers of health care services are becoming increasingly better informed as to their health and the availability of various treatment modalities. The aging baby boom generation is more sophisticated and exacting relative to their expectations from the health care system. They expect to be active participants in decisions relative to their health and health care including where and how they want to be able to access that care and the level of service that they expect. Society in general has adopted a customer service orientation as a key competitive differentiator. Consumers will expect no less from their health care system, requiring the system to migrate from its current provider focus to a client/outcome focus. This will create pressures on the demand for physicians, as well as changes to the current models of service delivery. Consumers will need to be active participants in shaping a system that meets their needs while being economically sustainable.

Increased demands for physician services arise from increased knowledge and new technology. Research and health promotion has enhanced the health care needs of the population. Examples include orthopedic surgery where joint replacement has become common and wait list pressures are increasing. Similar pressures exist for by-pass surgery for coronary artery disease. Furthermore, the rapid expansion of new knowledge is increasing the demand for new therapeutic interventions in areas such as neurological diseases (stroke, demyelination, epilepsy, and dementia), renal failure (dialysis and transplantation), and cardiology (angioplasty and the use of clot bursting drugs). The improved treatment and outcomes in areas such as trauma and cancer have also increased the public demand for physicians and other health care resources.[41]

Furthermore, in the coming 10-year forecast period, it is anticipated that the prevention component of health care in New Brunswick will be an increasing priority for Government, and as such, screening for disease and associated demands on the system must to be considered. Public education programs around preventative screening for health conditions such cholesterol, cancer, etc. will raise public awareness and hence demand on health system resources.

In the longer term it could be anticipated that the burden of illness may be reduced as a result of increased preventative health, with a healthier population placing less demand on primary and acute care.

[41] Canadian Medical Forum Task Force, Task Force on Physician Supply in Canada, 1999, p. 8.

6. NEW BRUNSWICK PHYSICIAN SUPPLY & DEMAND ANALYSIS AND FORECAST

6.1 Introduction

The analysis of the current supply of physicians in New Brunswick is comprehensive and multi-variant, in that it analyzes all relevant combinations of variables (based on available data) related to the supply of, and demand for physicians. This analysis is based on data collected from various sources as per the Minimum Data Set (MDS) stipulated by this project in Appendix B.

The physician demand analysis is based on current utilization of physician services, with additional analysis as to whether current utilization is accurately reflecting current demand/need of New Brunswickers. Current utilization of physician services is based on both Medicare and Hospital Services data, so as to accurately reflect or approximate total utilization of physician services in New Brunswick, both in and out of hospital.

6.2 The New Brunswick Physician Workforce – Big Picture

6.2.1 High-Level Overview of New Brunswick Physician Database

The New Brunswick Physician Database (hereafter referred to as, the database) contains 1239 physicians. The database is made up of 1234 active physicians currently practicing in the province, as well as 5 physicians who, indicated in their survey, that they were inactive at the time of survey, but intend to return to active practice in the near future. This figure also includes 25 physicians who practice in the province, but reside out of province. Collectively the database is therefore considered to contain active practitioners.

The analyses in the following pages will be primarily based on these 1239 physicians who comprise the current New Brunswick physician workforce. This current physician workforce (base stock) equates to a New Brunswick physician-to-population ratio of **1.6 physicians per 1000 population**. The 1991 Barer Stoddart Report recommended that Canada retain a ratio of **1.8 to 1.9 physicians per 1000 population** to maintain an adequate health care delivery system, and the Canadian Medical Forum Task Force on Physician Supply accepts that recommendation. This indicator for service provision is not sufficiently comprehensive however, in that it does not account for how physicians are actually practicing. The approach used in this current study for the New Brunswick Department of Health and Wellness is more complete, in that it incorporates physician practice patterns and recognizes how variations in practice impact the effective physician supply.

6.2.2 Gender and Age of Physicians in New Brunswick

Of the 1239 active physicians, 881 (71%) are male and 358 (29%) are female. By broad practice group, the largest group, General/Family Practice has 228 female physicians (37%) out of 612 in total. Of the 627 Specialty physicians, the majority are male, 497 (79%), and 130 (21%) are female. Within the Medical Specialties (a sub set of all specialty physicians), there are 112 female physicians (26%) out of 431 physicians in total, whereas in the Surgical Specialty group there are 19 female physicians (9%) out of 210 physicians in total. These data serve to demonstrate the relative distribution of females across the current physician workforce.

Within the specialties, the specialist group with the highest percentage of female representation is Geriatric Medicine with 5 of 6 physicians being female (83%), followed by Medical Microbiology with 3 of 5 (60%), Radiation Oncology with 5 of 9 (56%), and Dermatology with 4 of 8 (50%) being female.

The practice groups with the higher proportion of female representation have additional human resource planning issues associated with them, in that, females under the age of 40 years of age are in the childbearing age range and thus temporary leaves for this group need to be considered and planned for. In addition, it is important to consider the general trend of today's career woman toward extending childbearing past the age of 40.

In the New Brunswick physician workforce, the above mentioned considerations are important in that roughly 20% (251) of the total physician workforce in the province are females under the age of 45 (15% are under the age of 40), and of the total number of female physicians (358), 70% of them are under the age of 45 (51% are under the age of 40).

The impact of this demographic on workforce planning is further exemplified by the responses to the physician survey question which asked how much time in the past 2 years was taken for maternity/family leave. Fifty-eight percent of all those female physicians under 40 years of age in the database (n=105) responded to this question. Seventy-one percent took no leave for this purpose over the past 2 years. Of those who took leave, 10% indicated that they had taken between 1-3 months leave for this purpose and 15% indicated they had taken between 4-6 months leave. Ten percent of male physician respondents, 40 years of age, or less, also reported taken family leave of less than one month.

6.2.3 Language Profile

This analysis is based results from the physician survey responses where physicians were asked to indicate their perceived level of language proficiency: English only, French only, or equally proficient (written and oral) in both English and French. Those physicians who indicated abilities in "English and French with equal proficiency" were categorized as bilingual for the purposes of analysis.

The following results (table – Language by Practice Group) are based on the survey responses of all physicians: Family Practitioners/General Practice physicians and Specialists, which represent 56% of the provincial physician population.

Table 8 – Language by Practice Group

Count Col % Row %	Bilingual	English	French	Total
General Practice	96 54.6 28.4	215 44.0 63.6	27 79.4 8.0	338
Internal Medicine	13 7.4 21.3	48 9.8 78.7	0 0.0 0.0	61
Lab Medicine Specialties	4 2.3 18.2	17 3.5 77.3	1 3.0 4.5	22
Medical Specialties	35 20.0 21.7	122 25.0 75.8	4 11.8 2.5	161
Surgical Specialties	28 15.9 23.9	87 17.8 74.3	2 5.9 1.7	117
Total	**176**	**489**	**34**	**699**

Based on survey responses therefore, one quarter of all physicians consider themselves proficient in both English and French; 70% are proficient only in English and 5% only in French. These results are statistically significant at the 95% level.

Family Practitioners/General Practice physicians are slightly more likely than average to consider themselves bilingual; 28.4% of respondents in this category were categorized bilingual based on their responses.

Physicians specializing in Internal Medicine are more likely than other physicians to be proficient only in English (78.7%). This group had the highest proportion of English language-only proficiency amongst the 5 major categories of physicians.

Physicians specializing in Lab Medicine are the least likely to be bilingual; 18.2% of these physicians consider themselves bilingual.

Of interest, is the fact that physicians in New Brunswick report 48 mother tongue languages where 43 of these languages are represented by less than 5 physicians in each language. English is the most common mother tongue among physicians (59.8%), followed by French (26.3%). These 2 languages account for 86.1% of all mother tongue languages. Urdu is the third most popular mother tongue (1.4%), followed by Arabic (1.2%).

A further analysis correlating mother tongue with language fluency provides additional clarity to this issue, as depicted in the following table and discussion.

Table 9 - Analysis of Language Fluency by Mother Tongue

Count Col %	English	French	Bilingual	Total Col %
English	399 81.9	0 0	18 10.2	417 59.8
French	3 0.6	31 91.2	149 84.7	183 26.3
English and French	2 0.4	0 0	1 0.6	3 0.4
Other	83 17.0	3 8.8	8 4.5	94 13.5
Total **Row %**	487 69.9	34 4.9	176 25.2	697 100

The above table demonstrates the relationship between the mother tongue of physicians (rows) and their language fluency (columns). Language fluency is a derived variable, calculated based on the written and verbal proficiency of physicians, as self reported in the physician survey. The percentage distributions in the table indicate the mother tongue of English, French and bilingual physicians.

Analysis of the above table indicates that the majority of English language physicians in the province (81.9%) has an English mother tongue and is only fluent in English. About 4% of physicians (18) with an English mother tongue are bilingual.

More than 9 out of 10 (91%) of the 34 physicians fluent in French have a French mother tongue. The remaining 9% of physicians that are fluent in French have a mother tongue in another language.

About 85% of the bilingual physicians in the province have French as their mother tongue; 10% of these bilingual physicians have an English mother tongue.

The following 2 tables also show the strong, statistically significant relationship between the language proficiency of physicians and their age groups, for the 2 official languages of the province.

Table 10 - Language Proficiency by Age Group

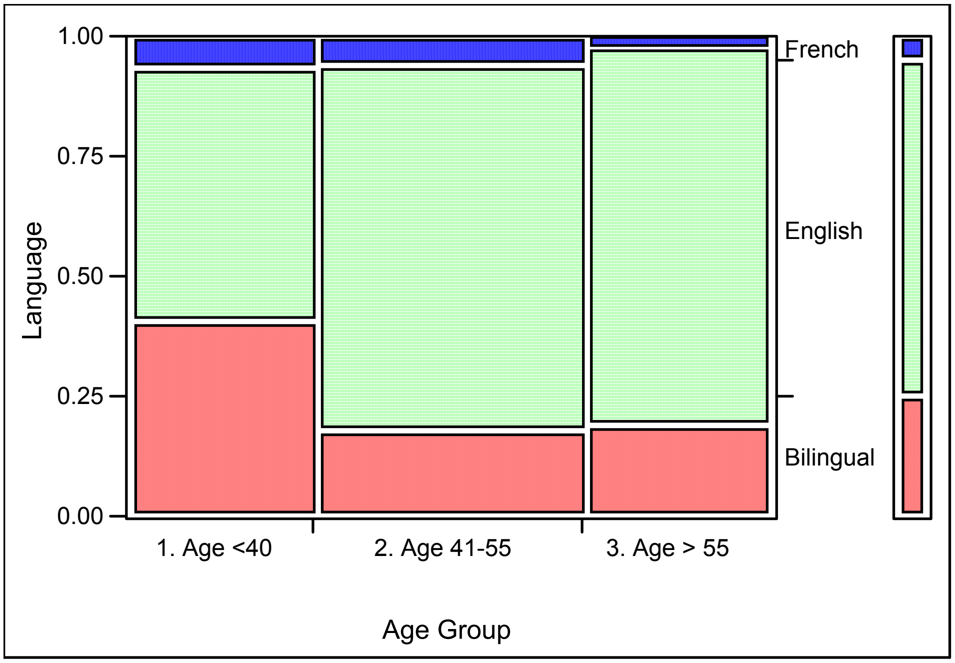

Table 11 - Language by Age Group

Count Total % Col % Row %	Bilingual	English	French	
Age <40	84 12.0 47.7 41.0	108 15.5 22.1 52.7	13 1.9 38.2 6.3	205 29.3
Age 41-55	54 7.7 30.7 18.3	224 32.1 45.8 75.9	17 2.4 50.0 5.8	295 42.2
Age > 55	38 5.4 21.6 19.1	157 22.5 32.1 78.9	4 0.6 11.8 2.0	199 28.5
Total **Row %**	**176** **25.2**	**489** **70**	**34** **4.8**	**699**

About 41% of physicians 40 years of age or less are bilingual, compared to 18% of physicians aged 41-55 and 19% of physicians older than 55; the average level of bilingual proficiency is 25.2% for all physicians.

The survey results indicate that 88.2% of the 34 physicians that report they are proficient only in the French language are 55 years of age or younger; 38.24% of these physicians are 40 years of age or younger.

The results of these analyses indicate an inverse relationship between age and the level of bilingualism. This is a positive factor in future recruitment of a bilingual workforce. A factor that may mitigate this however is the extent to which the province of Quebec becomes more of a competitive force as it proceeds to open its doors to out of province physicians to address a growing labour force shortage in that province.

6.2.4 Health Region

The database groups physicians according to the 7 provincial health regions, as well as out-of-province (which are referred to in the data tables as Region 9). Region 1, in some cases, can be further delineated, but it is difficult given a large portion of physicians practice in both Region 1 Southeast (SE) and Region 1 Beauséjour (B). As such, the analysis primarily focuses on Region 1 as a whole, and where possible, this analysis will focus on Region 1SE and Region 1B separately.

The following table presents the number of physicians practicing in each Health Region, as well as the percentage that number represents of the total physicians in the province.

Table 12 – Practicing Physicians in each Health Region

Region 1	Region 2	Region 3	Region 4	Region 5	Region 6	Region 7	OOP*	Total
346 *(28%)*	305 *(25%)*	238 *(19%)*	84 *(7%)*	59 *(5%)*	123 *(10%)*	59 *(5%)*	25 *(2%)*	**1239** *(100%)*
*OOP= Out-Of-Province								

This distribution is consistent with the distribution of the New Brunswick population reported by Statistics Canada (2001 Census) where, for example, 71% of New Brunswickers collectively reside in Regions 1, 2, and 3.

Region 1 is broken down into Southeast and Beauséjour. The database contains 346 physicians in total practicing in Region 1, with the breakdown as follows:

- Region 1 Beauséjour – 147 physicians
- Region 1 Southeast – 182 physicians
- Region 1 no breakdown – 17 physicians, all Psychiatrists

In addition to health region breakdown, hospital affiliation is also recorded, which does not necessarily coincide with the region breakdown. There are 152 physicians affiliated with Beauséjour Hospital, 192 physicians affiliated with Moncton Hospital (Region 1 Southeast), and for 2 physicians, hospital affiliation is unknown.

6.2.5 Full-Time Equivalent (FTE) Analysis Snap-shot

The Full-Time Equivalent (FTE) analysis is based on the most recent full year of Medicare billing data (2002) translated into FTEs in the Medicare database. Of the 1239 FTEs in the database (snapshot as of

March 2003), FTE data is available for 1223 (98%) and it is this group on which the following analysis is based.

Table 13 - FTE Breakdown

FTE Range	</=0.25	0.25-0.50	0.51-0.75	0.76-0.99	1.00	1.01-1.25	1.26-1.50	>1.50	TOTAL
FEMALE *(Row %)* *(Column %)*	29 *(8.2%)* *(34%)*	34 *(9.6%)* *(49%)*	55 *(15.5%)* *(42%)*	79 *(22.3%)* *(40%)*	42 *(11.8%)* *(28%)*	75 *(21%)* *(24%)*	31 *(8.8%)* *(16%)*	9 (2.5%) *(7%)*	**354**
MALE *(Row %)* *(Column %)*	57 *(6.5%)* *(66%)*	35 *(4%)* *(51%)*	74 *(8.5%)* *(58%)*	119 *(13.7%)* *(60%)*	106 *(12%)* *(72%)*	234 *(27%)* *(76%)*	162 *(18.6%)* *(84%)*	82 *(9.4%)* *(93%)*	**869**
TOTAL PHYSICIANS ***(Row %)***	***86*** ***(7%)***	**69** ***(6%)***	**129** ***(11%)***	**198** ***(16%)***	**148** ***(12%)***	**309** ***(25%)***	**193** ***(16%)***	**91** ***(7%)***	**1223**

As presented in the table above, the majority of physicians (60%) are in the 1.0 FTE range or greater with more of the total number of male physicians (67%) working at this level of intensity than female physicians (44%). Of all female physicians in the workforce, 32% work in the greater than 1.0 FTE range, as compared to 55% of all male physicians. On a percentage basis, considerably more male physicians work at the greater than 1.5 FTE level.

6.2.6 Stability of the New Brunswick Physician Workforce – Historical Analysis

Based on Medicare's Physician Movement Reports from 1989 to 2003, as presented in the table on the following page, New Brunswick has experienced a net gain of 272 physicians over this 14-year time period, which is an average net gain of 19 physicians each year over this time period.

For comparison purposes, over the past 10 years the movement reports indicate that New Brunswick has experienced a net gain of 163 physicians, which is contrary to figures reported by the Canadian Institute of Health Information's (CIHI) Net Interprovincial Migration of Physicians Report. This CIHI report shows that, over the past 10 years, New Brunswick has experienced a net gain of 40 physicians, as compared to Prince Edward Island with a net gain of 30 physicians, Nova Scotia with a net loss of 42 physicians, and Newfoundland with a net loss of nearly 400 physicians. This contradiction is partially explained by the fact that the Medicare data is physician "movement" versus the CIHI data, which records physicians "migration". Physician movement (in and out) includes a much wider range of causes for leaving a practice in New Brunswick than do CIHI's migration statistics, including: retirement, death, returning to study, migration, immigration and emigration, suspended license, and reasons unknown. Thus, it is important to recognize that variability exists in the manner in which statistics are tracked and reported. The above comparison underscores the dilemma for planners in trying to discern the real picture.

This historical analysis is relevant to the findings outlined in Section 6.0 of this report, which indicate that future demand for physicians will outweigh historical net gains for both Family Practitioners and Specialists.

Table 14 – NB Physician Movement

NEW BRUNSWICK PHYSICIAN MOVEMENT
1989/90 TO 2002/03

1989/90		# Out	# In	Total Net
GPs		13	40	27
SPs		24	25	1
TOTAL		**37**	**65**	**28**
	Deceased	4	USA	3
	Retired	5	Other	1
	Canada	18	Unknown	6

1990/91		# Out	# In	Total Net
GPs		19	44	25
SPs		15	24	9
TOTAL		**34**	**68**	**34**
	Deceased	2	USA	1
	Retired	2	Other	1
	Canada	25	Unknown	3

1991/92		# Out	# In	Total Net
GPs		23	42	19
SPs		18	36	18
TOTAL		**41**	**78**	**37**
	Deceased	2	USA	2
	Retired	2	Other	2
	Canada	28	Unknown	5

1992/93		# Out	# In	Total Net
GPs		27	37	10
SPs		14	14	0
TOTAL		**41**	**51**	**10**
	Deceased	1	USA	5
	Retired	2	Other	2
	Canada	15	Unknown	16

1993/94		# Out	# In	Total Net
GPs		17	27	10
SPs		14	20	6
TOTAL		**31**	**47**	**16**
	Deceased	1	USA	1
	Retired	6	Other	0
	Canada	13	Unknown	10

1994/95		# Out	# In	Total Net
GPs		28	33	5
SPs		21	35	14
TOTAL		**49**	**68**	**19**
	Deceased	1	USA	5
	Retired	13	Other	1
	Canada	8	Unknown	21

1995/96		# Out	# In	Total Net
GPs		32	27	-5
SPs		44	50	6
TOTAL		**76**	**77**	**1**
	Deceased	4	USA	10
	Retired	17	Other	11
	Canada	22	Unknown	12

1996/97		# Out	# In	Total Net
GPs		18	15	-3
SPs		27	38	11
TOTAL		**45**	**53**	**8**
	Deceased	2	USA	5
	Retired	9	Other	10
	Canada	8	Unknown	11

1997/98		# Out	# In	Total Net
GPs		14	25	11
SPs		27	32	5
TOTAL		**41**	**57**	**16**
	Deceased	1	USA	3
	Retired	13	Other	7
	Canada	12	Unknown	5

1998/99		# Out	# In	Total Net
GPs		18	28	10
SPs		33	40	7
TOTAL		**51**	**68**	**17**
	Deceased	2	USA	5
	Retired	18	Other	10
	Canada	15	Unknown	1

1999/00		# Out	# In	Total Net
GPs		16	31	15
SPs		44	42	-2
TOTAL		**60**	**73**	**13**
	Deceased	2	USA	4
	Retired	18	Other	3
	Canada	31	Unknown	2

2000/01		# Out	# In	Total Net
GPs		24	31	7
SPs		40	56	16
TOTAL		**64**	**87**	**23**
	Deceased	2	USA	1
	Retired	11	Other	13
	Canada	33	Unknown	4

2001/02		# Out	# In	Total Net
GPs		21	37	16
SPs		45	56	11
TOTAL		**66**	**93**	**27**
	Deceased	1	USA	8
	Retired	15	Other	14
	Canada	25	Unknown	3

2002/03		# Out	# In	Total Net
GPs		21	33	12
SPs		36	47	11
TOTAL		**57**	**80**	**23**
	Deceased	2	USA	7
	Retired	10	Other	15
	Canada	21	Unknown	1

6.3 General/Family Practice (GP/FP) - Current Picture and Window on the Future

6.3.1 Education of Family Practitioners

Throughout this section of the report, "FP" is synonymous with both Family Practitioner, as well as General Practitioner.

Family physicians are those practitioners who have completed residency training in a Family Medicine program certified by the College of Family Physicians of Canada. It should be noted that family physicians may provide a range of specialty services due to a combination of factors including the nature of their skills, geographic location, or work environment.

Family Medicine requires a minimum of 24 months of residency training in family medicine, in a program accredited by the College of Family Physicians of Canada (CFPC). All 16 medical schools across the country offer residencies in this field, many delivered in a distributed fashion in family medicine programs delivered throughout communities with whom the medical school has established agreements. There are also a number of programs that have a rural medicine focus and there seems to be an effort across the system to enhance this focus. A third year of training is also available at all medical schools. Those programs that are given certification by the CFPC including Emergency, Care of the Elderly, and Palliative Care. In addition, advanced skills training is also available in a number of targeted areas including Anesthesia, Obstetrics, Psychiatry, and Sports Medicine. There are not a preset number of positions in any given year, as positions are dependent on physician interest and available funding.

New Brunswick is largely a rural province and the demands of rural family medicine often differ from urban practice. Recruitment and retention of physicians in general, and family practitioners in particular, to rural communities in New Brunswick has been an ongoing challenge. The extent to which the medical education cycle fosters exposure to rural practice may have an influence on future commitment to practice rural medicine.

The College of Family Physicians of Canada Working Group on Post Graduate Education for rural family practice (1999) have recommended core undergraduate and postgraduate rural education experiences be considered as integral to all 2-year family medicine residency programs in Canada, in addition to the option to pursue a rural practice education stream. The Society of Rural Physicians of Canada, in their submission to the Romanow Commission (2001) cite research evidence that exposure to rural medicine during training, and being a rural origin medical student, are factors that positively influence the choice to practice in rural settings. Similar findings were cited in research to determine the predictors for rural practice where it was determined that physicians raised in rural communities were twice as likely than those from non rural communities to both choose rural practice locations and maintain a practice in these locations. [42] National medical education reform is being proffered as an integral component of a national rural health strategy.

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[42] Mark Estabrook et al, Rural Background and Clinical Rural Rotations During Medical Training: Effect on Practice Location, CMAJ, April 20, 1999, volume 160, p. 8.

Currently however, the opportunities for New Brunswick students to receive their clinical training here in New Brunswick through any of the programs listed in the table of Universities with Agreements for New Brunswick Student Placements varies widely, both for undergraduate clerkships, as well as post-graduate medical education (PGME) residency training.

Proportionately, Family Medicine residents typically have represented approximately 40% of the number of physicians exiting PGME programs in Canada. The 2002-2003, CAPER data indicates that, currently across the country, there are 1424 residents (870 female and 554 male) engaged in a Family Medicine residency program, with estimated completion dates listed in the table below.

Table 15 - Family Medicine Residents in Canada

2003	2004	Total
722	702	1424

Of this number, ACMC/CAPER data indicates that 40 (2.8% of all enrollments) are residents from New Brunswick, who are distributed across the Canadian Medical School system as indicated in the following table.

Table 16 – New Brunswick Family Medicine Residents

University	2003	2004	Total
Dalhousie University	10	10	20
Université de Sherbrooke	9	11	20

CAPER 2002/2003 data indicates that nationally, 23% of ministry funded trainees chose to take additional family medicine training, representing an increase of 35 seats over 2001/2002. An analysis of third year Family Medicine residency programs by gender, indicates, in the following table, expected graduates in 2003:

Table 17 – Third Year Family Residency

R3 Program	Total expected graduates in 2003
Emergency Medicine (CFPC)	**99** (31 Female, 68 Male)
Care of the Elderly (CFPC)	**15** (11 Female, 4 Male)
Other Family Med. Training	**21** (12 female, 9 male)
Palliative Medicine*	**13** (6 female, 7 male)
**Palliative Medicine is a one-year program of added competence conjointly accredited by the Royal College of Physicians and Surgeons of Canada and the College of Family Physicians of Canada*	

CAPER data further indicates that since 1990, a total of 7827 residents have graduated in Family Medicine across the country. Annual outputs averaged 602 per over this 13-year period, ranging from lows of 509 to highs of 684. The number of graduates over the next 2 years is predicted to be 18% higher on average, when compared to the average in the last decade; however, outputs over the past 3 years have been lower than average with decreasing frequency: 565, 534, and 509 respectively. It must also be noted that residents may choose to do a further year of specialty study in Family Medicine as noted above and this may delay time to market.

6.3.2 Current Family Practitioner Workforce in New Brunswick

6.3.2.1 Age and Gender

There are 612 General/Family Practitioners (hereafter referred to as FPs) contained in the New Brunswick Physician Database. Of the 612, 384 (63%) are male and 228 (37%) are female.

The data elements age, gender and region are 100% populated in the database and reveal the following:

Table 18 - Age Group and Gender Analysis

	</=30	31-35	36-40	41-45	46-50	51-55	56-60	61-65	66-70	71-75	76-80	>80	**Total**
Male	16	37	45	78	54	51	53	19	17	9	3	2	**384**
Row%	*4%*	*10%*	*12%*	*20%*	*14%*	*13%*	*14%*	*5%*	*4%*	*2%*	*1%*	*1%*	*63%*
Col%	*33%*	*46%*	*50%*	*61%*	*62%*	*75%*	*88%*	*95%*	*100%*	*100%*	*75%*	*100%*	
Female	32	43	45	49	33	17	7	1			1		**228**
Row%	*14%*	*19%*	*20%*	*21%*	*14%*	*7%*	*3%*	*0%*			*0%*		*37%*
Col%	*67%*	*54%*	*50%*	*39%*	*38%*	*25%*	*12%*	*5%*			*25%*		
TOTAL	48	80	90	127	87	68	60	20	17	9	4	2	**612**
Row%	*8%*	*13%*	*15%*	*21%*	*14%*	*11%*	*10%*	*3%*	*3%*	*1%*	*1%*	*0%*	*100%*

The table above paints an interesting picture of the FP workforce on the basis of age and gender. The data supports anecdotal information about the "new workforce" being majority female, with 20% of the total New Brunswick FP workforce being female 40 years of age or younger, in contrast with 16% of male physicians in the same age group. Of the entire female FP workforce, 90% are less than 50 years of age as compared to 60% of the male FP workforce. More than half of the female workforce 53% (120) are in fact less than or equal to 40 years of age as compared to 22% (98) of the male physician workforce. Across the practice life cycle, therefore, the female FPs outnumber their male counterparts in the under 35 age category, are on par with male counterparts between 36-40 years and then represent a steadily declining percentage of the workforce from age 41 to 65 years where the FP workforce becomes male dominate.

Given the trend toward a growing percentage of females in FP residency programs, physician workforce planners will need to be well aware of this distribution and be prepared to factor in the requirement for short-term leaves for maternity and other family reasons recognizing the need for sufficient slack into the system to allow for physician replacement during such temporary leaves. Coming on the heels of this next cohort are medical school graduates which represent a steadily increasing percentage of females (60%), suggesting this trend will continue. With an increasing percent female FP workforce, close attention will also need to be paid to their practice patterns over time, in relation to the overall impact on the primary care delivery system.

When looking at those in a later stage in their career, 25% (154 of 612) of the over 50-year old cohort of FPs is male, as compared to only 4% (26 of 612) female. Of the 612 FPs in the province who have reported, either by Medicare or self-reported through the physician survey, that they are still practicing in some capacity, 8% (52) of them are over 60 years of age and hence likely to retire within the 10-year forecast horizon. In addition, another 10% (60) are in the 56-60 age range and could potentially retire or scale down their practice significantly within the 10-year forecast horizon. This equates to a total of 112 FPs (18%) potentially leaving service or delivering a lower volume of service within the 10-year forecast period.

6.3.2.2 Health Region

The distribution of Family physicians by Health Region, based on 100 percent population of data, is as follows (table – Family Physician Distribution by Health Region):

Table 19 - Family Physician Distribution by Health Region

Region 1	Region 2	Region 3	Region 4	Region 5	Region 6	Region 7	OOP*	Total
162 *(26%)*	143 *(23%)*	128 *(21%)*	43 *(7%)*	28 *(5%)*	67 *(11%)*	33 *(5%)*	8 *(1%)*	612 *(100%)*
*OOP = out of province								

This distribution is consistent with overall population distribution across the health regions.

The following data elements were populated from physician responses to the New Brunswick Physician Supply and Demand Analysis Questionnaire, and as such, are not 100 percent populated. Level/percent of data population is indicated within the analysis for each data element.

Overall 55% (339 out of 612) of all Family Practitioners responded to the survey questionnaire, distributed as follows (table – FP Survey Response Rate by Region), represented as the relative percentage of all FPs in each region.

Table 20 - FP Survey Response Rate by Region

Region 1	Region 2	Region 3	Region 4	Region 5	Region 6	Region 7
76	75	75	27	18	43	24
47%	52%	59%	63%	64%	64%	64%

6.3.2.3 Language

As presented in Section 6.2.3, Family Practitioners are slightly more likely to consider themselves bilingual than the general physician population; 28.4% of respondents in this category were categorized bilingual, based on their responses to the physician survey. Language did not have a statistically significant influence on how physicians allocate their time to various areas of practice.

6.3.2.4 Practice Profile

The Practice Profile analysis seeks to understand where Family Practitioners practice and how are spending their time by analyzing areas of clinical practice, activities within that practice, and health care settings within which the FP practices. The following tables and the associated analyses provide this detailed profile of FP practice, based on the survey responses.

Clinical Practice Area

From a physician workforce planning perspective, the issue of **functional practice** is an important one. Physicians' scope of practice is not strictly dictated by their certification/credentials. Overlapping scopes of practice are commonplace amongst certain specialists and between specialists and family practitioners. Geographic (rural versus urban settings) and the critical mass of providers and /or service population are some factors influencing this phenomenon.

For the family practice group of practitioners, a physician's functional practice needs to be understood in the context of how primary care services are being provided to New Brunswickers as compared to hospital-based services or specialty level secondary care being provided by FPs. Understanding how the workforce is actually working, therefore, is significant from a workforce and health services planning perspective. Measures such as provider to population ratios do not provide this degree of specificity that is central to effective planning.

To gain an understanding of the type of work Family Practitioners are performing in their daily practice, FP survey respondents were asked to complete the following table, detailing areas of clinical practice.

Table 21 - Clinical Practice and Percentage Time Spent

Clinical Practice Area	Percentage Time Spent
General Family Medicine	
Emergency Medicine	
Obstetrics	
Geriatric Medicine	
OR Assist	
Anesthesia	
Allergy	
Palliative Medicine	
Alternative Medicine/Therapies	
Other (Please Specify):	
Total Time Spent	**100%**

An analysis of the responses to this survey question was conducted on the basis of age, gender, language and region. The following tables provide the detail for this analysis which generally revealed the following:

Amongst all Family Practitioners responding to the survey, 293 (86%) reported that General Family Medicine accounts for 73% of their overall time spent among the range of typical FP practice areas. Emergency Medicine was the next most important practice area, accounting for 38% of all physicians' time; 168 (48%) FPs reported working in this practice area. Geriatric Medicine comprised the next largest area of practice with 113 (39%) spending 15% of their time here and a further 110 (32%) spend nearly 10 % of their time in an OR Assist role.

On the basis of gender, female physicians report spending twice as much time as their male counterparts in obstetrics (17% versus 8%). Female physicians also spend more time in Geriatric Medicine than male physicians (19.6% versus 13%). Male physicians account for 100% of those practicing anesthesia where 4 FPs spend 27% of their time doing so. Also male physicians are nearly twice as likely as female physicians to practice in and OR Assist role (11% versus 6.7 %)

The influence of language on physician practice areas generally does not influence the percentage of time physicians spend in various practice areas.

Age differences amongst FPs influences their allocation of time in the areas of General Family Medicine and Emergency Medicine. Younger physicians, less than 41 years of age, spend more time in Emergency Medicine (42.6%) than physicians over 55 years of age (26%). However, older physicians spend more time in General Family Medicine (82%) compared to younger physicians (66%). Age is also inversely proportional to the time spent in obstetrical practice, which represents about 15% of younger FPs time as compared to 4.6% of older FPs.

The following table outlines the Distribution of Practice Allocated by Male/Female GPs.

Clinical Practice Areas by Gender

Table 22 - Distribution of Practice Allocated by Male/Female GPs

Count Row Mean	Male %	Female %	All Responses
General Family Medicine	178 72.55	115 74.24	293 73.21
Emergency Medicine	109 37.52	59 38.66	168 37.92
Obstetrics	32 7.90	29 16.93	61 12.20
Geriatric Medicine	77 13.09	36 19.56	113 15.15
OR Assist	75 11.00	35 6.71	110 9.63
Anaesthesia	4 26.75	0 0	4 26.75
Allergy	12 28.33	4 32.25	16 29.31
Palliative Medicine	48 8.37	36 10.42	84 9.25
Alternative Medicine/Therapies	5 8.20	2 5.00	7 7.28
Other (Please Specify):	28 21.96	5 9.80	33 20.12

The relative share of time allocated by male and female physicians in General Practice does not differ in any statistically significant way for many of the clinical practice areas. One notable exception is Obstetrics. While almost the same numbers of male and female physicians practice Obstetrics, female physicians spend twice as much time as the male physicians in this area. This is statistically significant at the P = 0.0001 level.

Overall, 293 of the 339 GPs reported that 73.21% of all their time was devoted to the General Family Medicine practice area. Emergency Medicine took up the second-most amount of their time, with both males and females spending about 38% of their time in this area.

The following table outlines the Distribution of FP Practice Allocated by Reported Language Proficiency.

Clinical Practice Areas by Language

Table 23 - Distribution of FP Practice Allocated by Reported Language Proficiency

Count Row Mean	English	French	Bilingual	All Responses
General Family Medicine	82 69.50	185 76.31	26 62.84	293 73.21
Emergency Medicine	54 39.46	93 39.72	21 26.00	168 37.92
Obstetrics	17 17.35	41 9.49	3 20.00	61 12.20
Geriatric Medicine	28 18.04	72 14.68	13 11.54	113 15.15
OR Assist	24 10.96	75 8.74	11 12.81	110 9.63
Anaesthesia	4 26.75	0 0	0 0	4 26.75
Allergy	1 5.00	14 33.07	1 1.00	16 29.31
Palliative Medicine	25 8.80	52 9.86	7 6.29	84 9.25
Alternative Medicine/Therapies	2 3.50	4 9.75	1 5.00	7 7.28
Other (Please Specify):	7 39.00	25 15.28	1 9.00	33 20.12

The language of a physician generally does not influence the percentage of time physicians allocate to different practice areas.

With the exception of Anesthesia, Allergy and Other, there are no strong differences in response amongst the 3 language groups for practice areas. However, these differences are not statistically significant due to large differences in the number of respondents in each language group.

According to the survey results, 100% of those FPs practicing anaesthesia have indicated their language fluency to be English. The Allergy practice area on the other hand is predominantly comprised of FPs who indicate their language fluency is French; 14 French-speaking FPs reported activity in Allergy Medicine compared to one Bilingual FP respondent and one English-speaking respondent.

The following table outlines Distribution of FP Practice Allocated by Age Cohorts.

Clinical Practice Areas by Age

Table 24 - Distribution of FP Practice Allocated by Age Cohorts

Count Row Mean	Age <=40	Age 41-55	Age > 55	Total
General Family Medicine	93 66.32	136 73.92	64 81.72	293 73.21
Emergency Medicine	71 42.56	75 36.93	22 26.32	168 37.92
Obstetrics	28 15.46	28 10.29	5 4.60	61 12.20
Geriatric Medicine	25 14.36	58 13.29	30 19.40	113 15.15
OR Assist	35 7.831	55 8.38	20 16.25	110 9.63
Anaesthesia	0 0	2 35.00	2 18.50	4 26.75
Allergy	0 0	9 18.56	7 43.14	16 29.31
Palliative Medicine	25 7.88	40 8.92	19 11.74	84 9.25
Alternative Medicine/Therapies	2 5.00	2 3.50	3 11.33	7 7.29
Other (Please Specify):	6 21.67	17 15.23	10 27.50	33 20.12

Age influences the amount of time allocated by FPs to the General Family Medicine practice area, where the percentage of time allocated increases based on age. This relationship is statistically significant at the P = 0.0002 level.

The table above also indicates that, compared to older physicians, younger FPs are more active in areas such as Obstetrics and Emergency Medicine and less likely to practice in the Allergy and Anesthesia practice areas. Older FPs, on the other hand, are more likely to practice in OR Assist and Allergy.

Clinical Practice Areas by Region

Table 25 - Distribution of FP Practice Allocated by Region

Count Row Mean	Region 1	Region 2	Region 3	Region 4	Region 5	Region 6	Region 7	OOP*	Total
General Family Medicine	63 78.70	64 79.52	69 73.43	25 58.64	15 60.73	37 66.84	19 75.63	1 50.00	293 73.21
Emergency Medicine	25 40.00	24 52.54	39 32.20	26 30.27	14 36.79	24 40.96	15 36.27	1 25.00	168 37.92
Obstetrics	16 12.81	12 13.83	14 7.71	5 18.40	3 8.33	4 17.25	7 11.29	0 0.00	61 12.20
Geriatric Medicine	21 20.29	23 13.04	24 10.79	11 13.91	8 12.50	16 13.87	9 25.22	1 25.00	113 15.15
OR Assist	23 15.13	17 7.47	33 6.42	11 10.09	9 18.00	8 9.12	9 3.00	0 0.00	110 9.63
Anaesthesia	0 0	1 2.00	2 27.50	0 0	0 0	0 0	1 50.00	0 0.00	4 26.75
Allergy	4 16.25	6 42.50	4 12.00	1 1.00	0 0	1 100.00	0 0.00	0 0.00	16 29.31
Palliative Medicine	14 11.86	15 8.40	19 13.68	6 7.17	8 10.87	14 4.36	8 4.25	0 0.00	84 9.25
Alternative Medicine/Therapies	2 3.50	1 30.00	1 5.00	0 0	0 0	2 3.50	1 2.00	0 0.00	7 7.29
Other (Please Specify):	9 25.00	8 18.00	10 15.80	4 6.75	0 0	2 55.00	0 0	0 0	33 20.12

**Note: OOP refers to physicians residing out of province*

The health region where a physician practices influences the amount of time devoted to practice areas. Several of the differences in response shown in the table above are statistically significant at various levels.

FPs practicing in Regions 4, 5, 6, and those residing out of province are less likely to spend time in General Family Medicine than those in Regions 1-3 and 7, inclusive. (Significant at the P = 0.0003 level). This may suggest physicians in these regions have a broader scope of practice, and have less access to, or refer to specialists less.

There is a statistically significant difference in the amount of time physicians in different regions allocate to the OR Assist practice area, with 110 FPS devoting some time to this area of practice. The overall average percent of time for all these physicians is 9.63%, but the physicians from Region 5 spend the greater amount of effort here, 6 times as much of their time in this area as physicians in Region 7 who devote the least amount of time to this area of practice.

To gain an understanding of how much time is spent on different activities within a practice, survey respondents were asked to complete the following table.

Table 26 - Percent FP Time Spent in Practice Activities

Activities	Percentage Time Spent
Insurable Clinical Practice - billable to NB Medicare (excluding on-call) i.e. FFS, salaried, sessional, alternate payment	
Non insured Clinical Practice (third party payments) e.g. WHSCC, RCMP, Insurance claims	
Medical Administration i.e. Department Head, Chief of Staff, VP Medicine	
Committee work (e.g. for Government, RHA, NBMS, etc.)	
Academic/Teaching	
Time spent on non-billable paper work, (e.g. forms, letters, claims), phone calls	
Other (Please specify)	
Total Time Spent	**100%**

The details of the responses, indicating the relative percentage of FP time spent in the 7 different kinds of activities are categorized according to the gender of these physicians and presented in the table below. Each row in the table shows the percentage of time that only those physicians providing a response spent on the activity. Results do not total 100% since each category had different numbers of responding physicians.

Table 27 - Percent FP Time Spent in Practice Activities by Gender

Activities	% Time Spent Males Count	% Time Spent Females Count	Total % of Time Spent Total
Insurable Clinical Practice - billable to NB Medicare (**excluding on-call**) i.e. FFS, salaried, sessional, alternate payment	75.2 204	75.9 125	75.5 329
Medical Administration i.e. Depart. Head, Chief of Staff, VP Medicine	16.0 56	14.0 23	15.5 79
Non-billable paper work, (e.g. forms, letters, claims), phone calls	11.0 161	13.1 113	11.9 274
Academic/Teaching	8.2 62	10.4 33	8.9 95
Non-insured Clinical Practice (third party payments) e.g. WHSCC, RCMP, Insurance claims	8.2 178	8.1 103	8.2 281
Committee work (e.g. for Government, RHA, NBMS etc.)	4.6 67	5.0 28	4.7 95
Other (Please specify):	14.1 17	5.1 8	11.2 25

The vast majority of GPs' time, regardless of gender, is spent in clinical practice areas. Some 329 of the 339 GPs that responded to the survey indicated that they spend more than three-quarters of their time in insurable clinical practice activities; 281 physicians spend time in non-insured clinical practice activities.

Female physicians spend about 2% more of their time on Academic/teaching activities than do male physicians, but this percent is small overall — about 10%.

Twenty-three female and 56 male Family Physicians spend some share of their time on Medical Administration activities. Amongst these physicians, males spend about 2% more time than females on Medical Administration, although the differences are not statistically significant.

Health Care Settings

The following table represents the age-related responses of all physicians that indicated the relative percentage of their time spent in 8 hospital and 12 community activities. Separate tables and analyses are provided for Family Practitioners and Specialist Physicians. It is important to note that each row in the table shows the percentage of their time that only those physicians providing a response spent on the activity.

Table 28 Percent FP Time Spent in Practice Activities by Age Group

Activities	Age <=40 % Time Spent	Age 41-55 % Time Spent	Age > 55 % Time Spent	Total % of Time Spent
HOSPITAL				
▪ Emergency Department	42.70	34.01	24.00	36.08
▪ Geriatrics/Long-Term Care	9.86	6.73	9.63	8.15
▪ Hospitalist	12.57	15.07	21.67	15.67
▪ In patient	12.46	12..24	15.30	12.91
▪ Oncology	13.78	10.69	1.00	10.31
▪ Other (specify)	49.00	27.83	11.86	24.81
▪ Out Patient Department	7.48	2.68	6.50	5.00
▪ Surgical Assist	6.24	7.06	11.52	7.59
COMMUNITY				
▪ Community Health Centre	19.50	49.43	52.5	37.87
▪ Extra Mural	3.11	3.04	3.66	3.04
▪ Government/Crown Corp	26.17	35.60	15.00	28.08
▪ House Calls	2.26	3.32	3.14	3.00
▪ Locum	51.67	4.67	40.00	39.92
▪ Mental Health Clinic[1]	***	***	***	***
▪ Nursing Home	9.56	10.50	13.38	11.00
▪ Other (specify)	14.33	23.75	12.40	16.96
▪ Physician Office	56.55	63.11	73.30	65.58
▪ Private industry (including clinical trials)	3.00	11.58	14.50	10.17
▪ Public Health	3.88	8.29	10.00	6.19
▪ Walk-in/after hours clinic	8.38	9.05	18.50	9.80

[1] Less than five responses.

A large share of physicians' community-related time is spent in community health centres, although there are no strong differences in response among the different age groups. It should be noted that at the time of this survey, there were no officially operating community health centres per se and "health centres" comprise settings in rural communities which serve often as a physician office practice and may or may not have other health programs/services operating out of the facility.

The Emergency Department is the source of the major activity within the hospital setting for FPs. The results in the table show that younger FPs spend more of their time in the Emergency Department than older FPs, and this relationship holds as these physicians age. The result is statistically significant at the P=0.05 level.

The data suggest that younger physicians spend more time in the Emergency Department and less in their office than older physicians, but that this relationship reverses with age. However, it is important to note that 165 (49%) of the 339 FPs indicated that they spent time in the Emergency Department, so that this relationship is not strictly deterministic.

6.3.2.5 Activity Levels

The physician survey asked a series of questions designed to gauge the activity levels of Family Physicians, based on the estimated number of active patient files in the physician's own practice, the numbers of scheduled patients that a physician would typically see during an average week, the hours per week spent in clinical practice activities, and the typical number of days per week that a physician had office hours. Where possible, these self-reported activity levels were compared to actual 2002-2003 Medicare office visits/office based procedures in an attempt to determine data validity.

An analysis of Family Physicians survey responses with respect to practice size was conducted on the basis of practice location, the age group of physician, and gender. Given the dynamic nature of the patient/physician relationship, there was no means by which to validate this self reported data, which poses limitations as to the reliability of the data.

The cells in each of the following tables show both the number of physicians responding and the percentage distribution of the responses within each column of the table.

Active Patient Files

Table 29 - Active Patient Files by Age Group

Count Col %	Age <=40	Age 41-55	Age > 55	Total
Less than 1000	17 16.50	7 4.76	6 8.00	30
1000-1500	18 17.48	11 7.48	6 8.00	35
1501-2000	16 15.53	15 10.20	7 9.33	38
2001-2500	14 13.59	18 12.24	9 12.00	41
2501-3500	10 9.71	45 30.61	16 21.33	71
3501-4500	1 0.97	20 13.61	11 14.67	32
4501-5500	1 0.97	8 5.44	4 5.33	13
More than 5500	1 0.97	2 1.36	8 10.67	11
Not Applicable	25 24.27	21 14.29	8 10.67	54
Total	103	147	75	325

The age of a physician has a statistically significant impact on the size of their practice, as indicated in the above table. The differences in responses are statistically significant at the P=0.05 level.

Physicians less than or equal to 41 years of age are more likely to have smaller practices than those physicians aged 41-55. In particular, 17.48% of FPs in the younger age group have practice sizes of 1000-1500 patients compared to 7.5% of FPs in the 41-55 age group.

FPs in the 41-55 age group tends to have the greatest share of practice sizes in the middle range. Practice sizes in the 2501-4500 range account for 44.2% of all practices for this age group.

Table 30 - Active Patient File by Gender

Count Col %	Female	Male	Total
Less than 1000	19 15.32	11 5.47	30
1000-1500	20 16.13	15 7.46	35
1501-2000	17 13.71	21 10.45	38
2001-2500	14 11.29	27 13.43	41
2501-3500	20 16.13	51 25.37	71
3501-4500	6 4.84	26 12.94	32
4501-5500	3 2.42	10 4.98	13
More than 5500	2 1.61	9 4.48	11
Not Applicable	23 18.55	31 15.42	54
Total	124	201	325

The gender of the Family Practitioner has a direct influence on practice size, and this relationship is statistically significant at the P=0.05 level.

Simply stated, male FPs tends to have larger practice sizes than female FPs. For example, 31.4% of female FPs have a practice with less than 1500 patients compared to 12.9% of male FPs with this practice size. When looking at the influence of both age and gender on practice size of survey respondents, 48 % of all female FPs less than 41 years of age have active patient files of 1500 or less, when compared to 11% of their male counterparts in the same age range.

Similarly, one quarter (25.4%) of male FPs have practice sizes in the 2501-3500 patient range, compared to only 16.1% of females. The 12.9% percentage of male FPs in the next group, with 3501-4500 patients, is close to 3 times the percentage of female FPS in this group (4.8%). When coupled with the influence of gender, 39% of female FPs in the 41-55 age group have practices in the 2501-4500 patient file range compared to 47% of male FPs.

In the 55 years of age plus cohort of survey responders, gender combined with age indicates a greater proportion of male FPs who tends to have practices with more active patient files. Fifty percent of female FPs in this age group have practice sizes of 2500 or less as compared to 35% of male FPs.

Each row of the following table shows the regional differences in responses for a particular practice size.

Table 31 - Active Patient Files by Health Region

Count Col %	Region 1	Region 2	Region 3	Region 4	Region 5	Region 6	Region 7	Region 9	Total
Less than 1000	5 6.94	4 5.56	5 6.94	4 14.81	3 16.67	8 20.51	0 0.00	1 100.00	30
1000-1500	12 16.67	3 4.17	5 6.94	7 25.93	1 5.56	1 2.56	6 25.00	0 0.00	35
1501-2000	7 9.72	11 15.28	8 11.11	4 14.81	4 22.22	1 2.56	3 12.50	0 0.00	38
2001-2500	7 9.72	7 9.72	12 16.67	2 7.41	1 5.56	7 17.95	5 20.83	0 0.00	41
2501-3500	15 20.83	19 26.39	22 30.56	5 18.52	4 22.22	4 10.26	2 8.33	0 0.00	71
3501-4500	6 8.33	11 15.28	7 9.72	1 3.70	1 5.56	3 7.69	3 12.50	0 0.00	32
4501-5500	2 2.78	3 4.17	5 6.94	0 0.00	1 5.56	2 5.13	0 0.00	0 0.00	13
More than 5500	0 0.00	1 1.39	1 1.39	1 3.70	0 0.00	7 17.95	1 4.17	0 0.00	11
Not Applicable	18 25.00	13 18.06	7 9.72	3 11.11	3 16.67	6 15.38	4 16.67	0 0.00	54
Total	72	72	72	27	18	39	24	1	325

The results in the above table, indicate that the practice size of 2501-3500 patients is the most common practice size, applicable to 71 (22%) of the 325 FP physicians responding to this question.

Regions 4-6 inclusive tend to have a higher percentage of FPs in practice sizes less than 1000 patients than Regions 1-3 inclusive.

The most common practice sizes for Regions 1-3 are 2501-3500 patients. These Regions have 20.8%, 26.4%, and 30.6 % of their physicians reporting this size of practice.

Close to half (47.2%) of the FP practices in Region 3 are between 2001-3500 patients. This concentration does not exist to the same degree in other regions. Region 2 has the highest concentration of physicians in the 3501-4500 practice size.

About 16.7% of all FPs responding to this question indicated that this question was “not applicable” to their practice.

When combining age and health region with practice, there were 35 survey respondents over 50 years of age with practice sizes of 3500 patients or greater. Of these, it would appear that Regions 2, 3 and 6 have the greatest number of physicians with this profile (10, 9 and 10 respectively). Within the 10-year planning horizon, these physicians can be expected to begin to scale back their practices or retire, leaving sizeable practices to be filled.

Patient Volumes Seen by Physicians

Based on responses to the survey, typical Family Physician/General Practitioner patient volumes were analyzed by practice size, age group of physicians, physician gender and active patient files.

Table 32 - Average Number of Patients Per Week by Age Group for FPs

Count Col %	Age <=40	Age 41-55	Age > 55	Total
Less than 50	10 9.80	8 5.33	11 14.67	29
51-100	37 36.27	30 20.00	16 21.33	83
101-150	31 30.39	46 30.67	11 14.67	88
151-200	9 8.82	36 24.00	25 33.33	70
More than 200	1 0.98	16 10.67	6 8.00	23
Not Applicable	14 13.73	14 9.33	6 8.00	34
Total	102	150	75	327

The number of patients seen per week increases directly with the age of the physician, as indicated in the table above. Physicians in the middle age group (41-55) see the most patients, and older physicians tend to see a decreased number of patients.

In particular, two thirds of physicians less than 41 years of age see between 51-150 patients per week. However, 50.7% of physicians aged 41-55 and 36.0% of physicians over the age of 55 see between 51-150 patients per week.

Physicians in the middle age group are most likely to see higher volumes of patients- more than 200 patients - in a week. Slightly more than 10% of physicians in this age group see higher volumes of patients.

The following table outlines the Number of Patients per Week by Gender for FPs.

Table 33 - Number of Patients Per Week by Gender for FPs

Count Col %	Female	Male	Total
Less than 50	10 8.00	19 9.41	29
51-100	46 36.80	37 18.32	83
101-150	43 34.40	45 22.28	88
151-200	12 9.60	58 28.71	70
More than 200	3 2.40	20 9.90	23
Not Applicable	11 8.80	23 11.39	34
Total	125	202	327

Patient volumes and gender are directly related in a statistically significant manner. Female physicians are more likely to see lower numbers of patients in a typical week than male physicians, although both males and females are about equally likely to see less than 50 patients per week.

At the higher end of the patients/week scale, male FPs (9.9%) are greater than 4 times more likely than female FPs (2.4%) to see more than 200 patients in a typical week.

Similarly, male FPs are 3 times more likely than female FPs to see 151-200 patients in a typical week; 28.7% of males FPs reported seeing this amount of patients compared to 9.6% of all female FPs.

When taking the combined view of age and gender, for FPs less than 41 years of age, there are 61% more female FPs than males in this age cohort and 60% of these female FPs see 100 patients per week or less as compared to 23% of their male counterparts. Gender plays less of a significant difference for FPs under 41 years of age who see 101-200 patients per week with 37% female FPs and 43% male FPs reporting these volumes of scheduled patient visits per week.

Of FP survey respondents in the 41-55 age group, 69% of female FPs report seeing 150 or less scheduled patients per week, compared to 49% of their male counterparts. Forty-five percent of males in this age group see 151 or more scheduled patients as compared to only 16% of female FPs.

A combined view of the impact of gender and age on practice volumes in the over 55 years cohort of survey responders, revealed that, besides being proportionately smaller in overall number, on balance there is less significant difference in practice volumes with the exception that no female FPs report seeing more than 200 scheduled patients per week as compared to 10% of male counterparts reporting these volumes.

Table 34 - Number of Patients Per Week by Active Patient Files for FPs

Count Col %	Less than 1000	1000-1500	1501-2000	2001-2500	2501-3500	3501-4500	4501-5500	More than 5500	N/A	Total
Less than 50	8 27.59	6 17.65	4 10.00	2 4.88	3 4.29	3 9.38	0 0.00	0 0.00	3 6.38	29
51-100	18 62.07	21 61.76	11 27.50	11 26.83	4 5.71	3 9.38	1 7.69	5 45.45	6 12.77	80
101-150	2 6.90	6 17.65	18 45.00	18 43.90	26 37.14	5 15.62	2 15.38	1 9.09	5 10.64	83
151-200	0 0.00	1 2.94	6 15.00	7 17.07	33 47.14	13 40.62	6 46.15	2 18.18	0 0.00	68
More than 200	0 0.00	0 0.00	1 2.50	3 7.32	4 5.71	8 25.00	4 30.77	3 27.27	0 0.00	23
Not Applicable	1 3.45	0 0.00	0 0.00	0 0.00	0 0.00	0 0.00	0 0.00	0 0.00	33 70.21	34
Total	29	34	40	41	70	32	13	11	47	317

The table above indicates typical weekly patient volumes compared to the practice size of FPs, as measured by the number of active patient files.

As would be expected, the table indicates a direct relationship between weekly patient volumes and practice size. As the practice size increases, the physician sees more patients in a typical week.

For example, as the table indicates, close to 80% of FPs, that see less than 100 patients per week have practice sizes with less than 1000 patients.

At the other end of the scale, about 77% of FPs that see more than 151 patients per week have practice sizes in the 4501-5500 patient range.

According to the table results, most FPs that see 151-200 patients per week have a practice size in excess of 2500 patients, but less than 5500 patients.

Number of Scheduled Days Worked

By Age

The number of days physicians work seeing scheduled patients is directly related to their age. Physicians 41-55 years work more 4- and 5-day weeks than those under 40 years or over 55 years.

The following table outlines Number of Scheduled Days Worked by Age.

Table 35 - Number of Scheduled Days Worked By Age

Count Row %	Age <=40	Age 41-55	Age > 55	
1	1 50.00	1 50.00	0 0.00	2 0.61
2	11 55.00	5 25.00	4 20.00	20 6.13
3	26 57.78	17 37.78	2 4.44	45 13.80
4	31 33.33	45 48.39	17 18.28	93 28.53
5	16 13.45	61 51.26	42 35.29	119 36.50
More than 5	1 16.67	2 33.33	3 50.00	6 1.84
Not Applicable	16 39.02	17 41.46	8 19.51	41 12.58
Total	102 31.29	148 45.40	76 23.31	326

Number of Scheduled Days Worked By Gender

The number of scheduled days worked per week is also directly related to gender of physicians where 21% of female FPs work 3 scheduled days per week, as compared to 9% of males FPs and 60% of female physicians who work 4-5 days per week, as compared to 68% of male FPs. There is no gender difference in the number of FPs that reportedly work 1 and 2 scheduled days per week.

The following table outlines Number of Scheduled Days Worked by Gender.

Table 36 - Number of Scheduled Days Worked By Gender

Count Row %	Female	Male	
1	1 50.00	1 50.00	2 0.61
2	10 50.00	10 50.00	20 6.13
3	26 57.78	19 42.22	45 13.80
4	42 45.16	51 54.84	93 28.53
5	32 26.89	87 73.11	119 36.50
More than 5	2 33.33	4 66.67	6 1.84
Not Applicable	11 26.83	30 73.17	41 12.58
	124 38.04	202 61.96	326

Number of Scheduled Days worked by Health Region

The greatest percentage of FPs reported working 4 and 5 scheduled days per week with FP Survey respondents practicing in Regions 2 and 3 having the highest likelihood of working 4 and 5 scheduled days per week.

The following table outlines Number of Scheduled Days Worked by Health Region.

Table 37 - Number of Scheduled Days Worked By Health Region

Count Col % Row %	1	2	3	4	5	6	7	9	
1	1 1.43 50.00	0 0.00 0.00	0 0.00 0.00	1 3.70 50.00	0 0.00 0.00	0 0.00 0.00	0 0.00 0.00	0 0.00 0.00	2 0.61
2	2 2.86 10.00	4 5.56 20.00	0 0.00 0.00	4 14.81 20.00	0 0.00 0.00	9 20.93 45.00	0 0.00 0.00	1 100.00 5.00	20 6.13
3	15 21.43 33.33	1 1.39 2.22	9 12.50 20.00	7 25.93 15.56	6 33.33 13.33	5 11.63 11.11	2 8.70 4.44	0 0.00 0.00	45 13.80
4	19 27.14 20.43	28 38.89 30.11	20 27.78 21.51	7 25.93 7.53	6 33.33 6.45	8 18.60 8.60	5 21.74 5.38	0 0.00 0.00	93 28.53
5	22 31.43 18.49	30 41.67 25.21	36 50.00 30.25	3 11.11 2.52	3 16.67 2.52	12 27.91 10.08	13 56.52 10.92	0 0.00 0.00	119 36.50
More than 5	0 0.00 0.00	0 0.00 0.00	3 4.17 50.00	0 0.00 0.00	1 5.56 16.67	2 4.65 33.33	0 0.00 0.00	0 0.00 0.00	6 1.84
Not Applicable	11 15.71 26.83	9 12.50 21.95	4 5.56 9.76	5 18.52 12.20	2 11.11 4.88	7 16.28 17.07	3 13.04 7.32	0 0.00 0.00	41 12.58
	70 21.47	72 22.09	72 22.09	27 8.28	18 5.52	43 13.19	23 7.06	1 0.31	326

Hours Per Week Spent in Clinical Practice

An analysis was conducted of the survey responses by Family Physicians/General Practitioners as to the number of hours spent per week in all areas of clinical practice. Three separate analyses are included that examine clinical practice hours per week by the age group of the physician, gender of the physician, and their practice location.

Each row of the table below shows the differences in hours worked per week by age group. The cells in each table show both the number of FP physicians responding and the percentage distribution of the responses within each column of the table.

Table 38 - Clinical Practice Hours Per Week by Age Group Clinical Practice Hours Per Week by Age Group

Count Col %	Age <=40	Age 41-55	Age > 55	Total
Less than 20	3 2.83	3 1.99	5 6.58	11
21 – 40	31 29.25	29 19.21	16 21.05	76
41 – 60	46 43.40	69 45.70	32 42.11	147
61 – 80	17 16.04	39 25.83	18 23.68	74
More than 80	2 1.89	7 4.64	2 2.63	11
Not Applicable	7 6.60	4 2.65	3 3.95	14
Total	106	151	76	333

The results in the above table indicate that the most common number of clinical hours per week for physicians in all 3 age groups is between 41 and 60 hours. Of the 333 physicians who responded, 147 (44.1%) worked this many hours per week.

FPs between age 41 and 55 worked longer hours more than the other age group, with close to half (45.7%) working between 41 and 60 hours and 25.8% working between 61 and 80 hours. Close to two thirds (63.6%) of all physicians who worked more than 80 hours per week were between 41 and 55 years old (although the numbers of FPs who reported working this number of hours per week is small).

Physicians over the age of 55 accounted for close to half (45%) of physicians who worked less than 20 clinical hours per week.

There is no difference in the percentage of male and female physicians that work 1 or 2 days per week.

Male physicians (3.0%) are 3 times more likely than females (1.0%) to work more than 5 days per week.

The following table outlines Clinical Practice Hours per Week by Gender.

Table 39 - Clinical Practice Hours Per Week by Gender

Count Col %	Female	Male	Total
Less than 20	1 0.78	10 4.90	11
21 – 40	40 31.01	36 17.65	76
41 – 60	65 50.39	82 40.20	147
61 – 80	12 9.30	62 30.39	74
More than 80	5 3.88	6 2.94	11
Not Applicable	6 4.65	8 3.92	14
Total	129	204	333

While the majority of both male and female FPs work between 41 and 60 hours per week, there is a clear relationship between the gender of the physician and the number of clinical practice hours per week.

Female physicians are more likely than male physicians to work fewer hours per week; 31.0% of female physicians who responded work between 21 and 40 hours per week. Only 17.6% of male physicians fall into this category.

Male physicians generally work more hours per week than female physicians. Close to one third of male physicians (30.1%) work between 61 and 80 hours per week, significantly higher than the 9.3% of female physicians in this category.

The following table outlines Clinical Practice Hours per Week by Health Region.

Table 40 - Clinical Practice Hours Per Week by Health Region

Count Col %	Region 1	Region 2	Region 3	Region 4	Region 5	Region 6	Region 7	Region 9	Total
Less than 20	4 5.56	1 1.33	2 2.70	2 7.41	1 5.56	0 0.00	0 0.00	1 100.00	11
21-40	17 23.61	17 22.67	15 20.27	8 29.63	2 11.11	12 27.91	5 21.74	0 0.00	76
41-60	37 51.39	31 41.33	31 41.89	12 44.44	6 33.33	18 41.86	12 52.17	0 0.00	147
61-80	8 11.11	19 25.33	22 29.73	3 11.11	7 38.89	10 23.26	5 21.74	0 0.00	74
More than 80	4 5.56	2 2.67	3 4.05	1 3.70	1 5.56	0 0.00	0 0.00	0 0.00	11
Not Applicable	2 2.78	5 6.67	1 1.35	1 3.70	1 5.56	3 6.98	1 4.35	0 0.00	14
Total	72	75	74	27	18	43	23	1	333

The majority of physicians in all regions worked between 41 and 60 clinical hours per week, with the exception of Region 5 where the majority of these physicians report working 61-80 hours per week.

Physicians in Regions 4 and 6 worked a shorter workweek (less than 40 hours) more often than they worked over 61 hours.

Physicians in Regions 3 and 5 were more likely to work more than 61 hours per week than to work a shorter than average workweek.

Percent of Patients Served that are not residents of New Brunswick

Five geographic areas are examined in detail, including the neighbouring provinces of Nova Scotia, PEI, and Quebec. General Practitioners served the least amount of non-New Brunswick residents, with 34% of physicians serving no non-New Brunswick residents. Only a small fraction (9.6%) of FPs provide services to more than 5% non-New Brunswick residents.

General practitioners provide services to Nova Scotia and Quebec residents most often, although 86 FPs report providing services to residents of the USA. Some 32% of FPs provide services to Nova Scotia and Quebec residents.

It is interesting to note that Region 5 survey respondents (both FPs and specialists) reported seeing the greatest number of non-New Brunswick residents with 38% reporting between 11-25% of their patients were from out of province. When looking at FPs alone, 16% reported that 11-25% of their patients were from out of province. Given the proximity, one might presume these are Quebec residents. However, this cannot be confirmed from the survey data, neither verified through Medicare, as there is no reciprocal billing relationship between New Brunswick and Quebec.

New Patients

Based on the results of the survey, 77% (261 of 339 respondents) of FPs reported having added new patients to their practice in the past 12 months.

Open/Closed Status of FP Practice

FPs are the most likely of any physicians to have a closed practice; more than 82% have a closed practice compared to Surgical Specialists who have closed less than 6% of their practices.

On-Call Profile of FP physicians

Three separate analyses are included that examine on-call time by physician age group, health region, and practice location. The percentages in the next table indicate the percentage of physicians in each age group and on-call category that indicated that they provide on-call services.

Table 41 - On-Call Category by Age Group

On Call Category % "on-call"	Age <= 40	Age 41-55	Age >= 55	Total
Emergency room	48 44.86	57 36.77	17 22.08	122
EMP/EMH	7 6.54	15 9.68	5 6.49	27
For hospital in-patients	78 72.90	110 70.97	46 59.74	234
For non-hospitalized patients	14 13.08	46 29.68	23 29.87	83
For other health regions	0 0	0 0	0 0	0
Military crash call – Air Evac	0 0	1 0.65	0 0	1
Obstetrical	25 23.36	24 15.48	4 5.19	53
Other	15 14.02	25 16.13	13 16.88	53
Do not do on-call	7 6.54	14 9.03	17 22.08	38

No FPs do on-call for other health regions and only one FP did military crash on-call.

Overall, regardless of age group, more FPs do on-call than do not provide these services. On-call for hospitalized in-patients is the most common kind of on-call services provided by FPs in New Brunswick; 234 of the 339 FPs provide these services (69%).

Younger FPs are almost 22% more likely than older FPs to provide on-call for hospital in-patients. For most categories, there is an inverse relationship between age and participating in providing on-call services, with the likelihood of being on call decreasing with age. The exception is on-call for non-hospitalized patients, where the older a physician is, the more likely he/she will be on-call.

The following table outlines On Call Category by Gender.

Table 42 -On Call Category by Gender

On Call Category	Female	Male	Total
Emergency room	38 29.23	84 40.19	122
EMP/EMH	14 10.77	13 6.22	27
For hospital in-patients	95 73.08	139 66.51	234
For non-hospitalized patients	23 17.69	60 28.71	83
For other health regions	0 0	0 0	0
Military crash call – Air Evac	0 0.00	1 0.48	1
Obstetrical	26 20.00	27 12.92	53
Other	20 15.38	33 15.79	53
Do not do on-call	12 9.23	26 12.44	38

The majority of both male and female physicians do on-call, with the most active on-call category for hospital in-patients.

Female FPs are less likely than male FPs to do emergency room on-call and on-call for non-hospitalized patients; 40% of male FPs indicated that they provide emergency room on-call services compared to 29% of female FPs, and 28% of male FPs indicated that they provide on-call services to non-hospitalized patients compared to 18% of female FPs.

Female FPs are significantly more likely to provide obstetrical on-call services than male FPs; 20% of female FPs provide these on-call services compared to 12.9% of male FPs.

More male FPs indicated that they did not do on-call than female FPs.

Table 43 -On Call Category by Health Region

On Call Category	Region 1	Region 2	Region 3	Region 4	Region 5	Region 6	Region 7	Region 9	Total
Emergency room	17 22.37	14 18.67	26 34.67	24 88.89	13 72.22	17 39.53	10 41.67	1 100.00	122
EMP/EMH	5 6.58	7 9.33	10 13.33	1 3.70	0 0.00	2 4.65	2 8.33	0 0.00	27
For hospital in-patients	54 71.05	45 60.00	58 77.33	21 77.78	17 94.44	24 55.81	15 62.50	0 0.00	234
For non-hospitalized patients	26 34.21	14 18.67	22 29.33	8 29.63	3 16.67	5 11.63	5 20.83	0 0.00	83
For other health regions	0	0	0	0	0	0	0	0	0
Military crash call - Air Evac	0 0.00	0 0.00	1 1.33	0 0.00	0 0.00	0 0.00	0 0.00	0 0.00	1
Obstetrical	17 22.37	8 10.67	12 16.00	4 14.81	2 11.11	4 9.30	6 25.00	0 0.00	53
Other	12 15.79	15 20.00	13 17.33	4 14.81	3 16.67	0 0.00	6 25.00	0 0.00	53
Do not do on-call	4 5.26	10 13.33	8 10.67	1 3.70	1 5.56	11 25.58	3 12.50	0 0.00	38

The above table indicates strong and significant regional differences in the provision of emergency on-call services by FPs in New Brunswick. Close to 9 of 10 FPs in Region 4 and 72% of FPs in Region 5 provide these services. In contrast, 22% and 19% of FPs in Regions 1 and 2 provide emergency on-call services.

Virtually all FPs in Region 5 provide on-call services for hospital in-patients; 60% of FPs in Region 2 provide these services.

On-call services for obstetrics are most commonly provided by FPs in Region 1 (22%) and Region 6 (25%).

Region 6 has the highest percentage of FPs that report that they do not provide on-call services; 26% do not provide these services.

Average Number of On-Call Contacts Per Month

The average number of on-call contacts per month for FPs is more than twice the average for specialists, excluding Lab Medicine Specialists. This analysis is statistically significant at the 99% confidence level.

Leaves of Absence from Practice

Family physicians were asked to indicate in the survey the amount of time they were away from their practice in the past 12 months for continuing medical education (CME) and for personal leave (vacations, illness etc.) Seventy-four percent of the 334 respondents indicated they took less than 2 weeks leave for CME purposes while 25% indicated they took between 2-4 weeks. Fifty-five percent of respondents indicated they took 2-4 weeks of personal leave while another 24% indicated they tool 5-7 weeks personal leave. The extent to which these leaves were covered within a physician's practice group or by locums is variable.

Planned Changes to Practice Activity

The physician survey asked FPs to indicate if over the next the next 5-year period they had plans to increase or decrease their current level of practice activity due to personal reasons such as maternity/family leaves, retirement, education reasons etc. or due to reasons influenced by others in their practice/community. Of the 334 FP physicians who responded to this question, 149 (45%) indicated they planned to reduce their practice, while 12 (4%) expressed plans to increase their practice and 173 (52%) had no plans to change current activity levels. Of the 149 planning reductions, 106 indicate plans to reduce practice activity permanently; 16 by 100%, 18 by at least 50% and 68 by at least 25%.

When analyzing these numbers relative to age and gender, 46% of all female respondents under 40 years of age (n=33) indicated plans to reduce their practice in the next 5 years, as compared to 40% of their male counterparts (n=17). For physicians between 41-55 years of age, 43% of males (n=44) and 25% of females (n=13) plan to reduce their practice activity. Sixty-seven percent (n=40) of male physicians over 55 expect to reduce their practice activity in the next 5 years as compared to 33% (n=2) of females in this age group.

When these planned reductions are viewed on the basis of the health region where the physician practices, the impact appears to be fairly evenly distributed, with Regions 1 and 5 having a potentially greater percentage of physicians planning to reduce their practice 56% and 53% respectively of all FP respondents (n=42 and n=9 respectively) and Region 3 having the least potential impact with 28% of their respondents (n=21) indicating plans to reduce activity levels. The other health regions have 44-48% of respondents indicating reductions. The magnitude and duration of reported increases/decreases have been factored into the forecast model as they have an impact on the potential supply of FPs during the 10-year planning horizon.

Interdisciplinary Practice

Family Physician survey respondents were asked to indicate their degree of interest in working within an interdisciplinary practice team practice either within their office, or in a CHC setting; very interested, somewhat interested or not interested.

Office Setting: There were 271 FPs (out of 339 FP respondents) who responded to the question relative to this practice model in their office setting. The analysis indicates that the age of FP physicians is the most significant variable that directly influences the level of interest in participating in an interdisciplinary practice. This relationship is statistically significant at the P=0.05 level. Forty-eight percent of those FPs under 40 years of age were very interested in this practice model. Most physicians in the 41-55 age cohort were somewhat interested and some were also very interested with 4 out of 5 having interest. Physicians over 55 years of age were least likely to be interested with 40% expressing no interest in interdisciplinary office practice.

In looking at this question on the basis of gender, there is no statistically significant difference between the level of interest expressed by male or female FPS in working with other health professionals in their office practice.

On a regional basis, FPs in Region 4 expressed almost twice the amount of interest in interdisciplinary office practice (nearly 60%) as their colleagues in Region 5 (33%). On average, 39% of FPs in Regions 1,2,3,6 and 7 were interested in this practice model.

CHC Setting: The analysis regarding interest in working in an interdisciplinary team model in a CHC setting revealed that almost 50% of physicians in the younger age group have a high degree of interest. Physicians between 41-55 show no strong tendency either way but are slightly more inclined to be less interested and older physicians are least interested in this model of practice.

On the basis of gender, female FPS are more inclined to be interested (78%) than male FPs (61%) in working in interdisciplinary teams within a CHC setting with 44% of female FPs expressing high degree of interest as compared to 28% male FPs.

On a regional basis, the FPs in Regions 6 and 2 expressed the least interest in interdisciplinary practice within a CHC, with 55% and 61% of physicians indicating very or somewhat interested as compared to other Regions, ranging between 66-79% of physicians expressing interest. Therefore, more than 50% of all respondents were very or somewhat interested in this model of practice.

6.3.2.6 Relative General/Family Practitioner Activity by Age and Sex[44]

There are systematic differences in relative activity level among male and female FPs of different ages. Annual billings, the “list size” (number of patients attributed to each physician), and the number of “active” days all follow similar patterns, which are stable throughout the time period examined (fiscal years 2000/2001 through 2002/2003). Younger female FPs (under age 35) with at least 50 active days of practice per year average 60% of the overall activity measures of the “typical” active family practitioner. Over the age of 35, female FPs average 85 to 90% of the billing activity of the “typical” active family practitioner. In contrast, male FPs under the age of 45 have average activity levels, and older male physicians 45 to 65 years old have the highest levels of activity, averaging 20 to 35% more General/Family Practice billings than the average active physician. These differences are summarized for 2000/2001, 2001/2002, and 2002/2003 in the following 3 tables.

[44] This analysis is based on Medicare physician billing and Hospital Services data versus survey data.

Table 44 - Average Activity Measures by FP Age and Sex in 2000/2001 (for FPs with at least 50 clinical days per year and not entering or leaving active clinical practice)

MD Age	Sex	Number	Mean Weight	Mean Active Days	Mean Number of Patients
Under 35	F	37	0.68	137	716
	M	32	1.00	169	1,096
35 - 44	F	79	0.85	165	1,055
	M	97	1.05	170	1,243
45 - 54	F	32	0.83	166	1,124
	M	86	1.34	198	1,675
55 - 64	F	5	0.89	166	1,134
	M	57	1.21	196	1,517
65 - 74	M	15	0.91	165	961
75+	M	3	0.53	162	712

Table 45 - Average Activity Measures by FP Age and Sex in 2001/2002 (for FPs with at least 50 clinical days per year and not entering or leaving active clinical practice)

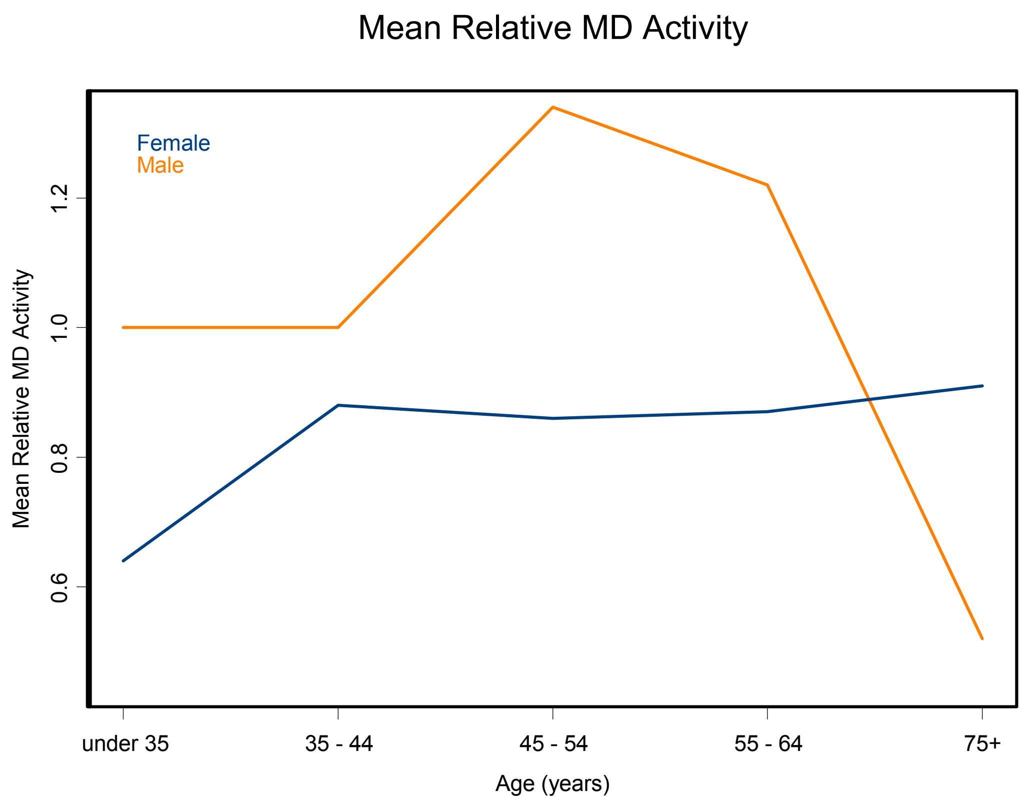
MD Age	Sex	Number	Mean Weight	Mean Active Days	Mean Number of Patients
Under 35	F	41	0.64	128	693
	M	29	1.05	173	1,101
35 - 44	F	75	0.89	166	1,067
	M	90	1.00	167	1,175
45 - 54	F	37	0.86	169	1,090
	M	93	1.35	192	1,589
55 - 64	F	5	0.87	163	1,110
	M	61	1.22	192	1,488
65 - 74	M	14	0.96	171	1,017
75+	M	2	0.35	106	448

Table 46 - Average Activity Measures by FP Age and Sex in 2002/2003 (for FPs with at least 50 clinical days per year and not entering or leaving active clinical practice)

MD Age	Sex	Number	Mean Weight	Mean Active Days	Mean Number of Patients
Under 35	F	48	0.64	124	678
	M	28	0.92	149	993
35 - 44	F	73	0.88	155	1,024
	M	80	1.00	163	1,157
45 - 54	F	37	0.91	165	1,133
	M	92	1.30	182	1,538
55 - 64	F	7	0.82	161	1,035
	M	65	1.32	192	1,546
65 - 74	M	16	0.89	164	975
75+	M	3	0.52	124	579

The next figure graphically illustrates the differences in physician activity by age and sex of physician.

Figure 9 - Annual Mean Relative Physician Activity Weight by Age and Sex of Physician (median of three fiscal years 2000/2001 to 2002/2003)



The implications of these practice patterns for physician human resource planning are clear and as such a customized New Brunswick approach to physician counting has been derived, based on the analysis presented above, to determine requirements for physicians, instead of the typical Full Time Equivalent (FTE) measurement tool. This new measurement tool is in the form of 'workload/activity weightings', and incorporates Medicare physician billing data correlated with Hospital Services data and broken down by age and gender and compared against average billings for Family Practitioners to determine a weighting, based on age and gender. Then as a qualitative checkpoint, results were compared against information received from the New Brunswick Physician Survey re: age and gender of FPs and their relative activity level. The results of this exercise are found in Section 6.3.2.8.

6.3.2.7 Summary Profile - Family Practitioners

The current analysis of the FP physician workforce in New Brunswick clearly indicates a trend toward reduction in effective supply.

From a new supply perspective, there is a shift occurring in the distribution among residents pursuing Family Practice and specialty practice with declining numbers of FP residents over the past 3-4 years, and an increasing percentage of females who, based on analysis, have smaller practices and are working fewer hours per week than their male counterparts. This trend will continue with females representing a steadily increasing percentage of medical school graduates.

When looking at the practice profile of FP survey respondents, generalized to the total FP population in New Brunswick, it would seem that there is evidence of a significant number of FPs practicing other than "traditional" general family medicine, which speaks to reduced access to primary care.

An additional factor supporting this risk is that 82% of FPs surveyed indicated they were not accepting new patients.

Based on Medicare billings, there is a difference in practice patterns on basis of age and gender that must be considered in planning New Brunswick's physician workforce. Data demonstrates that female physicians (the growing FP workforce) tend to work about 60% of a typical active FP up until the age of 35 after which time their practice increases to about 85-90% of the typical active FP. Current data tell us that females comprise a declining percentage of the older workforce and tend to leave practice at an earlier age. Male FPs between the ages of 45-65 tend to work 25-35% more than the typical active FP, therefore, physician replacement planning needs to recognize these phenomena and the significant gap this poses form an access to care perspective.

The new workforce (male and female) prefers smaller practice sizes (number of patient files in their practice). Survey results indicate that the most typical practice has 2500-3500 patients. When considering age, younger physicians report smaller practices, which could be a factor of building up a practice or, as other data and the literature would suggest, a preference for smaller practices (closer to 1500) plus they are working in other areas of practice other than general family medicine. Females (the growing percentage of the FP work force) have proportionately smaller practices yet again. Younger physicians also express interest in working in collaborative practice models in either an office based or CHC setting. Given the patient volumes are typically less in these service delivery models, the aging workforce with large practices has the potential to place a strain on the system in the absence of solid succession planning. The New Brunswick experience has shown that as physicians are leaving practices with larger numbers of patient files, there is insufficient capacity in the system to absorb these patients based on how physicians are practicing.

Of survey respondents, 149 (45%) indicated plans to reduce their practice activity over the next 5 years.

The net impact of all these factors is a reduction in effective supply. The implications for physician planning are clear. Planning must be dynamic and account for not only the breadth of practice of new supply, but their likely level of activity in the initial 5-10 years of practice, coupled with the tendency of the older workforce to taper off their practice. This is typical for most other professions and factors significantly into succession planning.

6.3.2.8 Supply Forecast of FP Workforce

Based on the information presented in the preceding sections, the supply forecast model results for Family Practitioners incorporates the following assumptions:

Gains

- New Brunswick attracts the following portion of national PGME graduates:

- – 2% in 2003-2013 based on historical average (ranging from 13 to 14 PGME entries to New Brunswick in these years) with a relative increased percentage of female FPs coming into the workforce

- New Brunswick recruits 3 FP international medical graduates (IMGs) per year from 2003 to 2013, based on historical averages

- New Brunswick receives 1 FP through immigration or return from abroad, excluding IMGs, per year from 2003 to 2013

Exits

- New Brunswick loses between 9 and 14 FPs to retirement per year from 2003 to 2013, based on historical physician-specific retirement rates, and knowledge of current New Brunswick FP demographics.

- New Brunswick loses between 1 and 2 FPs to death per year from 2003 to 2013, based on historical physician-specific death rates

- New Brunswick loses 4 FPs through emigration per year from 2003 to 2013, based on historical physician-specific rates of emigration

In addition, interprovincial migration nets out to zero FPs, as those leaving New Brunswick and coming to New Brunswick equate over the forecast period, based on historical physician-specific interprovincial migration data.

Given the dynamic nature of the physician workforce the following "what if" scenarios are presented to demonstrate the impact on the potential future supply of FPs in New Brunswick.

SCENARIO 1A – Base Case (All FPs)

In this scenario, all 609 FPs[45] contained in the New Brunswick Physician Database are entered into the model, regardless of their activity level or their activity areas (e.g. clinical, administration, teaching, etc.).

The results of this "what if" scenario, depicting the predicted supply of New Brunswick physicians at each year-end, can be found in the following table.

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[45] There are 612 FPs in the Physician Database, however, 3 of them are over 80 years of age and are not included in the forecast model, thus 609 is used as base stock for purposes of modeling.

Table 47- SCENARIO 1A - Base Case (All FPs)

All New Brunswick GPs/FPs			
YEAR-END	TOTAL GPs/FPs	% Female	% >55
Base Stock Mar 2003	609	37%	20%
2003	612	38%	18%
2004	615	39%	19%
2005	619	40%	21%
2006	622	42%	21%
2007	627	43%	22%
2008	632	44%	24%
2009	639	44%	25%
2010	648	45%	26%
2011	654	46%	26%
2012	660	47%	26%
2013	665	48%	29%

SCENARIO 1B – Base Case with Workload Weightings

Based on Medicare data over a three-year period (2000/01 – 2002/03), (see Section 6.3.2.6 - Relative General/Family Practitioner Activity by Age and Sex), and supported by information from the physician survey, a made-in-New Brunswick measurement/counting tool was developed to reflect, as closely as possible, how New Brunswick physicians are actually practicing, and how that will change over the 10-year forecast period.

Workload weighting takes into account the following assumptions and observations:

- Female physicians comprising an increasing proportion of total FP workforce
- Female physicians see fewer patients, work fewer hours than male counterparts and leave workforce sooner
- 'New workforce' working differently (i.e., smaller practices and lower patient volumes) than old workforce
- Older physicians ramping down their practice pre-retirement
- Workload/Activity Weightings presented in the table below are constant throughout the forecast period (e.g., a 34 year old female's weighting is 0.65 throughout).

The following table shows the workload weightings that are applied to the total FP workforce.

Table 48 - Workload/Activity Weighting, by Age and Sex

Age	Sex	Mean Weight[46]
Under 35	F	0.65
	M	0.99
35-44	F	0.87
	M	1.02
45-54	F	0.87
	M	1.33
55-64	F	0.86
	M	1.25
65-74	F	N/A
	M	0.92
75+	F	N/A
	M	0.48

The results of Scenario 1B, presented in the following table, forecasts the total GP/FP workforce with weightings applied (i.e. Scenario 1A multiplied by the weightings in the above table):

Table 49 - SCENARIO 1B - Workload Weighted Base Case

All GPs/FPs - Workload Weighted	
YEAR-END	**TOTAL GPs/FPs *workload weighted***
Base Stock Mar 2003	617
2004	626
2005	630
2006	635
2007	637
2008	635
2009	638
2010	644
2011	651
2012	652
2013	654

[46] Weighted average of 2000/01, 2001/02, and 2002/03 Medicare data.

SCENARIO 2A – Comprehensive FP Practice

Scenario 2 filters out a number of FPs according to responses to the physician survey and an analysis of those Medicare billings for services provided in a family physician's office setting as described below.

Family physicians were not considered to provide comprehensive FP primary care and were removed from this scenario if:

- >80% of their time/billings in the Emergency Room (ER)
- >80% of their time/billings doing Operative Assists (OR Assists)
- >80% of their time spent in Medical Administration + Academics/Teaching + Committee Work
- >80% of their time spent in Government + Private Industry

Scenario 2A would appear to be a more realistic reflection of the future picture for Family Physicians actually servicing the population in a comprehensive/fundamental primary care role. It reflects current data, as well as anecdotal evidence, of an emerging trend of family physicians providing other than office-based services, which is material to planning.

The results of this Scenario are represented in the following table[47].

[47] Note: the 2002/03 Medicare billing data are not an exact match to the current supply snapshot taken from the Medicare database in March 2003, and supplemented with additional information from the physician survey which spanned April to June 2003. Thus, Scenario 2 is a combination of information from these two sources.

Table 50 - SCENARIO 2A - Comprehensive FP Practice

GPs/FPs with Comprehensive FP Practice			
YEAR-END	TOTAL GPs/FPs	% Female	% >55
Base Stock Mar 2003	533	38%	21%
2003	536	39%	19%
2004	541	40%	20%
2005	545	41%	21%
2006	549	42%	22%
2007	554	43%	22%
2008	560	45%	24%
2009	569	46%	26%
2010	578	47%	25%
2011	586	48%	26%
2012	593	49%	26%
2013	599	49%	29%

FPs in other than office-based practices

It has been argued that, for planning access to primary care, FPs should be segmented between those providing community, office-based services and those providing other than office based primary care. Office location billings could therefore be considered a proxy for the fundamental, community-based primary services provided by family physicians, recognizing that family physicians also perform and bill for services outside the office setting as part of a comprehensive FP practice. The value of FPs providing other than office-based services is significant however, to the overall effectiveness of primary care services in the province. The relative percentage of those family practice physicians providing non-office based care needs to be closely monitored over time however, in relation to the effective demand for primary care.

Analysis of the current FP workforce shows that there are approximately 76 FPs playing a role in the system in other than an office-based setting, such as: the Emergency Room (ER), performing OR assists, Nursing Home duties, Medical Administration, Academic duties, and work in Industry and Government. The vast majority (around 40, or nearly 60%) of these FPs are primarily spending their time in the ER, followed by OR assists (over 20, or 35%), then Medical Administration (4 FPs), and then a few each in Nursing home roles, working for private industry and government.

Of the 76 FPs filling these roles in the system, there are currently 16 of them over the age of 50 which poses a potential retirement risk within the 10-year forecast period.

SCENARIO 2B – Comprehensive FPs with workload weighting

The same approach as was used for Scenario 1B is applied below and the results of Scenario 2B are presented in the following table:

Table 51 - Comprehensive FPs with workload weighting

Comprehensive FPs with Workload Weighting	
YEAR-END	COMP. GPs/FPs *workload weighted*
Base Stock Mar 2003	541
2004	548
2005	551
2006	557
2007	559
2008	559
2009	562
2010	568
2011	575
2012	579
2013	581

SCENARIO 3A & 3B –Comprehensive FPs with Workload Weighted and Planned Practice Changes

Scenario 3A and 3B are based on Scenario 2A; however, an additional consideration, based on response to the physician survey, further weights physicians up or down based on self reported planned practice changes (increase or decrease), the expected magnitude of that change (0-100%), and the duration. Only physicians who indicated that their practice plans were permanent were included in this weighting to allow application to the entire forecast period. It should be noted that this weighting could only be applied to the 55% of FP physicians responding to the survey and therefore supply could be overstated in this scenario.

In addition, Scenario 3B factors in workload weightings as discussed previously. The results of these scenarios are presented in the following table.

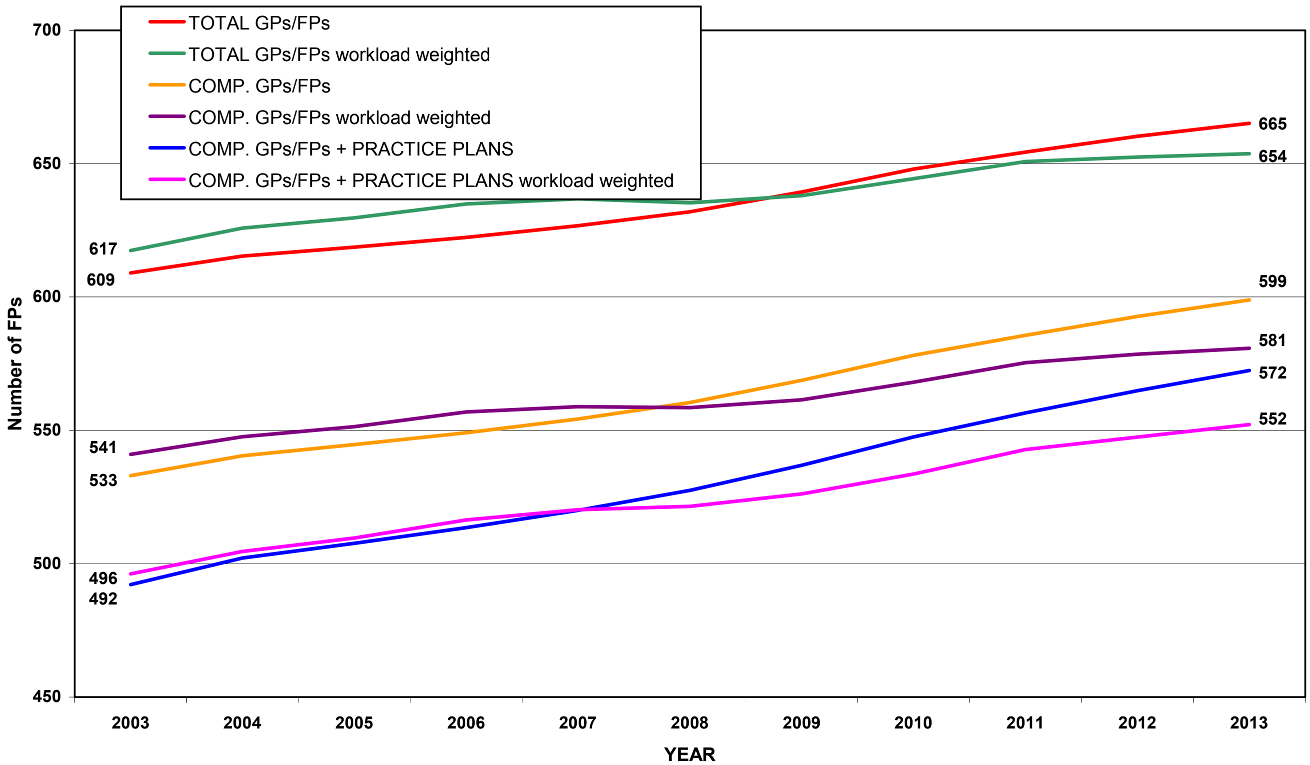
Table 52 - SCENARIO 3A & 3B – Comprehensive FPs with Workload Weighting & Planned Practice Changes

Comprehensive GPs/FPs - Workload Weighted + Planned Practice Changes		
	Scenario 3A	Scenario 3B
YEAR-END	COMP. GPs/FPs	COMP. GPs/FPs *workload weighted*
2003	492	496
2004	502	505
2005	508	510
2006	513	516
2007	520	520
2008	527	521
2009	537	526
2010	548	534
2011	557	543
2012	565	547
2013	572	552

Summary of "What if" Scenarios

Based on these three scenarios, the range of family physicians expected to be available over the forecast period (2003-2013) is detailed in the following figure.

Figure 10 - FP Supply Forecast (Scenarios 1, 2, and 3)



As depicted above, depending on the scenario used to describe this workforce, the **supply of Family Practitioners ranges from 492-617 in 2003, to 552-665 in 2013**. The nature of the growth of this current and future FP workforce is characterized as follows:

- The Total current FP workforce at 609 FPs (red line), expands to 617 (green line) when workload weights are applied, this reflects the fact that the portion of the workforce with a mean weight >1.0 (males <65 years old) is larger than the portion of the workforce with a mean weight of <1.0 (females).
- This phenomenon remains roughly constant until 2008-2009, when the lines intersect, which reflects the fact that the female portion of the workforce (weighting of <1.0) plus the >65 male portion (weighting of <1.0) is now outnumbering the <65 male portion of the workforce (weighting >1.0).
- Thereafter (to 2013) the gap widens between actual numbers of FPs (red line) and weighted FPs (green line), which reflects the fact that over this time period the portion of the workforce that is weighted at <1.0 continues to expand, and the portion of the workforce that is weighted at >1.0 continues to contract.
- A similar phenomenon occurs in the Comprehensive FP workforce, however, the gap between those FPs providing comprehensive care (orange line) and the workload weighted FPs providing comprehensive care (purple line) is narrower at the beginning of the forecast period, which reflects

the fact that there are more <1.0 weighted FPs (generally females) providing comprehensive FP care, and this continues to grow over time.

- In addition the intersection of these 2 lines (orange and purple) occurs sooner than for Total FPs, and the gap widens more quickly between 2007 and 2013, which reflects the fact that female FPs and the >65 male FPs are continuing to comprise more and more of the workforce over this time period.

- When planned practice changes are factored into the Comprehensive FP workforce, the number of physicians planning to reduce their practice far outweighs the number planning to expand their practice. Resulting in greatly reduced effective supply to service the population.

In summary, as discussed extensively in preceding sections of this report, this analysis for the New Brunswick FP workforce mirrors the national picture, of increasing feminization and aging of the physician workforce. This, coupled with the fact that female physicians' have smaller practice sizes and lower patient volumes than their male counterparts, and in addition, that the aging physicians' activity level/workload is lower than that of the <65 year old physicians, **equates to a workforce that is not necessarily contracting in numbers, but is working differently with reduced volumes**. This is supported by the planned practice changes as articulated by physicians in the physician survey, where at every age group there are plans to reduce practice activity level from 25% to 100% on a permanent basis. The extent to which patient acuity levels impact volumes of patients seen was not quantified in this study.

The implications from this analysis are that there is a high probability that more FP physicians will be required in the future to meet the same level of primary care as is required by New Brunswickers today.

Health Region FP Supply Forecast

As presented in the table and figure on the following page, the FP supply forecast by health region estimates the growth rates of FP supply, over the 2003-2013 period, as follows:

Table 53 – Growth Rates of FP Supply (2003 to 2013)

	Region 1	Region 2	Region 3	Region 4	Region 5	Region 6	Region 7
% Growth	28%	15%	17%	26%	0%	15%	33%

These growth rates are based on the following estimated inputs:

Gains = New entries from PGME + International Medical Grads (IMGs)

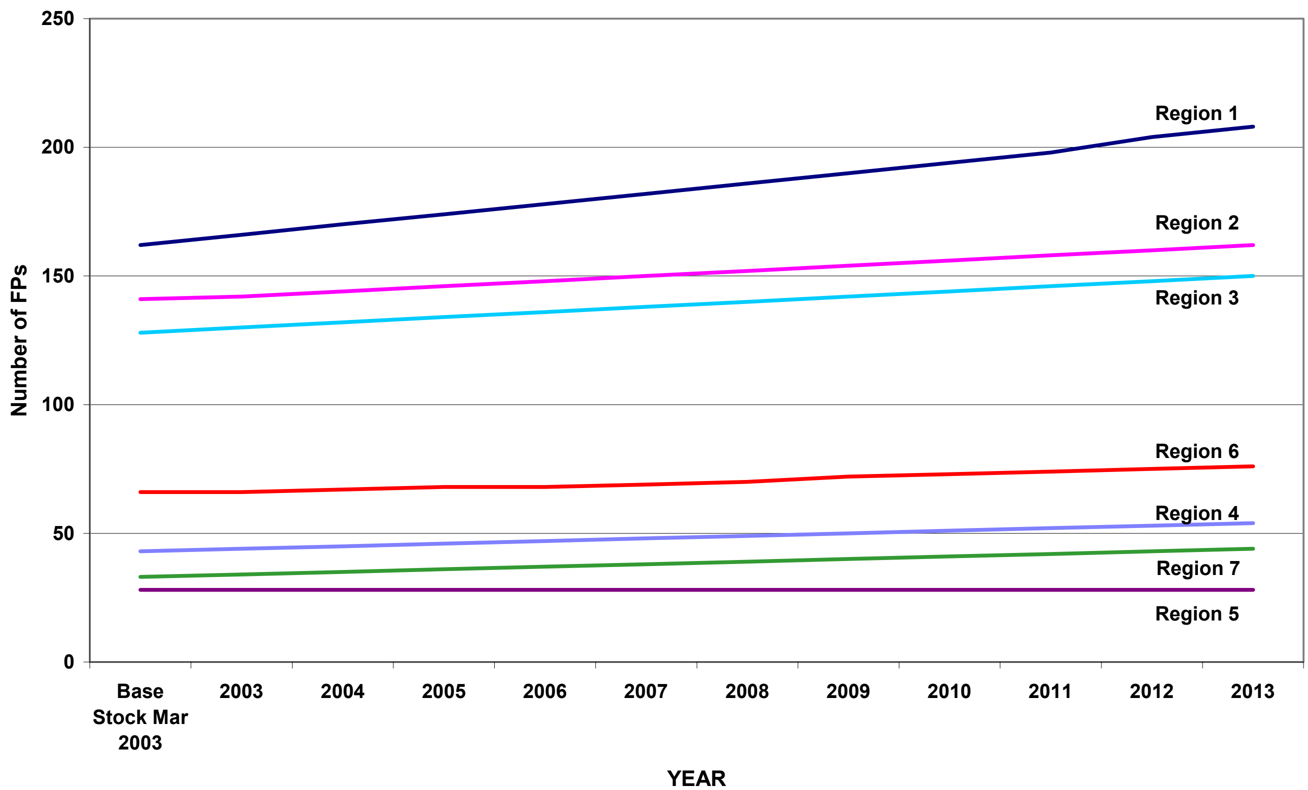
Exits = Retirements + Deaths

Due to the statistically small cell sizes when conducting health region forecasting, there is deemed to be a negligible impact from the following inputs: immigration, emigration, and interprovincial migration.

Table 54 – FP Supply Forecast, by Health Region

General/Family Practitioners - Health Region Supply Forecast							
YEAR	Region 1	Region 2	Region 3	Region 4	Region 5	Region 6	Region 7
Base Stock Mar 2003	**162**	**141**	**128**	**43**	**28**	**66**	**33**
2003	166	142	130	44	28	66	34
2004	170	144	132	45	28	67	35
2005	174	146	134	46	28	68	36
2006	178	148	136	47	28	68	37
2007	182	150	138	48	28	69	38
2008	186	152	140	49	28	70	39
2009	190	154	142	50	28	72	40
2010	194	156	144	51	28	73	41
2011	198	158	146	52	28	74	42
2012	204	160	148	53	28	75	43
2013	208	162	150	54	28	76	44

Figure 11 - FP Supply Forecast, by Health Region



A finer analysis of regional data would not be of any statistically significant value given the small cell sizes. However, the following highlights describing the composition of the current FP workforce lend value to the regional planning picture, and should be monitored throughout the planning period to enrich planning for family physicians on a region specific basis.

The table presented below reveals the health regions to be most impacted by impending retirements within the 10-year planning period are Regions 2, 5 and 6, all with 36% of the FP workforce currently over the age of 50, and thus coming into the potential retirement zone within the 2003 – 2013 period.

Table 55 - Potential Retirements within 10-year Forecast Period, by Health Region

	Region 1	Region 2	Region 3	Region 4	Region 5	Region 6	Region 7
# (%) of FPs >50 yrs.	33 of 162 (20%)	52 of 143 (36%)	40 of 128 (31%)	9 of 43 (21%)	10 of 28 (36%)	24 of 67 (36%)	10 of 33 (30%)

In addition, as presented in the table below, the health regions most representing, at current state, feminization of the workforce and hence evidenced lower patient volumes and smaller practice sizes per practitioner, are Regions 1, 3 and 6, with currently 46%, 40% and 39%, respectively, of the FP workforce being female. As discussed previously, this feminization of the FP workforce is expected to continue in the 10-year planning period and beyond.

This phenomenon brings new human resource planning considerations, in that, different male versus female practice patterns and temporary leaves due to maternity will be the common reality. Changes in the gender composition of regional FP workforces should be monitored over time to ensure that appropriate physician planning considerations are taken into account depending on regional variations.

Table 56 - Gender Composition of FP Workforce, by Health Region

	Region 1	Region 2	Region 3	Region 4	Region 5	Region 6	Region 7
Male	88 (54%)	101 (71%)	77 (60%)	29 (67%)	19 (68%)	41 (61%)	25 (76%)
Female	74 (46%)	42 (29%)	51 (40%)	14 (33%)	9 (32%)	26 (39%)	8 (24%)
Total	162	143	128	43	28	67	33

6.3.2.9 Demand for FP Services[48]

A schematic of the demand side methodology is presented in Section 4.4.1 and the detailed methodology can be found in Appendix H. The key factors and findings of the demand analysis for FP services are presented in this section of the report.

Data Sources

The data sources utilized for the Family Practitioner demand side analysis and forecast included:

- Medicare physician billing data for 2000/2001, 2001/2002, 2002/2003
- Hospital Discharge Abstract Data (DAD) from 2001/2002

Analysis was initially conducted for 2001/2002 with physician billing data and cross-referenced to the hospital abstract data for validity checks. All analyses for existing and future demand were based on physician billing data and was conducted first for 2001/2002 and verified with 2002/2003 data. Results for both years were very similar.

This analysis was conducted for all physicians listed as general practitioners in the billing database. This may not include salaried and/or sessional physicians. As such, the results of the analyses should be interpreted in light of known variations in the distribution and activity levels of the salaried/sessional physicians.

Influence of Population Change on Expected use of FP Services to 2013

Roughly 66% of the New Brunswick population had at least 1 office visit in the year. However, the expected use of FP services by the population varies with the age and sex of the patient. As anticipated, the utilization pattern is such that virtually all children 0 to 4 years of age have annual contact with family physicians. Older children and adolescents decrease contact with family physicians such that only 60% of 10- to 14-year olds will visit a family physician in any year. Thereafter, more than 80% of females have annual visits to family physicians throughout their lifetime, while for males the likelihood of visiting a family doctor within a year gradually increases from approximately 50% for 20 to 24 year olds, to 80% for those over the age of 65. In addition, the pattern of average annual number of encounters with family doctors by age and sex is similar. Figure 12 demonstrates the differences among per capita billings for different age and sex categories, Figure 13 shows probability of having a FP encounter based on age and sex category, and Figure 14 shows the number of FP encounters per year by age and sex category. Clearly, age and sex have a significant impact on FP utilization.

[48] Data and analysis for this section of the report provided by New Brunswick Department of Health and Wellness, Hospital Services Division.

Figure 12 - Per Capita Use of FP Care, by Age Category

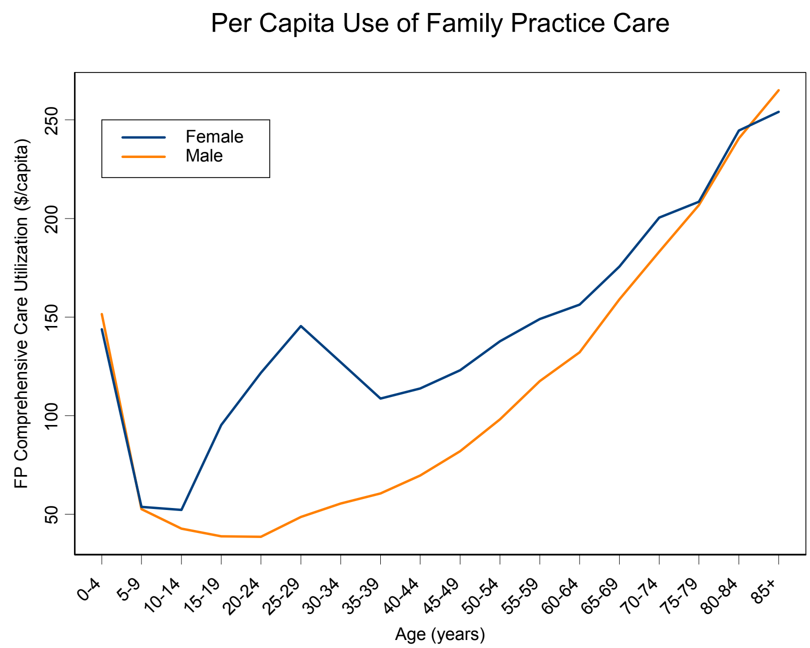


Figure 13 - Probability of FP Encounter, by Age and Sex Category

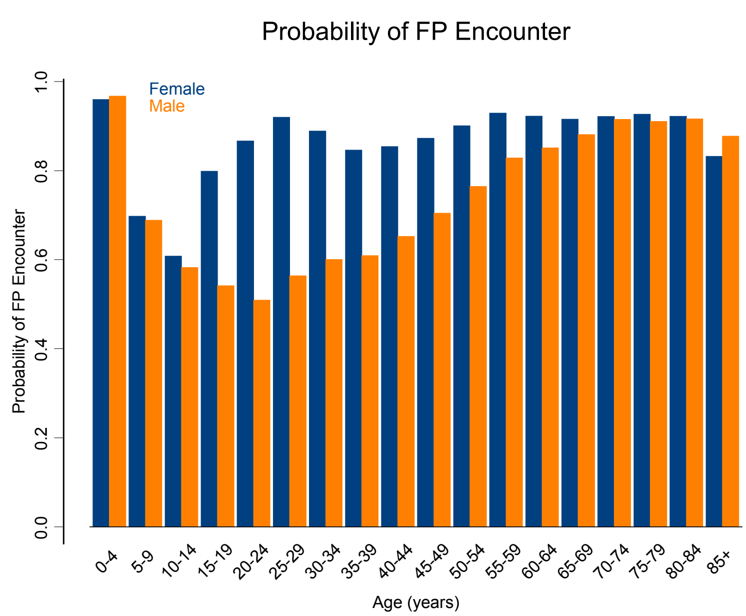
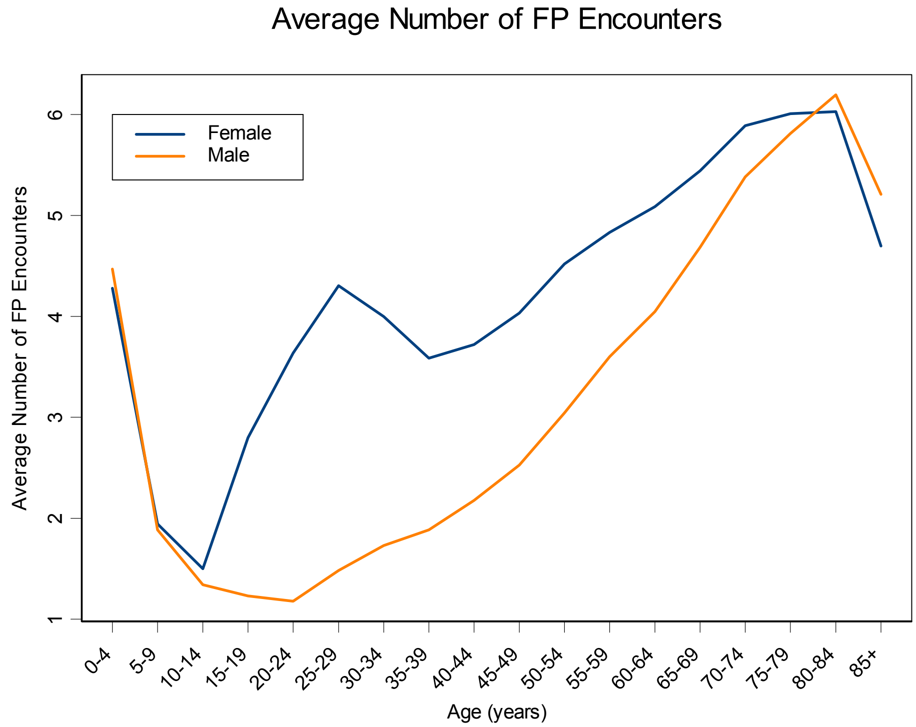


Figure 14 - Average Number of FP Encounters per year by Age and Sex Categories



Hence, the projected demand for FP services depends on both the utilization rate of service by age and sex, and the population structure. In order to estimate expected demand for FP services in the future, current rates of service (annual billings for "comprehensive family practice" service per capita by age and sex) were assumed, and these per capita rates were applied to the projected population size and structure for each health region in New Brunswick, for each year from 2001/2002 or 2002/2003 to 2013.

The projections of the future demand for FP services are based on the New Brunswick population forecasts to 2013, which were prepared in 2000 from existing Statistics Canada projections (based on 1996 Census data). Unfortunately, based on new knowledge from the 2001 Census, these projections of population structure for New Brunswick are seriously compromised by significant inaccuracies.

The population forecasts seriously overstated the overall size and the structure of the population. It is evident from the nature of the projections that they accurately estimated the aging of the population (as evident from the accurate estimate of the population size for those aged 50 years and older), but missed a large net migration among males aged 20-35 years, females in their 20s, and the combination of out-migration of younger children with their young parents, and lower provincial birth rates due to the out-migration of young families. The following figures illustrate the dramatic difference between 2001 projections (based on 1996 Census) and 2001 actual Census figures.

Figure 15 - New Brunswick Census and Projections - Males

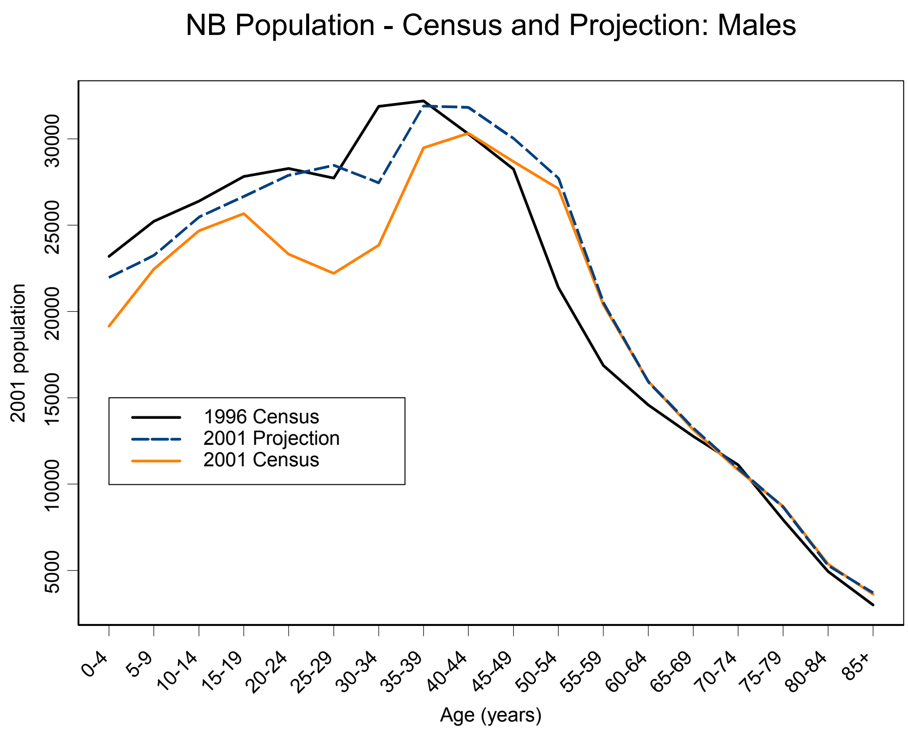


Figure 16 -New Brunswick Population Census and Projections – Females

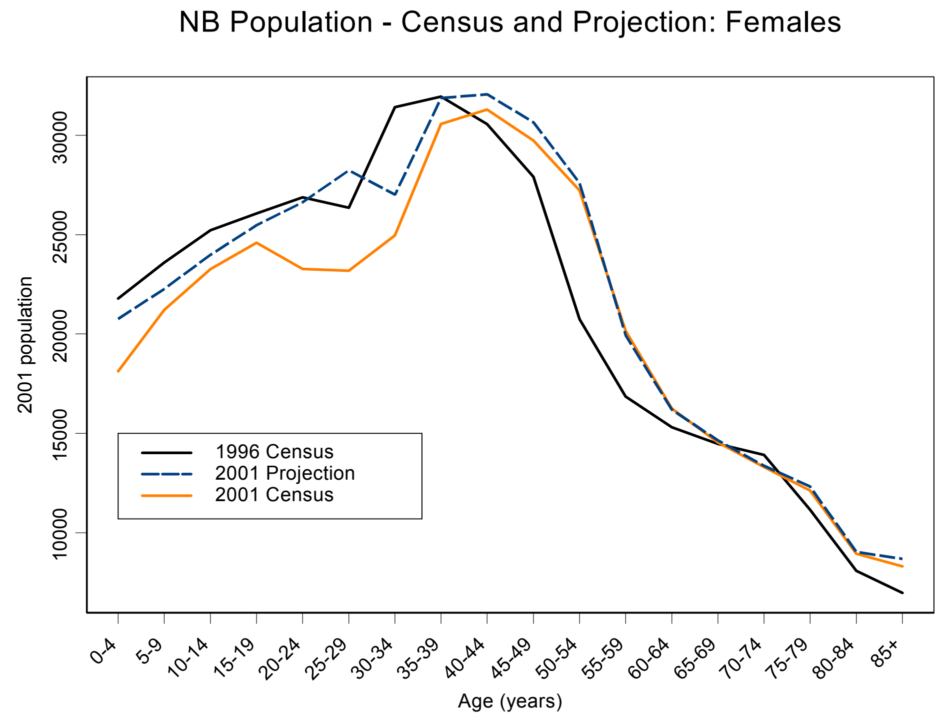
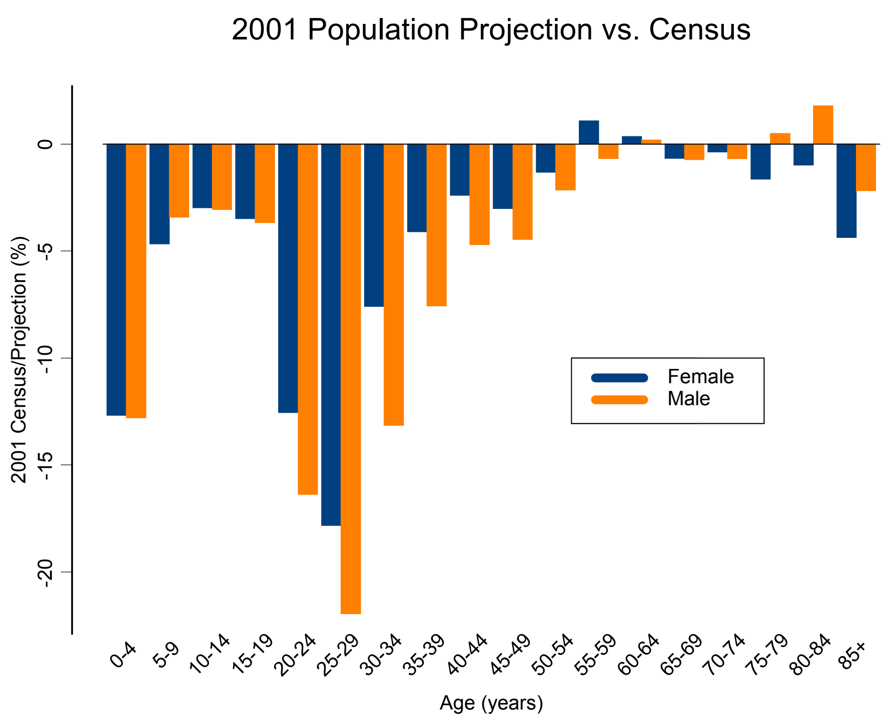


Figure 17 - Population Projections compared to 2001 Census



Hence, the population structure of the province in 2001 was radically different than that which had been projected in 2000 based on the 1996 Census. Since the existing population projections to the year 2016 are based on the same methodology, which neglected the phenomenon of migration of young adults, estimates of the future demand for FP services must be approached with caution.

Since approximately 50% of family practice billings are for patients aged 50 years and older, the component of increased demand due to aging ought to be accurately estimated with existing population projections. On the other hand, should the migration phenomenon continue, with further declines in the overall size of the younger population, existing projection patterns will overstate the growth in need for FP services, particularly for pediatric and obstetrical services.

The forecasts for increase in demand for FP services were calculated as per the methodology found in Appendix H. Using these projections, population-based needs and effective physician requirements by health region for the years from 2001 to 2013 were estimated. The expected numbers of Family Practice physicians were then calculated for future years, based on these growth projections. The results are presented in the following table.

Table 57 - Expected "Active" FPs by Region for 2001 and 2003 through 2013

Region	Expected "active" GPs 2001	Expected "active" GPs 2003	Expected "active" GPs 2004	Expected "active" GPs 2005	Expected "active" GPs 2006	Expected "active" GPs 2007	Expected "active" GPs 2008	Expected "active" GPs 2009	Expected "active" GPs 2010	Expected "active" GPs 2011	Expected "active" GPs 2012	Expected "active" GPs 2013
1	121.1	122.5	123.7	125.0	126.2	127.3	128.4	129.4	130.5	131.5	132.4	133.2
2	112.7	113.4	114.1	114.9	115.6	116.3	117.1	117.9	118.7	119.4	120.2	121.0
3	106	107.1	108.1	109.2	110.2	111.2	112.3	113.3	114.3	115.3	116.2	117.2
4	33.9	34.3	34.7	35.1	35.5	35.8	36.2	36.5	36.8	37.1	37.4	37.6
5	20.1	20.2	20.3	20.4	20.5	20.6	20.8	20.9	21.0	21.0	21.2	21.3
6	54.3	54.8	55.2	55.6	56.1	56.5	56.9	57.3	57.7	58.1	58.5	58.8
7	30.2	30.3	30.4	30.5	30.6	30.7	30.9	31.0	31.1	31.2	31.5	31.6
Total	478.3	482.5	486.5	490.7	494.6	498.5	502.5	506.3	510.1	513.7	517.3	520.7

Accounting for Current Unmet Demand

The table above presents the forecast of FP requirements, based on the population's past utilization of service of the existing FP workforce, and the changing population demographics over the 10-year forecast horizon.

In addition to this approach using strictly utilization and population demographics, it is crucial to account for what is perceived to be unmet demand in the province. The proxy for this unmet demand was determined, based on Steering Committee input, to be the current shortage of Family physicians in the system.

An April 30, 2003 snapshot of the shortage in General Practice/Family Medicine (comprised of unfilled positions, new positions added but not yet filled, and the shortfall in 2003/04 targets established by the Physician Resources Advisory Committee), indicated a significant **shortfall of 61 Family Practice positions** across the province. This number is added to the forecast for expected "active" FPs 2003 (482.5), for a Total Perceived Demand figure of 543.5. The same growth rate that is applied to expected "active" FPs is then applied to this new figure to arrive at Total Perceived Demand for each year of the Forecast Period. The table is provided on the following page.

Table 58 - Total Perceived Demand

YEAR	EXPECTED 'ACTIVE' GPs *based on util. & pop'n*	TOTAL PERCEIVED DEMAND
2003	482.5	543.5
2004	486.5	548.0
2005	490.7	552.7
2006	494.6	557.1
2007	498.5	561.5
2008	502.5	566.0
2009	506.3	570.3
2010	510.1	574.6
2011	513.7	578.6
2012	517.3	582.7
2013	520.7	586.5

Population Health and FP Services

Population health data is not included in the FP demand side analysis and forecast, as the confounding factors influencing demand for FP services are too numerous to allow isolation of direct relationships between disease prevalence and the associated demand for family practice services.

Demand Side Weighted Inputs

Rational physician resource planning should include quantified impacts of any provincial health policy or changes to service delivery models that will materially influence the demand for physician services. The Provincial Health Plan, which is under development by Government, is a critical element in physician resource planning. The details of this plan were not available for inclusion in this report; however, as these become articulated they must be factored into the forecast model, as there is a high probability any proposed changes to the current reality will significantly influence the demand for services.

6.3.2.10 Gap Analysis

The Provincial Picture

The gap analysis is to be used as a guideline for future planning, given that the source of the analysis is scenario-based and includes assumptions as to the nature of the FP workforce. It is important that numbers are not isolated and discussed out of context of the complete picture. The intent of the gap analysis is to bring physician planners closer to what is believed to be the reality of the current and future workforce.

If not addressed as early in the forecast period as possible, the requirements for family physicians, as presented in the following table, will continue to worsen as time goes on. There are qualitative factors that are believed to exacerbate this picture in that, as the situation worsens, the strain on the existing workforce increases, hence attrition may increase above what is forecast.

The gap analysis is most accurately conducted between supply-side Scenario 3A & 3B (Table 52) and demand-side Total Perceived Demand (Table 58). This brings together the Comprehensive FP workforce (both total and workload weighted), and the closest estimate of effective physician requirements to meet demand, in addition to the recognizing the existence of unmet demand in the system. The results of this analysis are presented in the following table. Please note the estimated requirement for FPs in each year of the forecast period is represented by the ranges between the 2 columns, which are dependent upon how replacement FPs may be practicing. These numbers represent the number of family physicians that will be required to replace exiting physicians, in addition to those needed to meet new population demand for service.

Table 59 – Predicted FP Requirements for New Brunswick (2003-2013)

	NEW BRUNSWICK FP Requirements* *accounting for replacements & forecast new demand*	
YEAR	**COMP FPs**	**COMP FPs** *workload weighted*
2003	51.4	47.4
2004	45.9	43.4
2005	45.1	43.1
2006	43.6	40.8
2007	41.6	41.3
2008	38.5	44.5
2009	33.4	44.1
2010	27.0	41.0
2011	22.1	35.8
2012	17.8	35.2
2013	14.1	34.4

** Only to be used as one input to inform solid Provincial FP planning*

In addition, over and above the requirements represented by the gap ranges above, there are currently physicians in the system who are forecast to retire over the next 10 years, who have much larger practices than the new generation of physicians replacing them are willing to assume. Specifically, 35 FPs in the province over the age of 50 years of age responded to the survey as having practices of between 3500 and more than 5500 active patients. These self reported practice sizes may or may not be inflated; however, based on the analysis relative to practice sizes and activity levels, the system needs to plan for a replacement factor of 2.3 to 3.0 times more FPs to assume the care for the patients in the practices of these retiring physicians (based on desired practice size of between 1500-2000 for new FPs).

The implications of this picture are such that the requirement for about 40 FPs on average over the 10-year period, as presented in Table 59, could in fact, be amplified significantly.

Government can attempt to mitigate these anticipated shortages, through aggressively escalating planned changes to service delivery models such as collaborative practice and Community Health Centres, in addition to creating more flexible physician resource management policies, thereby creating a truly

Physician Friendly New Brunswick. Active succession planning, requiring the cooperative efforts of the Department, the physician community, Regional Health Authorities and their respective communities will also be required to complement recruitment efforts in order to manage this situation.

The Regional Picture

In this section the physician requirements represented in the previous analysis, for the province as a whole, are distributed by health region. However, it is important to note that the margin for error increases with the small cell sizes of regional data, posing a significant limitation to this approach. Therefore, **an important caveat to the regional physician requirements presented in the following pages is that these data are to be used as only one input to inform solid regional planning.**

The distribution of provincial demand on a health region basis is presented in the following table:

Table 60 – Health Region Distribution of Provincial Demand for FP Services

	Region 1	Region 2	Region 3	Region 4	Region 5	Region 6	Region 7
% of total FP requirements	23.4%	22.9%	21.4%	8.6%	4.1%	12.8%	6.8%

Tables 61 to 67, presented on the following pages, provide the health region forecast for FP requirements for each year of the 10-year forecast period. As with the provincial forecast, the regional forecast presents ranges depending on the characterization of the FP workforce (comprehensive FPs and workload weighted comprehensive FPs). In addition, the tables provide a breakdown in the composition of the forecast FP requirements, as to what portion of the requirements are due to replacement (retirements and deaths), or due to additional new demand in the system for FP services. This breakdown is intended only to provide direction for planners, as it will be crucial to balance the forecast with region-specific information through collaboration with each health region.

All tables account for replacements for retirements and deaths, and forecast new demand, and factor in new PGME entries, based on New Brunswick's historical experience of attracting 2% of the national pool of PGMEs over each of the past 10 years. Forecasting this foreword over the 10-year planning period (2003-2013), this equates to between 13 and 19 new entrants to the New Brunswick Family Practice workforce each year that are proportionately divided amongst the health regions. As such, the physician requirements forecast in the following tables are over and above the PGME entries typically received by the province on an annual basis.

As presented in the tables on the following pages, and given the limitations discussed above, the current (2003) regional requirements for FPs (2003) are forecast as follows:

Region 1: 11-12 FPs (7.2% of current FP workforce in Region 1)

Region 2: 11-12 FPs (8.3% of current FP workforce in Region 2)

Region 3: 10-11 FPs (8.4% of current FP workforce in Region 3)

Region 4: 4-5 FPs (10.6% of current FP workforce in Region 4)

Region 5: 2 FPs (7.5% of current FP workforce in Region 5)

Region 6: 6-7 FPs (10.1% of current FP workforce in Region 6)

Region 7: 3-4 FPs (10.9% of current FP workforce in Region 7)

Generally, the forecast FP requirements decrease over each year of the 2003 to 2013 period; however, it is important to note that active management of the regional FP workforce is crucial, as the requirements forecast do not account for replacement of retiring FPs who have large practices. **As discussed previously in the provincial FP analysis, based on new workforce practice patterns, a replacement factor of 2.3 to 3.0 can be expected to be applied to these large practices, which means in some years of the forecast period, the requirements contained in the following tables will be understated.** This phenomenon is most pertinent for those health regions that have a high percentage of the current workforce over the age of 50, as depicted in Table 55.

Table 61 - Region 1 FP Forecast Requirements

REGION 1				
	FP Requirements* *accounting for replacements & forecast new demand*		**Breakdown of Comp FP Requirements** *based on lefthand column 'COMP FPs'*	
YEAR	COMP FPs	COMP FPs *workload weighted*	Approximate Replacement**	Approximate New Demand
2003	12.0	11.1	1.3	10.7
2004	10.7	10.2	1.4	9.3
2005	10.6	10.1	1.8	8.8
2006	10.2	9.5	1.8	8.4
2007	9.7	9.7	2.0	7.7
2008	9.0	10.4	2.2	6.8
2009	7.8	10.3	2.0	5.8
2010	6.3	9.6	2.2	4.1
2011	5.2	8.4	2.6	2.6
2012	4.2	8.2	2.9	1.3
2013	3.3	8.1	2.9	0.4
** Only to be used as one input to inform solid Regional FP planning*			*** for Retirement & Death*	

Table 62 - Region 2 FP Forecast Requirements

REGION 2				
	FP Requirements* *accounting for replacements & forecast new demand*		**Breakdown of Comp FP Requirements** *based on lefthand column 'COMP FPs'*	
YEAR	COMP FPs	COMP FPs *workload weighted*	Approximate Replacement**	Approximate New Demand
2003	11.8	10.8	3.3	8.5
2004	10.5	9.9	3.0	7.5
2005	10.3	9.9	2.9	7.4
2006	10.0	9.3	2.7	7.3
2007	9.5	9.5	2.7	6.8
2008	8.8	10.2	2.9	5.9
2009	7.6	10.1	2.8	4.8
2010	6.2	9.4	2.7	3.5
2011	5.1	8.2	3.2	1.9
2012	4.1	8.1	3.3	0.8
2013	3.2	7.9	3.2	0.0
** Only to be used as one input to inform solid Regional FP planning*			*** for Retirement & Death*	

Table 63 - Region 3 FP Forecast Requirements

REGION 3				
	FP Requirements* *accounting for replacements & forecast new demand*		**Breakdown of Comp FP Requirements** *based on lefthand column 'COMP FPs'*	
YEAR	**COMP FPs**	**COMP FPs** *workload weighted*	**Approximate Replacement****	**Approximate New Demand**
2003	11.0	10.1	2.5	8.5
2004	9.8	9.3	2.4	7.4
2005	9.7	9.2	2.3	7.4
2006	9.3	8.7	2.5	6.8
2007	8.9	8.8	2.6	6.3
2008	8.2	9.5	2.8	5.4
2009	7.1	9.4	2.5	4.6
2010	5.8	8.8	2.4	3.4
2011	4.7	7.7	2.9	1.8
2012	3.8	7.5	2.9	0.9
2013	3.0	7.4	2.9	0.1
** Only to be used as one input to inform solid Regional FP planning*			*** for Retirement & Death*	

Table 64 - Region 4 FP Forecast Requirements

REGION 4				
	FP Requirements* *accounting for replacements & forecast new demand*		**Breakdown of Comp FP Requirements** *based on lefthand column 'COMP FPs'*	
YEAR	**COMP FPs**	**COMP FPs** *workload weighted*	**Approximate Replacement****	**Approximate New Demand**
2003	4.4	4.1	0.5	3.9
2004	3.9	3.7	0.8	3.1
2005	3.9	3.7	0.7	3.2
2006	3.8	3.5	0.7	3.1
2007	3.6	3.6	0.6	3.0
2008	3.3	3.8	0.2	3.1
2009	2.9	3.8	0.5	2.4
2010	2.3	3.5	0.5	1.8
2011	1.9	3.1	0.6	1.3
2012	1.5	3.0	0.6	0.9
2013	1.2	3.0	0.7	0.5
** Only to be used as one input to inform solid Regional FP planning*			*** for Retirement & Death*	

Table 65 - Region 5 FP Forecast Requirements

REGION 5				
	FP Requirements* *accounting for replacements & forecast new demand*		**Breakdown of Comp FP Requirements** *based on lefthand column 'COMP FPs'*	
YEAR	COMP FPs	COMP FPs *workload weighted*	Approximate Replacement**	Approximate New Demand
2003	2.1	1.9	0.9	1.2
2004	1.9	1.8	0.8	1.1
2005	1.9	1.8	0.9	1.0
2006	1.8	1.7	0.9	0.9
2007	1.7	1.7	0.9	0.8
2008	1.6	1.8	0.7	0.9
2009	1.4	1.8	0.6	0.8
2010	1.1	1.7	0.6	0.5
2011	0.9	1.5	0.7	0.2
2012	0.7	1.4	0.7	0.0
2013	0.6	1.4	0.6	0.0
** Only to be used as one input to inform solid Regional FP planning*			*** for Retirement & Death*	

Table 66 - Region 6 FP Forecast Requirements

REGION 6				
	FP Requirements* *accounting for replacements & forecast new demand*		**Breakdown of Comp FP Requirements** *based on lefthand column 'COMP FPs'*	
YEAR	COMP FPs	COMP FPs *workload weighted*	Approximate Replacement**	Approximate New Demand
2003	6.6	6.1	1.7	4.9
2004	5.9	5.6	1.5	4.4
2005	5.8	5.5	1.5	4.3
2006	5.6	5.2	1.6	4.0
2007	5.3	5.3	1.5	3.8
2008	4.9	5.7	1.3	3.6
2009	4.3	5.6	1.2	3.1
2010	3.5	5.2	1.2	2.3
2011	2.8	4.6	1.3	1.5
2012	2.3	4.5	1.4	0.9
2013	1.8	4.4	1.5	0.3
** Only to be used as one input to inform solid Regional FP planning*			*** for Retirement & Death*	

Table 67 - Region 7 FP Forecast Requirements

REGION 7				
	FP Requirements* *accounting for replacements & forecast new demand*		**Breakdown of Comp FP Requirements** *based on lefthand column 'COMP FPs'*	
YEAR	**COMP FPs**	**COMP FPs** *workload weighted*	**Approximate Replacement****	**Approximate New Demand**
2003	**3.5**	**3.2**	**0.4**	**3.1**
2004	**3.1**	**3.0**	**0.4**	**2.7**
2005	**3.1**	**2.9**	**0.5**	**2.6**
2006	**3.0**	**2.8**	**0.5**	**2.5**
2007	**2.8**	**2.8**	**0.6**	**2.2**
2008	**2.6**	**3.0**	**0.6**	**2.0**
2009	**2.3**	**3.0**	**0.6**	**1.7**
2010	**1.8**	**2.8**	**0.5**	**1.3**
2011	**1.5**	**2.4**	**0.7**	**0.8**
2012	**1.2**	**2.4**	**0.8**	**0.4**
2013	**1.0**	**2.3**	**0.7**	**0.3**
** Only to be used as one input to inform solid Regional FP planning*			*** for Retirement & Death*	

6.4 Specialty Practice – Current Picture and Window on the Future

According to the Canadian Medical Association, a specialty physician is one who has satisfied the training, credentialing, and evaluation requirements established by the Royal College of Physicians and Surgeons of Canada (RCPSC). Twenty of the 35 specialty exams of the Collège des médecins du Québec (CMQ) have been fully integrated into those of the RCPSC. Physicians practicing in Canada who are not certified by RCPSC or CMQ may be given recognition by the College of Physicians and Surgeons of New Brunswick by virtue of their combined education and practice portfolio.

The 2002-2003 CAPER data indicate that 5895 residents are currently pursuing specialty training in Canada. Post-graduate medical education for specialty practice ranges from 4-7 years typically. The availability of specialty programs and their duration is outlined for each specialty, in the following sections.

The Specialty Practice section contains several main sub-sections, starting with an overview of the entire specialty workforce in the province, then moving to groupings of medical and surgical specialties, with specialty-specific analysis contained within each.

These sections present a picture of each specialty group, based on available information. It is important to note that there are some specialty groups for which a formal supply forecast, and thus a formal gap analysis, was not possible, due to small size of the group (<25 physicians). However, supply-side conclusions are provided based on projected retirements, and an informal gap analysis is presented based on current supply, current vacancies, projected retirements, and projected growth in demand. Projected growth in demand, where possible, is based on effective number of specialists, and where this information is not available it is based on actual supply of specialists.

6.4.1 The Specialty Workforce in New Brunswick[49]

Age and Gender

There are 627 specialist physicians (hereafter referred to as SPs) contained in the New Brunswick Physician database.

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[49] Data and analysis sources for this section are as follows:

<u>Supply:</u> New Brunswick Department of Health and Wellness Medicare database, and the New Brunswick Physician Survey.

<u>Demand:</u> New Brunswick Department of Health and Wellness Hospital Services Branch, with data provided by Hospital Services and Medicare).

The elements age, gender, and region are 100% populated in the database. An age group and gender analysis reveals the following, based on the following table:

Of the 627 SPs, the majority are male, 497 (79%), and 130 (21%) are female. The most even split between males and females occur in the under 30 age group, where representation is equal. The relative number of females, as a percentage of total SPs, changes in direct correlation with age; in the 31-35 age group the percentage drops to 40%, then to the 20-25% range between the ages of 36-50, and decreases dramatically thereafter.

For males, there is a fairly even split between those under the age of 50 and those over the age of 50. For females, the majority of SPs (80%) are in the under 50 age group (103 of 130).

Of particular concern for this group is that 252 of the 497 SPs (50%) are over the age of 50 and thus will be in the potential retirement zone within the 10-year forecast period. In addition 64 female SPs (50% of all females, or 13% of total SPs) are under the age of 40 and thus in the childbearing age range.

Table 68 - Specialty Physician Age Group and Gender Analysis

	</=30	31-35	36-40	41-45	46-50	51-55	56-60	61-65	66-70	71-75	76-80	>80	Total
Male	3	54	80	74	61	56	66	53	32	14	3	1	497
Row%	1	11	16	15	12	11	13	11	6	3	0.6	0.2	100
Col%	50	60	75	80	75	88	89	90	86	100	100	100	79
Female	3	35	26	19	20	8	8	6	5	0	0	0	130
Row%	2	27	20	15	15	6	6	5	4	0	0	0	100
Col%	50	40	25	20	25	12	11	10	14	0	0	0	21
TOTAL	6	89	106	93	81	64	74	59	37	14	3	1	627
Row%	1	14	17	15	13	10	12	9.3	6	2	0.5	0.2	100

Health Region

The distribution of specialty physicians by Health Region, based on 100% population of the database, is in the following table (percentages rounded up):

Table 69 - Specialty Physician Distribution by Health Region

Region 1	Region 2	Region 3	Region 4	Region 5	Region 6	Region 7	OOP*	Total
184	162	110	41	31	56	26	17	627
29%	26%	18%	7%	5%	9%	4%	3%	100%
*OOP = out of province								

The following data elements were derived from the New Brunswick Supply and Demand Analysis survey, and as such are not 100% populated in the database.

Overall 58% (361 out of 627) of all Specialist Physicians responded to the survey questionnaire, distributed across all regions, as per the following table, by relative percentage of specialty physicians in that region.

Table 70 - Specialty Survey Response Rate by Region

Region 1	Region 2	Region 3	Region 4	Region 5	Region 6	Region 7
94	119	70	17	14	27	17
51%	73%	64%	41%	45%	48%	65%

Language

Section 6.2.3 provides a profile of the self-reported language proficiency (English only, French only, Bilingual) of specialty physicians according to the categories of internal medicine, lab medicine, medical, or surgical specialty. On average 75-79% of specialists in all 4 categories who responded to the survey indicated fluency in English only; exclusive of Laboratory medicine physicians, 22% on average considered themselves to be bilingual and 2.1% reported being fluent only in French.

Practice Profile

The practice profile analysis contained in the following pages seeks to understand where and how specialists are practicing, as relates to their area of clinical practice, activities within that practice and health care settings in which they practice. The tables on the following pages, and the associated analyses, provide this detailed profile of specialist physician practice in New Brunswick, based on survey responses.

Table 71 - Percent Specialist Time Spent in Practice Activities

Activities	% Time Spent Males Count	% Time Spent Females Count	Total % Time Spent
Insurable Clinical Practice – billable to NB Medicare (**excluding on-call**) i.e. FFS, salaried, sessional, alternate payment	80.9 272	74.3 78	79.4 350
Non-billable paper work, (e.g. forms, letters, claims), phone calls	7.8 203	14.0 63	9.3 266
Medical Administration i.e. Depart. Head, Chief of Staff, VP Medicine	8.0 91	14.3 14	8.8 105
Academic/Teaching	6.6 140	7.8 48	6.9 188
Non-insured Clinical Practice (third party payments) e.g. WHSCC, RCMP, Insurance claims	6.6 176	7.0 37	6.6 213
Committee work (e.g. for Government, RHA, NBMS etc.)	4.6 99	5.2 31	4.8 130
Other (Please specify):	10.9 32	9.0 13	10.4 45

A total of 350 out of 361 Specialists, who responded to the survey, report spending the majority of their time on insurable clinical practice. The remaining time is primarily apportioned, in decreasing order of magnitude, across non-billable paperwork, medical administrative duties, teaching, non-insured clinical practice and committee work.

Gender variations are evident in how time is apportioned across the various practice activities: Male specialists spend almost 81% of their time in insurable clinical practice; female specialists spend almost 75%, a difference which is statistically significant at the $P=0.001$ level. Female physicians spend almost twice as much time as male physicians on non-billable paper work, a difference that is statistically significant for $P<0.0001$,and female physicians spend 6.3% more of their time than males on medical administration activities, a difference which is statistically significant at the $P=0.04$ level. Gender does not make a difference in the amount of time spent on non-insured clinical practice.

Practice Settings

An analysis was conducted of the age-related responses of specialist physicians and the relative percentage of their time spent in 8 hospital and 12 community activities, as shown in the following table. It is important to note that each row in the table shows the percentage of their time that, only those physicians providing a response, spent on the activity.

Results do not total 100 percent since each category had different numbers of responding physicians. In cases where less than 5 physicians have responded, we have suppressed results to ensure confidentiality.

Table 72 – SP Practice Settings by Age Group

Activities	Age <=40 % Time Spent	Age 41-55 % Time Spent	Age > 55 % Time Spent	Total % of Time Spent
HOSPITAL				
Emergency Department	12.87	11.90	12.17	12.28
Geriatrics/Long-Term Care	***	0.00	***	17.83
Hospitalist*	25.00	46.50	47.86	42.04
In patient	44.16	47.04	43.06	44.92
Oncology	38.56	31.75	47.86	40.45
Other (specify)	65.00	66.43	68.75	66.88
Out Patient Department	33.54	33.20	29.46	32.28
Surgical Assist	30.29	39.84	27.70	33.05
COMMUNITY				
Community Health Centre	***	***	***	***
Extra Mural	2.50	5.40	4.17	4.13
Government/Crown Corp	8.00	10.00	7.33	8.00
House Calls	6.25	3.67	8.60	6.58
Locum	***	***	***	***
Mental Health Clinic	***	62.86	***	56.07
Nursing Home	***	***	***	21.89
Other (specify)	***	6.83	37.67	19.47
Physician Office	39.16	50.81	54.33	48.64
Private industry (including clinical trials)	3.62	5.50	***	4.95
Public Health	***	***	***	***
Walk-in/after hours clinic	***	***	***	***

As might be expected the greatest percentage of specialty physician time is spent between hospital-based care and their office practice.

Results for specialist physicians also reflect their particular specialties to a great extent. For example, while the table indicates that 40.45 % of Specialists' time is allocated to Oncology, within a Hospital setting, these results are only applicable to those 20 Specialists that devote time to this area.

Similarly, the data indicate that Specialist practitioners do not allocate time to community areas such as Community Health Centres, Nursing Homes, Public Health, and Walk-in Clinics.

Overall, the 361 Specialists responding to the survey allocate close to half (48.64%) of their Community-related time to their office practice. The amount of time differs by age group at a statistically significant level (P=0.002). The results show that the allocation of office time increases with the age of the physician.

In-patient time is the most common activity within the Hospital setting, with 269 Specialists indicating that they spend some time in this area. Overall, 44.94% of the time of these 269 physicians is spent in in-patient activities. There are no statistically significant differences in responses among the 3 age groups shown in the table.

Out-Patient department activities were reported by 157 of the 361 Specialists. These activities accounted for close to one third (32.28%) of the time allocation of these physicians. Results do not differ by age group at a statistically significant level.

Activity Levels

Number of Scheduled Days Worked

The responses of physicians, by practice group were analyzed with respect to their number of scheduled days worked. Three separate analyses are included that examine this variable by practice location, the age group of physician, and gender.

Table 73 - Scheduled Days Worked By Practice Group

Count Col %	General Practice	Internal Medicine	Lab Medicine Specialties	Medical Specialties	Surgical Specialties	Total
1 day	2 0.61	3 4.92	1 5.00	5 3.33	7 6.03	18
2 days	20 6.13	7 11.48	0 0.00	6 4.00	22 18.97	55
3 days	45 13.80	6 9.84	0 0.00	4 2.67	29 25.00	84
4 days	93 28.53	16 26.23	0 0.00	22 14.67	27 23.28	158
5 days	119 36.50	23 37.70	1 5.00	71 47.33	26 22.41	240
More than 5 days	6 1.84	3 4.92	0 0.00	5 3.33	2 1.72	16
Not Applicable	41 12.58	3 4.92	18 90.00	37 24.67	3 2.59	102
Total	326	61	20	150	116	673

The practice area of physicians has a moderate influence on the number of days they work each week, seeing scheduled patients and the differences in response amongst the five groups in the above table are statistically significant at the P=0.05 level.

Excluding General Practice from this discussion, Medical specialists report the greatest concentration of 5 scheduled days of work per week. Close to half (47.3%) of all medical specialists work 5 days per week. Internal medicine physicians also work 5 days a week but to a lesser extent (37.7%).

The majority of surgical specialists see scheduled patients 3 days per week (25%), but their workload is almost evenly divided among those working 2, 4, and 5 days per week. This is the most evenly "balanced" workload of any practice group.

About 11% of specialty physicians reported working 2 days per week or less. About 2% of all physicians reported working more than 5 days per week although internal medicine specialists work nearly twice the level of "overtime days" as other physicians on average.

Table 74 – SP Scheduled Days Worked By Age Group

Count Col %	Age <=40	Age 41-55	Age > 55	Total
1 day	1 1.03	8 5.97	7 6.03	16
2 days	13 13.40	11 8.21	11 9.48	35
3 days	15 15.46	11 8.21	13 11.21	39
4 days	21 21.65	19 14.18	25 21.55	65
5 days	30 30.93	57 42.54	34 29.31	121
More than 5 days	3 3.09	3 2.24	4 3.45	10
Not Applicable	14 14.43	25 18.66	22 18.97	61
Total	97	134	116	347

Most specialists in all 3 age groups work 5-day weeks seeing scheduled patients. Thirty-one percent of young specialists and 29% of older physicians see scheduled patients 5 days per week, and specialists in the middle age category see scheduled patients 5 days per week most often (42%).

Although younger physicians work more one scheduled day weeks, they are more likely to work between 1 and 3 days than older specialists. Almost 30% of specialists in the younger age category and 27% of specialists in the oldest age category work less than 4 days per week seeing scheduled patients; 22% of specialists in the middle age category see scheduled patients less than 4 days per week.

Specialists between age 41 and 55 see scheduled patients 4 days a week 7% less often than younger or older physicians.

Table 75 – SP Scheduled Days Worked By Gender

Count Col %	Female	Male	Total
1 day	3 4.00	13 4.78	16
2 days	7 9.33	28 10.29	35
3 days	4 5.33	35 12.87	39
4 days	21 28.00	44 16.18	65
5 days	21 28.00	100 36.76	121
More than 5 days	0 0.00	10 3.68	10
Not Applicable	19 25.33	42 15.44	61
Total	75	272	347

Both male and female specialists work mostly 4 or 5 day weeks seeing scheduled patients, with 56% of female specialists and 53% of male specialists working in this manner. These results are statistically significant at the P=0.02 level.

Male specialists are more likely than female specialists to see scheduled patients less than 4 days per week, with 28% of respondents working 1, 2, or 3 days a week. Female specialists worked this workweek only 19% of the time. Male specialists are 3.68% more likely to see scheduled patients more than 5 days per week; no female respondents indicated seeing scheduled patients more than 5 days per week.

Table 76 - SP Scheduled Days Worked By Health Region

Count Col %	Region 1	Region 2	Region 3	Region 4	Region 5	Region 6	Region 7	Region 9	Total
1 day	4 4.40	2 1.74	5 7.46	2 13.33	0 0.00	1 4.17	1 5.88	1 25.00	16
2 days	7 7.69	12 10.43	6 8.96	0 0.00	3 21.43	4 16.67	3 17.65	0 0.00	35
3 days	8 8.79	12 10.43	10 14.93	3 20.00	2 14.29	2 8.33	2 11.76	0 0.00	39
4 days	17 18.68	20 17.39	9 13.43	1 6.67	4 28.57	8 33.33	5 29.41	1 25.00	65
5 days	33 36.26	46 40.00	28 41.79	4 26.67	2 14.29	4 16.67	4 23.53	0 0.00	121
More than 5 days	5 5.49	1 0.87	1 1.49	3 20.00	0 0.00	0 0.00	0 0.00	0 0.00	10
Not Applicable	17 18.68	22 19.13	8 11.94	2 13.33	3 21.43	5 20.83	2 11.76	2 50.00	61
Total	91	115	67	15	14	24	17	4	347

Specialists in Regions 5 (28.6%), 6 (33.3%) and 7 (29.4%) are most likely to work a 4-day week, as indicated by 65 of 347 respondents. In Regions 1 (36.3%), 2 (40.0%), 3 (41.8%), and 4 (26.7%) the most common workweek is 5 days, as indicated by 121 respondents. Specialists in Regions 1 and 4 are most likely to work more than 5 days per week.

A total of 51 respondents work a 1 or 2-day week, this occurred most often in Regions 5 (21.43%), 6 (20.8%), and 7 (23.5%).

New Patients/Consults

There were 361 physician specialists that responded to this survey question and 23% indicated their practices would generally be considered closed to new patients/consults. Excluding the lab medicine group of specialties, the majority of specialists indicated that they have accepted new patients/consults in the past 12 months; 92% of internal medicine specialists, 90% of the surgical specialists, and 60% of medical specialists. Age had a slight influence on the extent to which physicians accepted new patients/consults; 79% of all physicians less than 40 years of age as compared to 73% of those physicians in the 41-55 or over 55 year age groups. There was no appreciable regional variation indicated.

Patient Volumes

An analysis of typical patient volumes of Specialists examined the number of patients seen during scheduled office hours in a typical week by the age group and gender of physicians.

Table 77 - Number of Patients Per Week by Age Group for Specialists

Count	Age <=40	Age 41-55	Age > 55	Total
Less than 30	23	24	29	76
31 –50	29	32	32	93
51 – 75	13	17	11	41
76 – 100	10	19	9	38
More than 100	6	12	9	27
Not Applicable	13	31	24	68
Total	94	135	114	343

The above table reveals that specialist physicians in the middle age group see the most patients per week; 14% of physicians in the 41-55 age group see from 76-100 patients per week compared to 10.6% of younger physicians and 7.9% of older physicians who see this many patients. A similar age group relationship holds for the percentage of physicians who see more than 100 patients per week.

About 1 in 4 specialist physicians in the younger and older age groups see less than 30 patients per week (24.5% and 25.4%, respectively). Specialist physicians in the 41-55 age group are more inclined to see higher levels of patients than the other 2 age groups.

Specialist physicians in the middle age group are most likely to see - more than 200 patients - in a week. Slightly more than 10% of physicians in this age group see high numbers of patients.

Although there are clear differences in responses in the above table, these differences are not statistically significant.

Table 78 - Number of Patients Per Week by Gender for SPs

Count Col %	Female	Male	Total
Less than 30	21 28.77	55 20.37	76
31 –50	19 26.03	74 27.41	93
51 – 75	8 10.96	33 12.22	41
76 - 100	3 4.11	35 12.96	38
More than 100	5 6.85	22 8.15	27
Not Applicable	17 23.29	51 18.89	68
Total	73	270	343

Differences in patient volumes are not directly related to gender in a statistically significant manner, although the results in the table above show some interesting findings.

Female specialist physicians are more likely to see lower numbers of patients in a typical week than male physicians. In particular, 54.7% of female specialists see less than 50 patients per week while 47.7% of male specialists see this same amount of patients.

At the higher end of the patients/week scale, male specialists (12.96%) are more than 3 times likely than female specialists (4.1%) to see more from 76- 100 patients in a typical week.

Wait Times for Elective Consults

Physicians responding to the survey were asked how long, on average, patients waited to be seen by them for an *elective* consult. Three separate analyses were conducted that examined the differences in elective consult times based on the age group of physicians, health region, and practice group.

Table 79 - Elective Consult Wait Time by Age Group

Count Col %	Age <=40	Age 41-55	Age >=55	Total
Less than one month	16 16.84	11 8.33	37 32.46	64
1 – 2 months	14 14.74	30 22.73	26 22.81	70
3 – 4 months	25 26.32	27 20.45	14 12.28	66
5 – 6 months	12 12.63	4 3.03	4 3.51	20
Greater than 6 months (Specify)	15 15.79	23 17.45	6 5.26	44
Not Applicable	13 13.68	37 28.03	27 23.68	77
Total	95	132	114	341

The above table reveals that, on average, nearly 60% of specialists report seeing elective consults within 4 months; 19% within 1 month, 21% within 1 to 2 months and another 19% between 3 and 4 months. Thirteen percent report patients can wait greater than 6 months to see them for an elective consult.

The above table shows a clear and statistically significant correlation between physician age and waiting times. Older specialist physicians have a higher percentage of their wait times in the "less than one month" category (shorter waiting times), while younger physicians have longer waiting times for an elective consult.

Specialist physicians in the older age group may be more effective at seeing patients for an elective consult, seeing 32% of their patients in less than 1 month, compared to 17% and 8% for the younger and middle age groups, respectively. The older physicians saw two thirds of their patients in less than 4 months.

The younger group of physicians had significantly longer waiting times, with the highest share (26.3%) of their patients waiting between 3 and 4 months for an elective consult. Moreover, 28.3% of elective consults for younger specialists require a waiting period of more than 5 months; 20.4% and 8.7% of patients of the middle age group and younger age group have to wait more than 5 months.

Patients of specialist physicians aged 41-55 are almost equally likely to wait 3-4 months as 1-2 months; physicians in this age group saw 20.4% of their patients in 3-4 months compared to 22.7% in 1-2 months. This age group was also most likely to have waiting times of more than 6 months.

Table 80 - Elective Consult Wait Time by Health Region by Specialists

Count Col %	Region 1	Region 2	Region 3	Region 4	Region 5	Region 6	Region 7	Region 9	Total
Less than one month	10 11.36	25 21.74	12 18.18	5 35.71	2 14.29	6 24.00	4 26.67	0 0.00	64
1 – 2 months	13 14.77	27 23.48	11 16.67	4 28.57	0 0.00	8 32.00	6 40.00	1 25.00	70
3 – 4 months	17 19.32	22 19.13	17 25.76	0 0.00	2 14.29	3 12.00	2 13.33	3 75.00	66
5 – 6 months	6 6.82	10 8.70	2 3.03	0 0.00	1 7.14	1 4.00	0 0.00	0 0.00	20
Greater than 6 months (Specify)	24 27.28	4 3.48	8 12.13	3 21.43	2 14.29	2 8.00	1 6.67	0 0.00	44
Not Applicable	18 20.45	27 23.48	16 24.24	2 14.29	7 50.00	5 20.00	2 13.33	0 0.00	77
Total	88	115	66	14	14	25	15	4	341

The amount of time patients spend waiting for an elective consult is directly related to their health region, and this relationship is statistically significant at the P=0.05 level. The above table outlines Elective Consult Wait Time by Health Region by Specialists.

Patients waiting to see specialist physicians in Region 1 are reported to be significantly more likely than those in other regions to wait more than 6 months; more than 1 in 4 patients for elective consults in Region 1 wait more than 6 months, while less than 8% of patients in all other areas of the province wait this amount of time.

Region 4 has the shortest reported wait times for an elective consult. About 36% of patients waiting to see a specialist physician in this region reportedly wait less than 1 month; only 11.4% of patients in Region 1 wait less than 1 month.

Respecting the above regional variations, overall, about 40% of all New Brunswick patients waiting for an elective consult see their specialist physician within 2 months.

Table 81 - Elective Consult Wait Time by Practice Group by Specialists

Count Col %	Internal Medicine	Lab Medicine Specialties	Medical Specialties	Surgical Specialties	Total
Less than one month	11 18.03	2 10.53	33 22.30	18 15.93	64
1 – 2 months	18 29.51	1 5.26	20 13.51	31 27.43	70
3 – 4 months	17 27.87	1 5.26	17 11.49	31 27.43	66
5 – 6 months	4 6.56	0 0.00	4 2.70	12 10.62	20
Greater than 6 months (Specify)	10 16.39	0 0.00	16 10.82	18 15.92	44
Not Applicable	1 1.64	15 78.95	58 39.19	3 2.65	77
Total	61	19	148	113	341

The amount of time that patients wait to see a specialist physician for an elective consult in New Brunswick is directly related in a statistically significant manner (P=0.05) to the specialty practice of their physician. The above table outlines Elective Consult Wait Time By Practice Group by Specialists.

Patients of Medical Specialists are most likely to have shorter waiting times, than those waiting to see other specialist physicians. In particular, 22% of patients of Medical Specialists have to wait less than 1 month.

Patients of Internal Medicine Specialists and Surgical Specialists generally wait 3-4 months for an elective consult, although about 29.5% of patients are able to see their Internal Medicine or Surgical Specialist in the 1-2 month period.

However, patients of Internal Medicine Specialists are more likely to wait for more than 6 months, compared to other specialists; 16.4% of patients have to wait more than 6 months for an elective consult and 16% of patients have a similar wait time to see a Surgical Specialist.

Wait Times for Urgent Consults

Physicians responding to the survey were asked how long patients waited on average to see them for an *urgent* consult. Three separate analyses are included that examine wait time by physician age group, health region, and practice group.

Table 82 - Urgent Consult Wait Time By Age Group for Specialists

Count Col %	Age <= 40	Age 41-55	Age >= 55	Total
Less than 2 weeks	64 68.09	90 69.77	88 80.00	242
2 – 4 weeks	22 23.40	20 15.50	10 9.09	52
5 – 7 weeks	1 1.06	5 3.88	0 0.00	6
Greater than 7 weeks (Specify)	0 0.00	1 0.78	0 0.00	1
Not Applicable	7 7.45	13 10.08	12 10.91	32
Total	94	129	110	333

The wait time for an urgent consult is less than 2 weeks for all 3 age groups of physicians, as seen in the above table. Older physicians see 80% of their patients requiring an urgent consult within 2 weeks; younger physicians see almost 70% within 2 weeks. The physicians under the age of 41 were more likely to make their patients wait longer for an urgent consult, with 23% waiting between 2 and 4 weeks.

Patients of physicians in the middle age group had the longest waiting times, with almost 4% waiting greater than 5 weeks for urgent consult compared to 1% for the younger physicians and 0% for the oldest age group.

Table 83 - Urgent Consult Wait Time by Health Region for Specialists

Count Col %	Region 1	Region 2	Region 3	Region 4	Region 5	Region 6	Region 7	Region 9	Total
Less than 2 weeks	62 73.81	81 72.32	42 62.69	12 85.71	9 64.29	20 90.91	13 81.25	3 75.00	242
2 – 4 weeks	14 16.67	16 14.29	14 20.90	1 7.14	2 14.29	2 9.09	2 12.50	1 25.00	52
5 – 7 weeks	3 3.57	1 0.89	2 2.99	0 0.00	0 0.00	0 0.00	0 0.00	0 0.00	6
Greater than 7 weeks (Specify)	1 1.19	0 0.00	0 0.00	0 0.00	0 0.00	0 0.00	0 0.00	0 0.00	1
Not Applicable	4 4.76	14 12.50	9 13.43	1 7.14	3 21.43	0 0.00	1 6.25	0 0.00	32
Total	84	112	67	14	14	22	16	4	333

The above table outlines urgent consult wait time by health region for specialists. The majority of patients in all regions were able to see a specialist in less than 2 weeks, with physicians in Region 6 seeing 91% of their patients in this time frame and physicians in Region 3 seeing 63% of their patients.

Generally, patients in Regions 1, 2, 3 had to wait longer for urgent consult than in other regions. 21% of patients in Region 1 had to wait more than 2 weeks, 15% in Region 2, and 23% in Region 3.

Only patients in Region 1 had to wait longer than 7 weeks for urgent consult.

Table 84- Urgent Consult Wait Time by Practice Group by Specialists

Count Col %	Internal Medicine	Lab Medicine Specialties	Medical Specialties	Surgical Specialties	Total
Less than 2 weeks	46 76.67	5 31.25	99 70.21	92 79.31	242
2 – 4 weeks	11 18.33	0 0.00	21 14.89	20 17.24	52
5 – 7 weeks	3 5.00	0 0.00	1 0.71	2 1.72	6
Greater than 7 weeks (Specify)	0 0.00	0 0.00	1 0.71	0 0.00	1
Not Applicable	0 0.00	11 68.75	19 13.48	2 1.72	32
Total	60	16	141	116	333

With the exception of Lab Medicine Specialists, for which this question is generally not applicable, specialist physicians in all Practice Groups were able to see greater than 70% of patients needing urgent consults within 2 weeks, as seen in the above table.

Physicians in Internal Medicine were more likely to have longer waiting times, with 18% waiting between 2 and 4 weeks and 5% waiting between 5 and 7 weeks.

On Call Activities of Specialists

Physicians responding to the survey were asked the extent to which they participate in on-call. Three separate analyses are included that examine on-call time by physician age group, gender and practice location. The following table outlines On Call Category by Age Group for SPs.

Table 85 - On Call Category by Age Group for SPs

On Call Category Count % Providing Service	Age <= 40	Age 41-55	Age >= 55	Total
Do not do on call	2 2.04	5 3.55	28 22.95	35
For hospital in-patients	89 90.82	115 81.56	70 57.38	274
For non-hospitalized patients	61 62.24	62 43.97	42 34.43	165
Emergency room	46 46.94	70 49.65	39 31.97	155
For other health regions	28 28.57	46 32.62	27 22.13	101
Other	8 8.16	10 7.09	11 9.02	29

Generally, a physician's on call activity decrease with age, as seen in the table above. In all categories, younger specialist physicians are more likely to do on call than the middle or older age groups. Almost 23% of physicians in the older age group do not do on call, compared to only 2% for the younger group and 3.5% for the middle group.

Specialists in the young and middle age group are most likely to perform on call duties for hospital in-patients, while only 57% of older specialists provide this service.

Physicians in the middle age group are on call in other health regions more often than the younger or older age groups; one third of specialists between 41-55 reported that they provide on-call services in other health regions.

The following table outlines On Call Category by Gender for SPs.

Table 86 On Call Category By Gender for SPs

On Call Category Count % Providing Service	Female	Male	Total
Do not do on call	4 5.00	31 11.03	35
For hospital in-patients	60 75.00	214 76.16	274
For non-hospitalized patients	34 42.50	131 46.62	165
Emergency room	25 31.25	130 46.26	155
For other health regions	11 13.75	90 32.03	101
Other	10 12.50	19 6.76	29

Both male and female specialists are more likely to do on call for hospital in-patients than any other type of on call duty. There is no difference in response based on gender for this on-call category.

Male specialists are more likely than female specialists to do on call for the emergency room, for non-hospitalized patients, and in other health regions.

More than twice the percentage of male specialists (11%) than female specialists (5%) indicated that they do not do on call.

The following table outlines On Call Category by Health Region for SPs.

Table 87 - On Call Category by Health Region for SPs

On Call Category Count % Providing Service	Region 1	Region 2	Region 3	Region 4	Region 5	Region 6	Region 7	Region 9	Total
Do not do on call	7 7.45	10 8.40	8 11.43	6 40.00	0 0.00	3 11.11	0 0.00	1 20.00	35
For hospital in-patients	76 80.85	93 78.15	51 72.86	7 46.67	11 78.57	19 70.37	16 94.12	1 20.00	274
For non-hospitalized patients	50 53.19	51 42.86	33 47.14	3 20.00	5 35.71	14 51.85	8 47.06	1 20.00	165
Emergency Room	37 39.36	57 47.90	38 54.29	3 20.00	4 28.57	9 33.33	6 35.29	1 20.00	155
For other health regions	21 22.34	43 36.13	22 31.43	3 20.00	0 0.00	8 29.63	3 17.65	1 20.00	101
Other	9 9.57	5 4.20	9 12.86	2 13.33	1 7.14	3 11.11	0 0.00	0 0.00	29

Specialists in Region 4 do the least amount of on call work, with 40% indicating no on-call whatsoever. Specialists in Region 4 are also the least likely of specialists in any region to provide on call for hospital in-patients. In all cases, the small number of specialists in Region 4 in comparison to Regions 1-3 needs to be recognized.

Specialists in Regions 1-3 are more likely than those in other regions to provide emergency on-call services. Moreover, specialists in Regions 2 and 3 are almost twice as likely as those in Regions 4 and 5 to provide these services.

The percentage of specialists providing services to other health regions is approximately the same across regions, although specialists in Regions 2 and 3 are more likely than specialists in other regions to provide this service. This may be a function of the relative critical mass of providers in these regions.

The following table outlines Average Number of On Call Hours By Practice Group.

Table 88 - Average Number of On Call Hours By Practice Group

Count Mean	General Practice	Internal Medicine	Lab Medicine Specialties	Medical Specialties	Surgical Specialties	Total
Response	337 126.45	61 138.71	21 233.62	160 99.78	117 174.19	696

Lab Medicine Specialists report working the greatest average number of on call hours per month, with Surgical Specialists working the next greatest amount. Medical Specialists report working the least number of on call hours per month on average, less than half the number of hours of Lab Medicine Specialists. These results are statistically significant at the 99% confidence level, with a P value of less than 0.01. Specialists, excluding Lab Medicine Specialists had an average of 63 on call contacts per month.

Non NB Resident Patients

The following table outlines Percent Non- NB Residents served by NB Physicians By Practice Group.

Table 89 - Percent Non- NB Residents served by NB Physicians By Practice Group

Count % Providing Service	None	Less than 5%	5 – 10%	11 – 25%	More than 25%	Total
General Practice	110 34.38	181 56.56	20 6.25	8 2.50	1 0.31	320
Internal Medicine	8 13.33	33 55.00	10 16.67	8 13.33	1 1.67	60
Lab Medicine Specialties	1 7.14	5 35.71	7 50.00	1 7.14	0 0.00	14
Medical Specialties	31 20.67	85 56.67	20 13.33	12 8.00	2 1.33	150
Surgical Specialties	16 13.79	79 68.10	10 8.62	8 6.90	3 2.59	116
Total	166	383	67	37	7	660

More than half (58%) of all physicians responding to the survey indicated that less than 5% of their patients are non-New Brunswick residents; only Lab Medicine Specialists served more than 5% most often.

When analyzed on a regional basis, the 7 respondents indicating more than 25% of their patients were non-New Brunswick residents were distributed across Regions 1, 2, 3, 5, and 6 which suggests there is no one area of the province in particular where out of province patients are accessing New Brunswick specialty physician services. When combined with FP responses to this survey question, Region 5 had the greatest percent of out of province patients accessing all physician services in this region, with 38% of survey respondents indicating that between 11-25% of their patients were from outside New Brunswick. Region 1 followed a distant second at 11% of survey respondents indicating this volume of out of province patients.

Data from the survey question that asked the origin of Non-New Brunswick residents served by New Brunswick Physicians was analyzed the by practice group. Five geographic areas are examined in detail, including the neighbouring provinces of Nova Scotia, PEI and Quebec.

The following table indicates the number of physicians by practice group that provide services to non-New Brunswick residents from 5 areas. The table also shows the percentage of physicians in each practice group, that provides services. For example, 70 Medical Specialists in New Brunswick provided services to residents of Nova Scotia. This represents 59.8% of all Medical Specialists

Table 90 - Services Provided to Non-New Brunswick Residents Practice Group by Region

Count % Providing Service	Nova Scotia	PEI	Quebec	USA	Other Areas
General Practice	109 32.15	70 20.65	109 32.15	86 25.37	56 16.52
Internal Medicine	34 55.74	38 62.30	30 49.18	15 24.59	11 18.03
Lab Medicine Specialties	10 45.45	9 40.91	7 31.82	2 9.09	1 4.55
Medical Specialties	76 47.20	69 42.86	77 47.83	39 24.22	25 15.53
Surgical Specialties	70 59.83	55 47.01	67 57.26	37 31.62	21 17.95
Total	299	241	290	179	114

More than half (55.7%) of Internal Medicine specialists see patients from Nova Scotia, and 6 in 10 Surgical Specialists see patients from that province.

Close to half of Medical Specialists in the province report that they see patients from Nova Scotia (47.2%) and Quebec (47.8%); 42.9% of Medical Specialists see patients from PEI.

Although all practice groups see patients from the USA, most physicians do not see American patients. However, close to one third (31.6%) of Surgical Specialists indicated that they see American patients.

Leaves of Absence form Practice

Fifty-five percent of the 354 survey respondents indicated they took less than 2 weeks leave for continuing medical education in the past 12 months whereas another 42% indicated they took between 2-4 weeks. When asked about the amount of time absent from practice for personal reasons (vacation, illness etc.) in the past 12 months, 42% indicated 2-4 weeks and 34% were away between 5-7 weeks.

Planned Practice Changes

Of 353 specialist physicians who responded to the survey question regarding any planned changes to their practice activity over the next 5 years, 36% (n=127) indicated plans to reduce their practice as opposed to 2% indicating plans to increase practice activity. Of the 127 specialists planning to reduce their practice activity, 85 plan to do so permanently; 24 by 100%, 13 by at least 50% and 48 by at least 25%.

6.4.1.1 Functional Practice Issues

Physicians' scope of practice is not strictly dictated by their certification/credentials. Overlapping scopes of practice are commonplace amongst certain specialists and between specialists and family practitioners. Geographic (rural versus urban settings) and the critical mass of providers and /or service population are 2 factors influencing this phenomenon. In the following sections the concept of functional practice is discussed, in particular as relates to services provided by cardiologists and internists. There are, however, several other specialties for which other physicians, not credentialed/trained in the specialty and subject often to having acquired additional training, also perform some of the services of the specialty. Currently there is no secondary data available by which to measure the extent to which this practice is occurring. From a planning perspective, factors such as the health needs of the service population, the critical mass required to support specialty/sub specialty physicians and recruitment constraints, need to be considered in providing physician resources to meet the health needs of a given population. At issue, is the system's ability to provide an acceptable level of access to the appropriate levels of service in a timely fashion. Planners and policy makers need to strive for a model of practice that utilizes the full complement of physician and allied health resources most optimally; leveraging specialty skill sets through labour substitution and technology where possible. Collectively these approaches may moderate the demand identified for certain of specialists.

6.4.1.2 Summary Profile – Specialist Physicians

Specialty physicians in New Brunswick work predominantly in insured clinical practice (80%) in mainly hospital and office based settings. Age and gender has an impact on activity levels. Physicians in the mid age range of 41-55 have the most active practices and the heaviest workloads. As with Family Practitioners, younger specialty physicians work fewer scheduled days per week and see lower volumes of patients and female physicians tend to have lower activity levels and volumes than their male colleagues. There are some regional variations evident here which may be related to either the critical mass of providers or service population.

In considering New Brunswickers access to specialists only 23% of specialists in the province indicated they would consider their practices closed to new patients/consults. Respecting regional variations and type of specialty practice, overall, about 40% of all New Brunswick patients waiting for an elective consult can expect to see their specialist physician within two months. Patients in Region 1 wait the longest time for both elective and urgent consults with a specialist. This may be related to interprovincial and intraprovincial referral patterns, based on either linguistic preferences or geographic proximity for out-of-province patients.

When looking at on-call activities, the distribution of effort is somewhat skewed with specialists in the young and middle age group most likely to perform on-call duties for hospital in-patients, while only 57% of older specialists provide this service. One third of specialists between 41-55 reported that they also provide on-call services in other health regions. Gender and regional variations are evident in on call practices.

For the most part, specialists provide services to New Brunswickers, with less than 5% of their patients coming from out-of-province. Specialists indicating that more than 25% of their patients were non-New Brunswick residents were distributed across 5 health regions.

From a planning perspective, the specialty physician population is generally older, with as many as 50% eligible for retirement over the 10-year planning horizon. This is further punctuated by survey responses where 36% of specialists (n=127) indicated plans to reduce their practice within the next 5 years; 85 plan to do so permanently; 24 by 100%, 13 by at least 50% and 48 by at least 25%.

The following sections provide more detail on the issues germane to the specific specialty groups.

6.4.2 Medical Specialties

There are currently 427 medical specialists in the New Brunswick physician workforce, which includes physicians in the following 20 distinct specialty practices (as per RFP specifications):

1. Anesthesia
2. Cardiology
3. Dermatology
4. Diagnostic Radiology
5. Emergency Medicine
6. Gastroenterology
7. Geriatric Medicine
8. Hematology
9. Infection Diseases
10. Internal Medicine
11. Medical Oncology
12. Neonatology
13. Nephrology
14. Neurology
15. Nuclear Medicine
16. Pediatrics
17. Physical Medicine & Rehabilitation
18. Psychiatry
19. Respiratory Medicine
20. Rheumatology

For the purposes of the broad specialty grouping forecasts, the following four Laboratory Medicine specialties are included in this count as well:

1. Anatomical Pathology
2. General Pathology
3. Hematological Pathology
4. Medical Microbiology

Supply Forecast

The following table presents the Forecast Model results for all Medical Specialties, based on the following factors:

1. New Brunswick attracts/recruits 1.9% of national pool of PGME specialty graduates each year of the 10-year forecast period, based on CAPER historical average (ranging from 13 to 18, see Table 92)

2. Filter out time for those physicians who are spending >50% of their time in Medical Administration and/or Committee work

3. Additional gains, exits and net movements are based on medical specialty-specific historical averages as based on CMA data, see Table 92.

Highlights of the Supply Forecast for Medical Specialties

- The medical specialty workforce is expected to grow by 21%, from 427 physicians to 517 physicians, over the 10-year forecast period.

- The percentage of females practicing medical specialties is expected to increase significantly over the 10-year period, from 26% of total at present to nearly 40% in 2013.

- The percentage of physicians over the age of 55 is expected to remain roughly stable over the time period, fluctuating between 31% and 28% of total.

Please refer to the following tables for details.

Table 91 - All Medical Specialties - Supply Forecast 2003-2013

Medical Specialties			
YEAR-END	Total Physicians	% Female	% >55
Base Stock Mar 2003	427	26%	31%
2003	433	28%	29%
2004	440	29%	28%
2005	446	30%	28%
2006	452	31%	29%
2007	459	32%	28%
2008	468	33%	28%
2009	478	35%	29%
2010	490	36%	29%
2011	499	37%	29%
2012	508	38%	28%
2013	517	39%	28%

Table 92 - Medical Specialties - Gains, Exits, and Net Movements 2003-2013

	GAINS			EXITS			NET	YEARLY NET
YEAR	PGME Entries	IMGs	Returns from Abroad	Retired	Deaths	Emigration	Interprov. Migration	Gains - Exits +/- Net Movements
2003	13	2	1	7	1	2	1	7
2004	13	2	1	7	1	2	1	7
2005	13	2	1	7	1	2	1	7
2006	14	2	1	8	1	2	1	7
2007	14	2	1	8	1	2	1	8
2008	16	2	1	8	1	2	1	9
2009	17	2	1	7	1	2	1	11
2010	18	2	1	7	1	2	1	12
2011	18	2	1	8	2	2	1	10
2012	18	2	1	8	2	2	1	10
2013	18	2	1	9	2	2	1	10

The following sections present specialty specific profiles and, based on available information, supply and demand forecasts and the resulting gap analysis over the 10-year planning horizon. As an aid to recruitment, the number of students currently enrolled in each specialty program is provided along with completion dates, and, where available, the programs in which New Brunswick residents are enrolled and their expected completion dates.

6.4.2.1 Anesthesia

Education

A 5-year residency in this specialty is offered through all 16 university medical schools. The 2002-2003 CAPER data indicates that currently, across the country, there are 479 residents (156 female and 215 male) engaged in this program of study, with estimated completion dates listed in the table below.

Table 93 - Anesthesia

2003	2004	2005	2006	2007	Total
116	94	95	92	82	**479**

Further sub specialization is available in the area of Critical Care Anesthesia with 4 residents currently pursing this field (all male); 3 expecting to complete their residency in 2003 and 1 in 2004.

Six New Brunswick residents are enrolled in the Anesthesia program across the country as follows: 4 at Dalhousie University with expected completion dates of 2003 (2) and 2006 (2), 1 at the University of Alberta who is expected to complete in 2006, and 1 at the University of British Columbia who is expected to complete in 2004.

CAPER data indicates that since 1990, a total of 992 residents have graduated in Anesthesia across the country. Annual outputs averaged 76 per over this 13-year period, ranging from lows of 64 to highs of 85. The number of graduates over the next 5 years is predicted to be 26% higher when compared to the average in the last decade.

Current Workforce Analysis

There are currently 69 Anesthetists in the province, 55 (80%) of them are male, and 14 (20%) of them are female. The health region distribution is presented in the following table:

Table 94 – Anesthetists Distribution by Health Region

Region 1	Region 2	Region 3	Region 4	Region 5	Region 6	Region 7	OOP*	Total
22 (32%)	15 *(22%)*	12 *(17%)*	4 *(6%)*	6 *(9%)*	6 *(9%)*	3 *(4%)*	1 *(1%)*	69 (*100%*)
**OOP = out of province*								

The average age of Anesthetists is 49 for males, 45 for females, and 48 overall. There are 23 Anesthetists (33%) over the age of 50, and thus will come within the potential retirement zone in the 10-year forecast period.

The most recent 3 fiscal years (2000-2003) of Medicare billing data, as presented in the following tables, are not consistent with the current snapshot of the Anesthesia specialty as discussed above. This is due to the fact that a portion of the province's Anesthetists are salaried or locum practitioners, and the remainder of Anesthetists contained in the Medicare database over these 3 years have an inactive status.

The following tables provide some historical perspective of the Fee-for-Service practitioners within the Anesthesia group over this time period:

- Slight increase in the actual number and effective number of FFS Anesthetists.
- Relative stability in mean and median age of Anesthetists.
- Fluctuating service ratio for New Brunswickers – decrease then increase in population to FFS Anesthetist ratio over the time period.

Table 95 - Anesthesia - Medicare 3-year History

Year	Number of Physicians in Database for Year	FFS Active Physicians	All Active Physicians	Active Physicians' Mean Age	Active Physicians' Median Age
2000/1	85	56	56	47.1	43.8
2001/2	87	59	59	46.1	42.5
2002/3	77	57	57	45.9	43

Year	Mean Active Physicians' Core Billings ($)	Effective Number of Physicians	Population to Each Active Physician
2000/1	170,742	57.8	12,558
2001/2	184,410	60.9	11,915
2002/3	206,485	57.7	12,587

Supply Forecast

Highlights

- The Anesthesia workforce is expected to grow by 8.7% between 2003 and 2013 given the following estimates:
  - 2 PGME entries per year

– 1 retirement per year

– Negligible impact of immigration, emigration, IMGs, and interprovincial migration

- The percentage of female Anesthetists, as a percentage of total, is expected to steadily increase over the forecast period, from 20% at present to 26% in 2013.

- The percentage of the Anesthesia workforce over the age of 55 is expected to remain roughly stable over the forecast period, starting at a high of 26% in 2003, dropping to 21% in 2007, and steadily climbing thereafter to reach 26% by 2013.

Table 96 - Anesthesia Supply Forecast 2003-2013

Anesthesia			
YEAR	Total Physicians	% Female	% >55
Base Stock Mar 2003	**69**	**20%**	**28%**
2003	70	21%	25%
2004	70	21%	25%
2005	71	22%	24%
2006	71	23%	21%
2007	71	23%	22%
2008	72	24%	24%
2009	73	24%	25%
2010	74	24%	27%
2011	75	25%	25%
2012	75	25%	25%
2013	75	26%	26%

Additional information to factor into the supply forecast picture is that 11 Anesthetists who responded to the survey indicated that they intend to decrease their practice activity within the next 5 years (2003-2008). Specifically:

- In the 30-40 age range; 1 physician will be stopping practice for one year, 1 physician will be reducing practice by 25% for one year, and 1 physician will be permanently reducing practice by 50%.

- In the 40-55 age range; 2 physicians will be permanently reducing their practice by 25%

- In the 55+ age range; 1 physician will be permanently reducing practice by 25%, 1 physician will be permanently reducing practice by 50%, and 2 physicians will be permanently reducing their practice by 100% (all of these are accounted for in the forecast model and are retired out automatically).

Of note, no physicians plan to increase their practice activity in the next 5 years.

The impact of these survey responses is that if the results were extrapolated to the entire Anesthesia population, it would seem that the future workforce according to the supply model is slightly overestimated, as practice plan reductions are not replaced by practice plan increases. In addition, several of the planned leaves are temporary in nature, and thus the workload of these physicians will need to be absorbed by others.

The National Picture

A recent workforce planning study conducted by the Association of Canadian University Departments of Anesthesia (ACUDA)[50] found that:

- In the provinces for which data were available, it was apparent that the average workloads of practicing anesthetists have risen to meet demands of the workplace and that the current high levels of work may make it difficult to expect rising workloads to continue to make up for physician deficits.

- The analysis of what anesthetists do showed that approximately 80% of all anesthesia billings are for the provision of anesthesia services during the course of surgery. Four fields of activity accounted for more than 50% of all anesthesia services delivered: orthopedics, general surgery, cardiovascular and thoracic surgery, and obstetrical and gynecological surgery.

- The workloads of men and women have increased in recent years, but there is still a difference in the hours worked by men and women, with women on average working fewer hours than men, so that the feminization of the physician workforce will continue to be a factor leading to an increase in physician requirements.

- The workloads of anesthetists vary with age. Older physicians reduce their workload, so an aging physician complement leads to the need for more physicians. The data collected for the ACUDA planning model make clear that the demography of health care deliverers is a factor to be included in the model.

- Because of the age at which graduates of foreign medical schools become licensed in Canada, their average expected working lifetime following licensure is considerably lower than that of graduates of Canadian medical schools. This is another factor leading to increases in physician requirements.

With respect to current and future supply of anesthetists, the study showed that:

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[50] ACUDA, A Physician Workforce Planning Model for the Specialty of Anesthesia, 2000.

- Current rates of output from anesthesiology training programs are well below what is required to work towards a level of production that will ensure adequate future supply of anesthetists.

- Retention rates in practice in Canada of new certificants in anesthesiology are lower than they used to be. The brain drain of the 1990s may account for this.

- Even with the severe restrictions on graduates of foreign medical schools obtaining post-MD clinical training in Canada, such graduates constituted 183 out of 840 certificants (22%), who gained certification in anesthesia in the most recent decade, 1990-1999.

An alternate source of supply for this specialty lies in Family Practice Anesthetists (FPAs), who are a critical resource in rural health care in Canada in particular. The College of Family Physicians of Canada acknowledges the available of anesthesia services are pivotal in the provision of emergency, obstetrical, and surgical services to rural Canada. FPAs are considered a resource to meet this need. Of the 500-700 FPAs in Canada, about two thirds received the requisite 12 months post-graduate additional training in Canada. Programs are available in most medical schools west of Quebec. Typically these programs, which are funded through a PGY3 program in Family Medicine, or through under serviced area programs, are under subscribed. The Canadian Anesthesiology Society (CAS), the College of Family Physicians of Canada (CFPC), and the Society of Rural Physicians of Canada (SRPC) are committed to work collaboratively to address the realization of adequate structures and supports for FPA practice. This involves both a standardized and accredited Canadian training program in addition to a process of evaluation and verification of physicians who received this training out side of Canada. [51]

In New Brunswick Medicare data indicates there are 4 family physicians providing anesthesiology services.

Demand Analysis and Forecast

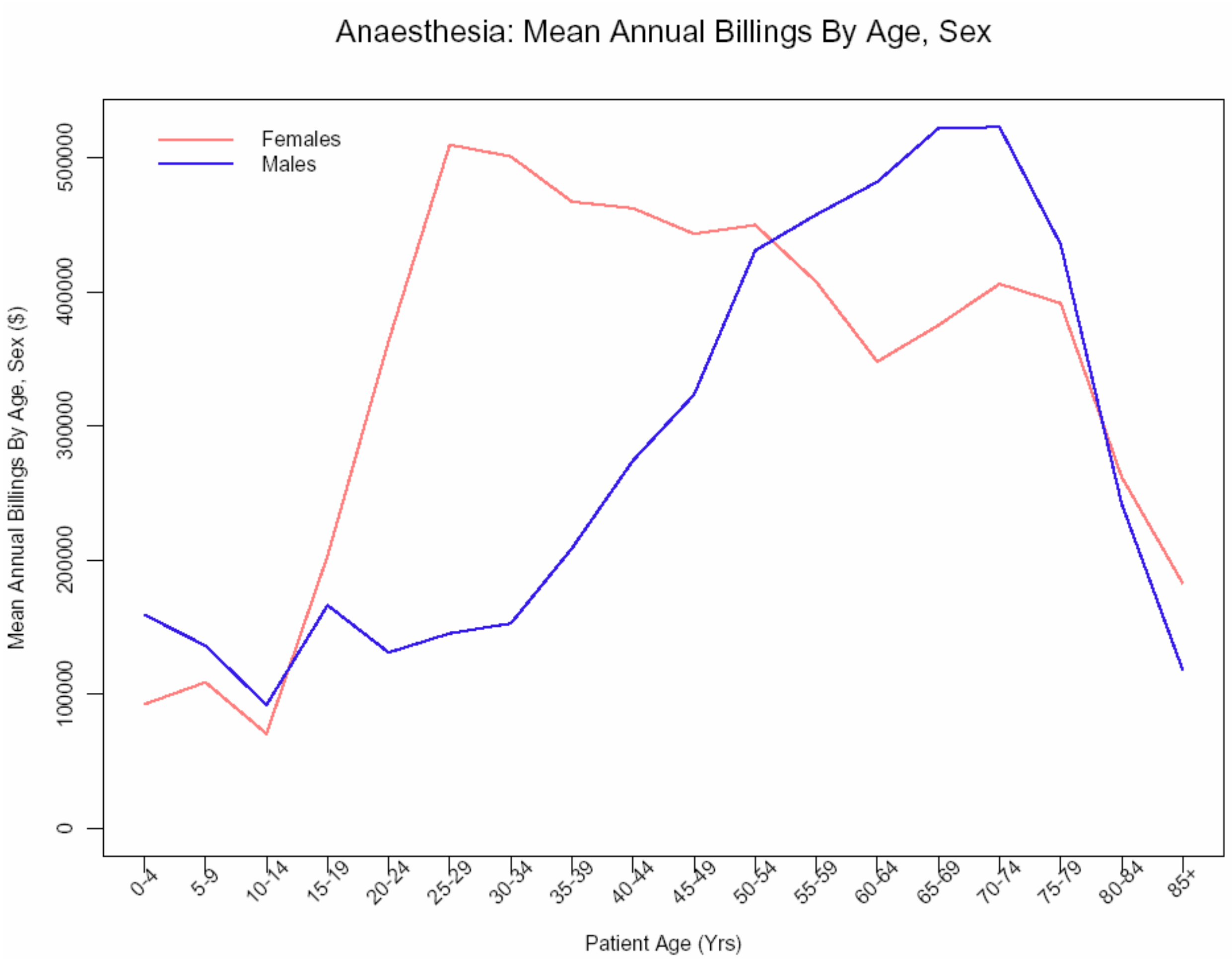
As depicted in the figure below, the consumption of Anesthesia services by the New Brunswick population over the past 3 years has the following characteristics:

- Male and female service use peaks at nearly opposite ends of the age spectrum, for males in the late 70s, and for females in the mid to late 20s.

- Female service use falls off gradually after the 25-29 age range, and male use fall steeply after the 70-74 age range.

[51] Joint Position Paper on Training for Rural Family Physicians in Anesthesia, March 2001.

Figure 18 - Anesthesia Mean Total Billings, by Age and Gender of Population



Based on the profile of Anesthesia service use as presented above, and applied to the changing age structure of the New Brunswick population in the coming 10 years, the following table shows the growth rates in requirements anticipated for Anesthesia to 2013.

Growth in demand for Anesthesia services is projected to grow by 12.5% from 2003 to 2013, which equates to an increase in effective requirements for Anesthetists from 69 presently, to 77.6 by 2013. These 69 Anesthetists includes 57.7 effective FFS Anesthetists and approximately 11 salaried practitioners who are assumed to be equivalent to 11 effective physicians.

Table 97 - Growth in Demand for Anesthesia Services (growth rates from base year)

Specialty	Effective No.	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Anesthesia		*1.10%*	*2.18%*	*3.26%*	*4.32%*	*5.45%*	*6.63%*	*7.79%*	*8.95%*	*10.08%*	*11.32%*	*12.51%*
	69.0	69.8	70.5	71.2	72.0	72.8	73.6	74.4	75.2	76.0	76.8	77.6

In addition, as of an April 30, 2003 a snapshot of vacancies in Anesthesia shows that there is a shortfall of 6.2 positions across the province.

Gap Analysis

Over the coming 10-year period the supply of Anesthetists in the province is expected to increase from 69 at present to 75 by 2013 (8.6% growth), while demand estimates predict growth in demand of over 12% between 2003-2013, to reach a requirement for 77.6 Anesthetists by 2013 (an additional 8.6 specialists over present). In addition current vacancies for this specialty are a shortfall of 6.2 positions. **This equates to a total requirement over this time period for up to an additional 15 Anesthetists.** If the current shortage position (6.2) were immediately redressed, the estimated future supply would meet demand, until 2006, when demand begins to outstrip supply, which continues thereafter.

In addition, the planned workload reductions of the equivalent of 3 full-time positions (permanently or temporary for a year) further exacerbates this situation. From a service delivery impact perspective, the interdependency between surgical specialties and anesthesia requires immediate attention on the part of the DHW and RHAs.

6.4.2.2 Cardiology

Education

Cardiology (adult or pediatric) is a subspecialty of Internal Medicine, which is offered at all medical schools in Canada. Typically, an additional 3 years of training is required following successful completion of the RCPSC Internal Medicine Certification. Programs are offered through all Canadian Medical Schools except Memorial University. The 2002-2003 CAPER data indicates that, currently across the country, there are 141 residents (33 female and 108 male) engaged in an adult cardiology program and 14 (8 female and 6 male) in a pediatric program. The following table shows the estimated completion dates.

Table 98 - Cardiology

	2003	2004	2005	Total
Adult Cardiology	69	36	36	141
Pediatric Cardiology	5	4	5	14

Two New Brunswick residents are enrolled in this specialty; one at Dalhousie University and one at University of Western Ontario, with both expecting to complete Cardiology (Internal Medicine) residencies in 2004.

CAPER data indicates that since 1990, a total of 422 residents graduated in Cardiology (Internal Medicine). Annual outputs averaged 32 per year over this 13-year period, ranging from a low of 26 to a high of 42. The number of graduates over the next 3 years is predicted to be about 47% greater than the average in the last decade.

During the same period, 44 residents completed a Pediatric Cardiology residency program, an average of 3 per year, ranging from a low of 1 graduate to a high of 7. The number of graduates over the next 3 years is predicted to be about 56% greater than average in the last decade, which for this small specialty only represents an additional 1.5 graduates per year.

Current Workforce Analysis

The New Brunswick Physician Database contains 15 active Cardiologists, 13 (87%) of them are male and 2 are female. An analysis of distribution by Health Region indicates 7 Cardiologists practice in Region 1, 6 in Region 2, and 2 are recorded as out-of-province and travel to practice in New Brunswick.

The average age in this group is 45 years, with no significant gender variation. Of particular concern for this group is that 4 of the 15 Cardiologists (27%) are over the age of 50, and thus are in the potential retirement zone within the 10-year forecast period.

The most recent 3 fiscal years (2000-2003)[52] of Medicare billing data, as presented in the subsequent tables, provide some historical perspective of the Cardiology group over this time period:

- Increased actual number and effective[53] number of Cardiologists
- Aging of the workforce - increase in mean and median age
- Improved service ratio for New Brunswickers - decrease in population to Cardiologist ratio

[52] **Note:** Current supply count and most recent full year of Medicare billing data are not always consistent due to the point in time in which the Physician Database was populated with snapshot data from the Medicare database, and supplemented/refined with survey data as based on the physician survey. This applies to all specialties analyzed in this Report.

[53] **Effective number** refers to the actual number of physicians billing above active threshold ($50,000) + total billings of all physicians billing below threshold divided by average billings of all above threshold physicians. This translates all below threshold billing physicians into an actual number of 'average' active physicians.

Table 99 – Cardiology - Medicare 3-year History

Year	Number of Physicians in Database for Year	FFS Active Physicians	All Active Physicians	Active Physicians' Mean Age	Active Physicians' Median Age
2000/1	33	14	14	43.6	44
2001/2	32	15	15	44.1	43.5
2002/3	29	16	16	45.9	46

Year	Mean Active Physicians' Core Billings ($)	Effective Number of Physicians	Population to Each Active Physician
2000/1	320,471	14.6	49,605
2001/2	349,762	15.5	46,717
2002/3	338,280	16.3	44,429

Demand Analysis and Forecast

The Cardiology program in New Brunswick primarily services a few high volume Case Mix Groups (CMGs). Most common are pacemaker implants, unstable angina, chest pain, and acute myocardial infarction (AMI).

Cardiology can be characterized as a decentralized regional program delivered by a variety of practitioners, including Family Practitioners, General Internists, and other Internal Medicine specialists, and Cardiologists. In fact, General Internists provide half of the Cardiology program service in Regions 3, 4, 6, and 7. Generally the care is divided between FPs and Cardiologists (in the larger centers) and other Internal Medicine specialists (this is especially true at the smaller regional centers). While the workload at the smaller regional hospitals is equivalent to that of one full-time Cardiologist, the work is usually distributed among 4 or more Internists.

Patient flow patterns for Cardiology show that patients are almost exclusively treated within their region of origin. There are no significant trends towards leaving the region for service, apart from the provision of care for centralized Cardiology CMGs in Region 2 and pacemaker patients traveling from Regions 6 and 7 to Region 1 Beauséjour. Further, out of province patients are evenly distributed among regions and there are no major discrepancies in the proportion of New Brunswickers seeking care out of province.

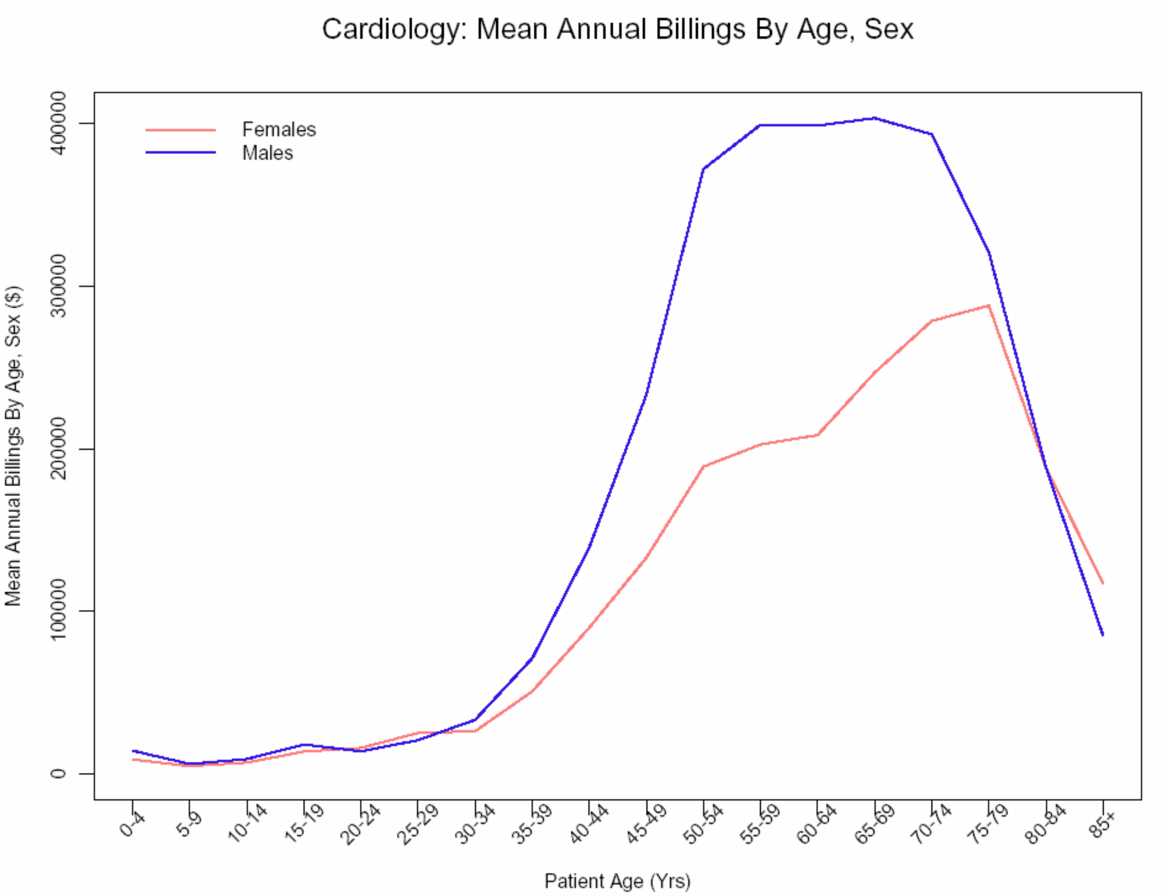
There is quite a significant variation in per capita rates of hospital service among regions for Cardiology. Region 2 has a significant ‘under use’ of Cardiology (driven by low utilization of decentralized and regional CMGs). However, this may be due to a correspondingly higher utilization of centralized Cardiology and Cardiac Surgery. Region 7 shows a higher utilization of Cardiology and Cardiac Surgery services than the average, due to an increased burden of illness.

The figure below depicts the consumption of Cardiology services by the New Brunswick population over the past 3 years:

- Use by gender is similar until the age of 30-34. Thereafter, male use is greater than females at every age

- Consumption by males rises to a peak between 65 and 75 years of age
- Consumption by females peaks at the 75-79 age range
- The majority of service is consumed by males over the age of 50

Figure 19 - Cardiology Mean Annual Total Billings, by Age and Sex of Population



Based on the utilization profile of Cardiology service as presented above, and considering the changing age structure of the New Brunswick population in the coming 10 years, the following table shows the growth rates in requirements anticipated for the Cardiology specialty to 2013.

Growth in demand for Cardiology services is projected to grow by over 23% from 2003 to 2013, which equates to an increase in effective requirements for Cardiologists from 16.3 presently, to 20.1 by 2013.

Table 100 – Growth in Demand for Cardiology Services (growth rates from base year)

Specialty	Effective No.	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Cardiology		*2.00%*	*3.95%*	*5.91%*	*7.86%*	*10.00%*	*12.20%*	*14.39%*	*16.61%*	*18.81%*	*21.18%*	*23.51%*
	16.3	16.6	16.9	17.3	17.6	17.9	18.3	18.6	19.0	19.4	19.8	20.1

An April 30, 2003 snapshot of vacancies in Cardiology indicates a net surplus of 1.2 positions, consisting of a shortfall of 1.94 Cardiologist positions across the province and a surplus of 3.16 Invasive Cardiologist positions.

The relative demand for Cardiologists as compared to Interventional Cardiologists is beyond the scope of this study; however, this is material to planning based on the service requirements determined by the province's new Provincial Health Plan.

Gap Analysis

Supply data indicates the current workforce at 15 Cardiologists, equivalent to 2001/02 levels as recorded by Medicare billings, and thus is assumed to be equivalent to 15.5 effective physicians. Current demand estimates indicate requirements for 16.3 effective Cardiologists, which leave a current shortfall of 0.8 effective Cardiologists, which calls into question the reported surplus of 1.2 positions, as it would appear that this level of service is being demanded and consumed.

Based on predicted retirements of 4 Cardiologists over the planning horizon (and not accounting for other gains and exits from the current and future cohort of active physicians), and given growth in demand requiring 20.1 Cardiologists by 2013, **there could be a requirement for up to 8 Cardiologists in the province over the coming 10-year period, the timing of which is dependent upon retirement of those Cardiologists in the retirement zone**. Close monitoring /succession planning is therefore required for this group of physicians in light of the changing population demographic.

Also of note, 2 respondents to the physician survey indicated that within the next 5 years, 2 each plan to reduce their practice by at least 25% permanently.

6.4.2.3 Dermatology

Education

Eight universities offer this specialty program: Dalhousie, McGill, Montreal, Laval, Ottawa, Toronto, Alberta, and British Columbia. The program duration for those entering direct from medical school is typically 5 years. The 2002-2003 CAPER data indicates that currently there are 53 residents (28 female and 25 male) in this program across the country with estimated completion dates in the following table.

Table 101 - Dermatology

2003	2004	2005	2006	2007	Total
15	14	10	7	7	**53**

No known residents from New Brunswick are enrolled in this specialty.

CAPER data indicates that since 1990, a total of 152 residents have graduated in Dermatology. Annual outputs averaged 12 per year over this 13-year period, ranging from a low of 8 to a high of 18. The number of graduates over the next 5 years is predicted to be about 13% less than the average in the last decade.

Current Workforce Analysis

There are 8 Dermatologists contained in the physician database, and they are equally split (50%) male and female. Of the 8, 4 are in Region 1, 2 are in Region 2, 1 each are in Regions 3 and 4.

A relatively young group of physicians are currently practicing in this specialty, with the average age of 49 years for males in this group, 38 years for females, and an overall average of 43 years.

Within the 10-year forecast period, retirements are not of particular concern for this specialty, as only 1 of the 8 Dermatologists is over the age of 50. However, a more crucial planning notable is that half of this workforce is female, and all are in the 36-40 year old age range, which means that maternity leaves may still need to be considered as short-term temporary planning issues.

The most recent 3 fiscal years (2000-2003) of Medicare billing data, as presented in the following tables, provide some historical perspective of the Dermatology group:

- Decreased actual number and effective number of Dermatologists
- Decrease in mean and median age
- Decline in service ratio for New Brunswickers - increase in population to Dermatologist ratio

Table 102 – Dermatology – Medicare 3-year History

Year	Number of Physicians in Database for Year	FFS Active Physicians	All Active Physicians	Active Physicians' Mean Age	Active Physicians' Median Age
2000/1	18	10	10	43	43.4
2001/2	18	8	8	43.8	43.9
2002/3	15	8	8	43.1	40.7

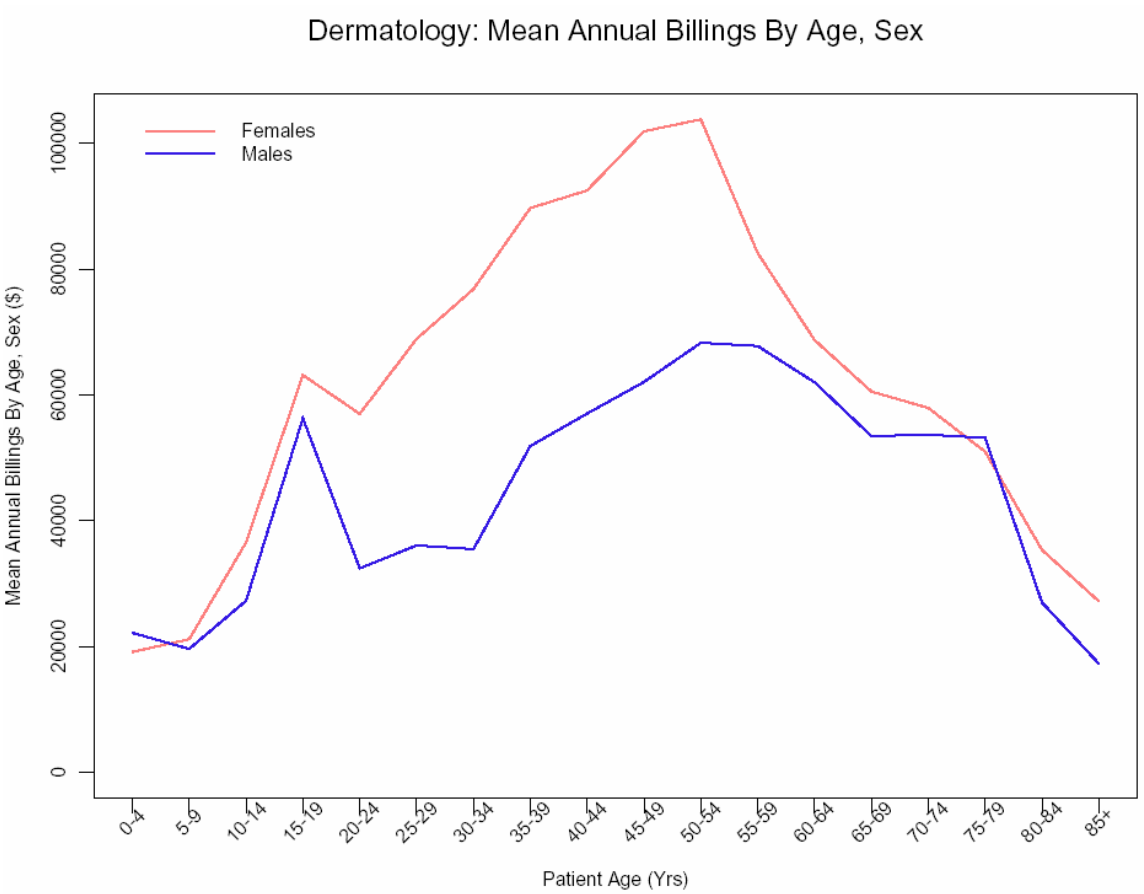
Year	Mean Active Physicians' Core Billings ($)	Effective Number of Physicians	Population to Each Active Physician
2000/1	200,289	10.1	72,157
2001/2	222,402	8.2	88,739
2002/3	238,249	8.1	90,163

Demand Analysis and Forecast

As depicted in the figure below, the consumption of Dermatology services by the New Brunswick population over the past 3 years has the following characteristics:

- Females consume more service than males at every age group
- Females in their mid-20 to mid-50's consume the majority of service.
- Service use rises steeply for both males and females between the ages of 5 to the mid to late teens.
- Service use by both males and females reaches an initial peak at the 15-19 age group, thereafter, use by both genders drops slightly until the mid-20's, and peaks again for males and females at the 50-54 age range.

Figure 20 - Dermatology Mean Annual Total Billings, by Age and Sex of Population



Based on the utilization profile of Dermatology service as presented above, and considering the changing age structure of the New Brunswick population in the coming 10 years, the following table shows the growth rates in requirements anticipated for Dermatology to 2013.

Growth in demand for Dermatology services is projected to grow by nearly 10% from 2003 to 2013, which equates to an increase in effective requirements for Dermatologists from 8.1 presently, to 8.9 by 2013.

Table 103 – Growth in Demand for Dermatology Services (growth rates from base year)

Specialty	Effective No.	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Dermatology		*0.95%*	*1.86%*	*2.78%*	*3.65%*	*4.56%*	*5.49%*	*6.38%*	*7.25%*	*8.09%*	*8.87%*	*9.62%*
	8.1	8.2	8.3	8.3	8.4	8.5	8.5	8.6	8.7	8.8	8.8	8.9

An April 30, 2003 snapshot of vacancies in Dermatology indicates a shortfall of 5.5 positions across the province.

Gap Analysis

Supply data indicates the current workforce at 8 Dermatologists, the same as 2002/03 levels as recorded by Medicare billings, and thus is assumed to be equivalent to 8.1 effective physicians (refer to Table 86).

When considering the current shortfall of 5.5 positions, and based on potential retirement of 1 Dermatologist over this time period (and not accounting for other gains and exits from the current and future cohort of active physicians), and the growth in demand estimating a need for 8.9 effective Dermatologists by 2013, **there could be a total requirement for up to an additional 8 Dermatologists in the province over the coming 10-year period**. In addition, planning for temporary leaves due to maternity must take into account the fact that 4 of the 8 Dermatologists are female and under the age of 40. The gradual reduction in number of expected graduates in this field over the next 5 years may also create a more competitive recruitment environment.

Also of note, respondents to the physician survey indicated the following changes to their practice plans over the coming 5 years:

- In the 40-55 age group one male plans to reduce by at least 50% permanently

6.4.2.4 Diagnostic Radiology

Education

This specialty residency is typically completed in 5 years and is offered through all 16 medical schools across Canada. The 2002-2003 CAPER data indicates that currently there are 371 residents (156 female and 215 male) in this program across the country with estimated completion dates as seen in the following table:

Table 104 - Diagnostic Radiology

2003	2004	2005	2006	2007	Total
85	84	74	69	59	**371**

Sub specialties in Neuroradiology or Pediatric Radiology may be taken following successful completion of a RCPSC Diagnostic Radiology program. Typically, two additional years of study are required; however, one may be taken concurrently during the Diagnostic Radiology residency program.

The sub specialty of Neuroradiology is concerned with both imaging and interventional procedures related to the brain, spine and spinal cord, head, neck, and organs of special senses of adults and children. The 2002-2003 CAPER data indicates that currently there are 4 residents (all male) enrolled in a residency program who are expected to enter the market in 2003. One candidate (male) is pursuing a pediatric radiology specialty and expects to complete in 2003.

Four New Brunswick residents are enrolled in Diagnostic Radiology at Dalhousie University with expected completion dates as follows: 2004 (1), 2005 (1), 2006 (1) and 2007 (1).

CAPER data indicates that since 1990, a total of 728 residents have graduated in Diagnostic Radiology. Annual outputs averaged 56 per year over this 13-year period, ranging from a low of 56 to a high of 64. The number of graduates over the next 5 years is predicted to be over 30% greater than average in the last decade.

Current Workforce Analysis

There are 61 Diagnostic Radiologists contained in the physician database, the majority 53 (87%) are male. Radiologists are distributed across the province as seen in the following table:

Table 105 - Diagnostic Radiology Distribution by Health Region

Region 1	Region 2	Region 3	Region 4	Region 5	Region 6	Region 7	OOP*	Total
14 (23%)	14 *(23%)*	13 *(21%)*	7 *(11%)*	4 *(7%)*	6 *(10%)*	1 *(2%)*	2 *(3%)*	61 (*100%)*
**OOP = out of province*								

The average age for males in this group is 51, for females is 43, and for the total group is 50 years of age.

Of particular concern for this specialty is that half of the Radiologist (30 of 61) are currently over the age of 50, and thus will come within the potential retirement zone over the 10-year forecast horizon. Of these potential retirements, only 1 Radiologist of the 30 is female.

Furthermore, as discussed previously, the gender composition of the Radiology workforce is shifting, with 50% of the current workforce 35 years of age and under comprised of women, compared with 13% in the total Radiology workforce.

Of the 61 Radiologists, there are 12 who are less than 0.25 FTE as calculated in the Medicare database. This is an important planning consideration in that, for example, the snapshot used for FTE analysis (2002/03) there were up to 8 Radiologists from Quebec, servicing the upper portion of Region 3 to make up for a shortage of 1 full-time Radiologist. As such, the count of 61 Radiologists in the province may be an overstatement.

Medicare billing data for the three most recent fiscal years is incomplete for this group, due to changes in reporting billings for Diagnostic Radiologists over this time. Therefore, these data are not credible as complete summaries of diagnostic radiology activity in the province.

Supply Forecast

Highlights

- The Radiology workforce is expected to remain roughly stable between 2003 and 2013, given the following estimates:
  - 2 PGME entries per year
  - 1 retirement per year
  - Negligible impact of immigration, emigration, IMGs, and interprovincial migration
- The percentage of female Radiologists as a percentage of total is expected to steadily increase over the forecast period, from 13% at present to 26% in 2013.
- The percentage of the Radiology workforce over the age of 55 is expected to remain roughly stable over the forecast period, starting at a high of 38% in 2003, dropping to 34% in 2005, and steadily climbing thereafter to reach 39% by 2013.

The following table outlines Diagnostic Radiology Supply Forecast 2003-2013

Table 106 - Diagnostic Radiology Supply Forecast 2003-2013

Diagnostic Radiology			
YEAR	Total Physicians	% Female	% >55
Base Stock Mar 2003	**61**	**13%**	**38%**
2003	61	14%	36%
2004	61	16%	35%
2005	61	17%	34%
2006	62	18%	39%
2007	62	19%	38%
2008	62	20%	40%
2009	62	21%	41%
2010	62	22%	39%
2011	62	24%	38%
2012	62	25%	38%
2013	61	26%	39%

Demand Analysis and Forecast

There was not sufficient billing and hospital data on which to base a comprehensive Diagnostic Radiology historical and current analysis.

However, based on the utilization profile of Radiology service, as provided by available data (interpret with caution), and considering the changing age structure of the New Brunswick population in the coming 10 years, the following table shows the growth rates in requirements anticipated for Radiology to 2013.

Growth in demand for Radiology services is projected to grow by 13% from 2003 to 2013, which equates to an increase in effective requirements for Diagnostic Radiologists from 61 presently (actual number), to 69 by 2013.

Table 107– Growth in Demand for Diagnostic Radiology Services (growth rates from base year)

Specialty	Effective No.	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Diagnostic Radiology		*1.24%*	*2.46%*	*3.68%*	*4.83%*	*6.02%*	*7.22%*	*8.39%*	*9.56%*	*10.70%*	*11.91%*	*13.04%*
	61.0	61.8	62.5	63.2	63.9	64.7	65.4	66.1	66.8	67.5	68.3	69.0

An April 30, 2003 snapshot of vacancies in Diagnostic Radiologists indicates a significant shortfall of 16.7 positions across the province.

Gap Analysis

Supply data shows the current workforce at 61 Radiologists, and the forecast for supply of Radiologists to 2013 is expected to remain roughly stagnant (in the 61-62 range throughout).

Based on demand estimates predicting growth in demand for Radiology services in the order of 13% over the 2003-2013 time period, it is estimated that 69 Radiologists will be required at the end of this time period. In addition, there is a current shortfall, as indicated by vacancies, of 16.7 positions. **Thus, in total there could be a shortage of up to 25 Radiologists over the 10-year forecast period, ranging from an immediate deficit in 2003 of 16.7 and rising to 25 or beyond by 2013, depending on retirements** (based on historical retirement rates, the forecast model assumes up to 10 retirements over the forecast period, however, 30 Radiologists will come within the potential retirement zone, thus, if retirements are larger than forecast the potential shortage could be much greater than 25 by 2013).

In addition, if it is determined that the current position(s) that are serviced by out-of-province Radiologists need to be filled with an in-province Radiologist, this equates to an additional shortage, over and above what is outlined above.

As well, one respondent to the physician survey indicated plans to reduce practice completely for 1 year or less within the coming 5 years.

Technology is a significant factor in moderating this predicted shortage where the geographic location of the Diagnostic Radiologist is less material to service access, and economies may be realized through further centralizing the service even within regions.

6.4.2.5 Emergency Medicine

Education

Memorial University and University of Saskatchewan are the only two university medical schools that do not offer residencies in this specialty. The duration of study is typically 5 years for those applying direct from medical school. The 2002-2003 CAPER data indicates that currently across the country 125 residents (42 female and 83 male) are engaged in an Emergency Medicine program and 15 residents (8 female and 7 male) are pursuing pediatric Emergency Medicine with estimated completion dates as shown in the following table.

Table 108 - Emergency Medicine

	2003	2004	2005	2006	2007	Total
Emergency Med.	24	21	32	24	24	**125**
Ped. Emergency Med.	11	4	-	-	-	**15**

In addition, CAPER data indicates that there is one candidate pursuing a subspecialty in Critical Care Emergency Medicine who expects to enter the market in 2003.

Two New Brunswick residents are enrolled in Emergency Medicine at Dalhousie University with expected completion dates as follows: 2006 (1) and 2007 (1).

CAPER data indicates that since 1990, a total of 162 residents have graduated in Emergency Medicine (RCPSC). Annual outputs averaged 12 per year over this 13-year period, ranging from a low of 4 to a high of 21. The last 3 years have seen increasing numbers of graduates — 20, 21, and 18 respectively. The number of graduates over the next 5 years is predicted to be 100% greater as compared to the average in the last decade. When compared with the forecast demand for this specialty, there have also been 578 Family Medicine practitioners graduate since 1990, with an Emergency Medicine residency accredited by the College of Family Physicians of Canada (CFPC). This represents an average of 44 per year. Currently, there are 99 enrolled in this residency who expect to complete in 2003. This represents 125% increase, as compared to the average over the past decade. This figure could be interpreted to mean more family physicians are seeking to broaden their credentials to support community based rural practices. Alternatively, it could also mean more community based family physicians are moving into emergency room practices and away from community based practices. The latter is more concerning when one considers public access to primary care and requires closer investigation and ongoing monitoring.

Current Workforce Analysis

There are 3 physicians in the province with a specialty certification in Emergency Medicine, of which 2 are female. Of the total, 2 are in Region 2 and 1 is in Region 3. All 3 are between 45 and 55 years old, with an average age for this group of 50 years old. One in the group will come into the potential retirement zone within the 10-year forecast period.

The issue of ‘functional specialty’ or ‘actual practice’ as discussed in previous sections is an important one in understanding the full Emergency Medicine picture in New Brunswick. As self-reported in the physician survey, 30 Family Practitioners indicated that they spend greater than 90% of their time practicing in the Emergency Room. Coupled with an increased number of family medicine residents pursing CFP Emergency Medicine credentials, this has positive implications for this service area; however, this may be at the expense of community based primary care medicine and warrants close monitoring.

Demand Analysis and Forecast

There are no active physicians from Medicare or hospital data, as these Emergency Medicine specialists are currently remunerated on either a salary or sessional basis and activity level/utilization data is therefore not captured currently.

An April 30, 2003 snapshot of vacancies in Emergency Medicine indicates a shortfall of 6.7 positions across the province.

Gap Analysis

Based on the shortfall of 6.7 positions currently (as per current vacancies), and accounting for the 1 potential retirement, **this group may require 7-8 Emergency Medicine specialists in the coming 10-year planning period.** This does not account for growth in demand within this specialty.

The extent to which Family Physicians, whose practice consists almost exclusively of Emergency Medicine, mitigates this demand warrants consideration, as does the relationship between the relative numbers of RCPSC and CFP credentialed physicians in the delivery of the expected standard of Emergency Medicine care in New Brunswick.

6.4.2.6 Gastroenterology

Education

Memorial University, University of Saskatchewan, and Université Laval do not offer this program of studies. The 13 universities offering residencies in this subspecialty program offer a focus on either/or adult or pediatric gastroenterology. Typically, 2 years of additional subspecialty training is required following either RCPSC certification in Internal Medicine or Pediatrics.

The 2002-2003, CAPER data indicates that currently there are 74 residents (29 female and 45 male) engaged in an adult gastroenterology program across the country and 5 residents (4 female and 1 male) engaged in a program with a pediatric focus. Estimated completion dates are in the following table.

Table 109 - Gastroenterology

	2003	2004	Total
Adult	40	34	**74**
Pediatric	4	1	**5**

One New Brunswick resident is enrolled in Gastroenterology at Dalhousie University and is expected to complete in 2004.

CAPER data indicates that since 1990, a total of 211 residents have graduated in Gastroenterology (Internal Medicine). Annual outputs averaged 16 per year over this 13-year period, ranging from a low of 9 to a high of 23. The number of graduates over the next 2 years is predicted to be 130% greater when compared to the average in the last decade. Over the same 13-year period, there were 38 graduates in Pediatric Gastroenterology, averaging 3 per year, which compares favourably with the predicted outputs over the next 2 years.

Current Workforce Analysis

There are 7 Gastroenterologists in the physician database and the majority (6 or 86%) of them male. An analysis by Health Region shows that 3 Gastroenterologists are in Region 2, 2 are in Region 3 and 1 each are in Regions 1 and 6.

Of particular concern is that the average age of the current group of Gastroenterologists practicing in New Brunswick is 55 years. Specifically, 4 of the 7 Gastroenterologists (57%) are over the age of 50, and thus fall into the potential retirement zone within the 10-year forecast horizon.

The most recent 3 fiscal years (2000-2003) of Medicare billing data, as presented in the following tables, provide some historical perspective of the Gastroenterology group:

- Stability in actual number and effective number of Gastroenterologists
- Increase in mean and median age
- Stable service ratio for New Brunswickers – relatively little change in population to Gastroenterologist ratio

The following table outlines Gastroenterology – Medicare 3-year History

Table 110 - Gastroenterology - Medicare 3-year History

Year	Number of Physicians in Database for Year	FFS Active Physicians	All Active Physicians	Active Physicians' Mean Age	Active Physicians' Median Age
2000/1	19	10	10	51.4	50.5
2001/2	17	10	10	52.4	51.5
2002/3	20	10	10	53.4	52.5

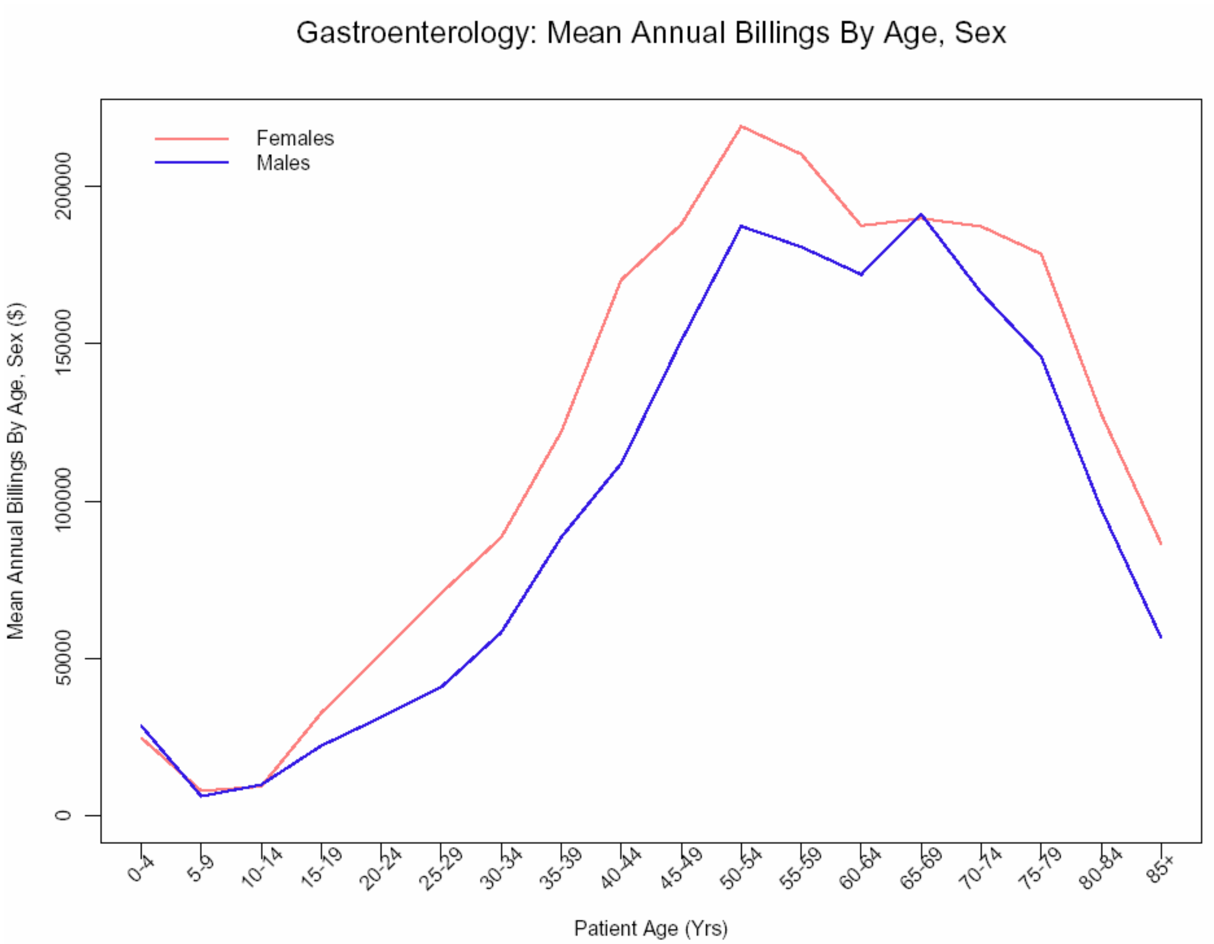
Year	Mean Active Physicians' Core Billings ($)	Effective Number of Physicians	Population to Each Active Physician
2000/1	371,364	10.1	72,153
2001/2	395,082	10	72,269
2002/3	397,130	10.1	72,182

Demand Analysis and Forecast

As depicted in the figure below, the consumption of Gastroenterology services by the New Brunswick population over the past 3 years has the following characteristics:

- Females consume more service at every age group, other than the under 14 and the 65-69 age groups
- Service consumption by females peaks at the 45-59 age group
- Service consumption for males reaches two fairly equal peaks, for the 45-49 age group, and again for the 65-69 age group

Figure 21 - Gastroenterology Mean Annual Total Billings, by Age and Sex of Population



Based on the utilization profile of Gastroenterology service, as presented above, and considering the changing age structure of the New Brunswick population in the coming 10 years, the following table shows the growth rates in requirements anticipated for Gastroenterology to 2013.

Growth in demand for Gastroenterology services is projected to grow by over 17% from 2003 to 2013, which equates to an increase in effective requirements for Gastroenterologists from 10.1 presently, to 11.9 by 2013.

Table 111 – Growth in Demand for Gastroenterology Services (growth rates from base year)

Specialty	Effective No.	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Gastroenterology		*1.58%*	*3.13%*	*4.68%*	*6.20%*	*7.77%*	*9.37%*	*10.93%*	*12.51%*	*14.06%*	*15.75%*	*17.34%*
	10.1	10.3	10.4	10.6	10.7	10.9	11.0	11.2	11.4	11.5	11.7	11.9

An April 30, 2003 snapshot of vacancies in Gastroenterology indicates a surplus of 3.2 positions across the province.

Gap Analysis

Supply data indicates the current workforce at 7 Gastroenterologists, less than the 2002/03 levels as recorded by Medicare billings. Current demand estimates for indicate requirements for 10.1 effective Gastroenterologists, which leaves a shortage of 3.1 Gastroenterologists. This shortage calls into question the reported surplus of 3.2 positions, as demand indicates that these positions are required to provide the required level of Gastroenterology service.

Demand is predicted to grow by over 17% to 11.9 Gastroenterologists required by 2013, which is an increase of 1.8 specialists over present. In addition, based on predicted retirements of 4 Gastroenterologists over the planning horizon (and not accounting for other gains and exits from the current and future cohort of active physicians), **there will be a total requirement for up to an additional 9 Gastroenterologists in the province over the coming 10-year period**, the timing of which is dependent upon retirement of those physicians in the retirement zone. In addition one physician the 40-55 age group plans to reduce by at least 25% permanently. Close monitoring/succession planning is therefore required for this group.

6.4.2.7 Geriatric Medicine

Education

This is an RCPSC subspecialty residency, which is 2 years in duration and is offered following a certification in Internal Medicine through 13 of Canada's medical schools. In Quebec, this field is delivered collectively through the provincial network of universities (Laval, Sherbrooke, Montreal, and McGill). Memorial University, Queens University, and the University of Saskatchewan do not have residencies in this subspecialty.

The 2002-2003 CAPER data indicates that currently across the country there are 19 residents (13 female and 6 male) pursuing this specialty. Estimated completion dates are in the following table.

Table 112 - Geriatric Medicine

2003	2004	Total
11	8	**19**

No known New Brunswick residents are enrolled in this specialty.

CAPER data indicates that since 1990, a total of 126 residents have graduated in Geriatric Medicine. Annual outputs averaged 10 per year over this 13-year period, ranging from a low of 6 to a high of 14. The number of graduates over the next 2 years is predicted to be comparative to the average in the last decade.

Current Workforce Analysis

There are 6 Geriatricians in the physician database, of which the majority are female (5 or 83%). The majority (3 or 50%) is located in Region 2, while 2 are in Region 1, and 1 is in Region 3.

The Geriatrics group is relatively young with an average age of 43. Of the 6 Geriatricians, 4 (67%) are under the age of 50.

From a planning perspective, it is of concern that 2 of the 6 Geriatricians are over the age of 55, and thus within the potential retirement zone in the 10-year forecast period. Additionally, 3 of the 6 Geriatricians are female and under the age of 40, thus in the childbearing age range, which poses additional planning considerations of a short-term/temporary nature. Given the changing population demographic and no predicted increase in outputs from the education sector, the competitive environment relative to recruitment may be an issue.

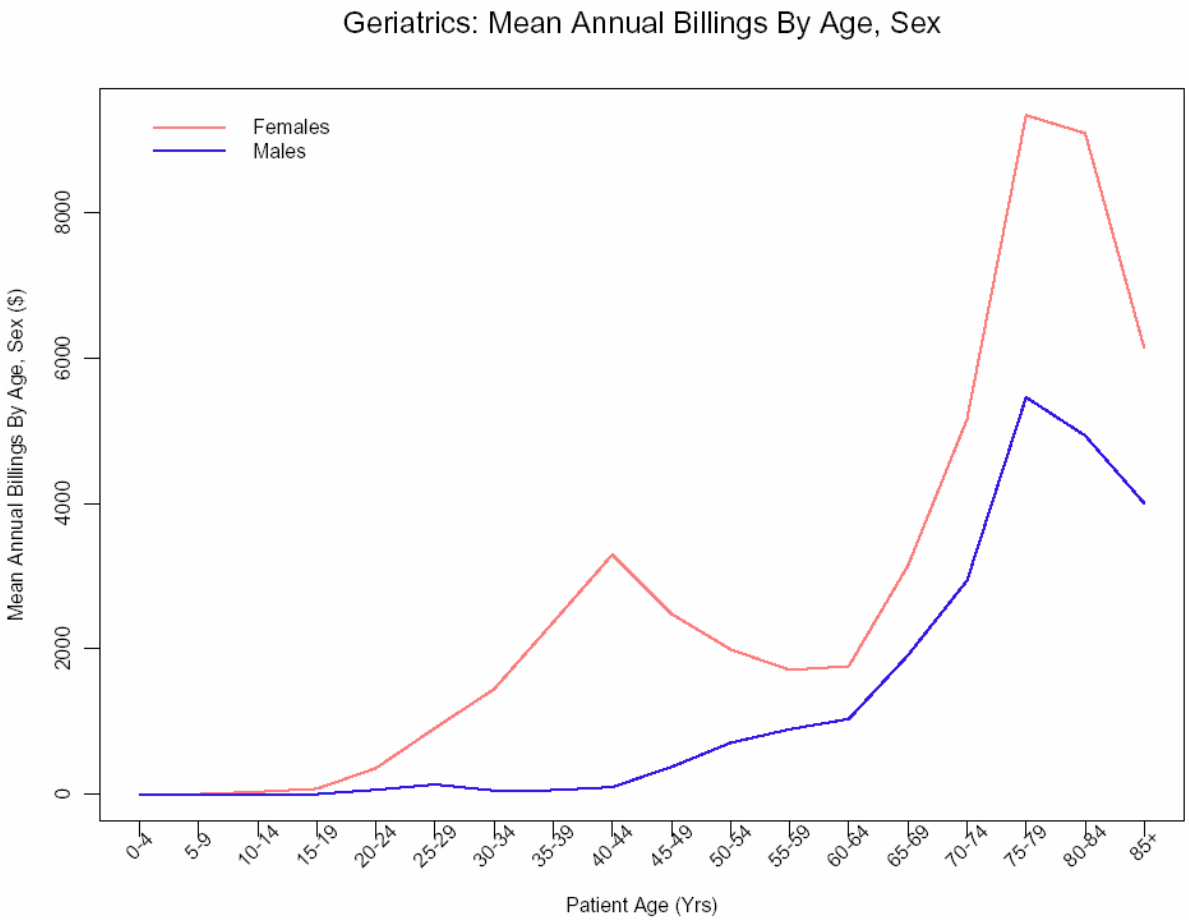
A historical Medicare billings analysis is unavailable for this group as all Geriatricians have sub-threshold billings as the majority of them are remunerated on a salaried basis and there is no activity/utilization measurement available. Of the 6 Geriatricians, the hospital data show 3 with active hospital practice in 2000/1 and 2001/2.

Demand Analysis and Forecast

As depicted in the figure below, the consumption of Geriatric services by the New Brunswick population over the past 3 years has the following characteristics:

- Females consume more service at every age group, other than the under 19 age groups, where no service is consumed by either gender.
- Female consumption of service rises gradually from the age of 20 to 45 to reach a first peak, and then rises again steeply from the age of 60 to 79 to reach a second peak.
- Service consumption peaks for both males and females at the 75-79 age range.
- Male consumption of service does not begin until after the age of 40, and then reaches 2 fairly equal peaks, for the 45-49 age group and again for the 65-69 age group.

Figure 22 - Geriatrics Mean Annual Total Billings, by Age and Sex of Population



Based on the utilization profile of Geriatric service, as presented above, and considering the changing age structure of the New Brunswick population in the coming 10 years, the following table shows the growth rates in requirements anticipated for Geriatrics to 2013.

Growth in demand for Geriatric services is projected to grow by 17% from 2003 to 2013, which equates to an increase in requirements for Geriatricians from 6 (actual) presently, to 7 by 2013.

Table 113 – Growth in Demand for Geriatric Services (growth rates from base year)

Specialty	Effective No.	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Geriatrics		*1.67%*	*3.05%*	*4.50%*	*5.93%*	*7.30%*	*8.74%*	*10.18%*	*11.65%*	*13.33%*	*15.17%*	*16.99%*
	6.0	6.1	6.2	6.3	6.4	6.4	6.5	6.6	6.7	6.8	6.9	7.0

An April 30, 2003 snapshot of vacancies in Geriatric Medicine indicates a shortfall of 1.2 positions across the province.

Gap Analysis

Based on predicted retirements of 2 (out of 6) Geriatricians over the planning horizon (not accounting for other gains and exits from the current and future cohort of active physicians), and given that growth in demand estimates requirements for 7 Geriatricians by 2013**, there could be additional requirements for up to 5 Geriatricians over the 2003 to 2013 forecast period**, which includes the immediate shortfall of 1.2 Geriatricians as reported by current vacancies. The timing of these requirements is dependent upon retirement of the 2 Geriatricians. As well, one physician in the 30-40 age group has indicated plans to reduce practice by at least 50% for 1 year or less.

6.4.2.8 Hematology

Education

Thirteen university medical schools offer programs in this specialty with either an adult hematology or pediatric hematology-oncology focus. The program of study is typically 2 years following RCPSC certification in Internal Medicine or Pediatrics up to one year of which may be taken concurrently with these residencies. Memorial University, Université de Sherbrooke, and University of Saskatchewan do not offer programs. The 2002-2003 CAPER data indicates that currently across the country there are 49 residents (24 female and 25 male) engaged in this program of study with an adult focus and 19 (12 female and 7 male) with a pediatric focus. Estimated completion dates are in the following table.

Table 114 - Hematology

	2003	2004	Total
Adult Hematology	33	16	**49**
Pediatric Hematology	16	3	**19**

No known New Brunswick residents are enrolled in this specialty.

CAPER data indicates that since 1990, a total of 130 residents have graduated in Hematology (Internal Medicine). Annual outputs averaged 10 per year over this 13-year period, ranging from a low of 7 to a high of 13. The number of graduates over the next 2 years is predicted to be 145% greater when compared to the average in the last decade.

Over the same 13-year period, 40 residents completed a Pediatric Hematology program, averaging 3 per year ranging from none to 6 graduates in any given year. The number of graduates predicted over the next 2 years far exceeds those produced historically by over 200% due to 16 residents expecting to graduate in this specialty in 2003 alone.

Current Workforce Analysis

There are 3 Hematologists in New Brunswick, and all are male and over the age of 40 (average age 49 years). Of the 3 in this group, 2 are located in Region 1 and 1 is in Region 2.

Within the 10-year forecast horizon, 1 of the 3 Hematologists (33%) will fall within the potential retirement zone.

The most recent 3 fiscal years (2000-2003) of Medicare billing data, as presented in the following tables, provide some historical perspective of the Hematology group over this time period:

- Decrease in actual number and effective number of Hematologists
- Significant increase in mean and median age
- Significant decline in service ratio for New Brunswickers – increase in population to Hematologist ratio

Table 115 - Hematology - Medicare 3-year History

Year	Number of Physicians in Database for Year	FFS Active Physicians	All Active Physicians	Active Physicians' Mean Age	Active Physicians' Median Age
2000/1	10	3	3	47.3	44.3
2001/2	10	3	3	48.3	45.3
2002/3	9	2	2	53	53

Year	Mean Active Physicians' Core Billings ($)	Effective Number of Physicians	Population to Each Active Physician
2000/1	285,750	3.2	229,140
2001/2	277,942	3.1	231,934
2002/3	411,297	2.1	337,886

Demand Analysis and Forecast

This analysis of Hematology is restricted to inpatient and day surgery Hematology activity, and therefore does not encompass all cancer care provided in the province.

Hematology CMGs include Leukemia, Lymphoma, Chemotherapy, and care of other Neoplasms. The majority of patient cases in Regions 5, 6, and 7, and a large proportion of cases from Region 3, travel out of region for service. As discussed in the supply analysis, the existing distribution is a single Hematologist at regional hospitals in Regions 1B, 1SE, and 2. Substantial outpatient activity occurs only at Regions 1SE and 2.

As depicted in the figure below, the consumption of Hematology services by the New Brunswick population over the past 3 years has the following characteristics:

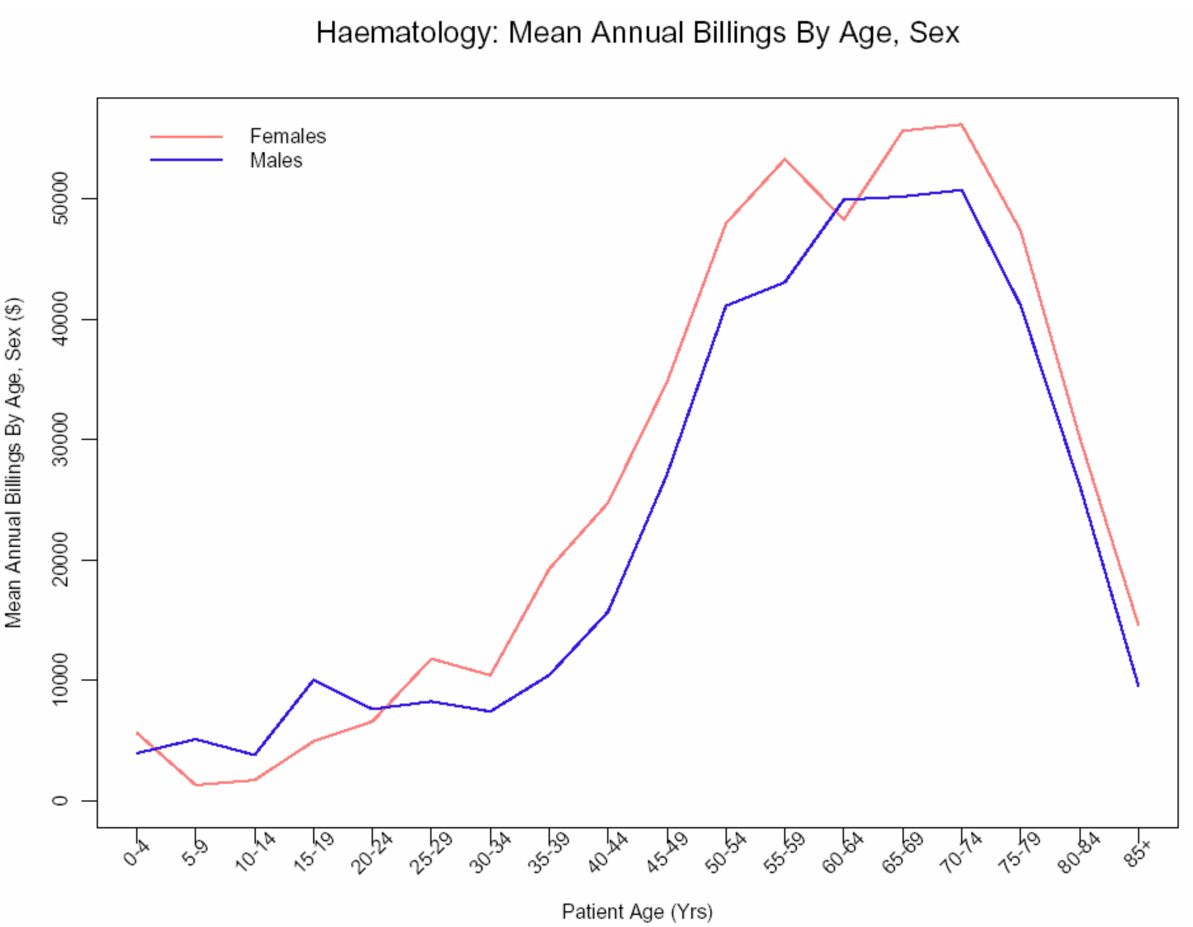
- Male consumption of service is greater than that of females from the age of 0 to 24, then females consume more service until the 60-64 age group, where service use is roughly consistent, and then females consume more service over the age of 65 than their male counterparts.

- Service consumption rises steeply for both genders after the age of 24, and for females, reaches a peak for the 55-59 age group, and for males reaches a sustained peak between the ages of 60 to 75.

- Service consumption drops steeply after the age of 75 for both genders.

- The majority of Hematology services are consumed by both genders between the ages of 45 to 75.

Figure 23 - Hematology Mean Annual Total Billings, by Age and Sex of Population



Based on the utilization profile of Hematology service, as presented above, and considering the changing age structure of the New Brunswick population in the coming 10 years, the following table shows the growth rates in requirements anticipated for Hematology to 2013.

Growth in demand for Hematology services is projected to grow by over 20% from 2003 to 2013, which equates to an increase in effective requirements for Hematologists from 3.1 presently, to 3.8 by 2013.

Table 116 – Growth in Demand for Hematology Services (growth rates from base year)

Specialty	Effective No.	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Haematology		*1.66%*	*3.35%*	*5.02%*	*6.74%*	*8.64%*	*10.63%*	*12.65%*	*14.68%*	*16.69%*	*18.98%*	*21.20%*
	3.1	3.2	3.2	3.3	3.3	3.4	3.4	3.5	3.6	3.6	3.7	3.8

An April 30, 2003 snapshot of vacancies in Hematology indicates that provincially this specialty is short by .02 positions, which for purposes of this analysis, is relative equilibrium.

Gap Analysis

Supply data indicates the current workforce at 3 Hematologists (the same as 2001/02 level), which is equated to 3.1 effective Hematologists. Current demand estimates indicate similar requirements, and given that there are no current vacancies, the current status of this specialty is deemed to be in equilibrium.

However, based on predicted retirements of 1 Hematologist over the planning horizon (not accounting for other gains and exits from the current and future cohort of active physicians), and given that growth in demand predicts requirements for 3.8 effective Hematologists by 2013, **there is a requirement for up to 2 Hematologists over the 2003 to 2013 forecast period**. As well, based on survey response, one physician in the 40-50 age range plans to reduce practice activity by at least 25% permanently.

6.4.2.9 Infectious Diseases

Education

This subspecialty typically requires an additional 2 years of study following RCPSC certification in Internal Medicine or Pediatrics; however, up to 1 year may be taken concurrently. Eleven universities offer residencies in this field with either a focus on adult or pediatric infectious diseases. The University of Saskatchewan, Memorial University, Université de Montréal, Queens, and Western Ontario do not offer programs. The 2002-2003 CAPER data indicates that currently across the country there are 14 residents (5 female and 9 male) engaged in this program of study with an adult focus and 5 (3 female and 2 male) with a pediatric focus. Estimated completion dates are in the following table.

Table 117 - Infectious Diseases

	2003	2004	Total
Adult Infectious Diseases	10	4	**14**
Pediatric Infectious Diseases	5		**5**

No known New Brunswick residents are enrolled in this specialty.

CAPER data indicates that since 1990, a total of 71 residents (27 female and 44 male) have graduated in Infectious Diseases (Internal Medicine) and 22 (10 female and 12 male) in Infectious Diseases (Pediatrics). Annual outputs averaged 5.5 and 1.7 per year, respectively, over this 13-year period. The number of graduates over the next 2 years is predicted to be 27% and 47% greater, respectively, when compared to the average in the last decade, which for this small specialty equates to about 1 additional position.

Current Workforce Analysis

There are 6 Infectious Disease specialists in New Brunswick, 4 are male (66%). If the 6 in this group, 3 are located in Region 1, 2 are in Region 2, and 1 is in Region 4. The average age for males in this group is 49 years old, for females 51 years old.

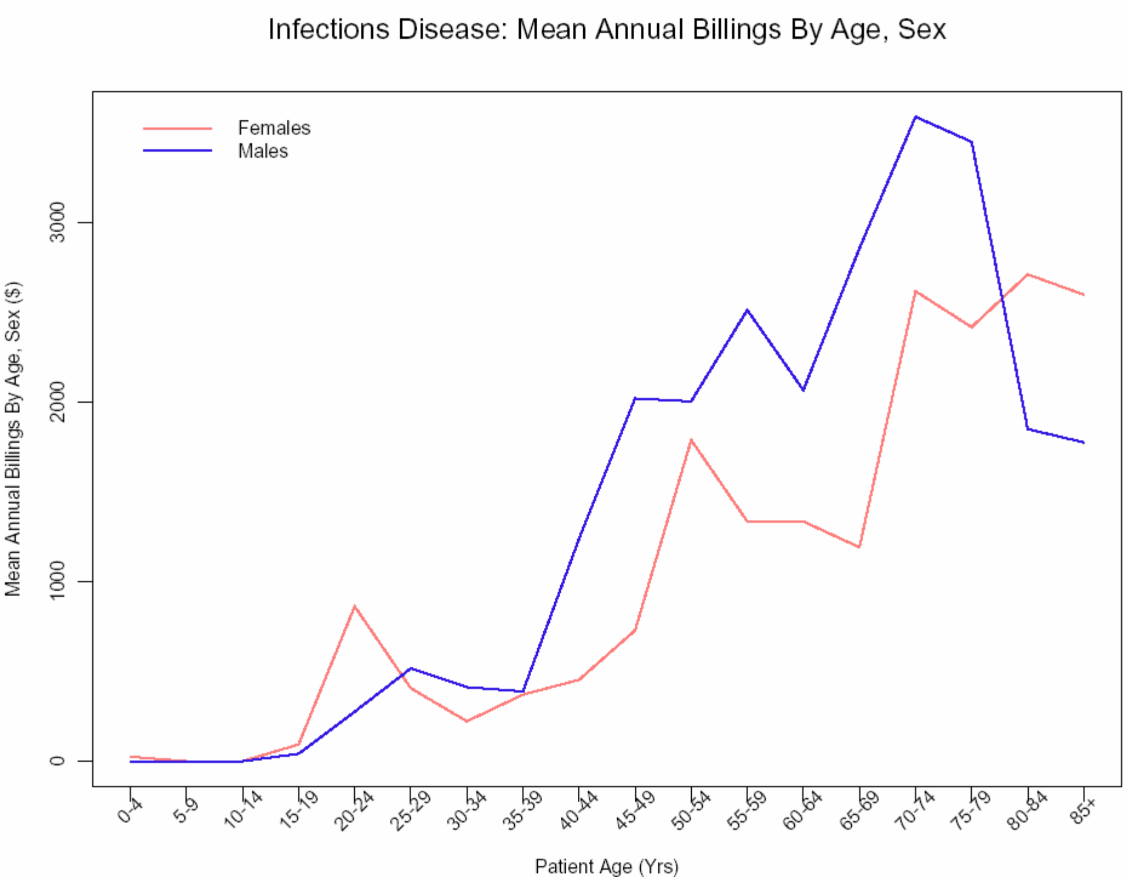
Within the 10-year forecast horizon, 1 of the 6 Infectious Disease specialists (17%) will fall within the potential retirement zone.

Demand Analysis and Forecast

As depicted in the figure below, the consumption of Infectious Disease services by the New Brunswick population over the past 3 years has the following characteristics:

- Male consumption of service is greater, than that of females from 35 through 80 years of age.
- Female consumption of service peaks several times, at the 20-24 age group, the 50-54 age group, the 70-74 age group, and finally at the 80-84 age group.
- Similarly, male service consumption se peaks at the 25-29 age group, the 45-49 age group, the 55-59 age group, and finally at the 70-74 age group.
- Use of Infectious Disease services by both genders does not begin until after the age of 20.

Figure 24 – Infectious Disease Mean Annual Total Billings, by Age and Sex of Population



Based on the utilization profile of Infectious Disease service, as presented above, and considering the changing age structure of the New Brunswick population in the coming 10 years, the following table shows the growth rates in requirements anticipated for the Infectious Disease specialty to 2013.

Growth in demand for Infectious Disease services is projected to grow by over 21% from 2003 to 2013, which equates to an increase in requirements for Infectious Disease specialists from 6 presently, to 7.3 by 2013.

Table 118 – Growth in Demand for Infectious Disease Services (growth rates from base year)

Specialty	Effective No.	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Infectious Disease		*2.06%*	*3.70%*	*5.51%*	*7.25%*	*9.25%*	*11.24%*	*13.31%*	*15.27%*	*17.37%*	*19.07%*	*20.93%*
	6.0	6.1	6.2	6.3	6.4	6.6	6.7	6.8	6.9	7.0	7.1	7.3

An April 30, 2003 snapshot of vacancies in Infectious Diseases indicates there are no vacancies in this specialty.

Gap Analysis

The Infectious Disease specialty is in relative equilibrium at present state based on current supply, demand and vacancies. Over the 10-year forecast period, however, there may be one retirement in this specialty who would need to be replaced, and in addition, growth in demand for Infectious Disease services in the planning period is expected to by over 20%, which would warrant an additional specialist by 2011.

6.4.2.10 Internal Medicine

Education

All 16 university medical schools in Canada offer residency programs in Internal Medicine that are typically a minimum of 4 years in duration. The 2002-2003 CAPER data indicates that currently across the country there are 779 residents (342 female and 437 male) engaged in this program of study with estimated completion dates in the following table.

Table 119 - Internal Medicine

2003	2004	2005	2006	Total
69	220	230	260	**779**

Given Internal Medicine is a prerequisite for other sub specialties, these outputs cannot be considered as solid sources of market supply for the timelines indicated. A number of accredited sub specialties of Internal Medicine are also available through the RCPSC, most with either an adult or a pediatric study focus, and most require 2 additional years of training following RCPSC Internal Medicine of Pediatric certifications. Cardiology has been dealt with separately under Section 6.3.2.2.

Four New Brunswick residents are enrolled in an Internal Medicine specialty program; 3 at Dalhousie University who are expected to complete in 2003 (1), 2004 (1), and 2006(1), and 1 at Université de Sherbrooke who is expected to complete in 2004.

CAPER data indicates that since 1990, a total of 833 residents have graduated in General Internal Medicine. Annual outputs averaged 64 per year over this 13-year period, ranging from a low of 38 to a high of 93. The number of graduates in this specialty over the last 5 years has been steadily declining. The number of graduates over the next 4 years, however, is predicted to be 204% greater when compared to the average in the last decade. As mentioned previously however, Internal Medicine is also an input to other sub specialties, potentially modifying the supply of General Internists.

The opportunities to sub specialize in this field of study are increasing and outputs have been variable. Since 1990, on average across the country there has been between 1-3 graduates in these respective disciplines with the exception of Critical Care (Adult) and Endocrinology (Adult), which has averaged 10 per year. The gender mix and expected completion dates of those currently enrolled in other Internal Medicine subspecialty residencies, according to the 2002-2003 CAPER data, can be found in the table below.

Table 120 - Internal Medicine Subspecialties

	2003	2004	TOTAL
Clinical Immunology/Allergy Adult	4	3	**7** (3 female, 4 male)
Clinical Immunology/Allergy Ped	4	3	**7** (3 female, 4 male)
Clinical Pharmacology Adult	10	-	**10** (7 female, 3 male)
Clinical Pharmacology Ped	3	-	**3** (2 female, 1 male)
Critical Care Adult	29	4	**33** (9 female, 24 male)
Critical Care Ped	11	3	**14** (7 female, 7 male)
Endocrinology/Metabolism Adult	16	11	**27** (19 female, 8 male)
Endocrinology/Metabolism Ped	13	3	**16** (11 female, 5 male)
Total	90	27	**117** (61 female,56 male)

One New Brunswick resident is enrolled in the Endocrinology/Metabolism program (Internal Medicine) and is expected to complete in 2003.

Current Workforce Analysis

There are 41 General Internists in the physician database, of which the majority are male (33 or 80%). The following health region distribution table shows that the majority of General Internists are in Region 1, followed by Region 3, then Region 2. These 3 regions account for 60% of the total number of General Internists in the province.

Table 121 – General Internist Distribution by Health Region

Region 1	Region 2	Region 3	Region 4	Region 5	Region 6	Region 7	Total
9 (22%)	*7 (17%)*	*8 (20%)*	*5 (12%)*	*2 (5%)*	*5 (12%)*	*5 (12%)*	41 (*100%)*

An age group analysis of this group shows that 14 of the 41 General Internists (34%) are under the age of 40, and 12 (29%) are between the age of 40 and 50. The average age of males in this group is 49 years, of females is 39 years, and overall is 47 years.

From a planning perspective, the high percentage of General Internists (15 of 41 or 37%) over the age of 50, who will fall within the potential retirements zone in the 10-year forecast period is worthy of note.

The most recent 3 fiscal years (2000-2003) of Medicare billing data, as presented in the following tables, provide some historical perspective of the General Internal Medicine group over this time period:

- Relative stability in actual number and effective number of Internists
- Increase in mean and median age of Internists
- Stability in service ratio for New Brunswickers – stable population to General Internist ratio

Table 122 - Internal Medicine - Medicare 3-year History

Year	Number of Physicians in Database for Year	FFS Active Physicians	All Active Physicians	Active Physicians' Mean Age	Active Physicians' Median Age
2000/1	54	30	30	47.4	45
2001/2	59	31	31	48.2	46
2002/3	61	29	29	49.2	47.5

Year	Mean Active Physicians' Core	Effective Number of Physicians	Population to Each Active Physician
2000/1	229,993	30.8	23,559
2001/2	229,818	32.6	22,260
2002/3	250,401	30.4	23,874

Supply Forecast

Highlights

- The General Internist workforce is expected to grow by nearly 10% between 2003 and 2013 given the following estimates:
  - 1 PGME entry per year
  - 1 retirement per year
  - Negligible impact of immigration, emigration, IMGs, and interprovincial migration
- The percentage of female General Internists as a percentage of total is expected to increase drastically over the forecast period, from 20% at present to 46% in 2013.
- The percentage of the General Internist workforce over the age of 55 is expected to drop steadily over the forecast period, from a high of 34% in 2003 to 28% by 2013.

The following table outlines General Internal Medicine Supply Forecast 2003-2013.

Table 123 - General Internal Medicine Supply Forecast 2003-2013

General Internal Medicine			
YEAR	**Total Physicians**	**% Female**	**% >55**
Base Stock Mar 2003	**41**	**20%**	**34%**
2003	42	26%	32%
2004	42	28%	30%
2005	43	29%	31%
2006	43	31%	28%
2007	43	33%	26%
2008	43	35%	30%
2009	44	37%	28%
2010	44	39%	28%
2011	45	41%	30%
2012	45	44%	28%
2013	45	46%	28%

Demand Analysis and Forecast

General Internists in New Brunswick are primarily involved in the Family Practice and regional Cardiology programs (35% and 50% of their activity, respectively). At the 4 hospitals with the highest General Internist presence, the General Internists covered 50% of the Cardiology program, and 6% of the Family Practice program. Hence, General Internists are typically found at the smaller of the regional hospitals, and primarily cover the regional Cardiology programs. There is no consistent province-wide pattern of practice for which they are uniquely responsible. At smaller hospitals, Family Practitioners perform the work that General Internists typically do at regional hospitals. At the larger regional hospitals, this work is typically distributed among internal medicine subspecialties.

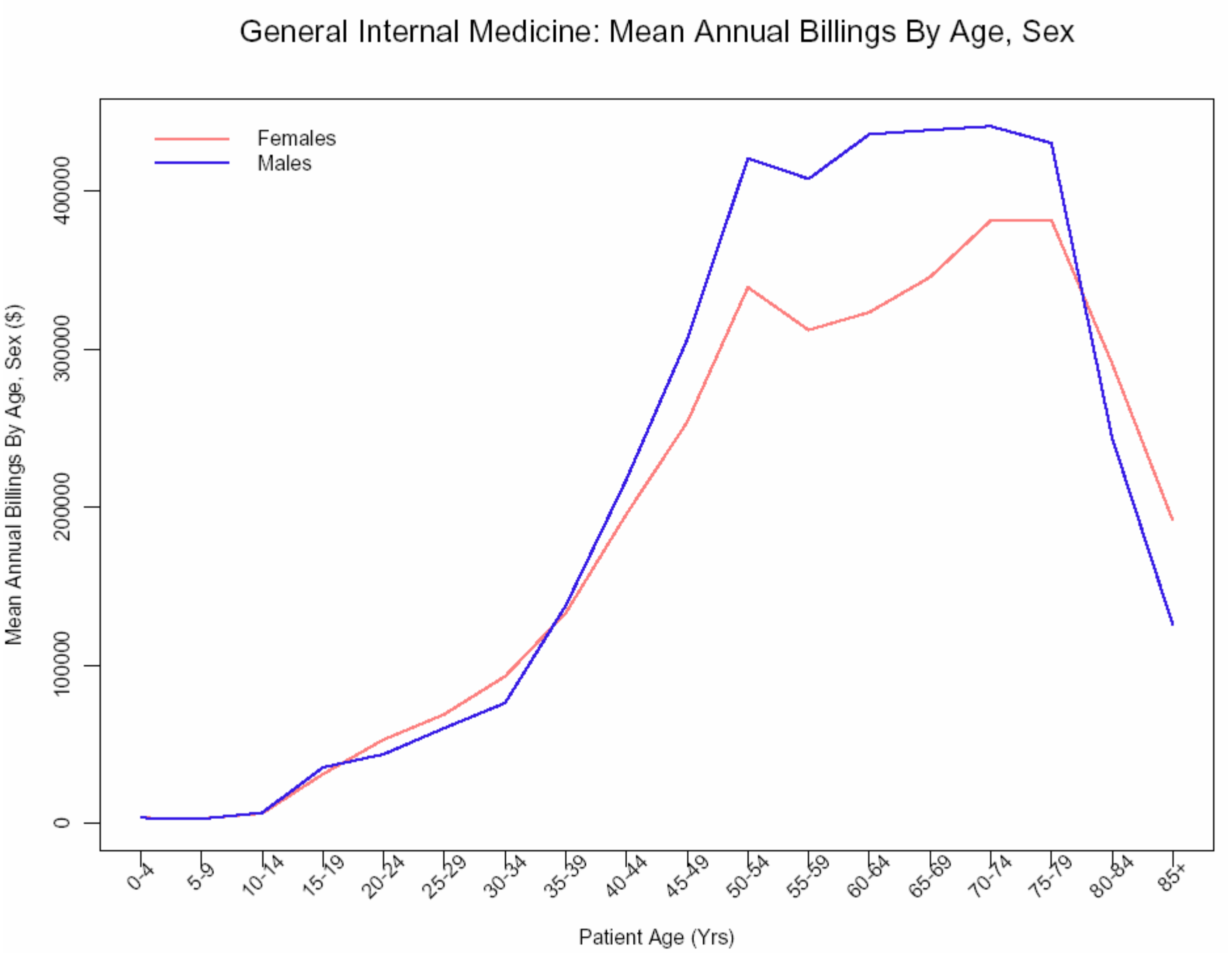
General Internists are important particularly to the smaller regional hospitals, where they account for a significant proportion of the weighted cases in hospitals. These practitioners provide service for many of the core programs at regional hospitals.

As depicted in the figure below, the consumption of General Internal Medicine services by the New Brunswick population over the past 3 years has the following characteristics:

- Service consumption by gender stays roughly constant until the age of 40, thereafter; males use more service than females at every age group, until the age of 80.
- Both male and female consumption peaks during the 50-54 age range, and again during the 70-74 age range.

- There is very little Internal Medicine consumption before the age of 20, with the majority of service being consumed between the age of 50 and 75 years (by both males and females).

Figure 25 - General Internal Medicine Mean Annual Total Billings, by Age and Sex of Population



Based on the utilization profile of General Internal Medicine service, as presented above, and considering the changing age structure of the New Brunswick population in the coming 10 years, the following table shows the growth rates in requirements anticipated for Internal Medicine to 2013.

Growth in demand for General Internal Medicine services is projected to grow by over 20% from 2003 to 2013, which equates to an increase in requirements for General Internists from 41 presently, to 49.5 by 2013. The growth rates are based on actual number of General Internists versus effective number as presented in the Medicare 3-year history data, as the Medicare data, 'All Active Physicians' does not include active salaried practitioners.

Table 124 – Growth in Demand for General Internal Medicine Services (growth rates from base year)

Specialty	Effective No.	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
General Internal Medicine		*1.78%*	*3.52%*	*5.24%*	*6.99%*	*8.92%*	*10.88%*	*12.80%*	*14.73%*	*16.64%*	*18.67%*	*20.66%*
	41.0	41.7	42.4	43.1	43.9	44.7	45.5	46.2	47.0	47.8	48.7	49.5

An April 30, 2003 snapshot of vacancies in General Internal Medicine indicates a surplus of 13 positions across the province.

Gap Analysis

Supply data shows the current workforce at 41 General Internists, and the forecast for supply of Internists to 2013 is expected to grow by 10% to 45. Demand estimates predict growth in demand for General Internal Medicine services in the order of 20% over the 2003-2013 time period, which equates to 8.5 General Internists above present.

The workforce will realize a shortage of 1-2 General Internists each year of the forecast period, beginning in 2007 and continuing until 2013, for a total requirement of up to 6 General Internists over the time period. Compounding this scenario is 4 physicians in the 40-55 age group who indicated in survey responses that they plan to reduce their practices by at least 25% permanently.

Regardless of the current reported surplus of 13 positions in this specialty, demand for General Internists' services as provided by the current workforce is being consumed and is expected to grow by over 20% in the next 10 years.

6.4.2.11 Medical Oncology

Education

A 2-year residency in this specialty can be obtained at all university medical schools with the exception of Université de Sherbrooke, Memorial University, and Saskatchewan University. The 2002-2003 CAPER data indicates that currently across the country there are 42 residents (23 female and 19 male) engaged in this program of study with estimated completion dates showing in the following table.

Table 125 - Medical Oncology

2003	2004	Total
29	13	**42**

CAPER data indicates that since 1990, a total of 187 residents have graduated in Medical Oncology. Annual outputs averaged 14 per year per year over this 13-year period, ranging from a low of 8 to a high of 22. The number of graduates over the next 2 years is predicted to be 50% higher when compared to the average in the last decade.

No known New Brunswick residents are enrolled in this specialty.

Current Workforce Analysis

There are 6 Medical Oncologists in the physician database, 4 are male (67%), and 2 are female. Analysis of distribution by health region reveals: 3 in Region 1, 1 in Region 2, and 2 in Region 3.

This is a relatively young group of physicians, with an average age of 40 years old. Of the 6 Oncologists 4 (67%) are under the age of 40, and 2 are in the 46-50 age range.

This group is predominantly salaried, thus Medicare data is incomplete, showing only one Oncologist with greater than $50,000 in Medicare billings. Additionally, hospital data show 2-3 active specialists in 2002/3, 2 with greater than 100 RIW in hospital.

Demand Analysis and Forecast

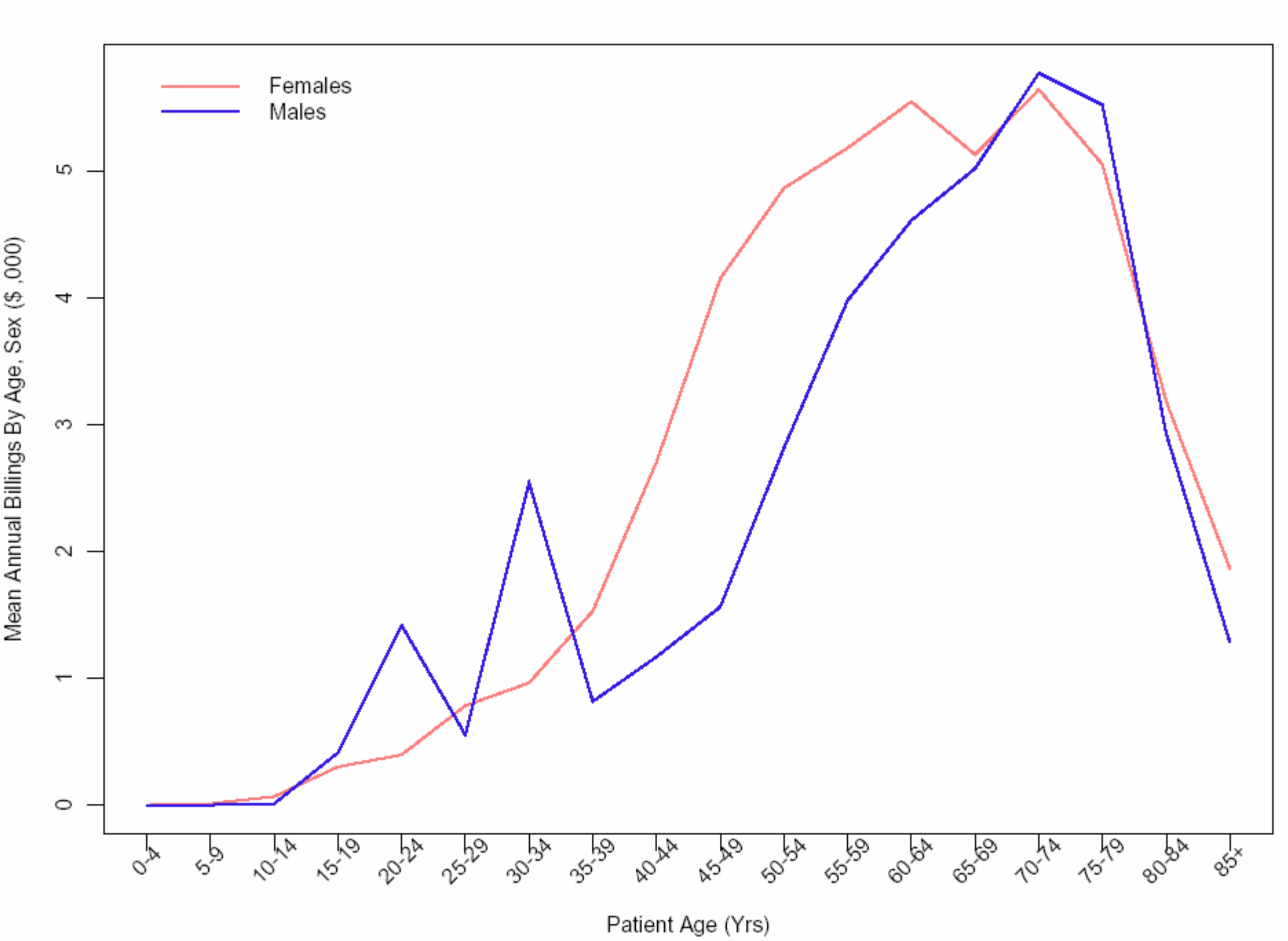
As depicted in the figure below, the consumption of Medical Oncology services by the New Brunswick population over the past 3 years has the following characteristics:

- There is very little use of Medical Oncology services before the age of 15, thereafter, use of service by males rises steeply to a peak during the 20-24 age range, and again at the 30-34 age range, then drops sharply until 40 years of age, then a gradual rise is experienced to peak at the 70-74 age group for males.

- Service consumption by females rises gradually after the age of 15, to peak at the 60-64 age range, and again at the 70-74 age range.

- Service consumption drops off sharply for both males and females after the early to mid-70s.

Figure 26 - Medical Oncology Mean Annual Total Billings, by Age and Sex of Population



Based on the utilization profile of Medical Oncology service, as presented above, and considering the changing age structure of the New Brunswick population in the coming 10 years, the following table shows the growth rates in requirements anticipated for Medical Oncology to 2013.

Growth in demand for Medical Oncology services is projected to grow by over 20% from 2003 to 2013, which equates to an increase in effective requirements for Medical Oncologists from 6 presently, to 7.2 by 2013. This demand projection does not take into consideration a new Cancer Control Strategy for New Brunswick, which is under development. However, the human resource impact of the strategy needs to be articulated by the Department of Health and Wellness and factored into this demand projection.

Table 126 – Growth in Demand for Medical Oncology Services (growth rates from base year)

Specialty	Effective No.	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Medical Oncology		*1.78%*	*3.54%*	*5.32%*	*7.12%*	*8.92%*	*10.80%*	*12.70%*	*14.59%*	*16.44%*	*18.61%*	*20.73%*
	6.0	6.1	6.2	6.3	6.4	6.5	6.6	6.8	6.9	7.0	7.1	7.2

In New Brunswick, an April 30, 2003 snapshot of vacancies Medical Oncology indicates a shortfall of 4.1 positions across the province.

Gap Analysis

Based on the current shortfall of 4.1 Medical Oncologists, no predicted retirements in this group over the 10-year forecast period (not accounting for other gains and exits from the current and future cohort of active physicians), and given that growth in demand estimates requirements for 7.2 Medical Oncologists by 2013, **there is a predicted gap of up to 6 Medical Oncologists over the forecast period.** Planned service delivery changes emanating from New Brunswick's cancer control strategy may influence this demand projection.

Across Canada there is a known shortage of Medical Oncologists, with the number of projected entrants into the market insufficient to meet even current demand. With a predicted gap of 5.3 positions over the planning horizon, New Brunswick's competitive position relative to recruitment of this specialty group is a barrier to recruitment.

6.4.2.12 Neonatology

Education

The residency for this subspecialty program of the RCPSC is offered at all university medical schools with the exception of Universities of Laval, Sherbrooke, Queens, and Memorial. The program is considered as having accreditation without certification, whereby the RCPSC recognizes the subspecialty for the purpose of accrediting the program, but does not offer examinations or certification to individuals completing the program. The 2002-2003 CAPER data indicates that currently across the country there are 22 residents (14 female and 8 male) engaged in this program of study with estimated completion dates showing in the following table.

Table 127 - Neonatology

2003	2004	Total
18	4	**22**

No known New Brunswick residents are enrolled in this specialty.

CAPER data indicates that since 1990, a total of 87 residents have graduated in Neonatology. Annual outputs averaged 7 per year per year over this 13-year period, ranging from a low of 3 to a high of 13. The number of graduates over the next 2 years is predicted to be 57% greater when compared to the average in the last decade.

Current Workforce Analysis

There are 4 practicing Neonatologists in New Brunswick, 3 female (75%) and 1 male. The health region breakdown is as follows: 1 each in Regions 2 and 3, and 2 in Region 6.

From a planning perspective, all 4 Neonatologists are over the age of 50 and thus will fall into the potential retirement zone within the 10-year forecast horizon.

Demand Analysis and Forecast

Neonatology services are closely aligned with obstetrical services and are not neatly designated as centralized or non-centralized. As such neonatal planning needs to be closely integrated with obstetrical care planning, to identify the sites for delivery of high-risk pregnancies.

The 3 hospitals with Neonatal programs (The Moncton Hospital, Saint John Regional Hospital, and the Dr. Everett Chalmers Regional Hospital) all provide care to high-risk pregnancies/neonates.

In New Brunswick, approximately 14% of Very Low Birth Weight (VLBW) neonates are born in hospitals other than the 3 hospitals offering care to VLBW neonates (The Moncton Hospital, Saint John Regional Hospital, and the Dr. Everett Chalmers Regional Hospital). Only 1% is born in hospitals not offering Caesarean Section capability.

The Neonatology group is analyzed as part of Pediatrics, (Section 6.4.2.15) based on how data is grouped in hospital and Medicare databases.

An April 30, 2003 snapshot of vacancies in the Neonatology indicates a surplus of 1.5 positions across the province.

Gap Analysis

Based on potential retirement of all 4 Neonatologists within the forecast period, it is important to closely monitor this group and ensure succession planning well in advance of retirements.

6.4.2.13 Nephrology

Education

This subspecialty residency requires 2 years of study following successful completion of RCPSC certification in Internal Medicine or Pediatrics, 1 year of which may be done concurrently. The programs focus in either adult or pediatric nephrology. The program is offered at all university medical schools with the exception of Saskatchewan. The 2002-2003 CAPER data indicates that currently across the country there are 55 residents (30 female and 25 male) engaged in this program of study with and adult focus and 6 residents (3 female and 3 male) pursuing the pediatric focus with estimated completion dates shown in the following table.

Table 128 - Nephrology

	2003	2004	Total
Adult Nephrology	33	22	**55**
Pediatric Nephrology	3	3	**6**

No known New Brunswick residents are enrolled in this specialty.

CAPER data indicates that since 1990, a total of 219 residents have graduated in Adult Nephrology and 26 in Pediatric Nephrology. Annual outputs averaged 17 and 2 per year respectively over this 13-year period, ranging from lows of 4 and 1 respectively, to highs of 10 and 6 respectively. The number of graduates over the next 2 years is predicted to be 61% and 50% higher respectively, when compared to the average in the last decade.

Current Workforce Analysis

There are 6 Nephrologists in the physician database, 4 males (67%) and 2 females. Of the 6, 3 each are located in Regions 1 and 2.

This is a relatively young group, with an overall average age of 41 (44 for males, and 34 for females).

The concern, from a planning perspective is that 2 Nephrologists are female and under the age of 40, thus within the childbearing age range. Additionally, one Nephrologist will fall into the potential retirement zone during the 10-year forecast period.

The most recent 3 fiscal years (2000-2003) of Medicare billing data, as presented in the following tables, provide some historical perspective of the Nephrology group over this time period:

- Relative stability in actual number and effective number of Nephrologists

- Increase in mean and median age

- Stability in service ratio for New Brunswickers – stable population to Nephrologist ratio

Table 129 - Nephrology - Medicare 3-year History

Year	Number of Physicians in Database for Year	FFS Active Physicians	All Active Physicians	Active Physicians' Mean Age	Active Physicians' Median Age
2000/1	15	6	6	39	33.2
2001/2	15	6	6	39.6	34.2
2002/3	12	6	6	40.6	35.2

Year	Mean Active Physicians' Core	Effective Number of Physicians	Population to Each Active Physician
2000/1	368,634	6.1	119,910
2001/2	380,154	6.1	118,845
2002/3	416,362	6	120,556

Demand Analysis and Forecast

Nephrology CMGs include dialysis and other CMGs associated with the care of patients with kidney failure. As discussed previously in the supply analysis, there are 2 sites with three Nephrologists each: Dr. Georges Dumont Hospital, and Saint John Regional Hospital. Saint John Nephrologists have lower inpatient activity but have significant outpatient activity. Currently data are not readily available describing outpatient Nephrology and dialysis in detail, therefore analysis concentrates primarily on inpatient and day surgery activity. Nephrology as a clinical program, encompasses inpatient and outpatient care, and is dependent on the presence of Urology and Vascular surgery programs.

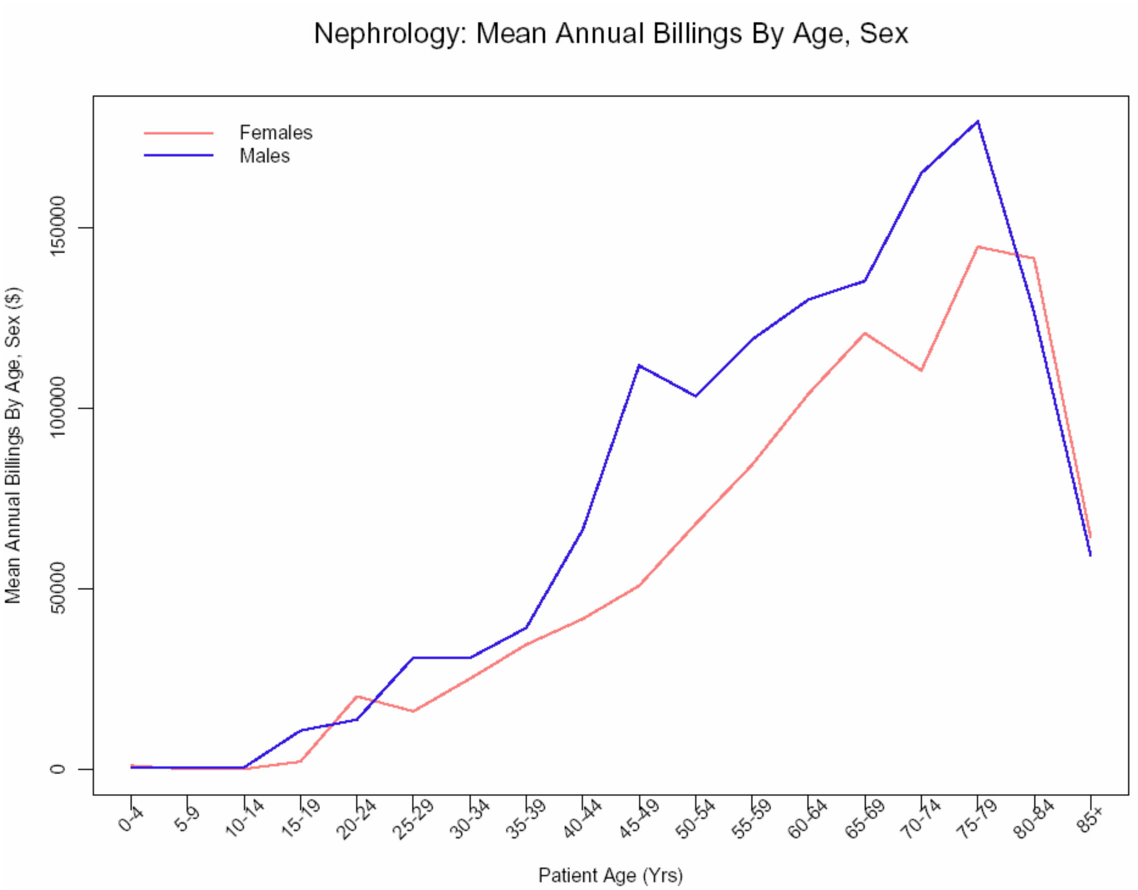
As depicted in the figure below, the consumption of Nephrology services by the New Brunswick population over the past 3 years has the following characteristics:

- Consumption of service begins for both genders after the age of 15, and rises to a peak for males at the 45-49 age group, and continues to rise to again reach a peak at the 75-79 age group.

- Female service consumption rises gradually to reach the first peak at the 65-69 age group, and rises again to reach a peak at the 75-79 age group.

- Nephrology service use by males is greater than that by females for every age group between the mid-20 to the early 80's.

Figure 27 - Nephrology Mean Annual Total Billings, by Age and Sex of Population



Based on the utilization profile of Nephrology service, as presented above, and considering the changing age structure of the New Brunswick population in the coming 10 years, the following table shows the growth rates in requirements anticipated for Nephrology to 2013.

Growth in demand for Nephrology services is projected to grow by over 20% from 2003 to 2013, which equates to an increase in effective requirements for Nephrologists from 6 presently, to 7.2 by 2013.

Table 130 – Growth in Demand for Nephrology Services (growth rates from base year)

Specialty	Effective No.	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Nephrology		*1.73%*	*3.39%*	*5.02%*	*6.68%*	*8.55%*	*10.47%*	*12.36%*	*14.22%*	*16.16%*	*18.17%*	*20.20%*
	6.0	6.1	6.2	6.3	6.4	6.5	6.6	6.7	6.9	7.0	7.1	7.2

An April 30, 2003 snapshot of vacancies in the Nephrology indicates a surplus of 4.9 positions across the province.

Gap Analysis

Supply data indicates the current workforce at 6 Nephrologists, equivalent to the 2002/03 levels as recorded by Medicare billings. Demand estimates for 2003 indicate requirements for 6.1 effective Nephrologists, which leaves the specialty in relative equilibrium at present, which calls into question the reported surplus in the specialty of 4.9 positions. Based on the 3-year Medicare history of no less than 6 Nephrologists, and a population to physician ratio that is higher than many other sub-specialties, the surplus should be regarded with caution.

Based on predicted retirements of 1 Nephrologist over the planning horizon (and not accounting for other gains and exits from the current and future cohort of active physicians), and estimated growth in demand for an additional 1.2 (7.2 effective Nephrologists by 2013), **there could be a requirement for up to 3 Nephrologists in the province over the coming 10-year period**, the timing of which is dependent upon the retirement of the one physician in the retirement zone.

6.4.2.14 Neurology

Education

Residency training in this specialty is 5 years in duration and is taken with either an adult or pediatric focus. All university medical schools offer this residency. The 2002-2003 CAPER data indicate that currently, across the country there are 125 residents (58 female and 67 male) engaged in this program of study with an adult focus and 22 residents (12 female and 10 male) in a pediatric neurology program, with estimated completion dates in the following table.

Table 131 - Neurology

	2003	2004	2005	2006	2007	Total
Adult Neurology	44	22	21	21	17	**125**
Pediatric Neurology	8	6	3	4	1	**22**

One New Brunswick resident is enrolled in the Neurology program at Dalhousie University and is expected to complete the program in 2004.

CAPER data indicates that since 1990, a total of 292 residents have graduated in Adult Neurology and 22 in Pediatric Neurology. Annual outputs averaged 22 and 2 per year respectively over this 13-year period, ranging from lows of 15 and 1 to highs of 35 and 4 respectively. The number of graduates over the next 2 years is predicted to be 14% higher in Adult Neurology when compared to the average in the last decade and slightly more than double those graduates from Pediatric Neurology. These numbers are more heavily weighted at the front end of this 5-year period.

Current Workforce Analysis

There are 13 Neurologists practicing in the province, 12 male (92%) and 1 female. The health region distribution is as follows: 5 Neurologists are located in Region 1, 3 each are in Regions 2 and 3, 1 is in Region 4, and 1 is traveling to New Brunswick from out of province.

The average age for males in this group is 48 years, for females is 44, and overall is 48 years old. There is only one Neurologist under the age of 40, 4 in the 41-45 age group, and 4 in the 46-50 age group.

From a planning perspective, of most particular concern, is that 4 of the 13 Neurologists (31%) are over the age of 50, and thus will fall into the potential retirement zone within the 10-year forecast horizon

The most recent 3 fiscal years (2000-2003) of Medicare billing data, as presented in the following tables, provide some historical perspective of the Neurology group over this time period:

- Increase in actual number and effective number of Neurologists
- Increase in mean and median age
- Improved service ratio for New Brunswickers – decrease in population to Neurologist ratio

Table 132 - Neurology - Medicare 3-year History

Year	Number of Physicians in Database for Year	FFS Active Physicians	All Active Physicians	Active Physicians' Mean Age	Active Physicians' Median Age
2000/1	22	10	10	46.3	46.8
2001/2	22	11	11	46.3	47.5
2002/3	23	13	13	47	48

Year	Mean Active Physicians' Core Billings ($)	Effective Number of Physicians	Population to Each Active Physician
2000/1	219,920	10.4	70,129
2001/2	220,611	11.4	63,588
2002/3	217,546	13.1	55,307

Demand Analysis and Forecast

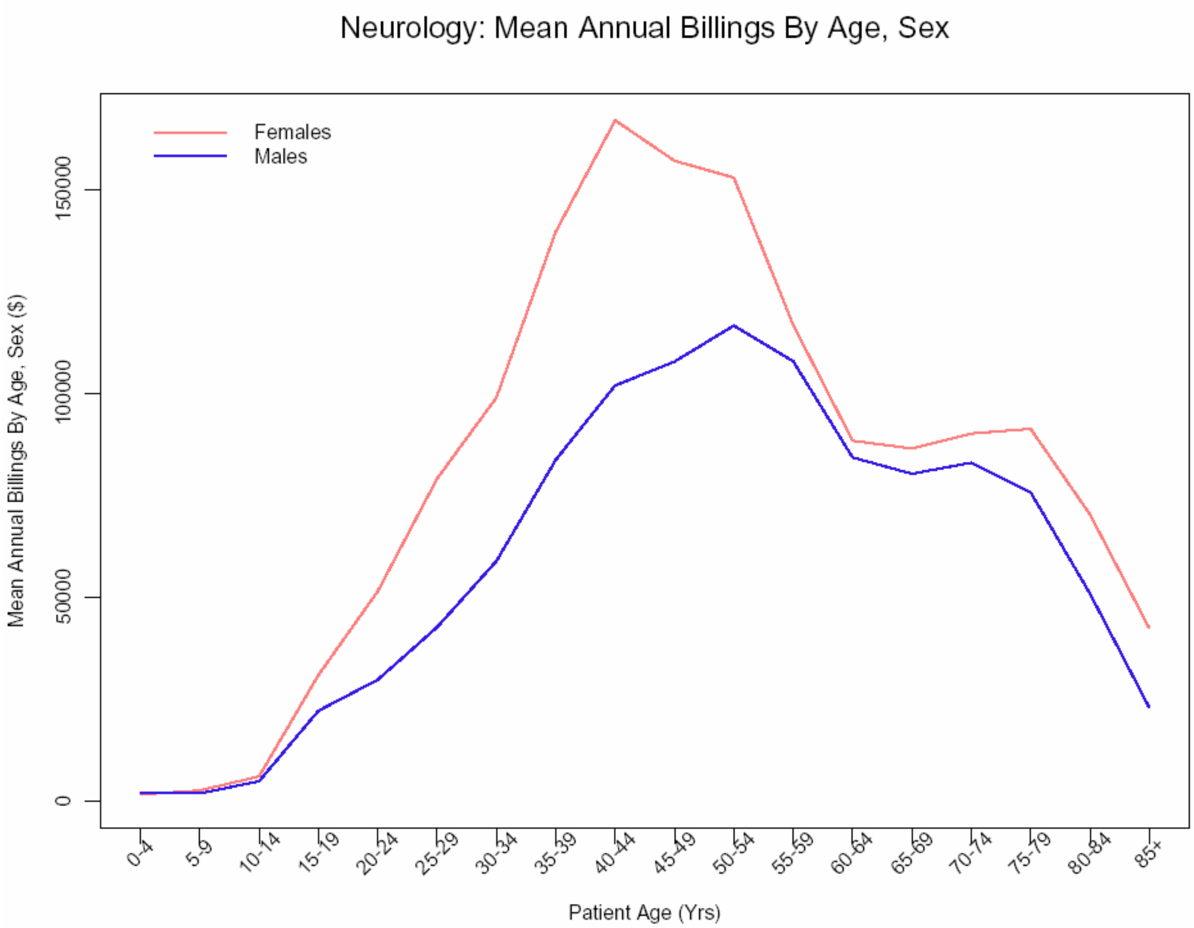
As depicted in the figure below, the consumption of Neurology services by the New Brunswick population over the past 3 years has the following characteristics:

- There is very little use of Neurology services before the age of 15, thereafter; more service is consumed by females at every age group.

- Female service use rises steeply to reach a peak at the 40-44 age group, and drops steadily thereafter.

- Male service use rises more gradually to reach a peak at the 50-54 age group, and then also drops steadily.

Figure 28 - Neurology Mean Annual Total Billings, by Age and Sex of Population



Based on the utilization profile of Neurology service, as presented above, and considering the changing age structure of the New Brunswick population in the coming 10 years, the following table shows the growth rates in requirements anticipated for Neurology to 2013.

Growth in demand for Neurology services is projected to grow by over 11% from 2003 to 2013, which equates to an increase in effective requirements for Neurologists from 13.1 presently, to 14.6 by 2013.

Table 133 – Growth in Demand for Neurology Services (growth rates from base year)

Specialty	Effective No.	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Neurology		*1.18%*	*2.30%*	*3.41%*	*4.47%*	*5.45%*	*6.44%*	*7.41%*	*8.38%*	*9.36%*	*10.31%*	*11.19%*
	13.1	13.3	13.4	13.5	13.7	13.8	13.9	14.1	14.2	14.3	14.5	14.6

An April 30, 2003 snapshot of vacancies in the Neurology indicates a surplus of 2.3 positions across the province.

Gap Analysis

Supply data indicates the current workforce at 13 Neurologists, the same as 2002/03 levels as recorded by Medicare billings, which equates to 13.1 effective Neurologists. Current demand estimates indicate requirements for 13.1 effective Neurologists, which leave the specialty in equilibrium at present, which calls into question the reported surplus of 2.3 positions, as Neurology service is being consumed at the current service ratio.

Based on predicted retirements of 4 Neurologists over the planning horizon (not accounting for other gains and exits from the current and future cohort of active physicians), and given estimated growth in demand of over 11%, equating to 1.5 effective Neurologists, over the 2003 to 2013 time period, **there could be a requirement for up to 6 Neurologists in the province over the coming 10-year period**, the timing of which is dependent upon retirement of those physicians in the retirement zone. In the 40-55 age group one physician responded to the survey indicating plans to reduce practice by at least 25% for 1 year or less. Close monitoring/succession planning is therefore required for this group.

6.4.2.15 Nuclear Medicine

Education

This specialty residency program is available at 9 medical schools across the country. It is not offered at the Universities of Calgary, Saskatchewan, Queens, McMaster, Ottawa, Laval, and Memorial. The residency is 5 years in duration. Those residents having recently completed 4 years of residency in diagnostic radiology can articulate to the nuclear medicine residency and complete in a shorter period of time.

The 2002-2003 CAPER data indicate that currently, across the country, there are 32 residents (9 female and 23 male) engaged in this program of study, with estimated completion dates showing in the following table.

Table 134 - Nuclear Medicine

2003	2004	2005	2006	2007	Total
12	5	6	5	4	**32**

No known New Brunswick residents are enrolled in this specialty.

CAPER data indicates that since 1990, a total of 73 residents have graduated in Nuclear Medicine across the country. Annual outputs averaged 5 per over this 13-year period, ranging from lows of 2 to highs of 8. The last 3 years have seen lower than average outputs of 3, 4, and 2 graduates respectively. The number of graduates over the next 5 years is predicted to be 18% higher on average when compared to the average in the last decade. This is due in large measure to a large class output of 12 expected in 2003, after which time the predicted output of about 5 per year is expected.

Current Workforce Analysis

There are 2 Nuclear Medicine specialists in New Brunswick, thus for privacy reasons, due to the small size of this group, demographic information is not presented in this report.

Demand Analysis and Forecast

There was inadequate billing and hospital data to permit analysis of demand for Nuclear Medicine services.

No vacancy data was available for this specialty.

Gap Analysis

A gap analysis was not possible for this specialty due to lack of data, though no retirements of current Nuclear Medicine specialists are predicted within the 10-year forecast period.

6.4.2.16 Pediatrics

Education

The Pediatrics program in New Brunswick is considered a core clinical program in hospitals, and as such is available at all the province's regional hospitals.

All 16 Canadian Medical Schools offer a 4-year residency in this specialty. The 2002-2003 CAPER data indicates that currently, across the country, there are 344 residents (249 female and 95 male) engaged in this program of study, with estimated completion dates listed in the following table.

Table 135 - Pediatrics

2003	2004	2005	2006	2007	Total
77	79	87	91	10	**344**

Four New Brunswick residents are enrolled in Pediatrics at Dalhousie University with expected completion dates in 2003 (1), 2004 (1), 2005 (1), and 2006 (1).

CAPER data indicates that since 1990, a total of 729 residents have graduated in Pediatrics across the country. Annual outputs averaged 56 per over this 13-year period, ranging from lows of 35 to highs of

72. The number of graduates over the next 5 years is predicted to be 23% higher on average when compared to the average in the last decade.

Current Workforce Analysis

There are 42 active Pediatricians in the province, the majority of which, 29 (69%), are male, and 13 are female (31%). Distribution by health region is presented in the following table:

Table 136 - Pediatrician Distribution by Health Region

Region 1	Region 2	Region 3	Region 4	Region 5	Region 6	Region 7	OOP*	Total
12 (29%)	10 *(24%)*	5 *(12%)*	3 *(7%)*	1 *(2%)*	1 *(2%)*	2 *(5%)*	8 *(19%)*	42 (*100%*)
**OOP = out of province*								

Of the 8 out-of-province Pediatricians providing service, 7 are from Halifax, and 1 is from Quebec City, which may speak to sub-specialty and/or linguistic service requirements.

The average age for this group is 50 for males and 39 for females, with an overall average age of 47. There are 16 Pediatricians (38%) over the age of 50 and thus will come into the potential retirement zone within the 10-year forecast period. In addition, 10 of the 42 Pediatricians (24%) are females under the age of 40 and within the childbearing age range. Both cases are significant from a planning perspective, succession planning and planning for temporary leaves, respectively.

The most recent 3 fiscal years (2000-2003) of Medicare billing data, as presented in the following tables, provide some historical perspective of the fee-for-service (FFS) portion of the Pediatrics group over this time period (over half of this workforce is remunerated on a salaried or sessional basis):

- Relative stability in the actual number and effective number of FFS Pediatricians
- Slight increase in mean and median age
- Slight improvement in service ratio for New Brunswickers – small decrease in population to FFS Pediatrician ratio

Table 137 - Pediatrics - Medicare 3-year History

Year	Number of Physicians in Database for Year	FFS Active Physicians	All Active Physicians	Active Physicians' Mean Age	Active Physicians' Median Age
2000/1	58	29	29	47.5	50.1
2001/2	57	27	27	49	51.1
2002/3	51	30	30	48.6	51.5

Year	Mean Active Physicians' Core Billings ($)	Effective Number of Physicians	Population to Each Active Physician
2000/1	312,845	30.1	24,107
2001/2	344,476	28.3	25,642
2002/3	311,678	30.8	23,543

Supply Forecast

Highlights

- The Pediatrics workforce is expected to grow by 14% between 2003 and 2013 given the following estimates:
  - 1-2 PGME entries per year
  - less than 1 retirement per year
  - Negligible impact of immigration, emigration, IMGs, and interprovincial migration
- The percentage of female Pediatricians as a percentage of total is expected to increase significantly over the forecast period, from 31% at present to 42% in 2013.
- The percentage of the Pediatrics workforce over the age of 55 is expected to drop steadily over the forecast period, from a high of 31% in 2003 to 23% by 2013.

The following table outlines Pediatrics Supply Forecast 2003-2013

Table 138 - Pediatrics Supply Forecast 2003-2013

Pediatrics			
YEAR	Total Physicians	% Female	% >55
Base Stock Mar 2003	**42**	**31%**	**31%**
2003	43	32%	29%
2004	43	33%	27%
2005	44	34%	25%
2006	45	35%	29%
2007	45	36%	27%
2008	46	37%	25%
2009	46	39%	27%
2010	47	39%	25%
2011	47	40%	23%
2012	48	41%	23%
2013	48	42%	23%

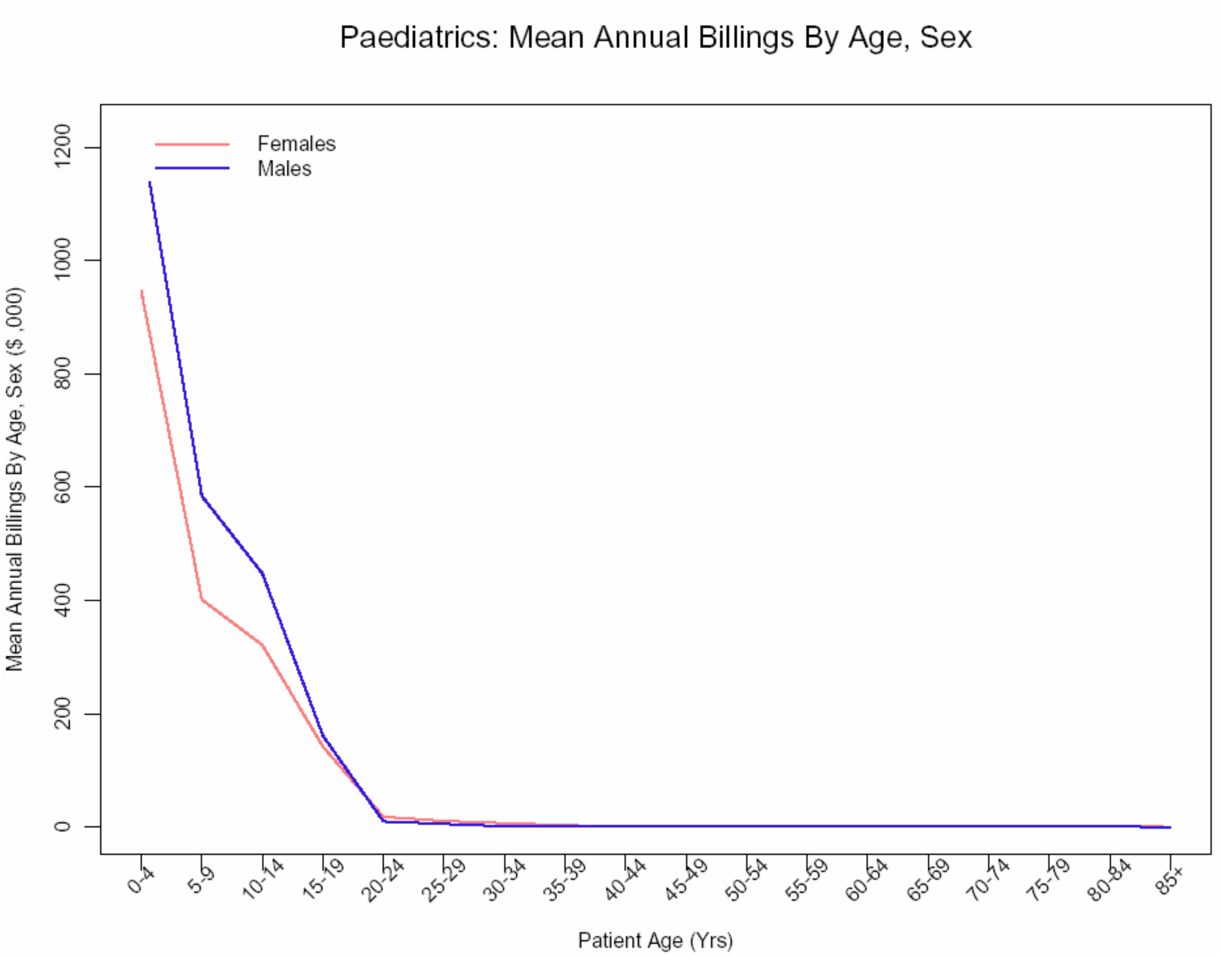
Demand Analysis and Forecast

Since there are no definitive Pediatric CMGs aside from Cystic Fibrosis, per capita rates of pediatricians' service were reviewed. This demonstrates considerable variation in the rates of pediatricians' hospital-based service to the population. In general, the rates were lower in urban areas and higher in rural areas (consistent with overall hospitalization rates), with the notable exceptions of higher rates in Moncton (possibly due to the larger number of Pediatricians per capita in this area) and low rates in the Miramichi. Pediatricians tend to cover hospital cases of children with gastroenteritis, asthma, bronchitis, and pneumonia. The majority of these cases are cared for by Family Physicians. At the Neonatology hospital sites, pediatricians also cover the Neonatal program.

As depicted in the figure below, the consumption of Pediatric services by the New Brunswick population over the past 3 years has the following characteristics:

- Pediatric service consumption is greater by males than by females at every age group up until service use drops off at around 20 years of age.
- Service consumption begins at a peak at the 0-4 age group and drops sharply thereafter to reach 0 at the 20-24 age group.

Figure 29 - Pediatrics Mean Annual Total Billings, by Age and Sex of Population



Based on the utilization profile of Pediatric service as presented above, and considering the changing age structure of the New Brunswick population in the coming 10 years, the following table shows the growth rates in requirements anticipated for Pediatrics to 2013.

Growth in demand for Pediatric services is projected to decrease by over 9% from 2003 to 2013, which equates to a decrease in effective requirements for Pediatricians from 42 presently, to 38 by 2013. The growth rates are based on actual number of Pediatricians versus effective number as presented in the Medicare 3-year history data, as the Medicare data, 'All Active Physicians' does not include active salaried practitioners.

Table 139 – Growth in Demand for Pediatric Services (growth rates from base year)

Specialty	Effective No.	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Pediatrics		*-0.98%*	*-1.95%*	*-2.87%*	*-3.77%*	*-4.63%*	*-5.43%*	*-6.22%*	*-7.00%*	*-7.71%*	*-8.61%*	*-9.47%*
	42.0	41.6	41.2	40.8	40.4	40.1	39.7	39.4	39.1	38.8	38.4	38.0

An April 30, 2003 snapshot of vacancies in Pediatrics indicates a surplus of 3.0 positions across the province.

Gap Analysis

Supply data indicates the current workforce at 42 Pediatricians, which is predicted to grow by 14% to 48 Pediatricians by 2013 (which could be less if all 16 of the Pediatricians who come into the potential retirement zone retire within the 10-year forecast period).

Based on estimated contraction in demand of nearly 10%, equating to 4 Pediatricians, over the 2003 to 2013 time period, there is no predicted shortage in this specialty at any time over the forecast period, and **requirements could potentially be reduced by up to 4 Pediatricians by 2013**.

A caveat to this forecast is the imprecise means by which to measure demand, which does not allow for measurement of activity of salaried/sessional practitioners, thus further investigation is required relative to current demand and the reported current surplus of 3.0 positions.

6.4.2.17 Physical Medicine & Rehabilitation

Education

This 5-year residency program is available at 10 university medical schools. It is not available at Universities of Calgary, Western Ontario, Laval, Sherbrooke, McGill, or Memorial. The 2002-2003 CAPER data indicates that currently, across the country, there are 65 residents (31 female and 34 male) engaged in this program of study, with estimated completion dates listed in the following table.

Table 140 - Physical Medicine & Rehabilitation

2003	2004	2005	2006	2007	Total
13	12	9	17	14	**65**

One New Brunswick resident is enrolled in the Physical Medicine and Rehabilitation program at Dalhousie University and is expected to complete in 2003.

CAPER data indicates that since 1990, a total of 153 residents have graduated in Physical Medicine and Rehabilitation across the country. Annual outputs averaged 12 per over this 13-year period, ranging from lows of 6 to highs of 19. The number of graduates over the next 5 years is predicted to be 8% higher on average when compared to the average in the last decade.

Current Workforce Analysis

The current supply-side snapshot, as captured in the New Brunswick Physician Database, records 9 Physical Medicine and Rehabilitation specialists. Of the 9, 6 (67%) are male and 3 are female. These specialists are distributed by health region as follows: 1 (11%) is located in Region 1, 2 (22%) are in Region 2, and 6 (67%) are in Region 3, which may be due to the Stan Cassidy Provincial Rehabilitation Center being located in Region 3.

The average age for males in this group is 48 years, for females, is 37, and for the total group is 45.

Of particular note is 3 of the 9 (33%) are over the age of 50 and thus will come into the potential retirement zone within the 10-year forecast horizon. Additionally, 2 specialists are females under the age of 40; therefore, planning for temporary leaves needs to be considered in light of maternity potential.

The most recent 3 fiscal years (2000-2003) of Medicare billing data, as presented in the following tables, provide some historical perspective of the Physical Medicine and Rehabilitation group over this time period. However, it is important to note that more than half of these specialists in the province are paid on a salaried basis, and as such, an analysis of effective supply and population to each active physician is not possible, other than for FFS physicians:

- Fluctuation in the actual number and effective number of FFS Physical Medicine and Rehab specialists

- Increase in mean and median age

- Fluctuation in the service ratio for New Brunswickers – increase in population to FFS specialist ratio between 2000/01 and 2001/02, and a drop again between 2001/02 and 2002/03.

Table 141 - Physical Medicine and Rehabilitation - Medicare 3-year History

Year	Number of Physicians in Database for Year	FFS Active Physicians	All Active Physicians	Active Physicians' Mean Age	Active Physicians' Median Age
2000/1	10	3	3	55.2	55.5
2001/2	11	2	2	53.6	53.6
2002/3	9	3	3	57.2	57.5

Year	Mean Active Physicians' Core Billings ($)	Effective Number of Physicians	Population to Each Active Physician
2000/1	153,550	3.2	228,713
2001/2	165,947	2.4	305,548
2002/3	150,451	3.2	228,020

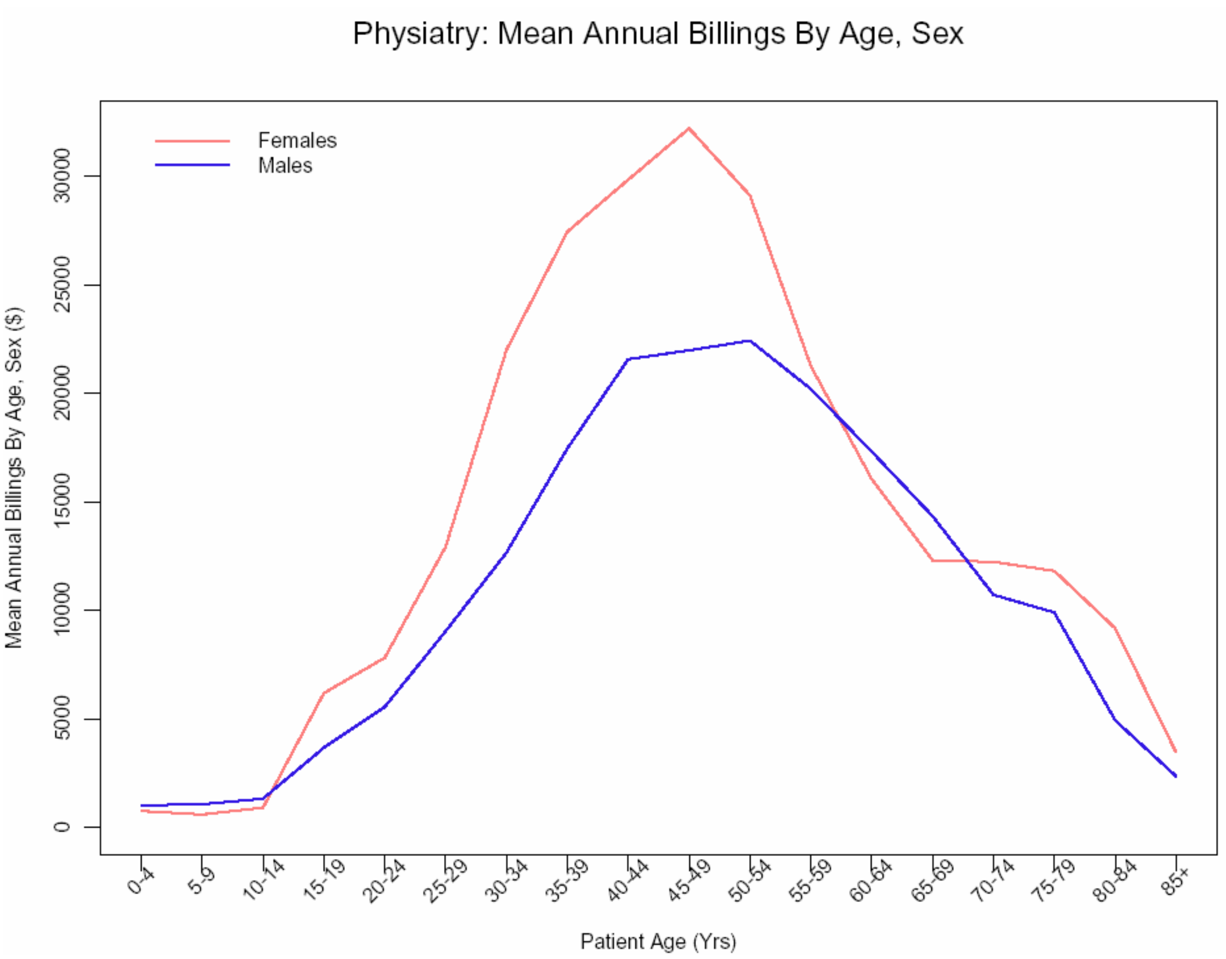
Demand Analysis and Forecast

As depicted in the figure below, the consumption of Physical Medicine and Rehabilitation services by the New Brunswick population over the past 3 years has the following characteristics:

- Service consumption by females is greater than males between the ages of 15 and 60, while male service use is greater than female use between the age of 60 and 70.

- Female service consumption rises sharply to peak at the 45-49 age group, while male use rises more gradually to reach a fairly sustained peak between the ages of 40 to 55.

Figure 30 - Physiatry Mean Annual Total Billings, by Age and Sex of Population



Based on the utilization profile of Physiatry service, as presented above, and applied to the changing age structure of the New Brunswick population in the coming 10 years, the following table shows the growth rates in requirements anticipated for Physiatry to 2013.

Growth in demand for Physical Medicine and Rehabilitation services is projected to grow by over 10% from 2003 to 2013, which equates to a increase in requirements for Physiatrists from 9 presently, to 10 by 2013.

Table 142 – Growth in Demand for Physical Medicine & Rehab Services (growth rates from base year)

Specialty	Effective No.	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Physical Medicine		*1.17%*	*2.27%*	*3.38%*	*4.43%*	*5.44%*	*6.44%*	*7.39%*	*8.33%*	*9.20%*	*9.95%*	*10.61%*
	9.0	9.1	9.2	9.3	9.4	9.5	9.6	9.7	9.7	9.8	9.9	10.0

An April 30, 2003 snapshot of vacancies in Physical Medicine and Rehabilitation indicates a shortfall of 1.4 positions across the province.

Gap Analysis

Supply data puts the current workforce at 9 Physical Medicine and Rehabilitation specialists, and demand is estimated to be consistent with supply at present. However, a current shortage position in this specialty arises from the fact that there are current vacancies of 1.4 positions.

In addition, based on predicted retirements of 3 Physical Medicine and Rehab specialists over the planning horizon (not accounting for other gains and exits from the current and future cohort of active physicians), and given estimated growth in demand of over 10%, equating to 1.0 effective specialist, over the 2003 to 2013 time period, **there could be a requirement for up to 6 Physical Medicine and Rehab specialists in the province over the coming 10-year period**. The timing of this shortage is dependent upon retirement of those physicians in the retirement zone. Close monitoring/succession planning is therefore required for this group.

6.4.2.18 Psychiatry

Education

This 5-year residency program is available at all 16 university medical schools. The 2002-2003 CAPER data indicate that currently, across the country, there are 600 residents (359 female and 241 male) engaged in this program of study, with estimated completion dates listed in the following table.

Table 143 - Psychiatry

2003	2004	2005	2006	2007	Total
162	111	110	113	104	**600**

One resident from New Brunswick is enrolled in the Psychiatry program at Dalhousie University and is expected to complete in 2004.

CAPER data indicate that since 1990, a total of 1346 residents have graduated in Psychiatry across the country. Annual outputs averaged 104 per over this 13-year period, ranging from lows of 88 to highs of

124. The number of graduates over the next 5 years is predicted to be 16% higher on average, when compared to the average in the last decade.

Current Workforce Analysis

There are 67 active Psychiatrists in the province, as recorded in the physician database, 48 of them (72%) are male, and 19 (28%) are female. The health region distribution is outlined in the following table:

Table 144 - Psychiatrist Distribution by Health Region

Region 1	Region 2	Region 3	Region 4	Region 5	Region 6	Region 7	OOP*	Total
17 *(25%)*	17 *(25%)*	8 *(12%)*	4 *(6%)*	8 *(12%)*	9 *(13%)*	3 *(4%)*	1 *(1%)*	67 (*100%*)
**OOP = out of province*								

The average age of this group is 53 for males, 48 for females, and 52 for the group as a whole. Of particular importance, from a planning perspective, is that 33 of the 67 Psychiatrists (50%) are over the age of 50, and thus will come into the potential retirement zone within the 10-year forecast period. In addition, 7 (10%) are females under the age of 40 and thus within the childbearing age range.

The most recent 3 fiscal years (2000-2003) of Medicare billing data, as presented in the following tables, provide some historical perspective of the Psychiatry group over this time period. However, it is important to note that more than half of Psychiatrists in the province are paid on a salaried basis, and as such, an analysis of effective supply and population to each active physician is not possible, other than for FFS physicians:

- Increase in number and effective supply of FFS Psychiatrists
- Increase in mean and median age of FFS Psychiatrists
- Improvement in service ratio for New Brunswickers – decrease in population to FFS specialist ratio.

Table 145 - Psychiatry - Medicare 3-year History

Year	Number of Physicians in Database for Year	FFS Active Physicians	All Active Physicians	Active Physicians' Mean Age	Active Physicians' Median Age
2000/1	69	37	37	51.2	52.1
2001/2	73	41	41	51.9	52.6
2002/3	63	41	41	54	55.4

Year	Mean Active Physicians' Core Billings ($)	Effective Number of Physicians	Population to Each Active Physician
2000/1	186,801	38.9	18,660
2001/2	193,419	42.7	16,993
2002/3	205,513	42.9	16,919

Supply Forecast

Highlights

- The Psychiatry workforce is expected to grow by 18% between 2003 and 2013 given the following estimates:
  - 3 PGME entries per year
  - 1-2 retirements per year
  - Negligible impact of immigration, emigration, IMGs, and interprovincial migration
- The percentage of female Psychiatrists as a percentage of total is expected to increase significantly over the forecast period, from 29% at present to 40% in 2013.
- The percentage of the Psychiatry workforce over the age of 55 is expected to drop steadily over the forecast period, from a high of 39% in 2003 to 33% by 2013.

The following table outlines Psychiatry Supply Forecast 2003-2013

Table 146 - Psychiatry Supply Forecast 2003-2013

Psychiatry			
YEAR	Total Physicians	% Female	% >55
Base Stock Mar 2003	**66**	**29%**	**39%**
2003	67	30%	36%
2004	68	31%	36%
2005	69	33%	34%
2006	70	34%	34%
2007	71	35%	33%
2008	72	36%	32%
2009	74	36%	33%
2010	75	37%	32%
2011	76	38%	31%
2012	77	39%	32%
2013	78	40%	33%

Demand Analysis and Forecast

The Psychiatry program in New Brunswick is considered a core clinical program in hospitals, and as such is available at all the province's regional hospitals.

Psychiatry is a decentralized and regional program encompassing the care of schizophrenia, depressive mood disorders, bipolar mood disorder, and other psychiatric disorders. Psychiatrists provide all care for schizophrenia, and the majority of care for other CMGs within the program.

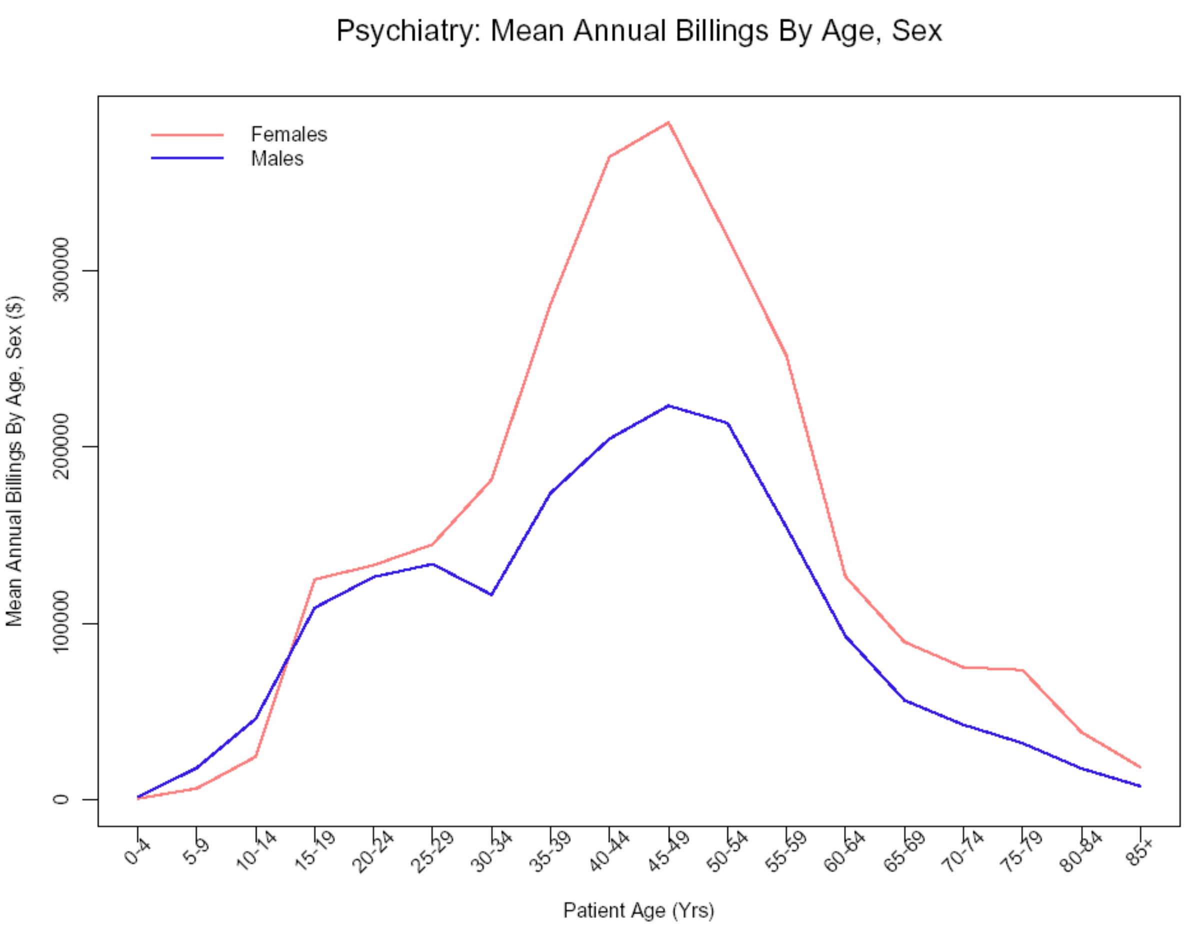
The great majority of patients admitted for psychiatric causes are treated in their home regions. The rates of admission in Regions 4, 5, and 6 are substantially higher than the New Brunswick average (between 33% and 90% greater); while the rates in Regions 2 and 3 are 40% and 16% lower than the New Brunswick average, respectively. These rate variations may be partly explained by the presence of a psychiatric care facility in Restigouche, explaining the high apparent per capita rate in Region 5. In addition, there may be increased access to outpatient services in urban areas, decreasing the pressure on inpatient facilities to provide psychiatric care.

As depicted in the figure below, the consumption of Psychiatry services by the New Brunswick population over the past 3 years has the following characteristics:

- Females consume more services than males at every age after the late teens; the majority of this service is consumed between the ages of 35 and 60 years of age.

- Both male and female service use peaks at the 45-49 age group, and drops steeply thereafter.

Figure 31 - Psychiatry Mean Annual Total Billings, by Age and Sex of Population



Based on the utilization profile of Psychiatry service, as presented above, and considering the changing age structure of the New Brunswick population in the coming 10 years, the following table shows the growth rates in requirements anticipated for Psychiatry to 2013.

Growth in demand for Psychiatry services is projected to grow by 6% from 2003 to 2013, which equates to a increase in requirements for Psychiatrists from 67 (actual) presently, to 71 by 2013.

Table 147 – Growth and Demand for Psychiatry Services (growth rates from base year)

Specialty	Effective No.	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Psychiatry		*0.99%*	*1.88%*	*2.75%*	*3.50%*	*4.05%*	*4.54%*	*4.96%*	*5.38%*	*5.74%*	*5.88%*	*5.93%*
	67.0	67.7	68.3	68.8	69.3	69.7	70.0	70.3	70.6	70.8	70.9	71.0

An April 30, 2003 snapshot of vacancies in Adult Psychiatry indicates a shortfall of 5.4 positions across the province and 2.5 positions short in Child Psychiatry, for a total of 7.9 positions.

Gap Analysis

Supply data indicates the current workforce at 67 Psychiatrists, which is predicted to grow by 18% to 78 by 2013. And based on estimated growth in demand of 6%, equating to 4 Psychiatrists, over the 2003 to 2013 time period, **if the current shortage situation (7.9 positions) were immediately redressed, the estimated future supply would meet demand, and there would be no predicted shortage in this specialty at any time over the forecast period**, unless retirements are larger than historical rates (equating to 17 retirements predicted out of 33 Psychiatrists who will be in the potential retirement zone).

In addition the following practice plans could alter the forecast for no predicted shortage: In the 30-40 age group 3 female physicians will be reducing practice; one by at least 25% for 3-5 years, 1 by at least 25% permanently, and 1 by at least 50% for 1 year or less. One female plans to increase her practice by at least 25% for 2-3 years and another to increase by at least 50% for 1 year or less. It is important to monitor this closely; as succession planning will be necessary to mitigate shortages if more than 10-20 retirements occur over the forecast period.

6.4.2.19 Radiation Oncology

Education

This 5-year residency program is available at all university medical schools except the universities of Saskatchewan, Sherbrooke, and Memorial. The 2002-2003 CAPER data indicates that currently, across the country, there are 96 residents (41 female and 55 male) engaged in this program of study, with estimated completion dates listed in the following table.

Table 148 - Radiation Oncology

2003	2004	2005	2006	2007	Total
13	11	24	27	21	**96**

No residents from New Brunswick are enrolled in this specialty program.

CAPER data indicates that since 1990, a total of 212 residents have graduated in Radiation Oncology across the country. Annual outputs averaged 16 per over this 13-year period, ranging from lows of 11 to highs of 22. The number of graduates over the next 5 years is predicted to be 20% higher when compared to the average in the last decade.

Current Workforce Analysis

There are 9 Radiation Oncologists recorded in the New Brunswick Physician Database, with the majority, 5 (56%), being female. The Radiation Oncologists are distributed as follows: 4 (44%) in Region 1 and 5 (56%) in Region 2.

The average age for this group is 46 years for males, 44 for females, and 45 for the group in total.

An important planning statistic is that of the 9 Radiation Oncologists, 4 are over the age of 50 (44%) and thus will come into the potential retirement zone within the 10-year forecast period. In addition, 2 of these physicians are female and thus are projected, based on historical data, to retire at an earlier age than their male counterparts. An additional planning note is that 2 of the 9 Oncologists are females under the age of 40, and thus pose a temporary leave risk due to childbearing potential.

Demand Analysis and Forecast

Due to the fact that all Radiation Oncologists in the province are remunerated on a salaried basis, there is no demand side service data associated with this group.

An April 30, 2003 snapshot of vacancies in Radiation Oncology indicates a surplus of 0.2 positions across the province.

Gap Analysis

A gap analysis is not possible for this group due to lack of data, however, based on the 4 potential possible retirements (out of 9) in this group in the 10-year forecast period, close monitoring and succession planning necessary.

Any demands that may emanate from the New Brunswick Cancer Strategy will need to be factored into future forecast requirements for these specialists.

6.4.2.20 Respiratory Medicine

Education

This specialty requires 2 additional years of training in either adult or pediatric respirology, following successful completion of an Internal Medicine residency. This subspecialty training can be taken at all university medical schools with the exception of Dalhousie and Memorial. Not all medical schools offer both adult and pediatric respirology programs. The 2002-2003 CAPER data indicates that currently, across the country, there are 66 residents (26 female and 40 male) engaged adult respirology residency programs and 3 (1 female and 2 males) in pediatric respirology residencies, with estimated completion dates listed in the table below.

Table 149 – Respiratory Medicine

Specialty/Year	2003	2004	Total
Adult Respiratory Medicine	39	27	**66**
Pediatric Respiratory Medicine	3	-	**3**

One resident from New Brunswick is enrolled in Respiratory Medicine (Internal Medicine) at Université de Sherbrooke and is expected to complete 2004.

CAPER data indicates that since 1990, across the country a total of 184 residents have graduated in Adult Respiratory Medicine and 32 in Pediatric Respiratory Medicine. Annual outputs averaged 14 and 2 per year respectively, over this 13-year period, ranging from lows of 10 and 0 to highs of 18 and 4 respectively. The number of graduates over the next 2 years is predicted to be 136% higher in Adult Respiratory Medicine when compared to the average in the last decade. Pediatric Respiratory Medicine outputs will be less by 33% over the next 2 years, representing about 1 less graduate given the small numbers produced in this subspecialty.

Current Workforce Analysis

There are 5 Respiratory Medicine specialists in the province, as recorded in the New Brunswick Physician Database, 3 (60%) are practicing in Region 1, and 2 (40%) in Region 2. All 5 Respirologists are male, and 2 of the 5 (40%) are over the age of 55 and thus will come into the potential retirement zone within the 10-year forecast horizon.

The most recent 3 fiscal years (2000-2003) of Medicare billing data, as presented in the following tables, provide some historical perspective of the Respiratory Medicine group over this time period:

- Increase in actual number and effective number of Respirologists
- Decrease in mean and median age
- Improved service ratio for New Brunswickers – decrease in population to Respirologist ratio

Table 150 - Respiratory Medicine - Medicare 3-year History

Year	Number of Physicians in Database for Year	FFS Active Physicians	All Active Physicians	Active Physicians' Mean Age	Active Physicians' Median Age
2000/1	12	4	4	46.6	47
2001/2	12	4	4	47.6	48
2002/3	12	5	5	46	38

Year	Mean Active Physicians' Core Billings ($)	Effective Number of Physicians	Population to Each Active Physician
2000/1	189,105	4.2	171,005
2001/2	202,694	4.3	168,112
2002/3	180,781	5.2	140,434

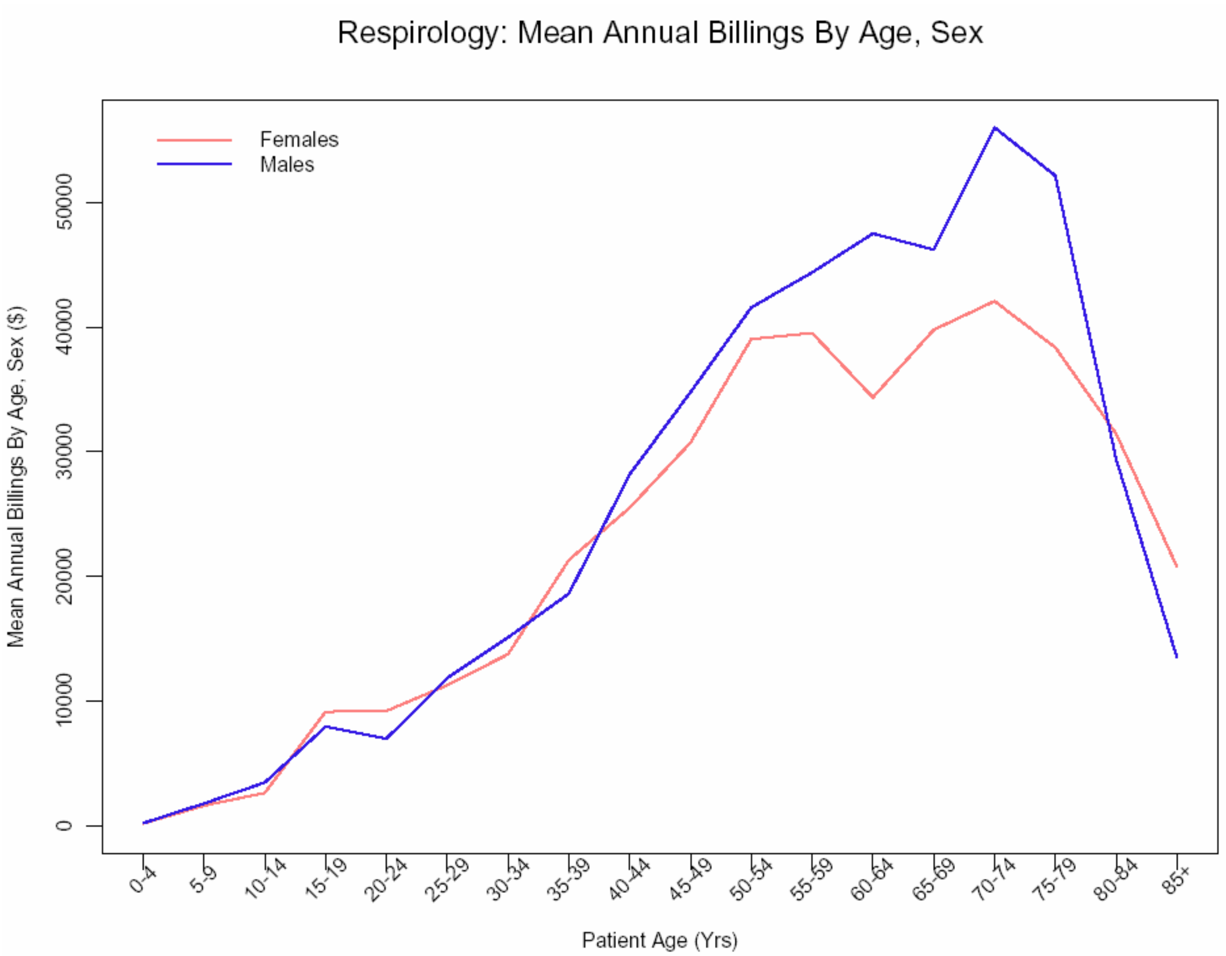
Demand Analysis and Forecast

As depicted in the figure below, the consumption of Respiratory Medicine services by the New Brunswick population over the past 3 years has the following characteristics:

- Male and female service use are very similar until around the 50-54 age range, and then male use rises steeply to reach a peak at the 70-74 age range, while female use remains as roughly the same level (though fluctuating) until the 70-74 age range.

- Service use for both groups drops off after the 70-74 age range.

Figure 32 - Respiratory Medicine Mean Annual Total Billings, by Age and Sex of Population



Based on the utilization profile of Respiratory Medicine service use as presented above, and applied to the changing age structure of the New Brunswick population in the coming 10 years, the following table shows the growth rates in requirements anticipated for Respiratory Medicine to 2013.

Growth in demand for Respiratory Medicine services is projected to grow by over 17% from 2003 to 2013, which equates to a increase in effective requirements for Respirologists from 5.2 presently, to 6.1 by 2013.

Table 151 – Growth in Demand for Respiratory Medicine Services (growth rates from base year)

Specialty	Effective No.	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Respiratory Medicine		*1.54%*	*2.99%*	*4.42%*	*5.86%*	*7.27%*	*8.80%*	*10.34%*	*11.90%*	*13.50%*	*15.29%*	*17.01%*
	5.2	5.3	5.4	5.4	5.5	5.6	5.7	5.7	5.8	5.9	6.0	6.1

An April 30, 2003 snapshot of vacancies in Respiratory Medicine indicates a shortfall of 2.0 positions across the province.

Gap Analysis

Supply data indicates the current workforce at 5 Respirologists, which according to the demand growth above table, is equivalent to 5.2 effective specialists.

Based current vacancies of 2.0 positions, estimated growth in demand of 17%, equating to 1 specialist, over the 2003 to 2013 time period, and given that 2 specialists are predicted to retire over this time period, **there will be a requirement for up to 5 Respiratory Medicine specialists over the 10-year forecast horizon**, the timing of which is dependant on the 2 retirements and needs to be closely monitored.

6.4.2.21 Rheumatology

Education

This subspecialty requires an additional 2 years of training beyond successful completion of either a Pediatric or Internal Medicine Specialty. The program is offered, in either pediatric or adult Rheumatology, at all university medical schools with the exception of the universities of McMaster, Laval, and Memorial.

The 2002-2003 CAPER data indicates that currently, across the country, there are 19 residents (12 female and 7 male) engaged in adult Rheumatology residency programs and 4 (3 female and 1 males) in pediatric Rheumatology residencies, with estimated completion dates listed in the following table.

Table 152 - Rheumatology

	2003	2004	Total
Adult Rheumatology	9	10	**19**
Pediatric Rheumatology	4	-	**4**

No New Brunswick residents are enrolled in this specialty program.

CAPER data indicate that since 1990, across the country a total of 137 residents have graduated in Adult Rheumatology and 12 in Pediatric Rheumatology. Annual outputs averaged 11 and 1 per year respectively over this 13-year period, ranging from lows of 5 and 0 to highs of 15 and 3 respectively. The number of graduates over the next 2 years is predicted to be 16% lower on average in Adult

Rheumatology and up by 1 per year on average for Pediatric Rheumatology when compared to the average in the last decade.

Current Workforce Analysis

There are 7 active Rheumatologists in the province, 6 (86%) are male. They are distributed by health region as follows: 3 are located in Region 1 (43%), and 2 each are in Regions 2 and 3.

The average age for this group is 45 years old, and of note, 2 of the 5 Rheumatologists (40%) are over the age of 50 and thus are a retirement risk within the 10-year planning period.

The most recent 3 fiscal years (2000-2003) of Medicare billing data, as presented in the following tables, provide some historical perspective of the Rheumatology group over this time period:

- Increase in actual number and effective number of Rheumatologists
- Decrease in mean and median age
- Relatively stable service ratio for New Brunswickers – only slight increase in population to Rheumatology ratio

Table 153 - Rheumatology - Medicare 3-year History

Year	Number of Physicians in Database for Year	FFS Active Physicians	All Active Physicians	Active Physicians' Mean Age	Active Physicians' Median Age
2000/1	12	4	4	46.6	47
2001/2	12	4	4	47.6	48
2002/3	12	5	5	46	38

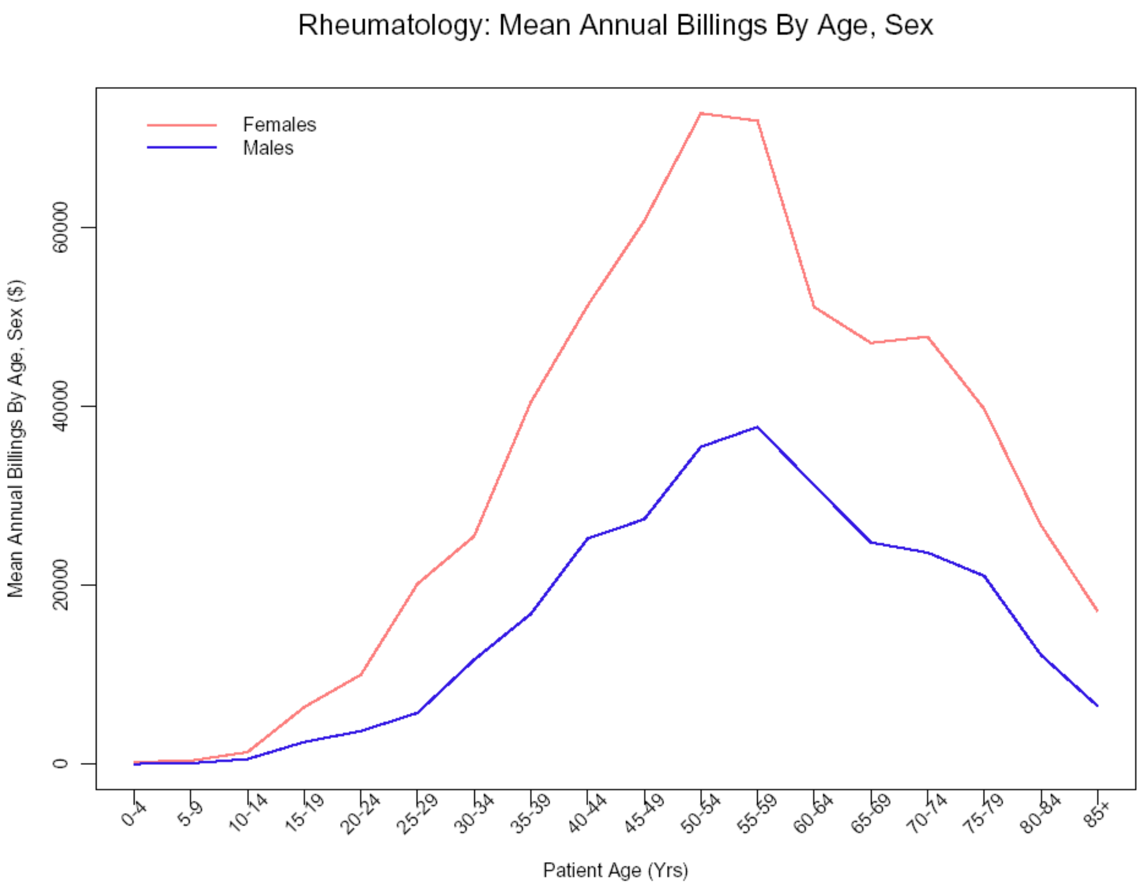
Year	Mean Active Physicians' Core Billings ($)	Effective Number of Physicians	Population to Each Active Physician
2000/1	193,310	4.2	170,815
2001/2	204,398	4.2	172,222
2002/3	224,270	4.2	171,867

Demand Analysis and Forecast

As depicted in the figure below, the consumption of Rheumatology services by the New Brunswick population over the past 3 years has the following characteristics:

- Female service use is greater than male use at every age group.
- Female service use peaks between the ages of 50 and 60, while male service use peaks in the 55-59 age range, service use declines thereafter.

Figure 33 - Rheumatology Mean Annual Total Billings, by Age and Sex of Population



Based on the utilization profile of Rheumatology service, as presented above, and applied to the changing age structure of the New Brunswick population in the coming 10 years, the following table shows the growth rates in requirements anticipated for Rheumatology to 2013.

Growth in demand for Rheumatology services is projected to grow by over 17% from 2003 to 2013, which equates to an increase in requirements for Rheumatologists from 7 (actual) presently, to 8.2 by 2013. Actual number of specialists is used as effective number if not available given nearly half of this group is remunerated on a salaried basis and thus there are no Medicare billings associated with them.

Table 154 – Growth in Demand for Rheumatology Services (growth rates from base year)

Specialty	Effective No.	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Rheumatology		*1.72%*	*3.37%*	*5.03%*	*6.60%*	*8.12%*	*9.65%*	*11.16%*	*12.72%*	*14.21%*	*15.66%*	*17.01%*
	7.0	7.1	7.2	7.4	7.5	7.6	7.7	7.8	7.9	8.0	8.1	8.2

An April 30, 2003 snapshot of vacancies in Rheumatology indicates a shortfall of 0.3 positions across the province.

Gap Analysis

Based on current vacancies of 0.3 Rheumatologists, predicted growth in demand of 17%, equating to 1 specialist, over the 2003 to 2013 time period, and given that 2 specialists are predicted to retire over this time period, **there will be a total requirement for up to 4 Rheumatologists over the 10-year forecast horizon**, the timing of which is dependant on the two retirements. It is relevant to note as well that based on survey response one physician in the 30-40 age group has plans within the next 5 years to reduce practice by at least 25% permanently.

6.4.2.22 Others

Analysis and forecasting of supply and demand for these sub specialties is outside the scope of this study; however a brief profile of expected market supply is provided as information to support recruitment/succession planning for these specialties.

Medical Genetics

The RCPSC specialty of Medical Genetics is a 5-year program offered at the Universities of British Columbia, Calgary, Manitoba, Toronto, Ottawa, McGill, and Montreal. The 2002-2003 CAPER data indicates 21 residents are currently pursuing this specialty (17 female and 4 male) with expected completion dates listed in the following table.

Table 155 - Medical Genetics

2003	2004	2005	2006	2007	Total
6	2	3	5	5	**17**

No New Brunswick residents are enrolled in this specialty program.

CAPER data indicates that since 1990, a total of 33 residents have graduated in Medical Genetics across the country. Annual outputs averaged 3 per over this 13-year period, ranging from lows of 1 to highs of 5. The number of graduates over the next 5 years is predicted to be 13% higher on average when compared to the average in the last decade. Given the small size of this subspecialty, this represents a small increase of less than 1 additional graduate per year on average.

Occupational Medicine

This 5-year residency program is only offered at with the University of Alberta or University of Toronto. The 2002-2003 CAPER data indicate 9 residents are currently pursuing this specialty (5 female and 4 male) with expected completion dates listed in the following table.

Table 156 - Occupational Medicine

2003	2004	2005	2006	2007	Total
2	2	1	1	3	**9**

No New Brunswick residents are enrolled in this specialty program.

CAPER data indicates that, across the country, there have been 10 graduates from this program recorded only since 1994. Annual outputs averaged only 1 per over this 9-year period with no graduates some years and between 1-4 in others. The number of graduates over the next 5 years is predicted to be marginally higher, by 1 per year on average, when compared to the average in the last decade.

Community Medicine

This residency is 5 years in duration and is offered at all university medical schools with the exception of the universities of Alberta, Saskatchewan, Western Ontario, Queens, Dalhousie, and Memorial. Those with a CFPC Family Medicine residency credential may potentially complete this specialty program in 3 years.

The 2002-2003 CAPER data indicate that currently, across the country, there are 60 residents (42 female and 18 male) engaged in this program of study, with estimated completion dates listed in the following table.

Table 157 - Community Medicine

2003	2004	2005	2006	2007	Total
10	17	17	10	6	**60**

No New Brunswick residents are enrolled in this specialty program.

CAPER data indicates that since 1990, across the country, a total of 111 residents have graduated in Community Medicine. Annual outputs averaged 9 per over this 13-year period, ranging from lows of 3 to highs of 18. The number of graduates over the next 5 years is predicted to be 41% higher on average when compared to the average in the last decade.

Neuropathology

This 5-year residency is available at the Universities of British Columbia, Calgary, Western Ontario, Toronto, Queens, McGill and Montreal. The 2002-2003 CAPER data indicate 4 residents (2 female and 2 male) are engaged in study with completion dates listed in the following table.

Table 158 - Neuropathology

2003	2004	2005	2006	2007	Total
-	-	1	2	1	**4**

No New Brunswick residents are enrolled in this specialty program.

CAPER data indicates that since 1990, a total of 22 residents have graduated in Neuropathology across the country. Annual outputs averaged 2 per over this 13-year period, ranging from lows of 0 to highs of 3. The number of graduates over the next 5 years is predicted to be less by about 1 graduate per year on average, when compared to the average in the last decade.

6.4.3 Lab Medicine Specialties

Supply Forecast

Highlights

- The Lab Medicine workforce is expected to contract by 5% between 2003 and 2013 given the following estimates:
  - Less than 1 PGME entries per year
  - Less than 1 retirement per year
  - Negligible impact of immigration, emigration, IMGs, and interprovincial migration
- The percentage of female Lab Medicine specialists as a percentage of total is expected to increase slightly over the forecast period, from 44% at present to 50% in 2013.
- The percentage of the Lab Medicine workforce over the age of 55 is expected to increase steadily over the forecast period, from a high of 32% in 2003 to 36% by 2013.

The following table outlines Lab Medicine Supply Forecast 2003-2013.

Table 159 - Lab Medicine Supply Forecast 2003-2013

Lab Medicine (all Pathologies & Medical Micro.)			
YEAR	**Total Physicians**	**% Female**	**% >55**
Base Stock Mar 2003	**41**	**44%**	**32%**
2003	41	45%	30%
2004	41	45%	31%
2005	40	46%	31%
2006	40	47%	29%
2007	40	48%	27%
2008	40	48%	26%
2009	40	49%	24%
2010	39	49%	30%
2011	39	50%	33%
2012	39	50%	36%
2013	39	50%	36%

Demand Analysis and Forecast

Due to these physicians being largely salaried, there is insufficient data from the hospital and Medicare databases, and a comprehensive demand analysis and forecast cannot be conducted for this group.

An April 30, 2003 snapshot of vacancies in the Laboratory Medicine group of specialties indicates a shortfall of 5.0 positions across the province; not differentiated by lab sub specialty.

6.4.3.1 Anatomical Pathology

Education

All medical schools with the exception of University of Saskatchewan offer residency training in this specialty. Students are recruited through the general laboratory medicine program in some of these universities and sub-specialize within this program. The 2002-2003 CAPER data indicates that currently there are 90 residents (48 female and 42 male) in this program across the country with estimated completion dates as follows:

Table 160 - Anatomical Pathology

2003	2004	2005	2006	2007	Total
18	14	17	22	19	**90**

Three New Brunswick residents are enrolled in Anatomical Pathology at Dalhousie University with expected completion dates as follows: 2003(1), 2004(1) and 2005(1).

CAPER data indicates that since 1990, a total of 296 residents have graduated in this specialty. Annual outputs averaged 22 per year over this 13-year period, ranging from a low of 17 to a high of 30. The number of graduates over the next 5 years is predicted to be less than average in the past decade.

Current Workforce Analysis

There are 19 Anatomical Pathologists practicing in the province, 10 (57%) are male, and 9 (43%) are female. They are distributed by health region as follows: 7 (37%) are located in Region 1, 5 (26%) are in Region 2, 2 each are in Regions 3 and 5, and 1 each are in Regions 4, 6, and 7. The average age for this group is 51 years for males, 45 for female, and 48 overall.

Of particular planning note, is that 6 of the 19 Anatomical Pathologists (32%) are over the age of 50 and thus will come into the potential retirement zone within the 10-year forecast period. In addition, the entire under-40 workforce is female, and thus planning for temporary leaves due to maternity is a reality.

Furthermore, respondents to the physician survey indicated the following changes to their practice plans over the coming 5 years:

- 30-40 age group - 1 female physician will be reducing practice completely for 1 year or less
- 40-55 age group - 1 female plans to reduce by at least 25% for 2-3 years
- 55+ range - 2 males plan to reduce permanently by at least 50% and by 100%, respectively

Demand Analysis and Forecast

There is insufficient data to permit demand side analysis and forecasting for this group.

6.4.3.2 General Pathology

Education

Five years of residency training is offered in this specialty at 11 medical schools in Canada, many who recruit to this specialty from their general laboratory medicine programs. The Universities of Calgary, McGill, Laval, Sherbrooke, and Laval do not offer this program. The 2002-2003 CAPER data indicates that currently across the country there are 21 residents (8 female and 13 male) pursuing this specialty. Estimated completion dates are as follows:

Table 161 - General Pathology

2003	2004	2005	2006	2007	Total
6	0	1	7	7	**21**

No known New Brunswick residents are enrolled in this specialty.

CAPER data indicates that since 1990, a total of 125 residents have graduated in General Pathology. Annual outputs averaged 10 per year over this 13-year period, ranging from a low of 3 to a high of 15. The trend over the past 4 years has been 3-4 per year with the exception of 2001 where 12 graduated. The number of graduates over the next 5 years is predicted to be 130% less than the average in the last decade.

Current Workforce Analysis

There are 16 General Pathologists practicing in the province, 10 (63%) are male, and 6 (38%) are female. They are distributed by health region as follows: 2 (13%) are located in Region 1, 4 (25%) are in Region 2, 4 (25%) are in Region 6, 3 (19%) are in Region 3, and 1 each are in Regions 4, 5, and 7. The average age for this group is 49 years for both males and females.

Of particular planning note, is that 6 of the 16 General Pathologists (38%) are over the age of 50 and thus will come into the potential retirement zone within the 10-year forecast period.

Furthermore, respondents to the physician survey indicated one physician in the 40-55 year age group plans to reduce practice activity by at least 25% for 1 year or less within the next 5 years.

Demand Analysis and Forecast

There is insufficient data to permit demand side analysis and forecasting for this group.

6.4.3.3 Hematological Pathology

There are 6 universities offering this residency program: British Columbia, Alberta, Toronto, Ottawa, Queens and Dalhousie. The program is 4 years in duration, and universities recruit primarily through their general laboratory medicine programs. The 2002-2003 CAPER data indicates that currently across the country there are 13 residents (4 female and 9 male) engaged in this program of study with estimated completion dates as follows:

Table 162 - Hematological Pathology

2003	2004	2005	2006	Total
5	3	3	2	**13**

No known residents from New Brunswick are enrolled in this specialty.

CAPER data indicates that since 1990, a total of 25 residents have graduated in Hematology Pathology. Annual outputs averaged 2 per year over this 13-year period, ranging from no graduates to a high of 6 in any given year. The number of graduates over the next 4 years is predicted to be 62% greater when compared to the average in the last decade; however, given the small numbers in this specialty, this only represents about 1 additional graduate per year.

Current Workforce Analysis

There is 1 Hematological Pathologist in New Brunswick, thus for privacy reasons, due to the small size of this group, demographic information is not presented in this report.

Demand Analysis and Forecast

There is insufficient data to permit demand side analysis and forecasting.

6.4.3.4 Medical Microbiology

This specialty requires a 5-year residency program that can be accessed at 11 of Canada's medical schools. Several recruit into this program from general laboratory medicine while Dalhousie University recruits from their Internal Medicine program. Memorial, Queens, McGill, and the Universities of Calgary, Saskatchewan do not offer this program. The 2002-2003 CAPER data indicates that currently across the country there are 25 residents (13 female and 12 male) engaged in this program of study with estimated completion dates as follows:

Table 163 - Medical Microbiology

2003	2004	2005	2006	2007	Total
8	4	4	4	5	**25**

No known New Brunswick residents are enrolled in this specialty.

CAPER data indicate that since 1990, a total of 103 residents have graduated in Medical Microbiology. Annual outputs averaged 8 per year per year over this 13-year period, ranging from a low of 4 to a high of 10. The number of graduates over the next 2 years is predicted to be 60% lower when compared to the average in the last decade.

Current Workforce Analysis

There are 5 Medical Microbiologists in the province, 3 are female (60%) and 2 are male. Health region distribution is as follows: 3 (605) are in Region 1, and 1 each are in Regions 2 and 4. The average age for this group is 42 years for males, 52 for females, and 48 years for the group as a whole.

A planning consideration for this group is that 2 of the 5 Medical Microbiologists (40%) are over 50 years of age and thus will enter the potential retirement zone within the 10-year planning period.

Furthermore, respondents to the physician survey indicated on physician in the 40-55 year age group plans to reduce practice by at least 25% permanently within the next 5 years.

Demand Analysis

An April 30, 2003 snapshot of vacancies in Medical Microbiology indicates a shortfall of 0.6 positions across the province.

6.4.3.5 Others

Medical Biochemistry

This specialty requires 5 years of residency training and is offered only at the Universities of British Columbia, McMaster, Toronto, or through the network of Quebec Universities. The 2002-2003 CAPER data indicates 10 residents (1 female and 9 male) are engaged in study with completion dates as follows:

Table 164 - Medical Biochemistry

2003	2004	2005	2006	2007	Total
2	-	3	3	2	**10**

No known New Brunswick residents are enrolled in this specialty program.

CAPER data indicates that since 1990, a total of 30 residents have graduated in Medical Biochemistry across the country. Annual outputs averaged 2 per over this 13-year period, ranging from lows of 0 to highs of 5. The number of graduates over the next 5 years is predicted to be on par when compared to the average in the last decade.

Undifferentiated Laboratory Medicine

Four residents (3 female and 1 male) are currently enrolled in a residency in undifferentiated laboratory medicine and expect to enter the market in 2003.

No New Brunswick residents are enrolled in this specialty program.

6.4.4 Surgical Specialties

There are currently 209 surgical specialists in the New Brunswick physician workforce, which includes physicians in the following 11 distinct specialty practices (as per RFP specifications):

1. Cardiac Surgery
2. General Surgery
3. Neurosurgery
4. Obstetrics/Gynecology
5. Ophthalmology
6. Orthopedic Surgery
7. Otolaryngology
8. Plastic Surgery
9. Thoracic Surgery
10. Urology
11. Vascular Surgery

The following table presents at the forecast model results for all Surgical Specialties grouped together. This forecast is based on the following assumptions:

- New Brunswick attracts/recruits 1.9% of national pool of PGME graduates each year of the 10-year forecast period, based on CAPER historical average (ranging from 6 to 8, see Table 160).
- Filter out of physicians' time for those who are spending greater than 50% of their time in Medical Administration and/or Committee work.
- Additional gains, exits and net movements are based on medical specialty-specific historical averages as based on CMA data (see Table 160).

Highlights

- The surgical specialty workforce is expected to grow by 17%, from 209 physicians to 245 physicians, over the 10-year forecast period.
- The percentage of females practicing in surgical specialties is expected to increase significantly over the 10-year period, from 9% of total at present to nearly 24% in 2013.
- The percentage of physicians over the age of 55 is expected to decline over the forecast period, from 38% at present to 27% in 2013.

Table 165 - All Surgical Specialties - Supply Forecast 2003-2013

Surgical Specialties			
YEAR-END	Total Physicians	% Female	% >55
Base Stock Mar 2003	**209**	**9%**	**38%**
2003	212	10%	36%
2004	215	12%	36%
2005	218	13%	36%
2006	220	14%	35%
2007	224	16%	33%
2008	226	17%	32%
2009	230	18%	31%
2010	233	20%	30%
2011	237	21%	29%
2012	241	22%	27%
2013	245	24%	27%

Table 166 – NB Physician Supply - Gains, Exits and Net Movements

	GAINS			EXITS			NET	YEARLY NET
YEAR	PGME Entries	IMGs	Returns from Abroad	Retired	Deaths	Emigration	Interprov. Migration	Gains - Exits +/- Net Movements
2003	6	1	0	4	1	1	1	3
2004	6	1	0	4	1	1	1	3
2005	6	1	0	4	1	1	1	3
2006	6	1	0	4	1	1	1	3
2007	7	1	0	4	1	1	1	3
2008	7	1	0	5	1	1	1	3
2009	8	1	0	4	1	1	1	4
2010	8	1	0	4	1	1	1	5
2011	8	1	0	5	1	1	1	4
2012	8	1	0	5	1	1	1	4
2013	8	1	0	5	1	1	1	4

The following section presents a profile for specific specialties including projected market supply, current analysis and the supply and demand forecast.

6.4.4.1 *Cardiac Surgery*

Education

Residency programs for this specialty are typically 6 years in duration. However, residents can access alternate pathways to achieve a Cardiac Surgery specialty following completion of either a RCPSC General Surgery residency plus 3.5 years or a RCPSC Thoracic Surgery residency plus 2.5 additional years of training. The universities of Calgary, Saskatchewan, Queens, Laval, Sherbrooke, and Memorial do not offer residency training in this specialty.

The 2002-2003 CAPER data indicate that currently, across the country, there are 56 residents (5 female and 51 male) engaged in this program of study, with estimated completion dates listed in the table below.

Table 167 - Cardiac Surgery

2003	2004	2005	2006	2007	2008	Total
9	13	14	8	6	6	**56**

No New Brunswick residents are enrolled in this specialty program.

CAPER data indicates that since 1996, a total of 48 residents have graduated in Cardiac Surgery across the country. Annual outputs averaged 7 per over this 7-year period, ranging from lows of 1 to highs of 12. The number of graduates over the next 6 years is predicted to be 33% higher when compared to the average in the last decade; however these outputs are larger in the short term and then level back out to the historic average.

Current Workforce Analysis

There are 3 Cardiac Surgeons in New Brunswick, thus for privacy reasons, due to the small size of this group, demographic information is not presented in this report. However, it is important to note, for succession planning purposes, that one surgeon will come into the potential retirement zone within the 10-year forecast period.

The most recent 3 fiscal years (2000-2003) of Medicare billing data, as presented in the following tables, provide some historical perspective of the Cardiac Surgery group over this time period:

- Stability in actual number and effective number of Cardiac Surgeons
- Increase in mean and median age of Anesthetists
- Stability in service ratio for New Brunswickers – stable population Cardiac Surgeon ratio over the time period

Table 168 - Cardiac Surgery - Medicare 3-year History

Year	Number of Surgeons in Database for Year	FFS Active Surgeons	All Active Surgeons	Active Surgeons' Mean Age	Active Surgeons' Median Age
2000/1	12	3	3	48	45.4
2001/2	11	3	3	49	46.4
2002/3	10	3	3	50	47.4

Year	Mean Active Surgeons' Core Billings ($)	Effective Number of Surgeons	Population to Each Active Surgeon
2000/1	468,511	3.1	233,486
2001/2	466,424	3.1	232,823
2002/3	488,027	3.1	232,543

Demand Analysis and Forecast

Cardiac Surgery in New Brunswick has a number of high RIW CMGs (centralized only). Most common are coronary bypass procedures and other cardio-thoracic procedures. Patient flow patterns for Cardiac Surgery indicate that patients are treated only in Region 2, as this is the only site for this provincial level service in New Brunswick.

There is significant variation among regions for Cardiac Surgery services. Regions 2 and 7 have higher utilization than the average. High use in Region 2 is likely associated with available supply of services, while in Region 7 it is likely due to increased burden of illness. Volume-outcome thresholds for invasive cardiac procedures set annual minimum limits of 500 Coronary Bypass procedures and 400 angioplasty procedures (Leapfrog Group 2000). These limits are only possible in New Brunswick through continued location of the program at a single site.

Typically, measures of access to invasive cardiac services must include the assessment of both invasive cardiology and cardiac surgery due to the relative exchangeability of Percutaneous Transluminal Coronary Angioplasty (PTCA) and Coronary Artery Bypass Surgery (CABS). As well, since procedures vary with populations studied, markers of the underlying cardiac disease burden in different areas are necessary to account for intervention variation due to the population rather than that health care system. Rates of Acute Myocardial Infarction (AMI) are useful in this regard.

As such, analyzing population based rates of PTCA to AMI and CABS to AMI show that there has been an increase in PTCA utilization with steady rates of CABS (adjusted for AMI rates). In addition, between 1997/98 and 1999/2000, the rates of AMI have varied significantly among regions, likely indicating variations in the underlying cardiac disease burden in New Brunswick.

The trend of increased use of PTCA over time is marked. The discrepancies in interventional cardiology rates among regions are only partly explained by differences in the marker of underlying cardiac disease burden: AMI rates. Among the cohort of AMI patients themselves, the supply-driven variation is obvious: twice the number of patients in Saint John Regional Hospital receive revascularization procedures in a timely fashion compared to those treated in other hospitals. This variation has been well described in the literature and does not necessarily imply an over-utilization of revascularization in Saint John. Rather, it may reflect under use of revascularization in other regions through lack of appropriate referral and triage mechanisms to deal with both the general population with cardiac disease and the AMI cohort.

Comparisons of New Brunswick revascularization rates to those in Ontario have been used as a guideline for analysis purposes. This barometer would suggest that New Brunswick rates are about right for Region 2, and low elsewhere in the province.

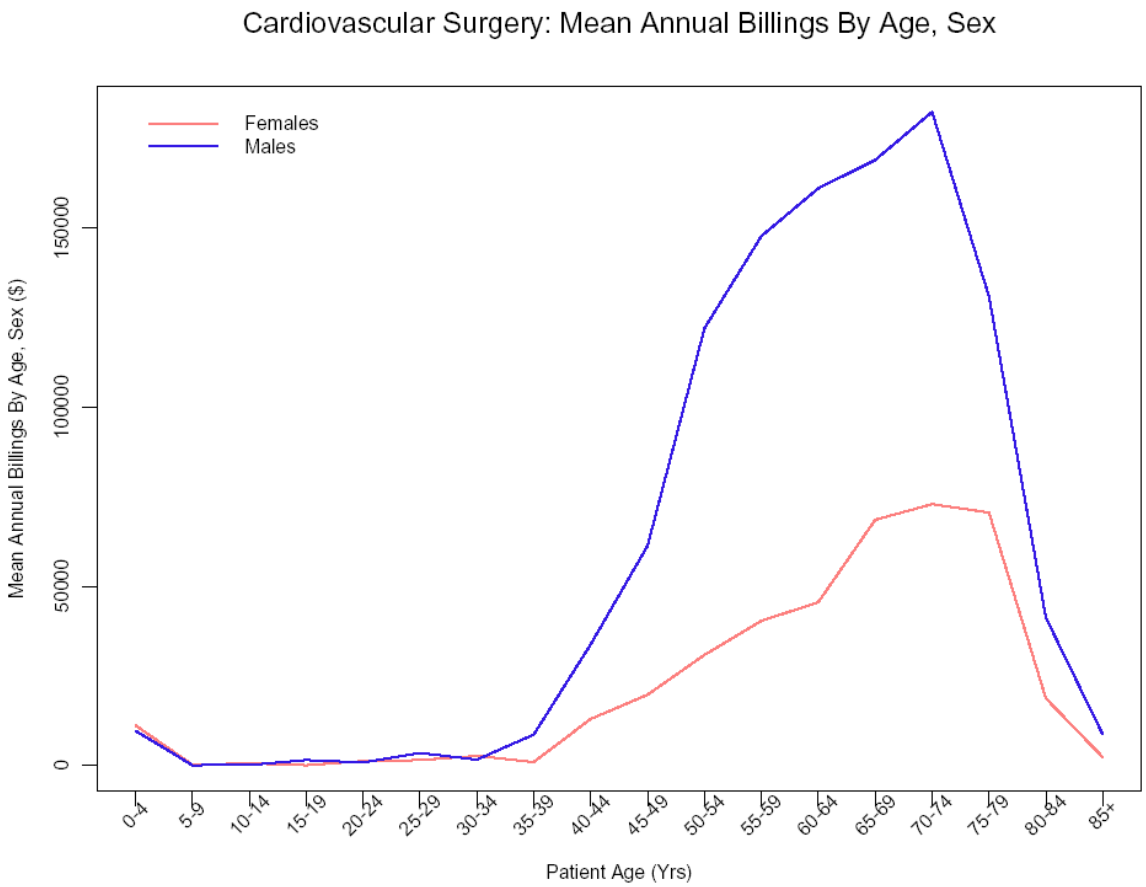
As depicted in the figure below, the consumption of Cardiac Surgery services by the New Brunswick population over the past 3 years has the following characteristics:

- There is very little Cardiac Surgery service use by either gender before the age of 40, and thereafter, male service use greatly outweighs female service use at every age group

- Male service use rises dramatically after the age of 40 to reach a peak at the 70-74 age range.

- Female service use rises very gradually after the age of 40 to reach a sustained peak (though much lower than for males) between the ages of 65 and 80.

Figure 34 - Cardiac Surgery Mean Total Billings, by Age and Gender of Population



Based on the utilization profile of Cardiac Surgery service as presented above, and considering the changing age structure of the New Brunswick population in the coming ten years, the following table shows the growth rates in requirements anticipated for Cardiac Surgery to 2013.

Growth in demand for Cardiac Surgery services is projected to grow by over 26% from 2003 to 2013, which equates to an increase in effective requirements for Cardiac Surgeons from 3.1 presently, to 3.9 by 2013.

Table 169 – Growth in Demand for Cardiac Surgery Services (growth rates from base year)

Specialty	Effective No.	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Cardiac Surgery		*2.04%*	*4.03%*	*6.04%*	*8.07%*	*10.46%*	*12.92%*	*15.50%*	*18.07%*	*20.66%*	*23.49%*	*26.39%*
	3.1	3.2	3.2	3.3	3.4	3.4	3.5	3.6	3.7	3.7	3.8	3.9

An April 30, 2003 snapshot of vacancies in Cardiac Surgery indicates a shortfall of 0.2 positions across the province.

Gap Analysis

There are currently 3 Cardiac Surgeons, equating to 3.1 effective surgeons. Predicted growth in demand estimates that by 2013 there will be a requirement for 3.9 effective surgeons, which means an additional 0.8 over present. In addition, there is the risk that one Cardiac Surgeon will retire over this time period, which means there **could be a total requirement over the 2003-2013 time period for up to 2 Cardiac Surgeons,** the timing of which is dependent on the retirement of one surgeon.

6.4.4.2 General Surgery

Education

The General Surgery program in New Brunswick is considered a core clinical program in hospitals, and as such is available at all the province's regional hospitals.

All 16 university medical schools offer a residency program in this specialty that typically takes 5 years. The 2002-2003 CAPER data indicates that currently, across the country, there are 471 residents (154 female and 317 male) engaged in this program of study, with estimated completion dates listed in the table below.

Table 170 - General Surgery

2003	2004	2005	2006	2007	2008	Total
101	68	92	90	103	17	**471**

Sub-specialties of General Surgery include colorectal, critical care, general surgical oncology, and pediatric general surgery. There is typically 2 additional years of training for these sub specialties; however, 1 year may, in some cases, be taken concurrently within a General Surgery residency. These residency programs are offered through only a few Canadian Medical Schools, due to the nature of clinical experience required. Since 1990, across the country there have been between 1–2 graduates per year, on average, from each of these sub specialties. The 2002-2003 CAPER data indicate that residents engaged in these programs of study are estimated to complete their programs as follows:

Table 171 – General Surgery Sub-specialties

Sub Specialty/Year	2003	2004	TOTAL
Colorectal Surgery	1	-	**1** (male)
Critical Care Surgery	4	-	**3** (male)
General Surgical Oncology	4	1	**5** (2 female, 3 male)
Pediatric General Surgery	5	1	**6** (3 female, e male)

Six residents from New Brunswick are enrolled in the General Surgery program at Dalhousie University with expected completion dates as follows: 2005 (1), 2006 (1), 2007 (2) and 2008 (2).

CAPER data indicates that since 1990, a total of 724 residents have graduated in General Surgery across the country. Annual outputs averaged 56 per over this 13-year period, ranging from lows of 46 to highs of 73. The number of graduates over the next 5 years (2003-2007) is predicted to be 62% higher on average when compared to the average in the last decade.

Current Workforce Analysis

There are 41 active General Surgeons in the province as recorded in the physician database, 38 (93%) of them are male, and 3 are female. The health region distribution of General Surgeons is as follows:

Region 1	Region 2	Region 3	Region 4	Region 5	Region 6	Region 7	OOP*	Total
10 *(24%)*	8 *(20%)*	9 *(22%)*	3 *(7%)*	3 *(7%)*	5 *(12%)*	2 *(5%)*	1 *(2%)*	41 *(100%)*
**OOP = out of province*								

The average age for males in this group is 49 years, for females 37 years, and for the total group is 48 years. Of note from a planning perspective is that 17 of the 41 surgeons (41%) are over the age of 50 and thus will come into the potential retirement zone within the 10-year forecast period (and currently 5 surgeons are already over the age of 65).

The most recent 3 fiscal years (2000-2003) of Medicare billing data, as presented in the following tables, provide some historical perspective of the General Surgery group over this time period:

- Decrease in actual number and effective number of General Surgeons
- Increase in mean and median age of General Surgeons
- Deterioration in service ratio for New Brunswickers – increase in population General Surgeon ratio over the time period

Table 172 - General Surgery - Medicare 3-year History

Year	Number of Surgeons in Database for Year	FFS Active Surgeons	All Active Surgeons	Active Surgeons' Mean Age	Active Surgeons' Median Age
2000/1	60	36	40	46.6	44.2
2001/2	69	33	36	47.6	45.2
2002/3	56	31	34	48.6	46.1

Year	Mean Active Surgeons' Core Billings ($)	Effective Number of Surgeons	Population to Each Active Surgeon
2000/1	229,236	41.7	17,402
2001/2	286,220	38.8	18,728
2002/3	330,067	35.5	20,423

Also of note from the Medicare historical data, of the General Surgeons identified as such at some point in the database, 42 were "inactive" (i.e. <$50,000 core billings) in both years, 4 left active practice, 1 entered active practice, and 32 were "active" in both years. There are presumed to be 5 salaried physicians.

Of note, those entering active practice were 31-35 years old, while those leaving practice are a combination of those of retirement age, mid-career and younger physicians (presumably those who leave the province). Those who stay inactive are a combination of both male and female physicians under 40 years of age, and older male surgeons.

Hence, there has been a net decrease in the number of active general surgeons over the last 3 years. Total billing activity among the active physicians has remained the same, with average billings increasing proportionately to both billing schedule increases and extra workload.

It is clear that there are a large number of surgeons who are identified as General Surgeons in either the Medicare billing or hospital databases, which have low levels of clinical activity by either measure.

Supply Forecast

Highlights

- The General Surgery workforce is expected to grow by 28% (from 40 to 51) between 2003 and 2013 given the following estimates:
  - 2 PGME entries per year
  - 1 retirement per year
  - Negligible impact of immigration, emigration, IMGs, and interprovincial migration
- The percentage of females General Surgeons as a percentage of total is expected to increase significantly over the forecast period, from 8% at present to 19% in 2013.
- The percentage of the General Surgery workforce over the age of 55 is expected to decrease drastically over the forecast period, from 35% at present to 20% by 2013.

The following table outlines General Surgery Forecast 2003-2013.

Table 173 - General Surgery Forecast 2003-2013

General Surgery			
YEAR	Total Physicians	% Female	% >55
Base Stock Mar 2003	**40**	**8%**	**35%**
2003	41	9%	32%
2004	42	10%	30%
2005	44	11%	30%
2006	45	12%	30%
2007	46	13%	28%
2008	47	14%	25%
2009	48	15%	25%
2010	48	16%	26%
2011	50	17%	24%
2012	51	18%	22%
2013	51	19%	20%

Demand Analysis and Forecast[54]

Multiple reports have been published regarding planning of the General Surgery workforce. These reports are referenced to augment the demand side planning methodology for General Surgery contained in this section. [55]

Given the apparent decrease in the number of active General Surgeons over the last 3 years, as discussed previously, it must be determined whether there is evidence of decreased service to the population over this period for those services, which are the primary domain of General Surgery. A number of procedures have been identified as "sentinel" procedures for General Surgery. These are:

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[54] Detailed General Surgery methodology can be found in Appendix I.

[55]

1. N. Roos, C. Black, J. Wade and K. Decker. How Many General Surgeons Do You Need in Rural Areas? Three Approaches to Physician Resource Planning in Southern Manitoba. CMAJ 1996, volume 155, pp. 395-401.
2. Expert Panel on Health Professional Human Resources, Ontario 2000.
3. F. Kwakwa and O. Jonasson, The General Surgery Workforce, Am J Surg, 1997, volume 173, pp. 59-64.
4. Canadian Association of General Surgeons, Submission to the Romanow Commission, 2002.

- Major Intestinal Procedures (e.g. colectomy)
- Major Breast Cancer Procedures (e.g. mastectomy)
- Cholecystectomy
- Inguinal Hernia Repair

A problem in estimating the trend in these procedure rates is that the structure of the New Brunswick population has been shifting quite dramatically over the last decade. Hence, these procedure rates were analyzed for the population in each available fiscal year and adjusted for the estimated shifts in the New Brunswick population in order to ascertain the trend in delivery of these "General Surgery Core Procedures" by General Surgeons over time. Both Hospital data and Medicare billing data were used for confirmation. The results are illustrated in the following figures.

Figure 35 - Annual rates of General Surgery Core Procedures for Males from Medicare Data

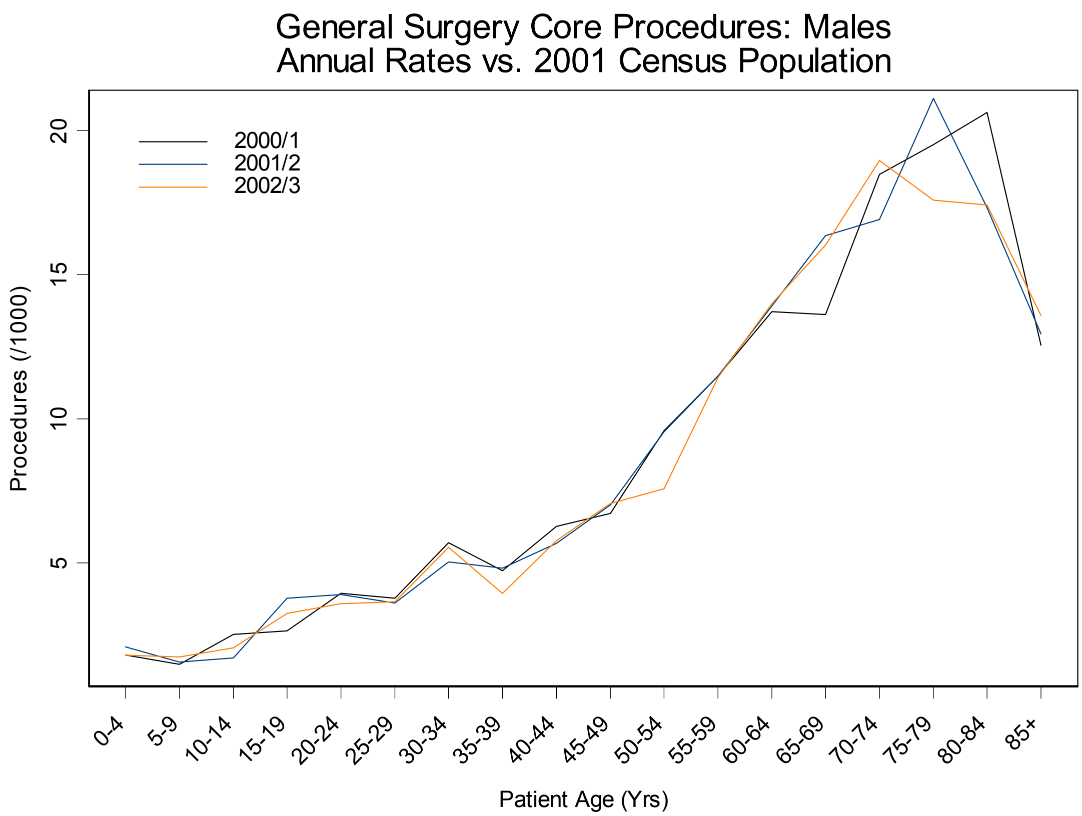
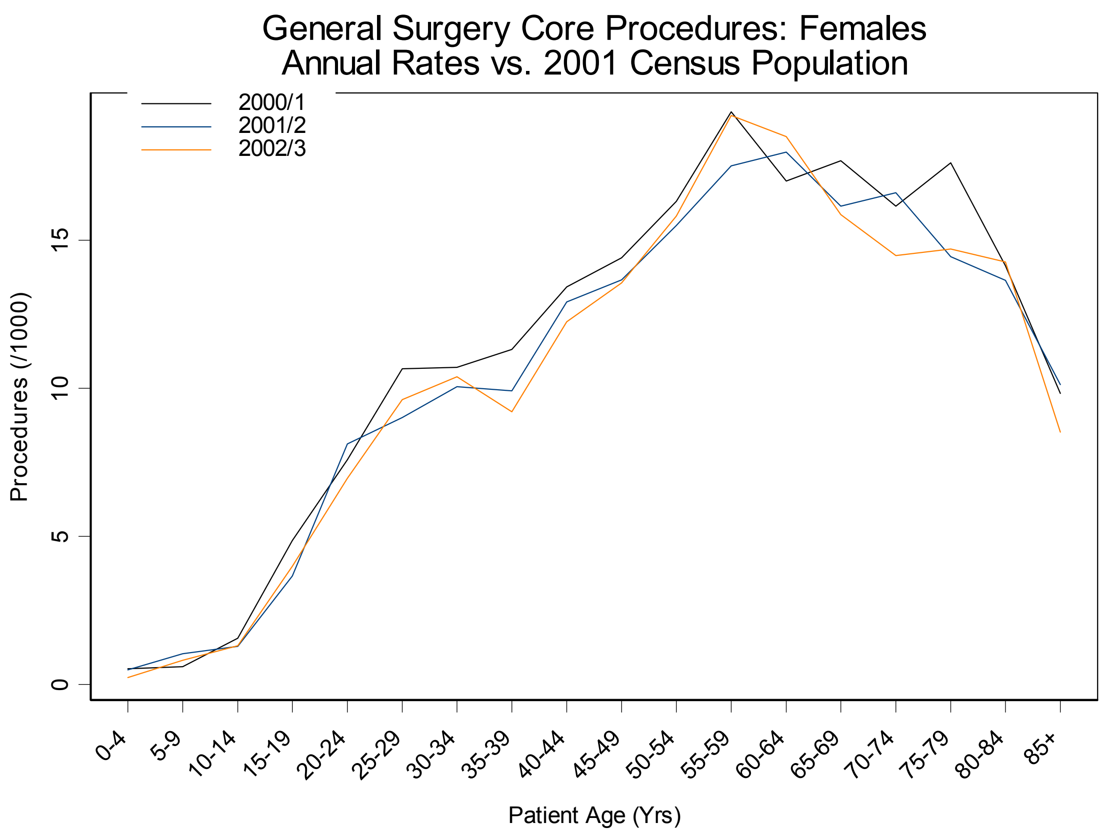


Figure 36 - Annual Rates of General Surgery Core Procedures for Females, from Medicare data



From these figures, there is evidence of a slippage in per-capita delivery of General Surgery core procedures to the population of New Brunswick over the last 3-6 years. For comparison, the General Surgeon to Population ratios are 1:17,241 for Canada as a whole (2000), 1:17,012 for Australia (1996), and 1:14,084 for USA (1996). These benchmarks must be reviewed with the caveat that considerable variation may result from differences in methodologies for ascertaining the measures and thresholds for clinical activity.

Due to a decline in number of active General Surgeons in New Brunswick over the last 3 years, there appears to be a corresponding decline in the per-capita rate of service delivery for a number of General Surgery Core procedures (after adjusting for population shifts). Moreover, the population to General Surgeon ratio, which was approximately equal to that of Canada's benchmark in 2000/1, has increased markedly during the subsequent 2 years.

These analyses suggest that the number of active General Surgeons in New Brunswick should be restored to the levels of 2000/2001, which were consistent with the Canadian benchmark ratios. However, supply data would indicate that the system is currently back up to 2000/01 levels of active General Surgeons, as of March/April 2003, however, current vacancies indicate that as of an April 30, 2003 snapshot there is still a significant shortfall of 20 positions across the province.

As presented in the table below, growth in demand for General Surgery services is projected to grow by over 15.73% from 2003 to 2013, which equates to an increase in effective requirements for General Surgeons from 41.7 effective surgeons presently, to 48.3 by 2013.

Table 174 – Growth in Demand for General Surgery Services (growth rates from base year)

Specialty	Effective No.	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
General Surgery		*1.47%*	*2.89%*	*4.32%*	*5.71%*	*7.15%*	*8.63%*	*10.07%*	*11.51%*	*12.92%*	*14.36%*	*15.73%*
	41.7	42.3	42.9	43.5	44.1	44.7	45.3	45.9	46.5	47.1	47.7	48.3

Gap Analysis

As discussed previously, it is recommended that this specialty return to the 2000/01 per capita rate of service delivery, as consistent with Canadian benchmark ratios, therefore the 35.5 effective surgeons as per 2002/03 levels should increase to 41.7 effective surgeons, leaving an immediate requirement for 6.2 effective General Surgeons. In addition, demand is projected to grow by 15.7%, which equates to a requirement for 48.3 effective surgeons by 2013 or 6.6 surgeons over the recommended 2003 levels (41.7). Thus, the total requirement over the 10-year forecast period is for an additional 12.8 effective General Surgeons.

There seems to be significant variability among General Surgeons' activity levels however, which creates a demand profile that is inconsistent with the current supply picture. Thus, it is difficult to interpret effective supply estimates over the coming 10-year period based on this phenomenon. However, an important additional planning consideration is that 17 of the 41 current supply of surgeons are over the age of 50, and thus will come into the potential retirement zone within the 10-year planning period, this could create significant additional demand over this time period, **which equates to total potential demand for upwards of 30 General Surgeons by 2013,** dependent on actual number and timing of retirements and warrants active succession planning. In addition, based on survey responses 1 physician in the 30-40 age group has plans to reduce practice by at least 50% for 1 year or less within the next 5 years and 3 physicians in this age group indicated plans to reduce activity by at least 25% permanently. In the 40-55 age group, 2 physicians have plans to reduce practice respectively by at least 25% and by at least 50% permanently, within the ensuing 5 years.

The reported current vacancies of 20 General Surgery positions warrants further discussion as it is not consistent with what is required to achieve Canadian benchmark ratios.

6.4.4.3 Neurosurgery

Education

This 6-year residency program is offered at all university medical schools with the exception of Queens and Memorial Universities. The 2002-2003 CAPER data indicates that there are currently 96 residents

(20 female and 76 male) pursuing studies toward this specialty, with expected completion dates as follows:

Table 175 - Neurosurgery

2003	2004	2005	2006	2007	2008	Total
23	16	14	15	12	16	**96**

No residents from New Brunswick are enrolled in this specialty program.

CAPER data indicates that since 1990, a total of 165 residents have graduated in Neurosurgery across the country. Annual outputs averaged 13 per over this 13-year period, ranging from lows of 8 to highs of 16. The number of graduates over the next 6 years is predicted to be 23% higher on average when compared to the average in the last decade. This is due primarily to a higher than expected output of 23 graduates predicted for 2003.

Current Workforce Analysis

There are 5 active Neurosurgeons in the province, as recorded in the physician database, all of them are male. These surgeons are distributed by health region as follows: 3 (60%) are in Region 2 and 2 (40%) are in Region 1.

The average age for this group is 45 years, and 2 Neurosurgeons (40%) in this group are over the age of 50 and thus present a planning risk to the group, in that they may potentially retire over the 10-year forecast period.

Demand Analysis and Forecast

Neurosurgery in New Brunswick is currently structured as two similar, relatively small programs in 2 sites, in Regions 1SE and 2. Neurosurgeons have a small number of high average RIW CMGs (centralized only), most commonly, craniotomy procedures, intracranial injuries, and trauma procedures including tracheostomy and gastrostomy, which are generally the result of swallowing and feeding problems for patients with brain injuries or other long-stay cases.

Patient flow patterns for Neurosurgery show that patients are mainly treated in Regions 1SE and 2. There is significant variation among regions for Neurosurgery services. Region 4 has significantly lower utilization than the average and Region 7 has high utilization. For Neurosurgery, there is some variation in service by region that is not readily explained, but there does not appear to be supply driven utilization variation.

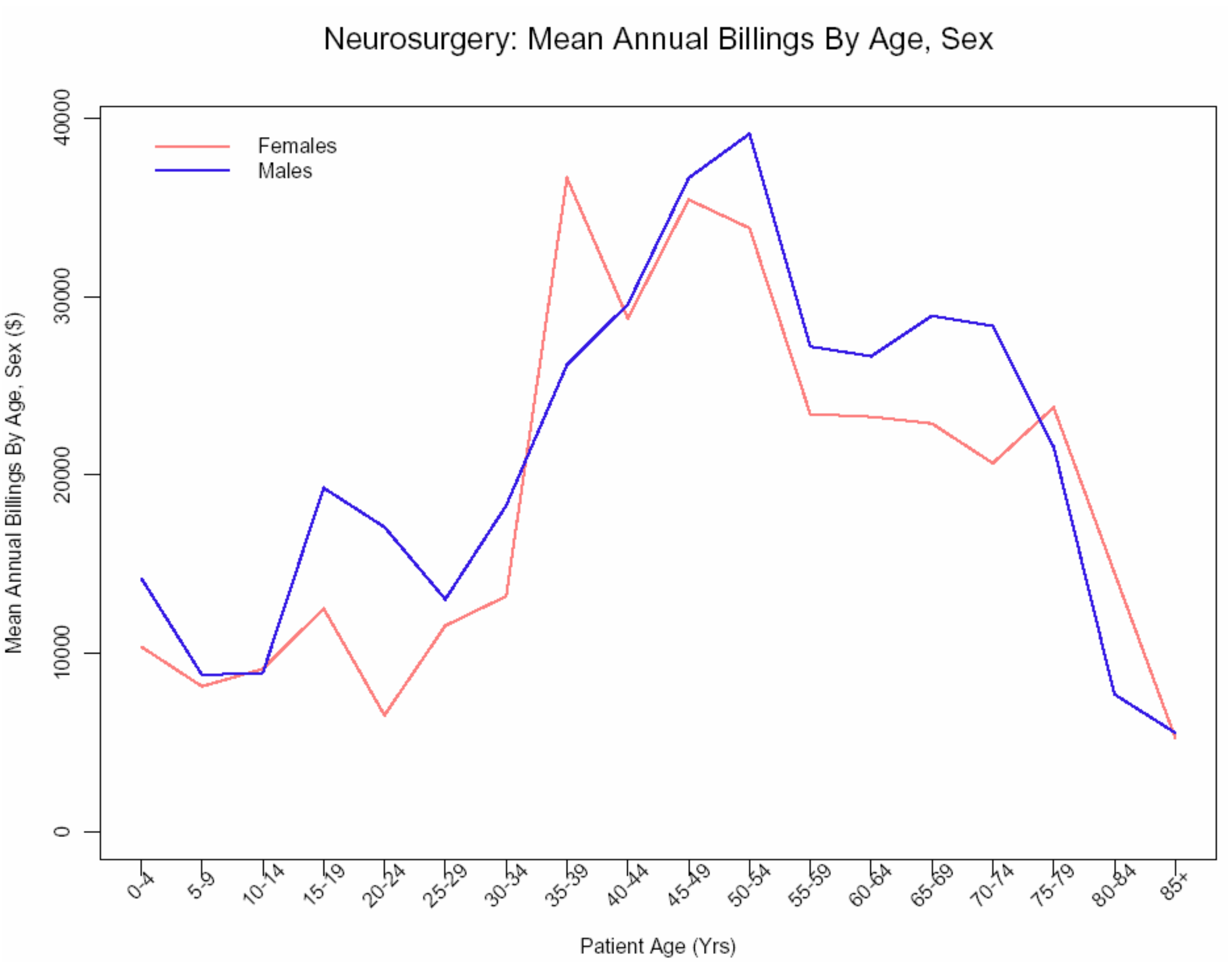
As depicted in the figure below, the consumption of Neurosurgery services by the New Brunswick population over the past 3 years has the following characteristics:

- Neurosurgeons' services are consumed at every age group, with the majority of services consumed after the age of 35 and before the age of 60.

- Male service use is greater than female use up until the age of 30 years, and then female use is greater than males until the age of 40 (with female use peaking in the 35-39 age range).

- Male service use peaks at the 50-54 age range.

Figure 37 - Neurosurgery Mean Annual Total Billings, by Age and Sex of Population



Based on the utilization profile of Neurosurgery service as presented above, and considering the changing age structure of the New Brunswick population in the coming 10 years, the following table shows the growth rates in requirements anticipated for Neurosurgery to 2013.

Growth in demand for Neurosurgery services is projected to grow by over 10% from 2003 to 2013, which equates to an increase in requirements for Neurosurgeons from 5 (actual) presently, to 5.5 by 2013.

Table 176 – Growth in Demand for Neurosurgery Services (growth rates from base year)

Specialty	Stock at time t	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Neurosurgery		*0.80%*	*1.55%*	*2.34%*	*3.18%*	*4.26%*	*5.32%*	*6.36%*	*7.36%*	*8.37%*	*9.34%*	*10.29%*
	5.0	5.0	5.1	5.1	5.2	5.2	5.3	5.3	5.4	5.4	5.5	5.5

An April 30, 2003 snapshot of vacancies in Neurosurgery indicates a shortfall of 0.6 positions across the province.

Gap Analysis

Based on the current shortage position of 0.6 Neurosurgeons, predicted retirements of potentially 2 Neurosurgeons over the 10-year forecast horizon (not accounting for other gains and exits from the current and future cohort of active physicians), and given growth in demand estimating requirements for 5.5 Neurosurgeons by 2013, **there could be a total requirement for up to 3 additional Neurosurgeons over this 10-year period,** the timing of which is dependent upon retirement of the 2 Neurosurgeons over the age of 50. Furthermore, in this small practice group 1 male in the 30-40 age group has also indicated plans to reduce practice by 50% permanently within the next 5 years; therefore active succession planning is required in this specialty.

6.4.4.4 Obstetrics and Gynecology

Education

A 5-year residency in this specialty is offered at all university medical schools across the country. The 2002-2003 CAPER data indicates that currently, across the country, there are 307 residents (225 female and 82 male) engaged in this program of study, with estimated completion dates as follows:

Table 177 - Obstetrics and Gynecology

2003	2004	2005	2006	2007	Total
64	54	58	63	68	**307**

Fields of sub specialization in Obstetrics and Gynecology include Gynecologic Oncology, Gynecologic Reproductive Endocrinology/Infertility, and Maternal/Fetal Medicine. These are available at several university medical schools across the country. Since 1990, across the country there has been an average of between 1-3 graduates per year from these subspecialty programs.

The 2002-2003 CAPER data indicates the following residents are expected to complete their programs of study in these fields as follows:

Table 178 - Obstetrics and Gynecology Sub-Specialties

Sub Specialty/Year	2003	2004	Total
Gynecologic Oncology	3	4	**7** (all female)
Gynecologic Reproductive Endocrinology/Infertility	5		**5** (4 female, 1 male)
Maternal/Fetal Medicine	8	3	**11** (all female)

Three residents from New Brunswick are enrolled in Obstetrics and Gynecology at Dalhousie University with expected completion dates in 2003 (1), 2005 (1) and 2006 (1).

CAPER data indicates that since 1990, a total of 692 residents have graduated in Obstetrics and Gynecology across the country. Annual outputs averaged 53 per over this 13-year period, ranging from lows of 42 to highs of 65. The number of graduates over the next 5 years is predicted to be nearly 16% higher on average when compared to the average in the last decade.

Current Workforce Analysis

There are 38 active Obstetricians/Gynecologists in the province as recorded in the physician database, 30 of them are male (79%), and 8 of them are female. The health region distribution of Obstetricians/Gynecologists is as follows:

Table 179 – Obstetrician/Gynecologist Health Region Distribution

Region 1	Region 2	Region 3	Region 4	Region 5	Region 6	Region 7	Total
9 *(24%)*	10 *(26%)*	8 *(21%)*	3 *(8%)*	1 *(3%)*	4 *(11%)*	3 *(8%)*	38 (*100%*)

The average age for this group is 54 years for males, 38 years for females, and 50 years for the group as a whole.

Of most particular concern from a planning perspective is that 19 of the 38 Obstetricians/Gynecologists (50%) are over the age of 50 and thus will come into the potential retirement zone within the 10-year forecast period. In addition, 7 of the 8 females in the group are under 40 years of age and thus, planning for temporary leaves due to maternity is a consideration.

The most recent 3 fiscal years (2000-2003) of Medicare billing data, as presented in the following tables, provide some historical perspective of the Obstetrics/Gynecology group over this time period:

- Slight decrease in actual number and effective number of Obstetricians/Gynecologists
- Decrease in mean age of Obstetricians/Gynecologists
- Decline in service ratio for New Brunswickers – increase in Obstetrician/Gynecologist to population ratio over the time period

Table 180 - Obstetrics/Gynecology - Medicare 3-year History

Year	Number of Surgeons in Database for Year	FFS Active Surgeons	All Active Surgeons	Active Surgeons' Mean Age
2000/1	53	36	49.8	49.7
2001/2	56	33	49.4	48.5
2002/3	58	35	48.5	48.3

Year	Mean Active Surgeons' Core Billings ($)	Effective Number of Surgeons	Population to Each Active Surgeon
2000/1	218,418	36.5	19,909.00
2001/2	260,460	33.7	21,528.00
2002/3	248,186	35.6	20,402.00

As stated previously, the number of Obstetricians/Gynecologists in New Brunswick has been relatively stable over the last 3 years, with physicians who leave active practice replaced to a great extent by those with relatively low overall levels of clinical activity, but with increasing obstetrical delivery workloads. In addition, the demographic distribution of these physicians who are becoming more active suggests that they can be expected to increase their overall clinical activity in the coming decade.

However, further analysis using both billing and obstetrical delivery data suggests that the workforce has stabilized with a relatively large number of physicians whose clinical practice is largely focused on providing obstetrical care.

Supply Forecast

Highlights

- The Obstetrics/Gynecology workforce is expected to remain roughly stable at 38-39 physicians between 2003 and 2013 given the following estimates:
  - 1 PGME entry per year
  - 1 retirement per year
  - Negligible impact of immigration, emigration, IMGs, and interprovincial migration
- The percentage of females Obstetricians/Gynecologists as a percentage of total is expected to increase steadily over the forecast period, from 21% at present to 30% in 2013.
- The percentage of the Obstetrics/Gynecology workforce over the age of 55 is expected to decrease significantly over the forecast period, from 42% at present to 33% by 2013.

The following table outlines Obstetrics/Gynecology Supply Forecast 2003-2013

Table 181 - Obstetrics/Gynecology Supply Forecast 2003-2013

Obstetrics/Gynecology			
YEAR	Total Physicians	% Female	% >55
Base Stock Mar 2003	**38**	**21%**	**42%**
2003	38	22%	40%
2004	38	22%	37%
2005	39	23%	37%
2006	39	24%	37%
2007	39	25%	36%
2008	38	25%	36%
2009	38	26%	35%
2010	38	27%	37%
2011	38	28%	36%
2012	39	29%	34%
2013	39	30%	33%

Demand Analysis and Forecast[56]

The Obstetrics and Gynecology program in New Brunswick is considered a core clinical program in hospitals, and, as such, is available at all the province's regional hospitals.

Obstetrical services in New Brunswick encompass the spectrum of care across prenatal, perinatal, and postnatal periods; a risk spectrum from low-risk obstetrics to the care and delivery of infants in high-risk pregnancies, and the ability to respond to rapidly evolving urgent and emergent situations. Obstetrics is primarily a regional service, with deliveries being the key type of CMG in this program. Virtually all specialists in the program are found at regional hospitals. Obstetrical services are generally well contained within regions. While there is significant inter-regional variation in the provision of Obstetrical services, the birth incidence is not something over which regions have control.

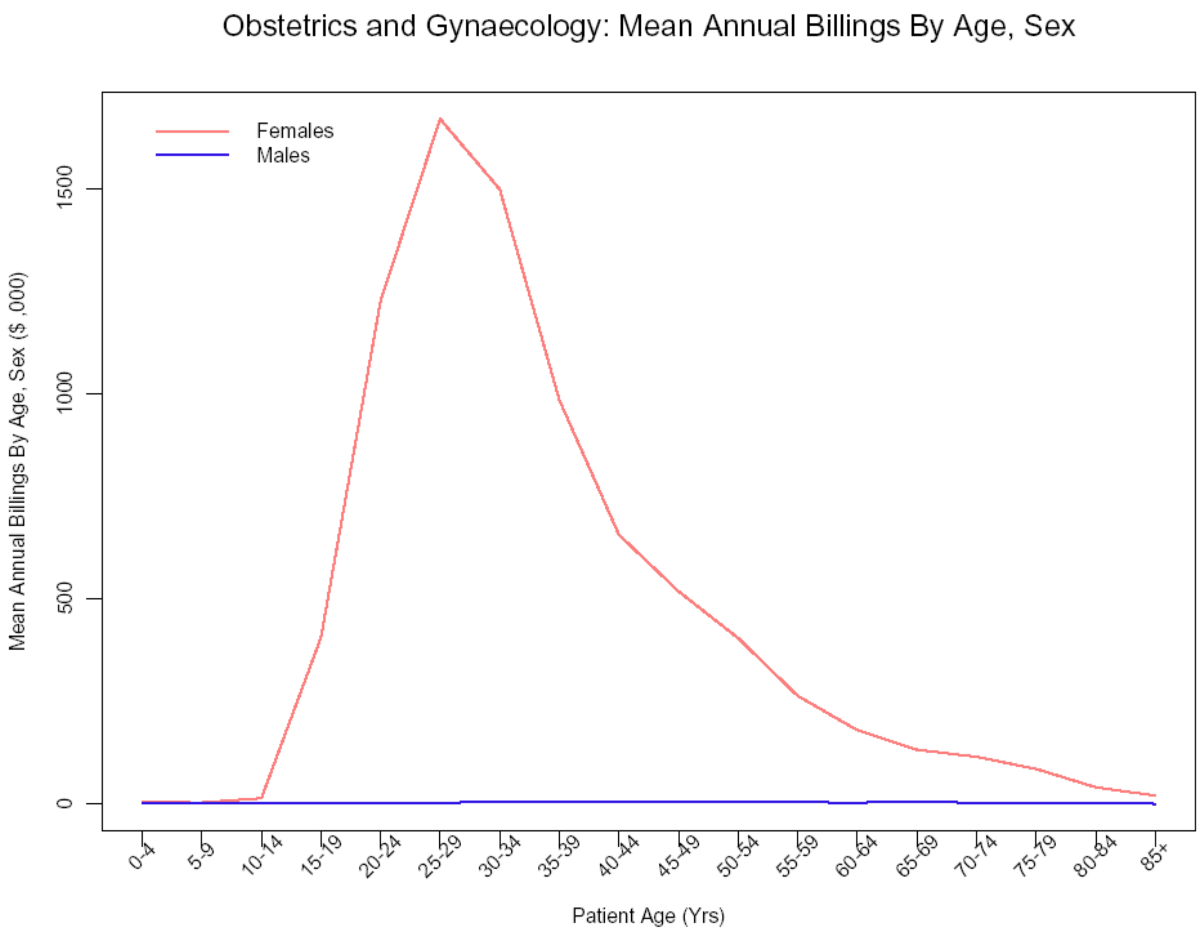
As depicted in the figure below, the consumption of Obstetrics/Gynecology services by the New Brunswick population over the past 3 years has the following characteristics:

- Predictably, the majority of service is consumed by women between the ages of 20 and 40

[56] Additional demand-side methodology and analysis is contained in Appendix J.

- Female service use peaks at the 25-29 age group, and drops steeply thereafter

Figure 38 - Obstetrics/Gynecology Mean Annual Total Billings, by Age and Sex of Population



Based on the utilization profile of Obstetric/Gynecology service as presented in the figure above, and considering the changing age structure of the New Brunswick population in the coming 10 years, the following table shows the growth rates in requirements anticipated for Obstetric/Gynecology to 2013.

Growth in demand for Obstetrics/Gynecology services is projected to contract only slightly (3%) from 2003 to 2013, which equates to relative stability in the effective requirement for Obstetricians/Gynecologists of 34-36 specialists between 2003 and 2013.

In spite of this negative growth rate, and due to the demographic shift over the next 10 years, there may be a predictable shift in distribution of core services in this specialty to Gynecological services versus

Obstetrics. Therefore, the negative growth rate as depicted below may not be a realistic projection of demand.

Table 182 – Growth in Demand for Obstetrics/Gynecology Services (growth rates from base year)

Specialty	Stock at time t	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Obstetrics/ Gynecology		*-0.06%*	*-0.09%*	*-0.17%*	*-0.41%*	*-0.71%*	*-0.96%*	*-1.21%*	*-1.57%*	*-2.03%*	*-2.56%*	*-3.15%*
	35.6	35.6	35.6	35.5	35.5	35.3	35.3	35.2	35.0	34.9	34.7	34.5

An April 30, 2003 snapshot of vacancies in Obstetrics and Gynecology indicates a surplus of 6.2 positions across the province.

Gap Analysis

Supply data indicates the current workforce at 38 Obstetricians/Gynecologists, which is projected to remain roughly stable, only growing to 39 specialists by 2013. Based on growth in demand and the discussion in the previous section, demand is also is anticipated to remain roughly stable for this group to 2013. **Thus, there is no predicted shortage in this group over the forecast period.** It is important to note that, despite the reported 6.2 surplus in positions, there has been a decline in service ratio over the past 3 years (as per Medicare history), which may suggest activity level variability within the specialty.

Of interest however, based on survey responses, is one physician the 30-40 age group who indicated plans to reduce practice by at least 25% permanently. As well, 2 physicians in the 40-55 age group each plan to reduce practice by at least 25% permanently.

6.4.4.5 Ophthalmology

Education

A 5-year residency in this specialty is available at all university medical schools except the Universities of Calgary, McMaster, Manitoba, and Memorial. The 2002-2003 CAPER data indicates that currently, across the country, there are 128 residents (38 female and 90 male) engaged in this program of study, with estimated completion dates as follows:

Table 183 - Ophthalmology

2003	2004	2005	2006	2007	Total
26	29	24	27	22	**128**

One resident from New Brunswick is enrolled in Ophthalmology at Dalhousie University and is expected to complete in 2007.

CAPER data indicates that since 1990, a total of 372 residents have graduated in Ophthalmology across the country. Annual outputs averaged 27 per over this 13-year period, ranging from lows of 16 to highs of 39. The last 2 years have seen lower than average outputs of 25 and 16 graduates respectively. The number of graduates over the next 5 years is predicted to be 5% lower on average when compared to the average in the last decade.

Current Workforce Analysis

There are 27 active Ophthalmologists recorded in the physician database, 24 (89%) are male, and 3 are female. Distribution by health region is presented in the following table:

Table 184 - Ophthalmologist Distribution by Health Region

Region 1	Region 2	Region 3	Region 4	Region 5	Region 6	Region 7	Total
9 *(33%)*	6 *(22%)*	5 *(19%)*	1 *(4%)*	2 *(7%)*	2 *(7%)*	2 *(7%)*	41 (*100%*)

The average age for this specialty is 50 years for males, 39 years for females, and 49 years for the entire group. Of particular importance from a planning perspective is that 13 of the 27, nearly 50%, are over the age of 50 and thus will come into the potential retirement zone within the 10-year forecast period.

The most recent 3 full fiscal years (2000-2003) of Medicare billing data, as presented in the following tables, provide some historical perspective of the Ophthalmology group:

- Relative stability in actual number and effective number of Ophthalmologists
- Slight increase in mean and median age
- Relative stability in service ratio for New Brunswickers – stable population to Ophthalmologist ratio

Table 185 - Ophthalmology - Medicare 3-year History

Year	Number of Surgeons in Database for Year	FFS Active Surgeons	All Active Surgeons	Active Surgeons' Mean Age	Active Surgeons' Median Age
2000/1	40	25	25	50.1	51.4
2001/2	41	26	26	50.4	52.7
2002/3	37	25	25	49.6	52

Year	Mean Active Surgeons' Core Billings ($)	Effective Number of Surgeons	Population to Each Active Surgeon
2000/1	368,016	25.2	28,821
2001/2	372,018	26.4	27,507
2002/3	450,054	25.3	28,667

Supply Forecast

Highlights

- The Ophthalmology workforce is expected to decline slightly (from 28 to 26 physicians) between 2003 and 2013 (see following table) given the following estimates:
  - Less than 1 PGME entries per year
  - Less than 1 retirement per year
  - Negligible impact of immigration, emigration, IMGs, and interprovincial migration
- Female Ophthalmologists as a percentage of total is expected to increase slightly over the forecast period, from 11% at present to 18% in 2013.
- The percentage of the Ophthalmology workforce over the age of 55 is expected to fluctuate over the forecast period, from 36% at present, up to 43% in 2006, and down to 34% by 2013.

Table 186 – Ophthalmology Supply Forecast 2003-2013

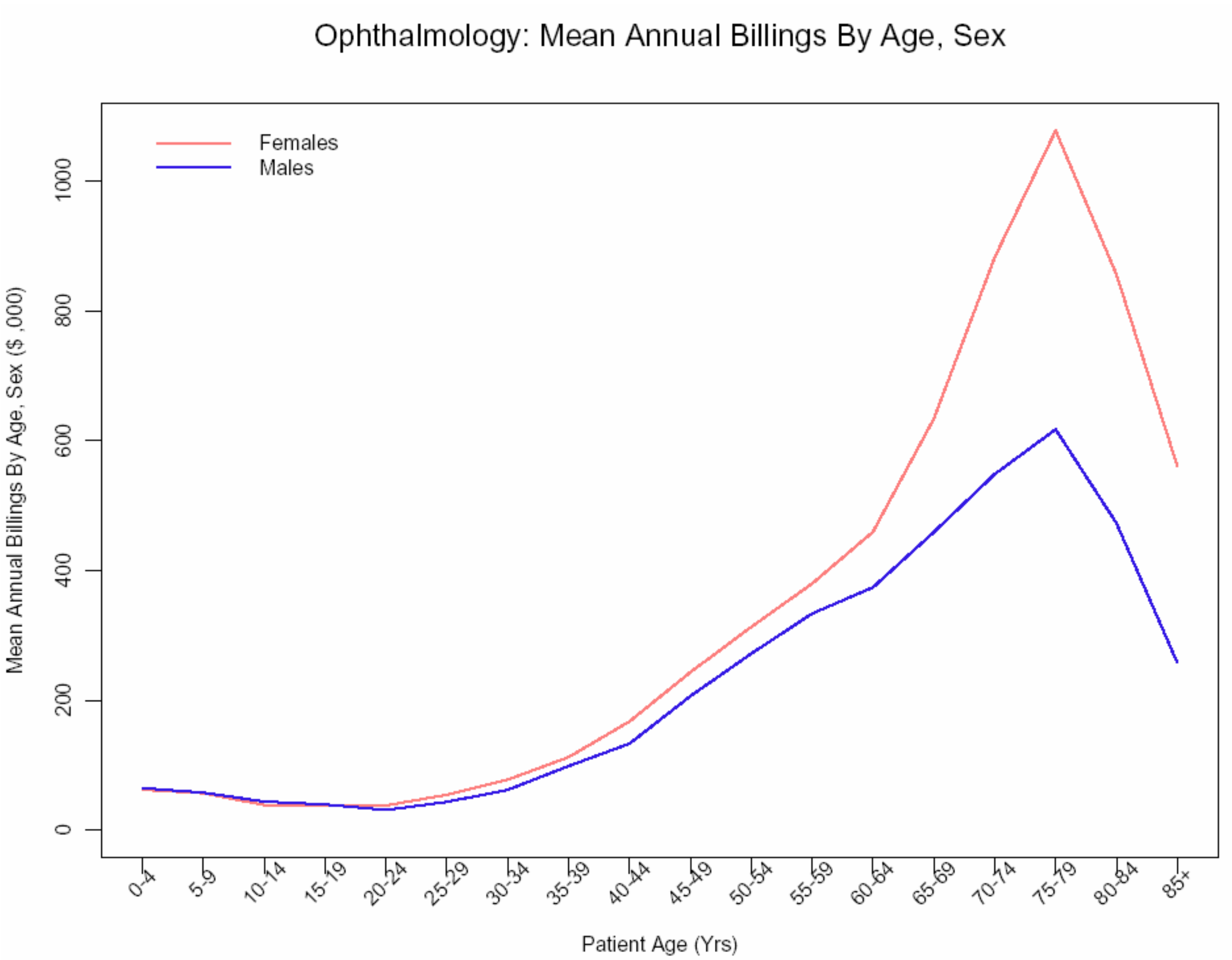
Opthalmology			
YEAR	Total Physicians	% Female	% >55
Base Stock Mar 2003	**27**	**11%**	**33%**
2003	27	12%	32%
2004	27	12%	37%
2005	27	13%	39%
2006	27	13%	41%
2007	27	14%	39%
2008	27	15%	37%
2009	27	15%	36%
2010	26	16%	33%
2011	26	17%	34%
2012	26	17%	32%
2013	25	18%	34%

Demand Analysis and Forecast

As depicted in the figure below, the consumption of Ophthalmology services by the New Brunswick population over the past 3 years has the following characteristics:

- Very little service is consumed by either gender before the age of 40.
- After the age of 40, service use rises gradually with female use only slightly greater than male use up to the age of 60-64.
- Female service use rises steeply after the 60-64 age range and peaks at the 75-79 age range.
- Male service use rises much less dramatically after the 60-64 age range, to also peak at the 75-79 age range, but at a much lower level than for females.

Figure 39 - Ophthalmology Mean Annual Total Billings, by Age and Sex of Population



Based on the profile of Ophthalmology service use as presented above, and applied to the changing age structure of the New Brunswick population in the coming 10 years, the following table shows the growth rates in requirements anticipated for Ophthalmology to 2013.

Growth in demand for Ophthalmology services is projected to grow by over 20% from 2003 to 2013, which equates to an increase in effective requirements for Ophthalmologists from 27 (actual) presently, to 32.5 by 2013.

Table 187 – Growth in Demand for Ophthalmology Services (growth rates from base year)

Specialty	Effective No.	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Ophthalmology		*1.66%*	*3.20%*	*4.73%*	*6.34%*	*8.08%*	*9.90%*	*11.77%*	*13.65%*	*15.65%*	*17.97%*	*20.25%*
	27.0	27.4	27.9	28.3	28.7	29.2	29.7	30.2	30.7	31.2	31.9	32.5

An April 30, 2003 snapshot of vacancies in Ophthalmology indicates a surplus of 0.5 positions across the province.

Gap Analysis

Supply data indicates the current workforce at 27 Ophthalmologists, which is expected contract by around 7% over the 2003-2013 period, to 25 Ophthalmologists by 2013.

Based on predicted growth in demand over the 10-year period of over 20%, equating to requirements for 32.5 Ophthalmologists by 2013 (5.5 above present level), and given the contraction in supply over this period, **this specialty is forecast to experience shortages over most of the forecast period, culminating with a shortage of up to 8 Ophthalmologists by 2013 if the problem is not redressed.** This situation calls into question the current reported surplus of 0.5 positions in this specialty.

In addition, given that 50% of the current workforce is over the age of 50 (13 specialists), and there is the potential that historical retirement rates (forecasting less than only 5 retirements over the period) may not accurately capture the reality of the future, the shortage position forecast for this specialty could be an understatement. Further, the survey responses indicate, for example, that within the next 5 years, 1 physician in the 30-40 age group will be reducing practice by at least 50% permanently; in the 40-55 age group one physician will be reducing practice by at least 25% permanently, while 1 physician plans to increase practice by at least 25% until a new specialist is recruited. Thus, it is important to monitor this situation closely and mitigate this risk with adequate succession planning.

6.4.4.6 Orthopedic Surgery

Education

A minimum of 5 years of residency training is required for this specialty, which is offered through all 16 university medical schools. The 2002-2003 CAPER data indicate that currently, across the country, there are 270 residents (40 female and 230 male) engaged in this program of study, with estimated completion dates as follows:

Table 188 - Orthopedic Surgery

2003	2004	2005	2006	2007	Total
94	42	45	46	43	**270**

Four residents from New Brunswick are enrolled in the Orthopedic Surgery program at Dalhousie University with expected completion dates as follows: 2003 (1), 2004 (1), 2005 (1) and 2007 (1).

CAPER data indicates that since 1990, a total of 639 residents have graduated in Orthopedic Surgery across the country. Annual outputs averaged 49 per over this 13-year period, ranging from lows of 44 to highs of 57. The number of graduates over the next 5 years is predicted to be 10% higher on average when compared to the average in the last decade.

Current Workforce Analysis

There are 34 Orthopedic Surgeons actively practicing in New Brunswick, 33 are male (97%), and 1 is female. Distribution of Orthopedic Surgeons by health region is presented as follows:

Region 1	Region 2	Region 3	Region 4	Region 5	Region 6	Region 7	Total
11 *(32%)*	*8 (24%)*	8 *(24%)*	2 *(6%)*	1 *(3%)*	2 *(6%)*	2 *(6%)*	34 (*100%)*

The average age for this group is 48. And of particular concern from a planning perspective is that 13 of the 34 Orthopedic Surgeons (38%) are over the age of 50 and thus will come into the potential retirement zone within the 10-year forecast period.

The most recent three full fiscal years (2000-2003) of Medicare billing data, as presented in the following tables, provide some historical perspective of the Orthopedic Surgery group:

- Increase in actual number and effective number of Orthopedic Surgeons
- Relative stability in mean and median age
- Improvement in service ratio for New Brunswickers – decrease in population to Orthopedic Surgeon ratio

It is important to note that the current supply of Orthopedic Surgeons (34) is noticeably inconsistent with 2002/03 Medicare data for all active surgeons (31); this is most probably due to data being extracted from Medicare at different points in time and changes in staffing complements during this time.

Table 189 - Orthopedic Surgery - Medicare 3-year History

Year	Number of Surgeons in Database for Year	FFS Active Surgeons	All Active Surgeons	Active Surgeons' Mean Age	Active Surgeons' Median Age
2000/1	43	27	27	46.7	43.4
2001/2	46	27	27	47.4	44.4
2002/3	48	31	31	46.2	43.5

Year	Mean Active Surgeons' Core Billings ($)	Effective Number of Surgeons	Population to Each Active Surgeon
2000/1	239,420	27.5	26,360
2001/2	264,819	27.7	26,229
2002/3	251,693	31.6	22,946

Supply Forecast

Highlights

- The Orthopedic Surgery workforce is expected to increase by nearly 30% (from 34 to 44 physicians) between 2003 and 2013 given (see following table) the following estimates:
  - 1-2 PGME entries per year
  - Less than 1 retirement per year
  - Negligible impact of immigration, emigration, IMGs, and interprovincial migration
- The percentage of female Orthopedic Surgeons as a percentage of total is expected to increase significantly over the forecast period, from 3% at present to 16% in 2013.
- The percentage of the Orthopedic Surgery workforce over the age of 55 is expected to decrease significantly over the forecast period, from 35% at present to 16% by 2013.

Table 190 - Orthopedic Surgery Supply Forecast 2003-2013

Orthopedic Surgery			
YEAR	Total Physicians	% Female	% >55
Base Stock Mar 2003	**34**	**3%**	**35%**
2003	35	4%	30%
2004	36	6%	30%
2005	37	7%	30%
2006	38	8%	28%
2007	39	10%	25%
2008	40	11%	23%
2009	41	12%	19%
2010	42	13%	15%
2011	43	14%	13%
2012	43	16%	14%
2013	44	16%	16%

Demand Analysis and Forecast

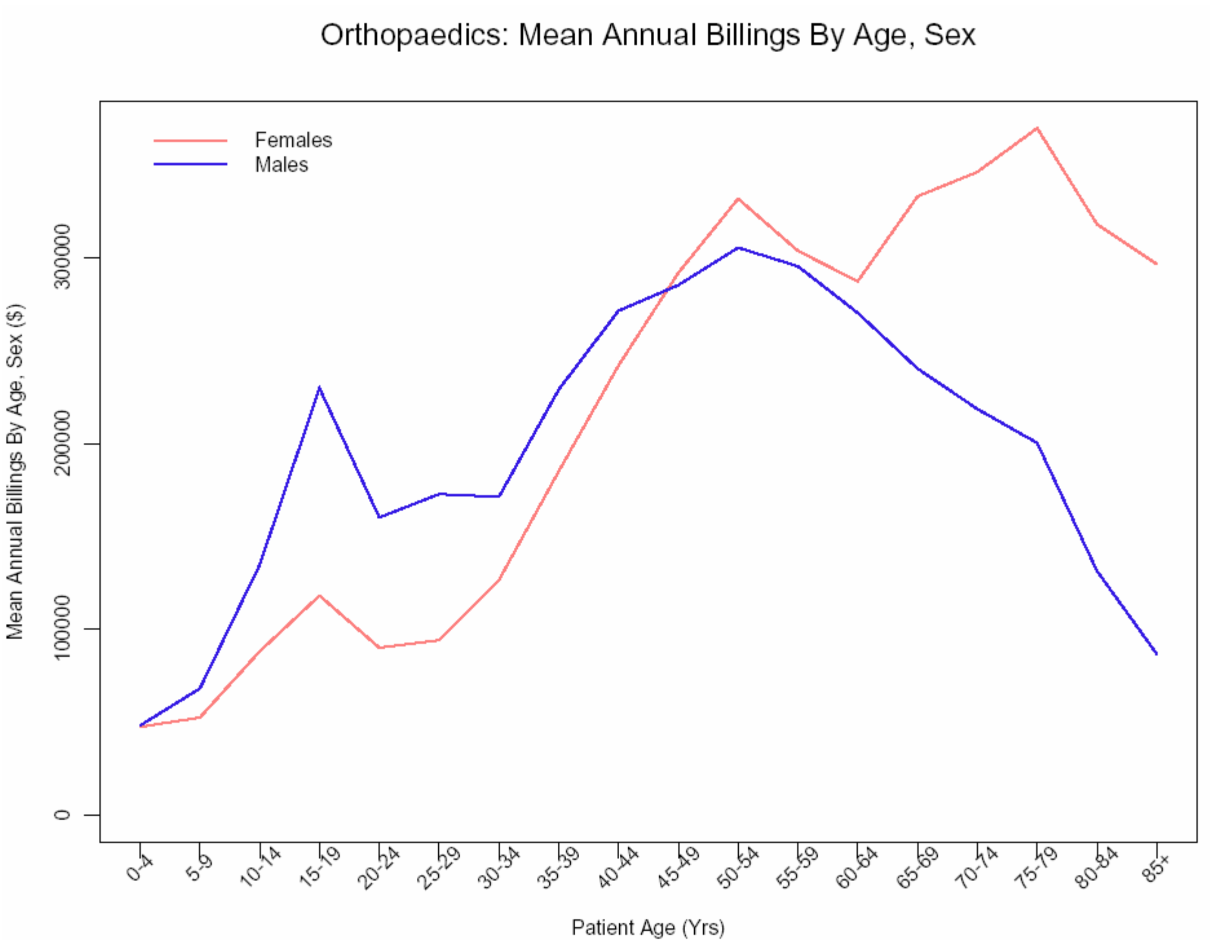
The New Brunswick Orthopedic Surgery program consists mainly of hip fractures, knee replacements, and hip replacements. Orthopedic Surgeons most often care for patients for whom they are the most responsible physician. Most of the Orthopedic Surgery CMGs are regional, with only a few decentralized CMGs. Most New Brunswick patients receive Orthopedic Surgery care in their region of residence. There is, however, a considerable amount of variation in the regional utilization of Orthopedic Surgery. Region 6 has a utilization rate 22% below the provincial average, while Region 3 has a utilization rate 12% above the provincial average. Region 3's above-average utilization rate is most likely a result of the large Orthopedic Surgery program located in this region. However, the relative underutilization of Orthopedic Surgery services by Region 6's population is worthy of further investigation.

As depicted in the figure below, the consumption of Orthopedic Surgery services by the New Brunswick population over the past 3 years has the following characteristics:

- Male service use is greater than female service use under the age of 50, and thereafter, female service use is greater than male use.

- Both male and female service use peaks first at the 15-19 age range, then both genders service use rises again to a peak at the 50-54 age range. In addition, female service use rises again to a higher peak at the 80-84 age range, while male service use drops off after the age of 55.

Figure 40 - Orthopedic Surgery Mean Annual Total Billings, by Age and Sex of Population



Based on the utilization profile of Orthopedic Surgery service as presented above, and considering the changing age structure of the New Brunswick population in the coming 10 years, the following table shows the growth rates in requirements anticipated for Orthopedic Surgery to 2013.

Growth in demand for Orthopedic Surgery services is projected to grow by over 13% from 2003 to 2013, which equates to an increase in effective requirements for Orthopedic Surgeons from an estimated 34 presently (actual number used as estimate for effective number), to 38.6 by 2013.

Table 191 – Growth in Demand for Orthopedic Surgery Services (growth rates from base year)

Specialty	Effective No.	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Orthopedic Surgery		*1.25%*	*2.44%*	*3.64%*	*4.82%*	*6.07%*	*7.32%*	*8.55%*	*9.77%*	*10.96%*	*12.22%*	*13.41%*
	34.0	34.4	34.8	35.2	35.6	36.1	36.5	36.9	37.3	37.7	38.2	38.6

An April 30, 2003 snapshot of vacancies in Orthopedic Surgery indicates a shortfall of 5.3 positions across the province.

Gap Analysis

Current supply data indicates there are 34 Orthopedic Surgeons, which is expected to increase by 30%, to 44 surgeons by 2013. Demand estimates predict growth in demand of just over 13%, from 34 surgeons at present time, to 38.6 by 2013. As such, **if the current reported shortfall of 5.3 positions were redressed immediately, supply would more than keep pace with demand over the 10-year planning period, and there would be no predicted shortfall in this specialty**, unless retirements are more than the 7 forecast, out of 13 who are currently over the age of 50.

In addition, survey responses indicate that within the 30-40 age group 2 physicians plan on reducing practice by at least 25% permanently and one by 100% for 1 year or less.

6.4.4.7 Otolaryngology

Education

This 5-year residency program can be taken at all university medical schools with the exception of the Universities of Calgary, Saskatchewan, Queens, and Memorial. The 2002-2003 CAPER data indicates that currently, across the country, there are 111 residents (31 female and 80 male) engaged in this program of study, with estimated completion dates listed in the following table.

Table 192 - Otolaryngology

2003	2004	2005	2006	2007	Total
29	21	23	20	18	**111**

Five residents from New Brunswick are enrolled in Otolaryngology at Dalhousie University with expected completion dates in 2004 (1), 2005 (2), 2006 (1), and 2007 (1).

CAPER data indicates that since 1990, a total of 276 residents have graduated in Otolaryngology across the country. Annual outputs averaged 21 per over this 13-year period, ranging from lows of 17 to highs of 28. The number of graduates over the next 5 years is predicted to be on par, when compared to the average in the last decade.

Current Workforce Analysis

There are 15 active Otolaryngologists in the province as contained in the physician database, 13 (87%) are male, and 2 are female. Distribution by health region is as follows: 5 (33%) are located in Region 1, 4 (27%) are in Region 2, 3 (20%) are in Region 6, and 1 each are in Regions 3, 4 and out-of-province.

The average age for males in the specialty is 46 years, for females 36 years, and for the total group is 45 years.

Of concern from a planning perspective is that 4 of the 15 Otolaryngologists (27%) are over the age of 50 and thus will be in the potential retirement zone within the 10-year forecast period.

The most recent 3 full fiscal years (2000-2003) of Medicare billing data, as presented in the following tables, provide some historical perspective of the Otolaryngology group:

- Decrease in actual number and effective number of Otolaryngologists
- Increase in mean and median age
- Decline in service ratio for New Brunswickers – increase in population to Otolaryngologist ratio

Table 193 - Otolaryngology - Medicare 3-year History

Year	Number of Surgeons in Database for Year	FFS Active Surgeons	All Active Surgeons	Active Surgeons' Mean Age	Active Surgeons' Median Age
2000/1	26	16	16	43.5	42.4
2001/2	24	16	16	44.4	43.4
2002/3	22	15	15	45.3	43.6

Year	Mean Active Physicians' Core Billings ($)	Effective Number of Physicians	Population to Each Active Physician
2000/1	257,105	16.1	44,978
2001/2	300,606	16.2	44,786
2002/3	342,940	15.1	47,998

Demand Analysis and Forecast

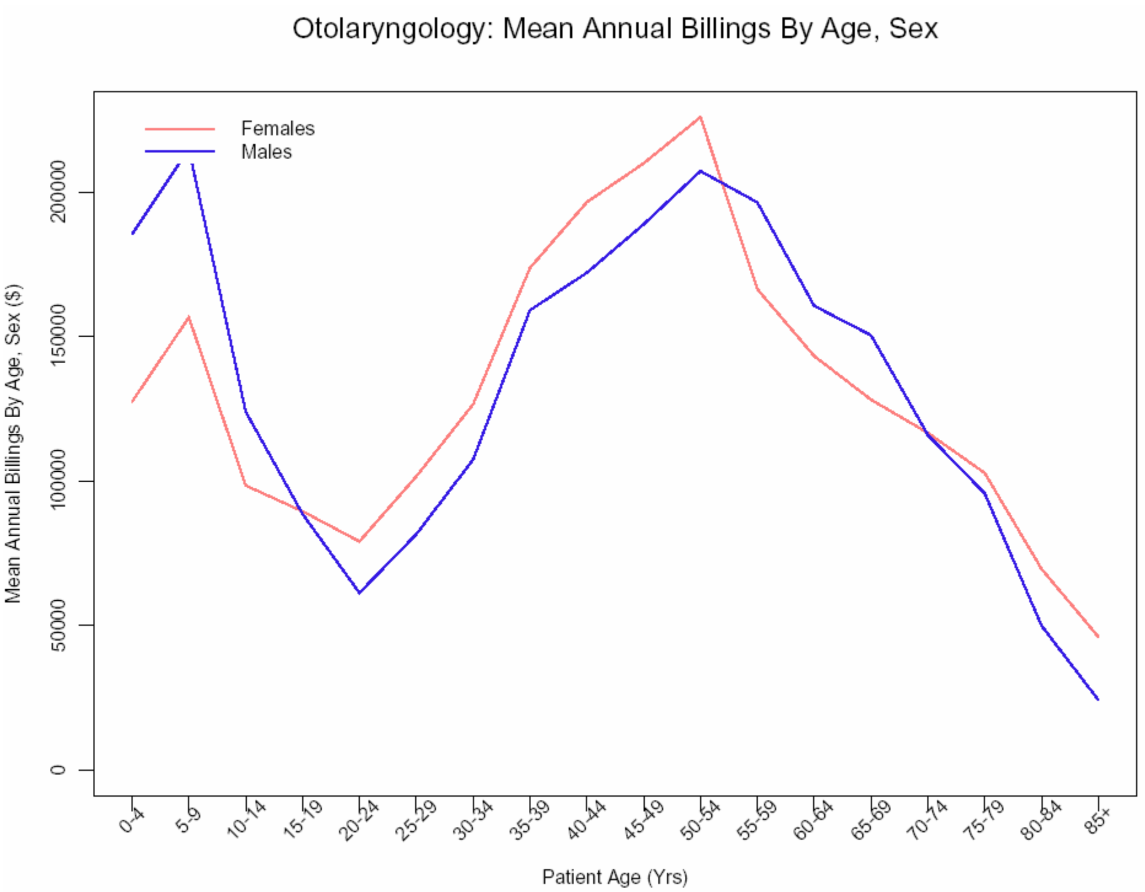
The Otolaryngology program consists primarily of tonsillectomy, myringotomy, and nasal procedures, in addition to thyroid and head and neck procedures.

The hospital-active surgeons are situated at the base regional hospitals. The only area with significant under service is Region 5. This corresponds with the fact that the majority of patients in Regions 5 and 7 travel out of region for service.

As depicted in the figure below, the consumption of Otolaryngology services by the New Brunswick population over the past 3 years has the following characteristics:

- Male and female service use mirrors one another at every age group.
- Males consume the majority if service in the under 20 age groups and again from 55 to 70 years of age, while females consume the majority of service between the ages of 20 to 55.
- Both male and female service use peaks at the 50-54 age group, thereafter service use drop dramatically for both genders.

Figure 41 - Otolaryngology Mean Annual Total Billings, by Age and Sex of Population



Based on the utilization profile of Otolaryngology service as presented above, and considering the changing age structure of the New Brunswick population in the coming 10 years, the following table shows the growth rates in requirements anticipated for Otolaryngology to 2013.

Growth in demand for Otolaryngology services is projected to grow by 8% from 2003 to 2013, which equates to an increase in effective requirements for Otolaryngologists from 15.1 at present, to 16.3 by 2013.

Table 194 – Growth in Demand for Otolaryngology Services (growth rates from base year)

Specialty	Effective No.	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Otolaryngology		*0.80%*	*1.57%*	*2.37%*	*3.14%*	*3.90%*	*4.67%*	*5.40%*	*6.14%*	*6.85%*	*7.48%*	*8.05%*
	15.1	15.2	15.3	15.5	15.6	15.7	15.8	15.9	16.0	16.1	16.2	16.3

An April 30, 2003 snapshot of vacancies in Otolaryngology indicates a shortfall of 5.0 positions across the province.

Gap Analysis

Supply data indicates the current workforce at 15 Otolaryngologists, equivalent to 2002/03 levels as per Medicare billing data, which equates to 15.1 effective Otolaryngologists.

Based on the current reported shortfall of 5.0 positions, predicted retirements of up to 5 Otolaryngologists over the 10-year forecast horizon (not accounting for other gains and exits from the current and future cohort of active physicians), and given growth in demand estimating requirements for 16.3 effective Otolaryngologists by 2013 (1.2 above present level), **there could be a total additional requirement for up to 12 Otolaryngologists over this 10-year period**, the timing of which is dependent upon the physicians' retirement plans. In addition survey responses indicate 2 physicians in the 40-55 age group plan to reduce practice respectively by at least 25% and by at least 50% permanently; therefore active succession planning is required.

6.4.4.8 Plastic Surgery

Education

This 5-year residency is offered at all university medical schools except the Universities of Saskatchewan, Queens, Ottawa, Sherbrooke, Laval, and Memorial. The 2002-2003 CAPER data indicates that currently, across the country, there are 75 residents (26 female and 49 male) engaged in this program of study, with estimated completion dates as follows:

Table 195 - Plastic Surgery

2003	2004	2005	2006	2007	Total
15	22	13	14	11	**75**

Four residents from New Brunswick are enrolled in the Plastic Surgery program: One at the University of Western Ontario with expected completion in 2005; One at the University of Toronto with expected completion in 2006, and 2 at Dalhousie University graduating in 2003 and 2006 respectively.

CAPER data indicates that since 1990, a total of 190 residents have graduated in Plastic Surgery across the country. Annual outputs averaged 15 per over this 13-year period, ranging from lows of 9 to highs of 19. On average, the number of graduates over the next 5 years is predicted to be on par, when compared to the average in the last decade.

Current Workforce Analysis

There are 13 Plastic Surgeons actively practicing in the province, 11 of them are male (85%) and 2 are female. Health Region distribution of Plastic Surgeons is as follows: 4 each in Regions 1 and 3, 3 in Region 2, and 2 in Region 6.

The average age for males in the group is 49 years, females is 46 years, and for the total group is 48 years. There are 2 (15%) physicians under the age of 40, and 6 (46%) between the age of 40 and 50.

Of particular note from a planning perspective is that 5 of the 13 Plastic Surgeons (38%) are over the age of 50 and thus fall within the potential retirement zone in the 10-year forecast period.

The most recent 3 full fiscal years (2000-2003) of Medicare billing data, as presented in the following tables, provide some historical perspective of the Plastic Surgery group:

- Decrease in actual number and effective number of Plastic Surgeons
- Increase in mean and median age
- Decline in service ratio for New Brunswickers – increase in population to Plastic Surgeon ratio

Table 196 - Plastic Surgery - Medicare 3-year History

Year	Number of Surgeons in Database for Year	FFS Active Surgeons	All Active Surgeons	Active Surgeons' Mean Age	Active Surgeons' Median Age
2000/1	20	13	13	46.5	46.8
2001/2	20	13	13	48.3	47.9
2002/3	19	12	12	47.8	48.4

Year	Mean Active Surgeons' Core Billings ($)	Effective Number of Surgeons	Population to Each Active Surgeon
2000/1	219,623	13.2	54,874
2001/2	236,953	13.1	55,600
2002/3	276,681	12.2	59,334

Demand Analysis and Forecast

Plastic Surgery procedures encompass breast procedures, carpal tunnel release, wound debridement and skin grafting, and burn care. A significant proportion of care in this program is delivered by physicians other than Plastic Surgeons.

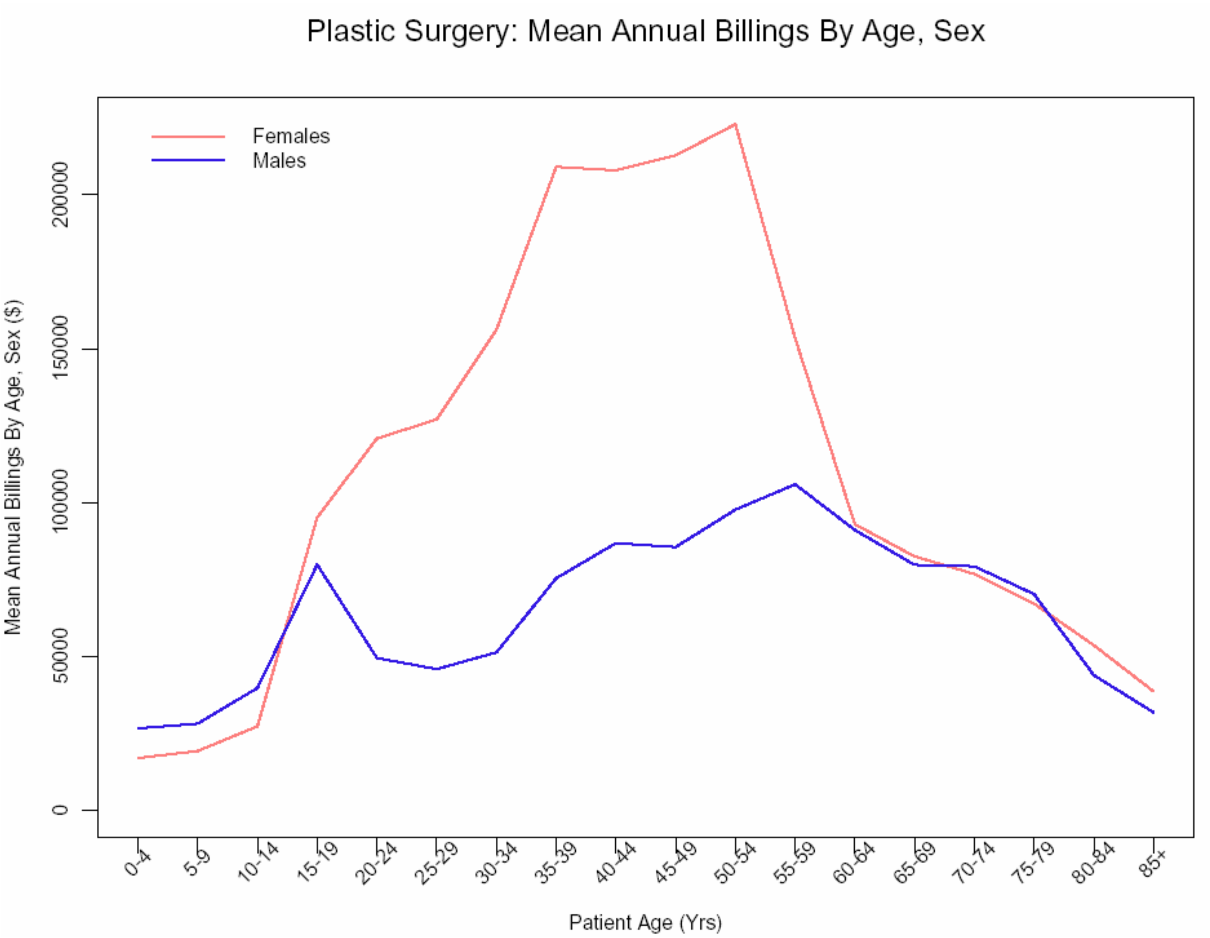
The existing Plastic Surgery programs are at the 4 large regional hospitals in Regions 1, 2, and 3, and Bathurst Regional Hospital in Region 6, and as such, it has been determined in previous work in this area that there should be a minimum FTE complement of at least 3 in all these hospitals, except the Dr. Georges Dumont Hospital, which would be expected to have less than 2 FTEs.

A large proportion of Plastic Surgery cases from Regions, 4, 5 and 7 are treated in other regions, though this is not associated with low per capita of surgery.

As depicted in the figure below, the consumption of Plastic Surgery services by the New Brunswick population over the past 3 years has the following characteristics:

- Females consume more service at every age group between the ages of 15 and 65.
- The majority of Plastic Surgery service is consumed by females between the ages of 35 to 60.
- Males consume a much lower volume of services than females, and their service use peaks at the 55-59 age group.
- Both male and female use of service falls off after the age of 55.

Figure 42 - Plastic Surgery Mean Annual Total Billings, by Age and Sex of Population



Based on the utilization profile of Plastic Surgery service as presented above, and considering the changing age structure of the New Brunswick population in the coming 10 years, the following table shows the growth rates in requirements anticipated for Plastic Surgery to 2013.

Growth in demand for Plastic Surgery services is projected to grow by 8% from 2003 to 2013, which equates to an increase in effective requirements for Plastic Surgeons from 13.2 in 2003, to 14.1 by 2013.

Table 197 – Growth in Demand for Plastic Surgery Services (growth rates from base year)

Specialty	Effective No.	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Plastic Surgery		*0.93%*	*1.79%*	*2.66%*	*3.47%*	*4.19%*	*4.90%*	*5.58%*	*6.26%*	*6.90%*	*7.49%*	*8.00%*
	13.1	13.2	13.3	13.4	13.6	13.6	13.7	13.8	13.9	14.0	14.1	14.1

An April 30, 2003 snapshot of vacancies in Plastic Surgery indicates a shortfall of 3.3 positions across the province.

Gap Analysis

Supply data indicates the current workforce at 13 Plastic Surgeons, equivalent to 2001/02 levels as per Medicare billing data, which equates to 13.1 effective Plastic Surgeons.

Based on current reported vacancies of 3.3 positions, predicted retirements of up to 5 Plastic Surgeons over the 10-year forecast horizon (not accounting for other gains and exits from the current and future cohort of active physicians), and given growth in demand estimating requirements for 14.1 effective Plastic Surgeons by 2013 (1 above present level), **there could be a total requirement for up to 10 additional Plastic Surgeons over this 10-year period**, the timing of which is dependent upon retirement of the 5 Plastic Surgeons, therefore active succession planning is required.

6.4.4.9 Thoracic Surgery

Education

A minimum of 6 years training is typically required for this specialty. Alternate pathways include a RCPSC General Surgery accreditation plus an additional 4 years or a RCPSC Cardiac Surgery accreditation plus 2.5 years. This program is offered only by the Universities British Columbia, Manitoba, Western Ontario, McMaster, Toronto, Ottawa, and a consortium of Quebec Universities.

The 2002-2003 CAPER data indicates that there are currently 16 residents (2 female and 14 male) pursuing studies toward this specialty, with expected completion dates as follows:

Table 198 - Thoracic Surgery

2003	2004	2005	2006	2007	2008	Total
10	1	2	1	1	1	**16**

CAPER data indicate that since 1990, a total of 28 residents have graduated in Thoracic Surgery across the country. Annual outputs averaged 2 per over this 13-year period, ranging from lows of 1 to highs of 5. The number of graduates over the next 6 years is predicted to be 27% higher on average when compared to the average in the last decade. However, this increase is a result of 10 graduates that are predicted for 2003, followed by a less than average output of about 1 per year over the subsequent 5 years.

Current Workforce Analysis

There are 2 Thoracic Surgeons in New Brunswick, thus for privacy reasons, due to the small size of this group, demographic information is not presented in this report.

Of importance from a planning perspective is that both Thoracic Surgeons will be in the potential retirement zone within the 10-year forecast horizon.

The most recent three full fiscal years (2000-2003) of Medicare billing data, as presented in the following tables, provide some historical perspective of the Thoracic Surgery group:

- Decrease in actual number and effective number of Thoracic Surgeons
- Significant increase in mean and median age
- Dramatic deterioration in service ratio for New Brunswickers – significant increase in population to Thoracic Surgeon ratio

Table 199 - Thoracic Surgery - Medicare 3-year History

Year	Number of Surgeons in Database for Year	FFS Active Surgeons	All Active Surgeons	Active Surgeons' Mean Age	Active Surgeons' Median Age
2000/1	9	2	2	52	52
2001/2	5	1	1	56.5	56.5
2002/3	5	1	1	57.5	57.5

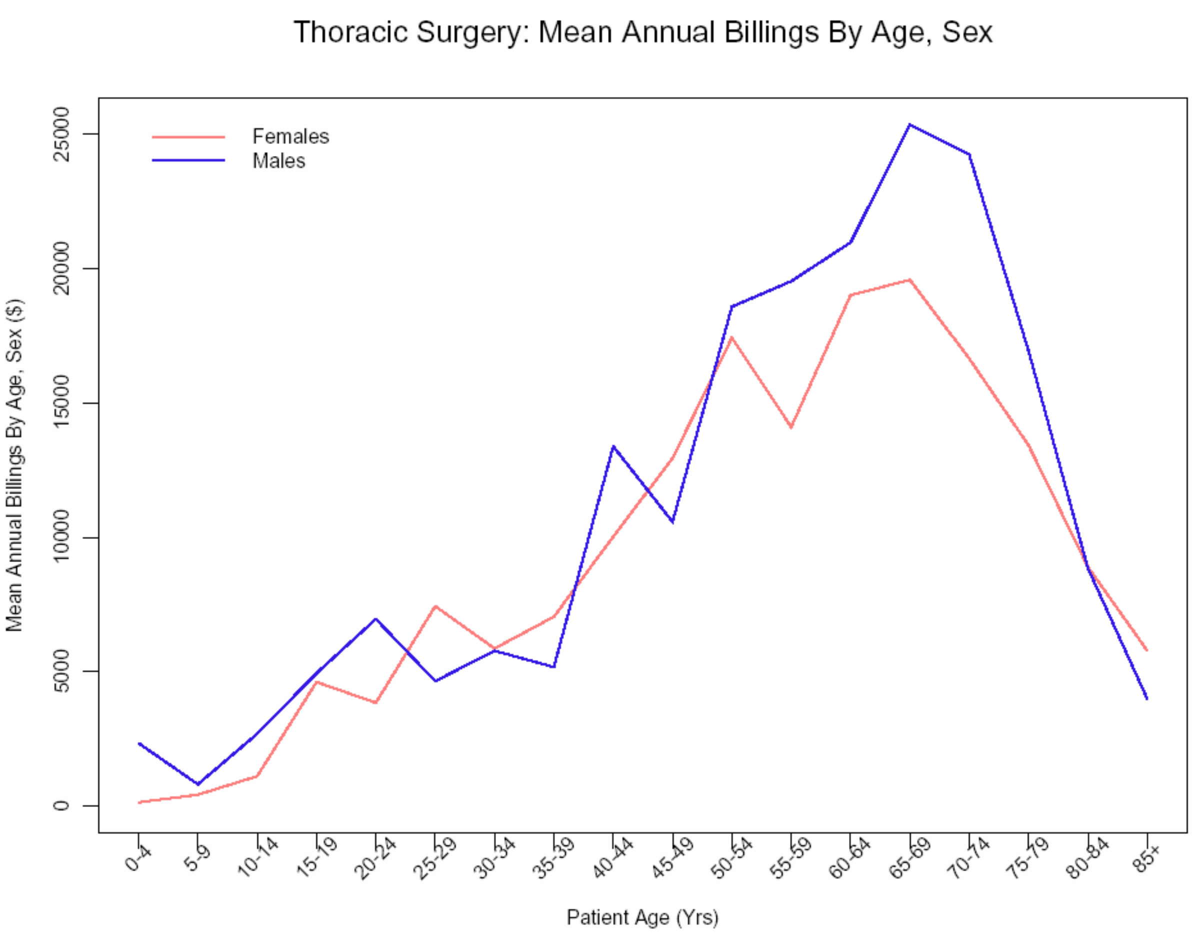
Year	Mean Active Surgeons' Core Billings ($)	Effective Number of Surgeons	Population to Each Active Surgeon
2000/1	189,085	2.1	352,763
2001/2	297,541	1.2	629,115
2002/3	313,285	1.1	640,862

Demand Analysis and Forecast

As depicted in the figure below, the consumption of Thoracic Surgery services by the New Brunswick population over the past 3 years has the following characteristics:

- Service use by both males and females fluctuates greatly between the ages of 20 and 50.
- Male service use rises to a peak at the 65-69 age group, and female service use reaches a sustained peak between the ages of 60 and 70.
- After the age of 70, service use declines rapidly for both genders.

Figure 43 - Thoracic Surgery Mean Annual Total Billings, by Age and Sex of Population



Based on the utilization profile of Thoracic Surgery service as presented above, and considering the changing age structure of the New Brunswick population in the coming 10 years, the following table shows the growth rates in requirements anticipated for Thoracic Surgery to 2013.

Growth in demand for Thoracic Surgery services is projected to grow by over 20% from 2003 to 2013, which equates to an increase in effective requirements for Thoracic Surgeons from 2.1 presently, to 2.5 by 2013.

Table 200 - Growth in Demand for Thoracic Surgery Services (growth rates from base year)

Specialty	Effective No.	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Thoracic Surgery		*1.64%*	*3.29%*	*4.94%*	*6.59%*	*8.38%*	*10.26%*	*12.12%*	*14.02%*	*15.90%*	*18.08%*	*20.24%*
	2.1	2.1	2.2	2.2	2.2	2.3	2.3	2.4	2.4	2.4	2.5	2.5

An April 30, 2003 snapshot of vacancies in Thoracic/Vascular Surgery indicates a surplus of 2.4 positions across the province.

Gap Analysis

Supply data indicates the current workforce at 2 Thoracic Surgeons, which is the same 2000/01 levels (as per Medicare 3-year history analysis) and thus is assumed to be equivalent to 2.1 effective physicians.

Based on predicted retirements of both Thoracic Surgeons over the 10-year forecast period (not accounting for other gains exits from the current and future cohort of active physicians), and predicted growth in demand estimating requirements for 2.5 effective Thoracic Surgeons by 2013 (0.4 above present level), **there could be an additional requirement for up to 3 Thoracic Surgeons in the province over the coming 10-year period**, the timing of which is dependent upon retirement of both Thoracic Surgeons. Therefore active succession planning is required, and the current vacancy surplus of 2.4 Thoracic/Vascular Surgery positions presents an unrealistic picture relative to the stability of this workforce. Given the predicted outputs from this residency program New Brunswick needs to carefully monitor its competitive position

6.4.4.10 Urology

Education

A 5-year residency in this specialty is offered at all university medical schools with the exception of the universities of Calgary, Saskatchewan, Sherbrooke, and Memorial. The 2002-2003 CAPER data indicates that currently, across the country, there are 116 residents (17 female and 99 male) engaged in this program of study, with estimated completion dates showing in the following table.

Table 201 - Urology

2003	2004	2005	2006	2007	Total
35	21	23	19	18	**116**

Two residents from New Brunswick are enrolled in the Urology program at Dalhousie University and are expected to complete in 2005 (1) and 2007 (1).

CAPER data indicate that since 1990, a total of 254 residents have graduated in Urology across the country. Annual outputs averaged 20 per over this 13-year period, ranging from lows of 15 to highs of 27. The number of graduates over the next 5 years is predicted to be 19% higher on average when compared to the average in the last decade.

Current Workforce Analysis

There are 17 active Urologists in the province, as contained in the New Brunswick Physician Database, and all of them are male. An analysis of Health Region distribution is as follows:

Table 202- Urologists Distribution by Health Region

Region 1	Region 2	Region 3	Region 4	Region 5	Region 6	Region 7	Total
5 (29%)	*5 (29%)*	3 *(18%)*	1 *(6%)*	0 *(0%)*	2 *(12%)*	1 *(6%)*	17 (*100%)*

The average age for this group is 52 years old, and of importance from a planning perspective, 10 of the 17 (nearly 60%) Urologists are over the age of 50, and thus within the 10-year forecast period they will be in the potential retirement zone. Currently 5 Urologists are over the age of 60, which equates to 30% of this workforce.

The most recent 3 full fiscal years (2000-2003) of Medicare billing data, as presented in the following tables, provide some historical perspective of the Urology group:

- Stable actual number and effective number of Urologists
- Stable mean and median age
- Stable service ratio for New Brunswickers – slight drop in population to Urologist ratio

Table 203 - Urology - Medicare 3-year History

Year	Number of Surgeons in Database for Year	FFS Active Surgeons	All Active Surgeons	Active Surgeons' Mean Age	Active Surgeons' Median Age
2000/1	26	17	17	51.9	53.8
2001/2	33	17	17	52.9	54.8
2002/3	27	17	17	50.2	53.6

Year	Mean Active Surgeons' Core Billings ($)	Effective Number of Surgeons	Population to Each Active Surgeon
2000/1	279,567	17.2	42,125
2001/2	291,452	17.3	42,041
2002/3	302,366	17.3	41,857

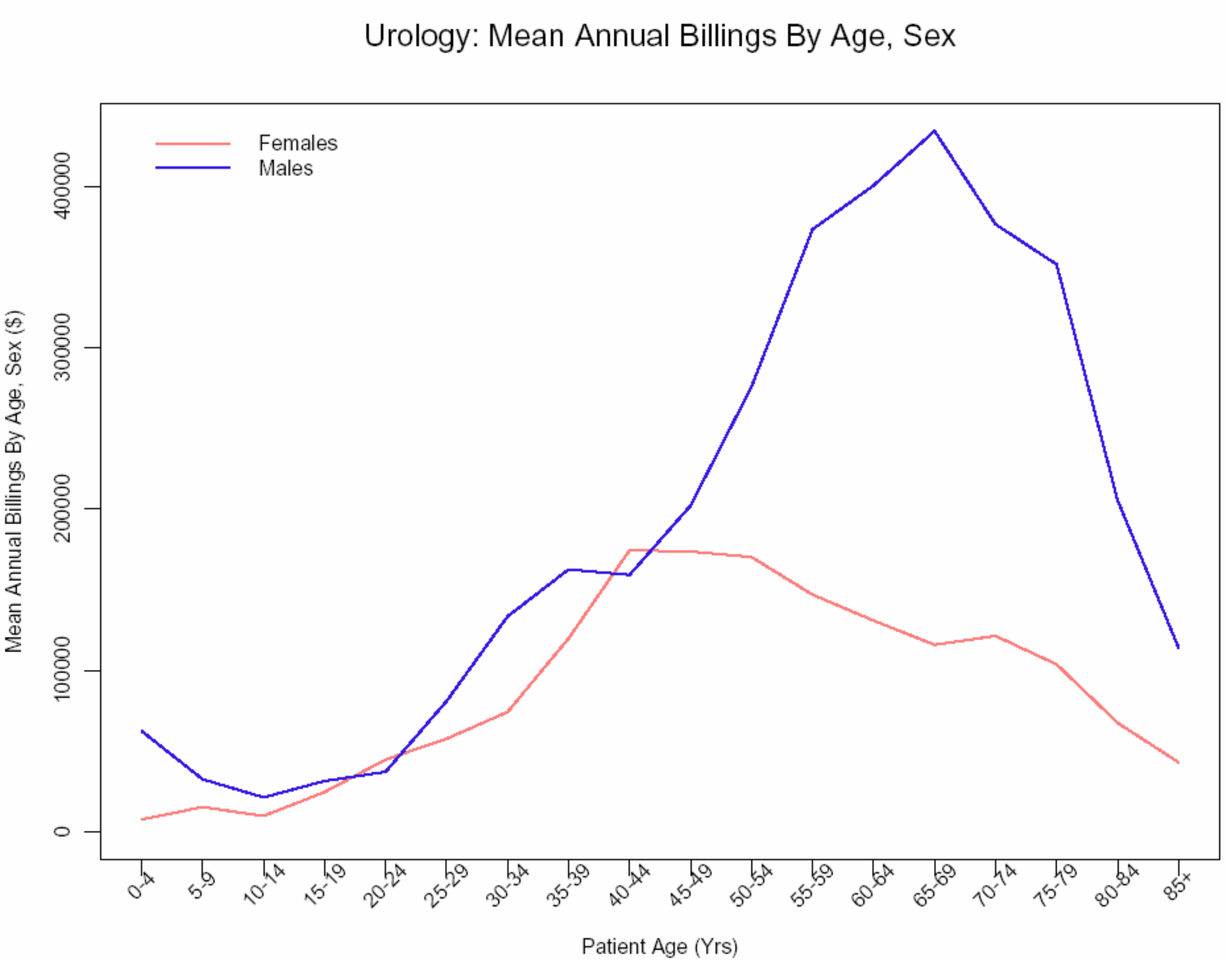
Demand Analysis and Forecast

Urology encompasses the care of urinary obstruction, urological cancers, and transurethral prostatectomy for benign prostatic hyperplasia. More than 80% of all weighted cases among patients in all regions except Region 5 were treated within region. One third of cases in Region 5 involved travel to other regions, primarily Regions 1B, 2, and 6. Despite this increased out of region travel, the per capita rate of Urology services in Region 5 was the highest in the province.

As depicted in the figure below, the consumption of Urology services by the New Brunswick population over the past 3 years has the following characteristics:

- Use by gender is similar until the age of 30-34
- Thereafter, male use is greater than females at every age
- Male use rises to a peak between 65 and 75 years of age
- Female use peaks at the 75-79 age range
- The majority of service is consumed by males over the age of 50

Figure 44 - Urology Mean Annual Total Billings, by Age and Sex of Population



Based on the utilization profile of Urology service as presented above, and considering the changing age structure of the New Brunswick population in the coming 10 years, the following table shows the growth rates in requirements anticipated for Urology to 2013.

Growth in demand for Urology services is projected to grow by 19% from 2003 to 2013, which equates to an increase in effective requirements for Urologists from 17.3 presently, to 20.6 by 2013.

Table 204 – Growth in Demand for Urology Services (growth rates from base year)

Specialty	Stock at time t	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Urology		*1.60%*	*3.20%*	*4.78%*	*6.39%*	*8.12%*	*9.92%*	*11.71%*	*13.54%*	*15.31%*	*17.23%*	*19.10%*
	17.3	17.6	17.9	18.1	18.4	18.7	19.0	19.3	19.6	19.9	20.3	20.6

An April 30, 2003 snapshot of vacancies in Urology indicates a shortfall of 3.4 positions across the province.

Gap Analysis

Supply data indicates the current workforce at 17 Urologists, which is the same 2002/03 levels and thus is assumed to be equivalent to 17.3 effective physicians.

Based on current reported vacancies of 3.4 positions, predicted retirements of 10 Urologists over the 10-year forecast period (not accounting for other gains and exits from the current and future cohort of active physicians), and predicted growth in demand estimating requirements for 20.6 effective Urologists by 2013 (3.3 over present level), **there could be a total requirement for up to 17 additional Urologists in the province over the coming 10-year period**, the timing of which is dependent upon retirement of those Urologists in the retirement zone.

Survey responses compound this picture potentially as 2 physicians in the 30-40 age group have plans to reduce practice by at least 25% permanently within the next 5 years and 2 in the 40-55 age group also have indicated plans to reduce practice by at least 25% permanently. Active succession planning is therefore advisable with this specialty group.

6.4.4.11 Vascular Surgery

Education

Two years of additional training are required for this specialty following successful completion of 1 of the following RCPSC accredited programs: General Surgery, Cardiac Surgery, or Thoracic Surgery. The Universities of British Columbia, Manitoba, Western Ontario, McMaster, Toronto, Ottawa, McGill, and Montreal offer residencies in Vascular Surgery.

The 2002-2003 CAPER data indicate that there are currently 16 residents (2 female and 14 male) pursuing studies toward this specialty, with expected completion dates as follows:

Table 205 - Vascular Surgery

2003	2004	2005	Total
9	6	1	16

CAPER data indicates that since 1990, a total of 52 residents have graduated in Vascular Surgery across the country. Annual outputs averaged 4 per over this 13-year period, ranging from lows of 1 to highs of 7. The number of graduates over the next 2 years (2003, 2004) is predicted to be 7% higher on average when compared to the average in the last decade.

Current Workforce Analysis

There are 5 active Vascular Surgeons in the province, as contained in the New Brunswick Physician Database, and all of them are male. An analysis of Health Region distribution is as follows: of the 5 Vascular Surgeons, 2 of them are in Region 1, and 1 each in Regions 2, 3, and 4.

The average age for this group is 47 years old, with 4 of the 5 between the ages of 35 and 50, and 1 physician over the age of 60, thus in the potential retirement zone within the 10-year forecast period.

The most recent 3 full fiscal years (2000-2003) of Medicare billing data, as presented in the following tables, provide some historical perspective of the Vascular Surgery group:

- Decrease in actual number and effective number of Vascular Surgeons
- Increase in mean and median age
- Decrease in service ratio for New Brunswickers – increase in population to Vascular Surgeon ratio

Table 206 - Vascular Surgery - Medicare 3-year History

Year	Number of Surgeons in Database for Year	FFS Active Surgeons	All Active Surgeons	Active Surgeons' Mean Age	Active Surgeons' Median Age
2000/1	10	7	7	43.7	43
2001/2	9	7	7	43.3	42.4
2002/3	9	6	6	45.2	44.3

Year	Mean Active Surgeons' Core Billings ($)	Effective Number of Surgeons	Population to Each Active Surgeon
2000/1	256,216	7.3	99,604
2001/2	307,456	7	103,476
2002/3	355,918	6	120,456

Demand Analysis and Forecast

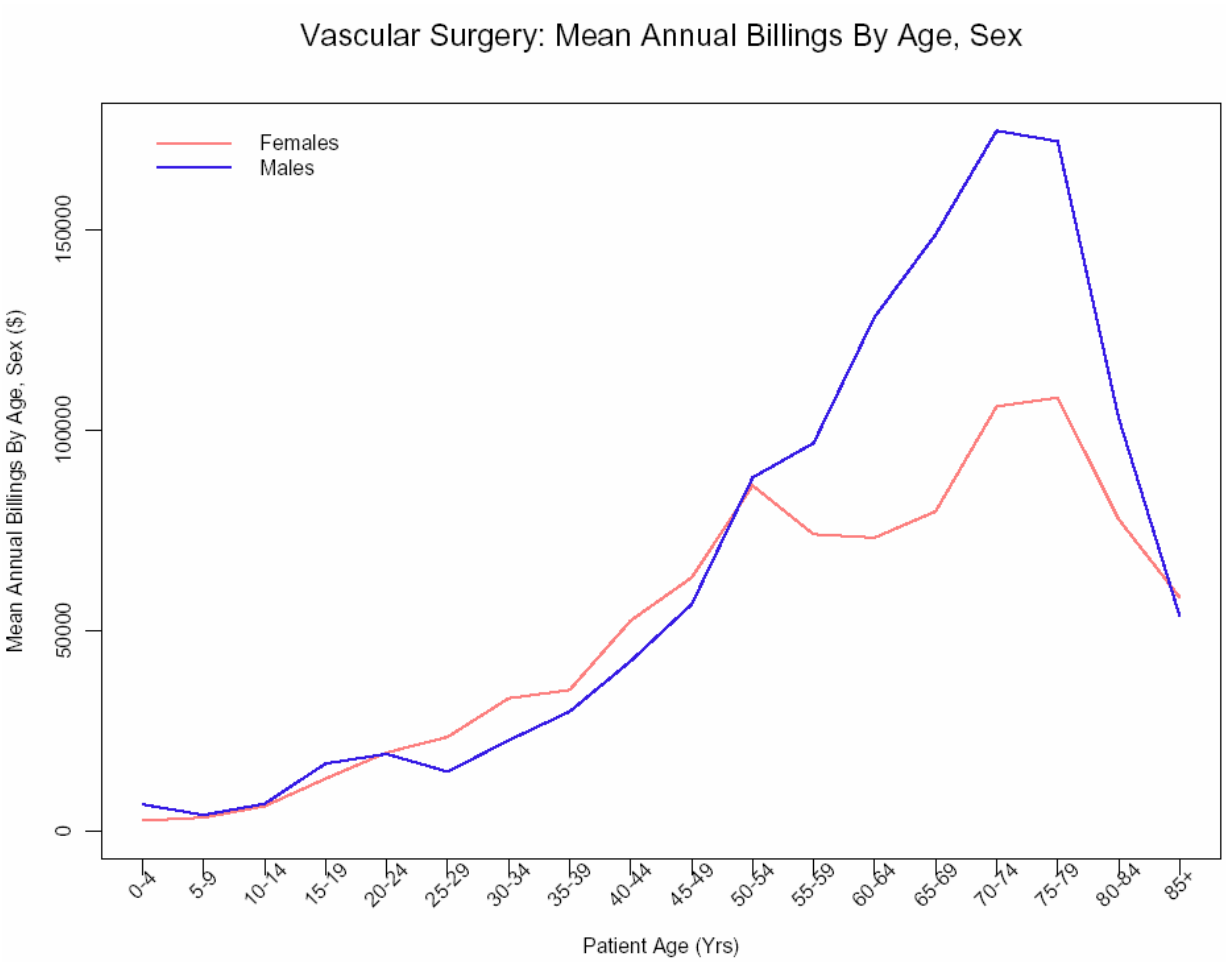
The main CMGs in the Vascular Surgery program are Aortic Replacement, Vascular Bypass Surgery, Carotid Endarterectomy, and other vascular repair and procedures. The majority of these patients in Regions 5, 6 and 7 currently travel to the Region 1 regional hospitals for Vascular Surgery.

The Vascular Surgeons are located at the 4 regional hospitals in Regions 1, 2, and 3 and Edmundston Regional Hospital in Region 4, and Vascular Surgeons account for 56% of the total Vascular Surgery program activity, with some care in the program delivered by General Surgeons. Where the cases are more concentrated (Moncton Hospital and Dr. Everett Chalmers Hospital), the average RIW per surgeon is 2-times that at the Saint John Regional Hospital and the Dr. Georges Dumont Hospital. As well, Edmundston Regional Hospital has low program volumes due to the small population.

As depicted in the figure below, the consumption of Vascular Surgery services by the New Brunswick population over the past 3 years has the following characteristics:

- Use by gender is fairly consistent until the age of 50
- The majority of service is consumed by males over the age of 50
- Male service use peaks at around the 70-74 age range
- Female service use peaks at around the 75-79 age range

Figure 45 - Vascular Surgery Mean Annual Total Billings, by Age and Sex of Population



Based on the utilization profile of Vascular Surgery service as presented above, and considering the changing age structure of the New Brunswick population in the coming 10 years, the following table shows the growth rates in requirements anticipated for Vascular Surgery to 2013.

Growth in demand for Vascular Surgery services is projected to grow by over 20% from 2003 to 2013, which equates to an increase in effective requirements for Vascular Surgeons from 6 presently, to 7.2 by 2013.

Table 207 – Growth in Demand for Vascular Surgery Services (growth rates from base year)

Specialty	Effective No.	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Vascular Surgery		*1.71%*	*3.34%*	*4.98%*	*6.67%*	*8.56%*	*10.49%*	*12.41%*	*14.33%*	*16.32%*	*18.50%*	*20.70%*
	6.0	6.1	6.2	6.3	6.4	6.5	6.6	6.7	6.9	7.0	7.1	7.2

An April 30, 2003 snapshot of vacancies in Thoracic/Vascular Surgery indicates a surplus of 2.4 positions across the province.

Gap Analysis

Supply data indicates the current workforce at 5 Vascular Surgeons, which is the below the level of the past 3 years, where there were between 6 and 7.3 effective Vascular Surgeons. Based on the most recent full year of Medicare data, where 6 Vascular Surgeons equates to 6 effective Vascular Surgeons, it is assumed that the current 5 surgeons are also 5 effective surgeons. Demand estimates currently indicate requirements for 6.1 effective Vascular Surgeons, which leave a current shortfall of 1 effective surgeon; this calls into question the current reported surplus of 2.4 positions for Thoracic/Vascular Surgery.

However, based on predicted retirements of 1 Vascular Surgeon over the 10-year forecast horizon (and not accounting for other gains and exits from the current and future cohort of active physicians), **there could be a total requirement up to 4 additional Vascular Surgeons over this 10-year period**. Thus it is recommended that the current vacancy surplus be regarded with caution given the current and future requirements for this specialty.

7. RECOMMENDATIONS

The findings from this analysis suggest an immediate call-to-action is required to mitigate the forecast shortfall in effective physician resources within New Brunswick over the next decade.

Multiple interdependent strategies will be necessary to provide for a stable physician workforce in New Brunswick. The overarching principles of flexibility, collaboration, and dynamic integrated human resource planning, will be the key critical success factors in reaching the required numbers and distribution of the physician workforce, to meet predicted demand, in a fiscally responsible manner.

Recommendations are organized around 3 main themes:

- Physician resources planning infrastructure
- Physician workforce management
- Ensuring adequate supply

Physician Resources Planning Infrastructure

1. The Department adopt a planning framework within an organizational model that embraces and supports integrated health workforce planning, under the aegis of a provincial Health Human Resources Planning Unit (HHRU). Details are provided in Appendix K- a Proposed Unit for Health Workforce Management in New Brunswick. This recommendation recognizes the inherent interdependencies among health service providers.

   It is critical to ensure the HHRU is adequately resourced, with a combination of skills represented by the following disciplines: health economics, health policy analysis, programming/data analysis, epidemiology, statistical analysis, and access to researchers with various areas of expertise, who may be drawn upon, as required, to provide support to the Unit.

2. The Department adopt the New Brunswick Physician Database (NBPD) as the new baseline for physician resource planning in New Brunswick, and update the database minimum data set annually, as an integral component of business planning within the Department and Region Health Authorities.

   - The data required to populate the minimum data set fields in this database should be generated from Medicare, Epidemiology, and from mandatory data captured by the College of Physicians and Surgeons of New Brunswick and/or the RHAs as appropriate. It will be necessary for all parties to reconcile their respective data collection responsibilities and these data to be provided to the HHRU on an annual basis, at minimum, to ensure the database remains current and evolves to meet new trends.

3. The Provincial Epidemiology Service of the Department revisit the focus of its research activities, to ensure the necessary alignment with required population health demand data for effective physician resource planning.

4. The Department adopt the New Brunswick Physician Planning Model and methodology as one of the dynamic planning tools within the HHRU integrated planning toolkit. This Planning Model requires active management by knowledgeable users within the HHRU, in collaboration with key stakeholder groups, and should be regularly enhanced and refined to meet evolving requirements, to inform implementation strategies and policy directions.

5. The Department, in collaboration with RHAs investigate the development of provincial wait list/wait time standards and protocols as an indicator of appropriate distribution of services, by practice type and in recognition of language of service requirements. This would provide a consistent and valuable future data source to be incorporated the demand-side of the forecast model.

Physician Workforce Management

6. Government overhaul the current physician workforce management policy structure, within the context of the Provincial Health Plan and changing workforce trends, with a view to creating a more flexible environment in relation to both the numbers of physicians, their distribution provincially and their remuneration, in order to:

   - Provide New Brunswick with greater competitive advantage in timely recruitment of physicians

   - Recognize and accommodate changing physician practice patterns and preferences/activity levels e.g. there is no one "typical physician practice"

   - Engage physicians and RHAs in active, short-to-longer term succession planning, to ensure access to service by an adequately resourced workforce

   - Incorporate adequate flexibility in the system (by acknowledging the need to plan for ranges of physicians required for given programs/services), as opposed to fixed targets, to accommodate a wide range of workload/activity levels, planned leaves of absence etc.

   - Be fiscally responsible in managing growth in physician supply, based on predicted population demand and utilization patterns

7. The HHRU support and coordinate active physician resource management by the RHAs, through such means as:

   - Providing a provincial forum for discussion of physician planning issues, through a *Medical Workforce Strategy Committee*, established as a working committee of the HHRU, and comprised of the key stakeholder groups necessary to plan a stable and predictable New Brunswick physician workforce. This committee should actively contribute to the development and analysis of policy options concerning changes to physician supply and demand, and factors impacting same, such as new service delivery models, changing practice patterns etc.

- The development of planning tools such as a provincial HHR impact assessment template, deployed across Government and Region Health Authorities, to ensure HHR impact analyses are consistently integrated with strategic/business planning, proposed policy, program and service changes at provincial and RHA levels, e.g. RHA 3-year business plans should include associated HHR plans. This would better inform collaborative health workforce management decision-making at the provincial and RHA levels, fostering interregional cooperation for resources, as compared to competition.

- Establishing an information systems infrastructure to support HHR data collection/information sharing.

- Supporting a rational approach for HHR management within each RHA that follows a systematic approach for data collection/development and aligns with the provincial health plan

8. A review of physician compensation models should be undertaken in relation to effective physician resource management, in an effort to accommodate the diverse working preferences of the new physician workforce, remain competitive with other provinces and manage the growth rate in overall health system expenditures.

9. It is recommended that Government, in collaboration with NBMS and other key stakeholders, continue to collaborate in the design of a blueprint for physician remuneration that considers a range of compensation alternatives to accommodate physicians' diverse practice patterns, and serve to positively influence recruitment as well as retention.

Ensuring Adequate New Supply

10. Based on predicted supply shortages, and assuming historical recruitment rates from the national new supply pool remain constant, it is recommended that the number of New Brunswick funded medical education seats increase by 48% (26 seats), incrementally over each of the next 4 years, to ensure New Brunswick retains its historic 3.2 % of enrollments in the Canadian medical school system, as ACMC moves to increase enrollment numbers to 2,500 by 2007; and

11. Allocate this increased funding proportionate to the relative language distribution of the New Brunswick population; targeting 16 seats in Anglophone programs and 10 seats in Francophone programs (note, this contributes to meeting language of service requirements, however, bilingual Francophone students also opt to attend and graduate form Anglophone programs. No data is presently available to substantiate this).

Recommendations 9 and 10 are based on the following rationale:

- A steadily increasing percentage of female medical students enrolled in Canadian medical schools, whose practice profiles are less than male counterparts, and who take more leaves of absence for family leave during the first 10 years of practice.

- Predicted growth in available medical education seats to 2,200 by 2005 and 2,500 by 2007 (ACMC) of which, based on historical patterns, New Brunswick should expect to have 80 or 3.2% of those seats. Given New Brunswick currently funds 55 medical education seats, this results in a gap of approximately 25 seats.

- The Canadian Medical Forum Task Force recommendation to increase enrollments by 4-5% to adjust for the increased enrollment of women in medical schools, who, statistics demonstrate, do not complete residencies due to pregnancy/family commitments etc. This translates into an additional 1.2 seats/year.

It is relevant to note that the Canadian Medical Forum Task Force indicates there are approximately 4-5 highly qualified students interviewed by Canadian medical schools for each available position. Therefore there is no perceived lack of potential supply to meet increasing demands.

12. The Department of Health and Wellness and the Department of Education, Post Secondary Division, promote national dialogue on the development of a process, to ensure allocation of PGME seats in Canadian medical schools is aligned with the predicted service demands across the country, as identified through provincial/regional physician supply/demand forecasts.

13. Government review the current terms and conditions associated with funding seats in targeted Canadian Medical Education programs, to improve the level of confidence in receiving a return on this investment which will meet the forecast service requirements of the province.

14. Government re-visit the current funding structure supporting medical education for both basic medical students and PGME residents to ensure adequate and sustained support throughout the medical education pathway, including adequate resource support for physician educators/preceptors.

15. The Department, in collaboration with ACMC and CAPER, establish and actively manage a provincial database of New Brunswick medical students/residents, enrolled in medical education programs across Canada, to track these students throughout their educational cycle, through their first 5 years of practice.

16. The Department, in collaboration with the New Brunswick Medical Education Coordinators, and with the cooperation of ACMC and CAPER, lead a direct marketing/recruiting strategy to actively identify, and target recruitment of all New Brunswick students enrolled in basic and PGME medical education programs across the country.

17. Government work in conjunction with those medical schools, for which New Brunswick funds seats for New Brunswick students, to improve opportunities for:

    - New Brunswick based clerkships to expose medical students to New Brunswick practice environments

    - New Brunswick student access to specialty residency seats that meet forecast service requirements; and

    - Future expansion of specialty residency programming within New Brunswick.

18. The Department, in conjunction with the health regions, provide medical and PGME students with active offers of summer employment /residency placements throughout their medical education cycle and to the extent possible expose trainees to alternate practice models/locations.

19. A formal evaluation of Government's 1999 *Physician Friendly New Brunswick* recruitment and retention strategy be undertaken to measure the impact of this strategy, in relation to its objectives, and refocus the strategy where required, to target planned new investments over the next 5 years, that position New Brunswick to successfully achieve stated health care renewal objectives.

20. Government continue to aggressively market New Brunswick as a *Physician Friendly* place to live and work, and proactively create the infrastructure to accommodate the preferred work practices of the new workforce.

    - Escalate the rollout of collaborative practice models across the province, commencing with hard-to-service / under-serviced areas, to improve New Brunswick's competitive position in attracting family practitioners and providing a stable cadre of primary care services.

    - Establish alternate compensation mechanisms to Fee for Service, to provide options which support practice preferences

    - Make active offers, with committed billing numbers, to residents early in their final years of residency

    - Reassess New Brunswick's competitive position, relative to location grants for hard to recruit to areas, and actively market as a debt-reduction incentive program: i.e. a 45 year debt pay down plan for newly graduated residents practicing in New Brunswick, with proportionate return-for-service agreements

    - Investigate the cost benefit of contracting private companies to undertake management of locum replacements for New Brunswick physicians

21. Within the context of a review of continued investment in physician recruitment and retention (updating *Physician Friendly New Brunswick*), Government continue to commit funding over the next 5 years to supernumerary residency positions for Canadian and IMG physicians targeting the following practice groups in particular:

    - General Surgery

    - Diagnostic Radiology

    - Anesthesiology

    - Urology

    - Otolaryngology

- Any other practice group for which a physician impact analysis has determined shortages will compromise realization of proposed new government policy directions (e.g. Provincial Health Plan, Primary Care Strategy, Provincial Cancer Control Strategy)

22. The College of Physicians and Surgeons of New Brunswick take immediate action to collaborate with the parties necessary, both provincially and nationally, in establishing a formal, standardized process to assess foreign trained medical graduates and accelerate their licensure to practice in New Brunswick, thereby bringing appropriately qualified foreign-trained doctors into the workforce in a timely fashion, as required to meet service demand.

23. Give priority attention to an assessment of New Brunswick's technology capacity within the health care system, with the development of a strategic investment plan for the acquisition, diffusion, and replacement of technology to optimize health care delivery to New Brunswickers. The use of enabling (e.g. permanent patient record) and health care technologies (e.g. new diagnostic/treatment technologies) has the potential to improve the recruitment/retention and effective utilization of scarce health provider resources.

Language Requirements

Demand for health care services, based on the recipients' language of service preferences, will be driven by a number of factors (population growth rates, epidemiologic data, the distribution of specific clinical programs, as directed under the Provincial Health Plan), and met through the execution of RHA guidelines for implementation of the Official Languages Act, as well as an ability to educate and recruit sufficient number of physicians to provide service in the recipient's language of choice. It is therefore recommended that:

24. To understand demand for service, based on New Brunswick's language demographic, the New Brunswick Medicare system be updated and kept current as to the following: language of recipient (card holder), preferred language of service, as well as language fluency (English/French/Bilingual).

25. Incorporate the language data described in Recommendation #23 into the Planning Model to ensure appropriate distribution of investment among English and French medical schools. It should be acknowledged; however, that the language of the program may not be the sole decision factor in choice of medical school, for bilingual students.

    The physician survey data demonstrated an increase in the percentage of bilingual physicians entering the marketplace, which may be as a result of increased focus on bilingualism within the general education system. In an effort to monitor the language profile of physician supply it is recommended that:

26. Government, in collaboration with ACMC, promote the mandatory capture of data on language fluency on medical school application forms (English/French/Bilingual) for all students entering medical school, and this be incorporated in ACMC /CAPER reports. It will therefore be possible for New Brunswick to track the language proficiency of all students from New Brunswick enrolled in the respective medical school programs across Canada, which may aid recruitment efforts.

27. Modify the Department Physician Registry database (under Medicare) to incorporate language fluency as a mandatory field (English, French, Bilingual), populated through data generated from the CPSNB registration form and/or Physician Medicare registration form.

Succession Planning

The increasing feminization of the physician workforce presents unique HR planning challenges. Gender aside, generally the new physician workforce wants to work differently, with more work/life balance. Rational physician resource planning cannot ignore this phenomenon and succession planning/workforce adjustments must accommodate for this by building sufficient flexibility in the system to effectively manage the ebbs and flows of the physician labour force over the next decade. It is therefore recommended that:

28. The Department acknowledge the requirement for flexibility in the system, by establishing dynamic physician resource plans that account for not only the practice profile of each physician entering practice in New Brunswick, but also their predicted level of activity over a prescribed planning horizon. This requires the cooperative effort of physicians themselves, RHAs, Government and the College of Physicians and Surgeons, in ensuring data is captured on an annual basis that characterizes how physicians are practicing.

29. The Department explore means by which to capture activity levels/service utilization for physicians paid through other than FFS (salary/sessional/alternate payment plans), to provide a true picture of physician resources in New Brunswick.

30. Given the competitive environment, length of time-to-market for many specialists, and a possible 2.3 to 3 replacement factor required to fill vacancies created by retiring family physicians with large practices, it is recommended that:

    - RHAs engage their respective physician communities in collaborative succession planning, based on longer term planning cycles, to prevent untimely gaps in access to service; and that administrative structures be put in place to assist RHAs to effectively meet their service obligations

    - The Department and RHAs redouble efforts to work cooperatively with interested physicians in the retirement age group, to achieve mutually satisfactory retirement solutions including, but not limited to:

        - Actively brokering shared practice relationships between physicians wanting to reduce/exit their practices, and new physicians wanting to startup a practice in New Brunswick

        - Investigating practice buy-out options, where no replacements are recruited, with a view to replacing a traditional private practice with a collaborative practice model in those communities where it is determined to be a more effective alternative

        - Considering strategies for retaining older physicians in the workforce who wish to discontinue their private practice and work in other than a Fee for Service model.

APPENDIX A – PHYSICIAN PRACTICE GROUPINGS

The following health occupations are included in the study:

Physicians
Family/General Practitioners
Specialists*

***Specialists includes:**
1. Anesthesia
2. Anatomical Pathology
3. Cardiology
4. Cardiovascular & Thoracic Surgery
5. Dermatology
6. Diagnostic Radiology
7. Emergency Medicine
8. Gastroenterology
9. General Pathology
10. General Practice/ Family Practice
11. General Surgery
12. Geriatric Medicine
13. Hematological Pathology
14. Hematology
15. Infectious Diseases
16. Internal Medicine
17. Medical Microbiology
18. Medical Oncology
19. Neonatology
20. Nephrology
21. Neurology
22. Neurosurgery
23. Nuclear Medicine
24. Obstetrics / Gynecology
25. Ophthalmology
26. Orthopedic Surgery
27. Otolaryngology
28. Pediatrics
29. Physical Medicine & Rehab
30. Plastic Surgery
31. Psychiatry
32. Radiation Oncology
33. Respiratory Medicine
34. Rheumatology
35. Thoracic Surgery
36. Urology
37. Vascular Surgery

APPENDIX B – MINIMUM DATA SETS

DATA ELEMENT	DESCRIPTION	Data Source
Sub-system #1 – Current Supply		
First Name	Not directly used in the analysis; these fields are required as a means to identify information that is obtained from different sources as being for the same individual	Medicare/Service Provider Registry/First Name
Last Name		Medicare/Service Provider Registry /Last Name
Middle Initial		Not Provided
Gender	Male/Female	Medicare/MDSS Statistical Info / Service Provider / Gender Code, Gender
Date of Birth	DD/MM/YYYY	Medicare/Service Provider Registry / Date of Birth
License Number	Registration number for the CPSNB.	CPSNB
Billing Number/Service Provider Number	Medicare billing #	Medicare/MDSS Statistical Info / Service Provider / Account Number
Practice Location	To determine the Health Region the physician works in	Physician Registry (Medicare)
Mother Tongue	English, French, Other	FP& Specialist Survey B4
Language Fluency 1 (Oral Proficiency)	English, French, English & French, Other (details)	FP & Specialist Survey B1
Language Fluency 2 (Written Proficiency)		FP & Specialist Survey B2
Preferred Working Language	English, French, Either English or French	FP & Specialist Survey B3
Language Of Majority of Medical Training	English, French, Other	FP & Specialist Survey B5
Occupation	Physician	
Specialty Primary Secondary*	As per the list of specialties in the RFP & Project Statement	Medicare/Service Provider Registry/ Specialty Code, Specialty Description. Physician Registry * FP & Specialist Survey A
Practice Specialty	May be different than 'Specialty' as captured above	Physician Registry
Post Graduate Fellowship 1	A credential that is accredited but not certified by the RCPSC /CFPC/CMQ	FP & Specialist Survey A
Post Graduate Fellowship 2	A credential that is accredited but not certified by the RCPSC /CFPC/CMQ	FP & Specialist Survey A
Post Graduate Fellowship 3	A credential that is accredited but not certified by the RCPSC /CFPC/CMQ	FP & Specialist Survey A
Post Graduate Fellowship 4	A credential that is accredited but not certified by the RCPSC /CFPC/CMQ	FP & Specialist Survey A

DATA ELEMENT	DESCRIPTION	Data Source
Functional Specialty #1	What physician is actually practicing	FP & Specialist Survey A, C matrix,
Functional Specialty #2	What physician is actually practicing	FP & Specialist Survey C matrix,
Functional Specialty #3	What physician is actually practicing	FP & Specialist Survey C matrix,
Functional Specialty #4	What physician is actually practicing	FP & Specialist Survey C matrix,
Functional Specialty #5	What physician is actually practicing	FP & Specialist Survey C matrix,
Basic Medical School Origin of training (school, province/state, country) Year of grad	Will require more information on the Education History of the Service Provider from CAPER or CPSNB.	Medicare/Service Provider Registry / Service Provider (FTE Data) / Education Facility Code
PGME Origin of training (school, province/state, country) Year of grad		Physicians Registration Database
Certified	Indicates whether the person is certified for each specialty	Medicare/MDSS Statistical Info / Service Provider / Service Provider Specialty Info /Certification Status
Licensure Status	Categories of licensure: Full license Public service license Border area Locum license Public service locum license Courtesy license	CPSNB Physician Registration Database
Billing Eligibility Status	Payment eligibility Status with Medicare (active or inactive) Fee for Service (FFS), Salary, Sessional	Medicare/MDSS Statistical Info / Service Provider / Registration Status (Payment eligibility Status)
Total Medicare Billings (FFS)	Most recent full year	
Total Salary payments	Most recent full year	Medicare - Manual payments
Total Sessional payments	Most recent full year	Medicare - Manual payments
Total Alternate payments	Most recent full year	Medicare - Manual payments
Total 'Other' payments	Payments by RHAs for Medical Administrators, top-ups, etc.	RHAs / Hospital Services
FTE Calculation	Health Canada standard calculation based on national benchmarks, and modified for NB based on contract increases (base year is 95/96 = most recent)	Calculated field based on all payments (FFS, salary, sessional, etc.)
Range of clinical and non clinical practice activities		FP & S Survey C matrix "Activities"
Size of the practice	Defined by "active" patient charts	FP Survey C1

DATA ELEMENT	DESCRIPTION	Data Source
Days seeing scheduled patients		FP Survey D6 Specialist Survey D 5
New patients added in past 12 months	Yes or No	FP Survey D4 Specialist Survey D1
Practice capacity	open or closed to new patients	FP Survey D5 Specialist Survey D4
Average number of patients seen/week by Family Physician	Scheduled and unscheduled	FP Survey D7
Average number of patients seen/week by Specialist		Specialist Survey D6
Average hours per week in clinical practice		FP Survey D 8 Specialist Survey D7
FP On-call Categories	Range of on -call services	FP Survey D9
Specialist On-call Categories	Range of on -call services	Specialist Survey D10
On call commitment: Average number of hours on- call per month		FP Survey D10 Specialist Survey D11
Intensity of on- call work	Number of on-call patient contacts per month	FP Survey D11 Specialist Survey D12
Leave time for CME	Average number of weeks per year	FP Survey D12 Specialist Survey D13
Leave time for other reasons than CME	Average number of weeks per year	FP Survey D 13 Specialist Survey D14
Maternity leave taken in the past 2 years	Time taken	FP Survey D14 Specialist Survey D15
Planned workload increase	Due to vacations, family leave, CME etc	FP Survey D15 Specialist Survey D16
Planned workload decrease	Due to vacations, family leave, CME etc	FP Survey D15 Specialist Survey D 16
Magnitude of planned increased work	Extent of increased work and length of time expected to continue increased work	FP Survey D16 Specialist Survey D17
Magnitude of planned work reduction	Extent of reduced work and length of time expected to continue reduced work	FP Survey D16 Specialist Survey D17
Locum coverage for planned absences from practice	Yes/No	FP Survey D17 Specialist Survey D18
Interdisciplinary Practice Patterns 1	Current work with other professions	FP Survey E1
Interdisciplinary Practice Patterns 2	Degree of interest in working in interdisciplinary team practice	FP Survey E2
Interdisciplinary Practice Patterns 2	Location where most interested in working in interdisciplinary team practice	FP Survey E2

Interdisciplinary Practice Patterns 3	Other health professions of most perceived value in a team practice	FP Survey E3
Percentage of patients who are non NB residents	"Scheduled" patients	FP & Specialist Survey D2
Location of patients who are non NB residents	"Scheduled" patients	FP & Specialist Survey D3
Average wait time for elective consults	From time of referral until seen by specialist	Specialist Survey D8
Average wait time for urgent consults	From time of referral until seen by specialist	Specialist Survey D9
Practice Activities	Clinical, Management, Education, Committee Work, Non–Billable Paper Work, Other	FP & Specialist Survey C matrix "Activities"
Health Sector ("Practice Settings" is how this is captured in Survey)	The health sector(s) a physician works in (may have more than one) Possible Values are: Hospital In-patient Hospitalist Surgical Assist Emergency Department Geriatrics/Long-term Care Oncology Out Patient Department Other (specify) Extra-mural Nursing home Physician's office Locum Community Health Centre Mental Health Clinic Public Health Government/Crown Corp Private Industry Walk-in/After Hours Clinic Other	Medicare/Service Location Code. FP & Specialist Survey C matrix "Health Sector" (practice settings- includes relative % range of time at each)
Priorities for Action impacting Recruitment/retention	by FP/Specialty	FP Survey Section F Specialist Survey Section E
General Comments on Factors impacting physician recruitment /retention		FP Survey Section G Specialist Survey Section F

Sub-system #2 – Education (basic MD and PGME)		
Family Practice or Specialty Designation	List of the 37 specialties listed in RFP	
General Information		
Name of Institution	Name of University	
Location of Institution	City and Country	
Program Name	Basic undergrad MD program or name of Specialty Program	Royal College of Physicians and Surgeons of Canada Web site www.rcpsc.edu
Length of Program	Duration of program in months	Royal College of Physicians and Surgeons of Canada Web site www.rcpsc.edu
Program Entry Requirements	Entry requirements	* ACMC for basic programs * An M.D. is the entry for all PGME programs * Certification in a 0primary specialty is required for all sub specialties
Language of program	English or French: Language in which the program content is delivered	Sherbrooke, Montreal and Laval are French; all others English
Accredited Y/N	Program has/has not accreditation status and by which organization	All PGME are accredited by Royal College and in Quebec are also accredited by the Collège des médecins du Québec
Clinical training	Is any of the clinical training for the program offered in NB and if so at what point in the program (Year 1, 2, 3, etc.), which NB Health region and for how long a period of time.	NB Anglophone and Francophone Medical Education Coordinators
Attrition Rate	Average rate of attrition. Any significant change to the attrition rate trend for a given institution should be noted.	CAPER indicates 1-3% average for Basic Med Ed PGME less or due to mobility b/w programs. Assume all get through as numbers are so small
Credential awarded	Level of the credential received: Basic MD, name of Specialty certification or other credential awarded	www.rcpsc.eddu for PGME
Pending changes to program	Describe changes to capacity of program, length of program, entry requirements etc.	www.rcpsc.edu

Student Information		
Number of Enrollments	Actual number of students enrolled in each year (Basic) or rank level (PGME) of the program effective September 2002	Basic: ACMC, NB Anglophone and Francophone coordinators and Lyne St. Pierre Ellis PGME: CAPER
Gender of students enrolled	Percentage male/female students enrolled in each year (Basic) or rank level (PGME) of the program effective September 2002	Basic: ACMC PGME: CAPER
Number of designated seats in the program for NB students	The number of seats funded by the NBDHW	MUN: 10 Sherbrooke: 20 Laval: 2 Montreal: 3 Dalhousie: 20* (*on average)
Number of NB students enrolled	NB Students - as defined by their self reported permanent address- enrolled in each year (Basic) or rank level (PGME) of the program effective September 2002	Basic: ACMC PGME: CAPER links individual to the province of residence at time of application to medical school
Gender of NB Students enrolled	% male/female students	Basic: ACMC PGME: CAPER
Mother Tongue of NB students enrolled	English, French, Other	Not captured therefore not available for this analysis
Language Fluency of NB students enrolled (Working Proficiency)	English, French, English & French, Other (details)	Not captured therefore not available for this analysis
Preferred Working Language of NB students enrolled	English, French, Either English or French	Not captured therefore not available for this analysis
Program capacity	The total number of students that can be admitted to year 1 of the program	Basic: ACMC PGME: quota entered by each school. Check www.carms.ca The reality of actual enrollments more accurate measure. Quebec's annual decree of capacity per specialty www.cmq.org
Number graduates over last 10 years	Number of grads in each of the years 1991-2001	CAPER - by training faculty, field of training, gender, age group, where MD was earned with outside Canada as one category
Age of Graduates	Age range of graduates at time of graduation	CAPER
Recruitment incentives offered to new grads	Publicly available information on incentives offered by employers	
Where do students go to work after graduation	New Brunswick, Other Canadian Province, USA, Other	CAPER retrospective snapshot at year 2,5,10

Appendix C – Steering Committee and Physician Working Group

Steering Committee Members

Members	
Rachel Bard	Co-Chair Assistant Deputy Minister Medicare Services
Joanne Fletcher	Co-Chair and Department Health and Wellness Project Manager
Dr. Omer Doiron	Provincial Medical Education Committee/Consultant
Lyne St. Pierre Ellis	Physician Resource Advisor, Department Health and Wellness
Lise Daigle	Executive Director Hospital Services, Department Health and Wellness
David Godfrey	Labour Market Analysis –Training & Employment Development
Pascal Robichaud	Policy Analyst, Department of Education Post Secondary Affairs
David Balmain	Executive Director, New Brunswick Medical Society
Dr. Ed Schollenberg	Registrar, College of Physicians and Surgeons of New Brunswick
Dr. John Brewer	College of Family Physicians – New Brunswick
Dr. James O'Brien	VP, Medicine Region Health Authority 2
Dan Arseneau	CEO, Region Health Authority 5
Michael Kervin	Fujitsu Project Manager
Anne Marie Atkinson	Fujitsu Lead Consultant
Sonya Hull	Fujitsu Health Economist

Physician Working Group Members

Member	
Dr. Marcel Mallet	Respirologist, Region 1 Beauséjour
Dr. Mary Catherine MacSween	Endocrinologist, Region 1 SE
Dr. Douglas Brien	Family Physician, Region 2
Dr. Ken Lacey	Family Physician, Stanley Community Health Centre, Region 3
Dr. John Milczarek	Physiatrist, Stan Cassidy Centre for Rehabilitation, Region 3
Dr. Denis Pelletier	Family Physician, Region 4
Dr. Ed Wilkins	Family Physician, Region 5
Dr. Jean Pierre Arseneau	Family Physician, Region 6
Dr. Jane Touchie	Family Physician, Region 3
David Balmain	New Brunswick Medical Society
Dr. Omer Doiron	New Brunswick Medical Education Committee
Lyne St-Pierre-Ellis	Physician Resource Advisor, Department of Health & Wellness
Joanne Fletcher	Director Strategic Planning & Policy Department of Health & Wellness
Anne Marie Atkinson	Fujitsu Consulting
Sonya Hull	Fujitsu Consulting

APPENDIX D – REFERENCES

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APPENDIX E – KEY RESPONDENTS

Physician Supply /Demand Analysis

Key Informant Interviews

New Brunswick Medical Society	David Balmain John Marr Janet Maston
College of Physicians and Surgeons of New Brunswick	Dr. Ed Schollenberg
Physician Resource Advisor	Lyne St. Pierre Ellis
DHW Medicare Division	Rachel Bard, Assistant Deputy Minister
DHW Hospital Services	Lise Daigle Bev Tedford
DHW Epidemiology	Dr. Chris Balram Dr. Jian Liu
Department of Education Post Secondary Affairs	Pascal Robichaud
NB Medical Education Committee	Dr. O. Doiron Dr. M. Iype Dr. A. Schofield
Canadian Post-M.D. Education Registry-CAPER	Dianne Thurber

APPENDIX F – SURVEY INSTRUMENTS

APPENDIX G – SURVEY RESPONDENTS

Appendix H – Family Practice Demand Side Methodology

Description of Data Used for Analysis[57]

The data sources for the Family Practitioner demand side analysis and forecast are:

- Medicare physician billing data for 2000/2001, 2001/2002, 2002/2003
- Hospital Discharge Abstract Data (DAD) to 2001/2002

Analysis was initially conducted for 2001/2002 with physician billing data and cross-referenced to the hospital abstract data for validity checks. All analyses for existing and future demand were based on physician billing data and was conducted first for 2001/2002 and verified with 2002/2003 data. Results for both years were very similar.

This analysis was conducted for all physicians listed as general practitioners in the billing database. This may not include salaried and/or sessional physicians. As such, the results of the analyses should be interpreted in light of known variations in the distribution and activity levels of the salaried/sessional physicians.

Developing a Family Practice Demand-side Database

All records for physicians identified as General Practitioners were extracted from the Medicare billing database. Other fields considered included:

- Physician and patient geography (health region)
- Physician and patient age and sex
- Physician identifier
- Patient identifier
- Type of service code

[57]The hospital and fee-for-service (Medicare) data combined with knowledge of patients' and providers' location and demographics comprise a comprehensive data resource for analysis of workload. These data, though not a perfect predictor, exceed those required to conform to Health Canada's assessments of 'full time equivalents', which rely solely on billings totals for physician groups/types. While these data fall short of formal direct workload (e.g. relative value information), they are at least as comprehensive as any available in Canada at the present time.

- New Brunswick service description
- Dollars paid
- Service date

Categorizing care provided by Family Practice Physicians

Within this database, visits by patients were classified into the following categories:

Table 208 - Family Practice Care Categories

Category	Description
Family Practice care	Basic family practice services not including ER (primarily "General office visits")
Hospital care	Includes FP intensive care, visit on 1st day of care, 2nd care of care, etc.
Obstetrical care	Includes deliveries, C-sections, etc.
ER care	Includes ER visits
Anesthesia	Includes all anesthesia codes
Operative assists	Includes all operative assist codes
House calls	Includes all house visits
Nursing home	Includes all nursing home visits

This categorization allowed for a more detailed understanding of Family Practice activity across the province, as presented in later sections.

Describing Actual Practice Patterns of FPs

To help describe the type of physicians that currently exist within the Family Practice area, actual numbers were also calculated by region that provide the number of physicians (by region) that participate in difference types of activity. The number of physicians is calculated for the following categories:

Table 209 - Practice Activity Categories

Type	Description
ER Major	Greater than 50% of Comprehensive Family Practice billing come from ER
ER Minor	Greater than $1,000 in ER billings
Obstetrics	Greater than or equal to 5 deliveries
Hospital $10K	Greater than $10,000 in billings for hospital care
Hospital $1K	Greater than $1,000 in billings for hospital care
House	Greater than 25 house calls
Nursing Home	Greater than $1,000 in Nursing Home care
Operative Assists	Greater than 50% of billings from operative assists

The number of physicians (weighted by market share) participating in each of these categories is shown in the following table.

Table 210 - Actual FPs (weighted) for Clinical Categories

		Categories							
Region	"Effective" FPs	ER Major	ER Minor	Obstetrics	Hospital $10K	Hospital $1K	House	Nursing Home	Operative Assists
1	119.3	22.3	60.2	24.6	76.8	123.0	32.7	3.9	9.0
2	115.4	10.9	32.3	9.4	39.3	70.2	51.2	8.2	5.6
3	112.1	9.0	69.1	20.0	69.1	101.3	58.4	7.9	3.7
4	30.4	1.7	21.0	7.2	29.3	39.0	20.9	3.0	1.3
5	21.3	3.3	15.2	3.8	18.2	26.6	7.2	1.1	1.9
6	57.0	6.6	27.2	8.0	34.0	44.0	29.5	7.1	3.8
7	31.8	2.1	17.0	8.0	20.2	23.8	9.2	2.9	2.7
Total	487.3	56.0	242.0	81.0	287.0	428.0	209.0	34.0	28.0

For each of these clinical categories, a physician is given an "index" of one or zero, based on whether he/she has any activity in the area or not. The accumulated index over these categories was then calculated for each physician. For example, if a physician does greater than 25 house calls and bills greater than $1,000 for nursing home care, but does not participate in ER, operative assists, hospital care, or obstetrics, his/her accumulated index would be 2. This index was then used to describe actual patterns of Family Practice physician activity. See following table.

Table 211 - Accumulated Index of FPs

Region	"Effective" FPs	Accumulated Index = 1	Accumulated Index = 2	Accumulated Index = 3
1	119.3	69.7	60.3	17.0
2	115.4	40.7	34.4	18.6
3	112.1	34.6	37.2	45.1
4	30.4	14.5	15.3	13.2
5	21.3	12.6	10.2	7.0
6	57.0	17.7	23.8	15.5
7	31.8	16.3	11.8	6.6
Total	487.3	206.0	193.0	123.0

Defining "Comprehensive Family Practice Care"

"Comprehensive family practice care" includes all categories except for operative (OR) assists, anesthesia, and some detailed services codes (e.g. Allergy Tests). This comprehensive definition was used to calculate effective physician requirements and population-based need. Comprehensive Family Practice care billings as a percentage of total billings by Family Practitioners was 92% and 90%, in 2001/2002 and 2002/2003, respectively.

Defining "Active" Family Practice Physicians

The methodology to arrive at an accurate count of active General Practitioners in the Medicare database is as follows:

1. Physicians with comprehensive family practice billings or operative assist billings less than 25% of their total billings were excluded.

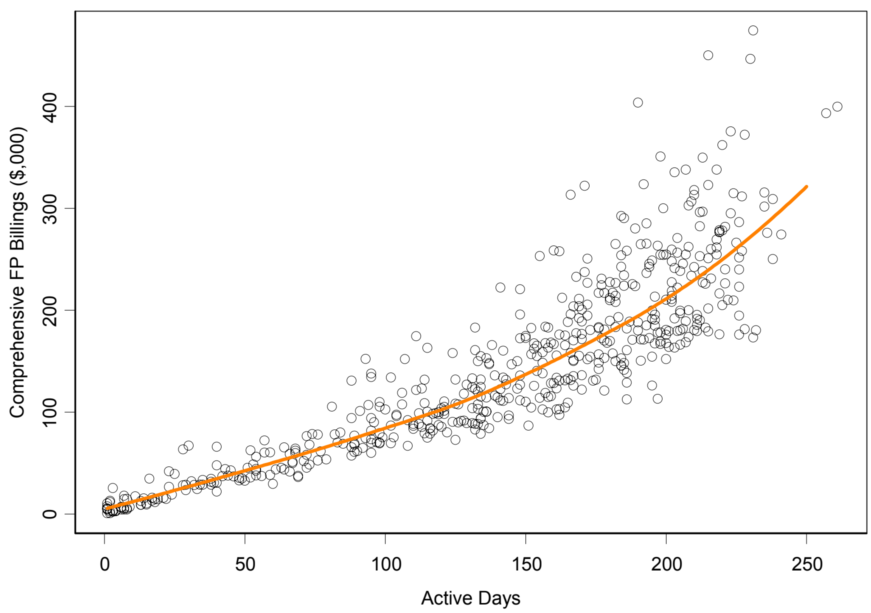
2. To further distinguish those that were truly practicing as FPs, consult codes were examined. Physicians with greater than $10,000 in specialist consult billings, or with more specialist consult than general practice consult billings were excluded. Confirmation of practice patterns in the hospital database verified this exclusion criterion.

This exercise resulted in a potential 629 FPs/FPs in 2001/2002 and 650 in 2002/2003. However, this number identifies only the actual individuals with any billings who potentially provide general practice care and do not quantify individual levels of clinical activity.

To refine measures of clinical activity, each patient in the database giving care in the basic Family Practice care category was assigned a physician, based on the physician with whom the patients had the majority of visits (or in the case of a tie, the patient assignment was split between 2 or more physicians). Each patient was therefore assigned to a Family Practice physician (with a total of approximately 567,000 patients in 2001/2002 and 560,000 in 2002/2003). Obstetrical patients were similarly assigned to Family Practice physicians using the same methodology applied to obstetrical delivery service codes. Assigning patients to physicians provided confirmatory measures of physician clinical activity – the physician's patient list size.

In order to address the definition and quantification of physician activity, the number of unique patients encountered (in the comprehensive Family Practice care category) by the physician on every day of the billing year was calculated. An "active" day was considered to be a day in which 10 or more unique patients were seen (or approximately $280 was billed). Then a regression was performed of the billing dollars for Family Practice care against the number of "active" days per year for each physician. Results from this regression are shown in the following figure.

Figure 46 - Billing dollars against "Active" Care Days for Family Physicians (2002/03)



Based on the information from this analysis, choosing a threshold of 50 active days per year (or approximately 1 day per week of active practice), annual billing thresholds of $37,750 in 2001/2002 and $42,601 in 2002/2003 were chosen to define "active" Family Practitioners (the differences in the billing thresholds reflect changes in the billing schedule between those years). In 2001/2002 and 2002/2003, there were 148 and 175 Family Practitioners below the threshold, and 481 and 475 above, the "active" billing levels, respectively.

The average billings of all physicians over that threshold were $152,514 in 2001/2002 and $163,243 in 2002/2003 (reflecting changes in the billing schedule between those years). The average, rather than the median, is the most appropriate descriptive statistic in this case because it was found that those physicians who have very high billing numbers also have much higher patient activity levels.

The threshold for "active" physicians' billings is $75,000 yearly, this accounts for >95% of all FP billings. Physician "effective number" is based on ratios of individual physicians' billings to the mean billings for "active" physicians.

For the purposes of this analysis, '"inactive" FPs are those physicians with no days of seeing 10 or more patients in a day.

Calculating Expected Family Practitioner numbers for New Brunswick

The expected number of "active" Family Practice physicians required to serve the New Brunswick population was calculated as follows:

$$\frac{\textbf{Total comprehensive Family Practice care billings for all physicians in the database}}{\textbf{the average comprehensive FP billings for "active" physicians}}$$

= 489 (487) "active" Family Practitioners in 2001/2002 (2002/2003)

Activity for physicians below the "active" billing threshold (148 Family Practitioners in 2001/2002 and 175 in 2002/2003) is the equivalent of the activity done by 8 (2001/2002) and 12 (2002/2003) "active" Family Practitioners.

This methodology was validated using the physicians' patient list sizes instead of billing volumes. Results were virtually identical, which gives confidence in using billings to define "active" Family Practitioners.

For each physician in the demand side database, a "weight" is calculated, which is the physician's billings divided by the average "active" billing number ($152,514 in 2001/2002 and $163,243 for 2002/2003). This is a measure of the relative level of activity compared to mean billing numbers. This weight is used later in allocating physician activity to region populations.

Calculating Population-based Rates for Health Regions

Using Family Practice billings by category, for all Family Practitioners in the billing database, per capita annual billing rates for each activity category are calculated for age and sex categories. For example, a 62 year old female would have an average New Brunswick billing rate of $156.34 for comprehensive Family Practice care for 2002/2003. This New Brunswick average per-capita rate was applied to each health region's population to calculate expected billings per region in each category.

This calculation is then compared to actual billings to provide an evaluation of relative use of services from region to region. The following tables summarize the expected, actual, and relative ratios for all Family Practice activity and for the Comprehensive Family Practice care category of services. Tables 212 and 213 address basic FP care, ER, and hospital FP care, and Table 214 addresses obstetrics, operative assists, and anesthesia.

Table 212 - Expected, Actual, and Relative Ratios of Activity for all FP Activity and Comprehensive FP Activity (2002/03)

Region	Expected All FP Activity	Actual All FP Activity	All FP Activity Relative Ratio (Actual/Expected)	Expected Comprehensive FP Activity	Actual Comprehensive FP Activity	Comprehensive FP Activity Relative Ratio (Actual/Expected)
1	$22,315,069	$21,614,897	97	$20,151,721	$19,476,030	97
2	$20,712,725	$20,693,046	100	$18,712,804	$18,901,471	101
3	$19,467,961	$20,398,946	105	$17,600,049	$18,300,080	104
4	$6,240,189	$5,572,512	89	$5,639,116	$4,931,945	87
5	$3,711,841	$3,797,305	102	$3,350,630	$3,467,380	103
6	$10,011,101	$10,214,559	102	$9,047,557	$9,274,829	103
7	$5,558,496	$5,727,474	103	$5,021,537	$5,172,854	103
Total	$88,017,382	$88,018,739	100	$79,523,414	$79,524,589	100

* A relative ratio of greater than 100 indicates relative over-utilization of FP services.
A relative ratio of less than 100 indicates relative under-utilization of FP services.

Table 213 - Expected, Actual, and Relative Ratios of Activity for basic FP care, ER FP care, and Hospital FP Care (2002/03)

Region	Expected FP Care Activity	Actual FP Care Activity	FP Care Activity Relative Ratio (Actual/Expected)	Expected ER FP Care Activity	Actual ER FP Care Activity	ER FP Care Activity Relative Ratio (Actual/Expected)	Expected Hospital FP Care Activity	Actual Hospital FP Care Activity	Hospital FP Care Activity Relative Ratio (Actual/Expected)
1	$16,558,830	$16,527,224	100	$1,367,322	$798,718	58	$2,181,637	$2,138,372	98
2	$15,364,609	$16,435,882	107	$1,294,461	$1,365,132	105	$2,019,436	$1,076,247	53
3	$14,526,877	$14,771,941	102	$1,237,673	$1,518,281	123	$1,810,087	$2,001,833	111
4	$4,665,683	$3,614,355	77	$387,835	$428,595	111	$575,751	$879,706	153
5	$2,748,714	$2,448,718	89	$219,739	$419,811	191	$374,049	$592,070	158
6	$7,487,602	$7,250,790	97	$612,158	$811,530	133	$930,168	$1,124,388	121
7	$4,127,054	$4,431,406	107	$341,570	$118,848	35	$543,069	$621,650	114
Total	$65,479,369	$65,480,316	100			100			100

* A relative ratio of greater than 100 indicates relative over-utilization of FP services.
A relative ratio of less than 100 indicates relative under-utilization of FP services.

Table 214 - Expected, Actual, and Relative Ratios of Activity for Obstetrics FP care, Operative assists FP care, and Anesthesia FP Care (2003-03)

Region	Expected Obstetrics FP Care Activity	Actual Obstetrics FP Care Activity	Obstetrics FP Care Activity Relative Ratio (Actual/Expected)	Expected Operative Assists FP Care Activity	Actual Operative Assists FP Care Activity	Operative Assists FP Care Activity Relative Ratio (Actual/Expected)	Expected Anesthesia FP Care Activity	Actual Anesthesia FP Care Activity	Anesthesia FP Care Activity Relative Ratio (Actual/Expected)
1	$289,844	$426,946	147	$595,659	$669,871	112	$114,895	$3,324	3
2	$261,242	$146,317	56	$542,167	$338,974	63	$105,479	$48,249	46
3	$261,876	$172,530	66	$508,138	$517,385	102	$98,943	$239,701	242
4	$75,142	$133,341	177	$166,066	$250,797	151	$31,848	$29,836	94
5	$38,485	$47,312	123	$102,313	$141,657	138	$19,236	$3,256	17
6	$120,165	$113,664	95	$270,567	$297,430	110	$51,313	$23,762	46
7	$66,640	$73,284	110	$149,097	$117,893	79	$28,549	$102,135	358
Total			100			100			100

* A relative ratio of greater than 100 indicates relative over-utilization of FP services.
A relative ratio of less than 100 indicates relative under-utilization of FP services.

The influence of population change on expected use of FP services to 2013

Roughly 66% of the New Brunswick population had at least one office visit in the year. However, the expected use of FP services by the population varies with the age and sex of the patient. As anticipated, the utilization pattern is such that virtually all children 0 to 4 years of age have annual contact with family physicians. Older children and adolescents decrease contact with family physicians such that only 60% of 10 to 14 year olds will visit a family physician in any year. Thereafter, more than 80% of females have annual visits to family physicians throughout their lifetime, while for males the likelihood of visiting a family doctor within a year gradually increases from approximately 50% for 20 to 24 year olds, to 80% for those over the age of 65. In addition, the pattern of average annual number of encounters with family doctors by age and sex is similar. Figure 41 demonstrates the differences among per capita billings for different age and sex categories, Figure 42 shows probability of having a FP encounter based on age and sex category, and Figure 43 shows the number of FP encounters per year by age and sex category. Clearly, age and sex have a significant impact on FP utilization.

Figure 47 - Per Capita Use of FP Care, by Age Category

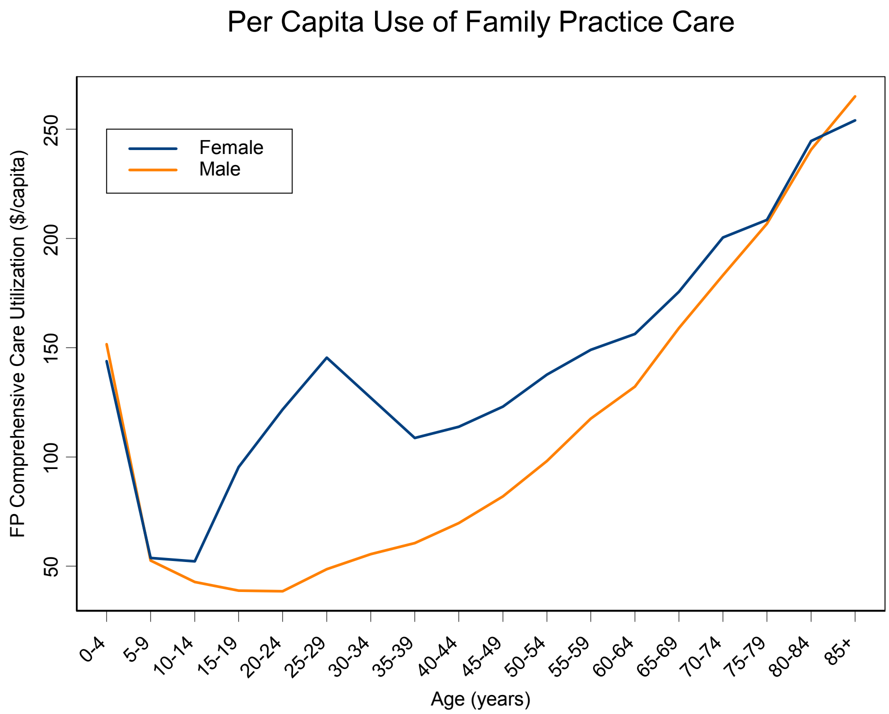


Figure 48 - Probability of FP Encounter, by Age and Sex Category

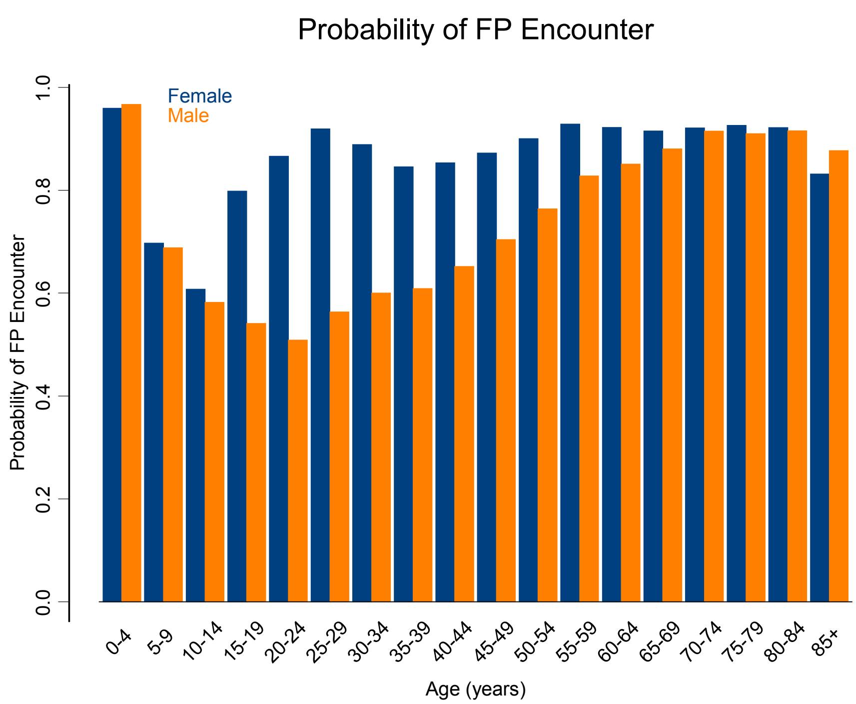
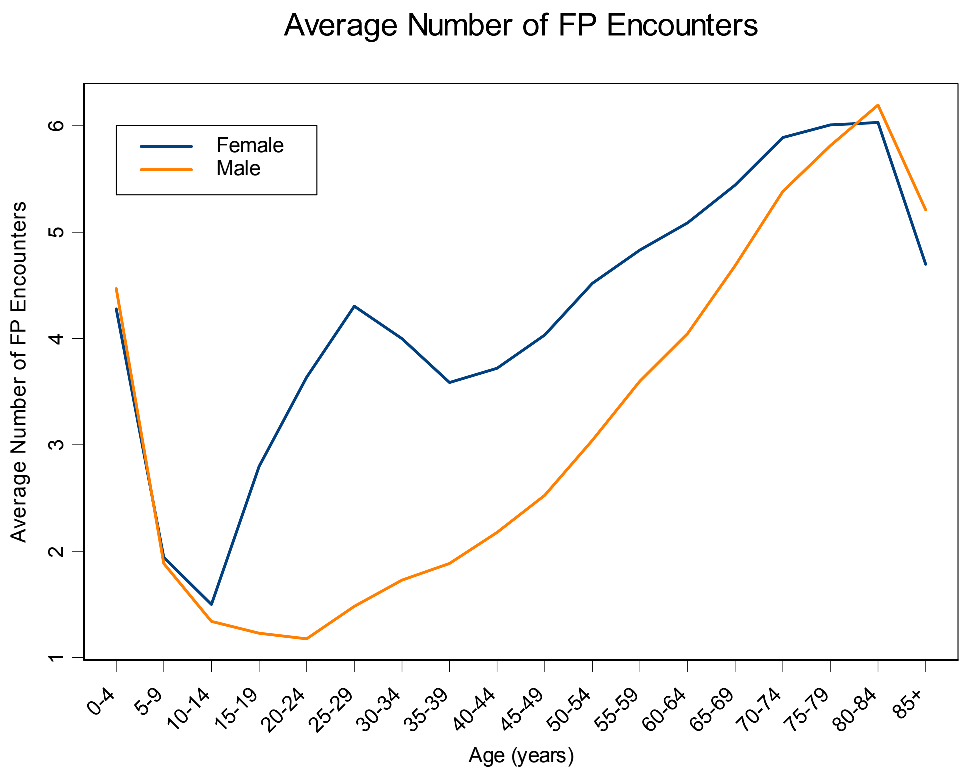


Figure 49 - Average Number of FP Encounters by Age and Sex Categories



Hence, the projected demand for FP services depends on both the utilization rate of service by age and sex, and the population structure. In order to estimate expected demand for FP services in the future, current rates of service (annual billings for "comprehensive family practice" service per capita by age and sex) were assumed, and these per capita rates were applied to the projected population size and structure for each health region in New Brunswick, for each year from 2001/2002 or 2002/2003 to 2013.

The projections of the future demand for FP services are based on the New Brunswick population forecasts to 2013, which were prepared in 2000 from existing Statistics Canada projections (based on 1996 Census data). Unfortunately, based on new knowledge from the 2001 Census, these projections of population structure for New Brunswick are seriously compromised by significant inaccuracies.

The population forecasts seriously overstated the overall size and the structure of the population. It is evident from the nature of the projections that they accurately estimated the aging of the population (as evident from the accurate estimate of the population size for those aged 50 years and older), but missed a large net migration among males aged 20-35 years, females in their 20s, and the combination of out-migration of younger children with their young parents, and lower provincial birth rates due to the out-migration of young families. The following figures illustrate the dramatic difference between 2001 projections (based on 1996 Census) and 2001 actual Census figures.

Figure 50 - New Brunswick Census and Projections - Males

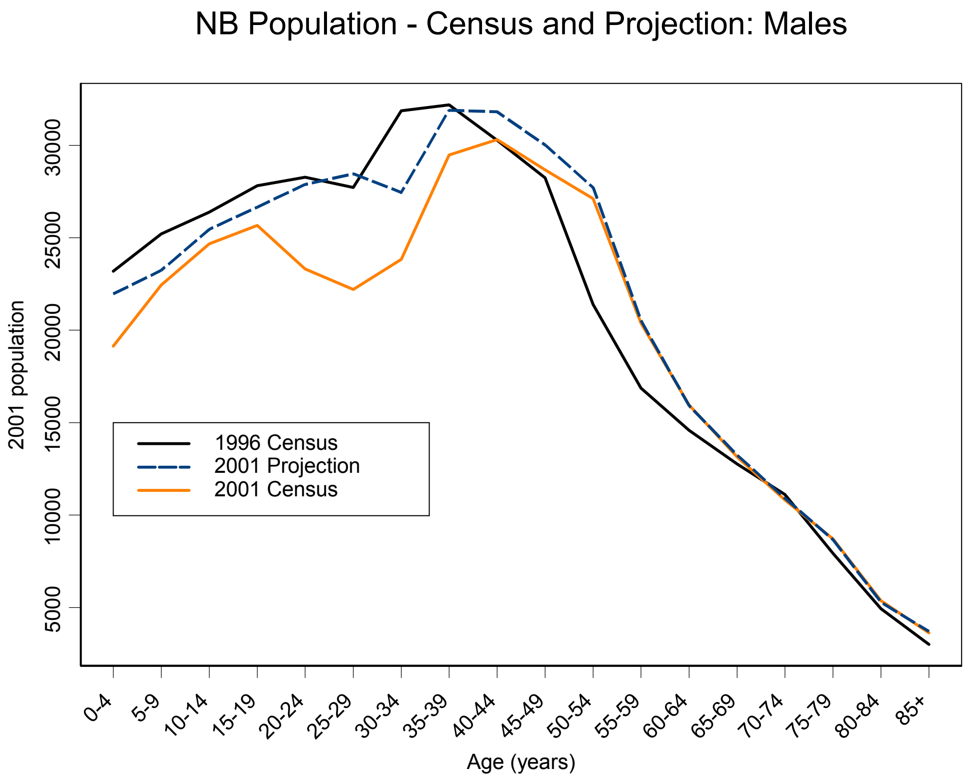


Figure 51 - New Brunswick Population Census and Projections - Females

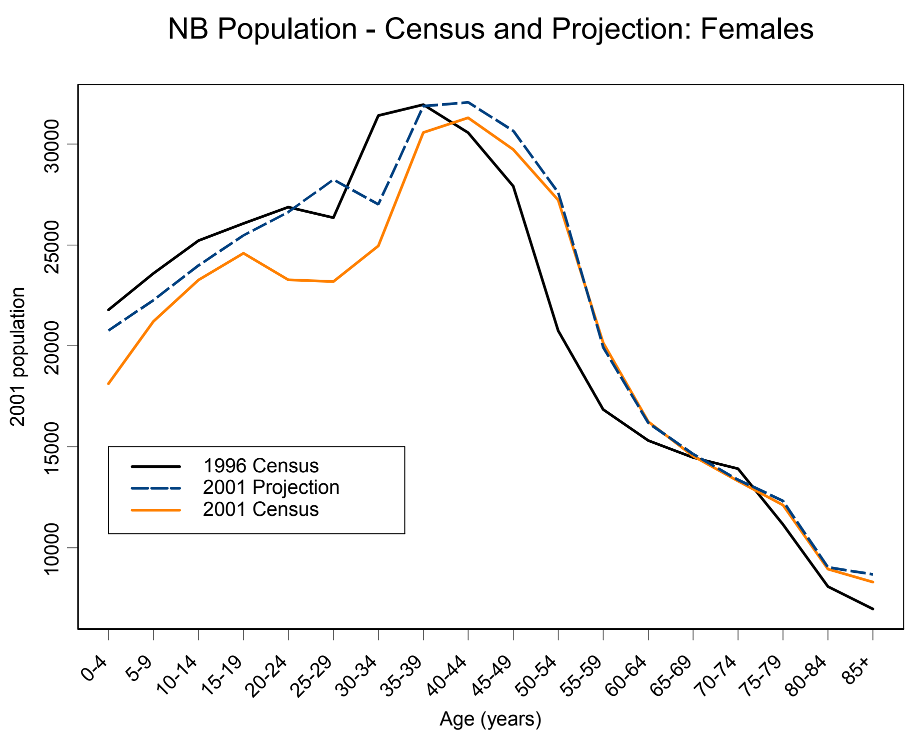
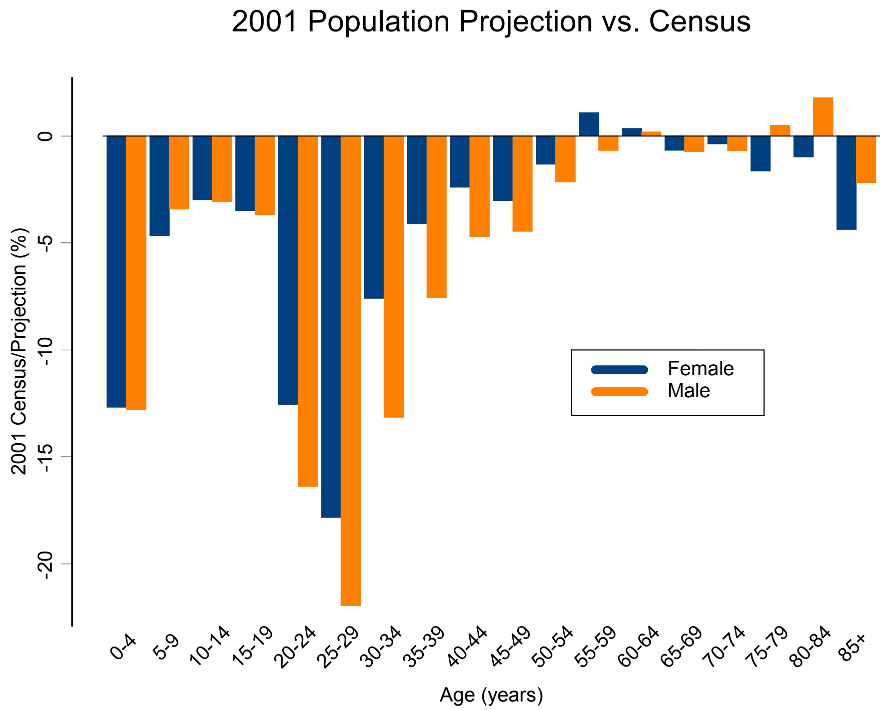


Figure 52 - Population Projections compared to 2001 Census



Hence, the population structure of the province in 2001 was radically different than that which had been projected in 2000 based on the 1996 Census. Since the existing population projections to the year 2016 are based on the same methodology, which neglected the phenomenon of migration of young adults, estimates of the future demand for FP services must be approached with caution.

Since approximately 50% of family practice billings are for patients aged 50 years and older, the component of increased demand due to aging ought to be accurately estimated with existing population projections. On the other hand, should the migration phenomenon continue, with further declines in the overall size of the younger population, existing projection patterns will overstate the growth in need for FP services, particularly for pediatric and obstetrical services.

The forecasts for increase in demand for FP services were calculated as follows.

- For each year (2001/2002 and 2002/2003), the annual rate of billing for comprehensive FP service per capita were calculated using the 2001 actual census structure for each health region.

- These per capita rates were then multiplied by the projected population for the relevant year (2001 or 2002) and by the projected population for each of the years 2003 to 2013. Hence, an expected volume of FP billings was calculated for each future year.

The relative growth of the billings (due largely to aging of the population) was then determined from the ratio of the projected billings for future years to the expected billings for the population had the population been as projected in the base year. This method minimizes the effect of the inaccuracies in the population projection, but does not address the issue of the influence of future population loss on expected demand.

The following table shows the actual Census 2001 population, the "effective" 2001 population reflecting age, and sex adjustments to describe variations in demand for Family Practice expected as a result of inter-regional differences in population age and sex structure, and the growth rates for each year from 2003 through 2013.

Table 215 – Growth Rates compared to 2001 Effective Demand for FP Services

Region	2001 Census Population	"Effective" 2001 Population	Growth Rate 2003	Growth Rate 2004	Growth Rate 2005	Growth Rate 2006	Growth Rate 2007	Growth Rate 2008	Growth Rate 2009	Growth Rate 2010	Growth Rate 2011	Growth Rate 2012	Growth Rate 2013
1	182,745	183,948	1.33	1.95	2.58	3.19	3.77	4.37	4.91	5.49	6.04	6.65	7.22
2	170,395	170,813	1.36	2.04	2.7	3.32	4	4.67	5.36	6	6.6	7.33	7.99
3	162,310	160,656	1.52	2.28	2.98	3.73	4.47	5.24	5.99	6.75	7.5	8.28	9.13
4	52,035	51,475	2.06	3.01	3.93	4.91	5.84	6.74	7.6	8.38	9.04	9.75	10.54
5	29,935	30,585	1.55	2.35	3.11	3.91	4.71	5.5	6.2	6.79	7.42	8.09	8.63
6	82,835	82,587	1.9	2.8	3.76	4.66	5.55	6.37	7.16	7.92	8.6	9.38	10.05
7	45,645	45,837	1.73	2.58	3.31	4.05	4.83	5.57	6.27	6.91	7.51	8.28	8.92
Total	725,900	725,901											

Using these projections, population-based needs and effective physician requirements by health region for the years from 2001 to 2013 (in the following section) were estimated.

Calculating Expected Family Practitioner Numbers for Health Regions in New Brunswick

To allocate physician requirements by region, physicians who provide service to patients in more than 1 region needed to be accounted for. The physician's market share (i.e. the proportion of billings for each region) was used to distribute the physician's "weight" across regions. This ensured that all physician activity was allocated to the correct region.

Then, using the expected billings per region, and dividing by the mean billings for an "active" Family Practice physician, the number of required active Family Practitioners was calculated (as shown in the following table).

Table 216: Expected "Active" GPs by Region (2000/1, 2001/2, and 2002/3)

Region	Expected "active" GPs (2000/1)	Expected "active" GPs (2001/2)	Expected "active" GPs (2002/3)
1	121.1	124.3	123.8
2	112.7	115.5	114.9
3	106	108.5	107.8
4	33.9	34.7	34.6
5	20.1	20.7	20.6
6	54.3	55.7	55.5
7	30.2	31	30.8
Total	478	490	488

The expected Family Practice physician numbers were then calculated for future years based on growth projections described previously. The results are presented in the following table.

Table 217 - Expected "Active" FPs by Region for 2001 and 2003 through 2013

Region	Expected "active" GPs 2001	Expected "active" GPs 2003	Expected "active" GPs 2004	Expected "active" GPs 2005	Expected "active" GPs 2006	Expected "active" GPs 2007	Expected "active" GPs 2008	Expected "active" GPs 2009	Expected "active" GPs 2010	Expected "active" GPs 2011	Expected "active" GPs 2012	Expected "active" GPs 2013
1	121.1	122.5	123.7	125.0	126.2	127.3	128.4	129.4	130.5	131.5	132.4	133.2
2	112.7	113.4	114.1	114.9	115.6	116.3	117.1	117.9	118.7	119.4	120.2	121.0
3	106	107.1	108.1	109.2	110.2	111.2	112.3	113.3	114.3	115.3	116.2	117.2
4	33.9	34.3	34.7	35.1	35.5	35.8	36.2	36.5	36.8	37.1	37.4	37.6
5	20.1	20.2	20.3	20.4	20.5	20.6	20.8	20.9	21.0	21.0	21.2	21.3
6	54.3	54.8	55.2	55.6	56.1	56.5	56.9	57.3	57.7	58.1	58.5	58.8
7	30.2	30.3	30.4	30.5	30.6	30.7	30.9	31.0	31.1	31.2	31.5	31.6
Total	478.3	482.5	486.5	490.7	494.6	498.5	502.5	506.3	510.1	513.7	517.3	520.7

To understand the current Family Practice service provided to each region, each physician's practice weight (e.g. billings divided by average "active" billings) was distributed among health regions according to the distribution of the health region of origin for the physician's patients. Hence, the effective number of Family Practitioners in each region reflects the distribution of existing physician activity (in "weights") across the various regions by market share.

The total physician weights allocated to each region are shown. For example, there were 119.6 effective family physicians serving Region 1. In addition, physicians were classified by their activity level and similarly allocated to health regions by market share. Physicians were classified according to the number of "active" days per year. As shown in the following table, of the 408 physicians with 100 or more "active" days in 2002/2003, the equivalent of 100.9 served Region 1.

Table 218 - Effective FPs, and FPs by Level of Activity (2002/2003)

Region	"Effective" GPs	Number of GPs with 100 or more 'active' days	Number of GPs with between 50 and 99 'active' days	Number of GPs with between 1 and 49 active days	Inactive MDs (with 0 active days)
1	119.6	100.9	21.1	30.9	18.6
2	115.4	94.9	16.8	21.6	10.8
3	112.0	97.6	10.6	16.3	13.3
4	30.5	27.3	7.9	10.7	3.4
5	21.5	16.7	4.2	8.4	2.9
6	57.5	43.3	5.9	14.7	5.8
7	31.7	27.3	1.5	8.5	3.2
Total	488.2	408.0	68.0	111.0	58.0

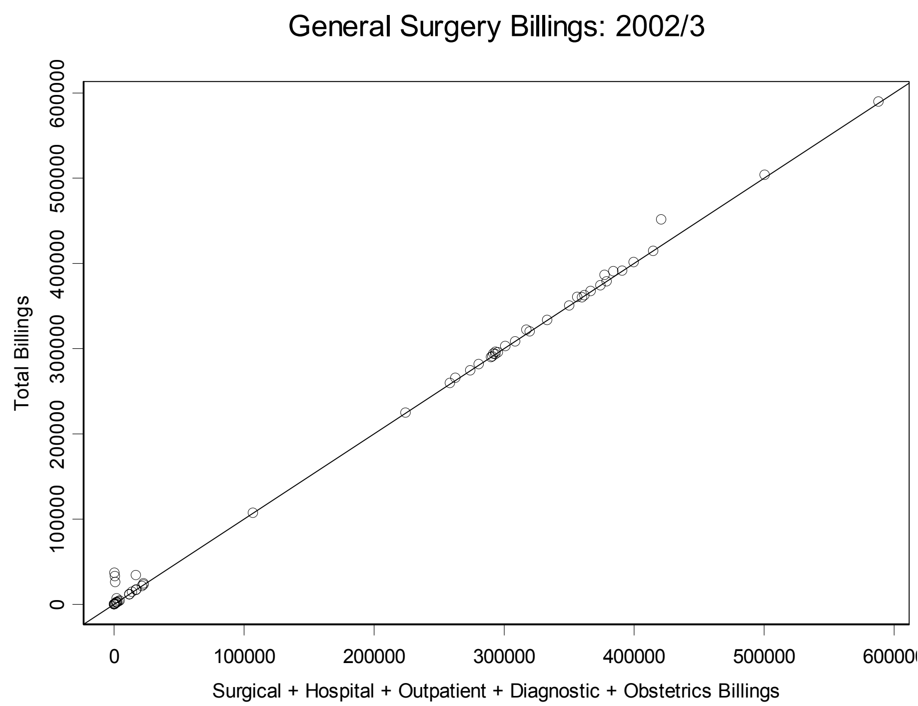
APPENDIX I – GENERAL SURGERY DEMAND SIDE METHODOLOGY

The data available for this planning analysis were hospital discharge abstract data (CIHI DAD data) for fiscal 1997/8 to 2001/2 and the New Brunswick Medicare database for fiscal years 2000/1 until 2002/3 (the hospital data were unavailable for the most recent complete fiscal year).

The analyses are based on extracts of General Surgeons' annual billings as contained in the Medicare database. This measure of clinical activity is compromised by the fact that a small number of surgeons have reported hospital clinical activity with no Medicare billings (i.e., salaried physicians). Hence, the billing data were augmented with a "billing equivalent" for these few surgeons based on their hospital activity during the last two years of available hospital data. For the last year of billing data (2002/3) where no hospital data were available, the billing equivalent for these physicians was projected based on the prior year's hospital activity and the trend in increased billing rates for the majority of active physicians (this methodology assumes that this small group of physicians remained active during the last fiscal year during which no billing or hospital data are available).

The "core billing" activity included all surgical, hospital care, obstetric, outpatient, and diagnostic billings for these physicians, and excluded billings for surgical assistance. As can be seen in the next figure, this core billing data comprised virtually all billing activity for active General Surgeons.

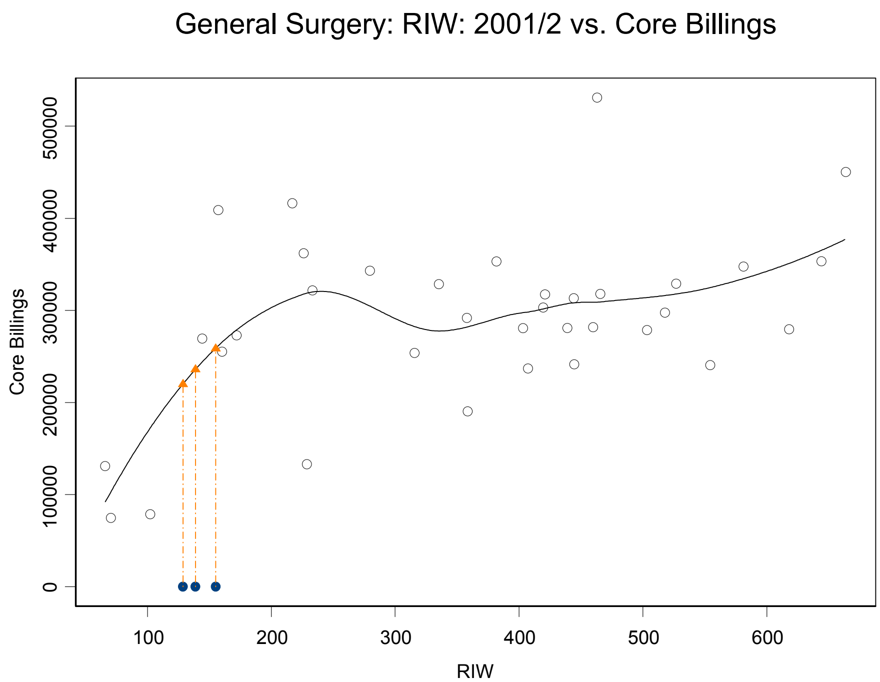
Figure 53 - Core Surgical Billings vs. Total Billings



For less active physicians (those in the bottom right of graph), the additional residual billings are due primarily to surgical assistance.

Setting core surgical billing equivalents for salaried physicians involved estimating the relationship between billing activity and hospital activity through local regression methods. The equivalent billing activity for salaried physicians was then estimated from this relationship in each year 2000/1 and 2001/2 and projected to 2002/3 based on 2001/2 data. The method is illustrated in the following figure.

Figure 54 - Relationship between hospital activity (RIW) and Core surgical billings. Estimated billings for salaried physicians imputed from the relationship.



We identify those entering and leaving active practice by reviewing billing activity in each pair of consecutive years and tracking those surgeons crossing the low-billing threshold of $50,000 per annum (see Figures 50, 51)

Figure 55 - Core Surgical Billings for 2000-01 vs. 2001-02

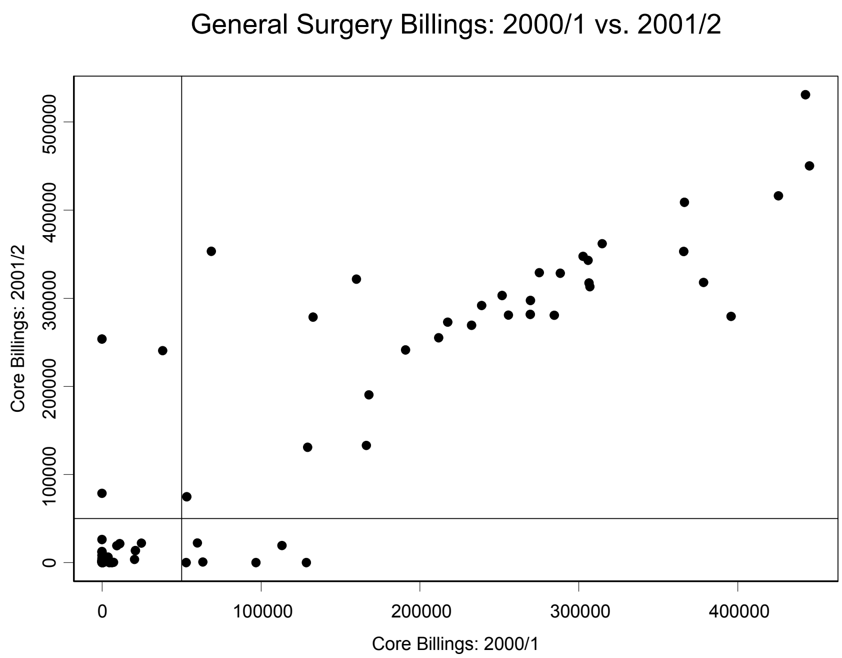
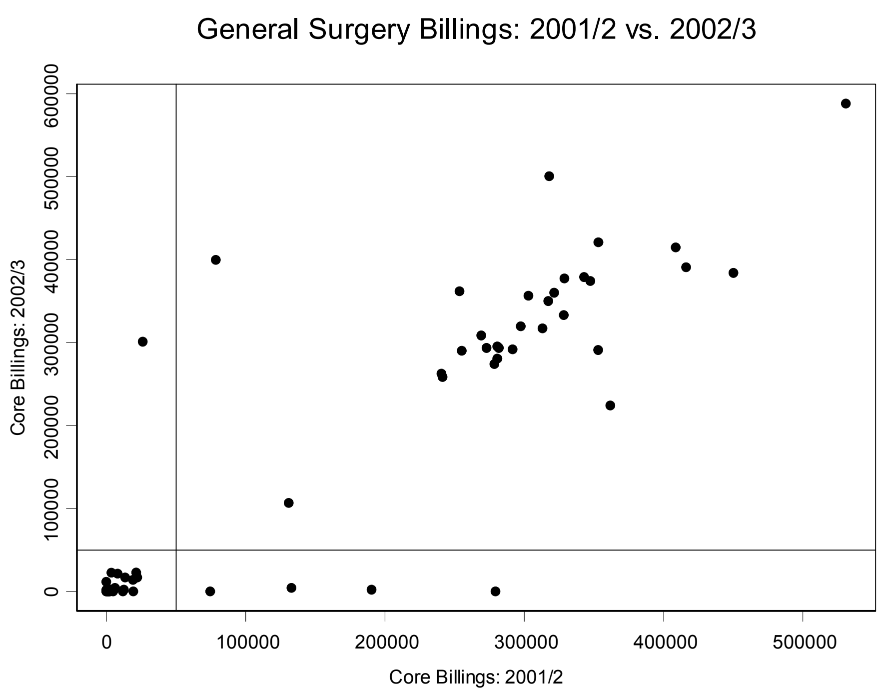


Figure 56 - Core Surgical Billings for 2001-02 vs. 2002-03



Of the General Surgeons identified as such at some point in the clinical databases, 44 were "inactive" (i.e. <$50,000 core billings) in both years, 3 left active practice (i.e. >$50,000 in 2000/1 and <$50,000 in

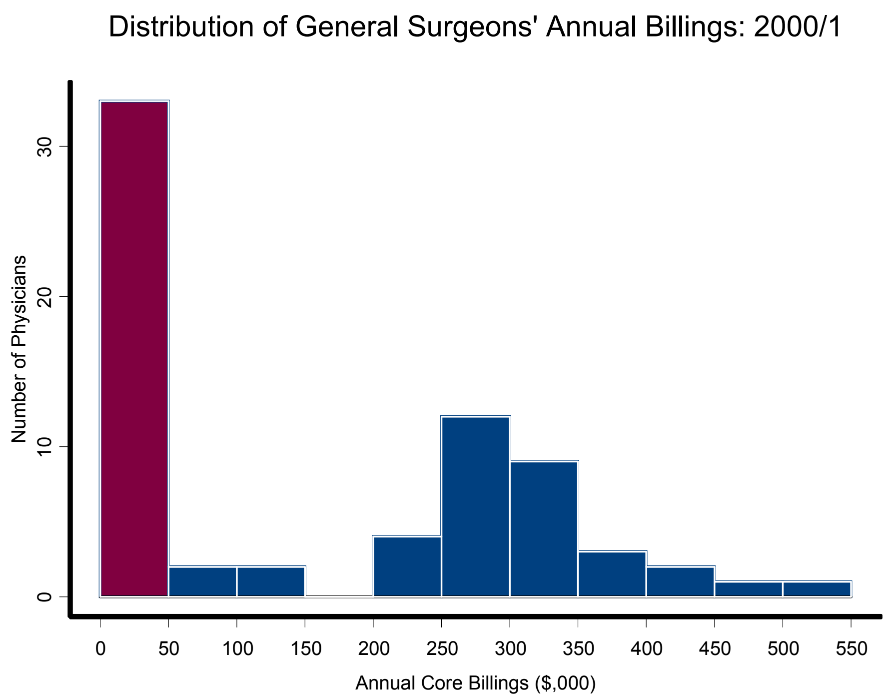
2001/2), 1 entered active practice, and 29 were “active” in both years. The 5 presumed salaried physicians not included in graph.

Of note, those entering active practice were 31-35 years old, while those leaving practice are a combination of those of retirement age, mid-career and younger physicians (presumably those who leave the province). Those who stay inactive are a combination of both male and female physicians under 40 years of age, and older male surgeons.

Hence, there has been a net decrease in the number of active general surgeons over the last 3 years. Total billing activity among the active physicians has remained the same, with average billings increasing proportionately to both billing schedule increases and extra workload.

It is clear that there are a large number of surgeons who are identified as General Surgeons in either the billing of hospital databases who have low levels of clinical activity by either measure. The distribution of surgeons by billing activity is illustrated for 2000/1 in Figure 53. The distribution for the subsequent two years is very similar.

Figure 57 - Distribution of General Surgeons by Annual Billings for those with >0 billings in the fiscal year 2000/1.



In order to track the stability of trends in billing patterns, we display the billing activity of general surgeons who have at least one year below the $50,000 threshold in the next sequence of Figures. Figure 6 illustrates all of these surgeons’ billing activity, Figure 7 displays the activity of those deemed to be entering active practice, Figure 8 the activity of those deemed to be leaving active practice and Figure 9 those who remain under the $50,000 threshold during the entire 3 years.

Figure 58 - Billing activity for all General Surgeons with at least one year below $50,000 core surgical billings

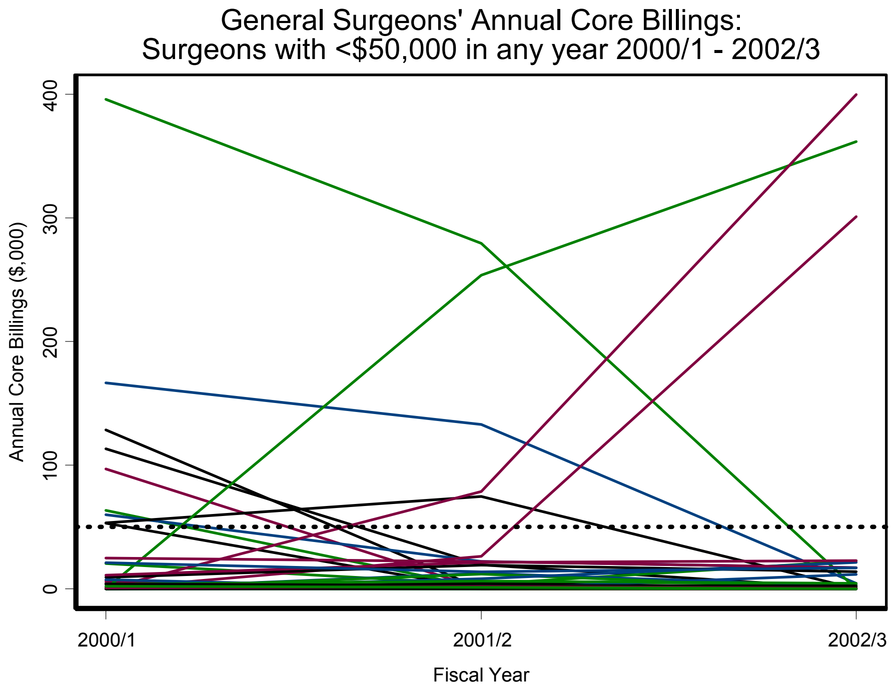


Figure 59 - Annual billings for General Surgeons entering active practice.

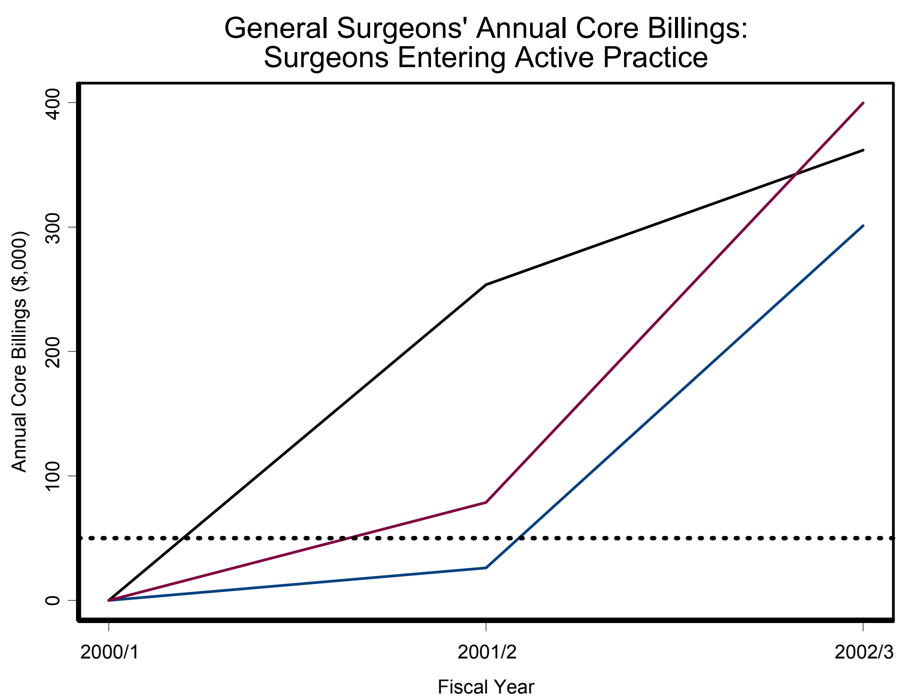


Figure 60 - Annual Billings for General Surgeons leaving active clinical practice.

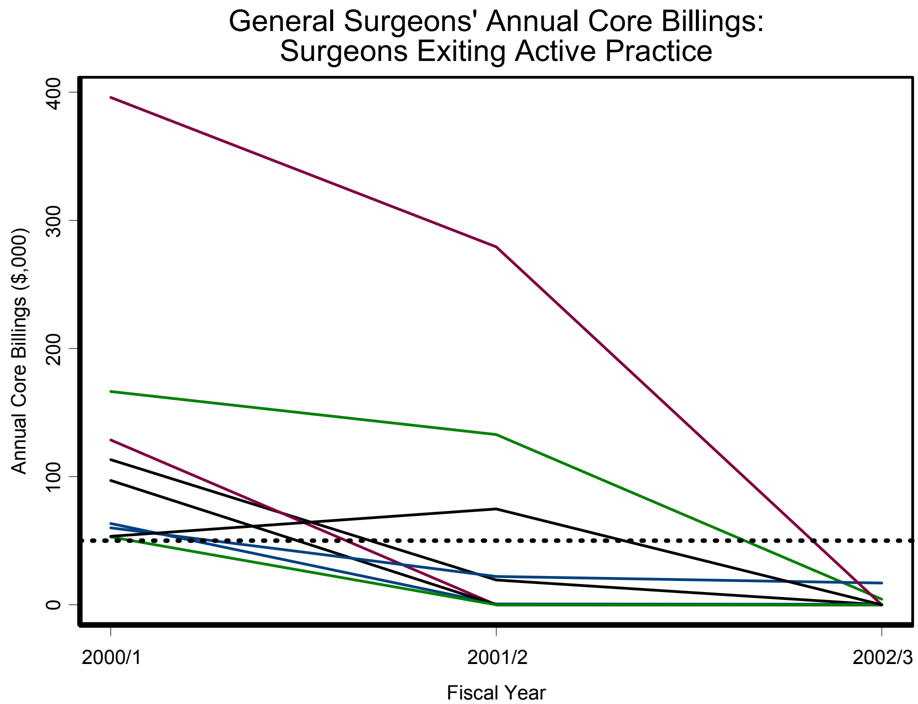
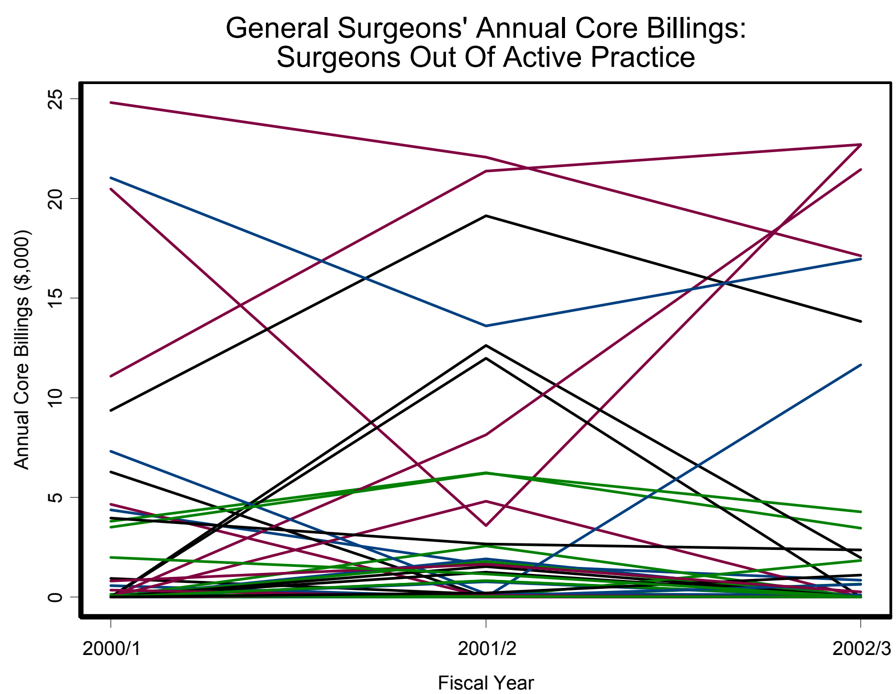


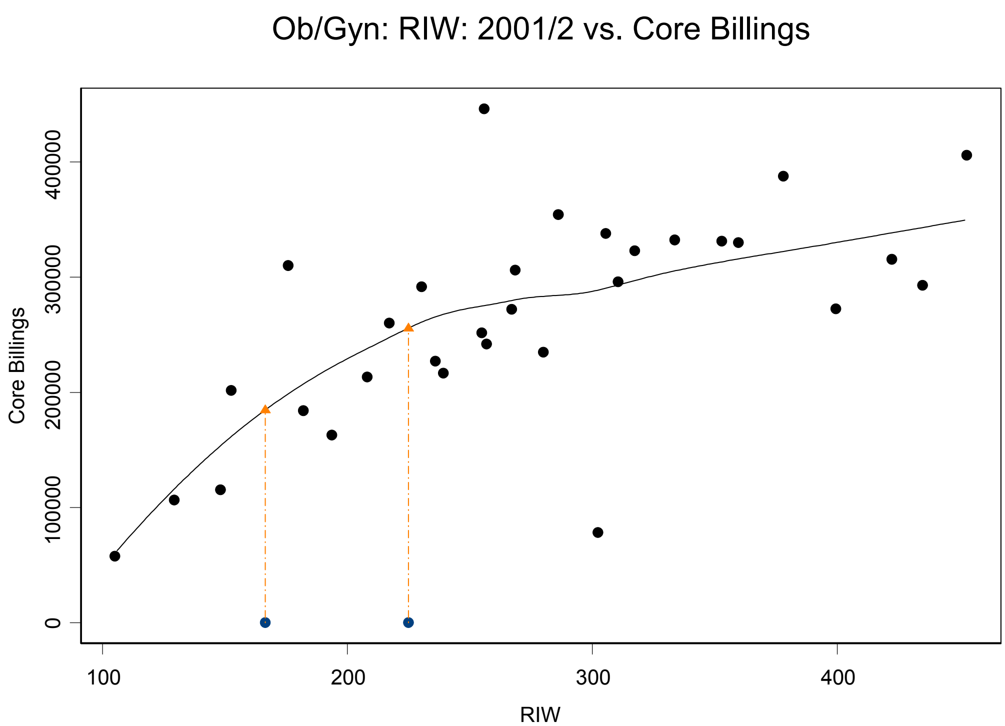
Figure 61 - Annual billings for surgeons with sub-threshold billings in all 3 years.



APPENDIX J - OBSTETRICS/GYNECOLOGY DEMAND SIDE METHODOLOGY

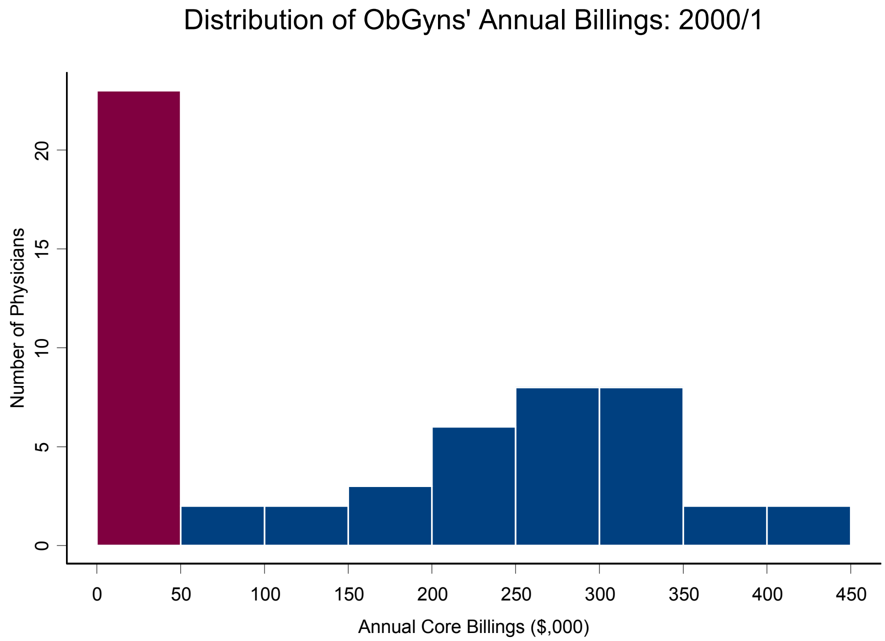
For this analysis, core Obstetrics/Gynecology billing activity included all surgical, hospital care, obstetric, outpatient, and diagnostic billings. In addition, numbers of deliveries per annum were estimated from available billing and hospital data for each physician. The estimated billings for salaried physicians were imputed within each year, and projected where necessary.

Figure 62 - Relationship between hospital activity (RIW) and Core surgical billings. Estimated billings for salaried physicians imputed from the relationship.



The number of physicians entering and leaving "active" clinical practice was assessed for each pair of consecutive years. As is seen in the next figure, there were a large number of physicians in the databases identified as Obstetricians/Gynecologists who had low levels of clinical activity in each year (as evidenced by less than $50,000 total clinical earnings or their equivalent). Of note, the threshold of $50,000 represents the approximate value such that the median of clinical billings over the threshold is five times the threshold value, which represents a reasonable cutoff for determining a threshold for active clinical activity in this specialty.

Figure 63 - Distribution of Obstetricians/Gynecologists by Annual Billings for those with >0 billings in fiscal year 2000/1.



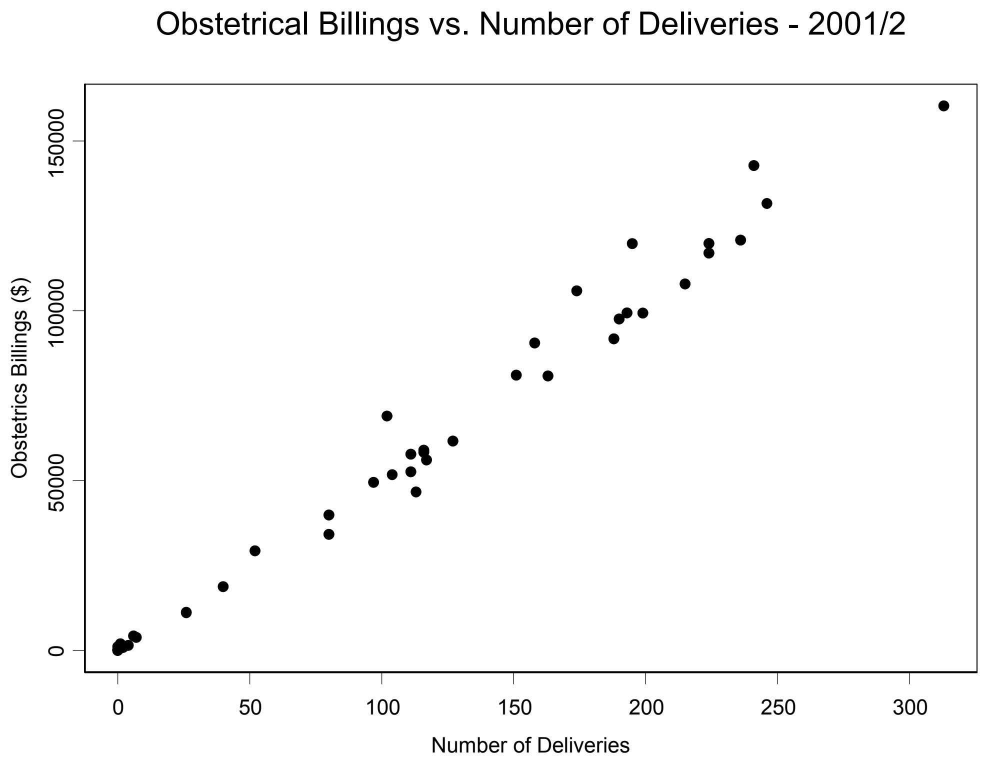
Further analysis focusing on these physicians demonstrates that a number of these physicians are primarily involved in obstetrical care (see figure above), with relatively low additional billings in the other surgical and hospital categories.

The following figure outlines Obstetrical Billings vs. Number of Deliveries – 2001/2

Of these physicians with greater than 10 deliveries in 2002/3, 4 are under 35 and 1 male under 45 who have become increasingly active in last year.

Hence, the “clinical activity threshold” was revised to include annual deliveries over a threshold (determined as 1/5 of the median above that threshold – approximately 28 deliveries per annum). The total number of deliveries and obstetrical billings are highly correlated (see Figure 8) – hence it matters little whether the total deliveries or obstetrical billings are used as a measure of obstetrical activity. Deliveries were used due to the ability to measure these for salaried physicians from hospital data.

Figure 64 – Obstetrical Billings vs. Number of Deliveries – 2001/2



APPENDIX K – A PROPOSED UNIT FOR HEALTH WORKFORCE MANAGEMENT

Introduction

Health human resources (HHR) management activities are complex and ideally should be approached from a systems perspective. It is best to adopt an integrated planning approach - the most efficient mix of personnel to meet the needs of the population. While this report pertains specifically to physician resources planning, the proposal for an HHR unit is defined and described here at a macro level of planning and management, to underscore the advantages of the integrated approach. The supply, distribution, quality, deployment, organization and utilization of health human resources are of interest to multiple stakeholders in New Brunswick: Governments, Regional Health Authorities, more than 30 health professional associations and regulatory bodies, many unions, training institutions and educational authorities, health providers and the public. It is evident therefore, that in an effort to address systemic problems, planning and policy cannot be narrowly focused for a single profession.

The purpose of health workforce management is to identify and achieve the optimal number, mix, and distribution of health human resources at a cost the province is able to afford; the efficient use of resources in the public interest.

A number of structural factors such as health and educational system organization, financing, and governance at the provincial level, and federal/provincial/territorial fiscal arrangements have major implications for health workforce management. In addition, service delivery issues such as organizational structures, management operations also have serious implications for the management of health human resources. A rational planning approach is vital in an effort to address these and related complex issues. However, both in the Canadian and in the international contexts, very slow progress has been made towards a systematic planning approach for managing the health workforce.

A systematic approach would include measuring and forecasting demand and supply to identify and address current and future imbalances, as an integral part of strategic planning in the health sector. Problems in adjusting supply to meet forecast demand are difficult to address without sustained collaborative efforts:

- Between the Department of Health and Wellness and Department of Education Post-Secondary Affairs
- Between the Department of Health and Wellness and the Regional Health Authorities (RHA)
- Inter-professional collaborative models between the New Brunswick Department of Health and Wellness and the regulatory bodies and professional associations of all health occupations.

The integration of health workforce management with strategic planning (services and finances) at the RHA level implies identification of the most appropriate and efficient mix of resources to provide the needed services in regions, congruent with the provincial health plan. This level of planning would enable RHAs to better plan and manage their health workforce and avoid interregional competition and ad hoc recruitment/crises management.

A prerequisite for rational planning is the information basis to support planning activities. It is important to identify and examine the type, level and quality (source) of information required for the purposes of workforce management, in order to set up structures and initiate processes to undertake such planning.

Type of available information for development of workforce databases

The type of data required is contingent on its use and application; that is data for what purposes? Clearly data on supply and demand are required, but what uses are to be made of these data? Monitoring of workforce mix and distribution, development and analysis of workforce policy, and evaluation of workforce deployment patterns are the basic functions of workforce management that rely heavily on data and information.

Administrative databases from professional associations and regulatory bodies have traditionally provided basic data on numbers and location of health personnel, as is the case of the eight regulated health professions which provide such data in New Brunswick. Secondary use of existing administrative data has both advantages and disadvantages. Lower costs than primary data collection, and timeliness are assets; however, breadth and depth of information are usually limited for these data. Unless personal identifiers are retained in such databases, longitudinal compilation of information would not be possible, thus limiting the analytic value of the data.

Other administrative data include population-based provincial health services payment information for general practitioners, specialists and other providers paid on a fee-for-service basis. These data assist in understanding healthcare utilization and, to a limited degree, demand for ambulatory health services.

Institutional care, acute and long-term-care, data are available through the auspices of the Canadian Institute for Health Information (CIHI), which acts as a national repository for several general and disease or procedure-specific databases such as the hospital discharge abstracts database (DAD), the hip replacement surgery register, and the cancer register.

Finally, national population health surveys have been undertaken since the early 1990's regarding health status and healthcare utilization that include more detailed socio-demographic and socio-behavioral information for survey respondents. In all of the above-mentioned databases the unit of observation is the individual, that is individual practitioner or individual patient. In addition, CIHI collects large quantities of healthcare information on an annual basis on resource utilization through its MIS database. The unit of observation in this instance is the healthcare institution.

Level of information for cross-sectional and longitudinal analysis

In an ideal world for health planning, all data would be collected at the level of the individual, whether patients or personnel. To be practical, however, we have to accept a mix of units of observation. While professional registration data are available at the individual level, other information such as system design or management structure and behavior, or financial information will likely be available only at the organization or region levels. A third level of data is that of the ecological variable, where the information for a community, such as average income or education, is assumed to apply to the individual(s) under study. There are methodologies for using mixed levels of information and this permits optimal use of data to support decision-making.

However, the unit of observation poses limitations pertaining to the type of analyses that can be done and, subsequently will have implications for the strength of conclusions drawn. Using the individual as the unit of observation, with a unique identifier to track the individual across time and/or regions, and/or employment positions will permit longitudinal analyses that can examine cause and effect relationships. On the other hand, when groups of individuals are being examined at different points in time (but not the same individuals in the group), cross-sectional analyses will provide information on the relationship between two or more factors under study.

Finally, data linkage methodologies can be applied to make optimal use of databases and enhance the level of available information.

Level of information is an important area, which warrants detailed separate consideration when data development is being planned.

Quality (source) of information for forecasting

In addition to the type of data, its quality is fundamental to the level of analytic detail and the integrity of the analysis (and the monitoring, planning and policy activities that may ensue). It is assumed that data quality is relatively high when the source is a licensing body or the data are from financial sources. Self-reported information is regarded less reliable, especially when it concerns recall of times past.

To work towards a minimum dataset that can support the various activities of HHR management, data collection activities need to be coordinated and efficient. For example, repeated surveys of health professionals are known to yield low response rates and incur high costs. To reduce the burden of surveys, information systems that draw on currently available data are preferable; adding selected new items of information, where needed, at marginal cost.

Issues about validity, reliability, quality and comprehensiveness are interrelated and frequently require tradeoffs in order to be sustainable. These issues warrant separate consideration when data development is being planned.

Addressing data gaps: An incremental approach

These gaps in current information exist because health workforce data generally exist primarily for administrative purposes and not specifically for planning and better management of health human resources. The absence of a rational, comprehensive health workforce planning and management framework has meant that information requirements for such activities at the national, provincial and health authority level have not been defined. Thus, while we can obtain a head count of physicians and nurses in most provinces, national comparisons by specialty, employment, labor-force activity, if available, are incomplete information, self-reported, and subject to serious limitations. As each regional health authority attempts to address their own "unique" situation, the provincial picture will be unclear and RHAs will be in competition with each other for the recruitment of scarce resources. A provincial health workforce management framework, from which each RHA develops its own, provides the parameters for a provincial minimum dataset. Based on this, and an inventory of what information currently exists, one, five, and ten-year goals and objectives can be established regarding the continuous development of the provincial health workforce database. It is unrealistic to expect to have all the needed data for planning, monitoring and management with little or no designated resources, funding, leadership, and technical skills. To engage the support and the participation of all the stakeholders, a collaborative model of health workforce management structures would be organized.

The Collaborative Integrated Model–Proposed Structure for New Brunswick HHRU

In order to effectively and efficiently manage the New Brunswick health workforce, it is important to have an organizational model that is congruent with the roles and responsibilities of the Regional Health Authorities, as well as congruent with the provincial accountability framework. Also, this proposed health workforce management structure should align with, or complement, currently existing bodies that directly or indirectly pertain to health human resources management.

The membership, mandate and structure of the proposed unit are described below. A set of first principles that underpin the successful implementation of such a unit provides a transparent frame of reference for participation in a collaborative effort.

The New Brunswick Department of Health and Wellness (DHW) would be responsible for:

- Establishing policy expectations in HHR based on the provincial health plan
- Setting general guidelines regarding data requirements for HHR management
- Supporting the participation of RHAs, which may need additional incentives
- Facilitating coordination where national certification issues arise
- Appointing a DHW official to coordinate HHR management by RHAs
- Developing standards for health workforces databases
- Providing technical support in the development/use of unique identifiers

Coordinating production with the Maritime Higher Education Commission, the Department of Education Post-Secondary Affairs, and the Department of Training and Employment Development.

Each RHA would be responsible for:

- Initiating a rational planning approach for HHR management that aligns with the provincial health plan.
- Determining general/specific information requirements for their HHR management activities and identifying existing sources of that information.

- Developing a systematic approach to standardized data collection and/or development for local information needs.

- Establishing efficient information systems to manage the local data and enable access to it for other RHAs.

The proposed collaborative model places appreciable responsibility for health workforce management at the RHA level and the expectation is that the RHAs will have the capacity, through a provincial organization that represents their interests, to interact with the relevant stakeholders to guide their workforce management activities at the local and provincial levels.

A province-wide forum to foster a collaborative and integrated approach to health workforce management would launch the activities and provide an opportunity to all regional interests to participate in the process of identifying and developing such a provincial structure.

To be effective, authority for health workforce management should be vested in an entity that can take action and develop/implement policy. To be practical, a small number of leaders at the apex of the organization would have policy development authority. However, that authority would be exercised at the conclusion of a democratic process that originates at the grass-roots level, resting with RHAs. Therefore, this unit would be comprised of a Steering Committee and an Operations Committee.

Steering Committee membership should include: Department of Health and Wellness, Department of Education Post-Secondary Affairs, Department of Training and Employment Development, Family Community Services, Office of Human Resources, and RHA CEO's representative.

The functions of the Steering Committee would be to:

- Endorse a framework for health workforce management that enables the matching of HHR with health service requirements in each region

- Set objectives and guidelines for HHR planning and management

- Develop common data collection guidelines for the regions and the professions

- Monitor such data collection activities

- Identify HHR issues arising at the inter-regional level that require provincial solutions

- Provide a forum for the discussion of provincial HHR issues and identify the appropriate medium and long-term solutions

Operations Committee membership should include: Cross-section of employer representatives from institutional, community, home care; representatives of VPs/Directors of HHR from RHAs; Union representatives and professional Associations/Regulatory bodies.

The functions of the Operations Committee would be to:

- Assist the RHAs in meeting the objectives and guidelines for HHR management set by the Steering Committee
- Support medium-range HHR planning and management
- Provide a forum for regional HHR issues where interregional solutions would be required and sought
- Provide input to the Steering Committee regarding HHR issues that require provincial solutions

To facilitate the implementation of such new structures, an incremental approach is suggested. For example, given the size and interdependency of the nursing and physician workforces, the existing Nursing Resources Advisory Committee structure and a newly constituted Medical Workforce Strategy Committee could each serve as an Operations Committee and begin the short-term planning process for the specific professions within the context of equitable health services delivered in the most efficient way.

Location and Staffing of Unit

The composition, size and location of the HHR unit should be commensurate with the performance expectations of the stakeholders from this unit; otherwise the unit will very rapidly be undermined. It is important to provide the unit with sufficient resources, both financial and human. It would be convenient to locate it within the Department's Planning and Evaluation Division, but it should also draw staff from the Division of Public Health and Medical Services from the outset. Population and public health are central to workforce management, as we move towards linking, in a transparent fashion, workforce supply with needs-based integrated planning and policy (the epidemiological approach).

Overall the Unit should have access to a combination of skills represented by the following disciplines: health economics, health policy analysis, programming/data analysis, epidemiology, statistical analysis and researchers with various areas of expertise. Structurally, it is essential to appoint an Executive Director who will spend at least 30% time engaged in external relations. A Director of Research and Planning is also required, to oversee continuous activities of data development and maintenance, and project-specific analyses. A senior Epidemiologist for consultation on burden of disease, and a Data Manager to develop and maintain information systems would complete the core team of professionals. To assist them, technical and administrative support staff such as a research assistant and a clerk/secretary would be needed. Positions need not all be full-time; resources can be shared among units or government departments; however, adequate allocation overall is essential to the success of the unit.