Social Sector Metrics Inc. and Health Intelligence Inc

ENVIRONMENTAL SCAN REPORT, December 31, 2011
submitted to
the Nova Scotia Department of Health and Wellness

Physician Resource Planning An Environmental Scan

ACKNOWLEDGEMENT

The Consultant acknowledges the many groups and individuals who have so willingly provided time, insight, and expertise to the project. Contributions were substantial from all stakeholder constituencies and, in particular, the medical profession, governance authorities, professional bodies, and individual representatives. The Nova Scotia Department of Health and Wellness (DHW), the Provincial Health Programs, District Health Authorities (DHA), Izaak Walton Killam Health Centre (IWK), Doctors Nova Scotia (DNS), Dalhousie Faculty of Medicine (DFM), and College of Physicians and Surgeons of Nova Scotia (CPSNS) have each provided extensive time, insight, and information throughout the course of the project.

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2 KEY DEFINITIONS

The following terms used in this document have the meanings described below.

1. **Alternative Payment Plan (APP) -** Type of compensation for physicians who are not paid on a fee-for-service basis but are salaried, sessional, or hired on service contract. These physicians submit claims (shadow billings) for administrative purposes only.
2. **Full-Time Academic –** Appointment status is full-time; typically, these are salaried positions with Dalhousie Faculty of Medicine with the ranks of Professor, Associate Professor, or Assistant Professor.
3. **Full-time Equivalency (FTE) –** Consultants followed the Health Canada definition of an FTE (i.e., "Canadian Institute for Health Information (CIHI)" methodology) with modification as noted in 'd', 'e', and 'f' below. This methodology is the national standard in the public health sector for converting physician earnings to FTE. The details of this method are as follows:

   a) All payments (fee-for-service (fee-for-service), block funded, salary, third party, on-call, sessional, etc. totalling $634 million in 2009/10) to each uniquely identified (Provincial ID number) physician within each functional specialty (e.g., General Practice, Nephrologist, etc.), during a one year period (2009/10), were rank ordered, smallest to largest. Physicians are sorted into percentiles. The 40th and 60th percentiles are computed as follows:

      - (# of physicians within the group) x (0.4) = 40th percentile physician
      - (# of physicians within the group) x (0.6) = 60th percentile physician

   b) FTE assignment is made using the following procedure:

      - Any ranked physician > 40th percentile, and < 60th percentile is assigned a value of 1.0 FTE.
      - Any ranked physician (i.e., "physician X") < 40th percentile is assigned an FTE equal to:
         - *($ value of payment to physician X) divided by ($ value of payment to 40th percentile physician)*
      - Any ranked physician (i.e., physician Y)> 60th percentile is assigned an FTE equal to:
         - *1 + (log of $ value of payment to physician Y) / ($ value of 60th percentile)*

   c) The methodology creates some compression in the range above the 60th percentile, but avoids assignment of extreme values (e.g., 4.0 FTE) to very high earning physicians.

Consultant modifications to CIHI Methodology

   d) Non-fee-for-service Payments: Nova Scotia payments and FTE calculations included non-fee-for-service payments, e.g., alternate funding/block-funded payments; CIHI inter-provincial fee-for-service data do not. CIHI does, however, report aggregated non-fee-for-service payments at a specialty group level by province. The Consultant modification is as follows:

      - Gross non-fee-for-service payments by specialty group, as reported to CIHI, were converted to FTE equivalents. This was done by applying province-specific specialty specific mean gross fee-for-service billing rates as reported to CIHI (by specialty) to the non-fee-for-service payments that are reported by CIHI at a specialty level. Nova Scotia data did not require such a refinement as the Consultants were working from complete payment data. The result is a more realistic estimation of total FTEs.

e) Where a functional specialty had a provincial count of less than twenty, the Consultant examined additional parameters to assess individual FTE status. Examples of other parameters included whether the physician had a full-time position at Dalhousie Faculty of Medicine, whether corroborating information (e.g., departmental interviews) indicated work status, and whether grey literature from within the province indicated status. By necessity, this added step increased the length of the process.

f) Individuals aged seventy years or older in 2011 have been removed from the FTE calculations on the assumption they will not be actively practising beyond the first year of the ten-year forecast beginning in 2012. There will be exceptions to this rule; however, in the interests of methodological consistency, the rule has been applied uniformly.

4. **Independent and Dependent Variables –** These terms distinguish between two types of quantities being considered, separating them into those available at the start of a process and those being created by it, where the latter (dependent variables) are dependent on the former (independent variables). The independent variable is typically the variable representing the value being manipulated or changed and the dependent variable is the observed result of the independent variable being manipulated. For example, with respect to PRP, the independent variable of physician inter-provincial migration can influence the dependent variable of future supply of general practitioners.

5. **Licensed and Functional Specialty –** Licensed and functional specialties are as reported by the College of Physicians and Surgeons of Nova Scotia as of May, 2011 and tracked by Department of Health and Wellness in the Physician Human Resource Database (PHReD). The functional specialty, in almost all cases, is the same as the licensed specialty. For Canadian trained physicians, the licensed specialty is determined by certification by the Royal College of Physicians and Surgeons or the College of Family Physicians of Canada. In a few cases, e.g., a General Practitioner (GP) working solely in the Emergency Department, the functional specialty may differ from the licensed specialty, but this only occurs when the variation is confirmed by the DHA or IWK. Where a physician is licensed in more than one specialty, e.g., emergency medicine and critical care medicine, the CPSNS will notify the Department of Health and Wellness of the predominant clinical practice.

6. **Net (Export)/Import –** Physician resource planning at the DHA and local level requires examination of patterns of service utilization by local residents and those who commute to a community to receive care. This is also true of physicians who commute outside a primary location to other communities to deliver care. In physician resource plan vernacular, this pattern of commuting to access or to provide care is termed '(export)/import' of services. Net (Export) means the residents of a given DHA access more services outside their DHA than they do within it. Net Import means the opposite, providing more services within the DHA than are accessed outside it.

7. **Part-Time Academic –** Appointment status is 'part-time' or less than 50% of professional time such as a non-salaried academic appointment with Dalhousie Faculty of Medicine as a lecturer. Typically these are non-research clinical preceptor/teacher positions.

8. **Sentinel Services (Physician) –** Sentinel services represent a significant proportion of the workload for a particular specialty. These are "determined by true patient need and not likely influenced heavily by physician discretion". For example hip or knee replacements in orthopaedics, deliveries in obstetrics, cholecystectomies and mastectomies in general surgery, and cataract surgery in ophthalmology (Ontario: Expert Panel on Health Professional Human Resources, 2001).

3 Key Observations

3.1 Introduction

The Department of Health and Wellness (Department of Health and Wellness) is the project sponsor for a Physician Resource Plan (PRP) for Nova Scotia on behalf of the Government of the Province of Nova Scotia (GNS) and the population it serves for the programs it delivers. The primary project objective is to deliver a quality, expertly led, collaboratively developed, ten-year physician resource plan (the 'deliverable'). The Department of Health and Wellness expectations for the deliverable are that it be evidence-based and forecast an appropriate, affordable, equitable, detailed description of need for the physician workforce for the coming ten years (2012-2021). The Consultant (Social Sector Metrics Inc. – Project Manager, and Health Intelligence Inc.) was contracted to design, deliver, and recommend the PRP as an evidence-based document.

There are four project deliverables: a Project Charter (May 2011) and Environmental Scan (September 2011), followed by PRP options analysis (October 2011) and a final report with recommendations.

The Consultant worked with two project committees:

Project Advisory Committee: comprised of senior executive representation from each key stakeholder, namely: DHAs, IWK, DNS, DFM, CPSNS, and the Department of Health and Wellness. It provided strategic feedback and advice on project methodology, draft reports, and recommendations.

Technical Working Group: comprised of a skilled methodology and data expert group of individuals providing detailed input and advice on methodology and particularly data sources, quality, and evaluation.

3.2 Governmental Strategic Direction

From the outset, the Department of Health and Wellness emphasized key principles to underpin the project. The physician resource plan must be:

- **Appropriate to population need**
  - Evidence-based markers of population need, e.g., growth, aging, mobility, gender, disease incidence/prevalence rates and morbidity and mortality rates
- **Affordable now and sustainable into the future**
  - Competitive relative to, and appropriate to, the economic base
- **Equitable across the geographic distribution of the population**
  - Local access to core services, referral access to added services
- **Preserve and enhance quality of care**
  - Acceptable, appropriate, accessible, efficient, effective, and safe
- **Supports appropriate access to needed services**
  - Local, regional, provincial, extra-provincial access
  - Standards and targets
- **Aligned with appropriate inter- and intra-professional, innovative, delivery models**
  - Collaborative models of care, role optimization of health professions

- **Designed in context of government and stakeholder strategic priorities and plans for the health system**
- **Appropriate to academic clinical mandate (education, teaching, research, leadership/administrative services)**
    - Consistent with approved mandate, strategic plan, defined goals, objectives, targets, and performance
    - Inclusive of education, teaching, research, leadership/administrative services
- **Inclusive of relevant determinants of current and future physician supply**
    - Age, gender, Canadian and provincial undergraduate and postgraduate medical education, international medical graduates, Canadians studying abroad
- **Predicated upon productive, sustainable, quality, benchmarked workload**
    - Full-time equivalency, sustainable call rota, sentinel equivalency, qualitative and quantitative metrics, protected time

3.3 Purpose and Scope

The Environmental Scan provided evidence-based information to inform the subsequent discussion, design, and development of a PRP model and forecast for the province. The Environmental Scan did not make recommendations on the PRP model and forecasting parameters. An Environmental Scan is an evidence gathering, synthesis, and reporting process designed to enable detailed, informed discussion on potential direction(s) for the subsequent PRP methodology and model.

To achieve its purpose the Environmental Scan included detailed research and analysis on:

- PRP methodologies
- Trends in the national health system environment with relevance to PRP
- Population Need - Current and future state of indicators of population need
- Physician Supply - Current and future state of indicators of physician supply and services
- Stakeholder perspectives – DHAs, Academic Medicine, individual specialties
- Physician Need – Review of specialty-specific indicators of population need and physician supply

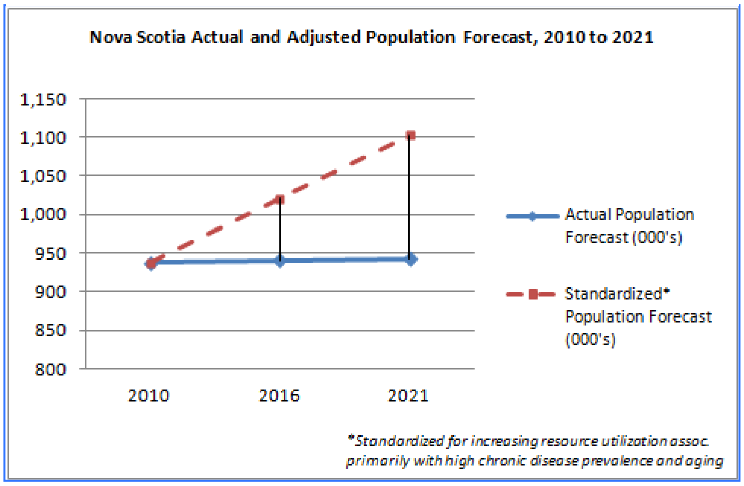
The Consultant conducted more than eighty separate interviews, plus follow-up communications in preparing the Environmental Scan. Many of the interviews involved five or more representatives. The Consultant also conducted data collection and analyses from multiple provincial data sets including physician payment, workload, hospitalization, academic roster, CPSNS roster, DNS survey, geographic data, wait times, and provincial programs. Project engagement and collaboration across the key stakeholders was high throughout the study.

3.4 Environmental Scan Key Observations

Context

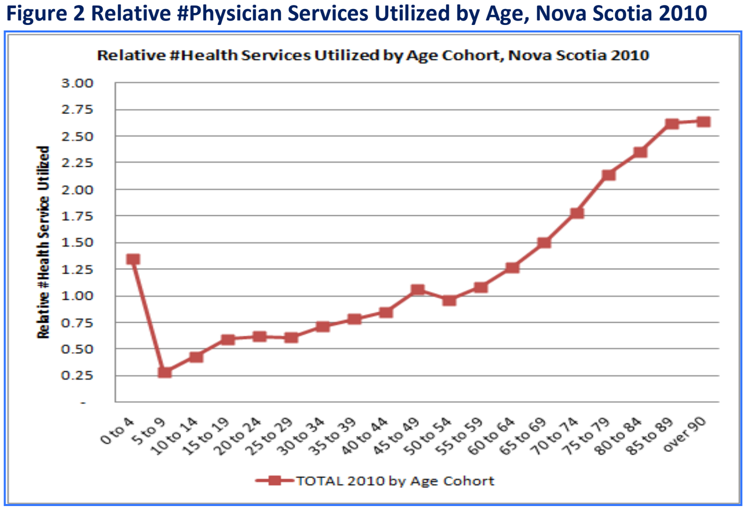
The provincial population context for health human resource planning is reflected in the adjacent graph. The bottom line represents the constant population of approximately 945,000 forecasted to 2021. The upper dotted line represents the standardized, for health service utilization, population forecast for the same period. In other words because the population will have increased chronic disease prevalence (assuming no change in the current trend) and be 6% older on average by 2021, it will consume health services equivalent to a population of 1,100,000.

Figure 1 Nova Scotia Actual and Adjusted Population Forecast, 2010-2021



So, while the actual population will show virtually no change in size, the impact on health service utilization if chronic disease prevalence does not stabilize, combined with an aging population, will be as if the population size increased 16%. The adjacent graph illustrates the increased utilization of health services in Nova Scotia as a population with high chronic disease prevalence ages.

Figure 2 Relative #Physician Services Utilized by Age, Nova Scotia 2010



A well-designed, evidence-based integrated physician resource plan is a critical requirement in order to effectively direct the health care system to meet the future needs of the population in an appropriate, affordable, quality, and equitable manner.

The following key observations reflect the cumulative research, analysis, modeling, and forecasting generated over the course of the project and documented in this final report. These observations serve two specific purposes: to provide context within which the subsequent recommendations can be interpreted, and to identify to the reader key developments in the national, provincial, and local environments that are particularly relevant to PRP planning, implementation, and its ongoing maintenance and enhancement.

KEY OBSERVATIONS

National Physician Resource Planning - Key Findings in the Nova Scotia Context

Health Care Delivery

- Quality of Care – Physician resource planning must maintain and enhance the quality of patient care. The importance of this outcome was emphasized by the Department of Health and Wellness in the guiding principles and roadmap for this project: “Preserve and enhance quality of care - acceptable, appropriate, accessible, efficient, effective, and safe”. A robust quality framework, evaluation methodology and processes are required to measure performance against this outcome. In this context the concurrent departmental renewal of its quality framework is fundamental to the ongoing management of the physician resource plan. For example, access to care guidelines will inform service delivery models that in turn, will inform physician resource planning.
- Primary Health Care - There is universal agreement that primary health care is the foundation of a quality health system. For a physician resource plan, this requires that the foundation is stable, sustainable, and high performing. Family practice models must be assessed in context of primary health care and collaborative care. Contracts must be structured to deliver performance-based services and sustainable recruitment and retention.
- Collaborative Care – The Primary Health Care Transition Fund of Health Canada working definition of collaborative care is, “The positive interaction of two or more health professionals, who bring their unique skills and knowledge, to assist patients/clients and families with their health decisions.” Examining a family physician and nurse practitioner practicing collaborative care in the United Kingdom National Health Service, United States Veterans Administration, and a study in Ontario indicate that a nurse practitioner, functioning to full scope of practice, can add a minimum of 604 patients to a family practice. The current “family practitioner only” ratio in Nova Scotia is 1.0 FTE per 1,121 residents, indicating that collaborative family practitioner/nurse practitioner practice can provide care for a minimum 1,725 residents while maintaining or improving health outcomes for all patients.

  From project inception, Nova Scotia has emphasized the strategic importance of evolving the current model of health services delivery to a fully collaborative care based model. The objective is to redesign primary health care delivery to a patient-centric model with care provided by collaborative care teams on a comprehensive basis (augmented by a provincial HealthLink 811 service). Key elements include enhanced access to culturally sensitive care, comprehensive chronic disease prevention and management, population-based services and programs, full use of electronic medical records, quality monitoring, dedicated time to team building and collaboration, and all providers functioning to a full scope of practice. The following figure illustrates current thinking on collaborative care in Nova Scotia.

Figure 3 Nova Scotia - Future of Primary Health Care

Current Model	Future Model
Problem-focused care	Patient-centred care
Heavy burden on individual providers	Collaborative care team (mix of providers) working to full scope-sharing the burden
•Up to 2-6 week wait for appointments •Availability 9 am to 5pm, 4-5 days/week •Walk-in clinics available (episodic care) •ER used as default	•Same day / Next day appointments •Extended hours, 7 days / week •Comprehensive care
Individual paper-based systems	Shared information - Electronic Medical Records
Reactive – high dependence on rescue technology	Proactive – preventative care and chronic disease management
Recruitment and retention challenges	•Should lead to increased job satisfaction •Better work/life balance (team support)

- Inpatient Care – Nationally models of inpatient care continue to evolve. Limited published evidence suggests there is little cost (e.g., longer stays) and quality (e.g., readmission, death) difference among patients managed primarily by family practitioners, general internists, or special interest/trained hospitalists. Hospitalists are predominantly family practitioners, general internists, or general paediatricians. An integrated model of one general internist consultant working seamlessly with family practitioners in a broader inpatient collaborative care team limits inefficiencies and quality issues associated with specialists, general internists, and family physicians providing inpatient care in isolation. General internists provide an effective bridge between family practitioners and subspecialists. In Nova Scotia 40% of all admissions are managed by family practitioners.
- Regionalization – Across Canada consolidation of governance from many local Boards to a few regional Boards has been undertaken to improve health system delivery performance through better system integration and rationalization. Consolidation of governance entities will also benefit provincial physician resource plan implementation (e.g. core services model, collaborative primary care) by delivering improved system wide integration and rationalization.
- Technology – Technology has a significant impact on physician practice and therefore on physician resource planning. A robust, evidence-based, assessment of technology is essential to separate efficacious advances from opportunistic changes in technology. The former can increase the need for physician resources while providing a positive overall cost/benefit. The latter can increase the need for physician resources but provide a negative overall cost/benefit. Advances in non-invasive surgical interventions continue to drive practice convergence, for example, the role of cardiologists, interventional radiologists, and cardiac surgeons in a broad range of heart procedures.
- Healthcare Policy – Healthcare policy, derived within a system an environment of finite resources, frequently impacts physician resource planning. For example, implementation of a cancer screening guideline revision may require more diagnostic endoscopy and a greater number of appropriately trained physicians to provide the service. Extending hours of in-house physician coverage of a particular service is another example of healthcare policy impacting physician resources. It is essential that physician resource plans be reflective of healthcare policy. The proposed physician resource plan model specifically incorporates the impact of healthcare policy as a defined variable.
- Core Physician Services - The concept of ‘core’ services has been implemented in a number of provinces. In general terms, the objective is to enable timely access for all residents to a defined range of primary and secondary care services, while centralizing tertiary and quaternary services. The consensus practice in Canada is to include the following as physician core services: comprehensive family practice, emergency medicine, general internal medicine, general surgery (and corresponding anaesthesia services), and general psychiatry, paediatrics, and obstetrics/gynaecology, supported by general laboratory (i.e., specimen collection and transport) and radiology (i.e., screening, routine diagnostic and imaging, x-ray, ECG) services. Detailed clinical service planning across all services is required to successfully implement a core service model.

Physician Supply

- Population per FTE – According to revised[1] CIHI data, Nova Scotia has less population per physician FTE than the Canadian average. In 2008/2009 the population per physician FTE in Canada was 553:1 compared to 514:1 in Nova Scotia. On this basis, Nova Scotia has 7.1% more physicians, equivalent to 129 FTE. The family practitioner ratio in Canada was 948:1 compared to 1,114:1 in Nova Scotia. On this basis Nova Scotia has (17.5%) fewer family practitioners, equivalent to (148) FTE. The specialist ratio in Canada was 1,354:1 compared to 953:1 in Nova Scotia. On this basis Nova Scotia has 30% more specialists, equivalent to 293

[1] See also ‘Key Definitions #3.d.’ for relevant methodology notation.

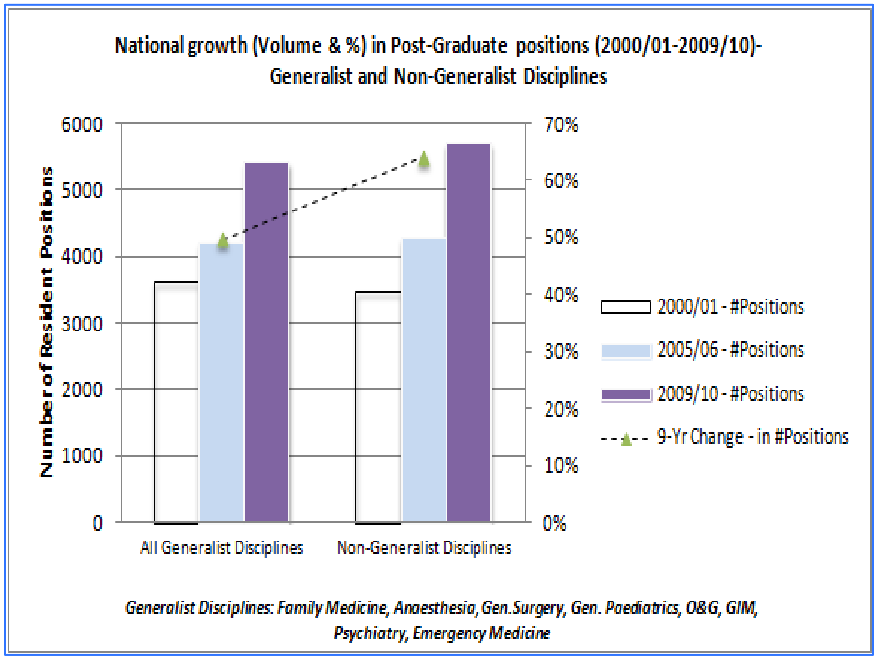
FTE. Population to FTE ratios of physician supply are a significant improvement on population to physician count ratios but do not substitute for more detailed assessment within each specialty. For example, the population of Nova Scotia has the highest or among the highest prevalence of chronic disease and certain subspecialties serve the broader Atlantic province population. These and other factors are incorporated in the forecast model and results.

Figure 4 Provinces - Population per Physician FTE, 2008/09 (Source: CIHI)

Population per Physician FTE (FFS plus Alternate Payments), 2008–2009	N.L.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Canada	N.S.-% more/(less) Physicians
Family Medicine	943	1,021	1,114	1,107	1,027	856	1,014	969	1,045	973	948	(17.5%)
Medical Specialties (All)	2,049	2,998	1,305	2,167	1,895	2,084	2,209	2,914	3,030	2,093	2,097	37.8%
Internal Medicine	4,584	6,495	2,341	5,886	4,118	4,074	4,272	6,422	8,805	5,504	4,509	48.1%
Neurology	43,480	u/a	48,933	57,715	32,972	42,572	64,902	60,968	90,576	37,878	42,920	(14.0%)
Psychiatry	9,393	8,644	7,853	11,584	7,764	9,398	9,877	11,630	9,483	9,827	9,066	13.4%
Pediatrics	8,567	28,595	6,137	18,181	12,118	11,855	11,681	18,706	13,796	13,151	12,120	49.4%
Dermatology	42,165	u/a	53,528	88,978	47,032	66,921	89,767	257,841	73,009	90,616	64,964	17.6%
Physical Medicine	u/a	34,600	80,617	8,219	45,265	193,403	192,328	36,077	72,501	12,363	42,451	(89.9%)
Anesthesia	u/a	u/a	u/a	u/a	u/a	u/a	u/a	u/a	u/a	u/a	u/a	u/a
Surgical Specialties (All)	3,843	4,759	3,538	3,518	3,983	3,559	4,158	3,860	4,965	3,689	3,824	7.5%
General Surgery	13,768	13,356	17,950	17,171	16,257	16,364	16,189	15,667	25,533	20,838	17,466	(2.8%)
Thoracic/Cardiovascular	188,253	u/a	44,401	89,625	180,462	112,019	72,429	109,978	100,900	42,448	93,566	52.5%
Urology	64,140	u/a	50,996	36,287	50,244	46,975	84,257	82,733	80,423	60,585	53,534	4.7%
Orthopaedic	43,009	u/a	27,364	24,090	27,810	23,915	27,240	25,343	31,967	23,746	25,988	(5.3%)
Plastic	u/a	u/a	88,973	56,685	98,155	70,360	70,795	60,234	77,057	46,283	71,968	(23.6%)
Neurosurgery	u/a	u/a	101,433	109,146	139,684	130,819	u/a	77,315	142,478	116,892	130,455	22.2%
Ophthalmology	31,046	30,619	19,903	22,931	26,683	25,253	38,702	25,480	33,158	24,331	26,298	24.3%
Otolaryngology	35,017	138,400	39,118	44,397	45,507	50,656	73,982	61,357	72,888	46,702	50,459	22.5%
Obstetrics/Gynecology	13,426	10,485	19,485	19,062	20,102	16,180	19,952	20,620	22,353	20,740	18,394	(5.9%)
Population/Specialty FTE	*1,336*	*1,839*	*953*	*1,341*	*1,284*	*1,314*	*1,443*	*1,660*	*1,882*	*1,335*	*1,354*	29.6%
Population/All Physician FTE	*542*	*617*	*514*	*594*	*560*	*516*	*589*	*601*	*672*	*560*	*553*	*7.1%*
% more/less than Canada mean	1.9%	(11.6%)	7.1%	(7.6%)	(1.3%)	6.7%	(6.6%)	(8.8%)	(21.6%)	(1.4%)	0.0%	
Total Physician - COUNT	1,213	298	2,186	1,593	16,427	24,596	2,399	1,836	6,772	9,611	66,931	
Population/Physician Count	417	464	424	465	468	521	497	546	519	450	491	
% more/less than Canada mean	14.9%	5.4%	13.6%	5.3%	4.6%	(6.1%)	(1.3%)	(11.3%)	(5.8%)	8.4%	0.0%	

- Physician Mix – In general terms, Nova Scotia is well supplied with physicians in comparison to other provinces. It does however, have a pronounced difference in mix of physicians compared to other provinces. In 2008/2009, the ratio of family practitioner to specialist was 1.4:1 in Canada and 0.9:1 in Nova Scotia. The ratio of medical to surgical specialist was 1.8:1 in Canada and 2.7:1 in Nova Scotia.
- Generalism – The foundation of a core service model is the generalist physician specialties listed previously as 'core physician services'. It is commonly agreed that over the past thirty years the health care system physician workforce has become overly subspecialized and does not have enough generalists. Despite a 57% increase since 2000 in the size of the undergraduate and postgraduate medical education and training programs, there are proportionately more subspecialists entering the workforce than ever before.

Figure 5 National Growth (Number and %) in Postgraduate Positions (2000/01-2009/10) - Generalist & Non-Generalist Disciplines



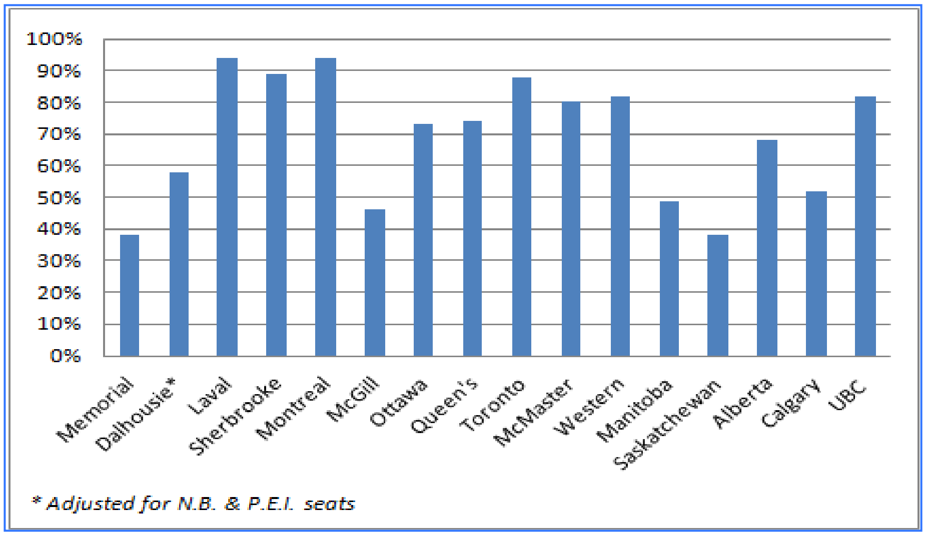
The pattern of growth at Dalhousie Faculty of Medicine parallels the national medical education system in terms of generalist/non-generalist distribution.

One of the keys to changing the distribution is altering the wide latitude afforded residents to pursue subspecialization after PGME year 3 once core training is completed in general surgery, general paediatrics, and internal medicine.

Non-generalist postgraduate training positions have increased by 64% compared to a 50% increase in generalist positions since 2000. The Royal College Physicians Surgeons of Canada and College Family Physicians of Canada view workforce supply compared to population need as a government responsibility. Governments and their primary delivery agents, health authorities, and faculties of medicine, will need to take responsibility for managing the supply of physicians to meet the need of populations.

- Physician Age - Nationally, the average age for family practitioners and specialists is 49.1 and 50.3 years respectively. Nova Scotia is comparable at an average age of 49.6 years for family practitioners and 49.9 years for specialists.
- Physician Gender – Nationally 35% of practising physicians and 28% of FTEs are female. In Nova Scotia the percentages are slightly higher at 37% and 31%, respectively. In 2009/2010, women represented 53% of first year medical postgraduate trainees, 45% of surgical, 46% of laboratory medicine, and 63% of family medicine trainees. Both the national and Nova Scotia ratio will continue to change towards a 47% men, 53% women ratio based upon current UGME and PGME trends. Data shows that women work from 10% to 20% less over their career span than men. Notably before and after family-raising years, women will work similarly or equivalently to men. The physician resource plan model and resulting forecasts in this Final Report adjust for the changing gender mix.
- Physician Practice Location and Medical School of Graduation – The location of the medical school of graduation is the single biggest factor in determining where physicians decide to practice. Only Newfoundland, Quebec (McGill), Manitoba, and Saskatchewan had less than 50% of practicing physicians as graduates of their medical school. Nova Scotia retains 58% of Dalhousie Faculty of Medicine graduates and Dalhousie Faculty of Medicine graduates comprise 47% of all practicing physicians in the province.

Figure 6 Percentage of Canadian-trained physicians practising in the jurisdiction where they graduated from Medical School, 2009 (Source: CIHI)



Given 58% of Dalhousie Faculty of Medicine graduates practice in the province, there is strong motivation to better align the postgraduate residency programs with the needs of the population and also to educate undergraduates accordingly.

- International Medical Graduates (IMGs) –Individuals who receive basic medical degrees from medical schools that are not accredited by the Committee on Accreditation of Canadian Medical Schools (CACMS) or the equivalent committee in the United States, the Liaison Committee on Medical Education (LCME), are considered to be IMGs. IMGs are typically Canadian citizens or permanent residents. Approximately thirty percent (30%) of IMGs are Canadians Studying Abroad (CSA). These individuals are typically born in Canada and take their undergraduate medical education outside Canada. Their main motivation (78%) for studying abroad is their inability to obtain a place in the highly competitive Canadian medical school system. In 2011, approximately 3,250 CSAs were studying medicine abroad with approximately 650 graduating each year and adding an additional 25% to the number of students looking for postgraduate training positions in Canada. Significant time is required to evaluate their UGME experience. In 2010, approximately 100 residents of Nova Scotia were CSAs, with approximately 25 applying annually through Canadian Resident Matching Service (CaRMS) to obtain a Canadian postgraduate training position.

  Approximately 45% of IMGs enter medical practice after completing postgraduate training in Canada and 55% enter practice by meeting requirements for licensure without Canadian postgraduate training. Licensure requirements are administered at a provincial level but certain requirements are common to all provinces such as successful completion of the Canada Evaluating Exam (MCCEE) and the Medical Council of Canada Qualifying Exam Part 1 (MCCQE1).

  IMGs are an integral component of physician workforce planning. Since 2000 IMGs have filled one in three vacancies and new positions per year across Canada. Since 2005, 320 per year have entered practice after completion of Canadian postgraduate residency training and 400 per year have entered practice directly by meeting licensure requirements. In Nova Scotia, an average 45 IMGs have entered practice annually since 2000 and have filled approximately 40% of vacancies and new positions.

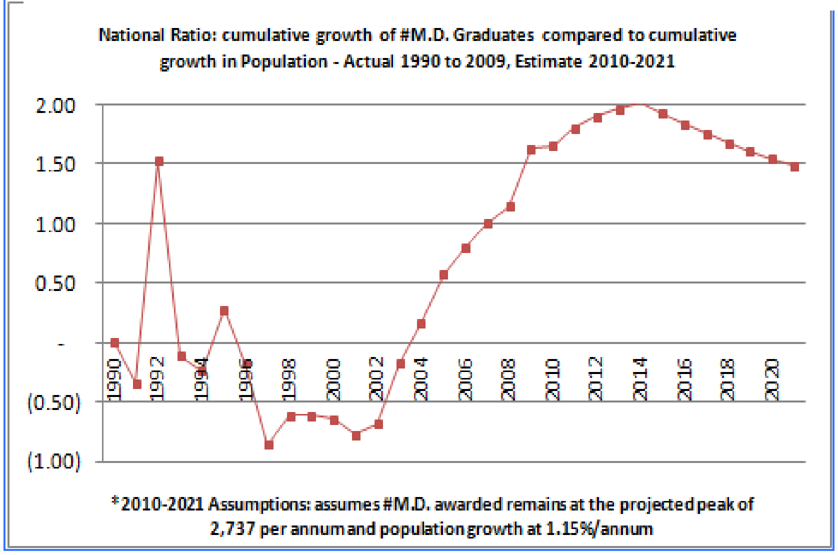
  IMGs also present two key challenges to physician workforce planning. Firstly, while robust data is available nationally on the 45% IMGs in Canadian postgraduate training, information on the 55% entering practice directly resides at a provincial level and is therefore less accessible and standardized. Secondly, IMGs are very likely to move jurisdictions once initially licensed. Nationally only 65% are continuously active five years later in their initial practice jurisdiction and in Nova Scotia the number drops to 36%. Physician workforce planning must recognize and address these challenges.

- Net Interprovincial Migration (NIPM) – Between 2008 and 2009, Ontario and British Columbia had a net increase and the remaining provinces a net decrease in physicians as a result of NIPM. Only about 1% of the national physician workforce changes provinces annually. Nova Scotia had a net out migration of 1.1% between 2008 and 2009 and most of these individuals are assumed to be IMGs.

- Hours of Work – Average hours worked remain relatively unchanged with the influx of new physicians to the workforce. The 2010 National Physician Survey suggests the average hours worked per week remains unchanged since 2003. The national and Nova Scotia average remains in the 50-55 hours per week range, excluding hours on-call. Contracts for service paid at full-time rates that require fewer hours of work are having a significant impact on productivity.

Physician Supply – Canadian Medical Education System

Figure 7 National Ratio: cumulative growth of #M.D. graduates compared to cumulative growth in population - Actual 1990 to 2009, Estimate 2010-2021

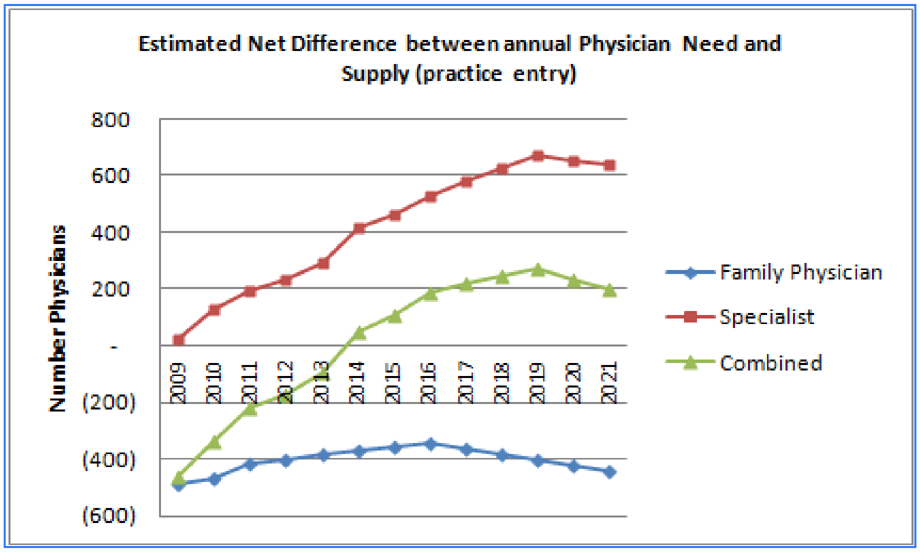


- Postgraduate training – Postgraduate trainee positions for Canadian citizens and permanent residents have increased 57% (4,011 positions) nationally since 2000 or 6.3% annually. Canada's population has grown an average 1.15% per annum over the same period.

  M.D. expansion since 2000 will have a profound impact on physician supply throughout and beyond the forecast period ending 2021.
  The figure does not ascertain whether a 1990 base year represents equilibrium between need and supply or whether population growth on its own might represent need. The figure does, however, illustrate a sustained increase in physician workforce disproportionate to population growth. Some likely medium and long-term outcomes of this dramatic sustained change in physician human resources include:

  - A significant reduction in need for graduates of medical schools outside Canada, necessitating a fairly expedient revision of relevant strategies.
  - Acceleration of the rise in fee-for-service costs in the absence of control of medical insurance billing numbers. The rise in fee-for-service costs will be much greater than the rate of age/gender standardized population growth, chronic disease, and other sentinel indicators of population need. This should provide substantial, increased impetus to governments to increase the proportion of physician payments paid by non-fee-for-service performance-based contract methods.
  - Continued domestic shortage of family physicians and growing domestic surplus of specialist trained physicians (37% of practice entrants were family physicians in 2009 compared to 51% of the workforce). The family physician shortage, without a change in PGME position allocations, would need to be filled by IMGs. The specialist surplus will be compounded by IMGs coming to Canada unless government policies and strategies are revised.

Figure 8 Estimated Net Difference Nationally between Annual Physician Need and Supply



This figure estimates physician need as the sum of annual turnover (e.g., retirement) plus population growth plus gender shift adjustment. Physician supply is based on the expanded M.D. programs plus continuance of incoming IMGs, including CSAs.

Since the 1990's the medical education system has invested heavily in renewing curriculum and teaching models (e.g., CanMEDS, community-based learning, longitudinal clerkships) and expanding education and training capacity to accommodate the dramatic growth in the number of UGME and PGME learners. Conversely there is little evidence of physician resource planning at the national or provincial levels to provide evidence-based direction and long term stability to the medical education system. Nova Scotia, by developing a physician resource plan, is availing itself of the opportunity to provide provincial direction and greater stability to the Dalhousie Faculty of Medicine UGME and PGME programs. The absence of national and inter-provincial collaboration on physician resource planning is a challenge Nova Scotia will have to manage proactively going forward.

Other

- Physician Payment Systems - Nationally, in 2008-09, 27% of payments were non-fee-for-service with the range being 49% in Nova Scotia to 15% in Alberta. Nova Scotia is a national leader in advancing alternative payment systems. Evidence supports the permanence, growth, and evolution of non-fee-for-service payment models. Alternative payment systems create a challenge for physician resource planning if an accurate measurement of services delivered is not maintained. This is not to say the services should be identical to fee-for-service; they do, however, need to be systematically defined, measured, and reported.

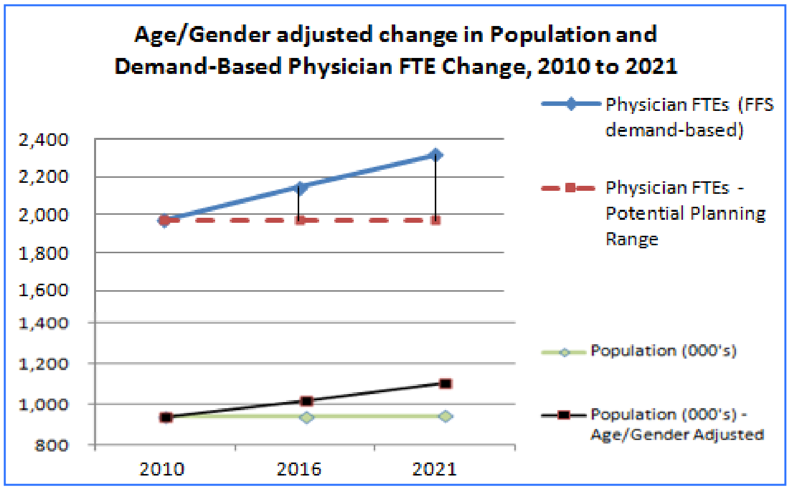
Figure 9 Physicians by Province paid partially and mainly through alternate payment methods, 2008/09 (Source: CIHI)

Figu

PROVINCE	Total #Physicians	# Receiving any portion of income from APP payments		Portion receiving majority income from APP payments		08-09 Pop.	#/1,000 Pop.
N.L.	1,213	610	50.30%	503	41.50%	506.5	2.39
P.E.I.	298	249	83.60%	169	56.70%	140.1	2.13
N.S.	2,343	1,546	66.00%	611	26.10%	927.5	2.53
N.B.	1,593	1,048	65.80%	666	41.80%	741.1	2.15
Que.	16,427	11,763	71.60%	4,452	27.10%	7,759.8	2.12
Ont.	24,596	13,447	54.70%	5,320	21.60%	12,952.9	1.90
Man.	2,399	1,890	78.80%	523	21.80%	1,204.3	1.99
Sask.	1,836	458	24.90%	n/a	n/a	1,015.6	1.81
Alta.	6,772	1,051	15.50%	700	10.3%	3,609.1	1.88
N.W.T.	78	75	96.20%	75	96.20%	n/a	n/a
Total	**67,166**	**35,051**	**52.2%**	**N/A**	**N/A**	**33,250.2**	**2.02**
Source: CIHI							

- Across Canada, physician resource planning is primarily reactive, unplanned, and predominantly demand-based. The following figure forecasts FTE growth in Nova Scotia of approximately 400 (20%) by 2021 in the current reactive, unplanned, demand-based environment.

  This FTE growth will arise primarily as a direct result of a dramatic increase in physician supply in context of an aging population with high chronic disease prevalence. Physician supply in excess of population-need will generate supply induced increases in service delivery.



Provincial Physician Resource Planning - Key Findings from Provincial Organizations, DHAs, and IWK

- Key Provincial Organization Observations
  - There is a strong reliance on IMGs to fill recruitment vacancies in physician workforce
  - It is essential to engage physician representatives in the project
  - Alternative Funding Plans are undergoing needed review and revision
  - There is strong support for expansion of collaborative care models
  - Provincial programs are focused and most continue to become progressively sophisticated. The use of multi-disciplinary teams is prominent in a number of the programs.
- Key Observations from interviews with DHAs and IWK
  - Seven DHAs cited a pressing need for improved access to quality mental health services
  - Five DHAs cited population with high social need linked to low income, low education, and moderate to high unemployment
  - A strong need for generalists was cited by seven DHAs
  - Opportunities to expand adoption of collaborative care models were cited by five DHAs
  - Majority felt that relations and engagement was generally good with Dalhousie Faculty of Medicine
  - Consensus that Dalhousie Faculty of Medicine needs to train more generalists
  - All DHAs and IWK have high interest in contributing to the physician resource plan project and most have provided substantial submissions to the Consultant
- Significant productivity differences exist across DHAs for the same specialty. Productivity is a function of many factors including infrastructure, distance, call-duty, and volume of local demand. Traditional productivity assessments do not incorporate measures of the quality of services.
- DHA local residents will commute beyond the county and DHA boundaries to receive care and physicians will also commute beyond a primary location to other communities to deliver care. This '(export)'/import

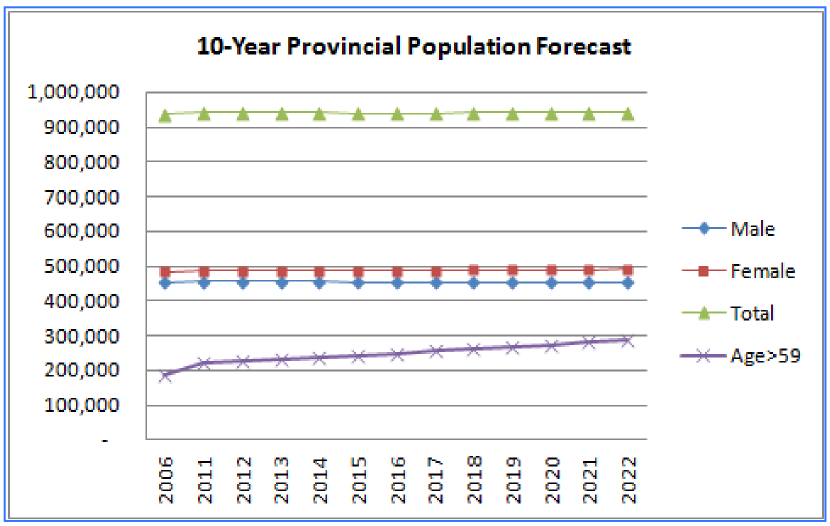
(see Key Definitions) behaviour is commonplace in health systems. Export/import behaviour provides valuable insight for service planning. For example, residents of South Shore and Colchester East Hants DHAs access 6% and 9% of general practice services outside their District Health Authority. This may represent a physician resource plan service gap. Similar examples exist in the data reflecting generalist services such as internal medicine, general surgery, and obstetrics.

- Surgical wait lists and times are tracked comprehensively. Wait lists are growing in most surgical services, albeit with significant variance across DHAs. Productivity per surgeon also varies significantly across DHAs.

Nova Scotia - Population Characteristics

- Population Growth - The population will not increase for the forecast period to 2021. DHA population will decrease slightly with the exception of Capital District Health Authority, which will increase by 17,500 by 2021. The average population age is forecast to increase 6% from 41.3 years in 2011 to 43.9 years in 2021. The age cohort greater than 60 years will increase from 23.4% to 30.5%.

Figure 11 Ten-Year Provincial Population Forecast (Source: NS Department of Finance



- Population Rurality and Remoteness – Nova Scotia has a population density three times the national average (excluding the Northwest Territories, Yukon Territory, and Nunavut). In this context remoteness and rurality are not significant factors for provincial physician resource planning in Nova Scotia. They are, however significant factors for subsequent clinical service planning since many people live in rural areas and some live in communities that are both rural and remote.

- Population Diversity - A physician resource plan must be able to serve the population with sensitivity to its characteristics and demography. 4% (approximately 37,000) of Nova Scotians have French as their first language and 2.5% are First Nations aboriginal. Among visible minorities, those of African descent are by far the largest group at 2.5%. Very few of African descent enter medical school in the province and those that do then leave to practice elsewhere.

- Chronic Disease - The prevalence of chronic disease in Nova Scotia is at or near the highest among Canadian provinces (Source: Public Health Agency of Canada, Community Health Survey). For example the following are all higher than the national average:
  - Arthritis - 61% higher (i.e., Nova Scotia 24.5%, Canada 15.2%);
  - Asthma - 14% higher (i.e., Nova Scotia 9.2%, Canada 8.1%);
  - Chronic obstructive pulmonary disease - 67% higher (i.e., Nova Scotia 7%, Canada 4.2%);
  - Diabetes - 28% higher (i.e., Nova Scotia 7.7%, Canada 6%);
  - Heart disease 33% higher (i.e., Nova Scotia 6.4%, Canada 4.8%); and
  - Hypertension 27% higher (i.e., Nova Scotia 21.5%, Canada 16.9%).

The incidence rate of new chronic disease cases in Nova Scotia is fairly constant with the exception of diabetes whose incidence has increased from 8.3% to 9.9%. Obesity, as measured by adult body mass index equal to or greater than 30, is 36% higher in Nova Scotia than the national average. The 'perceived' health of Nova Scotians is comparable to other provinces.

- Cancer - The incidence and prevalence of most female and male cancer types in Nova Scotia is or is near the highest in Canada. Combined cancer incidence is 12% higher than the Canadian average. The rate of change in cancer incidence has been slight.
  - The female age-standardized incidence rate (ASIR) of various cancers has increased 4.2% between the period of 2000-2004 and 2011 with significant variation by type of cancer. Non-Hodgkin's lymphoma and malignant melanoma account for the increase, while ovarian, cervical, and colorectal cancers have declined. ASIR overall is 7% higher in the province (396.0) compared to the national average (369.0).
  - The male ASIR of various cancers has increased slightly at 1.2% between the period of 2000-2004 and 2011 with significant variation by type of cancer. Bladder cancer and malignant melanoma account for the increase while lung, oral, and colorectal cancers have declined. ASIR overall is 16% higher in the province compared to the national average.
- Mental Health - It is estimated that 11.6% of Canadians suffer from some form of mental health disorder in comparison to 15% of Nova Scotians. 15% of Nova Scotians suffering from a mental health disorder are seen by a psychiatrist, 42% by a family practitioner, 10% by a psychologist, and 10% by a social worker. These figures exclude neurologic disorders most frequently associated with aging, such as the dementias.
- Provincial Programs – selected key findings
  - Cancer Care – Patient outcomes appear to be poor in comparison to other provinces.
  - Diabetes Care - The network of Diabetes Centres is unique in Canada and appears to be a significant factor in improved quality of care albeit with less evidence of this improvement in Halifax.
  - Cardiovascular Health – Expect specialists that are hybrid trained with fewer cardiac surgeons, and increasing collaboration and integration among cardiology, interventional radiology, cardiac and vascular surgery.
  - Renal Disease – Increased numbers of Nova Scotians are diagnosed with kidney disease, resulting in a 6% growth in demand for renal replacement therapy annually.
  - Reproductive Care - Birth rates have reversed downward trend and stabilized with some upswing (more in urban than rural).

Nova Scotia - Physician Supply

- Physician Supply Total - There were 1,988 physician FTE in 2009/10 in the province with a count of 2,215 active physicians from a CPSNS total registry of approximately 2,800. The majority (58.6%) are based in Capital DHA and IWK.

Figure 12 Number of FTE by Physician Category by DHA/IWK, 2009/10 (Source: NS MSI)

Category	DHA1 SSH	DHA2 SWNDHA	DHA3 AVH	DHA4 CEHHA	DHA5 CHA	DHA6 PCHA	DHA7 GASHA	DHA8 CBDHA	DHA9 CDHA	IWK	FTE PROVINCE	COUNT PROVINCE
Diagnostic & Therapeutic	6.8	6.6	10.8	6.7	2.5	3.8	5.4	12.9	85.2		141	151
Family Medicine/Practice*	53.6	52.0	68.1	60.3	29.8	33.4	44.1	103.8	395.6		841	940
Medical	12.5	12.7	22.5	19.5	6.8	11.1	13.5	51.8	315.3		466	519
Paediatric - Diagnostic & Therapeutic	-	-	1.0	-	-	-	-	-		12.1	13	15
Paediatric - Medical	1.2	3.1	2.7	6.2	-	1.0	3.1	7.4		99.7	124	137
Paediatric - Surgical	-	-	-	-	-	-	-	-		29.6	30	35
Surgical	16.0	14.1	31.3	16.1	7.5	11.9	12.5	36.7	227.1		373	411
TOTAL	90.1	88.5	136.4	108.8	46.7	61.3	78.6	212.5	999.9	164.8	1,988	2215
	4.5%	4.5%	6.9%	5.5%	2.3%	3.1%	4.0%	10.7%	50.3%	8.3%	100.0%	

*GPs with CCFP (EM) are included under 'Medical'

Figure 13 Population per Physician FTE, 2009/10 (Source: NS MSI)

- Physician Supply DHAs/IWK– The following figure identifies the ratio of population per FTE. The variance in population per Family Physician FTE ranges from 1,001 in DHA7/GASHA to 1,378 is DHA6/PCHA. GASHA is 12% above the provincial Family Practice average and PCHA is 19% below the average. The figure does not adjust for residents accessing services outside their DHA of residence. The IWK column is based on the population under age 18 only.

	DHA1 SSH	DHA2 SWNDHA	DHA3 AVH	DHA4 CEHHA	DHA5 CHA	DHA6 PCHA	DHA7 GASHA	DHA8 CBDHA	DHA9 CDHA	IWK	FTE PROVINCE
Population	59,782	62,097	82,028	72,222	31,485	46,093	44,106	125,829	418,881	*173,054*	942,522
Diagnostic & Therapeutic	8,742	9,371	7,589	10,780	12,374	12,196	8,190	9,788	4,916	n/a	6,696
Family Medicine/Practice*	1,116	1,194	1,205	1,198	1,057	1,378	1,001	1,212	1,059	n/a	1,121
Medical	4,768	4,898	3,652	3,695	4,604	4,135	3,276	2,431	1,334	n/a	2,030
Paediatric - Diagnostic & Therapeutic	-	-	82,028	-	-	-	-	-	-	11,079	56,712
Paediatric - Medical	-	20,129	30,465	-	-	-	-	-	-	1,799	7,800
Paediatric - Surgical	-	-	-	-	-	-	-	-	-	5,845	31,833
Surgical	3,741	4,391	2,617	4,477	4,207	3,864	3,529	3,425	1,833	n/a	2,515
TOTAL POPULATION/FTE	**663**	**701**	**602**	**664**	**675**	**752**	**561**	**592**	**419**	**1,050**	**474**
**GPs with CCFP (EM) are included under 'Medical'*											

Figure 14 CPSNS - Register Change 2006 to 2010

	2006	2007	2008	2009	2010	Change	
						Count	Annual %
Full Register	2001	2026	2026	2068	2102	101	1.3%
Defined Register	195	192	192	201	215	20	2.6%
Temporary Register	51	67	67	72	75	24	11.8%
Total	**2247**	**2285**	**2285**	**2341**	**2392**	**145**	**1.6%**
Specialists	1122	1159	1159	1195	1228	106	2.4%
Non-Specialists	1125	1126	1126	1146	1164	39	0.9%
Total	**2247**	**2285**	**2285**	**2341**	**2392**	**145**	**1.6%**
Place of Graduation							
Dalhousie	1050	1064	1064	1083	1089	39	0.9%
Other Canadian	540	551	551	559	587	47	2.2%
U.S.	34	37	37	30	32	-2	-1.5%
All other	623	633	635	669	684	61	2.4%
Total	**2247**	**2285**	**2287**	**2341**	**2392**	**145**	**1.6%**

- Physician Supply CPSNS – The CPSNS Defined Register lists physicians who are not eligible for full licensure; most are IMGs. The temporary Register lists physicians who are not eligible for full licensure but are sponsored by the Dalhousie Faculty of Medicine or Department of Health and Wellness and all are IMGs. CIHI data align with the CPSNS registry data and indicates an annual growth in count of 1.6% since 1999. Overall the provincial workforce continues to grow at a rate of 1.3% per annum according to the CPSNS register. The figure highlights the steady growth in provincial physician numbers.

Figure 15 Percent Above/(Below) the provincial average population per 1.0 Generalist FTE, 2009/10

Licensed Specialty	DHA1 SSH	DHA2 SWNDHA	DHA3 AVH	DHA4 CEHHA	DHA5 CHA	DHA6 PCHA	DHA7 GASHA	DHA8 CBDHA	DHA9 CDHA	TOTAL FTE Prov.
Population	59,782	62,097	82,028	72,222	31,485	46,093	44,106	125,829	418,881	942,522
General Practitioner	(5%)	(8%)	(6%)	(6%)	7%	(22%)	12%	(7%)	6%	0%
General Internal Medicine	15%	13%	0%	(7%)	45%	62%	10%	(31%)	(28%)	0%
Psychiatry	(298%)	(284%)	(119%)	(12%)	(44%)	(213%)	(6%)	(22%)	33%	0%
Paediatric General	nil	(34%)	(37%)	18%	nil	(105%)	37%	(30%)	25%	0%
Anaesthesia	(39%)	(76%)	(6%)	(92%)	(7%)	(78%)	(148%)	(67%)	30%	0%
General Surgery	19%	5%	(46%)	16%	(5%)	(2%)	19%	(53%)	7%	0%
Obstetrics & Gynaecology	12%	(19%)	14%	1%	(59%)	(26%)	29%	(73%)	10%	0%

- Physician Supply – Geographic Distribution of Generalist Physicians – The geographic distribution of generalist physicians is uneven. The figure below indicates the percentage each DHA is above or below (negative %) the provincial average population per 1.0 Generalist FTE. Six of nine DHAs have fewer general practitioners than the provincial average.

- Retirement - 31% of the current workforce will retire by 2021. This rate is consistent with national averages.
- Gender – Gender shift will continue in all specialties, especially in family practice, medical specialties, and diagnostic specialties. Female physicians work less over the course of their careers than males. 42.1% of family physician FTEs are female however 63% of PGME 1st year trainees are female. The adult medical specialties are 32% female now and this ratio will continue to increase to 53% over time. Paediatrics is 48% female and this will change somewhat over time to 50%-55%. Surgical specialties are 18% female currently and this will increase to 45% overall but with significant variation by surgical specialty.
- International Medical Graduates (IMGs) – Postgraduate trainee positions for Canadian citizens and permanent residents have increased by 57% (4,011 positions) nationally since 2000. This will have a dramatic downward effect on the need for IMG positions.
- National comparison of population to generalist physician FTE ratios – Compared to the national average population per FTE Nova Scotia has:
  - 4% fewer General Surgeons at 1:18,258 population compared to 1:17,481 nationally;
  - 5% fewer Family Physicians at 1:997 population compared to 1:947 nationally;
  - 8% fewer Obstetrician/Gynaecologists at 1:19,818 population compared to 1:18,335 nationally;
  - 54% fewer General Internal Medicine specialists at 1:21,652 compared to 1:14,058 nationally;
  - 24% more Psychiatrists at 1:7,268 population compared to 1:9,016 nationally;
  - 44% more General Paediatricians at 1:4,075 population under age 18 years compared to 1:7,287 under age 18 years nationally;
- Individual Specialties

Figure 16 Provincial ratio of population per FTE by Functional Specialty, March 31, 2010 (Source: PHReD)

Licensed Specialty	PROVINCE TOTAL	POP Nova Scotia (All) / FTE
Anatomic Pathology	24.3	38,747
Diagnostic Radiology	78.9	11,941
General Pathology	5.3	179,525
Haematological Pathology	7.2	130,229
Medical Biochemistry	2.0	471,253
Medical Genetics	0.7	1,346,437
Medical Microbiology	3.0	314,169
Neuropathology	2.0	471,253
Nuclear Medicine	4.2	224,406
Radiology - Oncology	13.1	71,903
Diagnostic & Therapeutic - Subtotal	**140.8**	**6,696**
Emergency Medicine	6.2	152,847
General Practitioner [1]	832.4	1,132
Palliative Medicine	2.1	448,303
Family Medicine/Practice - Subtotal	**840.7**	**1,121**
Cardiology	33.2	28,415
Community Medicine	1.8	538,575
Critical Care Medicine	12.9	73,029
Dermatology	17.3	54,502
Emergency Medicine	65.5	14,381
Endocrinology & Metabolism	5.3	176,594
Gastroenterology	17.5	53,829
General Internal Medicine	43.5	21,652
Geriatric Medicine	11.2	83,943
Haematology	10.6	88,649
Infectious Diseases	7.1	131,936
Medical Oncology	17.4	54,137
Nephrology	17.7	53,268
Neurology	20.8	45,242
Occupational Medicine	5.4	176,169
Palliative Medicine	9.1	103,572
Physical Medicine & Rehabilitation	11.5	81,957
Psychiatry	129.7	7,268
Psychiatry - Forensic	4.0	235,627
Respiratory Medicine	11.8	80,173
Rheumatology	12.4	76,201
Medical - Subtotal	**465.7**	**2,024**

[1] Includes the equivalent of 38 FTE GPs (without CCFP (EM)) who work in Emergency Departments across the DHAs.

The adjacent figure is a list, by licensed specialty, of the number of FTEs as of March 31, 2010 and relative to the Nova Scotia population.

Among the generalist disciplines the FTE to population ratios are:

- Family/general practice 1: 1,121;
- General internal medicine 1:21,652;
- Psychiatry 1:7,268;
- General paediatrics 1:4,075 under age 18;
- General surgery 1:18,258; and
- Obstetrics and gynaecology 1:19,818.

(Source: MSI, PHReD, AFP data, Departmental review)

Provincial ratio of population per FTE by Specialty, March 31, 2010 continued…

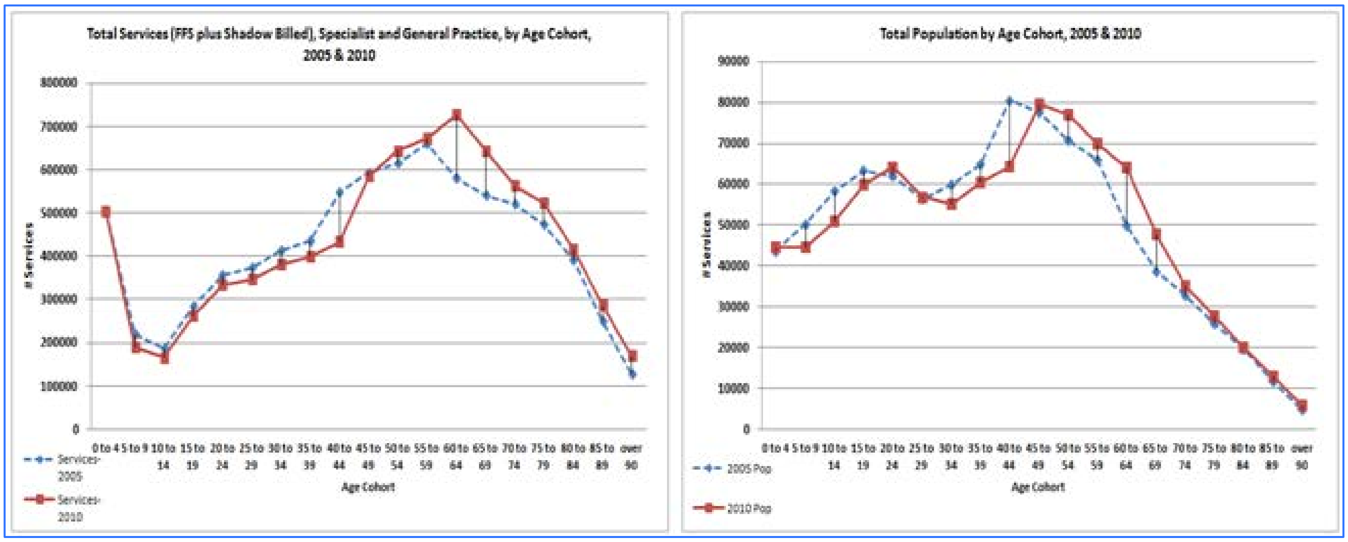
Licensed Specialty	PROVINCE TOTAL	POP Nova Scotia (All) / FTE	Pop Nova Scotia <age18/ FTE	Pop Maritimes <age18/ FTE
Anatomic Pathology	2.2	433,367		158,102
General Pathology	1.0	942,506		343,846
Paediatric Diagnostic Radiology	6.9	135,716		49,512
Paediatric Medical Genetics	3.0	314,169		114,615
Paediatric - Diagnostic & Therapeutic -	**13.1**	**71,840**		**26,209**
Paediatric Cardiology	4.2	224,406	41,203	81,868
Paediatric Child Health	0.8	1,256,675	230,739	-
Paediatric Clinical Immunology & Allergy	6.0	157,084	28,842	57,308
Paediatric Critical Care	5.4	174,881	32,110	63,800
Paediatric Developmental	4.0	235,627	43,264	85,962
Paediatric Emergency Medicine	4.6	205,063	37,652	-
Paediatric Endocrinology & Metabolism	3.0	314,169	57,685	114,615
Paediatric Gastroenterology	1.9	484,319	88,926	176,690
Paediatric General	42.5	22,195	4,075	-
Paediatric Haematology/Oncology	5.5	171,365	31,464	62,518
Paediatric Infectious Diseases	4.8	197,034	36,178	71,882
Paediatric Medical Genetics	2.9	323,649	59,425	118,074
Paediatric Medical Microbiology	0.7	1,357,344	249,223	495,188
Paediatric Neonatology	7.4	126,606	23,246	46,189
Paediatric Nephrology	1.0	942,506	173,054	343,846
Paediatric Neurology	7.0	134,644	24,722	49,121
Paediatric Palliative	1.7	553,316	101,595	201,861
Paediatric Respiratory Medicine	1.8	528,467	97,032	192,796
Paediatric Rheumatology	3.5	269,287	49,444	98,242
Psychiatry - Adolescent	15.7	60,149	11,044	21,944
Paediatric - Medical - Subtotal	**124.3**	**7,580**	**1,392**	**2,765**
Paediatric Anaesthesia	15.1	62,562	11,487	22,824
Paediatric Cardiac Surgery	1.0	942,506	173,054	343,846
Paediatric General Surgery	3.4	279,874	51,388	-
Paediatric Ophthalmology	2.0	463,322	85,071	169,030
Paediatric Orthopedic Surgery	2.4	390,760	71,748	142,558
Paediatric Otolaryngology	2.6	361,414	66,360	131,852
Paediatric Plastic Surgery	1.0	942,975	173,140	344,017
Paediatric Urology	2.1	444,074	81,537	162,008
Paediatric - Surgical - Subtotal	**29.6**	**31,832**	**5,845**	**11,613**
Anaesthesia	109.4	8,618		
Cardiac Surgery	8.0	117,813		
General Surgery	51.6	18,258		
Gynaecological Oncology	4.0	234,511		
Neurosurgery	9.1	103,224		
Obstetrics & Gynaecology	47.6	19,818		
Ophthalmology	46.6	20,227		
Orthopedic Surgery	33.9	27,809		
Otolaryngology	23.7	39,760		
Plastic Surgery	10.4	90,393		
Thoracic Surgery	5.5	170,898		
Urology	16.2	58,226		
Vascular Surgery	7.4	128,069		
Surgical - Subtotal	**373.4**	**2,524**		
TOTAL	**1,987.6**	**474**		

The provincial population of 942,522 is used as the denominator (column 3) except for the paediatric specialties where the Nova Scotia and Maritime population aged 0 to 17 of 173,054 (column 4) and 343,846 (column 5) respectively, has been applied.

Nova Scotia – Physician Services Utilization

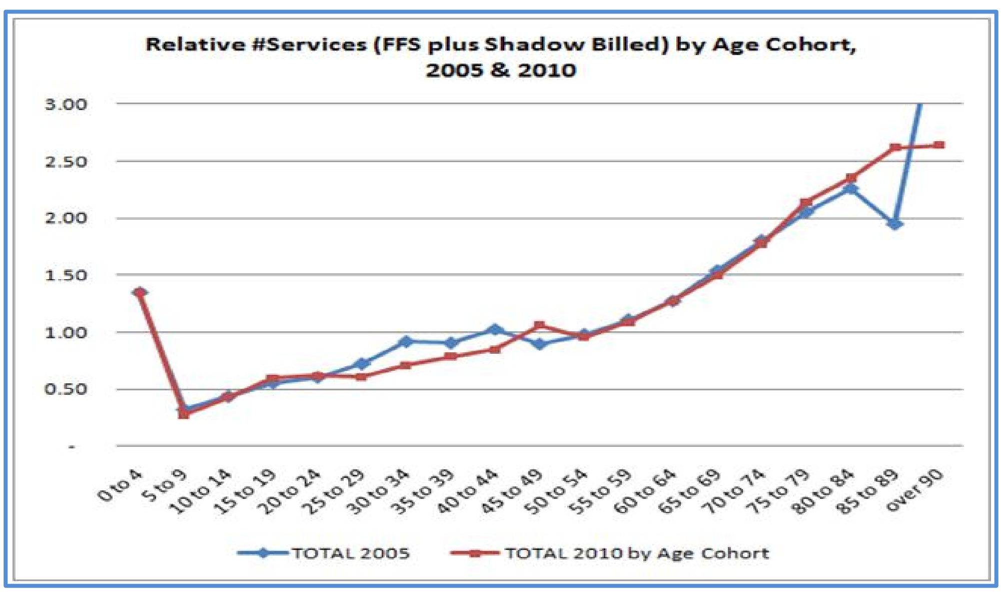
- Population Service Utilization - Between 2005 and 2010, provincial population over age 59 years increased from 20% to 23.4% with little increase in total population. The following graphs illustrate the decreases and increases in total physician service utilization between the two time periods by age cohorts. Most notable are the decreased total utilization by the 30 to 50 years cohorts and the increases from age 50 years and greater (particularly ages 60 to 70 years). This trend, in a status quo delivery system, reveals what can be anticipated over the next ten years as the population increases from 23.4% over age 59 years to 30.5% by 2022.

Figure 17 Provincial Physician Utilization - Total Services provided by Age Cohort (Source: NS MSI)



The relative inter-age cohort utilization of physician services in Nova Scotia, as illustrated in the next figure follows a similar pattern as other provinces.

Figure 18 Provincial Physician Utilization – Relative Utilization of Services by Age Cohort (Source: NS MSI)



- DHA/IWK Population – The correlation between the prevalence of chronic illness and physician service utilization is strong. Physician service utilization increases as a population ages and the longer-term effects of chronic illness become more evident. This relationship between chronic illness and age is an important variable in forecasting future physician resource needs. A closer examination of DHA-specific population age over the ten-year forecast period to 2021 reveals significant differences that are important in forecasting physician resource needs at a DHA and IWK level. Adjusting DHA and IWK (under age 18) population for the average provincial physician utilization rates based on five-year age cohorts has the effect of lowering the population of Cumberland and Pictou DHAs by (15%) and (17%) respectively and increasing the population of South Shore, Guysborough Antigonish Strait, and Cape Breton DHAs by 5%, 5%, and 8% respectively. In other words, Cumberland and Pictou DHA populations are younger and South Shore, Guysborough Antigonish Strait, and Cape Breton DHAs are older than the provincial average. A population-needs based approach to physician resource planning incorporates the relationship between aging, chronic illness, and increased service utilization as a significant forecast model variable.

- Access to Services – The median wait for surgical procedures as of July 2011 varied across the province as follows:
  - General surgical procedures - is highest in the Capital and Cape Breton DHAs and lowest in the South Shore and Guysborough Antigonish Strait DHAs. The Capital DHA wait list at 802 is high but the highest on a per population basis is the Cape Breton DHA.
  - Orthopaedic surgical procedures - is highest in Capital and Cape Breton DHAs, and lowest in Annapolis Valley DHA and IWK. The Capital DHA wait list at 3,752 is high but comparable to the other DHAs on a per population basis.
  - Obstetric/gynaecologic – is substantially higher in the Cape Breton DHA.
  - Urology procedures - is highest in Capital and Cape Breton DHAs.
  - Vascular surgery - is highest in the Capital DHA. Annapolis Valley and Cape Breton DHAs are comparable.
  - Neurosurgery - Of the two DHAs offering neurosurgery, the median wait is highest in Cape Breton DHA and lowest in Capital DHA.
- Out-of-Province Patients - Out-of-Province (OOP) inpatients represent 8% of total admissions and 6% of total inpatient days stay at QEII and 7.5% of total admissions and 14% of total inpatient days stay at IWK. At IWK, 20% of all patients (inpatient, outpatient, and travelling clinics) are from out-of-province. Based on detailed MSI and shadow-bill data and supplementary IWK data on travel clinics delivered outside the province, it is estimated that 19% to 23% of services provided and patients seen by IWK Department of Medicine full-time members are OOP residents. This includes services provided in New Brunswick and Prince Edward Island. New Brunswick and Prince Edward Island residents are the vast majority of OOP patients (followed by Newfoundland and Labrador) for certain subspecialty programs, such as renal transplantation.
- Nova Scotians Out-of-Province – 2.8% of physician services received by Nova Scotians were obtained out-of-province. 9,219 Nova Scotians received an average 5.73 services each in 2009/10 in New Brunswick.

Nova Scotia - Academic Medicine

- Medical Education and Population Need - The Association of Faculties of Medicine of Canada has reaffirmed that postgraduate medical education should reflect the right mix of physicians to meet societal needs, curricula and training models must be aligned to evolving health care needs, and faculties must provide support to clinician-teachers through professional development.

- Maritime Role at the Dalhousie Faculty of Medicine - 40% of Dalhousie Faculty of Medicine undergraduate seats are allocated to out-of-province Canadian students (New Brunswick 28%, P.E.I. 5%, and other provinces 7%).
- Nova Scotia Role of the Dalhousie Faculty of Medicine - 47% of the current provincial physician workforce, including 48% of the generalist specialties, are graduates of the Dalhousie medical school. At a DHA level, only SWNDHA, CHA, and IWK have a percentage of Dalhousie graduates less than 45%. Europe and Ontario medical schools are the next most frequent locations at 11% and 10% respectively among the current provincial physician workforce.
- Dalhousie Faculty of Medicine senior leadership identified the following factors as requiring careful consideration in physician resource planning:
  - General Internal Medicine has been left behind by sub-specialization
  - Pronounced need for more physicians practicing as generalists
  - The numbers of specialists may be reasonable but the geographic distribution and mix between specialties is not appropriate to need
  - A need to define core services at the provincial level then apply locally
  - A strong distributive undergraduate education and post-graduate training is critical to promote generalism and encourage rural recruitment and retention
  - The Dalhousie Faculty of Medicine residency programs can be changed once the Department of Health and Wellness defines needs by specialty and the mix between specialists and subspecialists
  - The ongoing Alternative Funding Plan review and design revision is needed if physician resource planning is to proceed optimally
- Dalhousie Faculty of Medicine Physicians - There are 864 active M.D. academic appointments at Dalhousie Faculty of Medicine including 16.2% full-time, 82.4% part-time, and 1.4% other. These include Nova Scotia physicians and those based in New Brunswick. On an income attribution basis, and in the absence of further data on workload, the equivalent of 55.8 FTE is 100% academic or 6.8% of the total FTE of 820. In academic medicine, the percentage time spent on academic work varies widely by individual (education, research, and leadership). The variation reflects many factors, including the ability to attract and sustain research grant salary support, the presence or absence of academic salary, alternative payment systems that develop and/or support fields of targeted strategically important research, and the quality of research infrastructure.
- Dalhousie Faculty of Medicine ranks tenth nationally out of seventeen medical schools in the ratio of full-time faculty per trainee. This ratio does not account for the rapidly increasing number of part-time preceptors/teachers in the community as all faculties look to distribute medical education outside major tertiary teaching centres.
- Research specialization presents difficult choices for strategic planning. A recently commissioned study identified Dalhousie Faculty of Medicine areas of greatest research opportunity in geriatrics and aging, arthritis, child health, obstetrics and gynaecology, gastroenterology, and nursing. Current identified strengths included these examples plus neurosciences, psychiatry, and general internal medicine.
- Dalhousie Faculty of Medicine current areas of research focus, as measured by CIHR grant revenue (only), are the fields of neurosciences, geriatric medicine, psychiatry, and population health/health outcomes specialties. The total research revenue (excluding industry contract research revenue) in 2008/2009 was $50,887,000.

Section 1. INTRODUCTION

A PROJECT INTRODUCTION AND METHODOLOGY REVIEW

4 THE PROJECT

4.1 Sponsor

The Department of Health and Wellness (Department of Health and Wellness) is the project sponsor on behalf of the Government of the Province of Nova Scotia.

4.2 Purpose/Deliverables

The primary project objective is to deliver a quality, expertly led, and collaboratively developed, ten-year physician resource plan (the 'Deliverable') for the Province of Nova Scotia and the population it serves for the programs it delivers.

The Department of Health and Wellness expectations for the Deliverable are that it be evidence-based and forecast an appropriate, affordable, equitable, detailed description of need for the physician workforce for the coming ten years (2012-2021).

The Consultant will design, deliver, and recommend a quality, expertly led and advised, collaboratively developed, ten-year physician resource plan (PRP) to the project sponsor. Four sequentially delivered reports will comprise the Deliverables. The reports are:

1. **PROJECT CHARTER** including mandate, scope, deliverables, committee(s) terms of reference, and project plan.
2. **ENVIRONMENTAL SCAN** of physician resources, utilization, and related issues in Nova Scotia. The Environmental Scan also provides an assessment of current and emerging physician resource planning methodologies in Canada and internationally (i.e. United Kingdom, Australia, and United States of America) along with an assessment of their applicability to the province. The Environmental Scan documents, and is informed by, key findings from extensive interviews of provincial stakeholders supplemented by stakeholder submissions. The report recommends an optimal approach to creating a high quality provincial physician resource plan.
3. **TEN-YEAR PRP FINAL REPORT** including ten-year forecasts (scenarios) based upon the agreed optimal detailed methodology design with final recommendations on methodology, determinants, forecasts, implications, and requisite next steps.

4.3 Stakeholders

The primary project stakeholders include:

- Department of Health and Wellness
- District Health Authorities and IWK Health Centre
- Dalhousie Faculty of Medicine
- Doctors Nova Scotia
- College of Physicians and Surgeons of Nova Scotia

In addition there are many other stakeholders across the health professions, including the College of Registered Nurses of Nova Scotia and other health professions as identified in the project initiation phase.

4.4 Consultant

Social Sector Metrics Inc. (SSM Inc.) and Health Intelligence Inc. (HII) have been contracted by the Sponsor to design and deliver a Physician Resource Plan (PRP) for Nova Scotia. The Consultant team is represented by Mr. Nicholas Tait, CMA, MSA of SSM Inc. (Project Manager) and Dr. David Peachey of HII (Project Senior Consultant). The Consultant will conduct itself at all times in accordance with its Code of Ethics (Appendix C).

4.5 Project Management

The Project Advisory Committee mandate is to provide expert advice to the Consultant on the design and development of a Physician Resource Plan (PRP) for the province and, at project conclusion, to provide the Project Sponsor with an informed opinion on the Consultant-designed and delivered PRP. See Appendix for membership.

The Project Leader, on behalf of the Sponsor, is Ms. Carmelle d'Entremont, Executive Director, Department of Health and Wellness Health System Workforce.

The Project Manager on behalf of the Consultant is Mr. Nicholas Tait, BMgt, CMA, MSA, SSM Inc. [Tel: (403) 208-3223, ntait@socialmetrics.net]. The Project Senior Consultant is Dr. David Peachey, Health Intelligence Inc.

A Technical Working Group (TWG) supports the PAC and Consultants in their work. The purpose of the TWG is to assist the Consultant, as required, in the achievement of the project mandate for a provincial ten-year physician resource plan and to communicate, as required, with the Project Advisory Committee. The scope of work of the TWG includes provision of expert technical advice to the Consultant by providing input and feedback on PRP methodology, assisting in the identification and collection of provincial data, and providing input and feedback on drafts of each project deliverable.

4.6 Background

The Department of Health and Wellness requires a Deliverable that is robust and that sufficiently and effectively addresses the key determinants of physician resource planning.

A PRP requires consideration of many determinants. Examples of determinants impacting the need for physicians are contemplated under the following subheadings:

- Population
  - Population growth, age, gender, distribution, culture, fertility, death rate, in/out migration (permanent and seasonal), and socio-economic status (i.e., family income, employment, education)
- Disease morbidity, incidence, prevalence, and mortality rates
- Access to services
- Target time to assessment, to diagnosis, and to treatment for defined services
  - Services delivered locally, regionally, provincially, and out-of-province
- Clinical Programs
- Factors impacting service sustainability (e.g., on-call intensity/frequency and maintenance of competency with an appropriate caseload.)
  - Evidence-based technology innovations
  - Major facility capital projects

- Academic Medicine
- *Teaching Programs* – Undergraduate medical students and postgraduate residents require educators and teachers of the right mix, skill, and practice profile; the scope of the Medical School and postgraduate training programs now and in the future impact PRP
  - Research Programs – Medical research programs require MDs, PhDs, clinician scientists, basic scientists, and extensive infrastructure (e.g., labs, technology); the focus (areas of excellence), depth (basic, translational, applied), and funding (commercial, grant) have direct bearing on research programs and consequently impact PRP

Examples of determinants impacting the supply of physicians include:

- Physician demography and mobility - age, gender, inter-/intra-provincial migration, international migration, and the rate of retirement of physicians
- Medical education and training system – requires evaluation of the national and provincial future supply of physicians by discipline
- Physician practice profile – physician scope of practice will vary from individual to individual. A family physician can practice in many capacities, e.g., comprehensive care, surgical assistant, community practitioner, hospitalist, special interest, and others; specialists have formal certification in a defined discipline but often have specific areas of special training, interest, and expertise, as a functional specialty
- Productivity – physician productivity is a complex determinant to assess; fee-for-service (FFS) as a proxy for productivity must be viewed cautiously; surrogate productivity markers lag behind in alternative payment models; an appropriate transition from an economic model to one that integrates a quality model is an inevitable opportunity and challenge, not yet addressed satisfactorily in the health sector
- Alternative service models – collaborative and integrated models of care continue to evolve with significant impact on PRP; role optimization of health professionals is central to these emerging models

The preceding are some of the examples of the determinants to be examined by the PRP project.

Data on determinants of physician need and supply come from many sources, including population, demographic, and socio-economic files, billing and alternative payment utilization records, epidemiology data, facility utilization records, physician rosters, the national and provincial medical education system, and other related sources.

4.7 Forecasting

The preceding description is introductory to the many determinants of physician need and supply included in a PRP scope of work. Application of these determinants to a model forecasting the future requires informed assumptions about their current state and future behaviour. The reliability of assumptions will be increased through rigorous detailed research on each key determinant. For this reason, the research phase of the project included extensive consultation across the province with a range of key informants, extensive data analysis, peer-reviewed literature review, and stakeholder strategic and operational plan analysis. Notably definitive policies on key determinants such as access time target for a specified service are not a prerequisite to achieving the deliverable, as the Consultant will generate scenarios within a range under a given assumption.

4.8 Methodology Guiding Principles

PRP methodology guiding principles are enduring statements, which guide the methodology design, e.g., '...supports appropriate access to needed services...' Methodology guiding principles provide strategic level direction to the PRP designers. See Section 3.2 for a list of guiding methodology principles.

4.9 Key Project Linkages

It is necessary for the NS PRP Project to maintain informed awareness of certain concurrent project initiatives with direct bearing on the NS PRP Project scope of work and deliverables. The following initiatives have been identified as relevant to the NS-PRP Project:

1. Nova Scotia Clinical Services Plan
2. New Academic Funding Plan Model
3. Department of Health and Wellness: HHR simulation modeling and evaluation framework in context of the Models of Care (MOCINS) project
4. Department of Health and Wellness: Primary Health Care review of population needs
5. Department of Health and Wellness: Renewal of Public Health Strategy
6. Department of Health and Wellness: Better Care Sooner
7. Department of Health and Wellness: A Mental Heath and Addictions Strategy was under development during the research period. This strategy will be highly relevant to physician resource planning in the future.

5 Provincial PRP Strategic Framework

At the project outset, Department of Health and Wellness described the overarching vision, guiding principles, and strategies for the project and reviewed them in detail with the Project Advisory Committee.

Vision

The provincial Health Human Resource (HHR) strategy (January 2010) provides a clear picture of the provincial overarching vision and impetus for this NS PRP Project:

- "The vision of success for HHR planning is to create a team of diverse health-care providers who are educated and supported to deliver safe, quality, and timely care to Nova Scotians. Nova Scotia proposes to determine the right number and right mix of health-care providers by focusing on population health needs and care delivery models. The determination of ***population health needs*** for the province will be the building blocks for its HHR Strategy."

Guiding Principles

The Department of Health and Wellness has determined that the development of a quality, expertly led, collaboratively developed physician resource plan will be guided by the following shared, **core guiding principles**:

The physician resource plan must be:

- **Appropriate to population need**
    - Evidence-based markers of population need, e.g., growth, aging, mobility, gender, disease incidence/prevalence rates and morbidity and mortality rates
- **Affordable now and sustainable into the future**
    - Competitive relative to, and appropriate to, the economic base
- **Equitable across the geographic distribution of the population**
    - Local access to core services, referral access to added services
- **Preserve and enhance quality of care**
    - Acceptable, appropriate, accessible, efficient, effective, and safe
- **Supports appropriate access to needed services**
    - Local, regional, provincial, extra-provincial access
    - Standards and targets
- **Aligned with appropriate inter- and intra-professional, innovative, delivery models**
    - Collaborative models of care, role optimization of health professions
- **Designed in context of government and stakeholder strategic priorities and plans for the health system**
- **Appropriate to academic clinical mandate (education, teaching, research, leadership/administrative services)**

- Consistent with approved mandate, strategic plan, defined goals, objectives, targets, and performance
- Inclusive of education, teaching, research, leadership/administrative services

- **Inclusive of relevant determinants of current and future physician supply**
  - Age, gender, Canadian and provincial undergraduate and postgraduate medical education, international medical graduates, Canadians studying abroad
- **Predicated upon productive, sustainable, quality, benchmarked workload**
  - Full-time equivalency, sustainable call rota, sentinel equivalency, qualitative and quantitative metrics, protected time

Context

- While Nova Scotia has the highest number of specialists and family doctors per capita in Canada, they are not necessarily located where they are most needed. Some rural communities are struggling to recruit and retain family doctors.

Strategies

- The physician resource plan (PRP) for Nova Scotia is seen as both a road map and guide post to the future for PRP in the province and the methodology for physician resource planning will be directed by population need.

6 Research Methodology

The research phase included an environmental scan and analyses informed by detailed data acquisition and analysis.

#	Task
1.	CLIENT & STAKEHOLDER INFORMATION Complete detailed interviews (see Appendix for list), including review and assessment of: • Department of Health and Wellness health human resource simulation modeling research; • Review framework developed for client health human resource simulation model as utilized for the Models of Care (MOCINS) project; • Incorporate Primary Health Care review of the needs of the population based on the population health model; • Incorporate current healthcare system governance structure, including nine district health authorities and IWK Health Centre; • Incorporate current remuneration system including fee-for-service, alternative payment and academic funding plans, while being sensitive to the potential for introduction of a new funding model(s); • Clinical and academic functions (service, teaching, research and administration) of physicians within the Faculty of Medicine at Dalhousie University; • Service delivery profiles (refer in/out, primary to quaternary, etc.) to Nova Scotia residents and Maritime and Atlantic provinces; • Provincial direction in the recruitment and retention of International Medical Graduates (IMGs); • DHA and DOH capital capacity expansion plans e.g., major hospital additions &/or expansions, community health centres, etc. Interviews were conducted to inform the Environmental Scan with the opinion, experience, and expertise of individuals and groups associated with key elements of the health system. Interview findings have been included in this report according to the most appropriate section under the heading “What We Heard”. Interviewees representing organizations with a province-wide mandate (e.g., provincial programs), have been included in the subsection – “Provincial Environment – What We Heard”. Interviewees representing Districts have been included in a subsequent subsection – “DHA Environment – What We Heard”. Interviewees representing specific specialties, or groups of specialties, have been included in a subsequent subsection – “Individual Specialties - What We Heard”. The appendix includes a complete list of interviewees.
	2. LITERATURE SEARCH Prepare key word and subject matrix to direct literature searches. Including physician resource planning, FTE methodologies, emerging methodologies of PRP by Discipline in the search criteria; Research grey literature including, but not limited to, • Stakeholders - Vendor will request shareable relevant reports from PAC and TWG members • Comparable organizations within Canada, USA, Western Europe, and Australia • Conference proceedings • Discipline-specific peer-reviewed journals. Typically the higher quality rated journals will contain insightful articles specific or related to PRP e.g., Journal of General Internal Medicine • Survey reports from Canadian Medical Association (e.g., 2007 last comprehensive survey), DNS, and

CFPC on physician trends (lifestyle, hours work, practice profile, contemplated changes, preferred payment models). Particularly valuable in this regard are client specific surveys of physicians, including family physicians. The latter have rapidly evolving practice profiles and insight specific to Nova Scotia and communities which is valuable in calibrating the FTE of family physicians doing 'true' community family practice on a 24/7 comprehensive (including obstetrics, on-call, after-hours care, etc.) basis versus 9/5 versus half-time in community and half-time in a hospital (hospitalist, surgical assistant, etc.).

Web-based search on:

- "Expert " web sites – e.g., EuroObservatory, USA Council on Graduate Medical Education (GMENAC), UK Royal College of Physicians, American Assoc. of Medical Colleges, American Board of Medical Specialties, the Advisory Board USA, and UK National Health Service and DOH
- "Other" web sites – i.e., OECD, WHO, World Bank
- Research databases such as PubMed

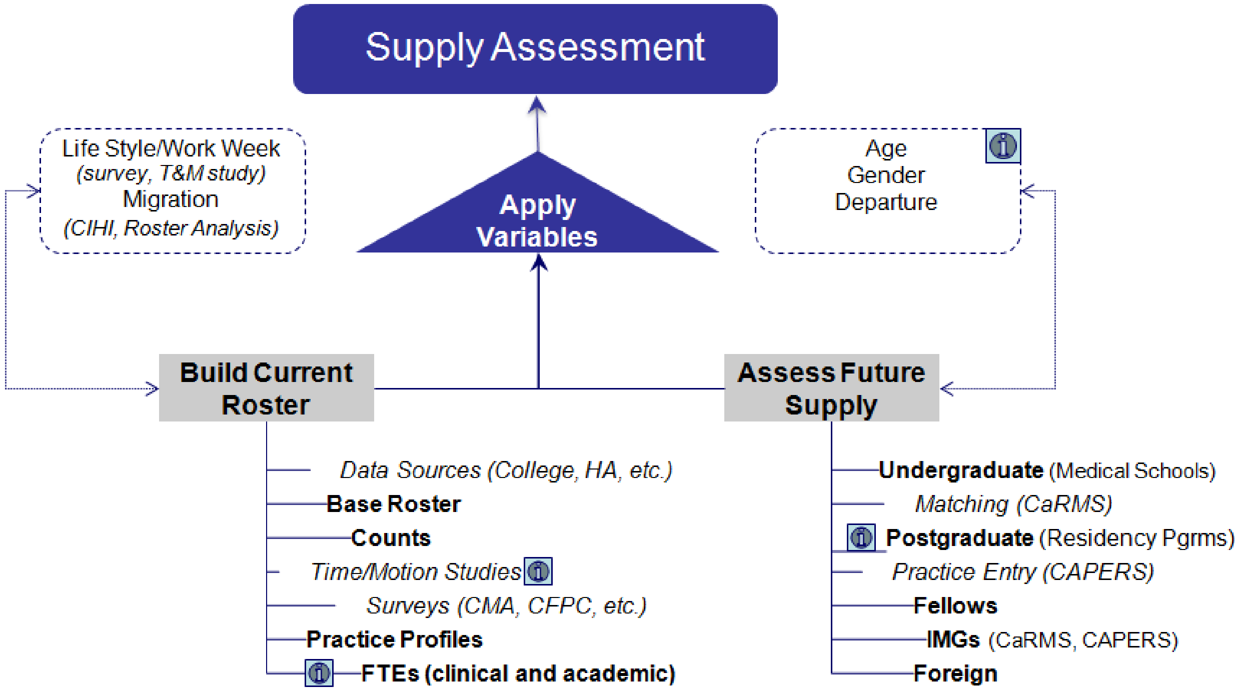
2. DATA COLLECTION AND ANALYSIS

Data collection included but was not limited to the following:

B.1 PHYSICIAN SUPPLY (see also the following Figure)

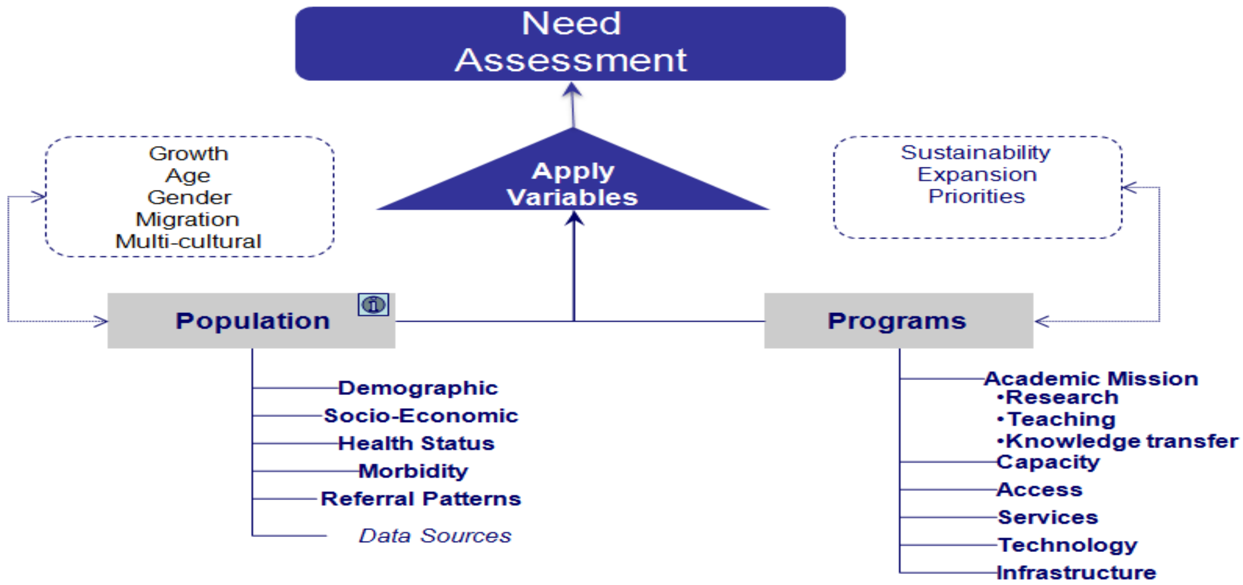
- Academic Faculties of Medicine of Canada annual statistical report
- CaRMS – Vendor maintains a constant update of CaRMS data which is integral to understanding future supply from the Canadian education and health system
- CAPER - Vendor maintains a constant update of CAPER data which is integral to understanding current new supply and trends therein
- CPSNS – Registry file of publicly available data points by physician
- DNS – Registry file of publicly available member data points
- Dalhousie FOM – Faculty appointments (full-time, clinical/part-time) registry file of shareable member data points. Data on protected research time, education time commitments, and leadership roles will be examined
- Medical Service Insurance (MSI) file – Detailed MSI claims files, with 3-year history, by physician. Required to inform FTE profile, services delivered, patient place of residence and trends in all the proceeding factors
- Alternative payment files – from IWK, DHAs and DOH on alternative payments by physician, by service. Required to inform FTE profile
- CIHI Report – Vendor discuss with Client the added value of obtaining a custom CIHI report showing relative billing intensity of physicians by age and gender. Published literature is dated on this subject
- Valuable to update using Canadian data. CIHI may already have this report on file at low cost to Client

Figure 19 Supply Assessment Model



#	Task
3.	DATA COLLECTION *continued*
	B.2 PHYSICIAN NEED (see also the following Figure) • Detailed provincial population demographic figures by DHAs including age, gender, and ten-year forecast • Population health data on disease incidence and prevalence in Nova Scotia, Maritimes, Atlantic Provinces and in comparison nationally • Dalhousie FOM program plans for expansion, contraction, addition as relates to UG and domino to PG (linked to IWK and DHAs as training provider host) residency training programs. This has direct impact on educator and teacher capacity requirements. • DHA profiles of institutional utilization e.g., acute care beds, average lengths of stay, case acuity, OR theatres, OR procedures, OR case time, emergency rooms, and clinics. The purpose of gathering and assessing this information was not to identify capacity issues but to provide trend information on trajectories of utilization. This trend information was compared to population disease incidence and prevalence data for converging or diverging trends from population versus institutional utilization perspectives.

Figure 20 Population Need Assessment Model



#	Task
4.	ENVIRONMENTAL SCAN – COMPILATION, ASSESSMENT, & REPORTING

- Compilation and assessment of Research Phase information
- Inventory, catalogue, and order research material
- Assess quality in terms of relevance, timeliness, and reliability/authoritative
- Fill gaps as/if needed
- Review meeting with TWG to ascertain completeness
- **REPORTING:** Submit draft Report – ENVIRONMENTAL SCAN to Client
- Revise as necessary based upon feedback

6.1 Data Model

Figure 21 Methodology – Data Model

The following Figure itemizes the primary data sets accessed and analyzed in this the Environmental Scan phase of the project.

Category	Description	Time Period	Primary Source(s)
1-Need-Geographic	Postal code file linked to community, county, DHA levels	2010	Department of Health and Wellness
2-Need-Demographic-Population	2006 to 2030 population data by age cohort, gender, county and province.	2007 – County level 2010 – Provincial level	Department of Finance
2b-Need-Demographic-Medical Services Insurance (MSI)	Blinded aggregated MSI data by anonymous provider and patient	2005 and 2010 Medavie FFS and Block Fund shadow billing	Department of Health and Wellness – Medavie

Category	Description	Time Period	Primary Source(s)
3-Need-Epidemiology	Incidence and prevalence e.g., chronic disease	2006 onward	CIHI Community Health Survey – 2011, Department of Health and Wellness provincial programs
3b-Need-Provinical Program managed Diseases	Cancer, Diabetes, Cardiovascular health, Kidney/Renal	2006 onward	Department of Health and Wellness provincial programs, CIHI, Statistics Canada
4a-Need-FacultyUtilizationIP	Hospital inpatient stays, procedures, doctor services	2005 and 2010	Department of Health and Wellness
4b-Need-FacultyUtilization-AMB	Day procedure, outpatient volume	2005 and 2010	Department of Health and Wellness
5-Supply-CurrentRoster (PHReD, Physician Health Resource Database)	Demographics of the current registered physician workforce, organized according to Functional Specialty (See 'Terminology' for description of Functional Specialty).	May, 2011	Department of Health and Wellness, DFM, CPSNS,
6-Supply-PaymentsCurrent-Roster	MSI, Block Fund, Salary, 3rd party, and other physician payment data	2008/09 and 2009/10	Department of Health and Wellness, DFM
7 - Wait Times	Wait time data on surgical and medical services	April 2010 to May 2011	Department of Health and Wellness Patient Access Registry Nova Scotia (PARNS) database
8 - CIHI Benchmarks	Inter-provincial comparative physician data	2005 onward	CIHI – National Physician database
9 – CAPERS & CaRMS	National medical education system data for all Faculties of Medicine	2000 onward	CAPERS & CaRMS database and websites.

6.2 Data Limitations

Each research source comes with limitations; however, the Consultant, with stakeholder assistance, has worked to mitigate each limitation. The Consultant consistently applied a number of research techniques including the use of corroborating evidence, standardized interview questionnaires, iterative data refinement to improve accuracy and quality, and conducted testing, revision, and validation of preliminary analytic results with stakeholders.

The data analyzed spanned 2004/05 to 2009/10. This time frame was long enough to permit trend identification and analysis. Within the data, limitations were noted:

- Access to services – Very good data on access to services are recorded by DHAs, IWK, and collected and reported by DHW on surgical wait times and lists. Data on access to medical consultation and services wait times and lists were not available. Validated data on residents without a family physician were spotty. The Consultant was, therefore, unable to incorporate this element as originally envisaged in the work plan.
- Active physicians – The Consultant narrowed the CPSNS registry file of 2,800 individuals to 2,500 active physicians as of 2009/10 by matching to itemized individual payment records. The list of 2,500 then underwent extensive external review and reconciliation to DHA department member lists, Alternative Funding Plan (AFP) rosters, and Dalhousie Faculty of Medicine academic appointment lists, resulting in a final count of 2,215 individual physicians and 1,988 full-time equivalents. These added review steps, albeit time consuming, added substantial integrity to the resulting databases.
- Alternative Funding Plan(s) – DHW, DHAs, IWK, and DFM are reviewing and revising AFP agreements. When complete, these agreements will establish a percentage distribution between clinical and academic (research, teaching, and academic leadership) time, whether funded by the AFP or another source. In the interim, the Consultant set the percentage of academic time equal to the proportion of academic salary to total income. This approach is not ideal but is a reasonable, evidence-based option. The Forecast Model specifically provides for disaggregation of an FTE into clinical and academic components by individual.
- Functional Specialty – Functional specialty (e.g., a cardiologist who spends 50% of professional time doing ‘general internal medicine’) is a complex, time-intensive construct to define and maintain. For example, an individual can, and often does, change a functional focus in response to changes in local physician supply, such as the recruitment of a general internal medicine specialist enabling a cardiologist to revert to full-time cardiology, which in turn decreases cardiology referrals outside that DHA. A second significant complication is blurring of the definitional line between licensed and functional specialty (e.g., to practise cardiology one must also practise general internal medicine.) This report uses licensed specialty except in a few (less than 2%) instances where an individual is licensed in one specialty but has, often for many years, functioned 100% in another specialty. In these instances, the individual is reassigned to their functional specialty.
- Licensed Specialty – Currently no single source has complete, accurate information on licensed specialty by individual. Working from the license status assigned by the CPSNS, the Consultant facilitated an external review with DHAs, IWK, DFM, and AFP which resulted in about 1% of individuals to change from a general adult or paediatric specialty (e.g., Internal Medicine or General Paediatrics) to a subspecialty (e.g., Cardiology or Hematology/Oncology).
- Payments – Block-funded contracts are paid to groups rather than individuals, making the determination of full-time (FTE) equivalency a challenge in some cases. The Consultant used corroborating evidence to mitigate this weakness, e.g., Alternative Funding Plan (AFP) FTE budget status, DFM work status (full-time, part-time, retired), CPSNS registry status, and income from all other sources for each physician.
- Timing - Changes in physician counts and FTEs occurring after March 31, 2010 are not reflected in the baseline of the forecast projections. This is particularly important in certain subspecialties with small numbers. This report contains specific recommendations on the importance of maintaining the transferred physician resource forecast model and supporting database. A system of ongoing updating of the model database to ‘current day’ physician counts and FTEs can eliminate timing differences to reproduce an updated forecast.

Section 2.
National Environment

A Review of PRP Conceptual Models, National Trends, and the Canadian Physician Workforce

7 CONCEPTUAL MODELS

7.1 Methodologies - General

The Department of Health and Wellness has predetermined that population health needs are the key drivers of PRP. This was identified in the PRP Strategic Framework earlier in this report; the Consultant strongly supports this approach.

In terms of the breadth of commonly employed PRP methodologies, there are many examples in the literature. They can be grouped into four general categories: demand-based, population ratio, benchmarking, and population health-based need.

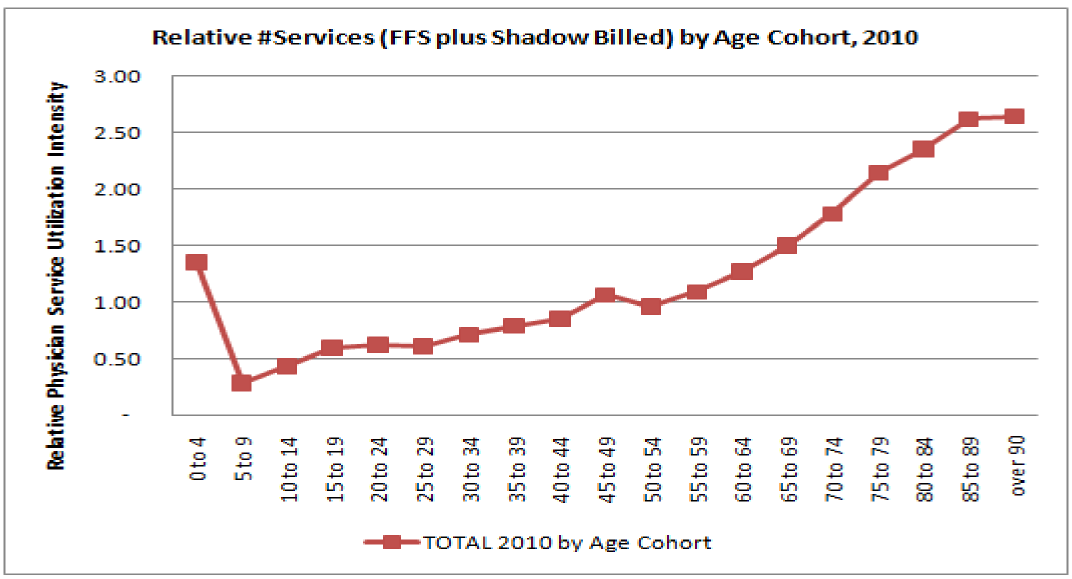
The Consultant has researched the relevant literature (see list at conclusion of this subsection). The most commonly asked and frequently unanswered question is, "How should a forecasting model effectively measure demand and need?" Each methodology has strengths and weaknesses. The following subsection provides an overview of the four most common methodologies.

7.2 Demand-Based

A demand-based formula extrapolates future physician utilization levels from current ones and then estimates supply requirements accordingly. If current utilization levels are appropriate, then FTE forecasts can be undertaken with a fairly high degree of accuracy. This approach does not control for "supply-induced" demand and frequently incorporates survey-based data.

"Demand-based models supported by 'supply-based' formulae extrapolate future physician supply levels from current ones based upon physician demography, medical education system, and physician migration."

Figure 22 Nova Scotia – Relative #Services utilized by age cohort (2009/10) (Source: Department of Health and Wellness MSI)



The graph is illustrative of the approach to demand-based forecasting. The utilization of physician services today is extrapolated into the future and adjusted for the changing broad demographics of the population (i.e., age, gender).

The U.S. National Department of Health[2] employs a demand-based approach, but with reference to alternative approaches described in the literature to estimate physician requirements, including a needs-based approach

[2] U.S. Department of Health and Human Services, Physician Supply and Demand: Projections to 2020, October 2006.

and the use of benchmarking (i.e., a specific form of the utilization-based approach). The needs-based approach defines physician requirements based on a clinical assessment of prevalence rates for medical problems and the time physicians require per patient encounter. This approach has been criticized in the U.S. because it ignores economic realities that influence utilization rates in the unique market driven U.S. private/public health system. The benchmarking approach was used extensively in the 1990s by applying Health Maintenance Organization physician-to-enrollee estimates to the United States population under a scenario with projected growth in managed care enrollment.

"The ten-year increase in fee-for-service utilization in B.C. was accounted for entirely by the combined effects of population growth (28.9%), aging (2.1%), and CPI inflation (41.4%). Service use per resident rose 10.5 %. This research underscores the importance of population growth and aging in any model of demand and need[3]."

The Manitoba Centre for Health Policy has tested a modified version of demand-based forecasting using the 'equivalent services measure'[4]. This measure represents a constant service value enabling comparison over time of number and type of physician services provided to a population. The measure normalizes ten years of changing fee/tariff schedules and service codes. Projections based upon this model are demand based and contingent upon historic trends in service provision continuing into the future.

The Australian Medical Workforce Advisory Committee modeled future physician need by matching the projected population health needs of Australia based upon current service utilisation rates. This approach was criticized by the Royal Australasian College of Physicians for being overly simplistic and for over reliance on current utilisation rates.

The Association of American Medical Colleges concluded that while a population need-based approach to physician workforce planning has merit, the structure of the U.S. health delivery system is not conducive to such a methodology. Utilization of the health system is driven by insurance coverage or absence, and patient- and provider-induced demand. Modelling physician workforce based upon population need would yield results completely at odds with the reality of a demand driven system. In addition to incompatibility with the delivery system the other key significant drawback according to the Association is the subjective nature of defining population need. The Association opted for a demand-based projection that assumes current utilization patterns will continue into the foreseeable future[5].

7.3 Population Ratio

This method blends expert opinion with epidemiologic data, member survey, and benchmarks from other jurisdictions to recommend standards for FTEs per "x" population. This approach does not control specifically for academic commitments. The RCPSC in 1995 published[6] population ratio-based guidelines developed from expert opinion. The US Council on Graduate Medical Education (COGME) believes that ranges of patient care generalists between 60-80 per 100,000 population and specialists between 85-105/100,000 are reasonable estimates of physician utilization in the early 21st century[7]. This method is generally poorly regarded for its lack of specificity to the determinants of need and supply.

[3] Barer, M.L., et.al: Beneath the calm surface: the changing face of physician-service use in British Columbia, 1985/86 versus 1996/97, CMAJ 2004, Mar. 2; 170 (5), 803-807.
[4] Katz A., Bogdanovic B., Ekuma O., et.al, February 2009
[5] Association of American Medical Colleges, The Complexities of Physician Supply and Demand: Projections Through 2025, Center for Workforce Studies, Nov 2008
[6] RCPSC, Specialty Physician Workforce Study 1995
[7] Council on Graduate Medical Education Resource Paper: Evaluation of Specialty Physician Workforce Methodologies, Rockville, MD: COGME; 2000.

7.4 Benchmarking

Benchmarking compares the present physician supply in an area with different geographic regions or with systems that have distinctive staffing patterns. It assumes that selected geographic regions are "the future" of health care and are de facto benchmarks[8].

7.5 Population Health-Based Need

Population needs-based planning estimates compare the projected physician supply with expert estimates of disease incidence and prevalence and estimates by provider panels of physician services required to manage these illnesses (Task Force Two, 2005). This approach includes new technology development. It does not control for substitution in health providers or that portion of an illness that does not require treatment by a physician (Source: Congress of the United States, Graduate Medical Education National Advisory Committee (GMENAC), Forecast of Physician Supply and Requirements, April 1980.)

Studies of this type are often criticized for generating forecasts of physician need that are unobtainable since the method does not reflect the functional realities of the health system or supply marketplace. It is also a particular challenge to translate population need into physician supply.

Related studies have considered integrating indicators of population structure including measures of relative socio-economic status, e.g. dwelling, employment, income, education, etc. One such study examined the evidence and finding no future state forecasts in existence for the identified socio-economic risk indicators decided to drop such indicators from their methodology (Katz, 2009). The same study observed that improved health status would more likely arise from improving the underlying problems in the sub-population than simply increasing services to regions of low health status[9]. Perversely in the U.S., people with limited income and financial resources, particularly the uninsured, are likely to seek fewer health services unless charges are on a sliding-scale basis or other resources are available to pay for their care[10].

7.6 Blended Models

Blended models of PRP combine attributes of the preceding four models. Blended approaches are adaptations to limitations in the primary model of choice. In this project, the primary model of choice is population health needs-based. Practical adaptations to compensate for the challenges of this model require gaps in population health need information being filled with demand, benchmarking, and ratio information. This 'Adjusted Population Needs-Based Model' enables triangulation of information into a probable forecast scenario(s). Adaptations of this type occur to varying degrees at the individual physician specialty level.

An Adjusted Population Needs-Based Model (APNM) combines demand model variables (e.g., current FFS/non-FFS utilization patterns by specialty) with population need model variables (e.g., population growth, disease incidence and prevalence, chronic disease management) and then conducts a reasonability test of the results against benchmarks and ratios.

An example of the APNM at a provincial level is as follows:

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[8] Goodman, D.C., et.al: Benchmarking US Physician Workforce, An Alternative to Needs-Based or Demand-Based Planning, JAMA 1996, December 11 276-22: 1811-1817, and Fried B.J., Physician resource planning in an era of uncertainty and change, CMAJ 1997, 157(9); 1227-28

[9] Manitoba Centre for Health Policy, September 2001

[10] Association of University Programs in Health Administration, Understanding the U.S. Health Services System 4th Ed., Editorial Board for Graduate Studies

- **Need:** Quantify current FTEs and productivity[11] per specialty using a robust methodology and adjust over the forecast period for:
  - Current over/under productivity and access wait times compared to specialty standards for Sentinel Services (assumes infrastructure can be modified accordingly);
  - Percent change in age/gender standardized population over the forecast period;
  - Any planned changes in academic mandate and academic protected time;
  - Disease incidence/prevalence rates forecasted to change significantly above or below the change in age/gender standardized population;
  - Significant expected changes in scope of practice and technology emerging nationally;
- **Supply:** Quantify physician supply factors over the forecast period for:
  - Change in workforce age and gender;
  - Return from abroad, depart abroad, inter-provincial migration, equals the required additional orthopaedic surgeons over the forecast period (excluding Baseline Supply replacement recruitment gap);
  - Significant changes in inter-professional practice e.g. collaborative care models

7.7 Specialist Specific

Most specialty workforce studies limited the scope of their analysis to physician supply and related matters. However, 20 percent of the studies that were reviewed, encompassing 18 of the 33 specialties, addressed questions of demand/need (COGME, Specialty Physician Workforce Methodologies, Rockville, MD: 2000).

Four general models were used:

- Adjusted Needs Models estimate the current and projected supply of physicians that is required to deal with the perceived burden of disease. Is based on an understanding of the current and projected prevalence of disease and the capacity of specific specialities to care for that disease burden e.g., GMENAC (Graduate Medical Education National Advisory Committee) 1979 and 1991.
- Demand-Utilization Models project the supply of physicians that is required to provide health care services at current levels of utilization. Projects future use based on anticipated changes in demography, financing, and productivity.
- Requirements Models are based on current HMO staffing patterns.
- Socio-Demographic Models project the effects of socioeconomic and demographic factors on the availability of future practice opportunities for physicians.

Comparative Ratios and Benchmarking is a fifth model that is an alternative to the four quantitative models above. The following table provides some comparative ratio's/100,000 in Canada (source: CIHI).

[11] BCMA, Doctors Today and Tomorrow Planning British Columbia's Physician Workforce, July 2011

Figure 23 Population per Physician FTE 2008/09 (Source: CIHI)

Factors affecting the future demand/need for specialist services (COGME, GMENAC):

- Aging of the population and the burden of disease
- Ethnicity
- Birth rate, e.g., inverse to income
- Technology, e.g., interventional cardiology and cardiologists versus open heart surgery and cardiac surgeons
- System Trends, e.g., hospitalists, on-call rota, alternate care providers in multi-disciplinary teams
- Geographic variation
- Personal income
- Government spending
- Uninsured services
- Information, i.e., internet-based information accessible to the consumer
- Availability of residents

7.8 Modeling Concepts

Forecasting is a complex undertaking, particularly in health care and health human resources. The objective of a physician resource plan (PRP) forecast is to describe the future state of specific dependent variables (DV_n) over time (Years 2012 to 2021 in this case). The primary dependent variables are the quantity (DV_1) and mix (DV_2) of physician resources needed by the population over time (T_1-T_{10}) in comparison to the predicted supply (DV_3) of physician resources. The complexity resides with the independent variables (IV_n) having an impact on the DV_n values over time. There are many IV_n that a forecast model could justifiably consider and integrate and all share a causal relationship with the DV_n.

Static models apply IV_n that are assumed fixed over time, whereas the more flexible dynamic modeling allows IV_n to vary over time. For example, the rate of net inter-provincial migration (NIPM) of physician workforce over T_1-T_{10} will vary in a dynamic model and remain fixed in a static model. Intuitively, based upon this example, one would tend to favour the use of a dynamic model until one realizes that each IV_n (e.g., NIPM) is in reality a dependent variable of still other independent variables e.g., the rate of NIPM can be set at a variable (dynamic) amount informed by historic CIHI, CPSNS, etc., data except for the likely probability that relative inter-provincial economic conditions, life style choice, familial circumstance, etc. have a high impact on the rate of inter-provincial migration. Hence a dynamic model must now add additional IV_n with their inherent associated uncertainty.

The technique of dynamic simulation modeling is required to examine adequately the complex causal relationships among the many variables (IV_n) that ultimately determine the values of the primary dependent variables (DV_n) i.e., quantity (DV_1) and mix (DV_2) of physician resources needed by the population over time (T_1-T_{10}) in comparison to the predicted supply (DV_3) of physician resources.

Dynamic simulation modeling attempts to incorporate as many variables as is required to reflect the health human resource system as a whole and then infer the statistical relationship between each variable. It is a complex undertaking that to date exists largely in the theoretical domain of forecasting[12]. Due to the inherent uncertainty of each of the many variables and further compounded by the uncertain extent of their causal relationships, dynamic simulation modeling requires large amounts of quality data extended over a period of years to enable ex post validation. Dynamic simulation modeling then applies a stochastic approach to uncertainty by applying random variation to each variable to generate a range of values for each variable. The result is a scatter diagram of probable outcomes with the area of highest density results being assigned the higher probability of being the likely range of outcomes.

Advancement of dynamic simulation modeling, which holds significant promise for health human resource forecasting, will benefit from focused research and peer-review publication that closes the current gap between its theoretical and practical utility.

7.9 Physician Supply

7.9.1 Gender

Over the span of their careers, female physicians work fewer hours than their male counterparts[13.] Two of three studies have arrived at the same conclusion when comparing male-to-female FTE ratio, i.e., "in general", a female physician over the course of her career will work the equivalent of 0.77 FTE to every 1.0 male FTE. More specifically, models project a female-to-male FTE ratio of 0.74 in Family Medicine, 0.81 in medical specialties, and 0.83 in surgical specialties. A ratio of 0.83 to 1.00 implies recruiting 1.2 females to equal 1.0 FTE and that, over her career, a female surgeon will work 0.17 FTE less than a male surgeon. Before and after family-raising years, females will work similarly or equivalent to males[14].

A British Medical Association 2006 survey of 2006 graduates found 21% of female graduates anticipated working part-time for most of their career and 48% want to train less than full-time (compared to 15% of men); 80% women and 50% men expected to take a career break at some stage.

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[12] O'Brien-Pallas, L, Birch, S., Bauman, A., Murphy, G.T., Integrating Workforce Planning, Human Resources, and Service Planning, Workshop on Global Health Workforce Strategy, WHO, 2001

[13] CIHI, Physicians in Canada: Average Gross Fee-for-Service Payments, 2008–2009

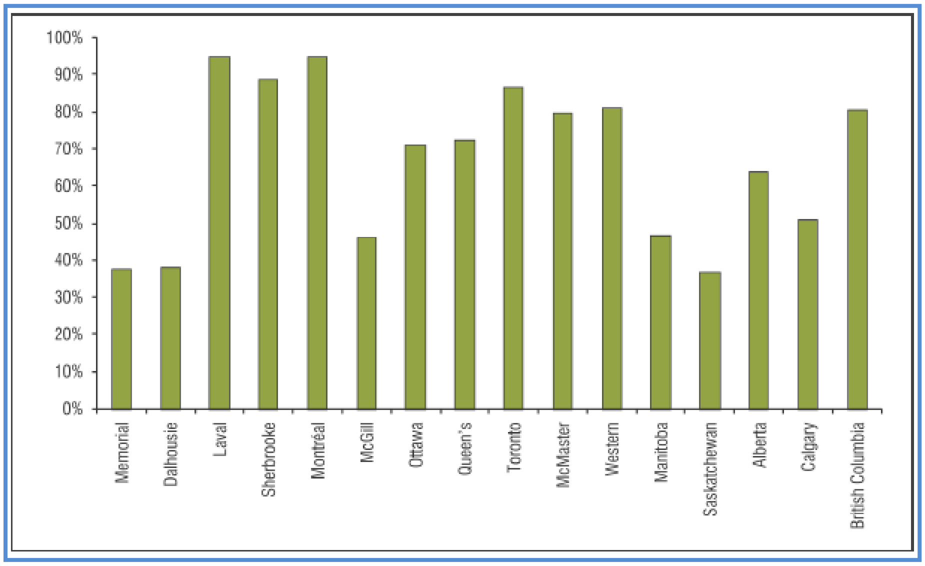
[14] Jeon, S.-H and Hurley, J., "The Relationship Between Physician Hours of Work, Service Volume and Service Intensity," Canadian Public Policy 33, Suppl. (2007): pp. S17–S29

7.9.2 Practice Location and Medical School Location

Numerous factors impact the decision of where to practice after graduation from medical school and completion of post-graduate residency: family ties, earning potential, clinical practice opening opportunity, lifestyle, marriage, academic pathway opportunity, experience during residency, particularly if the medical school is smaller with fewer residency slots.

The figure below is the percentage of Canadian-trained physicians who currently practice in the jurisdiction where they graduated from medical school, as reported by CIHI as of 2009.

Figure 24 Percent of Canadian-trained physicians practicing in the jurisdiction where they graduated from Medical School, 2009 (Source: CIHI)



It should be noted that approximately 33% of DFM undergraduate seats are allocated specifically to New Brunswick (28%) and P.E.I. (5%) residents. Consequently, the 39% retention indicated in the graph above relates to 67% of the undergraduate seats rather than 100% i.e. 39% of 67% is 58%. Dalhousie Faculty of Medicine (DFM) allocates a further 7% of total seats to residents of the remaining provinces; however, it is standard practice of all medical schools to reserve some portion of seats for students from out-of-province.

7.9.3 Migration

Figure 25 Net International Migration by Province, 2000 to 2009 (Source: CIHI)

2000-2009	Returned from Abroad	New IMG	Moved Abroad	Net Migration	Average Annual Net Impact	% Continuously Active 5-years later
N.L.	25	542	35	532	5.30%	27%
P.E.I.	10	19	7	22	1.10%	36%
N.S.	**85**	**450**	**102**	**433**	**2.10%**	**36%**
N.B.	33	268	53	248	1.90%	61%
Que.	310	721	465	566	0.30%	79%
Ont.	806	1,975	1,146	1,635	0.70%	70%
Man.	87	415	164	338	1.60%	44%
Sask.	38	510	107	441	2.80%	47%
Alta.	228	1,137	300	1,065	1.70%	60%
B.C.	370	1,081	473	978	1.10%	63%
Y.T.	3	50	4	49	8.10%	25%
N.W.T.	4	11	3	12	2.60%	18%
Nun.	1	2	0	3	3.30%	u/a
Canada	2,000	7,181	2,859	6,322	1.00%	65%

This figure identifies net international migration of physicians who returned from abroad, arrived as new IMGs, and less those who moved abroad. In ten years Nova Scotia had net international recruitment from these sources of 433 physicians for an annual net inflow of 2.1% of the total physician workforce.

Retention rate of recruits is indicated in the last column as the percentage of net migration still actively practising in the province five years later. For Nova Scotia, only 36% were still practising in-province five years later.

7.10 Key Observation – Conceptual Models

1. An **Adjusted Population Needs-Based Model (APNM)** provides the best alignment with the stated strategic government direction for PRP and the practical realities of modeling PRP with its many variables. An APNM combines demand model variables (e.g., current FFS/non-FFS utilization patterns by specialty) with population need model variables (e.g., population growth, disease incidence and prevalence, chronic disease management) and then conducts a reasonability test of the results against benchmarks and ratios.

8 NATIONAL ENVIRONMENT

8.1 Quality of Care

Quality of care has many dimensions. The U.S. Institute of Medicine[15] defines the core aims of quality care as:

• Safe: avoiding injuries to patients from the care that is intended to help them

• Effective: providing services based on scientific knowledge to all who could benefit, and refraining from providing services to those not likely to benefit

• Patient-centered: providing care that is respectful of and responsive to individual patient preferences, needs, and values, and ensuring that patient values guide all clinical decisions

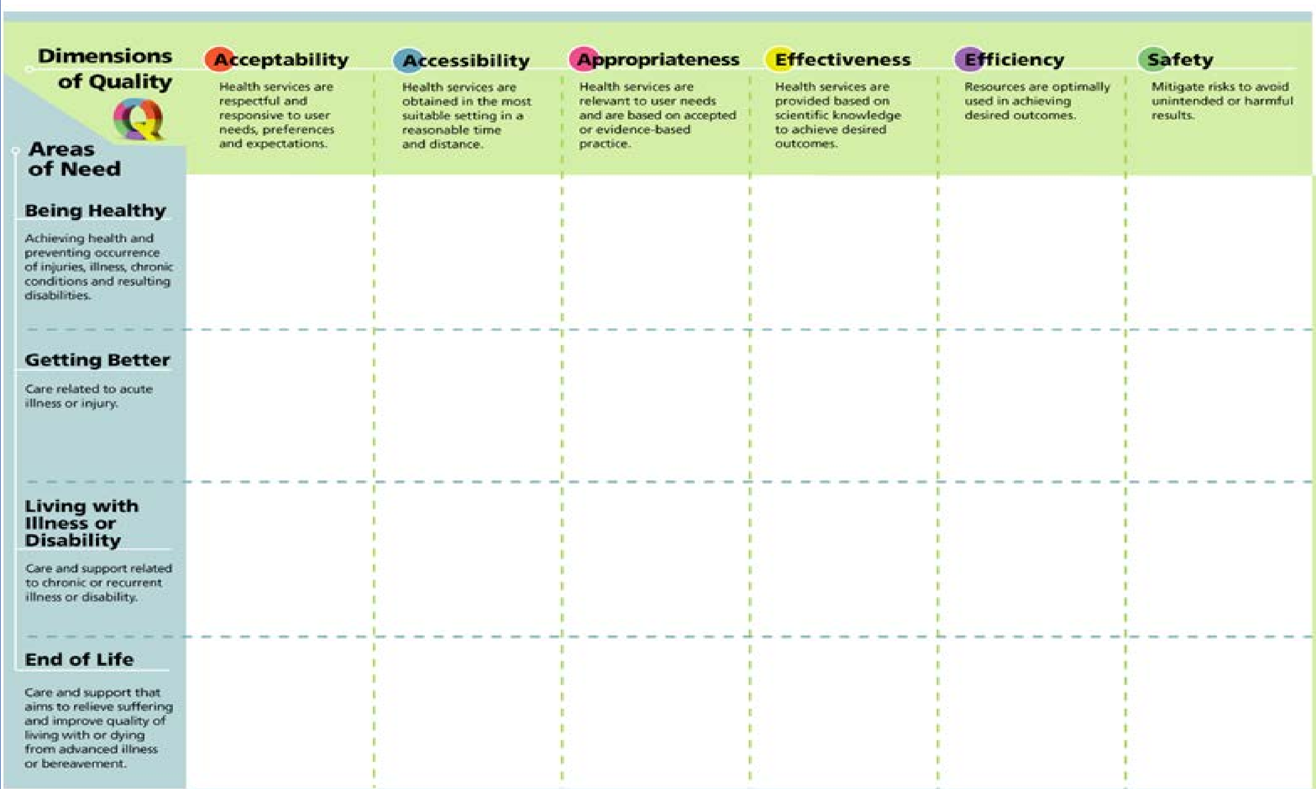
• Timely: reducing waits and, sometimes, harmful delays for both those who receive and those who give care

• Efficient: avoiding waste, including waste of equipment, supplies, ideas, and energy

• Equitable: providing care that does not vary in quality because of personal characteristics such as gender, ethnicity, geographic location, and socioeconomic status

Alberta has adapted and refined a quality framework that is now the standard for quality evaluation at both Alberta Health Services and the Alberta Ministry of Health and Wellness

Figure 26 Health Quality Matrix - Health Quality Council of Alberta



[15] Institute of Medicine, Shaping The Future For Health Crossing The Quality Chasm: A New Health System For The 21st Century, March 2001

Quality of care considerations are a central priority to PRP and are further emphasized by Department of Health and Wellness in one of the guiding principles for this project (“Preserve and enhance quality of care - acceptable, appropriate, accessible, efficient, effective, and safe”).

A complete approach to quality care addresses both the clinical and academic domains.

Figure 27 Quality Domains - Physician Workforce

Clinical Relevance	Academic Relevance	Professional Relevance
• Acceptability • Accessibility • Appropriateness • Effectiveness • Efficiency • Safety	• Excellence in Research • Excellence in Medical Education • Excellence in clinical precepting of trainees	• Maintenance of 'core competencies' • Continuing medical education (source: RCPSC CanMEDS)
Robust	**Standards Compliant**	**Best Practices**
• Scalable and amendable to the individual, the division, and the department • Apply defined, relevant, consistent, measureable, indicators	• CanMEDS (CFPC & RCPSC) and Health Quality frameworks are rigorously researched & validated methodologies • Underpinned by evolving best practices and is very accessible to outside users	• Apply lessons learned in Canada, USA, and abroad

Department of Health and Wellness, DHA, and other key stakeholder strategy, priorities, budgets, and policy are key determinants in PRP. Policy-derived targets for access, as have emerged nationally for joint replacement and cataracts, drive planning, budgets, and access.

Nova Scotia Department of Health and Wellness policy impacting the dimension of quality (e.g. access) will influence PRP. PRP will need to align with measures supportive of quality targets.

8.2 Core Services

The application of ‘core’ services is complex at the detailed level. Conceptually, what is intended is an understanding, based on evidence, of the population health service need that residents must be able to access as quickly and efficiently as possible.

8.2.1 British Columbia

The Interior Health Authority of British Columbia spans an area four times the size of Nova Scotia (215,000 sq.km. versus 55,000 sq.km.). Only 11 of the 58 incorporated communities in the health authority have a population of 10,000 or more. Interior Health is also home to 55 First Nations communities, the majority of which are rurally located. The DHA is divided into four health service district areas (HSDAs) and 31 local health authorities (LHAs). Its geography is very challenging for travel, making definition and application of core services an essential component of health system planning. Commute time was an equal or more heavily weighted factor than kilometre distance from point A to point B.

The Interior Health Authority defines core health services, as follows:

All communities in all LHAs:

- Health Promotion/Education
- Health Protection, Prevention & Community Health Services
- Primary Health Care
- Home and Community Care
- Home support
  - Home nursing care
  - Community rehabilitation

Communities of approximately 2,000 to 4,999 population have the following additional services:

- Acute Care (delivered by family practice)
  - Community Level 1 Hospital
  - Family practice delivered treatment services (acute and chronic care services)
  - Emergency health services
  - Diagnostic laboratory and x-ray services
- Home and Community Care
- Assisted living
  - Residential care
  - Short stay
  - Adult day services
- Mental Health & Addictions Services
- Mental Health Centre
  - Addictions programs and services

Communities 5,000 and larger will generally provide the following secondary level care:

- Provided in large community and regional hospitals and comprises emergency, general medical and surgical, anaesthesia, psychiatric, paediatric, obstetric and diagnostic services.

Each of the four HSDAs will provide in at least one urban centre the following added services:

- Urology, orthopaedics, ophthalmology, and neurology.

Tertiary care is provided in the largest urban centres (e.g., Kelowna, Kamloops) in the IAH i.e., neurosurgery, cardio-thoracic surgery, transplant services, specialized medical, obstetric, paediatric, gynaecological and psychiatric services.

Quaternary care is provided either at the largest urban centres or referred to Vancouver or out-of-province (e.g., paediatric heart transplantation).

Applying the IHA approach to Nova Scotia, with its network of community and regional hospitals, the core physician services become comprehensive family practice across the province and emergency, general internal medicine, general surgery, psychiatric, general paediatrics, general obstetrics, and general laboratory and radiology (screening, routine diagnostic and imaging, x-ray, ECG) services in community and regional hospitals. Certain regional hospitals would also have urology, orthopaedic surgery, ophthalmology, and neurology services.

8.2.2 Manitoba

Manitoba Health conducted a detailed study[16] to define core services for northern/rural areas of the province. The starting point was to state that all health services are 'core' but not all health services would be provided within all district health authorities. Some core health services would remain the primary responsibility of central agencies or Manitoba Health, as they can be more safely and efficiently administered centrally. The next logical step was to define those services that all district health authorities (DHA) would deliver. To inform this next step, , a robust, detailed community health needs assessment (CHNA) was conducted. DHAs are required to regularly update their CHNA. The findings from the CHNA resulted in identification of the following services as core:

- Health Promotion/Education
- Health Protection
- Prevention & Community Health Services
- Reproductive health, pregnancy/childbirth and parenting
  - Family health
  - Diabetes education, and
  - Other listed services
- Treatment, Emergency and Diagnostic Services
- Treatment services (acute and chronic care services)
  - Emergency health services
  - Diagnostic services
- Developmental and Rehabilitation Support Services
- Home-Based Care Services
- Assessment, Care planning and coordination, Direct services, and Process for managing long-term care placement
- Long-Term Care
- Mental Health Services
- Assessment/identification services
  - Acute care treatment
  - Intensive case management
  - Long-term care/treatment capacity
  - and a number of other listed services
- Substance Abuse/Addictions
- Detoxification, treatment and support
- Palliative Care (hospital and home-based)
- Treatment, emergency, and diagnostic services are further defined as follows:

Primary care is a basic level of care and is usually the first contact a person has with a nurse, physician, or other health professional. All regions must provide primary-care services to their residents. These services can be delivered at home, on an outpatient basis, or in residential facilities, clinics or community health centres.

Specialty-trained physicians and other health professionals provide secondary care in large community and regional hospitals, as well as teaching hospitals.

[16] Manitoba Health – Core Health Services for Northern/Rural Manitoba, 2009

Secondary care comprises emergency, general medical and surgical, anaesthesia, psychiatric, paediatric, obstetric, and diagnostic services. It will be available to all regions.

Tertiary care refers to more specialized diagnostic and treatment services that are provided on referral from other hospitals or from physicians. Tertiary services are those that cannot be efficiently or safely provided in most health regions because a large population base is not available to produce the number of cases required to sustain competence i.e., neurosurgery, cardio-thoracic surgery, transplant services, specialized medical, obstetric, paediatric, gynaecological and psychiatric services.

Quaternary services refer to the most technically demanding level of acute inpatient care, for people with extremely complex or rare medical conditions who require highly specialized care. The demand for service at this level would be very low; referrals would be made as required, and may be out of province.

Applying the Manitoba approach to Nova Scotia with its network of community and regional hospitals, the core physician services become comprehensive family practice across the province and emergency, general internal medicine, general surgery, psychiatric, general paediatrics, general obstetrics and general laboratory and radiology (screening, routine diagnostic and imaging, x-ray, ECG) services in community and regional hospitals.

The report goes on to identify the key requirements of an effectively integrated province-wide system of primary, secondary, tertiary, and quaternary care e.g., patient transport, diagnostic sampling, testing, and results reporting, etc.

8.2.3 Ontario

An Ontario joint policy and planning committee report[17] to the Ontario Ministry of Health defined the core service role of small hospitals. Preparatory to their report, they defined small hospitals as those with fewer than 4,000 inpatient weighted cases per year and divided these hospitals into two groups:

- Very Small: < 1,500 Weighted Cases (62 sites); and
- Small: 1,500 to 3,999 Weighted Cases (31 sites).

The Ontario report identified the following as core services for the very small hospitals and associated population centres:

- Emergency services:
  - Emergency departments must be prepared to provide care to, or stabilize and transfer, patients entering via the emergency department
- Medicine program with inpatient medical beds;
- Physician specialty of General/Family Practice supported by broadly trained Nurses;
- Inpatient allied health services, such as:
  - Physiotherapy, Clinical Nutrition, Occupational Therapy, Respiratory Therapy, Speech Pathology and Pharmacy; and,
  - Tailored to meet the specific needs of the population being served; and
- Diagnostic services, such as:
- Laboratory, Ultrasound, General Radiography and Non-invasive Cardiology.

The above definition is comparable to the 0-4,999 population centres in the IHA British Columbia definition.

[17] Ontario MOHLTC, The Core Service Role of Small Hospitals in Ontario Summary Report to The Minister of Health and Long-Term Care From The Ontario Joint Policy and Planning Committee (JPPC) Multi-Site/Small Hospitals Advisory Group, Dec/06.

For the group of relatively larger small hospitals, whose inpatient activity ranges from 1,500 to 4,000 weighted cases, the Advisory Group recommends that core services include all of the basic core services identified for very small hospitals above, PLUS:

- Physician specialties of General Surgery and Internal Medicine
  - General surgery and day surgery program;
  - Obstetrics program; and
  - Special Care Units with the ability to accommodate temporarily ventilated patients.

Under this criteria twenty three hospitals in Nova Scotia would be classified as very small, none as small, and the balance as medium or larger i.e., the regional hospitals, IWK, and Queen Elizabeth II Health Sciences Centre. Thus the twenty-three hospitals would provide family practice care.

8.2.4 Nova Scotia

Nova Scotia will be re-examining clinical service delivery models and plans for the province. The PRP, while specifically not a clinical service plan, is expected to be one of a number of initiatives that will help inform this re-examination.

The ‘Better Care Sooner’ Report reviews an emergency services delivery system with collaborative, community, regional, and provincial levels. Access standards will prescribe staffing levels, mix, and availability, and frequently irrespective of volume and acuity. Improved coordination of services is required, e.g., with Cardiovascular program on stroke will be reorganized in hospitals to provide coordinated and comprehensive care. Quality PRP is both short- and long-term in its time frame. Shifting models of delivery takes time and extensive planning. The practical examples provided in this subsection demonstrate a significant degree of consistency.

8.3 Generalism

The Council on Graduate Medical Education noted the decline of interest in the generalist specialties[18] in the context of a decline in graduate matching in family practice and general internal medicine and paediatrics.

Sheldon et. al. [19] offer a slightly different perspective when they advocate for a future that is focused on disease management and not specialty-based care. They contend certain services, i.e., trauma and emergency teams, cardiology and cardiac surgery specialties, and oncology are already functioning in that manner. In oncology, they note care teams include a patient advocate, clinical nurse specialist, radiologist, radiation oncologist, pathologist, surgeon, plastic surgeons, and medical oncologist. The result according to Sheldon is the need for a new concept of generalism. Rather than expecting a single practitioner to have some knowledge of all options, generalism should be a summation of the input of a spectrum of experts. One could interpret this viewpoint as being centred on tertiary programs but, perhaps, what is intended comes closer to Nova Scotia’s goal of collaborative care teams.

General Internal Medicine (GIM) has re-examined its future in recent years in the face of increasing subspecialization[20]. The RCPSC CanMEDS project has renewed a common focus on core competencies in the medical education system. Each Canadian Faculty of Medicine is revising curriculum extensively to align with the core competency focus. A senior representative of one large Faculty of Medicine had the following

[18] COGME: Update on the Physician Workforce, August 2000
[19] Sheldon, G.G., Anneke, T.S., Supply and demand—surgical and health workforce, Surg Clin N Am 84 (2004) 1493–1509
[20] Canadian Society of Internal Medicine: Care-fully: defining a Plan for General Internal Medicine in Canada. Oct/2005.

observation on generalism in context of the ongoing curriculum renewal; "I believe the majority of the health needs of the most people can be met by generalists: family physicians, general internists, general surgeons, general psychiatrists, general pediatricians, general obstetricians and gynecologists, general radiologists, general anesthetists and general laboratory specialists. I believe we should limit the number of sub-specialists trained[21]." The representative goes on to note that part of the trend to subspecialization can be attributed to the disproportionate amount of teaching done by subspecialists in comparison to GIM, general paediatricians, etc.

The RCPSC continues to examine the concept of generalism. There is broad support for a medical education system where training in all primary specialties must include a period of core training in order to develop a base of generalist competencies. There is however, no consensus on the issue of generalism at the RCPSC. The Royal College Standing Education Committee, at its 2006 conjoint meeting with the Deans of Postgraduate Medical Education, sought to arrive at mutual understanding on the issue of generalism in Canada.

> *"Participants, after deliberations, agreed that the issue is context driven and the definition of generalism will vary pending on numerous factors that include but not limited to, the region of practice and the area of specialization. Participants were therefore, unenthusiastic with the idea of presenting one all encompassing definition of generalism. The RCPSC and CFPC did recommend that the Royal College and the CFPC, in collaboration with key partners, engage in an on-going dialogue on the specialist and generalist mix to best meet the needs of Canadians[22]."*

One contributor opined that "…the 'generalism' debate is properly placed under the 'health care' and 'manpower' umbrella (Reznick)." This direction would take PGME towards a more managed allocation of training positions between generalist or primary specialties and subspecialties. This increasingly appears to be the outcome of governments directing the medical education system to graduate more generalists or 'primary specialties'.

8.4 Collaborative Care

8.4.1 Nova Scotia

From project inception, Nova Scotia has made clear the strategic importance placed upon evolving the current model of health services delivery to a truly collaborative care based model. Nova Scotia is redesigning primary health care delivery around the patient with care provided by collaborative care teams on a comprehensive basis (supported by a provincial HealthLink 811 service).

Figure 28 Nova Scotia - Future of Primary Health Care

Current Model	Future Model
Problem-focused care	Patient-centred care
Heavy burden on individual providers	Collaborative care team (mix of providers) working to full scope-sharing the burden
•Up to 2-6 week wait for appointments •Availability 9 am to 5pm, 4-5 days/week •Walk-in clinics available (episodic care) •ER used as default	•Same day / Next day appointments •Extended hours, 7 days / week •Comprehensive care
Individual paper-based systems	Shared information - Electronic Medical Records
Reactive – high dependence on rescue technology	Proactive – preventative care and chronic disease management
Recruitment and retention challenges	•Should lead to increased job satisfaction •Better work/life balance (team support)

Dentistry

[22] RCPSC and CFPC, Perspectives on Residency Education in Canada An Interim Report of the Core Competency Project, Sept/2007

The following seven elements are essential to enabling achievement of the future model.

- Enhanced access to culturally competent care
- Comprehensive Chronic Disease Prevention & Management
- Population Based Services & Programs
- Full use of EMR
- Quality monitoring
- Dedicated time to team building & collaboration
- All providers practice to full scope

Collaborative teams are described as 'providers that bring separate and shared knowledge together to support a comprehensive range of high quality, effective health-care service'. The team may include a family physician, dietician, nurse, and/or pharmacist, noting that no two teams need be identical.

Many challenges must be surmounted before the future model can be achieved. Planners caution that the process will take time, require extensive broad based engagement and consultation, and detailed careful analysis and planning.

The Consultant noted the following points in particular from physician leadership interviewees with respect to collaborative care:

- Gaps will be addressed through expanded roles and use of the family practice nurse and through collaborative care models
- Physicians continue to misunderstand the collaborative care model
- Specialists outside Halifax should be paired with an academic clinician in a mentoring role – should assist further in the integration of care and collaborative models

One of several examples of collaborative practice is in the DHA 3 Middleton area where four full-time general practitioners report serving 9,000 patients across three sites.

- Collaborative care should grow as expanded funding becomes available – model is expensive but provides real value with integrated care that focuses on outcomes rather than outputs

DNS encourages "including emerging collaborative models of care". The DNS membership study[23] of July 2011 points out that, "In addition, 60%+ of respondents (overall response rate of 16%) see allied health professionals as ideally suited for assisting or supporting physicians in collaborative care". Respondents are most interested in working collaboratively with nurses and mental health professionals. They have minimal interest in collaborating with midwives, although those doing obstetrics were twice as likely to support the idea than those who do not. Only 20% of practising respondents supported allied health professionals delivering direct patient care in their area of expertise, although 31% of residents and students supported the idea.

College of Registered Nurses of Nova Scotia (CRNNS) observes that, "collaborative care in Mental Health Services is in great need, e.g., one to many work with the elderly. According to CRNNS, in 2010-11, there were a total of 116 NPs with an active practising NP license in Nova Scotia with 65 registered as NP-Family/All Ages (majority employed in Primary Health Care settings); 42 are registered as NP-Adult (majority employed in acute care specialty areas); 2 are registered as NP-Pediatrics (acute care specialty areas); and 7 are registered as NP-Neonatal (acute care specialty areas). There is a lack of quality data on members of the health professions e.g., physiotherapy, occupational therapy, dieticians, social work, etc.

The CMA/CFPC 2010 National Physician Survey (NPS) asked specifically whether the respondent works in a collaborative care setting; unfortunately that response section is not available at the time of this Report. A less

[23] Doctors of Nova Scotia Physician Resource Plan Membership Study, July 2011

direct question was asked regarding practice in an inter-professional practice. The response to this question remained in the 20% range for both the 2007 and 2010 surveys with little variation by province other than Quebec at 28%.

Nova Scotia Health Research Foundation (NSHRF) reiterated support for and interest in expansion of collaborative care models.

Nurse Practitioners (NPs) play an integral and expanding role in health service delivery. Discussion with the CRNNS identified:

- There are 110-120 nurse practitioners currently practising in the province, and increasing by six to twelve per year.
- There is a need for a comprehensive strategic plan for NPs in the province.
- Concerns for compartmentalizing the scope of individual practice into a single health sector e.g., primary health care, acute care, and continuing or long-term care.
- Provincial funding is available to support recruitment and retention of NPs.
- Work on legislation is necessary to remove barriers to barriers admission/discharge to hospital. Legislation is in place to enable ordering drugs, tests, and interpretation.
- Role definitions are evolving and other practitioners are seen as distinct from NPs, e.g., advanced practice nurse for family physicians and clinical nurse specialists in CDHA acute care. This individual will hold a four-year degree plus have completed a post-certification program for ten months. The family doctor can employ an APN whereas an NP is almost always employed by the DHA.
- The North End Clinic in Halifax is widely recognized as an excellent example of an integrated model that includes salaried physicians.

The Department of Health and Wellness is hiring significantly more NPs as part of their multi-pronged strategy to achieve ‘Better Care Sooner’.

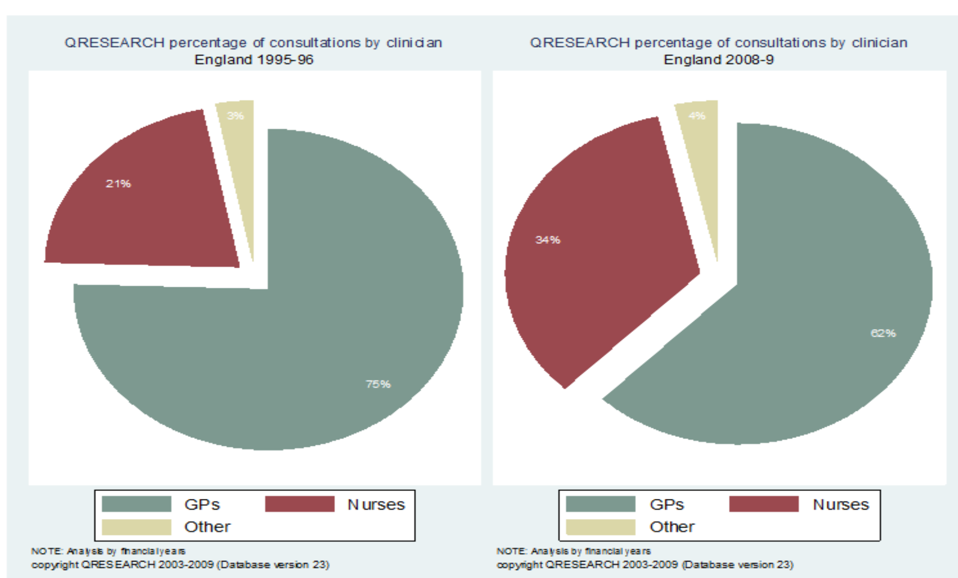
Clearly, collaborative care is an integral component of PRP planning with, by far, it’s most significant relevance being on the future of primary health care.

8.4.2 International

England National Health Service

The workforce research arm of the England National Health Service, the Centre for Workforce Intelligence, reported 5.45 primary health care consultations per patient per annum in 2008 based on a detailed analysis of Primary Care Trusts with an enrolled population of 4.9 million. The 5.45 consultations per patient waere distributed among GPs at 3.4, GP Practice Nurses at 1.8, and other health

Figure 29 U.K. NHS - Change in proportion of consultations by provider

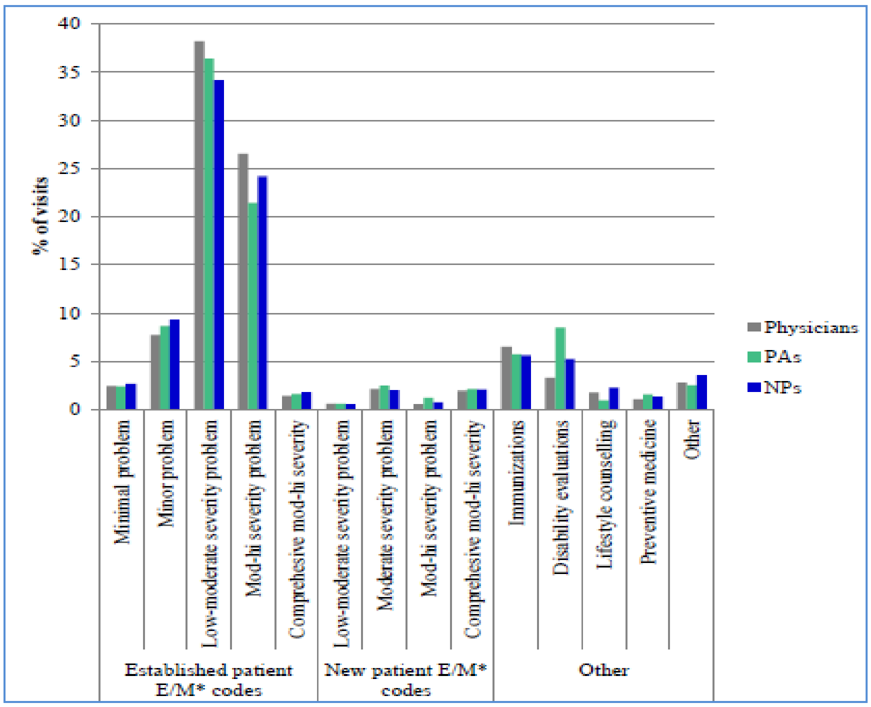


professionals at 0.25[24]. The percentage of primary care visits seen by NPs in the Primary Care Trusts has grown from 21% in 1995/96 to 34% in 2008/09 and is now levelling off. A U.K. General Practice nurse would see an average 16 patients per day.

Nova Scotia GPs average 6,889 services (FFS plus Shadow Bill) per 1.0 FTE, 1,124 population per 1.0 FTE, and 6.09 services per resident.

Applying the U.K. Primary Care Trust experience to Nova Scotia implies 1.0 FTE GP plus a 1.0 FTE NP would manage ~1,750 residents compared to the current ratio of 1.0 FTE GP to 1,124 residents. This is an increase of 54% in the ratio of GP 1.0 FTE to population. The addition of a family practice nurse (FPN) would not be necessary under this model but could be spotted into certain situations based on local need.

Figure 30 Veterans Affairs- Comparison of primary visit procedure codes, 2010*



United States – Department of Veterans Affairs

The U.S. Department of Veterans Affairs (VA) has made extensive use of physician assistants (PAs) and nurse practitioners (NPs). The VA recently evaluated the roles and impact of PAs and NPs for quality assurance purposes[25]. Patient encounter data from 2005 to 2010 was reviewed. In 2010, the VA delivered 11 million primary care encounters; physicians provided 7,700,000, NPs 2,000,000, and PAs 890,000. Approximately one in four encounters was managed by an NP or PA. This ratio is lower than the England NHS experience of one in three encounters managed by a non-physician (i.e. 3.4 GP to 1.8 NP).

Less than 1% of NP and PA encounters listed a physician as a second provider to the encounter. There was no difference in the patient demographic profile across providers, i.e. age, gender, and ethnicity. The adjacent graph suggests no, or little, difference in reasons for visits across providers. The number and proportion of visits by provider has been stable from 2005 to 2010. A key concluding observation was, **"***PAs, NPs, and physicians seem to fill similar roles in VA primary care clinics. Additional research is needed to examine whether this is the most effective and efficient division of labor."*

[24] U.K. NHS Centre for Workforce Intelligence, August 2010
[25] Morgan, P., Abbott, D.H., McNeill, R., Fisher, D.A., Characteristics of Primary Care Office Visits to Physician Assistants, Nurse Practitioners, and Physicians in the VA, 2005-2010, Poster 2011.

8.4.3 National

Ontario commissioned an expert panel to examine and report on health professional human resources. In their report to the Minister of Health and Long Term Care they noted that effective use of nurse practitioners (NPs) can have a positive impact on the availability of primary care services[26]. The results of their research indicated that a collaborative physician/NP practice can provide primary care for 25-50% more patients than a physician practice without NPs. The U.K. Primary Care Trust suggests a 53% increase occurs. Collaborative practices also have the potential to reduce some of the pressure on physicians, particularly in underserviced areas, and to reduce the time that patients have to wait for appointments. The Panel in its forecasting assumed a 33% increase in patients in a collaborative physician/NP practice versus a physician practice without NPs.

Per 100,000 residents
Current Model
Assume 1 GP/1,124
100 GP FTE ~$28.3m
Collaborative Model
75 GP FTE ~$21m
75 NP FTE ~$7.5m (inc. benefits)

The financial implications of a 33% increase in patients per physician/NP collaborative practice are roughly as described in the adjacent illustration. From a provider payment (only) financial perspective the collaborative model is equivalent in cost. The Ontario report did, however, provide little elaboration on the collaborative model, e.g., could the NP safely care for added patients?

In the Nova Scotia experience, the majority (47%) of NPs saw between six to 10 patients per day, with the next highest percentage (32%) being 11 to 15 patients. An additional 16% of NPs indicated they routinely see more than 15 patients per day[27]. Taking an average of 11 patients per day over 220 worked days is equivalent to 2,420 patient visits per annum. Since 2002/03 Nova Scotians have averaged about 7 GP physician insured services per annum (source: Department of Health and Wellness Annual Statistical Report) or 6 visits per annum assuming 15% of visits result in more than 1 service. This would imply one full-time NP 'managing' 400 patients at an average 6 visits each per annum which in a collaborative model would indicate a ratio of 1,400 patients per GP/NP collaborative team as compared to the 1,333 projected in Ontario using 2001 data.

Current GP cost per patient $250
($283,000/1,124 patients)
Current NP cost per Resident $250
($100,000/400 patients)
NP breakeven point occurs at 400 patients/1.0 NP FTE

The preceding crude analysis suggests that the provider financial payments (only) breakeven point occurs at 1,524 (1,124 plus 400) patients. This crude costing assumes all other financial implications remain constant e.g., drug, test, exam ordering patterns, ratio of visits per patient, etc. This costing also does not account for the added administrative/overhead costs to the system of monitoring, evaluation, legislation, regulation, etc. that goes with all health professions and particularly those providing direct medically delegated patient care.

The Ontario Medical Association section on General and Family Practice commissioned a study of the NP model. A finding relevant to the preceding cost analysis was "A balanced analysis reveals that NPs are not a less expensive alternative to FPs; further, cost effectiveness was not put forward as a characteristic element in the formative thinking about NP models. Overall, the literature on comparative costs for NPs versus FPs is scant and no comprehensive cost-effectiveness analyses were located"[28].

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[26] Ontario MOHLTC, Expert Panel Health Professional Human Resources: "Shaping Ontario's Physician Workforce", 2001
* E/M – Evaluation and Management
[27] CRNNS, Report on the 2010 Nurse Practitioner – Quality Monitoring & Improvement Program (NP-QMP)
[28] Health Intelligence Inc., A Review and Analysis of the Nurse Practitioner Model: A Report to the Section of General and Family Practice, Ontario Medical Association, June 8, 2009

Figure 31 Collaborative Care - Cost comparison between Nova Scotia Current State and U.K. Model

		Population	FTE GP	Pop/FTE	Services/ FTE	Total Services	Services/ Resident	Cost/FTE	Total Cost
Current State	Nova Scotia - 2009/10	942,000	838	1,124	6,889	5,772,982	6.13	$ 283,000	$ 237,154,000
Future State?	Applying U.K. experience to Nova Scotia								
	U.K. PCT-GP	942,000	545	1,728	6,889	3,754,505	3.98	$ 283,000	$ 154,235,000
	U.K. PCT-NP	942,000	545	1,728	3,704	2,018,477	2.14	$ 100,000	$ 54,500,000
	TOTAL	942,000	1,090	864	5,296	5,772,982	6.13	$ 191,500	$ 208,735,000
	DIFFERENCE	N/C	293 fewer GP, 545 more NP	23% more FTE/ Population	N/C	N/C	N/C	32% Decrease	$28.4m saving

Positive financial benefits are achieved if the U.K. Primary Care Trust experience of a GP to GP Practice Nurse patient ratio of 1.9:1.0 is applied compared to 2.8:1.0 (1,124 to 400) in the preceding costing analysis based on limited experience in Canada. Applying a ratio of 1.9:1.0 implies a collaborative care practice of 1,728 patients per GP/NP, well above the provider financial payments breakeven point. A saving of $28.4m (next figure) is potentially achievable using the U.K. model of collaborative care.

Collaborative care is integral to the Nova Scotia long-term health system strategy. The above analysis underscores the need for evidence-based quantitative and qualitative research and analysis on collaborative care teams to ensure value for money in both the qualitative and quantitative sense is achieved.

The same Ontario Panel noted that about 197 midwives were licensed to practice in Ontario and approximately 40 more enter practice each year. At the time, the typical caseload for each midwife was 40 deliveries per year (less than one per week) and a significant proportion of those deliveries (25% to 30%) involve shared care with an obstetrician/gynecologist. Anecdotal reports indicate many of the obstetrician/gynecologist interventions were required for administrative rather than clinical reasons.

8.5 Primary Health Care Renewal

Health Canada, through the primary health care transition fund, has invested in the belief that the Romanow Commission[29] statement of "…high-quality, effective primary health care services have profound implications for the entire health care system." The final report states, "there is almost universal agreement that primary health care offers tremendous potential benefits to Canadians and to the health care system ... no other initiative holds as much potential for improving health and sustaining our health care system." A target was set and agreed by first Ministers to a Health Care Accord that identified to a target of 50% of Canadians having 24/7 access to an appropriate primary health care provider by 2011.

The College of Family Physicians of Canada (CFPC) strategic plan emphasizes that access to comprehensive continuing care in a family practice setting is the cornerstone of high-quality health care for the people of Canada.

The Canadian Medical Association (CMA) in its policy for principles to guide health care transformation in Canada states unequivocally, "A strong primary care foundation and collaboration and communication within and between health professional disciplines along the continuum are essential to achieving patient-centred care."

The American Academy of Family Physicians conducts a regular assessment of PRP. Among its chief concerns is the increasing generalist-specialist imbalance in the United States, undermining the nation's ability to achieve

[29] Romanow, R., Building Values The Future Of Health Care In Canada, Nov/2002.

universal health care access and limits its ability to meet needs of underserved rural and urban populations [30] 62% of the US physician workforce is specialists.

The Council on Graduate Medical Education and the Association of American Medical Colleges have called for 50 percent of U.S. medical graduates to enter generalist careers. In Nova Scotia (section 13) 42% of Full-Time Equivalent (FTE) physicians are general practitioners and 50.5% as generalists (general practice, general surgery, general internal medicine, and general paediatrics). CIHI 2008-09 data reports 58% of the national physician workforce FTEs are general practice with a range from 51% in Nova Scotia to 63% in Saskatchewan.

Initiatives focused on strengthening primary care have and continue to be developed and implemented across Canada.

8.6 Hospital Inpatient Care

Hospital inpatients, particularly in tertiary settings, are increasingly acute as measured by prevalence of comorbid conditions, multi-system dysfunction, and patient age. Subspecialization has contributed to the fragmentation of inpatient care. Hospitalist programs are 95% staffed by family physicians[31]. A school of thought is inpatient care will be enhanced if a GIM specialist is involved early in the admission process to a hospitalist unit (Raju M., DFM, Kassen B., St. Paul's Vancouver). Raju and the Canadian Society of Internal Medicine propose a model of one GIM from a formal community-based rotation per 36 inpatients. The proposed model sees the GIM specialist in a consultative role to family physicians and as a direct bridge between family physicians and subspecialists[32].

One of the first major studies (76,000 admissions across multiple facilities between 2002-2005 and across seven target diagnoses) of hospitalist cost and quality was published in 2007. The USA-based study found little or no difference in cost or quality of care between patients cared for by family physicians, GIM, or hospitalists[33]. They did find a small reduction (0.4) in length of stay without adverse effect on death rate or readmission for those managed by hospitalists. In the USA 75% of hospitalists are general internists, 11% general paediatricians, and only 3% family physicians[34]. Hospitalists work a median of 1,833 inpatients on ward shift hours (206 shifts, 8.9 hours per shift) plus 1,139 call hours (82 days on call, 12.8 hours per day on call).

The findings of the major study suggest caution in launching into any one particular model. Currently in Nova Scotia 39.8% of all hospital admissions list a family practitioner as the most responsible doctor service. 33.5% of admissions within DHA 9 are also family practitioner.

[30] American Academy of Family Physicians, Family Physician Workforce Reform: Recommendations of the American Academy of Family Physicians (AAFP Reprint No. 305b), 2009

[31] Ennis, E.M., Latest Developments in the Hospitalist Model: A New Paradigm for Inpatient Care. Canadian Hospital Survey Results. Insight Conference. Toronto. June 16, 2004.

[32] Raju, M., The Care of Acute Medical In-Patients – Whose Job Is It? Hospitalist Program in Canada, Care-Fully: Defining a Plan for General Internal Medicine in Canada, Canadian Society of Internal Medicine, October, 2005

[33] Lindenauer, P.K., Auerbach, A.D., et.al., Outcomes of Care by Hospitalists, General Internists, and Family Physicians, N Engl J Med 2007; 357:2589-2600, December 20, 2007

[34] The SHM 2005-2006 Survey: The Authoritative Source on the State of the Hospitalist Movement.

Figure 32 Nova Scotia - Hospital Admissions by Most Responsible Doctor Service, 2009/10 (Source: DAD)

	PROVINCIAL TOTAL (2010)					PROVINCIAL %				
Doctor Service Name	COUNT	AVG IP RIW	AVG TOTAL RIW	AVG ACUTE LOS	AVG TOTAL LOS	% of Total Count	% of Total AVG IP RIW	% of Total AVG RIW	% of Total AVG Acute LOS	% of Total AVG Total LOS
Family Practioner/ GP	37,416	1.55	3.13	8.31	11.38	39.8%	52.9%	106.7%	112.2%	126.2%
Obstetrics and Gynecology	8,966	1.99	1.99	2.90	2.96	9.5%	67.7%	67.7%	39.2%	32.9%
General Surgery	8,744	2.15	2.15	6.08	6.35	9.3%	73.0%	73.0%	82.1%	70.4%
Orthopedic Surgery	6,400	2.50	2.50	5.60	6.24	6.8%	85.2%	85.2%	75.5%	69.2%
Cardiology	4,784	3.82	3.82	5.16	5.31	5.1%	130.1%	130.1%	69.7%	58.9%
Internal Medicine	4,491	3.18	3.18	7.29	8.01	4.8%	108.2%	108.2%	98.4%	88.9%
Psychiatry	2,538	4.37	4.37	24.23	30.96	2.7%	148.6%	148.6%	327.0%	343.4%
Urology	2,488	1.62	1.62	3.88	3.93	2.6%	55.1%	55.1%	52.4%	43.6%
Paediatrics	2,160	1.92	1.92	4.82	4.82	2.3%	65.3%	65.3%	65.0%	53.4%
Otolaryngology	1,792	1.22	1.22	2.55	2.65	1.9%	41.4%	41.4%	34.4%	29.4%
Neurosurgery	1,369	3.51	3.51	8.08	8.60	1.5%	119.3%	119.3%	109.0%	95.4%
Vascular Surgery	1,274	3.59	3.59	8.44	9.22	1.4%	122.3%	122.3%	113.9%	102.3%
Cardiac Surgery	1,136	6.38	6.38	12.16	12.16	1.2%	217.2%	217.2%	164.1%	134.8%
Thoracic Surgery	1,029	2.54	2.54	6.70	6.75	1.1%	86.3%	86.3%	90.4%	74.9%
Subtotal	84,587	1.59	2.87	7.24	8.95	89.9%	54.3%	97.8%	97.7%	99.3%
OTHER	9,518	2.35	3.51	8.95	9.62	10.1%	80.0%	119.4%	120.8%	106.6%
TOTAL	**94,105**	**2.94**	**2.94**	**7.41**	**9.02**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

Provincially Family practitioner admissions are 52.9% (at 1.55) of the provincial average acute resource intensity weight (RIW) of 2.94 but 106.7% (at 3.13) of the provincial average total (typical plus atypical) RIW of 2.94. Acute length of stay is 112.2% (at 8.31) of the provincial average of 7.41.

8.7 Regionalization (and Provincialization)

Governance models to oversee health service delivery in the provinces continue to evolve. Regionalized governance has taken hold in most provinces. B.C. is divided into five regions plus a provincial authority. Alberta has recently consolidated to a single province-wide health authority. Saskatchewan has thirteen health regions. Manitoba has eleven health authorities.

Ontario employs a complex hybrid model of academic health science centres, hospitals, and fourteen local health integration networks. New Brunswick employs a tiered system of provincial health network (Horizon), two regional health authorities divided into health zones. Nova Scotia has nine District Health Authorities (DHAs) and one provincial paediatric health science centre (Isaac Walton Killam Health Centre).

Provincial and integrated regional planning has replaced hospital-centric planning in virtually all provinces.

8.8 Technology

The cost of health care continues to rise across Canada and is a pressing challenge for virtually all jurisdictions. Nova Scotia is no different in this regard. Technology in the broadest sense plays a key role on both sides of the ledger, cost and savings. The adage 'best test first' was coined to say the test that delivers the least diagnosis ambiguity with the most quality will improve patient care and save costs. Unfortunately, health technology assessment (HTA) is a daunting task given the state and volume of continuous change driven internally by research and externally by industry. Drugs, along with diagnostic and surgical equipment, are the best examples of this constant state of change that demands cost/benefit assessment and evaluation. The national agency responsible for HTA, the Canadian Agency for Drugs and Technologies in Health, is overwhelmed by demands. CADTH is the largest producer of HTA in the country[35].

[35] Menon, D., Stafinski, T., Health Technology Assessment in Canada: 20 Years Strong? University of Alberta, Edmonton, AB, Canada, Value in Health 12:2:2009.

Technology evolution impacts PRP in a very significant way. Today's 'best test' will not be tomorrow's, yet a physician is expected to keep pace with emerging knowledge. Technology-enabling non-invasive surgery has had a profound impact on PRP. The 'heart' is no longer the domain of one or two specialties. Interventional radiology, interventional cardiology, vascular surgery, and cardiac surgery are evolving in significant ways with direct impact on PRP.

8.9 Population Demand and Expectations

Canadians are accustomed to the standards and quality that characterize our health system. All developed countries are facing the same cost and sustainability challenge as populations age and grow. We expect rapid access to high quality service regardless of circumstance. Government policy on access to health services sets de facto standards. The IHA in B.C. has made many explicit decisions around access for its many widely spread communities. Ontario and Manitoba, by addressing core services, have done likewise.

Government policy on access directly impacts PRP planning assumptions.

Winnipeg Health Authority examined the question more directly through Community Health Councils and elicited specific responses[36] to what were 'reasonable' and 'unreasonable' expectations.

Unreasonable expectations were stated as:

- That the health care system can fix everyone and that people do not have any responsibility for their own well-being
- That funding for health care is infinite
- That people should be able to access health care for any issue at any time and,
- That people with non-urgent medical issues receive immediate care at emergency departments.

- Reasonable expectations included:

  - The right to primary care
  - Fair and equitable access to health care for all
  - Timely access to primary care, specialists, diagnostics, and treatment
  - Respectful and compassionate care
  - Electronic medical records
  - More resources provided for disease prevention and health promotion
  - The use of most current technology, and,
  - That health care is provided in the community, as much as possible

Ipsos Canada, Decima Research, Environics Research Group, Innovative Research Group Inc., Ekos Research Associates Inc., Pollara Inc., and The Strategic Counsel, among others tend to ask the question in terms of 'expectations' rather than reasonable/unreasonable. Their surveys and results comprise the primary research base for a high level report to the Health Council of Canada [37] that summarized public perceptions and expectations as follows:

- Overall ratings of the health care system have improved slightly in recent years, but a large majority of Canadians still believe that the system is unsustainable and urgently in need of substantive change.

[36] Winnipeg Health Authority, "Public Expectations of the Health Care System" Community Health Advisory Councils, May/10

[37] Soroka, S.N., A report to the Health Council of Canada, Canadian Perceptions of the Health Care System, McGill University, Feb/07.

- Federal and provincial governments receive relatively low ratings for their performance on health care, though Canadians have slightly more confidence in their provincial governments.
- There is overwhelming support for increased spending on health care, from both levels of government. There is a strong sense that the federal government should transfer more money to the provinces, but not without conditions – there is also strong support for national standards in health care provision.
- The highest policy priority for Canadians is timely access to care. Quality is also a major concern. Both are believed to have declined in recent years, and – without fundamental change to the system – are seen as likely to decline more in the future..
- There is increasing attention to private sector provision of health care services, in large part a response to expectations about the quality of public services. Most people interested in private health care view this as an addition to, rather than a replacement for, the public health care system. And support for private care does not preclude support for additional public funding – many support both.
- There is strong support for additional home care services, and moderate support for a national pharmacare program.

It can be reasonably argued that Winnipeg asked the more appropriate question than the national pollsters if one assumes resources (local, provincial, and national) are indeed finite.

9 National - Physician Profile

9.1 Profile – Number and Payments

The number of physicians varies substantially across the country. According to CIHI, Nova Scotia with 2.53 per 1,000 population has the greatest ratio, 25.1% higher than the national average of 2.02. Saskatchewan has the lowest at 10.5% below the national average. These results do not indicate any one province to be better or worse off for physician supply given the many, many assumptions implicit in a crude head count per population, e.g., age/gender standardization of population, mix and age of physicians. Nonetheless, Nova Scotia is starting from a point of relative strength based upon a crude number count.

In Canada, physician payment reform has been well underway for many years. Today, more than 50% of physicians include non-fee-for-service (non-FFS) payments in their income. Atlantic provinces lead the way in number of physicians paid mainly by non-FFS. With the growth in non-FFS payments, the quality of FTE and productivity data related to non-FFS payments is of increasingly critical importance to PRP and health planning.

Figure 33 Physicians by Province paid partially and mainly through alternate payment methods, 2008/09 (Source: CIHI)

PROVINCE	Total #Physicians	#Paid through APP		#Paid mainly through APP		08-09 Pop.	#/1,000 Pop.
N.L.	1,213	610	50.30%	503	41.50%	506.5	2.39
P.E.I.	298	249	83.60%	169	56.70%	140.1	2.13
N.S.	2,343	1,546	66.00%	611	26.10%	927.5	2.53
N.B.	1,593	1,048	65.80%	666	41.80%	741.1	2.15
Que.	16,427	11,763	71.60%	4,452	27.10%	7,759.8	2.12
Ont.	24,596	13,447	54.70%	5,320	21.60%	12,952.9	1.90
Man.	2,399	1,890	78.80%	523	21.80%	1,204.3	1.99
Sask.	1,836	458	24.90%	n/a	n/a	1,015.6	1.81
Alta.	6,772	1,051	15.50%	700	10.3%	3,609.1	1.88
B.C.	9,611	2,914	30.30%	n/a	n/a	4,393.2	2.19
Y.T.	NR	NR	NR	NR	NR	n/a	n/a
N.W.T.	78	75	96.20%	75	96.20%	n/a	n/a
Total	**67,166**	**35,051**	**52.2%**	**N/A**	**N/A**	**33,250.2**	**2.02**

Block funding and capitation payments are the predominant non-FFS models at 21% and 16%, respectively, of all national non-FFS payments. In 2008-09, 27% of payments nationally were non-FFS, with the range being 49% in Nova Scotia to 15% in Alberta. Block funding to specialists comprise the majority of non-FFS payments in Nova Scotia. Physician surveys consistently support payment models that blend FFS with non-FFS contracts for services, e.g., 48% of respondents to the 2004 CMA/CFSC national physician survey. The figure rose to 58% in physicians less than 35 years of age. The July 2011 DNS member survey reports the perception that specialists are paid predominantly by non-FFS and family physicians by FFS and that the percentage of family physicians favouring non-FFS will grow.

Evidence supports the permanence, growth, and evolution of non-FFS payment models.

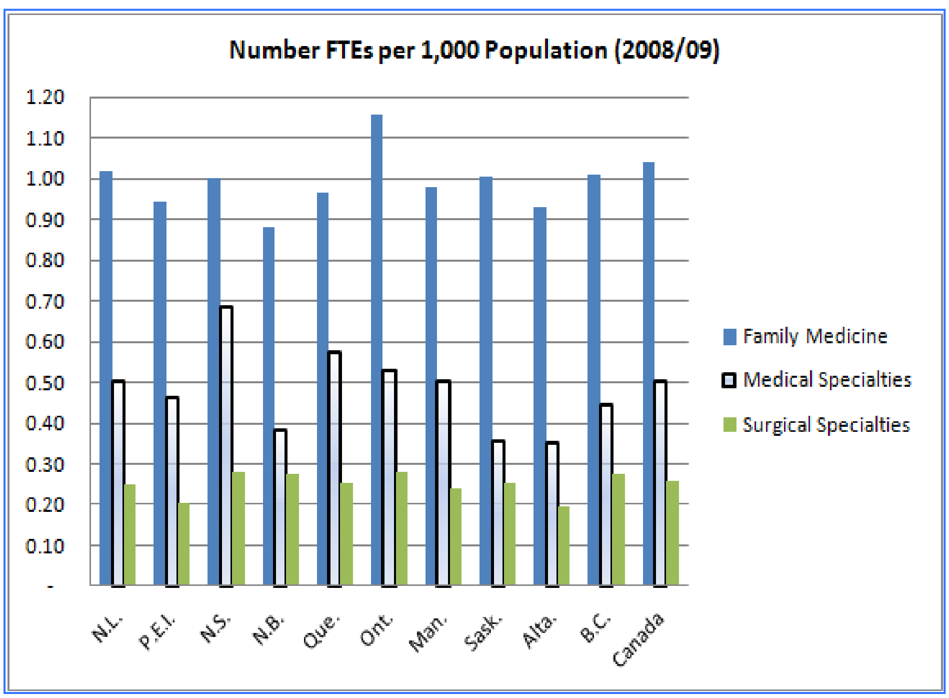
Figure 34 Alternative Clinical Payments by Payment Mode and Province/Territory, 2008/09 (Source: CIHI)

Total Alternative (non-FFS) Clinical Payments ($000's) by Payment Mode and Province/Territory, 2008–2009														
MODE	N.L.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Y.T.	N.W.T.	NV	Total
Salary	$ 72,445	$16,511	**$ 31,285**	$ 57,995	$ 76,440	$ 78,181	$195,820	N/A	N/A	$ 7,063	NR	$ 29,136		$ 564,875
Sessional	†	92	**1,475**	43,730	283,083	0	N/A	N/A	5,057	70,848	NR	N/A		404,286
Capitation	N/A	N/A	**N/A**	N/A	75,396	694,344	N/A	N/A	5,585	N/A	NR	N/A	0	775,325
Block	13,371	N/A	**165,004**	N/A	N/A	835,598	N/A	20,478	N/A	N/A	NR	N/A	0	1,034,450
Psychiatry	N/A	N/A	**10,476**	N/A	N/A	1,632	N/A	N/A	N/A	N/A	NR	N/A	0	12,109
Blended	N/A	N/A	**N/A**	N/A	468,532	299,635	N/A	N/A	N/A	12,571	NR	N/A	0	780,738
Northern	N/A	342	**N/A**	N/A	N/A	69,964	N/A	7,685	N/A	59,522	NR	N/A	0	137,514
Emergency On Call	N/A	832	**40,249**	14,237	N/A	306,289	N/A	16,622	79,870	128,008	NR	N/A	0	586,107
Contracted/Unspecified	N/A	8,176	**12,284**	6,433	N/A	N/A	N/A	111,610	196,376	192,435	NR	N/A	0	527,314
SUBTOTAL	85,815	25,952	**260,774**	122,395	903,451	2,285,644	195,820	156,395	286,888	470,447	NR	29,136	0	4,822,717
% Alternative Pay	*32%*	*40%*	***49%***	*32%*	*26%*	*31%*	*32%*	*29%*	*15%*	*20%*	.	*96%*	.	*27%*
FFS CLINICAL PAYMENTS	181,857	38,966	**269,077**	259,593	2,536,172	5,193,728	423,287	381,904	1,670,934	1,900,936	.	1,105	----	12,857,558
TOTAL	$267,672	$64,918	**$529,851**	$381,988	$3,439,623	$7,479,372	$619,107	$538,299	$1,957,822	$2,371,383	NR	$ 30,241	----	17,680,275

In Nova Scotia, non-FFS payment models and amounts are of key importance to PRP planning. This importance relates not only to government policy and planning but, on a technical level, in terms of developing a quality evidence base of information for PRP planning, including detailed analysis of non-FFS payments, productivity, and related shadow-reporting of work.

In the opening subsection of this section on Physician Workforce Profile, we noted the weaknesses of crude counts per 1,000 population. The table below represents a marked improvement by converting counts of physicians into FTEs based on intra-provincial FFS and non-FFS data from CIHI. An FTE to population ratio is still fraught with interpretative challenges stemming from implicit assumptions that have to be made to create such a table and analysis. The prior section on physician workforce methodologies highlights this weakness. Nonetheless, at a health system level and working with provincial numbers, the analysis provides a high level picture of the relative physician workforce by specialty group by province.

Figure 35 Provinces – FTEs per 1,000 Population (Source: CIHI)



The national average population per FTE is 553 with a range from Nova Scotia at 514 to Alberta at 672. Nova Scotia is 7.1% greater than the national average.

For Nova Scotia there is substantial variation by specialty group above and below national averages. The right hand column in the next figure lists this variation with the range from 53.9% greater (neurosurgeons) to 56.9% fewer (plastic surgeons) than the national average.

Figure 36 Provinces - Population per Physician FTE, 2008/09 (Source: CIHI)

	Population per Physician FTE (FFS plus Alternate Payments), 2008–2009											N.S.-% more/(less)
	N.L.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Canada	Physicians
Family Medicine	943	1,021	1,114	1,107	1,027	856	1,014	969	1,045	973	948	(17.5%)
Medical Specialties (All)	2,049	2,998	1,305	2,167	1,895	2,084	2,209	2,914	3,030	2,093	2,097	37.8%
Internal Medicine	4,584	6,495	2,341	5,886	4,118	4,074	4,272	6,422	8,805	5,504	4,509	48.1%
Neurology	43,480	u/a	48,933	57,715	32,972	42,572	64,902	60,968	90,576	37,878	42,920	(14.0%)
Psychiatry	9,393	8,644	7,853	11,584	7,764	9,398	9,877	11,630	9,483	9,827	9,066	13.4%
Pediatrics	8,567	28,595	6,137	18,181	12,118	11,855	11,681	18,706	13,796	13,151	12,120	49.4%
Dermatology	42,165	u/a	53,528	88,978	47,032	66,921	89,767	257,841	73,009	90,616	64,964	17.6%
Physical Medicine	u/a	34,600	80,617	8,219	45,265	193,403	192,328	36,077	72,501	12,363	42,451	(89.9%)
Anesthesia	u/a	u/a	u/a	u/a	u/a	u/a	u/a	u/a	u/a	u/a	u/a	u/a
Surgical Specialties (All)	3,843	4,759	3,538	3,518	3,983	3,559	4,158	3,860	4,965	3,689	3,824	7.5%
General Surgery	13,768	13,356	17,950	17,171	16,257	16,364	16,189	15,667	25,533	20,838	17,466	(2.8%)
Thoracic/Cardiovascular	188,253	u/a	44,401	89,625	180,462	112,019	72,429	109,978	100,900	42,448	93,566	52.5%
Urology	64,140	u/a	50,996	36,287	50,244	46,975	84,257	82,733	80,423	60,585	53,534	4.7%
Orthopaedic	43,009	u/a	27,364	24,090	27,810	23,915	27,240	25,343	31,967	23,746	25,988	(5.3%)
Plastic	u/a	u/a	88,973	56,685	98,155	70,360	70,795	60,234	77,057	46,283	71,968	(23.6%)
Neurosurgery	u/a	u/a	101,433	109,146	139,684	130,819	u/a	77,315	142,478	116,892	130,455	22.2%
Ophthalmology	31,046	30,619	19,903	22,931	26,683	25,253	38,702	25,480	33,158	24,331	26,298	24.3%
Otolaryngology	35,017	138,400	39,118	44,397	45,507	50,656	73,982	61,357	72,888	46,702	50,459	22.5%
Obstetrics/Gynecology	13,426	10,485	19,485	19,062	20,102	16,180	19,952	20,620	22,353	20,740	18,394	(5.9%)
Population/Specialty FTE	*1,336*	*1,839*	*953*	*1,341*	*1,284*	*1,314*	*1,443*	*1,660*	*1,882*	*1,335*	*1,354*	29.6%
Population/All Physician FTE	*542*	*617*	*514*	*594*	*560*	*516*	*589*	*601*	*672*	*560*	*553*	*7.1%*
% more/less than Canada mean	1.9%	(11.6%)	7.1%	(7.6%)	(1.3%)	6.7%	(6.6%)	(8.8%)	(21.6%)	(1.4%)	0.0%	
Total Physician - COUNT	1,213	298	2,186	1,593	16,427	24,596	2,399	1,836	6,772	9,611	66,931	
Population/Physician Count	417	464	424	465	468	521	497	546	519	450	491	
% more/less than Canada mean	14.9%	5.4%	13.6%	5.3%	4.6%	(6.1%)	(1.3%)	(11.3%)	(5.8%)	8.4%	0.0%	

Methodological Note: *The preceding table is a Consultant refinement on CIHI sourced data. The refinement relates to the non-Nova Scotia provinces where gross non-FFS payments by specialty group as reported to CIHI were converted by the Consultant to FTE equivalents. This was done by applying province-specific mean gross FFS billing rates as reported to CIHI (by specialty) to the non-FFS payments which are reported by CIHI at a specialty level as seen in the table below. Nova Scotia data did not require such a refinement as the Consultants were working from more detailed data. The result is a more realistic estimation of total FTEs.*

Figure 37 Provinces – FTE by Specialty 2008/09 (Source: CIHI)

Physician FTE (FFS plus Alternate Payments) by Physician Specialty and Selected Provinces/Territories, 2008–2009

	N.L.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Total
Family Medicine	517	132	930	652	7,485	14,970	1,177	1,022	3,363	4,440	34,689
Medical Specialties	255	65	635	284	4,462	6,854	603	363	1,267	1,957	16,744
Internal Medicine	106	20	212	124	1,867	3,144	279	156	410	785	7,104
Neurology	11	-	21	13	233	301	18	16	39	114	766
Psychiatry	49	15	150	60	990	1,363	121	84	371	440	3,643
Pediatrics	54	5	114	39	635	1,081	102	52	255	329	2,666
Dermatology	12	-	14	8	163	191	13	4	48	48	502
Physical Medicine	-	4	13	84	146	14	4	21	48	309	644
Anesthesia	16	13	102	23	265	131	20	28	-	37	634
Surgical Specialties	126	28	259	203	1,952	3,600	287	258	697	1,217	8,627
General Surgery	35	10	53	42	473	783	74	64	138	207	1,879
Thoracic/Cardiovascular	3	-	10	8	43	114	16	9	22	49	275
Urology	8	-	21	20	153	273	14	12	44	71	616
Orthopaedic	11	-	28	31	276	536	44	39	110	182	1,257
Plastic	-	-	7	13	78	182	17	16	46	55	415
Neurosurgery	-	-	10	1	39	72	-	8	3	37	170
Ophthalmology	16	5	54	32	288	507	31	38	106	178	1,255
Otolaryngology	14	1	17	17	169	253	16	16	48	93	644
Obstetrics/Gynecology	36	13	57	38	383	792	60	48	157	208	1,791
Total Physician - FTEs	**898**	**225**	**1,823**	**1,138**	**13,899**	**25,424**	**2,067**	**1,644**	**5,327**	**7,614**	**60,060**
Total Physician - COUNT	**1,213**	**298**	**2,343**	**1,593**	**16,427**	**24,596**	**2,399**	**1,836**	**6,772**	**9,611**	**67,088**
Source: adapted from CIHI											

9.2 Profile – Gender

Figure 38 National PGME – Residents by Gender 2009/10 (Source: CAPERS)

2009-10	Female		Male		Total
	Count	%	Count	%	Count
Dalhousie University					
Family Medicine	69	66%	36	34%	105
Medical Specialties	113	50%	112	50%	225
Lab Medicine Specialties	15	71%	6	29%	21
Surgical Specialties	53	37%	89	63%	142
Dalhousie University	250	51%	243	49%	493
Memorial University	124	50%	123	50%	247
Quebec	1751	62%	1087	38%	2838
Ontario	2240	51%	2142	49%	4382
Western Provinces	1580	51%	1542	49%	3122
Total	**5945**	**54%**	**5137**	**46%**	**11082**

Nationally, the proportion of female students in the medical education system continues to increase. The adjacent table identifies all 2009/10 post-graduate residents for all years by gender. 54% are female; Dalhousie Faculty of Medicine is comparable at 51% female including family medicine at 66% and lab medicine specialties at 71% female.

The figure below describes the gender split for 2009-10 in year one of PGME. 55.7% of first year residents are female.

Figure 39 Field of Post-M.D. Training by Gender (2009-2010)

(First Year Trainees Only – Canadian Citizens and Permanent Residents)					
FIELD OF POST-M.D. TRAINING BY GENDER (2009 – 2010)					
Field of Post-M.D. Training	**FEMALE**		**MALE**		**TOTAL**
Family Medicine	678	63.20%	395	36.80%	1073
FAMILY MEDICINE	**678**	**63.20%**	**395**	**36.80%**	**1073**
Urology	7	24.10%	22	75.90%	29
Plastic Surgery	12	44.40%	15	55.60%	27
Orthopedic Surgery	20	23.80%	64	76.20%	84
Otolaryngology -	12	44.40%	15	55.60%	27
Ophthalmology	12	38.70%	19	61.30%	31
Obstetrics/Gynecology	84	84.00%	16	16.00%	100
Neurosurgery	5	22.70%	17	77.30%	22
General Surgery	51	40.80%	74	59.20%	125
Cardiac Surgery	2	28.60%	5	71.40%	7
SURGICAL SPECIALTIES	**205**	**45.35%**	**247**	**54.65%**	**452**
Neuropathology	1	33.30%	2	66.70%	3
Medical Microbiology	4	40.00%	6	60.00%	10
Medical Biochemistry	1	33.30%	2	66.70%	3
Hematological Pathology	2	50.00%	2	50.00%	4
General Pathology	2	28.60%	5	71.40%	7
Anatomical Pathology	18	48.60%	19	51.40%	37
Laboratory Med.	4	66.70%	2	33.30%	6
LAB MEDICINE SPECIALTIES SUBTOTAL	**32**	**45.71%**	**38**	**54.29%**	**70**
Radiation Oncology	13	52.00%	12	48.00%	25
Psychiatry	89	60.10%	59	39.90%	148
Physical Medicine	9	37.50%	15	62.50%	24
Pediatrics	110	77.50%	32	22.50%	142
Nuclear Medicine	2	25.00%	6	75.00%	8
Neurology (Pediatrics)	8	72.70%	3	27.30%	11
Neurology	21	48.80%	22	51.20%	43
Medical Genetics	6	75.00%	2	25.00%	8
Internal Medicine	221	51.60%	207	48.40%	428
Emergency Medicine	25	41.00%	36	59.00%	61
Diagnostic Radiology	28	34.60%	53	65.40%	81
Dermatology	10	62.50%	6	37.50%	16
Community Medicine	14	46.70%	16	53.30%	30
Anesthesiology	55	45.80%	65	54.20%	120
MEDICAL SPECIALTIES	**611**	**53.40%**	**534**	**46.60%**	**1145**
TOTAL	**1526**	**55.70%**	**1214**	**44.30%**	**2740**

The following CIHI table provides additional insight in terms of practicing physicians by gender and province. Nationally, 35% of physicians and 28% of FTEs are female. In Nova Scotia, the percentages are 37% and 31% respectively. Both the national and Nova Scotia ratio will continue changing towards a 45% male, 55% female ratio based upon current UGME and PGME trends.

The table also compares counts with FTEs. In Nova Scotia, a count of 411 female family physicians translates to 220.45 FTE for a 54% ratio of count to FTE, 58% ratio for specialists and 55% overall. Nationally the ratios are 60% in family medicine, 67% in specialties, and 63% overall.

Figure 40 FFS counts and FTE by Province, Gender, and Broad Physician Specialty, 2008/09 (Source: CIHI)

Fee-for-Service Counts and Full-Time Equivalents by Province, Gender and Broad Physician Specialty, 2008–2009

		Family Medicine			Total Specialists			Total Physicians			Total Physicians	
		Male	Female	Total	Male	Female	Total	Male	Female	Total	% Male	% Female
N.L.	Count	410	207	617	295	104	399	705	311	1,016	69%	31%
	FTE	299.58	108.80	408.38	204.30	48.28	252.58	503.88	157.08	660.96	76%	24%
		73%	*53%*	*66%*	*69%*	*46%*	*63%*	*71%*	*51%*	*65%*		
P.E.I.	Count	105	42	147	56	16	72	161	58	219	74%	26%
	FTE	74.11	19.76	93.87	36.64	4.59	41.23	110.75	24.35	135.10	82%	18%
		71%	*47%*	*64%*	*65%*	*29%*	*57%*	*69%*	*42%*	*62%*		
N.S.	Count	545	411	956	350	120	470	895	531	1,426	63%	37%
	FTE	391.24	220.45	611.69	246.31	69.45	315.76	637.55	289.90	927.45	69%	31%
	%	*72%*	***54%***	*64%*	*70%*	***58%***	*67%*	*71%*	***55%***	*65%*		
	Ratio		***0.75***			***0.82***			***0.77***			
N.B.	Count	416	297	713	435	123	558	851	420	1,271	67%	33%
	FTE	296.33	151.84	448.17	291.37	58.13	349.50	587.70	209.97	797.67	74%	26%
		71%	*51%*	*63%*	*67%*	*47%*	*63%*	*69%*	*50%*	*63%*		
Que.	Count	4,028	3,628	7,656	4,181	2,145	6,326	8,209	5,773	13,982	59%	41%
	FTE	3,335.82	2,272.44	5,608.26	3,442.97	1,467.05	4,910.02	6,778.79	3,739.49	10,518.28	64%	36%
		83%	*63%*	*73%*	*82%*	*68%*	*78%*	*83%*	*65%*	*75%*		
Ont.	Count	7,396	4,293	11,690	7,208	2,795	10,003	14,604	7,088	21,693	67%	33%
	FTE	6,200.00	2,665.19	8,865.37	6,845.58	2,038.00	8,883.58	13,045.58	4,703.19	17,748.95	74%	26%
		84%	*62%*	*76%*	*95%*	*73%*	*89%*	*89%*	*66%*	*82%*		
Western Provinces												
	Count	6,995	3,843	10,841	5,067	1,864	6,932	12,062	5,707	17,773	68%	32%
	FTE	5,729	2,233	7,964	4,135	1,129	5,265	9,864	3,362	13,229	75%	25%
		82%	*58%*	*73%*	*82%*	*61%*	*76%*	*82%*	*59%*	*74%*		
Canada	Count	**19,895**	**12,721**	**32,620**	**17,592**	**7,167**	**24,760**	**37,487**	**19,888**	**57,380**	65%	35%
	FTE	**16,325.65**	**7,671.40**	**23,999.55**	**15,202.10**	**4,814.41**	**20,017.51**	**31,527.75**	**12,485.81**	**44,017.06**	72%	28%
	%	***82%***	***60%***	***74%***	***86%***	***67%***	***81%***	***84%***	***63%***	***77%***		
	Ratio		***0.73***			***0.78***			***0.75***			
Notes												
Due to the variation in the role that fee-for-service payment plays in physician compensation across jurisdictions, comparisons across jurisdictions of the NPDB indicators should be made with caution. Ex. Anaesthesia.								Source: CIHI				

Nationally, and more pronounced in Nova Scotia, female physicians work less as physicians over the course of their careers[38]. There are many reasons for this but raising a family is perhaps the most significant. The female ratio of count to FTE is not unexpected. Quality PRP planning can, however, inform the medical education system as it considers and/or implements growth scenarios.

The following figure describes the difference in FTE by functional category between males and females based upon all actual province-wide 2009/10 FFS and Shadow-bill compensation data (source: MSI and PHReD). The female to male ratio is 0.84 in general practice, 0.93 in surgical specialties, and 0.96 in medical specialties.

[38] Canadian Medical Association, Average Hours Worked Per Week by Physicians, by Sex, 1982–2007 (Ottawa, Ont.: CMA)

Figure 41 Nova Scotia – FTE by Gender - Actual province-wide 2009/10 FFS and Shadow-bill data (source: MSI and PHReD)

FUNC_SPEC_DESCRIPTION	FEMALE COUNT	FEMALE FTE	FEMALE RATIO (Female /Male)	MALE COUNT	MALE FTE	TOTAL COUNT	TOTAL FTE
Diagnostic & Therapeutic Total	55.0	48.2	0.92	116.0	110.2	171.0	158.4
PERCENT	32.2%	30.4%		67.8%	69.6%	100.0%	100.0%
Family Medicine/Practice Total	428	349	0.84	495	480	923.0	829.0
PERCENT	46.4%	42.1%		53.6%	57.9%	100.0%	100.0%
Medical Total	172.0	146.5	0.96	356.0	317.1	528.0	463.6
PERCENT	32.6%	31.6%		67.4%	68.4%	100.0%	100.0%
Medical-Paediatric Total	60.0	55.1	1.02	65.0	58.6	125.0	113.7
PERCENT	48.0%	48.4%		52.0%	51.6%	100.0%	100.0%
Surgical Total	86.0	74.3	0.93	358.0	332.5	444.0	406.8
PERCENT	19.4%	18.3%		80.6%	81.7%	100.0%	100.0%
PROVINCE	801.0	673.3	0.90	1,393.0	1,299.7	2,194.0	1,973.0
PERCENT	36.5%	34.1%		63.5%	65.9%	100.0%	100.0%

The following CIHI table compares FFS counts with FFS FTEs. In Nova Scotia the ratio of female to male is 0.75 in family medicine, 0.82 for specialists, and 0.77 overall. Nationally the ratio's are 0.73, 0.78, and 0.75 respectively.

Figure 42 Physician Ratio of Counts and FTEs, 2008/09

Fee-for-Service Counts and Full-Time Equivalents by Province, Gender and Broad Physician Specialty, 2008–2009

		Family Medicine Male	Family Medicine Female	Family Medicine Total	Total Specialists Male	Total Specialists Female	Total Specialists Total	Total Physicians Male	Total Physicians Female	Total Physicians Total
N.S.	Count	545	411	956	350	120	470	895	531	1,426
	FTE	391.24	220.45	611.69	246.31	69.45	315.76	637.55	289.90	927.45
	%	72%	54%	64%	70%	58%	67%	71%	55%	65%
	Ratio		0.75			0.82			0.77	
Canada	Count	19,895	12,721	32,620	17,592	7,167	24,760	37,487	19,888	57,380
	FTE	16,325.65	7,671.40	23,999.55	15,202.10	4,814.41	20,017.51	31,527.75	12,485.81	44,017.06
	%	82%	60%	74%	86%	67%	81%	84%	63%	77%
	Ratio		0.73			0.78			0.75	

Notes

Due to the variation in the role that fee-for-service payment plays in physician compensation across jurisdictions, comparisons across jurisdictions of the NPDB indicators should be made with caution. Ex. Anaesthesia.

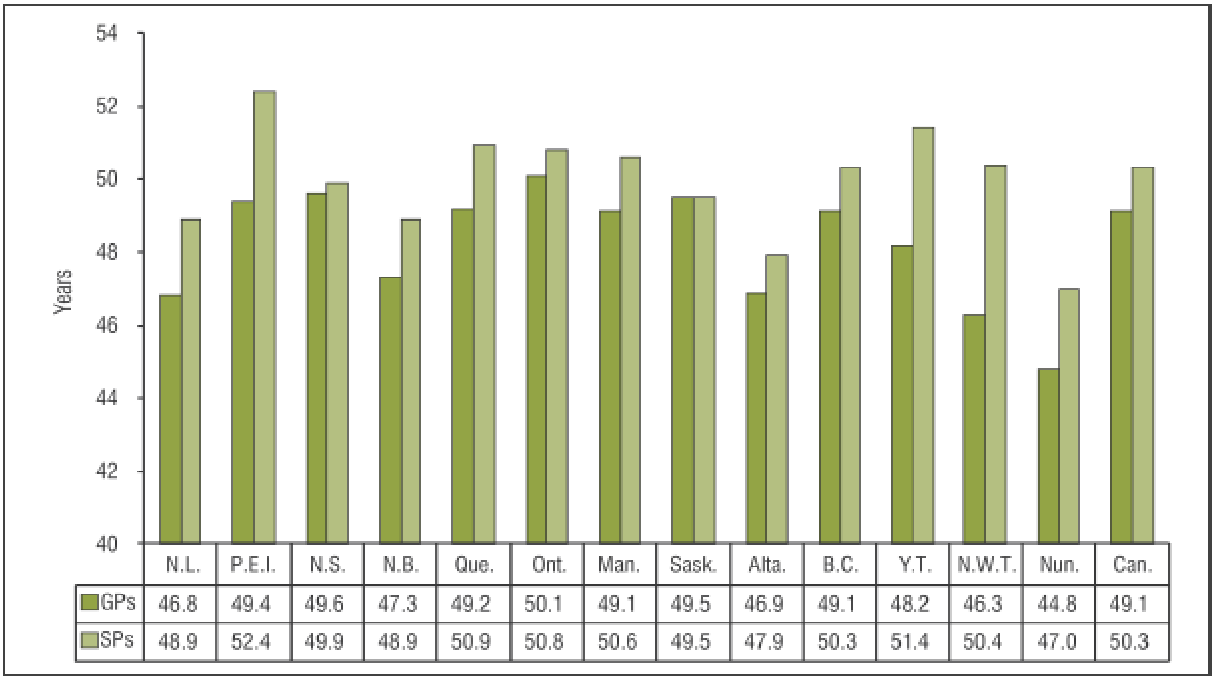
Source: CIHI

9.3 Profile – Age

CIHI released the latest national estimates of physician age in 2009. The figure below shows Nova Scotia very similar to the national average for general practitioners and specialists. Nova Scotia is 49.6 and 49.9, respectively, and nationally the average is 49.1 and 50.3, respectively, for general practitioners and specialists.

The American Association of Medical Colleges (AAMC), in 2008 (data by specialty), reported the specialties with the highest percentage of members over age 55 were preventive medicine, psychiatry, pathology, allergy & immunology, urology, and thoracic surgery. The 2010 National Physician Survey, Nova Scotia specific, reported that 8.1% of respondents aged 55-64 planned to retire from clinical practice within two years and 40.6% of those age 65 and over. The responses were evenly divided between general practice and specialists.

Figure 43 Average Age for General Practitioners and Specialists by Province, 2009 (Source: CIHI)



	N.L.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Y.T.	N.W.T.	Nun.	Can.
GPs	46.8	49.4	49.6	47.3	49.2	50.1	49.1	49.5	46.9	49.1	48.2	46.3	44.8	49.1
SPs	48.9	52.4	49.9	48.9	50.9	50.8	50.6	49.5	47.9	50.3	51.4	50.4	47.0	50.3

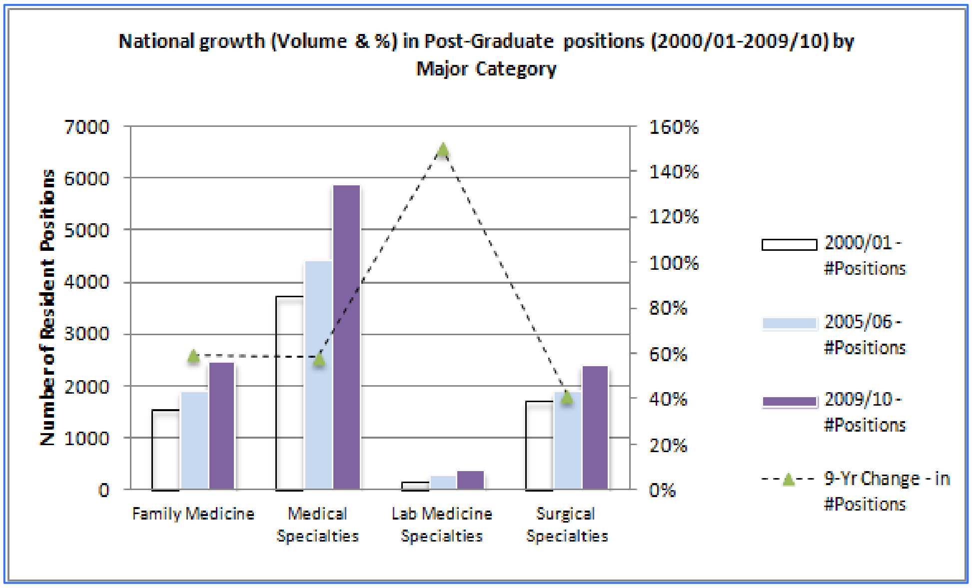
9.4 Profile – Supply – Medical Education System

The number of post-graduate residency positions for Canadian citizens (CC) and permanent residents (PR) has increased 57% over nine years (2000/01-2009/10) or by 4,011 positions. The overall annual growth rate has been 6.3% and is consistent across specialty groupings i.e. general medicine 6.7%, medical specialties 6.5%, and surgical specialties 6.3%. The one exception is Laboratory Medicine at 16.7% per annum growth. The following figure lists the total change at DFM, Other (Medical Schools), Subtotal DFM plus Other, less non-resident/Visa positions, and Net CC/PR.

Figure 44 Post-Graduate Resident Positions - Change 2000/01-2009/10

	2009-2010					Total Change 2000/01-2009/10					Annual Change 2000/01-2009/10				
SPECIALTY	DFM	Other	Subtotal	Less: NonRes	NET (CC/PR)	DFM	Other	*Subtotal*	Less: NonRes	NET (CC/PR)	DFM	Other	*Subtotal*	Less: NonRes	NET (CC/PR)
General Medicine															
Family Medicine	105	2,366	2471	22	2449	16	855	*871*	-44	915	2.0%	6.3%	6.0%	-7.4%	6.6%
Palliative Medicine	2	28	30	7	23	2	20	*22*	3	19	n/a	27.8%	30.6%	8.3%	52.8%
	107	**2394**	**2501**	**29**	**2472**	**18**	**875**	***893***	**-41**	**934**	**2.2%**	**6.4%**	**6.2%**	**-6.5%**	**6.7%**
Medicine & Medical Subspec.															
Anesthesia	30	774	804	138	666	9	255	*264*	57	207	4.8%	5.5%	5.4%	7.8%	5.0%
Cardiology	10	340	350	149	201	1	155	*156*	86	70	1.2%	9.3%	8.9%	15.2%	5.9%
Clinical Immunology & Allergy	0	12	12	3	9	0	1	*1*	-2	3	n/a	1.0%	1.0%	-4.4%	5.6%
Clinical Pharmacology	0	6	6	2	4	0	(6)	*-6*	0	-6	n/a	-5.6%	-5.6%	0.0%	-6.7%
Community Medicine	0	131	131	3	128	0	52	*52*	-12	64	n/a	7.3%	7.3%	-8.9%	11.1%
Critical Care	2	87	89	44	45	2	40	*42*	35	7	n/a	9.5%	9.9%	43.2%	2.0%
Dermatology	3	119	122	24	98	1	55	*56*	11	45	5.6%	9.5%	9.4%	9.4%	9.4%
Diagnostic Radiology	22	597	619	116	503	2	220	*222*	63	159	1.1%	6.5%	6.2%	13.2%	5.1%
Emergency Medicine	6	258	264	21	243	4	134	*138*	7	131	22.2%	12.0%	12.2%	5.6%	13.0%
Endocrinology & Metabolism	2	54	56	19	37	1	19	*20*	11	9	11.1%	6.0%	6.2%	15.3%	3.6%
Gastroenterology	2	124	126	44	82	-1	55	*54*	18	36	-3.7%	8.9%	8.3%	7.7%	8.7%
Geriatric Medicine	3	20	23	3	20	2	(8)	*-6*	-3	-3	22.2%	-3.2%	-2.3%	-5.6%	-1.4%
Hematology	3	91	94	32	62	3	34	*37*	20	17	n/a	6.6%	7.2%	18.5%	4.2%
Infectious Diseases	1	37	38	11	27	1	18	*19*	9	10	n/a	10.5%	11.1%	50.0%	6.5%
General Internal Medicine	51	1,423	1474	107	1367	15	590	*605*	7	598	4.6%	7.9%	7.7%	0.8%	8.6%
Medical Genetics	0	52	52	11	41	0	31	*31*	8	23	n/a	16.4%	16.4%	29.6%	14.2%
Medical Oncology	3	116	119	49	70	3	70	*73*	45	28	n/a	16.9%	17.6%	125.0%	7.4%
Nephrology	2	87	89	36	53	-1	18	*17*	33	-16	-3.7%	2.9%	2.6%	122.2%	-2.6%
Neurology	5	290	295	72	223	2	130	*132*	39	93	7.4%	9.0%	9.0%	13.1%	7.9%
Nuclear Medicine	4	46	50	6	44	3	24	*27*	7	20	33.3%	12.1%	13.0%	-77.8%	9.3%
General Pediatrics	*21*	*557*	*578*	58	520	0	164	*164*	-15	179	0.0%	4.6%	4.4%	-2.3%	5.8%
Neonatal-Perinatal Medicine	*4*	*97*	*101*	73	28	4	48	*52*	47	5	n/a	10.9%	11.8%	20.1%	2.4%
Pediatrics-Other	*4*	*506*	*510*	291	219	0	334	*334*	226	108	0.0%	21.6%	21.1%	38.6%	10.8%
Subtotal, Paediatrics (only)	***29***	***1160***	***1189***	***422***	***767***	***4***	***546***	***550***	***258***	***292***	1.8%	9.9%	9.6%	17.5%	6.8%
Physical Medicine & Reh	6	111	117	5	112	1	59	*60*	5	55	2.2%	12.6%	11.7%	n/a	10.7%
Psychiatry	38	792	830	58	772	7	179	*186*	23	163	2.5%	3.2%	3.2%	7.3%	3.0%
Radiation Oncology	6	207	213	43	170	4	125	*129*	25	104	22.2%	16.9%	17.1%	15.4%	17.5%
Respiratory Medicine	1	104	105	23	82	1	34	*35*	5	30	n/a	5.4%	5.6%	3.1%	6.4%
Rheumatology	0	62	62	19	43	-3	26	*23*	-1	24	-11.1%	8.0%	6.6%	-0.6%	14.0%
Subtotal, Medical Specialties	**229**	**7100**	**7329**	**1460**	**5869**	**61**	**2856**	***2917***	**754**	**2163**	**4.0%**	**7.5%**	**7.3%**	**11.9%**	**6.5%**
Laboratory Medicine															
Anatomical Pathology	8	235	243	29	214	-3	129	*126*	-16	142	-3.0%	13.5%	12.0%	-4.0%	21.9%
Hematological Pathology	5	22	27	9	18	5	17	*22*	10	12	n/a	37.8%	48.9%	-111.1%	22.2%
Pathology, General	4	2	6	0	6	4	2	*6*	0	6	n/a	n/a	n/a	n/a	n/a
Medical Biochemistry	0	25	25	7	18	0	20	*20*	9	11	n/a	44.4%	44.4%	-50.0%	17.5%
Medical Microbiology	0	67	67	3	64	-1	38	*37*	-3	40	-11.1%	14.6%	13.7%	-5.6%	18.5%
Neuropathology	0	11	11	7	4	0	8	*8*	9	-1	n/a	29.6%	29.6%	-50.0%	-2.2%
Pathology, General	4	29	33	1	32	4	(8)	*-4*	-8	4	n/a	-2.4%	-1.2%	-9.9%	1.6%
Subtotal, Lab. Medicine	**21**	**391**	**412**	**56**	**356**	**9**	**206**	***215***	**1**	**214**	**8.3%**	**12.4%**	**12.1%**	**0.2%**	**16.7%**
Surgery & Surgical Subspec.															
Cardiac Surgery	4	100	104	47	57	-2	7	*5*	6	-1	-3.7%	0.8%	0.6%	1.6%	-0.2%
Trauma Surgery	0	15	15	1	14	0	11	*11*	0	11	n/a	30.6%	30.6%	0.0%	40.7%
Neurosurgery	8	180	188	64	124	3	38	*41*	23	18	6.7%	3.0%	3.1%	6.2%	1.9%
Obstetrics & Gynecology	27	538	565	81	484	3	170	*173*	8	165	1.4%	5.1%	4.9%	1.2%	5.7%
Ophthalmology	14	238	252	58	194	2	86	*88*	10	78	1.9%	6.3%	6.0%	2.3%	7.5%
Orthopedic Surgery	23	540	563	138	425	5	215	*220*	71	149	3.1%	7.4%	7.1%	11.8%	6.0%
Otolaryngology	14	176	190	41	149	3	48	*51*	14	37	3.0%	4.2%	4.1%	5.8%	3.7%
Pediatric General Surgery	1	15	16	6	10	0	2	*2*	-1	3	0.0%	1.7%	1.6%	-1.6%	4.8%
Plastic Surgery	13	150	163	30	133	6	50	*56*	0	56	9.5%	5.6%	5.8%	0.0%	8.1%
General Surgery	35	684	719	110	609	4	152	*156*	21	135	1.4%	3.2%	3.1%	2.6%	3.2%
Cardiovascular & Thoracic Surgery	0	32	32	18	14	0	11	*11*	12	-1	n/a	5.8%	5.8%	22.2%	-0.7%
Urology	13	187	200	38	162	-5	66	*61*	4	57	-3.1%	6.1%	4.9%	1.3%	6.0%
Vascular Surgery	0	18	18	8	10	0	3	*3*	10	-7	n/a	2.2%	2.2%	-55.6%	-4.6%
Subtotal, Surgery	**152**	**2873**	**3025**	**640**	**2385**	**19**	**859**	***878***	**178**	**700**	1.6%	4.7%	4.5%	4.3%	4.6%
TOTAL	**509**	**12,758**	**13,267**	**2,185**	**11,082**	**107**	**4,796**	***4,903***	**892**	**4,011**	**3.0%**	**6.7%**	**6.5%**	**7.7%**	**6.3%**
Total 9 Year Change (2000/01-2009/10)						**27%**	**60%**	**59%**	**69%**	**57%**					

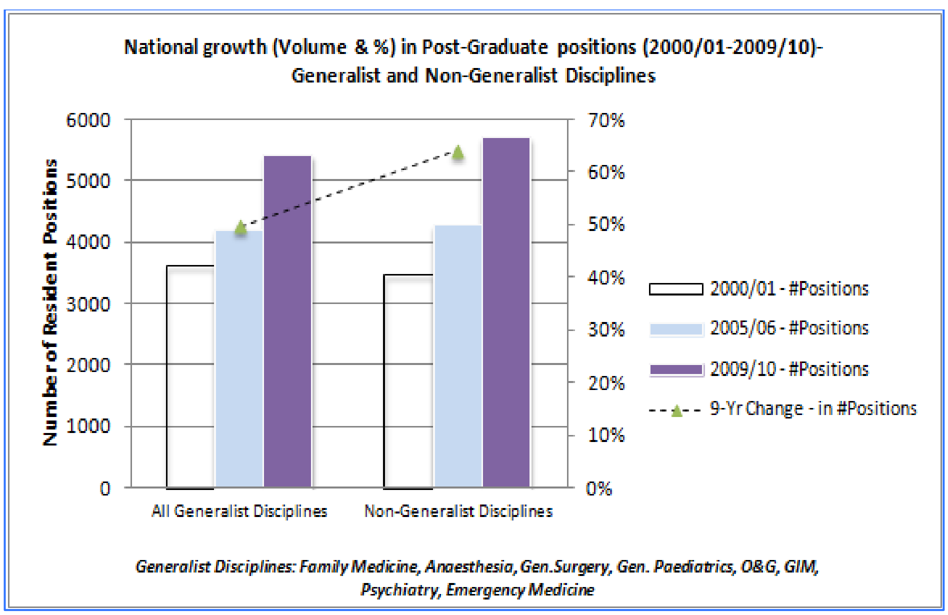
Figure 45 National growth (Volume & %) in Post-Graduate positions (2000/01-2009/10) by Major Category



The rapid growth in postgraduate positions presents both opportunities and challenges to the health system and medical education system. The focus of the 13th International Health Workforce Collaborative 2011[39] (October, 2011) included growth in resident programs among numerous other key developments such as a study presentation of Canadians studying abroad, role of non-physicians, etc. The conference is attended by representatives from Australia, New Zealand, U.S.A., U.K., and Canada and promoted by the RCPSC in Canada. Presentations are by invitation only. Challenges of rapid post-graduate expansion in Canada include how the expansion is catered for in postgraduate training, affects of the expansion on health care costs, on population health, on national self-sufficiency and immigration policy, and on the potential for 'crowding out' the growth in the roles of non-medical health professionals.

Notably, and understandably, the RCPSC presentation (Tepper, J.) focused on the first challenge; how the expansion will be catered in postgraduate training. Of equal note, while the medical education system has been planning and gearing up for ten years for training expansion, dialogue and planning by government and other authorities on the other challenges (e.g. costs, self-sufficiency, etc.) are noticeably absent from the literature (published, grey, or otherwise) in Canada.

Figure 46 National growth (Volume & %) in Post-Graduate positions (2000/01-2009/10)- Generalist and Non-Generalist Disciplines



The adjacent figure adds credence to the perception of a lack of public policy dialog and action. While governments frequently call for more generalist physicians they have not acted to close the compensation gap through payment reform nor has the medical education system responded by altering PGME ratios.

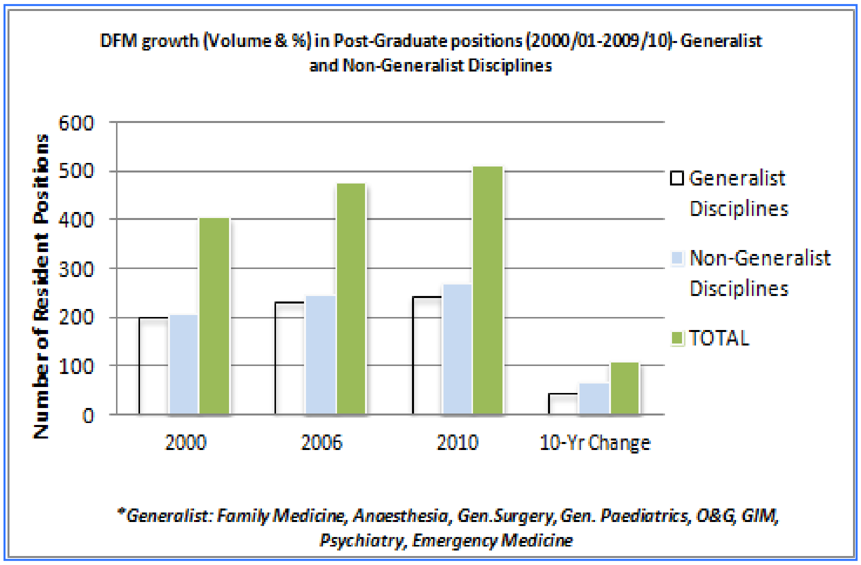
Non-generalist PGME positions have increased 64% since 2000/01 and generalist

[39] http://rcpsc.medical.org/publicpolicy/imwc/conference13.php

positions by 50%[40]. The medical education system response is planned and based on detailed, lengthy study led by the RCPSC and CFPC. The RCPSC and CFPC considered and rejected a proposal to create a small number of core programs in surgery and medicine that most residents would start with before pursuing a specialty. Instead, a plan has been recommended to increase generalist competency development during UGME and early PGME.

In effect, the RCPSC has elected to remain distant from the health system 'physician workforce planning' arena by deferring to governments to manage the type of positions available in the health system workforce. For example the medical education system may graduate a specialist in nephrology with a stronger base in generalist competencies and the health system may elect to offer gainful work to the individual only as a general internist.

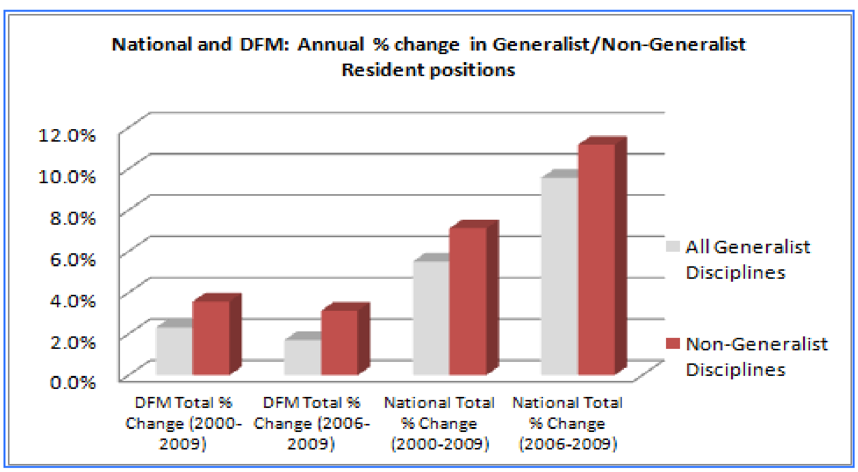
Figure 47 DFM growth (Volume & %) in Post-Graduate positions (2000/01-2009/10)- Generalist and Non-Generalist Disciplines



As seen in the adjacent figure, the pattern of growth at DFM parallels the national medical education system in terms of generalist/non-generalist distribution.

Observations regarding the generalist/non-generalist figures do not contemplate the multiple factors influencing the relative distribution, e.g., impact of market forces associated with relative compensation, life-style (GIM is acknowledged to be a demanding practice given the high proportion of hospital inpatient work), etc. Central to the challenge of changing the distribution is altering the wide latitude to pursue subspecialization after PGME year 3 once core training is completed in general surgery, general paediatrics, and internal medicine. This is a multi-faceted challenge.

Figure 48 National and DFM: Annual % change in Generalist/Non-Generalist Resident positions



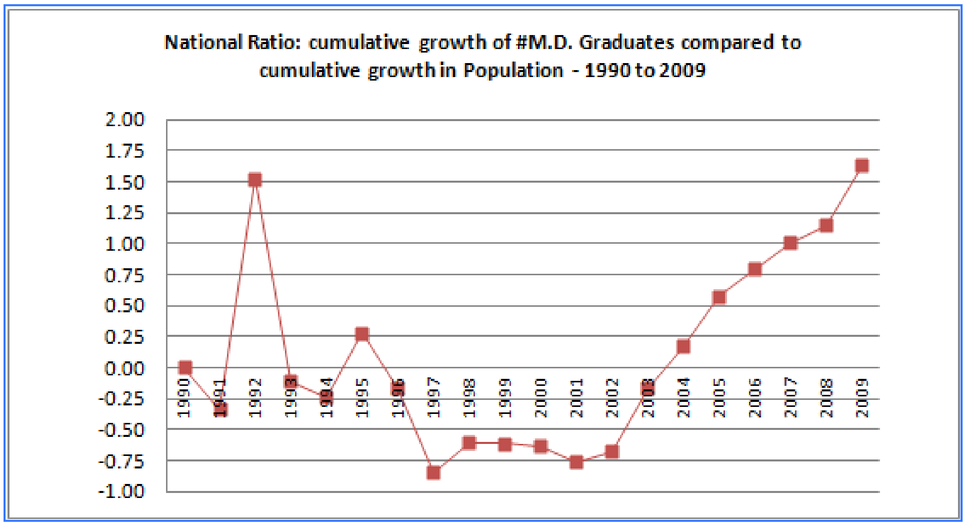
The adjacent figure notes that the relative distribution gap between generalist/non-generalist disciplines has not lessened in the most recent three-years (2006-2009) when the call for increased generalism has been most pronounced.

Two other key developments at the RCPSC will impact generalism significantly. The RCPSC has granted

[40] The figure (and next) assumes 10% of Internal Medicine residents will actually enter practice as general internal medicine specialists. The figure of 10% was derived by detail review of two resident cohorts and two practice entrant cohorts between 2000-2010.

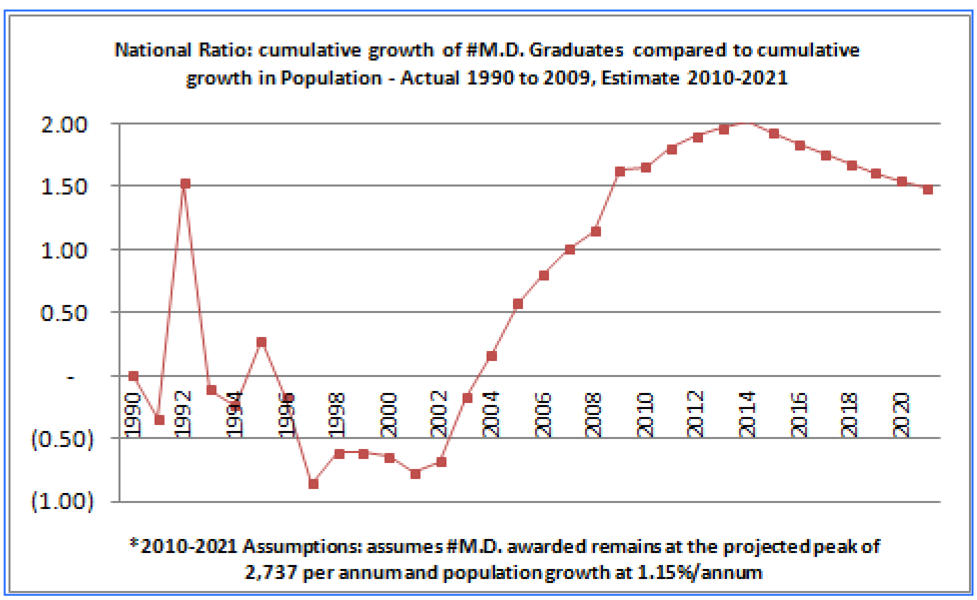
full certification status to General Internal Medicine effective December 2010. This is a positive development for generalism. The RCPSC is also introducing several new categories of recognition in addition to their historical “primary specialty” and “sub-specialty” designation: Fundamentals program, Area of Focused Competence (Diploma) program and Specialist Interest Group for Medical Activity. The first will aid in promoting recognition generalism. The outcome of the latter two in terms of generalism is unclear. All are characterized by the RCPSC as responses to the Social Accountability mission and therefore linked to societal needs.

Figure 49 National Ratio: Growth of #M.D. Graduates over Growth in Population - 1990 to 2009



The adjacent figure plots the cumulative difference between national growth in M.D. graduates and population. Since 2004 cumulative M.D. graduate growth has exceeded cumulative population growth. As of 2009 M.D. graduates had increased by 37% (631) since 1990 compared to 23% (6.2m) population growth.

Figure 50 National Ratio: cumulative growth of #M.D. Graduates compared to cumulative growth in Population - Actual 1990 to 2009, Estimate 2010-2021



The influence of M.D. expansion since 2000 will have a sustained impact on physician supply beyond the forecast period ending 2021.

The figure and associated observations do not consider whether the 1990 starting point represents equilibrium between need and supply or that population growth on its own is representative of need.

The purpose of the figure is to highlight a significant, sustained, change in physician supply in Canada in the coming years.

9.5 Canadians Studying Abroad

Since 2003, there has been a significant increase in the number of Canadian students studying medicine abroad (CSAs) as seen through applications at CaRMS. International Medical Schools are located in in approximately 80 schools in almost 30 countries including Ireland, Czech Republic, Poland, United Kingdom, Israel, Caribbean, Bahrain, and Australia. CaRMS reports[41] 3,000 to 3,500 CSA with approximately 600 to 700 graduating per year adding an additional 25% to the number of students looking for post-graduate residency training positions in Canada each year. The dominant motivation (78%) for studying abroad is inability to obtain a place in a Canadian medical school. In 2010 approximately 3% (90-105) of CSAs were resident of Nova Scotia prior to becoming a CSA with 23 to 26 applying to Canadian post-graduate training positions annually.

Canadians studying abroad present a number of challenges to the Canadian health system. They are 'lost' to the system for a period of years and are often overlooked in physician workforce planning as a result. They compete for residency positions with IMGs at a time when integration of IMGs is a priority for the health system. Studying abroad is very expensive and it is thus inferred that CSAs most often come from affluent and influential backgrounds.

9.6 Net Interprovincial Migration and Return from Abroad

9.6.1 Medical School Location

The next figure analyzes where the current physician workforce obtained their M.D. degree by continent, country, and/or province where the medical school was located. The figure is further broken down by DHA of the physician location (March, 2010) and their FTE equivalent. Of particular note, 47% of the current provincial workforce including 48% of the generalist specialties are graduates of the Dalhousie medical school. At a DHA level only DHA 2, DHA 5, and IWK have a percentage of Dalhousie graduates less than 45%. Europe and Ontario medical schools are the next most frequent locations at 11% and 10% respectively.

Figure 51 Provincial physician workforce by DHA 2009/10 - M.D. degree according to location of medical school

Continent/ Country/ Province	1	2	3	4	5	6	7	8	9	IWK	Total FTE	%
Canada												
Alberta	2.2	1.3	6.6	3.1	0.0	1.3	1.2	4.2	33.9	5.3	59.0	3.0%
British Columbia	2.6	1.1	4.7				1.3	0.6	15.2	1.3	26.7	1.4%
Manitoba		1.0	6.6		0.0		1.9	3.5	15.5	0.0	28.5	1.4%
Newfoundland	8.3	3.1	6.1	9.4	2.8	2.5	5.0	5.5	61.0	8.4	112.1	5.7%
Nova Scotia	47.7	22.7	73.7	56.2	17.5	28.8	41.4	99.4	495.6	40.5	923.4	46.8%
Ontario	4.2	3.0	11.7	5.7	2.1	4.1	3.7	8.3	135.1	19.5	197.3	10.0%
Quebec	1.9	2.2	0.4	2.1	0.5	1.0	3.6	7.3	28.6	6.3	53.9	2.7%
Saskatchewan	0.0	0.0	1.0	0.0	0.0	0.0	0.0	3.4	4.0	0.5	9.0	0.5%
Canada Subtotal	**66.9**	**34.4**	**110.7**	**76.5**	**22.9**	**37.6**	**57.9**	**132.2**	**788.9**	**81.7**	**1409.9**	**71.4%**
Africa	2.1	12.3		2.1	2.0	5.8	1.2	10.7	21.7	3.5	61.3	3.1%
Asia	2.6	2.8	1.0	2.4	1.2		1.2	5.7	6.1	0.0	23.1	1.2%
Australia		1.2				0.2	1.1		1.7	0.0	4.2	0.2%
Caribbean	1.2	1.8	4.7	0.5		1.4	0.1	2.3	8.4	0.0	20.4	1.0%
Europe	9.5	13.6	17.7	16.7	6.5	11.7	3.0	28.3	94.0	15.9	216.9	11.0%
Far East		0.0	0.9			1.0		1.0	10.7	0.0	13.7	0.7%
India	0.0	7.8	1.9	4.8	6.8	2.3	4.8	14.2	25.7	2.2	70.5	3.6%
Middle East	2.9	6.6	2.4	3.6	2.8	4.7	5.7	13.1	26.5	3.4	71.7	3.6%
Pakistan		1.0			0.9		3.3	7.4	5.9	1.0	19.6	1.0%
South America					7.2			0.2	13.3	0.0	20.7	1.0%
Unknown	2.4	0.0	0.0	0.9	1.0	0.0	1.0	2.8	8.3	1.0	17.5	0.9%
USA	0.0	4.5	1.0	1.0	0.6			2.2	8.1	6.5	24.0	1.2%
Other Subtotal	**20.6**	**51.8**	**29.5**	**32.1**	**29.0**	**26.9**	**21.5**	**87.9**	**230.6**	**33.6**	**563.5**	**28.6%**
TOTAL	**88**	**86**	**140**	**109**	**52**	**65**	**79**	**220**	**1019**	**115**	**1973**	**100.0%**
% Nova Scotia	*54%*	*26%*	*53%*	*52%*	*34%*	*45%*	*52%*	*45%*	*49%*	*35%*	*47%*	*47%*
% Europe	*11%*	*16%*	*13%*	*15%*	*13%*	*18%*	*4%*	*13%*	*9%*	*14%*	*11%*	*11%*
% Ontario	*5%*	*3%*	*8%*	*5%*	*4%*	*6%*	*5%*	*4%*	*13%*	*17%*	*10%*	*10%*

The preceding and next figures underscore the importance of the Dalhousie Faculty of Medicine to the provincial and DHA workforce now and into the future. The next figure indicates the percentage of the provincial generalist workforce that obtained their M.D. abroad implying they are potentially at higher risk of leaving the province based upon CIHI data findings. We see in the figure though that the percentage with a foreign M.D. is no different than the entire provincial workforce. For generalists 48% are Dalhousie graduates, 12% graduates of European medical schools, 9% from Ontario, and 31% from other locations.

Figure 52 Provincial generalist physician workforce 2009/10 - M.D. degree according to location of medical school

Continent/ Country/ Province	Anaesthesia	Diagnostic Radiology	Emergency Medicine	General Practitioner	General Surgery	Internal Medicine	Obstetrics & Gynaecology	Paediatric General	Psychiatry	Psychiatry - Adolescent	TOTAL
Canada											
Alberta	2.7	2.1	1.0	18.4	1.2	1.4	4.3		8.5		39.5
British Columbia	3.0	2.1	0.0	11.1	0.6		3.4		1.0		21.2
Manitoba	2.5	3.0		8.2	2.0		1.0		2.9		19.6
Newfoundland	4.5	11.7	3.0	42.0	3.0	5.9	2.1	1.7	4.5	2.2	80.6
Nova Scotia	53.6	42.8	36.0	445.8	26.7	18.3	15.9	20.4	41.2	4.3	705.0
Ontario	9.3	5.3	9.4	67.7	8.0	5.5	7.9	10.9	11.5	1.1	136.8
Quebec	2.1	1.6	2.6	15.5	0.0	1.0	1.3	4.6	3.1		32.0
Saskatchewan	0.8	0.0	0.5	2.1		1.0					4.4
Canada Subtotal	**78.5**	**68.6**	**52.5**	**610.7**	**41.6**	**33.1**	**36.1**	**37.6**	**72.7**	**7.6**	**1039.0**
Africa	4.5	0.0	2.6	24.6	2.0	3.9	0.7	1.7	5.6		45.6
Asia	2.2	1.9		12.7	1.1	1.2					19.1
Australia				3.2							3.2
Caribbean		1.0		12.3	0.0	1.2	1.1				15.6
Europe	31.4	5.7	5.0	64.7	6.9	14.4	9.0	4.6	29.4	5.2	176.4
Far East	1.1	0.0		6.3					1.0		8.4
India	3.3	1.3	1.5	36.7	0.0	2.8	1.7	1.7	6.7		55.6
Middle East	1.9	1.2	1.6	32.8	2.8	2.7	2.1	2.4	6.5	1.0	55.1
Pakistan	1.0	6.1		3.1		1.1		1.0	3.6	0.0	16.1
South America	1.1			14.6					1.0		16.7
Unknown	2.4		0.0	5.0	0.1	0.0	1.0	1.0	0.0	0.0	9.5
USA	1.8	8.0	1.8	3.3				2.0	3.1	1.0	21.0
Other Subtotal	**50.8**	**25.3**	**12.4**	**219.3**	**12.9**	**27.4**	**15.5**	**14.6**	**57.0**	**7.2**	**442.4**
TOTAL	**129.3**	**93.9**	**64.9**	**830.1**	**54.5**	**60.5**	**51.6**	**52.2**	**129.7**	**14.8**	**1481.3**
% Nova Scotia	*41%*	*46%*	*55%*	*54%*	*49%*	*30%*	*31%*	*39%*	*32%*	*29%*	*48%*
% Europe	*24%*	*6%*	*8%*	*8%*	*13%*	*24%*	*17%*	*9%*	*23%*	*35%*	*12%*
% Ontario	*7%*	*6%*	*15%*	*8%*	*15%*	*9%*	*15%*	*21%*	*9%*	*7%*	*9%*

Each Case assumes Dalhousie University will continue to be the dominant provider of the provincial workforce over the forecast period.

9.6.2 International Medical Graduates

International medical graduates (IMG) represent an increasing proportion of the workforce. The next figure identifies the number of physicians who returned from abroad, arrived as new IMGs, less those who moved abroad, and the net in/(out) migration within each province. In ten years Nova Scotia had net recruitment from these sources of 433 physicians for an annual net inflow of 2.1% of the total physician workforce. Retention rate of recruits is indicated in the last column as the percentage of net migration still actively practicing in the province five years later. For Nova Scotia only 36% were still practicing in-province five years later. This implies an annual turnover rate of (16.0%) in the IMG portion of the provincial workforce. IMGs comprise 28.6% of the provincial workforce.

Figure 53 Net in/(out) migration by province, 2000-2009

2000-2009	Returned from Abroad	New IMG	Moved Abroad	Net Migration	Average Annual Net Impact	% Continuously Active 5-years later
N.L.	25	542	35	532	5.30%	27%
P.E.I.	10	19	7	22	1.10%	36%
N.S.	**85**	**450**	**102**	**433**	**2.10%**	**36%**
N.B.	33	268	53	248	1.90%	61%
Que.	310	721	465	566	0.30%	79%
Ont.	806	1,975	1,146	1,635	0.70%	70%
Man.	87	415	164	338	1.60%	44%
Sask.	38	510	107	441	2.80%	47%
Alta.	228	1,137	300	1,065	1.70%	60%
B.C.	370	1,081	473	978	1.10%	63%
Y.T.	3	50	4	49	8.10%	25%
N.W.T.	4	11	3	12	2.60%	18%
Nun.	1	2	0	3	3.30%	u/a
Canada	2,000	7,181	2,859	6,322	1.00%	65%
Source: CIHI						

A large proportion of new IMGs in Newfoundland and Labrador (63.3%), Nova Scotia (77.5%), Manitoba (80.4%) and Saskatchewan (92.1%) moved to Ontario, Alberta or British Columbia.

In the opinion of the CPSNS there will be even fewer opportunities for IMGs as enrolment in medical schools increases in Canada.

Figure 54 National Enrollment 1989-2009, 1st Yr M.D. Entrants, and Year Practice Entry

TOTAL ENROLLMENT			1ST YEAR M.D. ENTRANTS (Only)			Year Enter PG	Year Enter Practice	
YEAR	TOTAL	5-Yr Change	YEAR	No.	% Change	-	FP/GP	SP
1989	7,072		1989	1,780		1993	1995	1998
1990	7,110		1990	1,791	0.62%	1994	1996	1999
1991	7,128		1991	1,775	-0.89%	1995	1997	2000
1992	7,041		1992	1,604	-9.63%	1996	1998	2001
1993	6,916		1993	1,683	4.93%	1997	1999	2002
1994	6,820	(0.71%)	1994	1,651	-1.90%	1998	2000	2003
1995	6,634		1995	1,613	-2.30%	1999	2001	2004
1996	6,451		1996	1,598	-0.93%	2000	2002	2005
1997	6,435		1997	1,577	-1.31%	2001	2003	2006
1998	6,392		1998	1,581	0.25%	2002	2004	2007
1999	6,388	(1.27%)	1999	1,634	3.35%	2003	2005	2008
2000	6,559		2000	1,763	7.89%	2004	2006	2009
2001	6,937		2001	1,921	8.96%	2005	2007	2010
2002	7,392		2002	2,028	5.57%	2006	2008	2011
2003	7,808		2003	2,096	3.35%	2007	2009	2012
2004	8,236	5.79%	2004	2,193	4.63%	2008	2010	2013
2005	8,687		2005	2,380	8.53%	2009	2011	2014
2006	9,151		2006	2,460	3.36%	2010	2012	2015
2007	9,640		2007	2,569	4.43%	2011	2013	2016
2008	10,148		2008	2,660	3.54%	2012	2014	2017
2009	10,518	5.54%	2009	2,742	3.08%	2013	2015	2018

The adjacent figure illustrates enrolment in Canadian medical schools has increased annually 5.79% between 1999 and 2004 and 5.54% annually between 2004 and 2009. Overall enrolment has increased 64.7% between 1999 and 2009. First year entrants have increased from 1,634 in 1999 to 2,742 in 2009. The impact of these large increases is only now starting to be seen in the health system and will plateau in 2018, subject to any further change in enrolment size.

This information supports the CPSNS opinion that fewer positions will be available for IMGs in the future. Fewer IMGs means a lower turnover rate in Nova Scotia.

9.6.3 Inter-Provincial Migration

Inter-provincial migration contributed a net decrease in the provincial workforce by (1.1%) between 2008 and 2009 according to the CIHI figure and data below.

Figure 55 Physicians Migrating within Canada Who Were in Canada on Both December 31, 2008, and December 31, 2009

Jurisdiction on December 31, 2008		Jurisdiction on December 31, 2009										
Total in Jurisdiction in 2008		N.L.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	CAN
N.L.	1,058	1,012	1	4	1	2	24	1	0	10	3	1,058
P.E.I.	225	1	221	2	0	0	1	0	0	0	0	225
N.S.	2,097	0	2	2,041	7	3	31	1	0	6	6	2,097
N.B.	1,414	2	0	2	1,385	10	13	1	0	1	0	1,414
Que.	16,758	1	1	3	5	16,675	56	1	0	7	9	16,758
Ont.	22,895	4	1	7	2	16	22,760	12	7	31	54	22,894
Man.	2,165	1	0	1	0	0	17	2,113	3	12	18	2,165
Sask.	1,601	0	0	1	0	0	18	1	1,555	8	18	1,601
Alta.	7,098	0	0	9	3	8	39	9	11	6,948	70	7,097
B.C.	8,836	1	1	4	0	7	41	3	2	26	8,749	8,834
TOTAL	**64,147**											
Total Residing in Jurisdiction in 2009		**1,022**	**227**	**2074**	**1403**	**16721**	**23000**	**2142**	**1578**	**7049**	**8927**	**64,143**
Total Migrating Into Jurisdiction in 2009		10	6	34	19	46	245	30	23	104	180	697
In Migration %		*1.0%*	*2.6%*	*1.6%*	*1.4%*	*0.3%*	*1.1%*	*1.4%*	*1.5%*	*1.5%*	*2.0%*	
Total Migrating Out of Jurisdiction in 2009		46	4	56	29	83	135	52	46	150	87	688
Out Migration %		*(4.5%)*	*(1.8%)*	*(2.7%)*	*(2.1%)*	*(0.5%)*	*(0.6%)*	*(2.4%)*	*(2.9%)*	*(2.1%)*	*(1.0%)*	
% NIPM in 2009		(3.5%)	0.9%	**(1.1%)**	(0.7%)	(0.2%)	0.5%	(1.0%)	(1.5%)	(0.7%)	1.0%	**0.0%**
FAMILY MEDICINE ONLY												
Total Residing in Jurisdiction in 2009		**532**	**122**	**1,041**	**779**	**8,370**	**11,304**	**1,109**	**882**	**3,830**	**4,888**	**32857**
Total Migrating Into Jurisdiction in 2009		6	3	16	9	13	138	18	13	54	83	353
Total Migrating Out of Jurisdiction in 2009		27	1	34	13	45	59	29	29	70	37	344
% NIPM in 2009		(3.9%)	1.6%	**(1.7%)**	(0.5%)	(0.4%)	0.7%	(1.0%)	(1.8%)	(0.4%)	0.9%	**0.0%**
SPECIALISTS ONLY												
Total Residing in Jurisdiction in 2009		**481**	**86**	**1,022**	**613**	**8,138**	**11,664**	**1,025**	**685**	**3,167**	**4,001**	**30882**
Total Migrating Into Jurisdiction in 2009		4	3	16	7	32	102	12	9	49	92	**326**
Total Migrating Out of Jurisdiction in 2009		18	2	21	14	36	76	22	17	71	49	**326**
% NIPM in 2009		(2.9%)	1.2%	**(0.5%)**	(1.1%)	(0.0%)	0.2%	(1.0%)	(1.2%)	(0.7%)	1.1%	**0.0%**

9.7 Worked Hours

The pattern of average hours worked per week remains unchanged since 2003 according to the latest National Physician Survey conducted in 2010. The average remains in the 50-55 hours per week range plus hours on-call.

Figure 56 National Physician Survey, 2010, Average weekly hours of work

Physicians: NOVA SCOTIA

Q18 Average weekly work hours - excluding on-call activities.

		FP/GP or Specialist		Sex			Age Group						
		FP/GP	Other Spec	Male	Female	NR	<35	35-44	45-54	55-64	65+	NR	All Physicians
Direct patient care without a teaching component, regardless of setting	Mean	28.50	22.07	26.54	23.65	**	**	24.64	24.58	26.54	24.00	**	25.56
Direct patient care with a teaching component, regardless of setting	Mean	4.80	10.64	8.16	6.60	**	**	10.51	8.59	6.03	2.34	**	7.47
Teaching/Education without direct patient care	Mean	1.26	2.60	2.05	1.65	**	**	1.83	2.01	1.74	.94	**	1.87
Indirect patient care	Mean	6.67	5.74	5.94	6.88	**	**	6.84	6.25	5.30	5.75	**	6.24
Health facility committees (academic planning committees)	Mean	.95	1.64	1.38	1.10	**	**	1.08	1.63	1.28	.86	**	1.26
Administration	Mean	2.15	3.60	3.04	2.53	**	**	2.30	3.70	3.26	1.50	**	2.82
Research (including management of research and publications)	Mean	.58	2.44	1.57	1.24	**	**	1.43	2.30	1.05	.46	**	1.43
Managing your practice	Mean	1.54	1.22	1.54	1.14	**	**	1.50	1.34	1.43	.98	**	1.39
Continuing medical education/professional development	Mean	3.11	2.87	3.15	2.75	**	**	2.69	3.17	3.13	2.82	**	3.00
Other work activity, specified	Mean	1.28	1.45	1.44	1.26	**	**	.79	1.33	2.14	1.83	**	1.36
Total hours worked per week	Mean	50.84	54.27	54.82	48.80	**	**	53.60	54.88	51.90	41.49	**	52.41
Total	N	1121	946	1285	741	40	74	582	624	542	196	48	2066
	n	243	168	248	154	9	11	98	122	119	50	11	411

Figure 57 National Physician Survey, 2003, Average weekly hours of work

Results from the CMA's 2003 Physician Resource Questionnaire

Hours worked per week

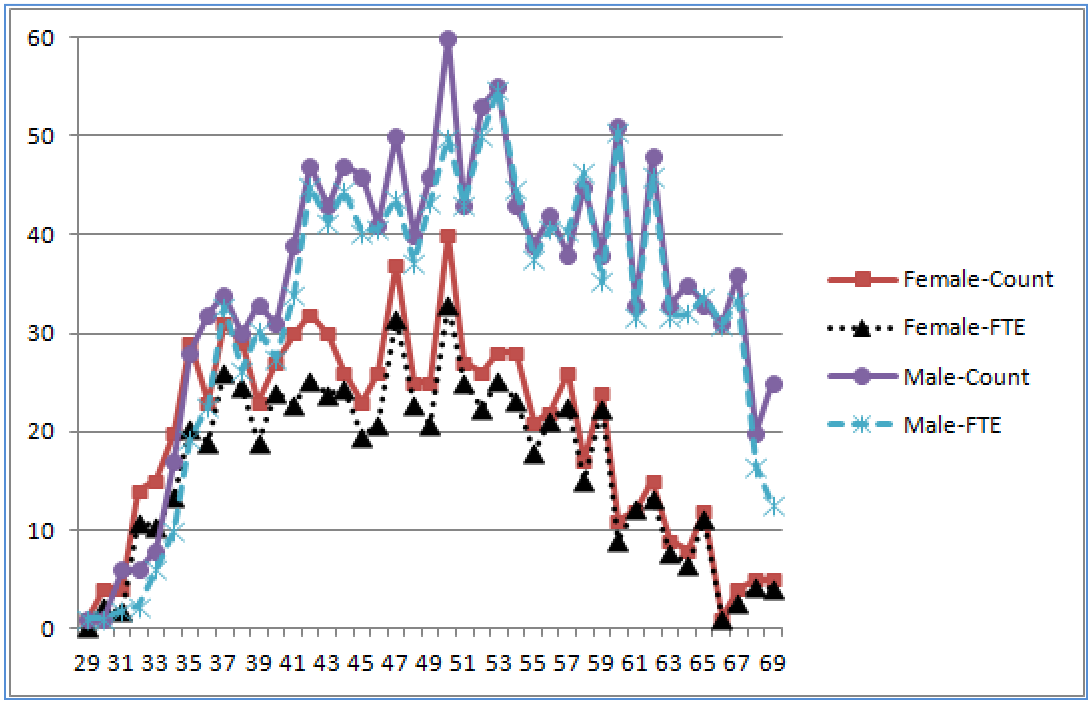
Average hours worked per week (excluding on-call)

	Overall	Female	Male	< 35	35 - 44	45 - 54	55 - 64	65+	GP/FP	Med Spec	Surg Spec	Rural	Urban
Number of respondents	2173	731	1442	208	593	714	441	217	1196	709	568	198	1975
Direct patient care	35.4	31.5	37.3	35.5	34.6	36.5	36.8	30.7	35.4	33.5	40.0	36.9	35.2
Health facility committees	1.2	1.0	1.3	0.7	1.2	1.4	1.2	0.9	0.9	1.6	1.5	1.3	1.2
Managing practice	2.2	1.7	2.4	1.8	2.0	2.4	2.3	2.0	2.0	2.2	2.5	2.0	2.2
Other indirect patient care	5.2	5.7	5.0	5.9	5.3	5.6	4.7	4.3	5.7	4.8	4.3	5.5	5.2
Research	1.5	1.0	1.7	1.3	2.1	1.3	1.1	1.3	0.7	2.8	1.4	0.5	1.6
Administration	1.8	1.2	2.2	0.9	1.5	2.2	2.4	1.3	1.4	2.6	1.6	0.8	1.9
Teaching	1.4	1.3	1.5	1.4	1.6	1.5	1.4	0.8	0.8	2.3	2.0	0.6	1.5
Continuing medical education	3.0	2.9	3.1	2.9	2.8	3.1	3.2	3.5	2.9	3.4	3.0	2.8	3.1
Other	1.2	1.1	1.2	0.4	0.9	1.4	1.5	1.3	1.1	1.3	1.3	1.0	1.2
Total	52.9	47.5	55.6	50.7	52.0	55.4	54.6	45.9	50.9	54.5	57.6	51.5	53.1

9.8 Separations

The following figure based on 2009/10 provincial data illustrates the change in FTE as one ages. The data from this figure was used to generate the detailed age/gender specific separation rates found in Chapter C Appendix.

Figure 58 Nova Scotia Physicians ratio of Count to FTE by Gender (Source: MSI and PHReD 2009/10)



Overall the provincial workforce continues to grow at a rate of 1.3% per annum.

Figure 59 CPSNS - Register Change 2006 to 2010

	2006	2007	2008	2009	2010	Change	
						Count	Annual %
Full Register	2001	2026	2026	2068	2102	101	1.3%
Defined Register	195	192	192	201	215	20	2.6%
Temporary Register	51	67	67	72	75	24	11.8%
Total	2247	2285	2285	2341	2392	145	1.6%
Specialists	1122	1159	1159	1195	1228	106	2.4%
Non-Specialists	1125	1126	1126	1146	1164	39	0.9%
Total	2247	2285	2285	2341	2392	145	1.6%
Place of Graduation							
Dalhousie	1050	1064	1064	1083	1089	39	0.9%
Other Canadian	540	551	551	559	587	47	2.2%
U.S.	34	37	37	30	32	-2	-1.5%
All other	623	633	635	669	684	61	2.4%
Total	2247	2285	2287	2341	2392	145	1.6%

Defined Register lists physicians who are not eligible for full licensure; most are IMGs.

Temporary Register lists physicians who are not eligible for full licensure but are sponsored by the DFM or Department of Health and Wellness and all are IMGs.

CIHI data align with the CPSNS registry data and indicate an annual growth in count of 1.6% since 1999.

Figure 60 Number and Percentage Change for Total Physicians, Jurisdiction, Canada, 1978 to 2009

Year	N.L.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Canada
COUNT											
1979 (30 year)	655	148	1,250	723	10,053	13,453	1,516	1,242	2,698	4,612	36,413
1999 (10 year)	925	180	1,868	1,162	15,582	20,701	2,049	1,568	4,962	7,812	56,914
2004 (5 year)	992	210	2,000	1,262	16,145	22,067	2,078	1,529	5,953	8,257	60,612
2009	1,117	233	2,174	1,460	17,430	24,515	2,238	1,703	7,554	9,548	68,101
AVERAGE % Growth in Count											
30 Year (1977-2009)	2.4%	1.9%	2.5%	3.4%	2.4%	2.7%	1.6%	1.2%	6.0%	3.6%	2.9%
10 Year (1999-2009)	2.1%	2.9%	1.6%	2.6%	1.2%	1.8%	0.9%	0.9%	5.2%	2.2%	2.0%
5 Year (2004-2009)	2.5%	2.2%	1.7%	3.1%	1.6%	2.2%	1.5%	2.3%	5.4%	3.1%	2.5%

The following figure points to two observations. The distribution of Nova Scotia physicians by years experience cohort is comparable nationally and the percentages above ten years since M.D. graduation are indicative of an experienced workforce. Physician mobility is generally more pronounced in the early career years with more experienced physicians less included to leave their province of work. These observations point to a quite stable workforce with the known exception of IMGs.

Figure 61 Physicians, by Physician Type, Years Since MD Graduation and by Jurisdiction, 2009

Years Since M.D. Graduation	N.L.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Canada
Family Medicine											
<11	28%	12%	14%	20%	17%	16%	13%	12%	23%	16%	17%
11–15	12%	13%	13%	14%	11%	12%	10%	9%	14%	12%	12%
16–20	14%	16%	17%	17%	12%	16%	14%	11%	15%	16%	15%
21–25	12%	14%	17%	15%	15%	15%	16%	12%	13%	17%	15%
26–30	10%	8%	14%	13%	15%	14%	13%	10%	13%	12%	13%
31–35	12%	13%	13%	10%	15%	11%	9%	9%	9%	12%	12%
36+	12%	15%	12%	11%	15%	17%	13%	18%	12%	14%	15%
Unknown	1%	9%	1%	0%	0%	0%	11%	19%	1%	0%	1%
Subtotal	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
n	599	126	1094	820	8635	11817	1165	964	4187	5282	34793
Specialists											
<11	14%	5%	12%	14%	14%	14%	12%	14%	20%	14%	14%
11–15	14%	9%	15%	16%	13%	14%	14%	13%	16%	13%	14%
16–20	14%	16%	14%	17%	12%	12%	12%	14%	12%	11%	12%
21–25	16%	13%	16%	13%	13%	13%	14%	15%	12%	14%	13%
26–30	17%	22%	13%	12%	12%	15%	16%	14%	14%	15%	14%
31–35	11%	7%	14%	10%	10%	12%	13%	10%	12%	13%	12%
36+	13%	20%	16%	18%	26%	21%	20%	16%	14%	20%	21%
Unknown	0%	7%	0%	0%	0%	0%	1%	5%	0%	0%	0%
Subtotal	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
n	518	107	1080	640	8795	12698	1073	739	3367	4266	33308
Total—All											
<11	22%	9%	13%	18%	15%	15%	13%	13%	21%	15%	16%
11–15	13%	12%	14%	15%	12%	13%	12%	11%	15%	13%	13%
16–20	14%	16%	15%	17%	12%	14%	13%	12%	14%	14%	13%
21–25	14%	14%	17%	15%	14%	14%	15%	13%	13%	16%	14%
26–30	13%	15%	13%	12%	13%	14%	14%	11%	13%	13%	14%
31–35	11%	10%	13%	10%	13%	12%	11%	9%	10%	12%	12%
36+	13%	17%	14%	14%	21%	19%	16%	17%	13%	16%	18%
Unknown	0%	8%	0%	0%	0%	0%	6%	13%	0%	0%	1%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
n	1117	233	2174	1460	17430	24515	2238	1703	7554	9548	68101

** The number of physicians represented by applying the Canada % Distribution to the N.S. Physician cohort.*

10 Key Observations – National Environment

1. Quality of care considerations are a central priority for PRP and are further emphasized by Department of Health and Wellness in the guiding principles for this project, i.e., "Preserve and enhance quality of care - acceptable, appropriate, accessible, efficient, effective, and safe".
2. The application of 'core' services is complex at the detailed level. Conceptually what is intended is an understanding, based on evidence, of the population health service need that residents are able to access as quickly and efficiently as possible. Consensus practice in Canada is to define core services as follows: comprehensive 24/7 family practice across the province and anaesthesia, emergency, general internal medicine, general surgery, general psychiatric, general paediatrics, general obstetrics and general laboratory and radiology (screening, routine diagnostic and imaging, x-ray, ECG) services in community and regional hospitals. Certain regional hospitals would also have urology, orthopaedics, and ophthalmology services.
3. Generalism is a repeated but not commonly understood term. The term arises within the health delivery system, as an unmet priority need. The medical education system sees parallels between generalism and the CanMEDs core competencies but defers to government on the question of matching supply to population need. Future physicians, as individuals, continue to match to subspecialties in large numbers.
4. Collaborative care is central to comprehensive PRP in Nova Scotia. Collaborative care can have a substantial and sustained impact on primary health care including family medicine/general practice workforce planning. Experience in the U.K., U.S. Veterans Administration, a study in Ontario, and analysis in Nova Scotia suggest a nurse practitioner functioning to full scope of practice can add 626 patients in a collaborative GP/NP practice. The current GP only ratio is 1.0 FTE per 1,124 residents implying a collaborative GP/NP practice per 1,750 residents.
5. There is universal agreement that primary care is the foundation of a quality health care system. For PRP, this means ensuring the foundation is secure, sustainable, and high performing. This principle has direct meaning for family medicine/general practice workforce planning.
6. Models of inpatient care continue to evolve. Limited published evidence suggests there is little cost (e.g., longer stays) and quality (e.g., readmission, death) difference between patients managed primarily by family practitioners, general internists, or special interest/trained hospitalists. Hospitalists are predominantly one of family physicians, general internists, or general paediatricians. 40% of all admissions in the province are managed by family physicians.
7. Regionalization is identified as a means to improve health system performance. This concept is inter-related with the concept of core services. Provincial and regional planning for a rationalized, effective, efficient, high quality health system will impact PRP.
8. Scope of physician practice is evolving due to advances in technology particularly in certain specialties. This evolution must be integrated within a PRP process.
9. Government policy directly impacts health system planning, priorities, budgeting, and operations. Government health policy, constrained by available resources, requires an assessment of what can be reasonably delivered to meet reasonable expectations versus expectations that assume limitless resources.

10. Nova Scotia, at an aggregate level, has 7% more physician FTE per population than other provinces. Substantial variation exists at the individual specialty level but the province is generally well supplied in comparison to other provinces. Population-to-FTE ratios of physician supply are a significant improvement on population-to-count ratios but do not substitute for more detailed assessment within each specialty.
11. The age and gender mix of the physician workforce is comparable to other provinces. The gender shift of more female than male physicians continues, carrying with it significant implications for PRP. In 2009/10 females represented 53% of first year medical postgraduate trainees, 45% of surgical, 46% of lab medicine, and 63% of family practitioner trainees.
12. Nova Scotia is a national leader in the development and advancement of alternate payment models. This is consistent with new physicians favouring a blended payment model. APPs create a challenge for PRP in terms of quantification of productivity.
13. Postgraduate trainee positions for Canadian citizens and permanent residents have increased 57% (4,011 positions) nationally since 2000. While governments frequently call for more generalist physicians they have not acted to close the compensation gap through payment reform nor has the medical education system responded by changing the ratio of generalist to non-generalist postgraduate trainee positions since 2000. In fact, non-generalist positions have increased by 64% compared to a 50% increase in generalist positions.
14. In a positive move for generalism, General Internal Medicine has been granted full certification status by RCPSC, effective 2011. Conversely, the RCPSC also appears to be expanding specialization and subspecialization by introducing several new categories of recognition in addition to their historical “primary specialty” and “sub-specialty” designation: Fundamentals program, Area of Focused Competence (Diploma) program and Specialist Interest Group for Medical Activity. The last two have been described as responses to the Social Accountability mission and therefore linked to societal needs.
15. Approximately 3% (90-105) of CSAs were resident of Nova Scotia prior to becoming a CSA with 23 to 26 applying to Canadian post-graduate training positions annually. CSAs are often overlooked in physician workforce planning, compete for residency positions with IMGs at a time when integration of IMGs is a priority for the health system, and frequently come from affluent and influential family backgrounds.

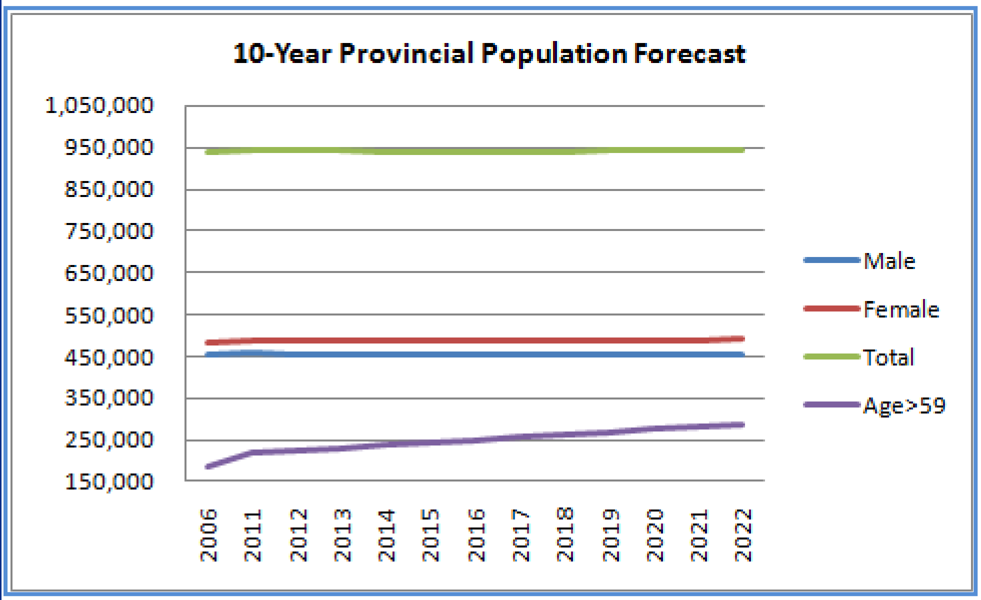
Section 3.
PROVINCIAL ENVIRONMENT

A REVIEW OF THE NOVA SCOTIA POPULATION, HEALTH CARE SYSTEM, PHYSICIAN SERVICES AND RESOURCES, ACADEMIC MEDICINE, AND STAKEHOLDER INPUT

11 Population

***Methodological Note**: In 2007, the Department of Finance (DOF) issued detailed long-term provincial and county level population forecasts. At the time of this report, the Department of Finance had, in 2011, released revised provincial projections but had not yet completed the revised county level projections. This report requires population projections at the DHA and county levels. The population projections used throughout this report have been drilled down by the Consultant to the DHA and county levels based upon the revised 2011 provincial projections in combination with the detailed country level forecasts from 2007. This approach ensures that the sum of the DHA and county projections equal the 2011 DOF provincial figures. The Consultants also apportioned the populations of the Hants and Inverness counties between the affected DHAs. This was done by going to the population data at the individual community (village, town) level and assigning the population to the appropriate DHA based upon the geographic location of the community in comparison to the DHA geographic boundaries. The result of this detailed exercise was the Hants county population being divided 47% to 'Hants-east' in DHA4 and 53% to 'Hants-west' in DHA9 and the Inverness county population being divided 62% to 'Inverness-north' in DHA8 and 38% to 'Inverness-south' in DHA 7. The allocation was refined to five-year age cohorts (ages 0 to 4, ages 5 to 9, etc.).*

Figure 62 10-Year Provincial Population Forecast (Source: NS DOF)



The DOF provincial population forecast is for no net growth over the ten-year PRP forecast period. In 2011, 23.4% of the population was older than age 59 (20% in 2006). By 2022, this age cohort is projected to increase to 30.5% of the population and to have a significant impact on health services (as illustrated in Figure 4 Section 9). The average population age is forecast to increase 6% from 41.3 in 2011 to 43.9 in 2022.

Net migration into the Halifax metropolitan area (HRM) is expected to continue with an increase in population of 4.2% in DHA 9 over the ten years. The other DHAs are expected to decline slightly over the coming ten years with a more significant decline in DHA 7 and DHA 8. Population growth and change (age and gender) are the two most significant determinants of future change in physician workforce need.

Figure 63 Ten-Year DHA Population Forecast (Source: NS DOF)

DHA	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Change	% Change	% Annual Change
1 Total	59,782	59,607	59,426	59,238	59,062	58,921	58,812	58,726	58,659	58,600	58,534	58,467	(1,315)	(2.2%)	(0.2%)
2 Total	62,097	61,878	61,637	61,400	61,180	60,995	60,833	60,702	60,599	60,495	60,380	60,263	(1,834)	(3.0%)	(0.3%)
3 Total	82,028	81,888	81,748	81,594	81,458	81,364	81,308	81,283	81,292	81,305	81,314	81,319	(709)	(0.9%)	(0.1%)
4 Total	72,222	72,241	72,236	72,212	72,193	72,201	72,230	72,279	72,344	72,414	72,469	72,523	301	0.4%	0.0%
5 Total	31,485	31,325	31,159	30,998	30,855	30,736	30,635	30,548	30,472	30,405	30,342	30,282	(1,203)	(3.8%)	(0.4%)
6 Total	46,093	45,905	45,709	45,509	45,325	45,158	45,011	44,883	44,761	44,649	44,527	44,402	(1,691)	(3.7%)	(0.4%)
7 Total	44,106	43,711	43,321	42,941	42,585	42,267	41,977	41,719	41,483	41,261	41,045	40,843	(3,262)	(7.4%)	(0.7%)
8 Total	125,829	125,038	124,238	123,430	122,663	121,967	121,327	120,743	120,204	119,687	119,176	118,669	(7,160)	(5.7%)	(0.6%)
9 Total	418,881	420,757	422,425	423,933	425,390	426,946	428,543	430,177	431,870	433,514	435,033	436,459	17,578	4.2%	0.4%
PROV	942,522	942,349	941,899	941,255	940,711	940,556	940,675	941,060	941,683	942,329	942,820	943,227	705	0.1%	0.0%

11.1 Geography and Rurality

Nova Scotia is 55,000 square kilometers in size. Its highest point above sea level is 530 meters in the Cape Breton highlands. There are 3,000 lakes. Population is concentrated along the coastline and in the Halifax greater metropolitan area. Population density is 17 per square kilometer. Nationally, excluding the Northwest Territories, Nunavut, and Yukon Territory, the population density is 5.3 per square kilometer.

Detailed studies of rurality have been conducted in a number of provinces including British Columbia, Alberta, and Ontario[42]. The markers of rurality in these studies would not apply to the same degree to Nova Scotia given its comparatively small geographic size, i.e., NS being a tenth to twentieth the size of B.C., Alberta, and Ontario.

11.2 Population Cultural Diversity

Four percent (approximately 37,000) of Nova Scotians identify French as their first language. 2.5% are First Nations aboriginal. Among visible minorities those of African descent are by far the largest group at 2.1%.

Figure 64 Visible Minority Population (Source: Statistics Canada, 2006)

Geography	Total Population	Total Visible Minorities	Black	Arab/West Asian	South Asian	Chinese	Other
Nova Scotia	903,090	37,685	19,225	5,280	3,810	4,305	5,065

- The majority of Nova Scotians are descendants of Irish, Scottish, and other European immigrants. Nova Scotians of African descent (ANS) have been in the province for more than 400 years.
- Acadians arrived in Nova Scotia more than 400 years ago. With the successful negotiation of the Canada-Nova Scotia Agreement of French-language Services ($5 million over 4 years), the GNS is poised to increase its capacity to provide services in French[43]. Government services need to ensure that Acadian and francophone needs are addressed in the development of programs, policies and services.
- The provincial immigration strategy is to double the number of immigrants coming to NS on an annual basis.

[42] Kralj B. Measuring "rurality" for purposes of health care planning: an empirical measure for Ontario. OMR. 67 (9); 2000
[43] Government of Nova Scotia Office of Acadian Affairs Business Plan 2006-2007

- The overriding goals for the province are to achieve 'health equity' which includes fair treatment, understanding the importance of history, and providing treatment appropriately. The diversity program is quick to point out that health equity is not the same 'health equality'. Achieving health equity requires health providers to be competent culturally with population specific approaches. There is strong support across the province for health equity. 'Equity' is about unfair difference. Cultural competency starts at a very early age, i.e., from kindergarten, in elementary school with attendance at science camps, and continues through middle and high school with mentoring.
- NS is the first province to introduce cultural competence guidelines for primary health care professionals. The guidelines include a discussion guide and DVD, cultural competency and health literacy guide, health equity forum to focus on refugees/immigrants with particular attention to identifying mental health issues. The DFM has introduced an affirmative action policy.
- All health providers need to receive cultural competence training and to serve underserved and marginalized populations:
  - Cultural competence is viewed as a life-long journey that requires awareness, skill, and effective policy.
  - An MD has a role as a learner and populations have something to teach. MDs can benefit from experiential learning once becoming an MD. Program representatives point out that one cannot understand in the absence of experience it e.g., on a 'reserve' or how to work with interpreters.

Co-leads from the Department of Health and the HHR community will work with stakeholders to refine and implement a Health Human Resources Strategy that will support health care providers using their full scope of practice and support a culturally competent health care system that will respond effectively to the diversity of Nova Scotians[44].

- Notable findings for PRP include:
  - A PRP must be able to serve the population and people that are reflective of the population.
  - No ANS have ever practised in medicine in NS. Few apply and three have graduated but all left NS. Long history of ANS not being part of any professional groups.
  - The Dalhousie Faculty of Law has a progressive and successful indigenous black and aboriginal model that works well. In NS many AFN are lawyers and the model is used to track/encourage/support AFNs; however, this is not the case in medicine.

[44] Nova Scotia Department of Health and Wellness, 2009-10 Business Plan

12 POPULATION HEALTH STATUS

12.1 Population Health Indicators

Figure 65 Dependency Ratio – Interprovincial Comparison (Source: Statistics Canada and CIHI 2009 CHS)

PROV	2009	Range-Low	Range-High
N.L.	56.2	53.7	61.8
P.E.I.	64.2	64.2	64.2
N.S.	59.5	51.8	67.8
N.B.	59.2	56.4	62.4
Que.	59.2	55.1	63.2
Ont.	59.8	53.2	65
Man.	66.8	59.4	80.5
Sask.	69.6	61.8	84.2
Alta.	55	50.5	66.4
B.C.	57.6	42.0	68.7
Canada	59.3	42.0	84.2

In 2009, Nova Scotia had a dependency ratio of 59.5 (or the sum of the populations aged 0 to 19 plus 65 and older over the population aged 20 to 64 equaled 59.5 percent). Statistics Canada suggests the dependency ratio is one measure of the social and/or economic dependency of non-working age to working-age Canadians. Based upon health service utilization data it is known that non-working age residents put additional demands on health services. The Nova Scotia ratio is on par with the Canadian average of 59.3.

The following figures examine selected chronic disease prevalence rates as measured by the 2009 national community health survey and reported by Statistics Canada and CIHI[45]. In all cases Nova Scotians report prevalence of chronic disease significantly above the Canadian average, i.e., diabetes 28% higher, high blood pressure 27%, asthma 14%, chronic obstructive pulmonary disease (COPD) 67%, and arthritis 61%.

Figure 66 Interprovincial - prevalence of Chronic Disease – Comparison (Source: Statistics Canada and CIHI 2009 CHS)

	Diabetes (age 12+), 2009		High Blood Pressure (age 12+), 2009		Asthma (age 14+), 2009		COPD (age 35+), 2009	
PROV	%	95% CI	%	95% CI	%	95% CI	%	95% CI
N.L.	8.1	(6.7–9.5)	21.6	(19.6–23.6)	8.7	(7.2–10.2)	4.7	(3.2–6.2)
P.E.I.	6	(4.4–7.6)	17.9	(15.3–20.6)	8.2	(6.3–10.2)	3.2	(1.9–4.6)
N.S.	**7.7**	**(6.4–8.9)**	**21.5**	**(19.6–23.4)**	**9.2**	**(7.5–11.0)**	**7.0**	**(5.4–8.5)**
N.B.	6.6	(5.4–7.7)	20.7	(18.8–22.6)	7.6	(6.3–8.9)	5.4	(4.0–6.7)
Que.	5.7	(5.2–6.3)	17	(16.1–18.0)	7.3	(6.6–8.0)	4.8	(4.1–5.4)
Ont.	6.4	(5.9–7.0)	17.2	(16.5–17.9)	8.2	(7.6–8.9)	4.0	(3.6–4.4)
Man.	5.6	(4.5–6.7)	17.1	(15.1–19.1)	10.7	(8.5–12.8)	3.9	(2.9–4.8)
Sask.	5.6	(4.7–6.5)	18.2	(16.6–19.7)	9.0	(7.6–10.5)	4.3	(3.3–5.3)
Alta.	4.8	(4.1–5.6)	14.6	(13.4–15.8)	8.5	(7.4–9.7)	3.3	(2.6–4.1)
B.C.	5.4	(4.7–6.1)	14.9	(13.9–15.9)	7.5	(6.6–8.5)	3.8	(3.2–4.5)
Y.T.	4.2	(1.9–6.5)	13.7	(9.3–18.1)	10.4	(7.8–13.0)	*	**
N.W.T.	5.2	(2.1–8.3)	12.3&	(7.8–16.8)	6.4	(3.6–9.1)	*	**
Nun.	4.3	(2.1–6.5)	11.8	(8.2–15.4)	3.5	(1.9–5.1)	*	**
Canada	**6.0**	**(5.7–6.2)**	**16.9**	**(16.5–17.3)**	**8.1**	**(7.7–8.5)**	**4.2**	**(4.0–4.5)**
N.S./Canada	**1.28**		**1.27**		**1.14**		**1.67**	

[45] CIHI and Statistics Canada, Health Indicators 2011

Figure 67 Interprovincial - prevalence of Chronic Disease – Comparison (Source: Statistics Canada and CIHI 2009 CHS)

	Arthritis (age 12+), 2009		Adult Body Mass Index =>30 (age 18+), 2009	
PROV	**%**	**95% CI**	**%**	**95% CI**
N.L.	21.9	(19.4–24.4)	26.8	(24.0–29.6)
P.E.I.	18.2	(15.5–21.0)	23.8	(20.1–27.4)
N.S.	**24.5**	**(22.4–26.5)**	**24.3**	**(21.4–27.2)**
N.B.	17.8	(16.0–19.6)	28.5	(25.6–31.3)
Que.	10.6	(9.8–11.3)	16.9	(15.7–18.1)
Ont.	16.8	(16.0–17.6)	17.4	(16.6–18.3)
Man.	17.5	(15.5–19.5)	22.3	(19.7–24.8)
Sask.	18.1	(16.6–19.7)	22.2	(20.2–24.3)
Alta.	14.8	(13.4–16.1)	19	(17.2–20.9)
B.C.	14.4	(13.3–15.4)	13.6	(12.4–14.8)
Y.T.	14.9	(11.7–18.1)	22.1	(17.3–26.8)
N.W.T.	13.6	(10.3–16.9)	27.1	(20.6–33.5)
Nun.	7.7&	(4.0–11.4)	25.4	(17.9–32.9)
Canada	**15.2**	**(14.8–15.6)**	**17.9**	**(17.4–18.4)**
N.S./Canada	**1.61**		**1.36**	

Obesity as measured by adult body mass index equal or greater than 30 is 36% higher than the national average. According to the World Health Organization and Health Canada guidelines, a BMI of 30 or greater is classified as obesity and is associated with increased health risk.

Each of these chronic diseases is a key barometer of population health need.

Figure 68 Interprovincial - Self-Reported Conditions and Well-being – Comparison (Source: (Source: Statistics Canada/CIHI 2009 CHS)

Self-Reported Conditions and Well-Being		*%	95% CI
Perceived health	N.S.	59.3	(56.7–61.9)
	Canada	60.5	(59.8–61.1)
Perceived mental health	N.S.	74.5	(71.9–77.2)
	Canada	73.9	(73.3–74.5)
Perceived life stress	N.S.	18.9	(16.6–21.2)
	Canada	23.2	(22.6–23.8)
Mood disorder	N.S.	7.6	(6.1–9.0)
	Canada	6.3	(6.1–6.6)

**reporting very good to excellent. Source: StatCan/CIHI Community Health Survey, 2011*

Self-reported conditions and well being by Nova Scotians are comparable to national averages with the exception of mood related disorders.

The following CIHI/Statistics Canada table reports the age-standardized rate of hospitalization per 100,000 population for selected conditions. Of the eight reported indicators, five are below and three above the national average. The notable variations are myocardial infarction (#2) at 27% higher, knee replacement (#6) at 74% higher, and mental illness (#4) at 26% below the national average. Hospitalization does not necessarily mean higher incidence or prevalence but may be more indicative of different practice patterns or differences in health service infrastructure and access.

Figure 69 Age Standardized rates (ASR) of Hospitalization for select conditions, 2009/10 (Source: CIHI)

Hospitalization Conditions		*ASR/100,000	95% CI	In N.S. Range
1 Injury Hospitalization (09-10)	N.S.	504	(490-518)	Capital Health Region
	Canada	517	(514-519)	420, Cape Breton 597
		97%		
2 Hospitalized Acute Myocardial Infarction Event	N.S.	265	(255-275)	Capital Health Region
	Canada	209	(208-211)	180, Cape Breton 346
		127%		
3 Hospitalized Stroke Event 2009–2010	N.S.	116	(109-122)	Capital Health Region
	Canada	124	(123-126)	105, South-west Nova
		94%		
4 Mental Illness Hospitalization 2009–2010	N.S.	364	(345-383)	Capital Health Region
	Canada	465	(461-468)	180, Cape Breton 654
		78%		
5 Hip Replacement 2009–2010	N.S.	107	(101-114)	South-West Nova 79, Annapolis & Sth Shore
	Canada	100	(99-101)	125
		107%		
6 Knee Replacement 2009–2010	N.S.	174	(166-182)	South-West Nova 147,
	Canada	100	(99-101)	Sth Shore 205
		174%		
7 Percutaneous Coronary Intervention 2009–2010	N.S.	166	(158-174)	Annapolis 142, South-West Nova 182
	Canada	169	(167-171)	
		98%		
8 Cardiac Revascularization 2009–2010	N.S.	225	(215-234)	Annapolis 205, Cape Breton 240
	Canada	236	(234-238)	
*(Age-Standardized Rate - (ASR) per 100,000)		95%	Source: StatCan/CIHI Community Health	

12.2 Cancer

Figure 70 Cancer incidence – National comparison of Female cancers (Source: Cancer Registry Canada, 2011)

FEMALES - Cancer Type	NS-2000-04 ASIR	NS-2011-Est. ASIR	Canada 2011 Est. ASIR	NS- % Change (04-11)	NS-2004 (New Cases)
Breast	105	101.0	102.0	(3.8%)	647
Colorectal	53.6	48.0	40.0	(10.4%)	363
Lung	53.2	55.0	51.0	3.4%	333
Body of Uterus	18.4	18.0	20.0	(2.2%)	120
Non-H Lymphoma	13.2	17.0	15.0	28.8%	86
Melanoma	16.4	19.0	12.0	15.9%	99
Cervix	12.2	10.0	7.0	(18.0%)	62
Kidney	11.5	12.0	8.0	4.3%	69
Ovary	11.1	9.0	11.0	(18.9%)	56
All Cancers	380.1	396.0	369.0	4.2%	2405
Source: Canadian Cancer Statistics 2011					

The female age-standardized incidence rate (ASIR) of various cancers has increased 4.2% between the period of 2000-2004 and 2011 with significant variation by cancer. Non-Hodgkin's lymphoma and melanomas account for the increase while ovary, cervix, and colorectal cancers have declined. ASIR overall is 7% higher in the province (396.0) compared to the national (369.0) average.

Figure 71 Cancer – Canada incidence Trend in Females (Source: Cancer Registry Canada, 2011)

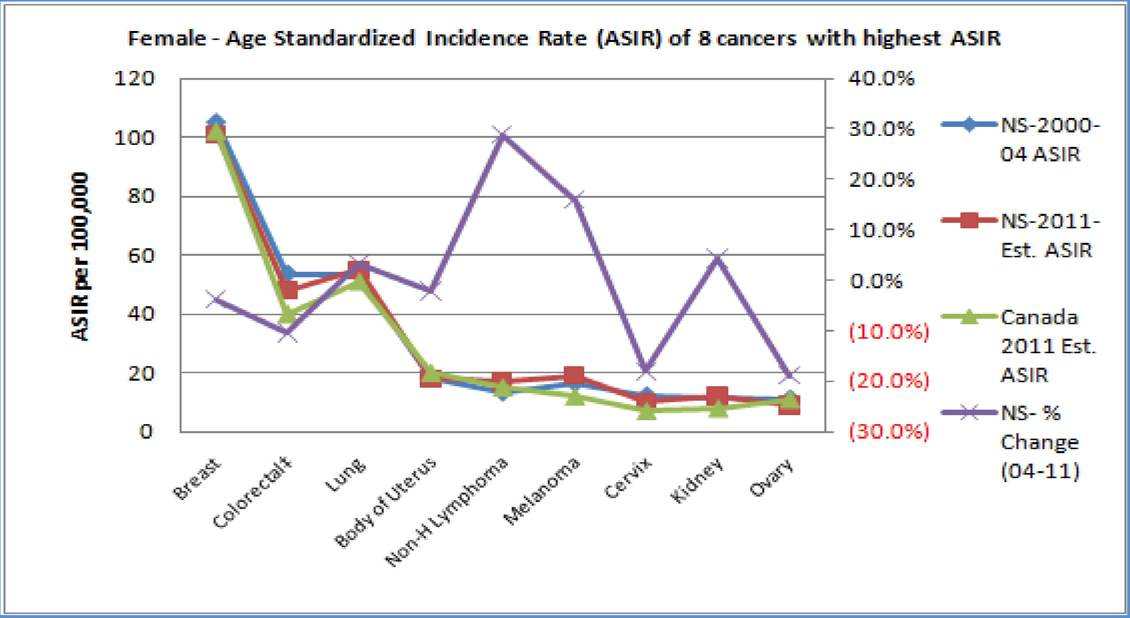
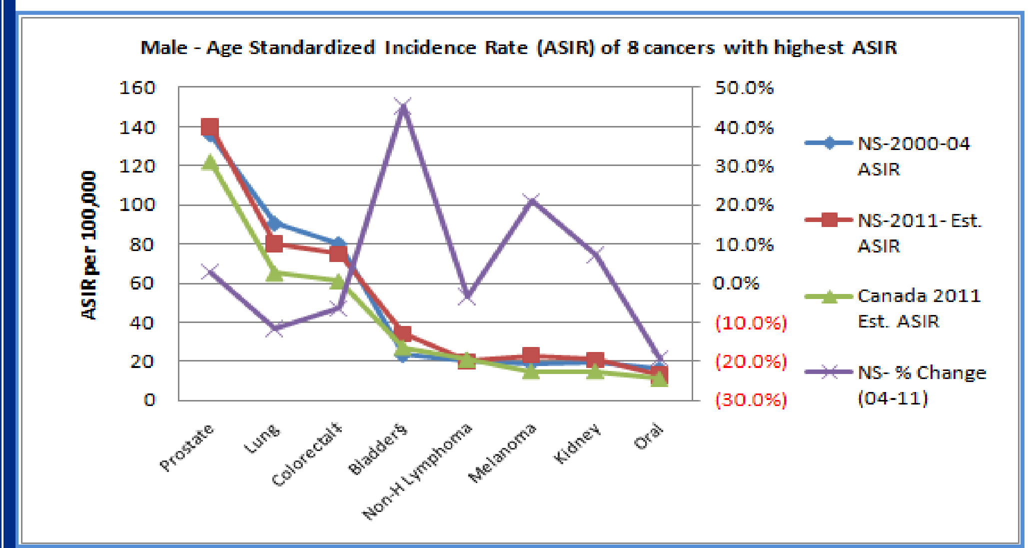


Figure 72 Cancer incidence – National comparison of Male cancers (Source: Cancer Registry Canada, 2011)

MALES - Cancer Type	NS-2000-04 ASIR	NS-2011-Est. ASIR	Canada 2011 Est. ASIR	NS- % Change (04-11)	NS-2004 (New Cases)
Prostate	136.2	140.0	122.0	2.8%	733
Lung	90.5	80.0	65.0	(11.6%)	470
Colorectal	80.2	75.0	61.0	(6.5%)	409
Bladder	23.4	34.0	27.0	45.3%	101
Non-H Lymphoma	20.7	20.0	21.0	(3.4%)	119
Melanoma	19	23.0	15.0	21.1%	105
Kidney	19.6	21.0	15.0	7.1%	105
Oral	16.1	13.0	11.0	(19.3%)	86
All Cancers (Males)	522.7	529.0	456.0	1.2%	2742
Source: Canadian Cancer Statistics 2011					

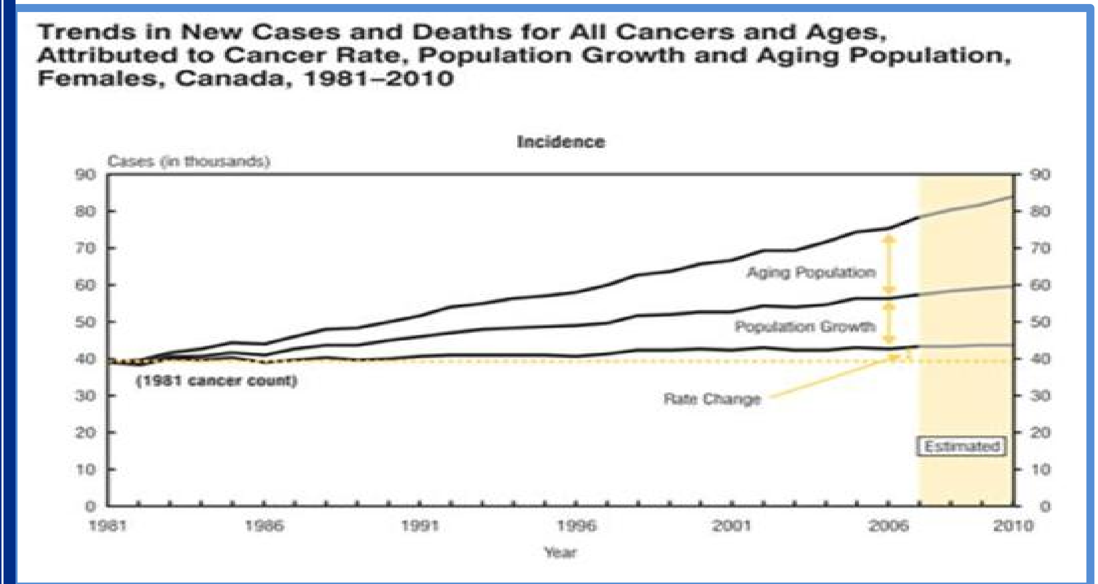
The male ASIR of various cancers has increased slightly at 1.2% between the period of 2000-2004 and 2011 with significant variation by cancer. Bladder and melanomas account for the increase while lung, oral, and colorectal cancers have declined. ASIR overall is 16% higher in the province compared to the national average.

Figure 73 Cancer incidence – National comparison of Male cancers (Source: Cancer Registry Canada, 2011)



Nationally, population growth and aging have contributed to increased incidence of all cancers. For Nova Scotia the aging factor is particularly relevant, as is seen in the preceding sectional analysis on provincial population forecasts.

Figure 74 Trends in New Cases and Deaths – Females, Canada, 1981-2010



Breast screening program has a target of 70% participation rate of eligible women aged 50-69; NS is currently at 65% participation. Aggregate data reveal 778,000 screens of 117,000 women in the program since 1991.

12.3 Diabetes

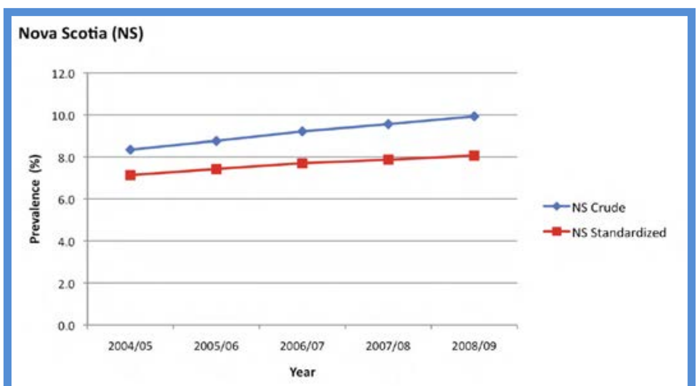
Figure 75 Provincial & DHA diabetes prevalence population Aged 20+, 2008/09 (Source: NS Diabetes Care Program)

Province & DHAs	Population Aged 20+	Diabetes Cases	Crude Diabetes Prevalence (%)	Standardized Diabetes Prevalence (%)
Nova Scotia	775,890	77,015	9.9	8.1
1-South Shore	51,458	6,111	11.9	8.8
2-Southwest	49,038	5,700	11.6	8.3
3-Annapolis Valley	65,595	6,824	10.4	7.9
4-Colchester East Hants	58,383	5,643	9.7	7.9
5-Cumberland	27,446	2,982	10.9	7.7
6-Pictou	38,806	3,851	9.9	7.7
7-Guysborough Antigonish Strait	37,772	4,236	11.2	8.4
8-Cape Breton	106,013	13,013	12.3	9.4
9-CDHA	341,379	28,594	8.5	7.7

PREVALENCE

Time trends in the crude prevalence of diabetes revealed an increase from 8.3% to 9.9% (a 19% increase over the five-year period), as did the standardized prevalence figures (7.1% to 8.1%), which are consistently lower than the crude figures.

Figure 76 Provincial prevalence of diabetes – 2004/05-2008/09 (Source: NS Diabetes Care Program)



There has been an increase in prevalence over time for those in the 60 to 69, 70 to 79, and 80+ age cohorts, with the largest increase occurring among those 80 years of age and older (from 20% in 2004/05 to 24% in 2008/09). Over this same period, standardized prevalence figures for Cape Breton and South Shore DHAs remained consistently higher than those for the province as a whole.

INCIDENCE

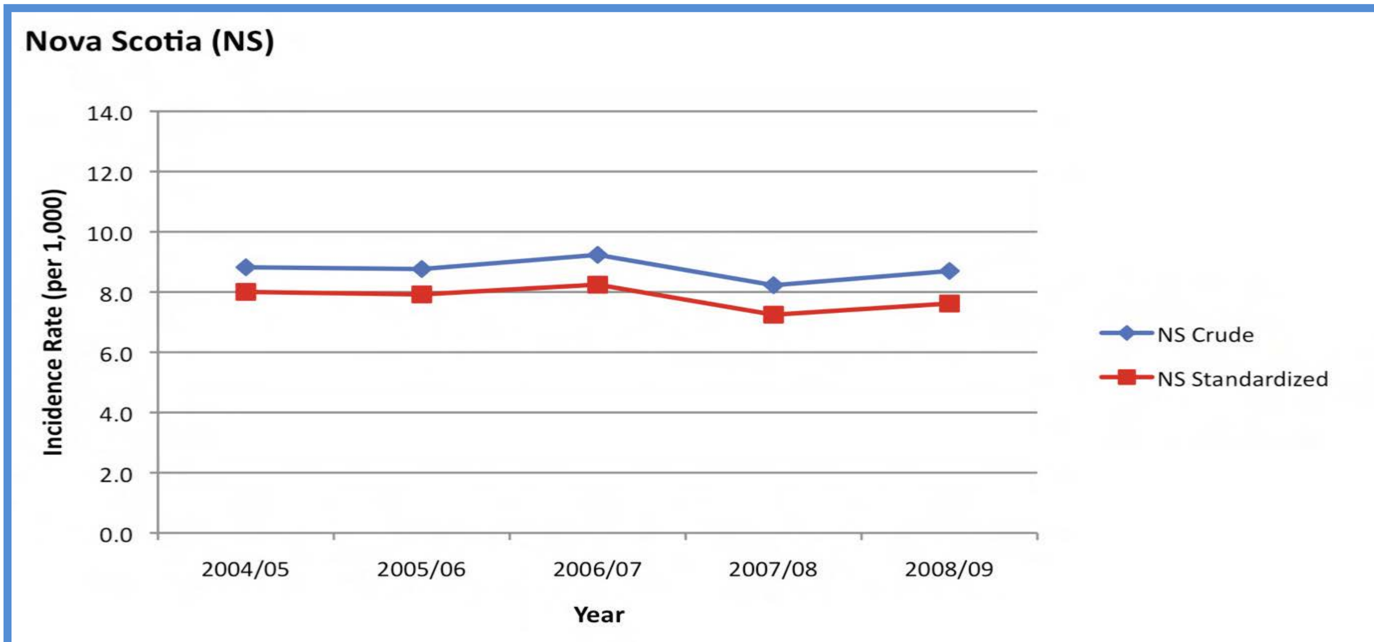
In the year 2008/09, over 6,133 new cases of diabetes were diagnosed among adults age 20+ in Nova Scotia (8.7 per 1000 population). For the year 2008/09, there was variation in the crude incidence rates (IR) of diabetes in the population aged 20+ across DHAs, ranging from 8.0 per 1000 to 10.4 per 1000 population (see next Figure). Comparison of standardized incidence rates across the DHAs revealed that the variation in incidence across the province (6.1 to 8.6 per 1000 population) persisted, although the numbers appeared smaller. The differences in population structure likely account for the smaller numbers in standard rates.

Figure 77 Provincial & DHA diabetes IR (per 1000) for the Population Aged 20+, 2008/09 (Source: NS Diabetes Care Program)

Province and Districts (DHAs)	Population at Risk (20+)	New Diabetes Cases	Crude Diabetes Incidence Rate (per 1,000)	Standardized Diabetes Incidence Rate (per 1,000)
Nova Scotia	**705,008**	**6,133**	**8.7**	**7.6**
Annapolis Valley (3)	59,328	557	9.4	7.8
Cape Breton (8)	93,944	944	10.1	8.4
Capital Health (9)	309,574	2,491	8.1	7.6
Colchester East Hants (4)	53,184	444	8.4	7.2
Cumberland (5)	24,660	196	8.0	6.1
Guysborough Antigonish Strait (7)	33,842	306	9.0	7.5
Pictou County (6)	35,251	296	8.4	7.0
South Shore (1)	43,758	420	9.6	7.5
Southwest (2)	45,822	475	10.4	8.6

Time trends in the crude incidence of diabetes revealed little change over time, hovering at approximately 8.8 per 1000, as did the standardized incidence rates (7.8 per 1000), which were consistently lower than the crude rates. Standardized incidence figures for Cape Breton and South West DHAs remained consistently higher than those for the province as a whole over time.

Figure 78 Provincial trend in Crude & Standardized Diabetes IR (per 1000) for the Population Aged 20+, 2004/05 to 2008/09 (Source: NS Diabetes Care Program)



Diabetes Comorbidity[46]

Cardiovascular disease

In the year 2008/09, approximately 8.5% of Nova Scotia's adults age 20+ with diabetes had CVD, compared to 1.6% of adults without diabetes. Time trends in the ratio of the standardized CVD rates revealed virtually no change, hovering at approximately 3.1. Individuals with diabetes were 3 times more likely to have CVD than individuals without diabetes.

Acute myocardial infarction

In the year 2008/09, approximately 1.5% of Nova Scotia's adults age 20+ with diabetes had an AMI, compared to 0.3% of adults without diabetes. Time trends in the ratio of the standardized AMI rates revealed virtually no change, hovering at approximately 3.0. Individuals with diabetes were 3 times more likely to have an AMI than individuals without diabetes.

Ischemic heart disease (IHD)

In the year 2008/09, approximately 4.0% of Nova Scotia's adults age 20+ with diabetes had IHD, compared to 0.6% of adults without diabetes. Time trends in the ratio of the standardized IHD rates revealed virtually no change, hovering at approximately 3.4

Stroke

In the year 2008/09, approximately 1.0% of Nova Scotia's adults age 20+ with diabetes had a stroke, compared to 0.2% of adults without diabetes. Time trends in the ratio of the standardized stroke rates revealed virtually no change, hovering around 2.6. Individuals with diabetes were approximately 3 times more likely to have a stroke than individuals without diabetes.

Unstable angina

In the year 2008/09, approximately 0.5% of Nova Scotia's adults age 20+ with diabetes had UA, compared to less than 0.1% of adults without diabetes. Time trends in the ratio of the standardized UA rates revealed little change, hovering at 3.3.

Heart failure

In the year 2008/09, approximately 2.2% of Nova Scotia's adults age 20+ with diabetes had HF, compared to 0.3% of adults without diabetes. Time trends in the ratio of the standardized HF rates revealed virtually no change, hovering at approximately 3.8. Individuals with diabetes were approximately 4 times more likely to have HF than individuals without diabetes.

Hypertension

In the year 2008/09, approximately 71% of Nova Scotia's adults age 20+ with diabetes had HTN, compared to 25% of adults without diabetes. Time trends in the ratio of the standardized HTN rates revealed virtually no change, hovering at approximately 1.9. Individuals with diabetes were twice as likely to have HTN as individuals without diabetes.

Nephropathy

In the year 2008/09, approximately 1.4% of Nova Scotia's adults age 20+ with diabetes had nephropathy (diabetic kidney disease), compared to 0.1% of adults without diabetes. Time trends in the ratio of the standardized nephropathy rates revealed little change, hovering at approximately 6.2.

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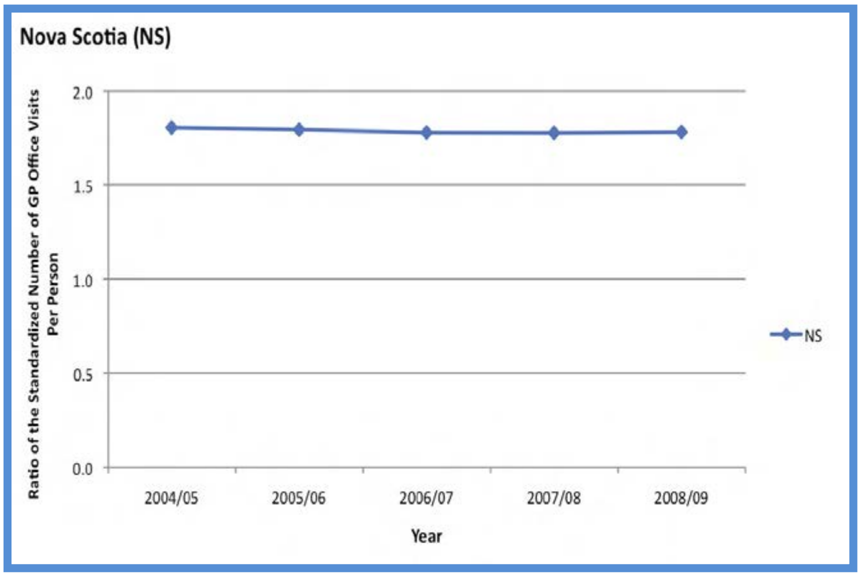
[46] Nova Scotia Department of Health and Wellness, Diabetes Care Program of Nova Scotia

PHYSICIAN SERVICES

Comparison of the standardized number of GP office visits per person revealed smaller numbers and less variation within the population with diabetes across the province (7.6 to 8.2), suggesting that differences in population structure (e.g., older versus younger population) account for some of the variation between districts.

Figure 79 Provincial trend in Ratio of Standardized number of GP Office Visits for the Diabetes Pop. Aged 20+ (Source: NS Diabetes Care Program)



Comparison of the standardized number of specialist physician office visits per person revealed both smaller figures and less variation within the population with diabetes across the province (2.3 to 3.9 visits per person), suggesting that differences in population structure (e.g., older versus younger population) account for some of the variation between districts.

Figure 80 Provincial trend in the Ratio of the Standardized Number of Specialist Office Visits for the Diabetes Population Aged 20+ (Source: NS Diabetes Care Program)

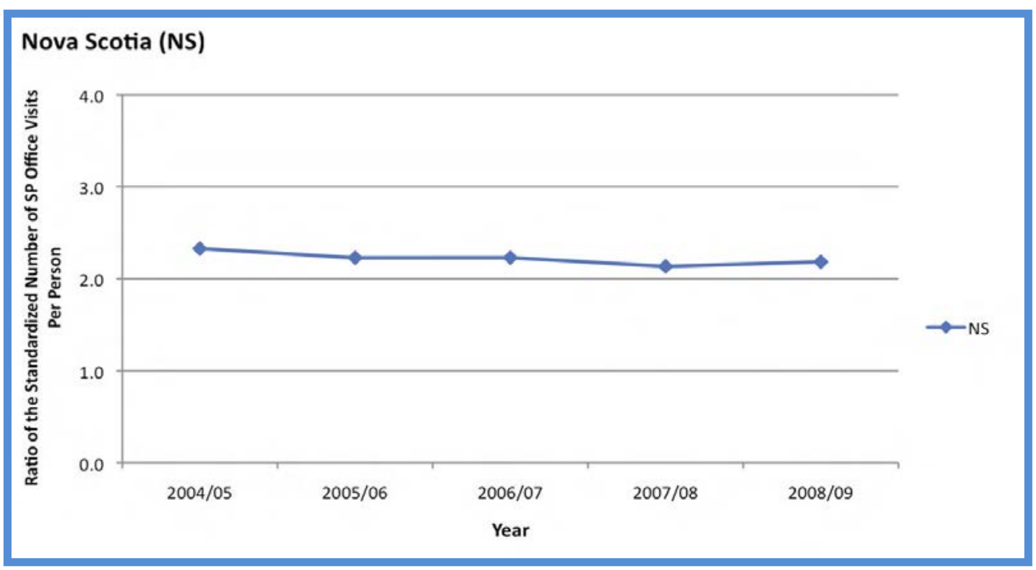
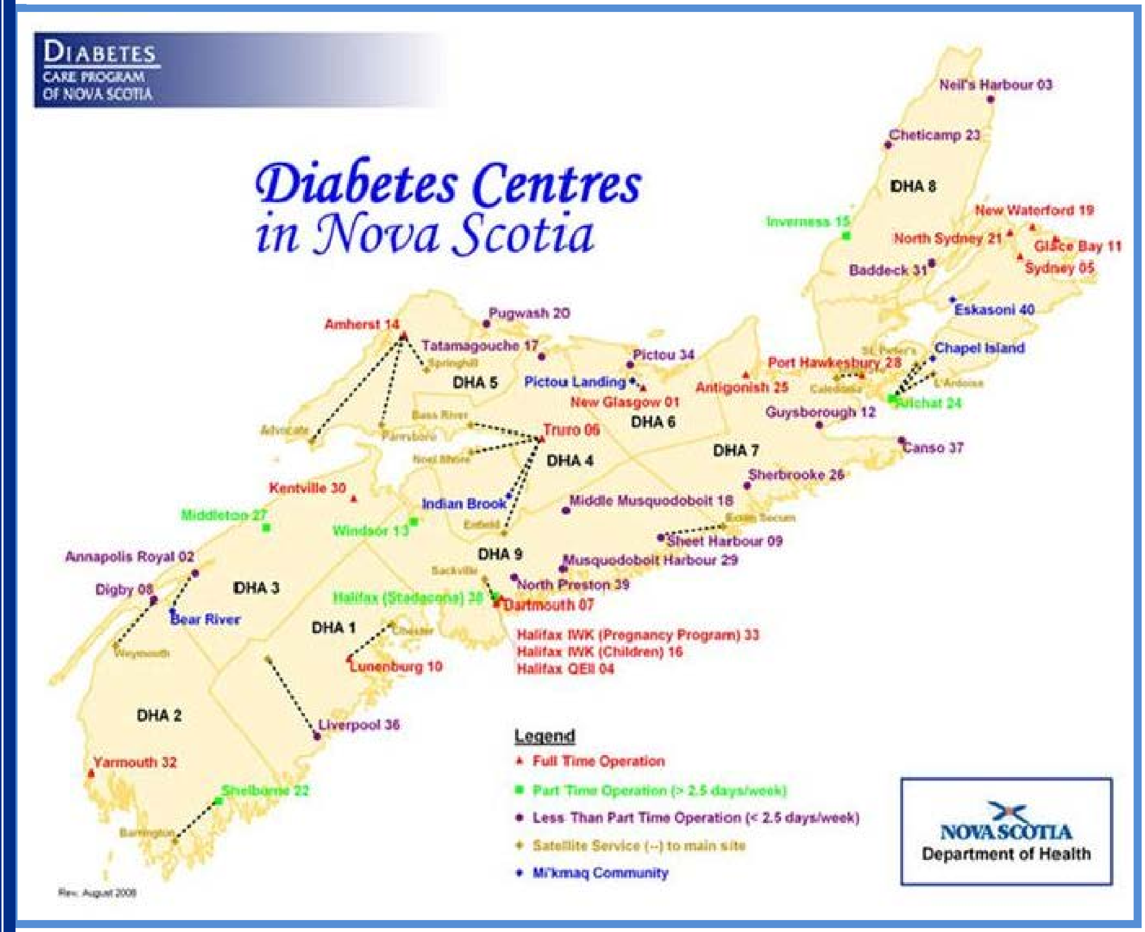


Figure 81 Location of Diabetes Centres in the Province (Source: NS Diabetes Care Program)



This map illustrates the comprehensive province-wide geographic access to the Diabetes Centres.

12.4 Cardiovascular Disease

Figure 82 New cases & incidence rate of CHF and ACS in DHAs (Source: NS Cardiovascular Health Program)

	CHF (by Place of Residence) 2002-05**		ACS (by Place of Residence) 2002-05**	
DHA	New Cases	IR/100,000 >age20	New Cases	IR/100,000 >age20
1	149	312	252	526
2	205	418	316	645
3	200	320	368	587
4	164	300	327	600
5	116	451	185	723
6	136	373	256	704
7	147	416	160	452
8	433	434	784	786
9	771	253	1325	435
ALL	2321	324	3973	555

CHF-Congestive Heart Failure ACS- Acute Coronary Syndrome

** Rate/100,000 >age20; 4-yr average

Source: ICONS Database

The incidence of new cases of congestive heart failure (CHF) and acute coronary syndrome (ACS) vary significantly across DHAs. DHA 9 has the lowest combined CHF/ACS IR at 688 while DHA 8 has the highest combined IR at 1,220.

Nationally Nova Scotia ranks highest among provinces and territories with a self reported (Source: Public Health Agency of Canada, Community Health Survey, 2007/08) prevalence of heart disease of 6.4% of the population age 12 or older compared to a national average of 4.8%.

12.5 Renal Disease

- Kidney transplant wait time in Nova Scotia is the lowest in Canada per Canadian Organ Replacement Website.
- Transplantation - is an Atlantic Canada program, about 85 per year.
- The rate of renal replacement therapy rose 41% (4.5% per annum) in Canada, from 112 per million population in 1995 to 158 per million population in 2004.
- In 2004, more than half of the new End-Stage Renal Disease (ESRD) patients (53.2%) in Canada started renal replacement therapy at age 65 years or older.

Figure 83 Prevalence of End Stage Kidney Disease, 2009

Province		0-19 Years	20-44 Years	45-64 Years	65-74 Years	75 + Years	Total	Prevalence/M
B.C./Y.T.	N	73	785	1,963	995	948	**4,764**	**1,061**
Alta./N.W.T./Nun	N	88	782	1,750	765	590	**3,975**	**1,056**
Sask.	N	3	232	478	201	203	**1,117**	**1,084**
Man.	N	43	363	810	323	235	**1,774**	**1,452**
Ont.	N	197	2,368	6,100	3,311	3,316	**15,292**	**1,170**
Que.	N	113	1,187	3,129	1,780	1,645	**7,854**	**1,003**
N.B.	N	0	132	361	189	171	**853**	**1,138**
N.S.	N	28	270	603	278	243	**1,422**	**1,318**
	%	2.0	19.0	42.4	19.5	17.1	**100.0**	
N.L.	N	3	113	319	134	124	**693**	**1,362**
Canada	**N**	**548**	**6,232**	**15,513**	**7,976**	**7,475**	**37,744**	**1,119**
	%	**1.5**	**16.5**	**41.1**	**21.1**	**19.8**	**100.0**	

Sources: Canadian Organ Replacement Register, 2010, Canadian Institute for Health Information; Statistics Canada.

- The largest mortality risk was found for patients 65 years and older, and the 2nd largest was for those with Type II diabetes. **Increasing numbers of Nova Scotians are suffering from kidney disease, as evidenced by an 6% growth in demand for renal replacement therapy since 2004.**

There were 532 Nova Scotians receiving renal replacement therapy in 2004, 577 in 2008/09, and 690 in 2009/10 for a 5.9% annual growth rate. 85% of patients are on Hemodialysis (Central, Satellite Unit, Home Hemodialysis) and 15% on Peritoneal Dialysis (Home, Home assisted, Long Term Care).

Figure 84 Renal Program Treatment Statistics - 2008/09 & 2009/10

	Pre-Dialysis (<30)			Peritoneal Dialysis			Hemodialysis			TOTAL - PD & Hemo		
DHA of Patient Residence	2008/09	2009/10	% Change	2008/09	2009/10	% Change	2008/09	2009/10	% Change	2008/09	2009/10	% Change
South Shore	58	79	36%	9	9	0%	25	61	144%	34	70	106%
South West	66	82	24%	5	8	60%	48	46	-4%	53	54	2%
Annapolis Valley	44	48	9%	10	11	10%	22	38	73%	32	49	53%
Colchester / East Hants	57	57	0%	10	13	30%	32	44	38%	42	57	36%
Cumberland*	36	37	3%	3	5	67%	6	20	233%	9	25	178%
Pictou	43	40	-7%	8	6	-25%	14	27	93%	22	33	50%
GASHA	27	30	11%	7	7	0%	18	36	100%	25	43	72%
Cape Breton	194	210	8%	22	14	-36%	92	108	17%	114	122	7%
CDHA	471	472	0%	28	30	7%	218	207	-5%	246	237	-4%
Totals	**996**	**1055**	**6%**	**102**	**103**	**1%**	**475**	**587**	**24%**	**577**	**690**	**20%**
DHA of Treatment Location												
South Shore							n/a	26	n/a	n/a	26	n/a
South West	55	74	35%				45	47	4%	45	47	4%
Annapolis Valley							n/a	14	n/a	n/a	14	n/a
Colchester / East Hants							n/a	13	n/a	n/a	13	n/a
Cumberland*							n/a	9	n/a	n/a	9	n/a
Pictou							n/a	13	n/a	n/a	13	n/a
GASHA							n/a	16	n/a	n/a	16	n/a
Cape Breton	204	225	10%	27	19	-30%	92	108	17%	119	127	7%
CDHA	747	756	1%	75	84	12%	338	341	1%	413	425	3%
Totals	**1006**	**1055**	**46%**	**102**	**103**	**-18%**	**475**	**587**	**23%**	**577**	**690**	**14%**

- Persons at risk of developing chronic kidney disease are those with: diabetes mellitus; hypertension; heart failure; atherosclerotic coronary, cerebrovascular or peripheral vascular disease; unexplained anemia; a family history of ESRD; and 1st Nations peoples.
- End stage renal disease (ESRD) risk factors for persons with diabetes include: high blood pressure; duration and type of diabetes; poor blood sugar control; microalbuminuria; a family history of high blood pressure or kidney disease; and smoking.
- 40% of all registered end-stage renal failure patients who initiated treatment between 1995 and 2004 were diagnosed with diabetes.
- The proportion of incident ESRD patients as the result of vascular disease was the highest in the Atlantic Provinces.

12.6 Mental Health

An analysis of the 2002 Canadian Community Health Survey (CHS) indicated that 11.6% (9.6%-13%) of the population consulted a health professional about their emotions, mental health, or use of alcohol or drugs.

Figure 85 Prevalence of a mental health condition (Source: 2002 CHS)

	Past-year use by type of provider: Prevalence % (95% CI)										
	GP	SW	PSY	Ψ	SHG	RA	NUR	TEL	INT	MD	OTH
CAN	5.3 (5.0-5.7)	2.3 (2.0-2.5)	2.0 (1.8-2.2)	2.0 (1.8-2.2)	1.3 (1.2-1.5)	0.9 (0.8-1.1)	0.5 (0.4-0.6)	0.4 (0.4-0.5)	0.4 (0.3-0.5)	0.3 (0.2-0.4)	0.3 (0.2-0.4)
NL	4.8 (3.5-6.0)	1.9 (1.0-2.8)	0.7 (0.2-1.2)	1.5 (0.8-2.2)	0.4 (0.1-0.8)	0.8 (0.2-1.4)	-	-	0.3 (0.03-0.6)	-	-
PE	2.9 (1.9-4.0)	2.3 (1.2-3.3)	0.8 (0.2-1.3)	1.5 (0.7-2.4)	2.4 (1.3-3.6)	0.4 (0.03-0.8)	-	-	0.5 (-0.03-1.0)	-	-
NS	7.4 (6.2-8.6)	1.7 (1.2-2.2)	1.7 (1.0-2.5)	2.6 (1.8-3.4)	1.4 (0.8-1.9)	1.1 (0.5-1.6)	0.5 (0.2-0.8)	0.3 (0.02-0.6)	0.2 (0.01-0.4)	0.4 (0.1-0.7)	0.2 (0.1-0.4)
NB	5.0 (3.8-6.2)	1.6 (1.0-2.2)	2.0 (1.3-2.7)	2.2 (1.5-3.0)	0.9 (0.5-1.4)	0.6 (0.3-1.0)	0.6 (0.2-0.9)	0.2 (-0.01-0.5)	0.3 (0.03-0.5)	0.4 (0.1-0.7)	-
QC	4.9 (4.1-5.6)	1.8 (1.1-2.5)	3.9 (3.2-4.6)	1.3 (0.9-1.6)	1.2 (0.8-1.6)	0.4 (0.2-0.7)	0.4 (0.2-0.5)	0.5 (0.3-0.6)	0.3 (0.1-0.4)	0.2 (0.1-0.3)	0.4 (0.2-0.7)
ON	5.3 (4.8-5.8)	2.2 (1.9-2.5)	1.1 (0.9-1.3)	2.3 (2.0-2.7)	1.0 (0.8-1.2)	0.9 (0.7-1.1)	0.5 (0.4-0.7)	0.4 (0.3-0.5)	0.4 (0.3-0.5)	0.4 (0.2-0.5)	0.3 (0.2-0.40)
MB	5.1 (3.9-6.4)	2.4 (1.5-3.3)	1.2 (0.6-1.8)	2.5 (1.5-3.5)	1.5 (0.8-2.2)	1.3 (0.8-1.9)	0.9 (0.3-1.4)	0.4 (0.1-0.6)	0.6 (0.2-0.9)	0.5 (0.1-0.9)	-
SK	4.5 (3.5-5.5)	3.1 (2.2-4.0)	1.0 (0.4-1.5)	1.7 (1.1-2.4)	2.5 (1.6-3.5)	1.7 (1.0-2.4)	0.5 (0.2-0.9)	0.4 (0.1-0.7)	0.2 (0.01-0.4)	0.2 (0.05-0.4)	0.4 (0.1-0.7)
AB	5.1 (4.2-6.1)	2.0 (1.5-2.5)	2.0 (1.4-2.7)	2.0 (1.4-2.7)	2.1 (1.5-2.8)	1.4 (0.9-1.8)	0.4 (0.2-0.6)	0.4 (0.2-0.7)	0.7 (0.4-1.1)	0.2 (0.03-0.30)	0.1 (0.02-0.3)
BC	6.6 (5.6-7.6)	3.5 (2.8-4.2)	1.7 (1.2-2.2)	2.0 (1.4-2.5)	1.7 (1.2-2.1)	1.5 (1.0-2.0)	0.7 (0.4-1.0)	0.7 (0.4-1.0)	0.3 (0.1-0.5)	0.3 (0.2-0.5)	0.5 (0.3-0.8)

GP: General Practitioners; SW: Social Workers/Counselors/Psychotherapists; PSY: Psychologists;
Ψ: Psychiatrists; SHG: Self-Help Groups; RA: Religious Advisors; NUR: Nurses; TEL: Telephone Help Lines
INT: Internet Chat Rooms; MD: Other Medical Doctors; OTH: Other Professionals.

The Public Health Agency of Canada (PHAC) in conjunction with CIHI, Health Canada, Statistics Canada and other partners published a detailed assessment of mental health in Canada in 2006[47]. The publication contains estimates of mental health disorder prevalence according to predominant or major groupings. The figure below applies those same rates on an unadjusted basis to the population of Nova Scotia and results in a total

[47] Public Health Agency of Canada (PHAC) The Human Face of Mental Health and Mental Illness in Canada, 2006

prevalence of 137,251 cases or 15% of the population. The figure below excludes neurologic disorders most frequently associated with aging, such as the dementias.

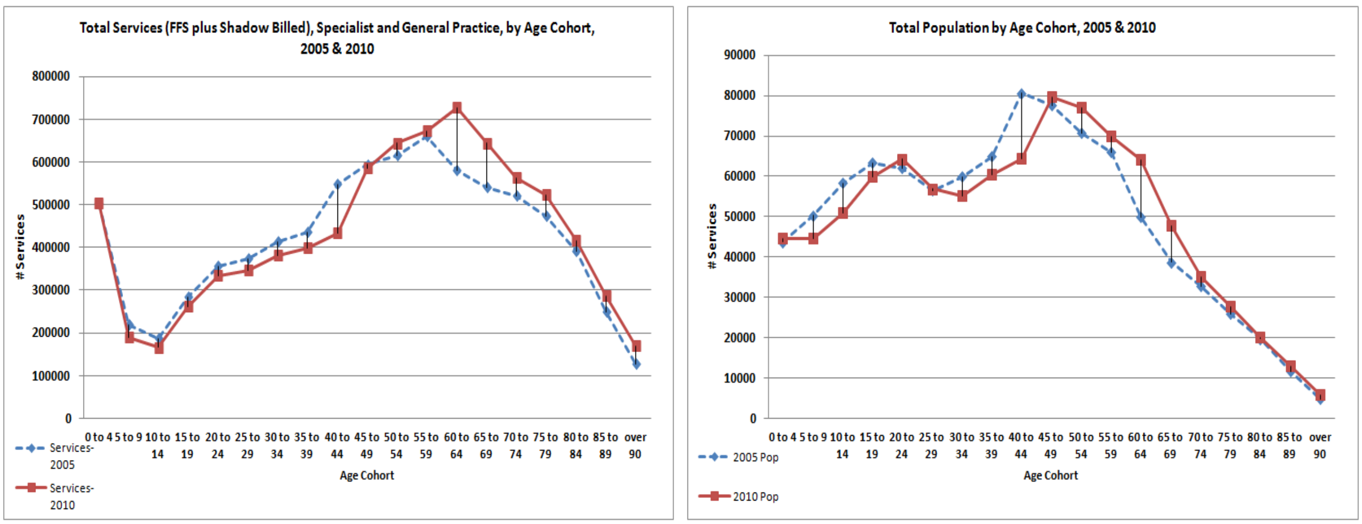
Figure 86 Nova Scotia – Estimated prevalence of a mental health condition

	PREDOMINANT DISORDER GROUPINGS											
	1	2	3	4	5	6	7	8	9	10	11	
DATA	MOOD			ANXIETY				Schizo phrenia	EATING DISORDER	Problematic Substance Abuse		TOTAL
% Prevalence - Nova Scotia (Source CCHS 1.2 2002 Community Health Survey - Analysis by Canadian Collaborative Mental Health Initiative, 2006)	3.6%	1.0%	1.0%	1.5%	3.3%	0.5%	0.5%	0.8%	1.1%	3.2%	0.6%	15%
DISORDERS	Depressive	Dysthymic & Other	Bi-polar	Panic, OCD	Social	PTSD	Generalized e.g. Psycho somatic			Alcohol	Drugs, Gambling, Other	ALL
Prevalence/ 100000	3,640	960	1,000	1,500	3,300	500	500	800	1,100	3,200	600	17,100
Total prevalence	29,216	7,705	8,026	12,040	26,487	4,013	4,013	6,421	8,829	25,684	4,816	137,251

13 PHYSICIAN UTILIZATION

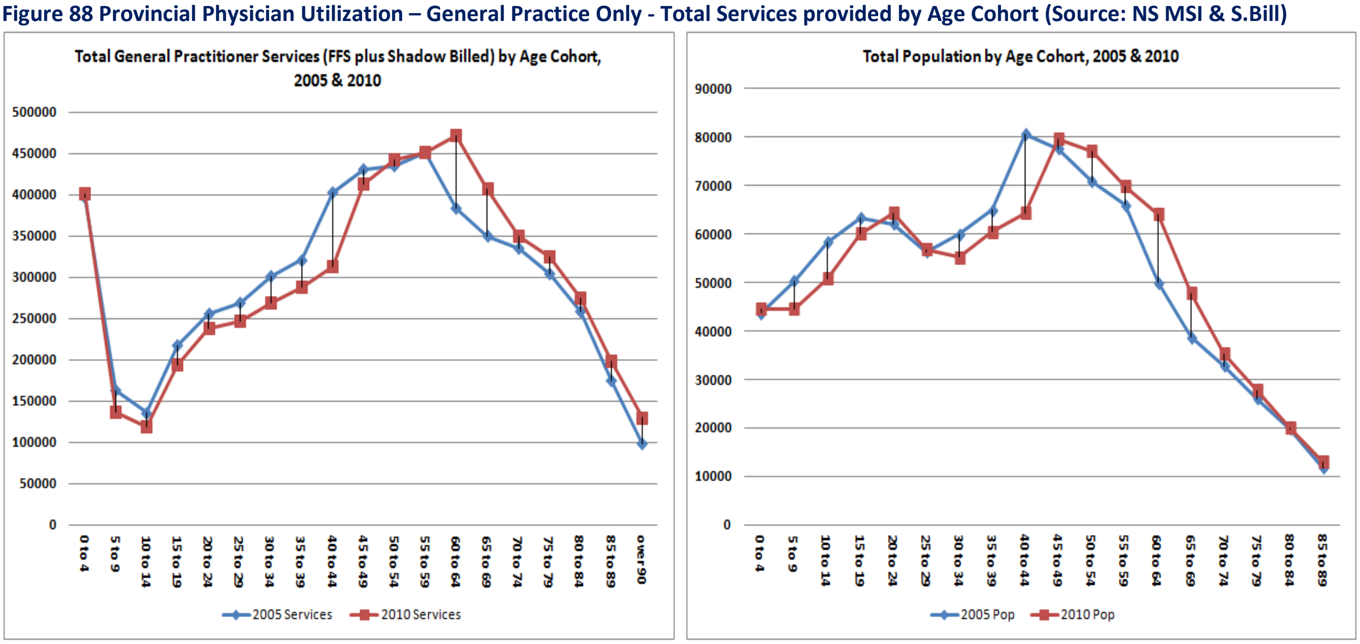
The following table looks in detail at physician service utilization by age cohort over time. The figures represent the total (not relative) number of FFS plus shadow billed (non-FFS) services delivered by population age cohort. Between 2005 and 2010, the provincial population went from 20% over age 59 to 23.4% with little increase in total population. The figure illustrates the decreases and increases in total service utilization between the two time periods by age groups. Most notable are the decreased total utilization by the age 30 to 50 age cohorts and the increases from age 50 onward and particularly ages 60 to 70. This trend can be significantly attributed to the aging population and illustrative (in a status quo delivery system) of what can be expected in the next ten years as the population goes from 23.4% over age 59 to 30.5% by 2022.

Figure 87 Provincial Physician Utilization - Total Services provided by Age Cohort (Source: NS MSI)



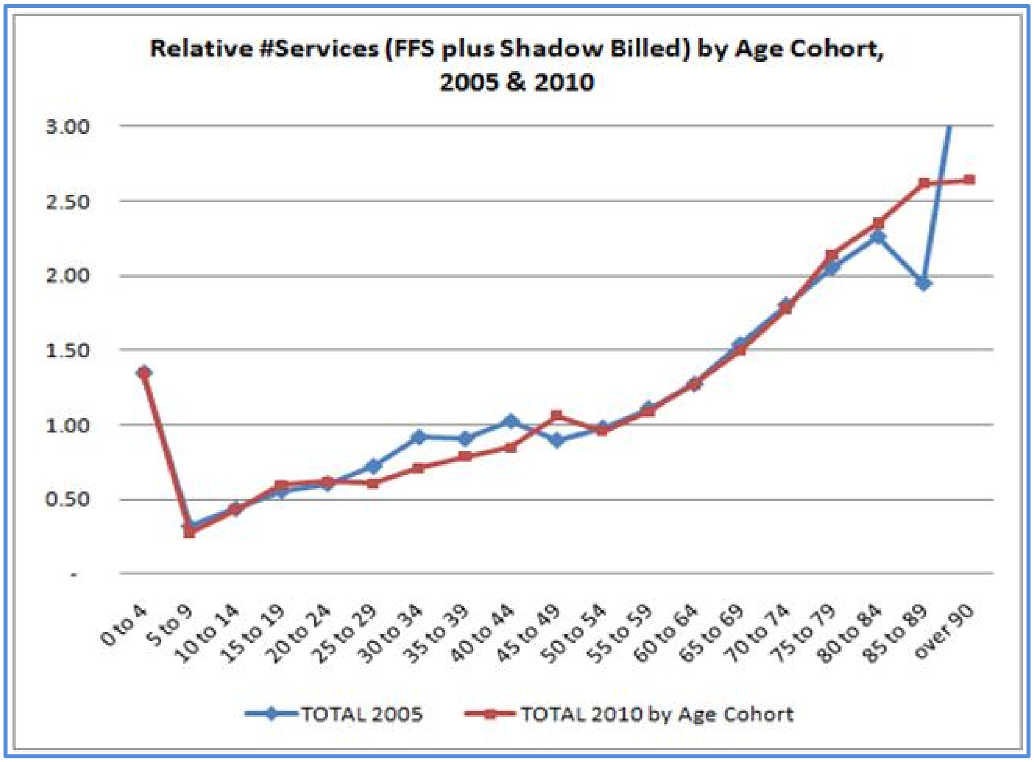
Looking at the data for general practitioners illustrates a very similar trend to the preceding graph which combined all physician specialties.

Figure 88 Provincial Physician Utilization – General Practice Only - Total Services provided by Age Cohort (Source: NS MSI & S.Bill)



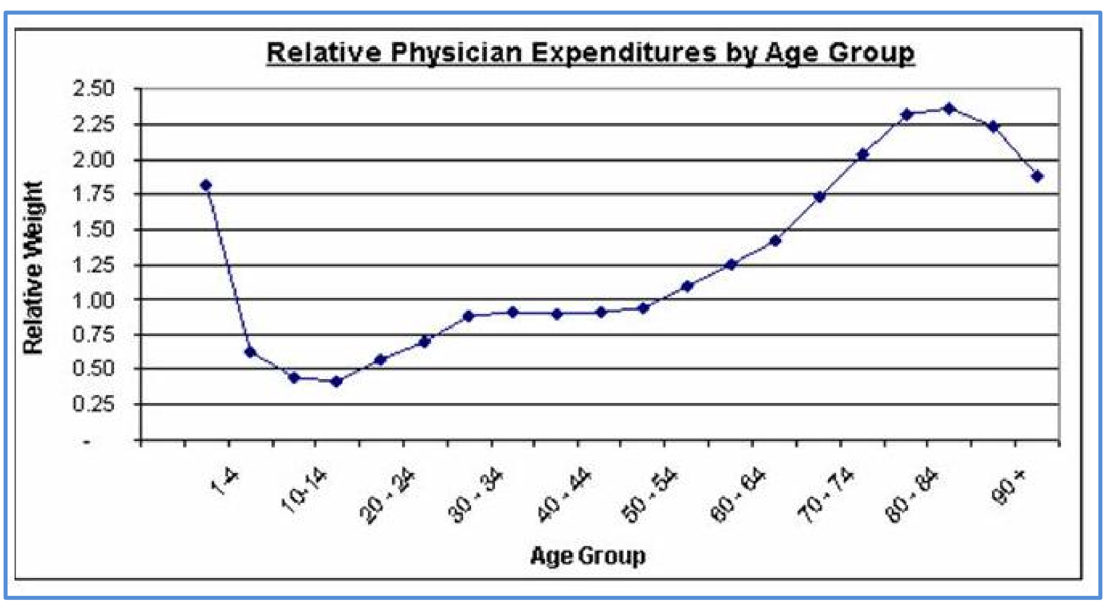
Today across the provinces the relative inter-age cohort utilization of physician services follows a similar pattern to that of Nova Scotia as illustrated in the graph below.

Figure 89 Provincial Physician Utilization – Relative utilization of services by Age Cohort (Source: NS MSI)



Interestingly, the next graph is derived from Alberta 1999-2000 FFS data and shows a similar pattern to 2010 with the exception of the over age 84 population where the trajectory declines significantly in 1999/00 but only plateaus in 2010. This notable point may be attributable to any number of factors including more people living longer, higher public expectations for medical intervention in advanced years, or advances in health technology enabling greater medical intervention.

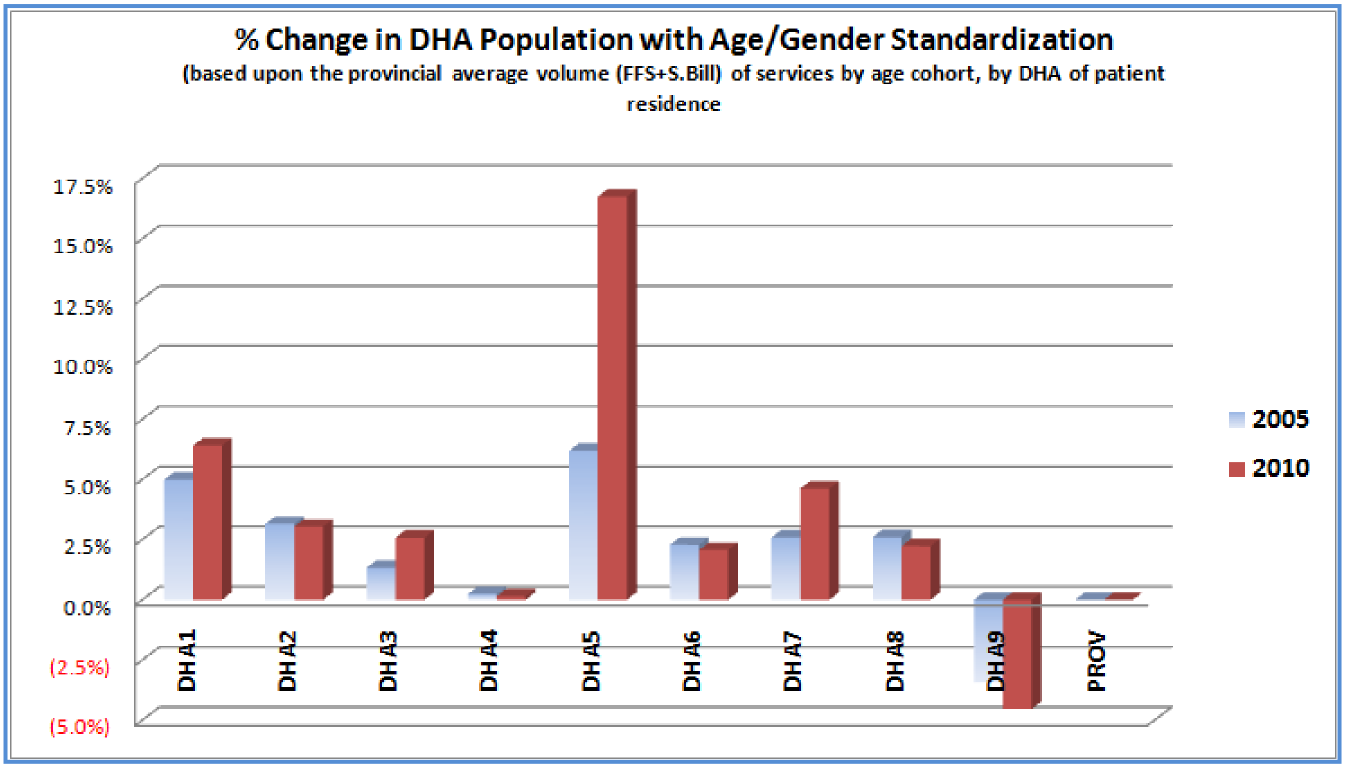
Figure 90 Alberta Physician Utilization – Relative utilization of services by Age Cohort, 2000 (Source: Alberta Health Care Ins. Plan)



In PRP planning, it is important to use age- and gender-standardized population data. The provincial population grew marginally (3,000 individuals or 0.3%) between 2005 and 2010.

Looking at a DHA level in the next figure, DHAs 1 through 8 are relatively older than DHA9 when age/gender standardized, e.g., DHA5 population increases by 16.7% when age/gender standardized. PRP planning needs to adjust for relative age/gender of populations as the impact is very significant and relevant.

Figure 91 Impact of standardizing DHA populations for age/gender based differences in physician service utilization, 2005 & 2010 (Derived from NS MSI & S.Bill)



14 PHYSICIAN UTILIZATION – CURRENT DEMAND

PRP planning can be based on population-need, demand, or ratios of population-to-specialty. In the absence of PRP based health system planning, policy, and implementation, the status quo will prevail. Across Canada, the status quo implies a largely demand-based system of growth and change in physician workforce needs. The aging Nova Scotia population will place continued pressure on health services between 2011 and 2022. The following figure identifies current volume of services (FFS plus shadow-bill) provided by each specialty per FTE. For example, in the next table General Practitioners based in DHAs 1 through 9 provided an average of 6,889 services per 1.0 FTE with a range from 6,184 in DHA7 to 7,526 in DHA3. Only specialties represented in three or more DHAs are included in the figure. Generalist specialties are shaded in grey and bolded. Data on the number of visits represented by total services was not available.

Figure 92 #Physician Services provided per FTE by Specialty by DHA (2009/10) (Source: NS MSI)

#Services (FFS+nonFFS) per 1.0 FTE by Specialty (SELECTED- >2 DHAs represented) by DHA										
LICENSED SPECIALTY	1	2	3	4	5	6	7	8	9	PROV
Diagnostic Radiology	649	838	751	726	623	923	617	980	733	756
General Practitioner	**7,052**	**6,390**	**7,526**	**7,081**	**5,523**	**6,739**	**6,184**	**7,403**	**6,858**	**6,889**
Cardiology	2,384	-	2,361	2,551	-	-	2,775	3,267	2,798	2,794
Emergency Medicine	6,881	6,848	3,433	3,082	-	8,852	1,889	5,736	2,374	3,433
Endocrinology & Metabolics	-	-	-	-	-	-	4,474	2,264	1,110	1,738
Gastroenterology	3,415	1,500	-	-	-	1,686	2,713	4,321	3,048	3,179
Geriatric Medicine	-	-	-	-	-	-	4,218	321	1,747	1,683
Haematology	-	-	-	3,116	-	-	-	3,940	3,593	3,566
Internal Medicine	**2,073**	**2,473**	**2,055**	**1,262**	**2,249**	**2,911**	**3,654**	**3,722**	**2,322**	**2,566**
Medical Oncology	-	-	2,427	-	-	-	-	1,766	1,482	1,618
Nephrology	-	3,712	-	-	-	-	-	5,245	4,839	4,737
Neurology	-	3,100	4,860	-	1,858	-	-	4,741	1,691	2,416
Occupational Medicine	-	-	430	-	-	1,420	-	-	3,187	2,847
Psychiatry	**-**	**35**	**3,049**	**346**	**-**	**252**	**221**	**926**	**263**	**479**
Rheumatology	3,109	-	-	-	-	-	-	2,440	1,737	1,944
Paediatric General	**1,431**	**1,524**	**1,597**	**660**	**-**	**1,247**	**1,192**	**2,405**	**1,018**	**1,192**
Anaesthesia	**585**	**312**	**1,568**	**1,522**	**419**	**1,033**	**784**	**3,313**	**971**	**1,132**
General Surgery	**3,293**	**3,444**	**3,592**	**4,623**	**3,415**	**4,912**	**3,497**	**6,037**	**2,163**	**3,148**
Obstetrics & Gynaecology	**2,618**	**4,277**	**4,504**	**4,389**	**3,061**	**4,039**	**4,913**	**4,966**	**4,538**	**4,392**
Opthalmology	7,252	14,119	9,873	10,003	5,939	8,971	12,841	8,893	7,045	8,193
Orthopedic Surgery	-	-	4,169	-	-	4,526	-	4,767	3,065	3,603
Otolaryngology	-	8,577	7,447	-	4,975	-	10,463	11,484	4,603	5,899
Plastic Surgery	2,808	-	-	-	-	-	4,078	5,629	3,280	3,504
Thoracic Surgery	-	-	-	-	-	-	-	3,611	2,210	2,568
Urology	-	-	5,064	6,646	-	-	-	5,017	5,355	5,377
Vascular Surgery	-	-	3,461	-	-	-	-	2,395	3,156	3,050

Caution must be used in interpreting the above data. The quality and applicability of shadow-billing and/or FFS billing varies by specialty. Psychiatry, as largely a time-based specialty, historically does not report services counts. Anaesthetists compensated through an alternative payment system may report hours of work but not surgical cases.

The following figure identifies the number of unique patients seen on a FFS and shadow-bill basis per 1.0 FTE by DHA for selected specialties as well as the number of services per unique patient per 1.0 FTE by DHA.

Figure 93 # Unique Patients seen on a FFS and Shadow-Bill basis per 1.0 FTE by DHA, 2009/10 (Source: MSI & S-Bill)

	# Unique Patients Seen on a FFS and Shadow-Bill basis per 1.0 FTE by DHA, 2009/10												
SPECIALTY	DHA1	DHA2	DHA3	DHA4	DHA5	DHA6	DHA7	DHA8	DHA9	PROV	MEDIAN	STDEV	% STDEV
General Practitioner	1,777	1,726	1,886	1,857	2,009	1,872	1,899	2,013	2,022	1,962	1,886	105	5%
Cardiology	1,527	n/a	1,277	1,648	n/a	n/a	1,476	1,695	987	1,595	1,501	264	17%
Internal Medicine	900	1,323	1,252	912	1,435	1,150	1,655	1,375	979	1,157	1,252	258	22%
Paediatric General	n/a	620	897	334	n/a	719	493	1,048	384	495	620	264	53%
General Surgery	2,073	2,054	1,996	1,936	3,236	2,104	1,587	3,423	1,111	1,698	2,054	731	43%
Obstetrics & Gynaecology	1,099	1,823	2,029	1,835	1,222	1,794	2,444	1,793	1,217	1,919	1,794	438	23%
Orthopedic Surgery	n/a	n/a	1,983	n/a	n/a	2,089	n/a	2,149	1,698	1,879	2,036	200	11%

The shaded cells are more or less than one standard deviation from the provincial average. The percentage standard deviation in general paediatrics and general surgery (in terms of number of unique patients) is very high, at 53% and 43% respectively, reinforcing the need to interpret this information with caution.

In the subsequent 'analysis' phase of the project a closer examination of a demand-based model will be provided to give context and comparison to a population health needs based model.

Figure 94 # Services per Patient seen on a FFS and Shadow-Bill basis per 1.0 FTE by DHA, 2009/10 (Source: MSI & S-Bill)

# Services per Patient Seen on a FFS and Shadow-Bill basis per 1.0 FTE by DHA, 2009/10													
#services/patient	DHA1	DHA2	DHA3	DHA4	DHA5	DHA6	DHA7	DHA8	DHA9	PROV	MEDIAN	STDEV	% STDEV
General Practitioner	3.97	3.70	3.99	3.81	2.75	3.60	3.26	3.68	3.39	3.51	3.68	0.39	11%
Cardiology	1.56	n/a	1.85	1.55	n/a	n/a	1.88	1.93	2.84	1.75	1.86	0.47	27%
Internal Medicine	2.30	1.87	1.64	1.38	1.57	2.53	2.21	2.71	2.37	2.22	2.21	0.47	21%
Paediatric General	n/a	2.46	1.78	1.98	n/a	1.73	2.42	2.29	2.65	2.41	2.29	0.36	15%
General Surgery	1.59	1.68	1.80	2.39	1.06	2.33	2.20	1.76	1.95	1.85	1.80	0.42	23%
Obstetrics & Gynaecology	2.38	2.35	2.22	2.39	2.50	2.25	2.01	2.77	3.73	2.29	2.38	0.50	22%
Orthopedic Surgery	n/a	n/a	2.10	n/a	n/a	2.17	n/a	2.22	1.80	1.92	2.13	0.19	10%

14.1 Inpatients from Out-of-Province

Information on patient admissions from out-of-province (O.O.P.) is provided in the following figures. Fifty-three percent of all 3,946 O.O.P. patients are admitted to QEII (2,105 admissions), 31% to IWK, 4% to Cumberland Regional Health Care Centre (160 admissions), and the balance distributed across a number of hospitals.

O.O.P. admissions represent 8% of total admissions and 6% of total inpatient days stay at QEII and 7.5% of total admissions and 14% of total inpatient days stay at IWK. Cardiology (14.3%), general surgery (7.8%), and neonatal-perinatal medicine (3.2% of admissions, but 10% of days stay) represent the most frequent doctor services for O.O.P. patients. Overall the O.O.P. patient volume does not represent a significant portion of total admissions to QEII. At IWK a significant portion (14%) of hospital days stay are O.O.P. patients and a third of the days stay are attributable to one doctor service; neonatal-perinatal medicine.

Figure 95 Out-of-Province Hospital Admissions – Summary 2009/10 (Source: NS Hospital Discharge Data)

DHA	DOCTOR SERVICE	#Admits	LOS	ALOS	INPAT_RIW	AVG RIW
DHA1	Majority Family Practice	40	378	9.5	56.5	1.4
DHA2	Majority Family Practice	45	262	5.8	46.2	1.0
DHA3	Majority Family Practice	52	325	6.3	94.5	1.8
DHA4	Majority Family Practice	30	113	3.8	24.6	0.8
DHA5	See below	160	574	3.6	123.1	0.8
DHA6	Majority Family Practice	27	121	4.5	22.5	0.8
DHA7	Majority Family Practice	67	444	6.6	66.1	1.0
DHA8	Majority Family Practice	113	519	4.6	111.0	1.0
DHA9 & IWK	See below	3,412	24,843	7.3	8,871.9	2.6
	Subtotal - Out-of-Province Patients	3,946	27,579	7.0	9,416.4	2.4
	Percent of Total	*4.2%*	*3.3%*		*6.0%*	
	Subtotal - In-Province Residents	90,159	821,004	9.1	147,830	1.6
	Total	94105	848583	9.0	157,246.0	1.7

Figure 96 Out-of-Province Admissions to DHA9 and IWK Paediatrics, 2009/10, by Doctor Service (Source: NS Hospital Discharge

Added O.O.P. Detail - DHA9						
DOCTOR SERVICE		#Admits	LOS	ALOS	INPAT_RIW	AVG RIW
Family Practioner/ General Practioner	2.6%	90	451	5.0	75.5	0.8
Radiation Oncology	0.3%	10	143	14.3	18.9	1.9
Cardiology	14.3%	488	2,430	5.0	990.5	2.0
Hematology	1.8%	61	941	15.4	277.0	4.5
Gynecologic Oncology	1.1%	39	276	7.1	78.5	2.0
Nephrology	1.1%	38	427	11.2	135.8	3.6
Critical Care Medicine	1.1%	37	710	19.2	434.9	11.8
Neurology	1.0%	34	349	10.3	57.3	1.7
Other Medical Services	1.8%	62	1029	16.6	294	4.7
Subtotal Adult Medicine	*22.2%*	*759*	*6162*	*8.1*	*2,268*	*3.0*
Paediatric General Surgery	4.9%	167	807	4.8	252.9	1.5
Paediatric Orthopedic Surgery	3.6%	122	418	3.4	166.9	1.4
Neonatal-Perinatal Medicine	3.2%	110	2,464	22.4	803.5	7.3
Paediatric Hematology	2.4%	83	728	8.8	168.4	2.0
Paediatrics	2.1%	73	713	9.8	269.3	3.7
Paediatric Neurosurgery	1.6%	55	346	6.3	122.4	2.2
Paediatric Nephrology	1.5%	52	762	14.7	297.1	5.7
Paediatric Cardiac Surgery	1.4%	48	708	14.8	432.9	9.0
Paediatric Cardiology	1.4%	48	240	5.0	102.1	2.1
Other Paediatric Services	6.3%	214	811	3.8	291.9	1.4
Subtotal Paediatric Medicine	*28.5%*	*972*	*7997*	*8.2*	*2,907*	*3.0*
General Surgery	7.8%	265	2,389	9.0	771.1	2.9
Oral Surgeon	5.8%	197	456	2.3	200.8	1.0
Obstetrics and Gynecology	5.7%	194	1,302	6.7	211.5	1.1
Orthopedic Surgery	4.9%	166	1,001	6.0	321.9	1.9
Cardiac Surgery	4.5%	153	1,791	11.7	839.3	5.5
Otolaryngology	3.7%	126	418	3.3	199.3	1.6
Neurosurgery	3.7%	126	671	5.3	296.5	2.4
Urology	3.5%	119	587	4.9	188.9	1.6
Other Surgical Services	6.9%	235	1475	6.3	572.9	2.4
Subtotal Surgery	*46.3%*	*1581*	*10090*	*6.4*	*3,602*	*2.3*
Total	100.0%	3412	24,843	7.3	8,872	2.6

Methodology Note: RIWs in the preceding Figure exclude outlier days stay in hospital:

14.2 Patients from Out-of-Province

14.2.1 Paediatrics

The following figure lists by functional specialty the volume and percentage of MSI and shadow-billed services by province of patient residence. Twelve percent (12%) of all services are provided to residence of NB and PEI and 1% to other provinces than NS.

Within the Paediatric Department of Medicine (only) the percentage increases to 15% for NB and PEI residents plus 1% from other provinces. Certain paediatric specialties see a much larger proportion of patients from out-of-province (OOP):

- Cardiology – 30%
- Gastroenterology – 26%
- Haematology/Oncology – 36%
- Infectious Diseases – 23%
- Nephrology – 25%
- Rheumatology – 29%

The above figures exclude services provided in NB and PEI by NS paediatricians. IWK based specialists have regularly scheduled clinics in NB and PEI which are not captured in the NS MSI and S-Bill data.

Figure 97 Number of services provided in NS to out-of-province patients, 2009/10 (Source: MSI & S-Bill)

Functional_Specialty	FTE-TOTAL	NS	% NS	NB	PE	% NB + PE	Subtotal Maritimes	% Maritimes	NF	Other	TOTAL
Paediatric Cardiology Total	4.00	3,189	70%	945	286	27%	4,420	97%	132	25	4,577
Paediatric Child Health Total	0.75	288	92%	17	6	7%	312	99%	-	2	314
Paediatric Clinical Immunology & Allergy Total	5.00	10,832	93%	451	289	6%	11,577	99%	39	63	11,679
Paediatric Critical Care Total	5.38	3,628	73%	997	251	25%	4,880	98%	78	24	4,982
Paediatric Developmental Total	4.00	1,098	98%	13	8	2%	1,123	100%	2	(3)	1,122
Paediatric Diagnostic Radiology Total	5.25	1,085	78%	226	63	21%	1,380	99%	12	4	1,396
Paediatric Emergency Medicine Total	1.00	79	93%	6	-	7%	86	101%	-	(1)	85
Paediatric Endocrinology & Metabolics Total	3.00	2,021	86%	202	107	13%	2,333	100%	2	7	2,342
Paediatric Gastroenterology Total	1.95	2,971	74%	792	224	25%	3,989	100%	9	(1)	3,997
Paediatric General Total	22.76	28,229	96%	566	273	3%	29,090	99%	22	342	29,454
Paediatric General Surgery Total	3.37	5,158	84%	717	214	15%	6,093	99%	39	36	6,168
Paediatric Haematology/Oncology Total	5.50	3,379	64%	1,626	270	36%	5,279	99%	9	21	5,309
Paediatric Infectious Diseases Total	4.00	1,477	77%	295	105	21%	1,880	98%	39	(2)	1,917
Paediatric Neonatology Total	5.44	11,104	84%	763	1,083	14%	12,955	98%	193	11	13,159
Paediatric Nephrology Total	1.00	1,343	75%	332	56	22%	1,732	97%	47	4	1,783
Paediatric Neurology Total	5.50	3,179	89%	234	116	10%	3,534	99%	5	17	3,556
Paediatric Opthalmology Total	2.04	7,128	81%	1,110	374	17%	8,614	97%	143	82	8,839
Paediatric Orthopedic Surgery Total	2.18	4,297	87%	517	125	13%	4,942	100%	8	8	4,958
Paediatric Otolaryngology Total	2.61	13,619	94%	551	182	5%	14,355	99%	55	48	14,458
Paediatric Palliative Total	1.70	349	72%	52	78	27%	481	99%	7	(2)	486
Paediatric Plastic Surgery Total	1.00	2,673	89%	228	85	10%	2,987	99%	3	25	3,015
Paediatric Respiratory Medicine Total	1.78	1,142	83%	176	17	14%	1,337	98%	26	6	1,369
Paediatric Rheumatology Total	3.50	1,944	71%	628	140	28%	2,715	100%	3	3	2,721
Paediatric Urology Total	2.12	3,375	87%	354	135	13%	3,867	100%	6	11	3,884
Psychiatry - Adolescent Total	2.49	578	99%	2	-	0%	582	99%	-	4	586
TOTAL - ALL	**98.00**	**114,165**	86%	**11,800**	**4,487**	12%	**130,540**	99%	**879**	**737**	**132,156**
TOTAL - Department of Medicine (inc. 5.5 GenP)	**57.45**	**55,595**	84%	**7,038**	**2,996**	15%	**65,630**	99%	**525**	**260**	**66,415**

The following figure provided by IWK Department of Paediatrics identifies 21% of all patients seen in 2010/11 (inpatient, outpatient, and travelling clinics) as out-of-province. The range between 2006/07 and 2010/11 is from 23% to 21% out-of-province.

Figure 98 Home Residence of all patients seen by IWK Department of Paediatrics, 2010/11

Residence	2006/07	2007/08	2008/09	2009/10	2010/11
NB	14.68%	14.73%	15.07%	14.19%	13.43%
NL	0.85%	0.51%	1.30%	1.29%	0.95%
NS	76.61%	77.70%	78.02%	76.87%	78.98%
PE	7.16%	6.06%	4.88%	6.97%	6.37%
Other	0.70%	1.00%	0.72%	0.68%	0.28%

Source: (1) MSI Billing via MOM Database (2) Department of Pediatrics

NS MSI and shadow-bill data demonstrate 16% of services delivered at IWK in the Department of Medicine are for OOP residents. The Department of Paediatrics at IWK reports 23% of patients as OOP residents. This implies that 7% (23% less 16%) of patients were seen in NB and PEI in travel clinics.

Based on detailed MSI and shadow-bill data and the following supplementary data provided by IWK Department of Medicine, it can be stated that from 19% to 23% of services provided and patients seen by IWK

Department of Medicine full-time members are OOP residents. This includes patients and services provided in NB and PEI.

The following figure is a count of travel clinics performed from 2005/06 to 2007/08. The clinics include all those outside the IWK setting in Halifax and therefore include those in Nova Scotia, P.E.I. and N.B. The half days include travel time. Patient numbers include new and return consultations/visits.

Figure 99 Travel Clinics by Division 2005/06 to 2007/08 (Source: Postl Report, Jan/11)

		2005/06			2006/07			2007/08	
DIVISION	Locations	Patients	# 1/2 days	Locations	Patients	# 1/2 days	Locations	Patients	# 1/2 days
Cardiology	8	1060	105	8	1012	106	8	1003	108
Gastoenterology	1	16	4	1	29	2	1	36	2
Medical Genetics	5	125	29	3	98	31	2	113	22
Neonatology	8	161	55	8	179	59	8	196	66
Neurology	12	370	74	12	285	57	12	245	49
Respirology	4	98	20	4	173	23	4	187	28
Rheumatology	3	139	16	3	142	16	3	132	16
TOTAL	41	1969	303	39	1918	294	38	1912	291

The following added information is provided by IWK and list the number of patients seen in travelling clinics in 2010/11 outside of Halifax.

Figure 100 Number of patients seen in travelling clinics outside Halifax, 2010/11 (Source: IWK)

Specialty	NS	NB	PEI	Nfld	Total
Allergy	-	32	-	-	32
Cardiology	161	705	136	-	1,002
Gastroenterology	42	-	-	-	42
Genetics	-	158	82	-	240
Neonatology	112	-	62	-	174
Neurology	105	-	120	-	225
Respirology	14	57	50	87	208
Rheumatology	-	57	51	-	108
Total	434	1,009	501	87	2,031

14.2.2 Specialists based at the QEII/Halifax Infirmary Health Campus

The following figure summarizes the percentage services provided by province of patient residence for specialists at the QEII/Halifax Infirmary Campus in 2009/10. Services are as reported in MSI data for both FFS and shadow billing. Two specialties (cardiac surgery and ophthalmology) had 10% or more out-of-province patients.

Figure 101 Services to Out-of-Province Patients provided at the QEII/Halifax Infirmary Health Campus, 2009/10 (Source: MSI & S-Bill)

Functional_Specialty	%NS	%NB+PEI	% Other	Total
Anaesthesia Total	91%	6%	3%	100%
Cardiac Surgery Total	86%	11%	2%	100%
Cardiology Total	91%	8%	1%	100%
Critical Care Medicine Total	89%	8%	3%	100%
Dermatology Total	98%	1%	1%	100%
Diagnostic Radiology Total	95%	3%	1%	100%
Emergency Medicine Total	91%	1%	8%	100%
Endocrinology & Metabolics Total	98%	1%	1%	100%
Gastroenterology Total	94%	5%	2%	100%
General Surgery Total	93%	6%	2%	100%
Geriatric Medicine Total	99%	1%	1%	100%
Haematology Total	94%	4%	2%	100%
Infectious Diseases Total	93%	4%	3%	100%
Internal Medicine Total	95%	3%	2%	100%
Medical Oncology Total	98%	1%	1%	100%
Nephrology Total	96%	3%	2%	100%
Neurology Total	94%	4%	1%	100%
Neurosurgery Total	94%	4%	3%	100%
Ophthalmology Total	89%	10%	1%	100%
Orthopedic Surgery Total	90%	3%	7%	100%
Otolaryngology Total	90%	9%	1%	100%
Palliative Medicine Total	98%	1%	1%	100%
Physical Medicine & Rehabilitation Total	97%	1%	2%	100%
Plastic Surgery Total	92%	1%	7%	100%
Psychiatry Total	96%	1%	3%	100%
Radiology - Oncology Total	97%	2%	1%	100%
Respiratory Medicine Total	94%	4%	2%	100%
Thoracic Surgery Total	94%	5%	1%	100%
Urology Total	97%	2%	1%	100%
Vascular Surgery Total	97%	2%	1%	100%
TOTAL	94%	4%	2%	100%

14.3 Physician Utilization - Inter-DHA- Resident Net (Export)/Import of Services

PRP planning at the district and local level requires examination of patterns of service utilization by local residents and those who commute to another community to receive care. This is also true of physicians who commute outside of a primary location to other communities to deliver care. In PRP vernacular, this pattern of commuting to access or to provide care is termed '(export)/import' of services. Net (Export) means the residents of a given DHA access more services outside their DHA than they do within their DHA, e.g., DHA1 in the figure below is a net (exporter). Net Import means the converse: providing more services within the DHA than are accessed outside the DHA, e.g. DHA9, is a net importer.

Methodology Note: The Out-of-Province (O.O.P.) column (2nd from right) excludes services for Nova Scotians receiving services O.O.P. i.e. reciprocal billing data).

The following figures provide a quantitative picture of the sum of FFS and non-FFS physician payments in terms of the (export)/import of services. Provincially (far right column in table below) the Net (Export)/Import is always zero. The total payment value of services accessed and provided is $397,004,314. The provincial level table is not particularly insightful since one would expect the vast majority of tertiary and all quaternary services to be accessed in DHA 9 by those residing in the other DHAs. Where the analysis is insightful is looking at particular non-tertiary, non-quaternary 'core' services, as detailed in the succeeding figures.

Figure 102 Physician Utilization - Inter-DHA- Resident Net (Export)/Import of Services 2009/10 – Payment Summary (Source: NS MSI)

-	STATUS	DHA1-Total$	DHA2-Total$	DHA3-Total$	DHA4-Total$	DHA5-Total$	DHA6-Total$	DHA7-Total$	DHA8-Total$	DHA9-Total$	O.O.P.-Total$	PROV-Total$
PROVINCIAL	By Patient Pcode	25,756,973	23,996,569	33,016,444	30,030,422	10,906,789	16,715,498	18,995,569	58,092,722	163,590,942	15,902,387	397,004,314
PROVINCIAL	By Provider Pcode	18,288,451	17,309,952	31,813,354	20,639,624	9,000,824	14,333,644	15,524,564	54,225,654	215,577,807	364,654	397,004,314
PROVINCIAL	NET (Export)/Import	(7,468,523)	(6,686,617)	(1,203,090)	(9,390,798)	(1,905,964)	(2,381,854)	(3,471,005)	(3,867,067)	51,986,865	(15,537,733)	(0)
PROVINCIAL	NET % (Export)/Import	-29%	-28%	-4%	-31%	-17%	-14%	-18%	-7%	32%	-98%	0%

Figure 103 Physician Utilization - Inter-DHA- Resident Net (Export)/Import of Services – General Practitioner Payments (Source: NS MSI)

FUNCTIONAL SPECIALTY DESCRIPTION	STATUS	DHA1-Total$	DHA2-Total$	DHA3-Total$	DHA4-Total$	DHA5-Total$	DHA6-Total$	DHA7-Total$	DHA8-Total$	DHA9-Total$	O.O.P.-Total$	PROV-Total$
General Practitioner	By Patient Pcode	11,915,703	10,225,870	14,467,088	13,471,310	5,279,412	6,457,161	8,468,104	23,392,567	70,957,894	3,168,781	167,803,891
General Practitioner	By Provider Pcode	11,253,814	9,734,541	14,243,416	12,220,432	5,053,243	6,504,018	8,228,707	23,475,014	77,006,847	83,859	167,803,891
General Practitioner	NET (Export)/Import	(661,889)	(491,328)	(223,672)	(1,250,878)	(226,170)	46,857	(239,398)	82,446	6,048,953	(3,084,922)	(0)
General Practitioner	NET % (Export)/Import	-6%	-5%	-2%	-9%	-4%	1%	-3%	0%	9%	-97%	0%

Primary health care, including General Practice, is the underpinning foundation of a health care system. In a prior section, various health system planning models were examined for core services and, in all cases, quality primary health care and general practice requires local access. The table below suggests that, at a DHA level, most are succeeding in this task. DHAs 1 and 4 are a bit higher at 6% and 9% export, respectively. This may be explained by the proximity to DHA 9.

The picture changes significantly when looking at selected specialties i.e., general internal medicine, general surgery, obstetrics and gynaecology, orthopaedic surgery, and ophthalmology. Looking particularly at general surgery and general internal medicine, the data point to significant export levels in DHAs 1, 2, 3, 4, and 7.

Figure 104 Physician Utilization - Inter-DHA- Resident Net (Export)/Import of Services – Selected Specialties and Payments 2009/10 (Source: NS MSI)

FUNCTIONAL SPECIALTY DESCRIPTION	STATUS	DHA1-Total$	DHA2-Total$	DHA3-Total$	DHA4-Total$	DHA5-Total$	DHA6-Total$	DHA7-Total$	DHA8-Total$	DHA9-Total$	O.O.P.-Total$	PROV-Total$
Internal Medicine	By Patient Pcode	749,740	1,238,613	789,207	770,141	790,365	1,248,206	881,123	2,250,891	4,145,023	526,180	13,389,488
Internal Medicine	By Provider Pcode	608,426	1,048,261	650,207	365,121	852,669	1,327,421	735,046	2,177,756	5,624,440	141	13,389,488
Internal Medicine	NET (Export)/Import	(141,313)	(190,352)	(139,001)	(405,020)	62,304	79,215	(146,076)	(73,135)	1,479,417	(526,039)	-
Internal Medicine	NET % (Export)/Import	-19%	-15%	-18%	-53%	8%	6%	-17%	-3%	36%	-100%	0%
General Surgery	By Patient Pcode	1,546,173	1,538,066	1,328,463	1,923,864	942,357	1,263,352	1,090,694	2,882,213	5,740,518	761,921	19,017,619
General Surgery	By Provider Pcode	1,488,951	1,386,154	1,157,358	1,839,604	886,586	1,254,972	908,692	2,819,628	7,275,584	90	19,017,619
General Surgery	NET (Export)/Import	(57,222)	(151,912)	(171,104)	(84,260)	(55,770)	(8,380)	(182,002)	(62,585)	1,535,066	(761,831)	-
General Surgery	NET % (Export)/Import	-4%	-10%	-13%	-4%	-6%	-1%	-17%	-2%	27%	-100%	0%
Obstetrics & Gynaecology	By Patient Pcode	835,281	1,071,801	1,746,811	1,461,817	420,660	819,596	920,191	1,496,269	7,222,156	605,999	16,600,580
Obstetrics & Gynaecology	By Provider Pcode	585,074	831,957	1,947,865	1,060,626	284,591	708,118	1,113,249	1,208,755	8,714,269	146,075	16,600,580
Obstetrics & Gynaecology	NET (Export)/Import	(250,207)	(239,844)	201,053	(401,191)	(136,069)	(111,478)	193,058	(287,513)	1,492,113	(459,923)	-
Obstetrics & Gynaecology	NET % (Export)/Import	-30%	-22%	12%	-27%	-32%	-14%	21%	-19%	21%	-76%	0%
Ophthalmology	By Patient Pcode	1,809,329	2,345,856	2,360,817	1,984,587	899,733	1,232,180	1,416,829	3,457,462	9,973,510	2,029,378	27,509,680
Ophthalmology	By Provider Pcode	1,110,220	1,295,671	2,520,295	1,388,496	790,717	1,117,830	1,241,910	2,826,269	15,221,204	-	27,509,680
Ophthalmology	NET (Export)/Import	(699,109)	(1,050,185)	159,478	(596,091)	(109,016)	(114,350)	(174,919)	(631,193)	5,247,694	(2,029,378)	-
Ophthalmology	NET % (Export)/Import	-39%	-45%	7%	-30%	-12%	-9%	-12%	-18%	53%	-100%	0%
Orthopedic Surgery	By Patient Pcode	1,036,803	716,540	1,387,592	1,023,964	221,239	694,811	673,145	2,502,925	5,411,371	465,287	14,133,677
Orthopedic Surgery	By Provider Pcode	72,630	89,981	2,041,344	16,288	848	1,248,867	-	2,560,722	8,088,658	14,340	14,133,677
Orthopedic Surgery	NET (Export)/Import	(964,173)	(626,559)	653,752	(1,007,676)	(220,390)	554,056	(673,145)	57,797	2,677,287	(450,947)	-
Orthopedic Surgery	NET % (Export)/Import	-93%	-87%	47%	-98%	-100%	80%	-100%	2%	49%	-97%	0%

Integral to Net (Export)/Import analysis is the productivity per FTE as measured by number of FFS/non-FFS services provided. Productivity is a function of many clinical factors including infrastructure, distance, call-duty, relative average case acuity/complexity, portion of academic FTE commitment, and volume of local demand. Productivity does not indicate the quality of services provided as the focus is on outputs rather than outcomes.

Figure 105 Services (FFS + S. Bill Services) per FTE by DHA - Selected Specialties 2009/10 (Source: NS MSI)

Licensed Specialty	Primary Payment Model	1	2	3	4	5	6	7	8	9 & IWK (Paeds, O&G)	PROV	1 Standard Dev.	
Diagnostic Radiology	AFP	649	838	751	726	623	923	617	980	733	756	130 +/-	17.2%
General Practitioner	FFS	7,052	6,390	7,526	7,081	5,523	6,739	6,184	7,403	6,858	6,889	632 +/-	9.2%
Emergency Medicine	AFP	6,881	6,848	3,433	3,082	Nil FTE	8,852	1,889	5,736	2,374	3,433	**	**
Internal Medicine	FFS	2,073	2,473	2,055	1,262	2,249	2,911	3,654	3,722	2,322	2,566	790 +/-	30.8%
Psychiatry	AFP	**	**	3,049	346	**	252	221	926	263	479	**	**
Paediatric General	FFS	1,431	1,524	1,597	660	Nil FTE	1,247	1,192	2,405	1,018	1,192	510 +/-	42.8%
Anaesthesia	AFP	585	312	1,568	1,522	419	1,033	784	3,313	971	1,132	**	**
General Surgery	FFS	3,293	3,444	3,592	4,623	3,415	4,912	3,497	6,037	2,163	3,148	1129 +/-	35.9%
Obstetrics & Gynaecology	FFS	2,618	4,277	4,504	4,389	3,061	4,039	4,913	4,966	4,538	4,392	802 +/-	18.3%
Opthalmology	FFS	7,252	14,119	9,873	10,003	5,939	8,971	12,841	8,893	7,045	8,193	2675 +/-	32.7%
Orthopedic Surgery	FFS	Nil FTE	Nil FTE	4,169	Nil FTE	Nil FTE	4,526	Nil FTE	4,767	3,065	3,603	753 +/-	20.9%

*** not reported due to variation in AFP shadow bill reporting*

Grey shaded cells are <>1Std.Dev from Prov average

With these qualifications, the following figure looks at services per FTE for selected generalist specialties and other specialties prominent in multiple DHAs currently. The grey shaded cells represent results more than +/- one standard deviation from the provincial average. General practice, which is predominantly FFS, has the least variation at 9.2%. Variation is substantial as reflected in specialty data. Psychiatry service data is materially incomplete. The service range per FTE in anaesthesia and emergency medicine calls into question the quality of reported service data.

14.4 Nova Scotians Out-of-Province

The following figure provides information according to inter-provincial reciprocal billing data on the quantity of services consumed by residents of the province while in other provinces. Nova Scotians received 230,265 services during 108,263 visits. In comparison, Nova Scotians received 8,036,000 services within Nova Scotia.

Figure 106 Services consumed by Nova Scotians in other provinces, 2009/10 (Source: MSI Reciprocal Billing)

Fiscal Year Start	Province	Total Number Services	Number of Visits *	Unique Health Card Numbers	Total Fee Paid	Services/ Health Card	Visits/ Health Card
2009-10	AB Total	28,702	14,931	7,299	$1,434,870	3.93	2.05
2009-10	BC Total	13,448	8,365	3,723	477,388	3.61	2.25
2009-10	MB Total	2,001	1,182	550	79,883	3.64	2.15
2009-10	NB Total	90,994	42,560	20,286	2,682,665	4.49	2.10
2009-10	NF Total	9,870	6,477	3,223	286,775	3.06	2.01
2009-10	ON Total	81,235	31,639	13,378	2,118,343	6.07	2.37
2009-10	PE Total	4,015	3,109	1,968	169,946	2.04	1.58
2009-10	YEAR TOTAL	230,265	108,263	50,427	$7,249,869	4.57	2.15

* (unique province/ provider number/ health card number/ service date combinations)

Services received out-of-province by Nova Scotians represent 2.8% of total services consumed by residents.

The following figure lists the highest volume services by specialty accessed out-of-province. General practice represents the majority of services.

9,219 Nova Scotians received an average 5.73 services each in 2009/10 in New Brunswick. Data on their DHA of residence is unavailable however it is likely many reside in DHA5 which had a negative (4%) net (export)/ import balance in general practice services.

Figure 107 Ten most frequent Specialties accessed by Nova Scotians in other provinces, 2009/10 (Source: MSI Reciprocal Billing)

Province	Specialty	Total Number Services	Number of Visits	Unique Health Card Numbers	Total Fee Paid	Services/ Health Card	Visits/ Health Card
NB	General Practice	52,805	17,502	9,219	778,217	5.73	1.90
ON	General Practice	23,702	14,853	6,291	594,853	3.77	2.36
ON	Lab Medicine	15,543	4,007	2,160	183,250	7.20	1.86
AB	General Practice	12,848	9,006	3,761	601,861	3.42	2.39
ON	Anaesthesia	12,220	571	217	182,575	56.31	2.63
BC	General Practice	7,292	6,174	2,464	262,442	2.96	2.51
NF	General Practice	6,578	4,876	2,212	165,121	2.97	2.20
ON	Internal Medicine	5,436	1,914	682	161,343	7.97	2.81
AB	Pathology	5,384	1,159	781	111,527	6.89	1.48
ON	Microbiology	5,290	836	566	38,703	9.35	1.48
	SUBTOTAL	**147,098**	**60,898**	**28,353**	**3,079,891**	**5.19**	**2.15**
		64%	*56%*	*56%*	*42%*		
	OTHER	**83,167**	**47,365**	**22,074**	**4,169,978**	**3.77**	**2.15**
		36%	*44%*	*44%*	*58%*		
	TOTAL	**230,266**	**108,264**	**50,428**	**7,249,870**	**4.57**	**2.15**

14.5 Hospital Inpatient Utilization

This subsection looks at hospital utilization rates by residents of each DHA, regardless of the location of the hospital i.e. hospital stay is within or outside the DHA. The hospitalization rates are subdivided by the physician service designated as most responsible for the inpatient stay. General practitioners are by far the most responsible service for inpatients followed distantly by obstetrics, general surgery, and orthopaedic surgery. Overall DHA rates of admission per 1,000 residents range from 81.5 for residents of DHA 9 to 129.7 for residents of DHA 6 with a provincial average of 101. Interestingly six of the top nine are named in the core services discussion from the national scan, orthopaedics, cardiology, and urology being the exceptions.

Figure 108 Hospital Utilization – Admission Rate per 1,000 Residents (DHA of Residence) 2009/10 (Source: NS Hospital Discharge

Doctor Service Name (Most Responsible for Inpatient Stay)	DHA 1	DHA 2	DHA 3	DHA 4	DHA 5	DHA 6	DHA 7	DHA 8	DHA 9	PROV
	ADMISSION RATE PER 1,000 RESIDENTS									
Family Practioner/ General P	44.7	62.7	40.2	37.2	46.4	57.2	52.4	56.6	27.3	40.1
Obstetrics and Gynecology	7.2	6.4	13.0	13.4	11.6	13.9	15.4	5.8	8.5	9.6
General Surgery	10.0	7.7	6.8	8.8	14.9	16.3	8.8	9.8	8.0	9.4
Orthopedic Surgery	8.6	6.3	7.4	7.4	5.2	7.3	7.7	7.4	5.9	6.9
Cardiology	4.1	5.2	6.2	3.8	3.2	5.3	4.5	6.3	3.9	5.1
Internal Medicine	6.3	5.0	3.5	4.8	3.9	13.9	9.3	3.6	3.6	4.8
Psychiatry	1.4	4.0	1.9	2.1	1.8	0.7	1.6	4.8	2.7	2.7
Urology	2.6	2.6	2.6	2.2	1.6	2.7	2.3	2.3	2.7	2.7
Paediatrics	0.9	1.3	1.5	1.4	0.6	1.1	1.6	5.5	2.2	2.3
Otolaryngology	1.9	1.2	2.2	1.9	2.8	1.1	1.4	2.5	1.5	1.9
Neurosurgery	1.4	1.3	1.1	1.4	0.7	1.4	1.1	1.5	1.4	1.5
Subtotal	89.3	103.7	86.2	84.5	92.8	120.9	106.2	106.2	67.6	87.0
Other Services	10.7	8.4	11.2	10.9	7.7	8.7	9.9	12.3	13.9	13.9
Total	100.0	112.1	97.4	95.4	100.5	129.7	116.1	118.5	81.5	101
Variation	0.99	1.11	0.97	0.95	1.00	1.28	1.15	1.17	0.81	1.00

Hospitalization is subject to many variables; this makes it difficult to infer too much for PRP initiatives. For example, social need may heavily influence LOS, the presence/absence of local ambulatory follow up capacity, and sustained high percentage occupancy will tend to shorten LOS per admission somewhat.

The following figure looks at the rate of total days stay in hospital per 1,000 residents. Combining the results of the prior figure and the figure below, residents of DHA 4 and 9 are noted to have a lower than average hospital utilization rate and residents of DHAs 6 and 7 a higher hospitalization rate (but significantly lower average stays in hospital). The data exclude admissions by Nova Scotians to out-of-province hospitals (which may impact DHA 4 data significantly).

Figure 109 Hospital Utilization – Days Stay in Hospital (LOS) Rate per 1,000 Residents (DHA of Residence) 2009/10 (Source: NS Hospital Discharge Data)

Doctor Service Name	DHA 1	DHA 2	DHA 3	DHA 4	DHA 5	DHA 6	DHA 7	DHA 8	DHA 9	PROV
(Most Responsible for Inpatient Stay)	Total LOS (Inpatient Days Stay) RATE PER 1,000 RESIDENTS									
Family Practioner/ General P	645.9	772.8	469.6	397.9	607.4	577.6	548.8	730.3	270.2	456.6
Obstetrics and Gynecology	24.9	15.8	37.7	36.9	32.3	41.1	45.7	19.6	23.3	28.5
General Surgery	49.7	44.6	45.8	62.7	96.5	99.6	52.2	73.4	47.9	59.5
Orthopedic Surgery	52.8	33.1	44.5	39.4	28.9	41.0	35.2	43.4	42.2	42.8
Cardiology	15.2	23.9	30.3	18.3	12.7	18.7	17.3	32.6	25.8	27.3
Internal Medicine	30.1	19.2	30.7	25.4	21.5	62.1	65.9	32.9	42.8	38.6
Psychiatry	29.3	47.9	22.6	42.8	26.6	10.3	25.1	107.2	127.1	84.3
Urology	7.9	9.4	9.5	9.5	10.8	9.5	8.2	8.6	10.9	10.5
Paediatrics	4.8	5.3	10.4	6.5	2.4	7.6	9.0	28.1	8.3	11.2
Otolaryngology	3.7	3.5	5.2	4.3	4.9	3.6	7.4	6.2	4.2	5.1
Neurosurgery	16.8	9.0	8.6	9.7	8.9	7.6	8.3	10.4	14.2	12.6
Subtotal	881.0	984.5	714.9	653.4	852.9	878.8	823.2	1,092.6	616.9	776.9
Other Services	89.1	65.9	92.2	88.9	81.3	66.6	74.2	105.8	155.1	133.0
Total	970.1	1,050.4	807.0	742.3	934.2	945.3	897.4	1,198.5	772.0	909.9
Variation	1.07	1.15	0.89	0.82	1.03	1.04	0.99	1.32	0.85	1.00

Maternal/newborn related conditions comprise three of the nine most frequent reasons for admission. The importance of comprehensive primary care is evident as 40.1% of admissions are managed by general practice, implying a significant portion of maternal/newborn admissions, postpartum, are being managed by family physicians. Heart disease (2 and 5 in the figure below) is the next most prevalent condition, highlighting the importance of timely, appropriate access to general internal medicine and cardiology consultation.

Figure 110 Hospital Utilization – Inpatient Procedure Rates per 1,000 Residents (DHA of Residence) (Source: NS Hospital Discharge Data)

No.	Major Clinical Category (MCC)	Case-Mix Group (CMG)	DHA 1	DHA 2	DHA 3	DHA 4	DHA 5	DHA 6	DHA 7	DHA 8	DHA 9	PROV
			INPATIENT PROCEDURE RATE PER 1,000 RESIDENTS									
1	Pregnancy & Childbirth	Vaginal Delivery, No Oth Int	8.7	6.9	9.9	10.0	8.4	7.4	9.5	8.3	10.5	9.5
2	D&D Circulatory System	PCI w MI/Shock/Arrest/Hrt Fail	2.7	2.6	3.0	2.6	2.9	3.4	1.7	3.0	2.2	2.5
3	Pregnancy & Childbirth	Primary Caesarean Section	1.8	2.1	2.2	2.3	1.6	1.3	2.0	2.3	2.5	2.3
4	D&D Female Reproductive System	Hysterectomy w Non Mal Dx	1.3	1.4	3.1	2.8	3.3	3.4	2.4	2.0	1.3	1.9
5	D&D Circulatory System	PCI wo MI/Shck/Arrst/Hrt Fail	1.0	2.4	1.3	1.5	1.4	2.3	2.9	1.5	1.4	1.6
6	D&D Digestive System	Colostomy/Enterostomy	1.7	1.4	1.9	1.2	0.7	2.4	1.3	2.2	1.4	1.6
7	D&D Circulatory System	Cardiac Valve Replacement	1.5	0.2	1.3	1.7	1.7	1.2	1.8	1.8	1.1	1.3
8	D&D Nervous System	Other MSK Interv on Head	1.0	0.4	0.6	1.0	1.0	0.4	0.7	0.7	1.3	1.0
9	Pregnancy & Childbirth	Forceps/Vac Del, No Oth Int	1.2	1.9	1.0	1.4	0.9	0.5	1.7	1.9	1.3	1.4
10	D&D MSK Sys & Connect Tissue	Unilateral Knee Replacement	2.1	0.9	1.4	1.5	0.5	1.4	1.3	1.5	1.2	1.3
11	D&D Circulatory System	CABG+Cath+MI/Shock/Arr+Pump	1.2	0.9	0.9	0.7	1.4	1.6	0.8	1.6	0.6	0.9
12	Pregnancy & Childbirth	Repeat Caesarean Section	0.7	0.7	1.1	1.3	0.7	1.5	0.9	0.9	1.1	1.0
13	D&D Digestive System	Op Lrg Int/Rec Res wo Col,Plnd	0.9	1.3	0.6	0.9	1.2	1.4	1.2	1.2	0.7	0.9
14	D&D Digestive System	Lap Cholecystect w/wo CBD Expl	0.9	0.7	0.7	0.8	1.6	1.2	0.4	1.0	0.7	0.8
15	D&D MSK Sys & Connect Tissue	Unilateral Hip Replacement	1.3	0.7	0.8	1.0	0.6	0.7	0.6	1.1	0.6	0.8
		Subtotal	28.2	24.6	29.8	30.8	28.0	30.3	29.2	30.9	28.1	28.8
		Other Services	50.1	48.1	45.2	47.7	49.7	42.7	43.6	63.6	45.9	48.6
		Total	78.3	72.7	75.0	78.5	77.7	73.0	72.8	94.5	74.1	77.4
		Variation from PROV	1.01	0.94	0.97	1.01	1.00	0.94	0.94	1.22	0.96	1.00

Figure 111 Hospital Utilization – Total days stay (LOS) by DHA and Change in RIW per Patient - 2005 to 2010 (Source: NS Hospital Discharge Data)

No.	DHA	COUNTY	Number of Hospitals	Role	2005 LOS	2010 LOS	Change LOS	Change %Total LOS	Change % Total RIW*	Change % Avg RIW/ Patient
	DHA 1 Total		n of 3	Acute Care Hosp.	36507	45175	8,668	23.7%	22.3%	24.9%
	DHA 2 Total		n of 3	Acute Care Hosp.	47528	55190	7,662	16.1%	19.1%	20.5%
	DHA 3 Total		n of 3	Acute Care Hosp.	52535	58666	6,131	11.7%	6.9%	19.9%
	DHA 4 Total		n of 2	Acute Care Hosp.	34452	37923	3,471	10.1%	8.2%	18.8%
	DHA 5 Total		n of 4	Acute Care Hosp.	21616	22901	1,285	5.9%	3.6%	30.8%
	DHA 6 Total		n of 1	Acute Care Hosp.	32751	36203	3,452	10.5%	2.5%	14.4%
	DHA 7 Total		n of 5	Acute Care Hosp.	33952	33684	(268)	(0.8%)	8.3%	0.1%
	DHA 8 Total		n of 5	Acute Care Hosp.	137134	139594	2,460	1.8%	2.5%	17.9%
	DHA 9 Total		n of 7 (includes NS Hospital M.Health)	Acute Care Hosp.	325692	353141	27,449	8.4%	14.2%	11.6%
	IWK Total			Children's Hosp.	69237	66106	(3,131)	(4.5%)	1.1%	(3.9%)
	TOTAL				791404	848583	57,179	7.2%	10.6%	13.0%
	*Resource intensity weight (excludes 'outlier RIWs')									

Methodology Note: RIWs in the preceding Figure exclude outlier days stay in hospital:

15 PROVINCIAL ENVIRONMENT - ACCESS TO SERVICES

Surgical Services

The Patient Access Registry Nova Scotia (PARNS) wait time system tracks wait times for all non-Category I (emergent) operating room procedures requiring an anesthetic and therefore tracks both inpatient and 'day' (e.g., endoscopy) procedure bookings. The discharge abstract database (DAD) and the CIHI National Ambulatory Care Reporting System (NACRS) and day surgical procedure databases track all operating room procedures (elective and emergent, with and without anaesthetic).

15.1 Specialty-Specific

The following table provides analysis of adult surgical capacity (FTE, imputed OR hours per week per FTE), adult surgeon productivity (cases/FTE/month, average OR hours per case), and wait time (wait list change from April/10 to May/11, and number on wait list May/11). For comparative purposes, only procedures performed with anaesthetic have been included (i.e. more than 90% of these case types are performed in the main operating room(s)). Imputed OR hours per week is determined by known benchmarks for average set up to clean up time. Four specialties have been selected from the PARNS and DAD databases as being provided to a significant level outside DHA9.

The first line within each specialty identifies the number of clinical FTE for that specialty. The next lines identify the number of inpatient (source: DAD) and day surgical (source: Day Surgery and NACRS) cases performed by each 1.0 clinical FTE as well as the operating room (OR) hours on a weekly basis. The range across DHAs in case volume per FTE per year is substantial as is the wait list numbers and trend between April 2010 and May 2011.

Figure 112 Surgical capacity, surgeon productivity and change in wait times April/10-May/11 (Source: PARNS & DAD)

	DHA9	DHA8	DHA7	DHA6	DHA5	DHA4	DHA3	DHA2	DHA1	IWK	TOTAL
Otolaryngology FTE	15.8	2.2	1.2	-	1.4	-	2.0	1.1	-	2.6	23.7
Inpatient Cases	1,537	327	21	-	186	-	152	21	-	-	2,244
OR Theatre Min/Case	110	99	99	99	99	99	99	99	99	99	99
OR Hours per Week per FTE	3.9	5.3	0.6	-	4.7	-	2.7	0.7	-	-	3.4
Day Surgical Cases	788	542	85	-	186	-	631	467	205	1,336	4,240
OR Theatre Min/Case	40	36	36	36	36	36	36	36	36	36	36
OR Hours per Week per FTE	0.7	3.2	0.9	-	1.7	-	4.1	5.8	-	6.7	2.3
Total Cases	2,325	869	106	-	372	-	783	488	205	1,336	6,484
Cases/FTE/Week (46 week/yr)	3.2	8.5	2.0	-	5.7	-	8.5	10.1	-	11.1	6.0
OR Hours per Week per FTE	4.6	8.4	1.6	-	6.4	-	6.8	6.5	-	6.7	5.7
Wait List Change (April/10-May/11)	25%	54%	28%	0%	233%	0%	75%	160%	0%	(6%)	31%
# on Wait List May/11	1,131	255	44	-	42	-	168	39	-	302	1,679
General Surgery FTE	27.8	6.7	4.2	2.5	2.1	3.5	3.1	3.3	4.0	2.5	59.7
Inpatient Cases	3,390	2,417	230	383	358	306	399	364	409	358	8,614
OR Theatre Min/Case	160	144	144	144	144	144	144	144	144	144	144
OR Hours per Week per FTE	7.1	18.8	2.9	8.1	8.7	4.6	6.8	5.8	5.3	7.5	7.5
Day Surgical Cases	6,245	4,398	431	1,403	1,001	3,097	1,574	1,811	2,673	720	23,353
OR Theatre Min/Case	90	81	81	81	81	81	81	81	81	81	81
OR Hours per Week per FTE	7.3	19.3	3.0	16.6	13.7	25.9	15.0	16.1	19.4	8.5	11.5
Total Cases	9,635	6,815	661	1,786	1,359	3,403	1,973	2,175	3,082	1,078	31,967
Cases/FTE/Week (46 week/yr)	7.5	22.1	3.5	15.6	13.8	21.1	13.9	14.3	16.6	9.4	11.6
OR Hours per Week per FTE	14.4	38.1	5.9	24.6	22.5	30.5	21.8	21.8	24.7	15.9	19.0
Wait List Change (April/10-May/11)	(4%)	19%	27%	71%	282%	(59%)	(15%)	21%	68%	42%	5%
# on Wait List May/11	802	704	109	159	42	102	105	111	52	104	2,290

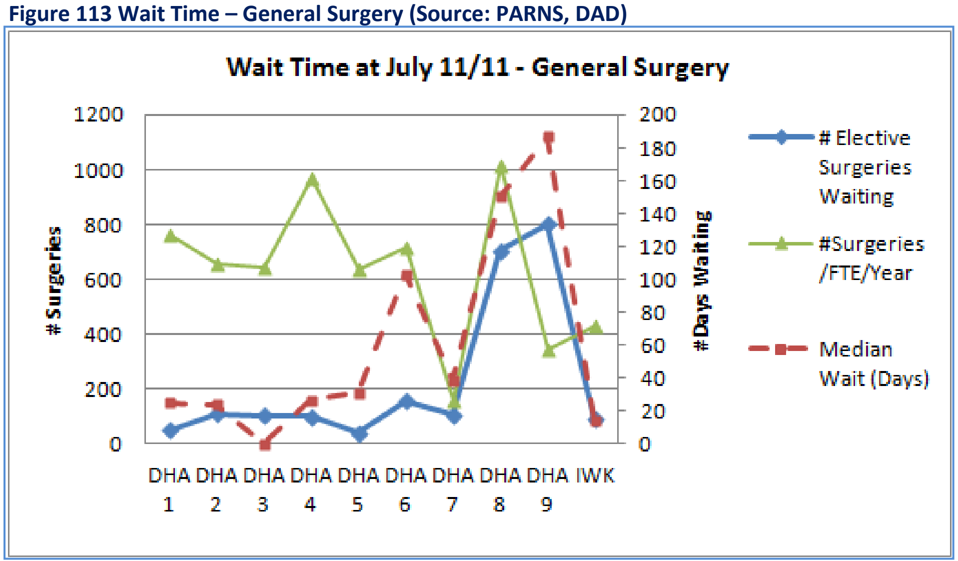
Continued…

	DHA9	DHA8	DHA7	DHA6	DHA5	DHA4	DHA3	DHA2	DHA1	IWK	TOTAL
Ophthalmology FTE	16.7	5.4	2.2	2.0	11.2	2.1	3.5	2.8	2.5	2.0	39.2
Inpatient Cases	377	-	-	-	-	-	-	-	-	376	753
OR Theatre Min/Case	110	99	99	99	99	99	99	99	99	99	99
OR Hours per Week per FTE	0.9	-	-	-	-	-	-	-	-	6.6	0.7
Day Surgical Cases	6,791	1,180	163	657	749	860	1,533	328	1,175	275	12,962
OR Theatre Min/Case	35	31	31	31	31	31	31	31	31	31	31
OR Hours per Week per FTE	5.2	2.5	0.8	3.7	0.7	4.6	4.9	1.3	5.3	1.5	3.7
Total Cases	7,168.0	1,180.0	163.0	657.0	749.0	860.0	1,533.0	328.0	1,175.0	651.0	13,715.0
Cases/FTE/Week (46 week/yr)	9.3	4.8	1.6	7.1	1.5	8.8	9.4	2.6	10.2	7.0	7.6
OR Hours per Week per FTE	6.1	2.5	0.8	3.7	0.7	4.6	4.9	1.3	5.3	8.1	4.4
Wait List Change (April/10-May/11)	36%	137%	24%	0%	29%	28%	29%	277%	16%	(12%)	**50%**
# on Wait List May/11	2,552	121	147	97	257	235	1,194	351	311	50	5,315
Orthopaedic Surgery FTE	20.3	6.0	-	2.6	-	-	5.0	-	-	2.5	36.4
Inpatient Cases	4,426	1,033	-	706	-	-	1,103	-	-	657	7,925
OR Theatre Min/Case	160	144	144	144	144	144	144	144	144	144	144
OR Hours per Week per FTE	12.6	8.9	-	14.2	-	-	11.6	-	-	13.7	11.4
Day Surgical Cases	3,410	971	-	488	-	-	1,196	-	-	79	6,144
OR Theatre Min/Case	120	108	108	108	108	108	108	108	108	108	108
OR Hours per Week per FTE	7.3	6.3	-	7.4	-	-	9.4	-	-	1.2	6.6
Total Cases	7,836	2,004	-	1,194	-	-	2,299	-	-	736	14,069
Cases/FTE/Week (46 week/yr)	8.4	7.2	-	10.0	-	-	10.1	-	-	6.4	8.4
OR Hours per Week per FTE	19.9	15.2	-	21.6	-	-	21.0	-	-	14.9	18.0
Wait List Change (April/10-May/11)	18%	1%		27%			(33%)			100%	**10%**
# on Wait List May/11	3,752	1,120	-	441	-	-	704	-	-	96	6,113

Orthopaedic surgery is interesting because only four distinct DHAs provide the service and each has a significant number of surgeons. In this specialty, productivity is reasonably comparable but the wait list trends are not. DHA 9 and DHA 6 lists continue to grow while DHA 8 is stable and DHA 3 is declining significantly.

Surgeon productivity and OR hours are important for PRP forecast modeling. The preceding figure records a conservatively 10% higher OR theatre minutes (min) per case in DHA 9 in all specialties based upon interview findings. This difference is not due to case complexity but rather to higher throughput efficiency of secondary level ORs in comparison to tertiary ORs. This interview finding is consistent with the Consultant findings in similar projects within Canada.

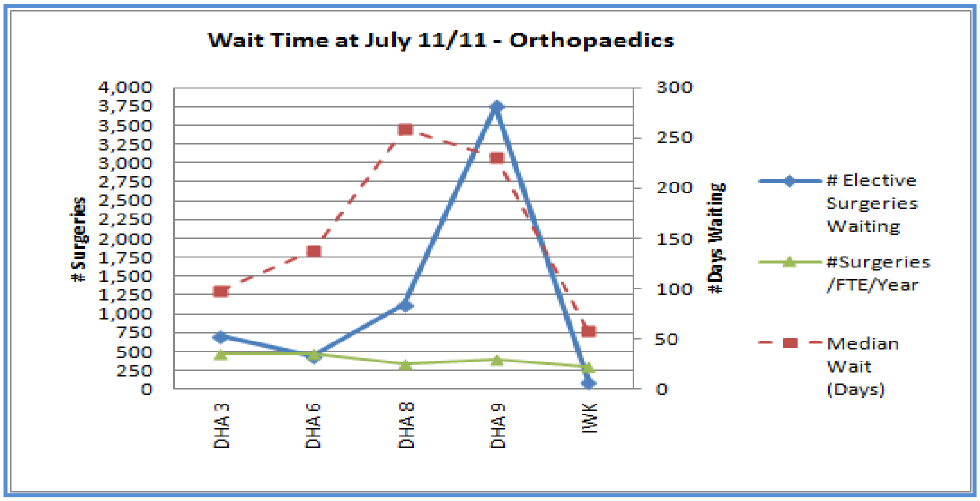
Figure 113 Wait Time – General Surgery (Source: PARNS, DAD)



The following graphs look at the median days waiting and number waiting for elective surgery as at July 11, 2011 as well as the annual total surgeries performed per FTE.

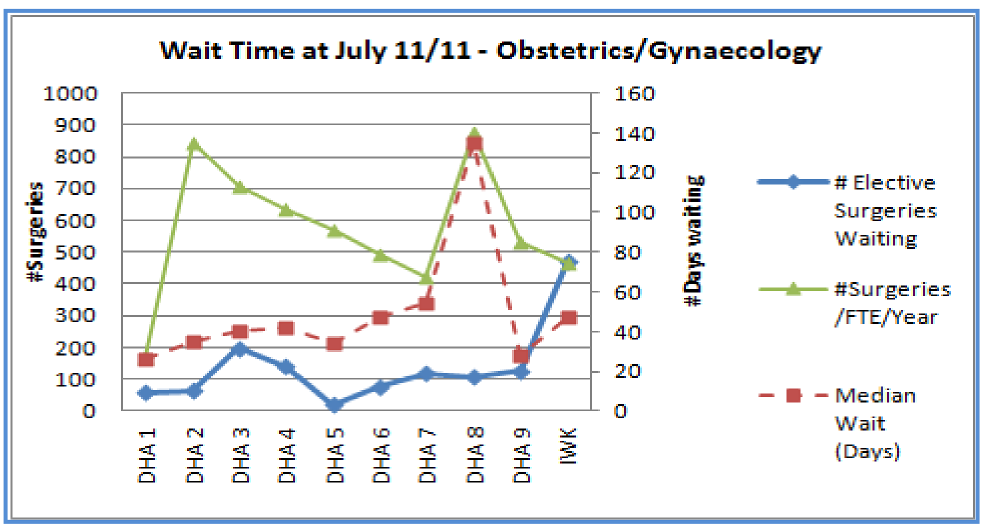
Median wait for general surgical procedures is highest in DHAs 9 and 8 and lowest in DHAs 1 to 5 and 7. Cases per FTE are significantly lower in DHAs 9, 7, and IWK. The DHA 9 wait list at 802 is high but the highest on a per population basis is DHA 8.

Figure 114 Wait Time – Orthopaedic surgery (Source: PARNS, DAD)



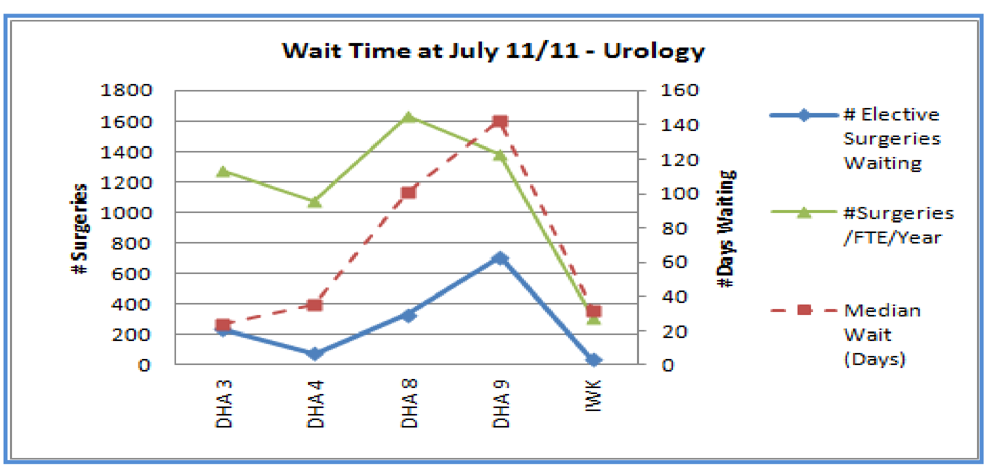
Median wait for orthopaedic procedures is highest in DHAs 9 and 8, and lowest in DHA 3 and IWK. Cases per FTE are lower in DHAs 9, 8, and IWK. The DHA 9 wait list at 3,752 is high but comparable to the other DHAs on a per population basis.

Figure 115 Wait Time – Obstetrical & Gynaecology (Source: PARNS, DAD)



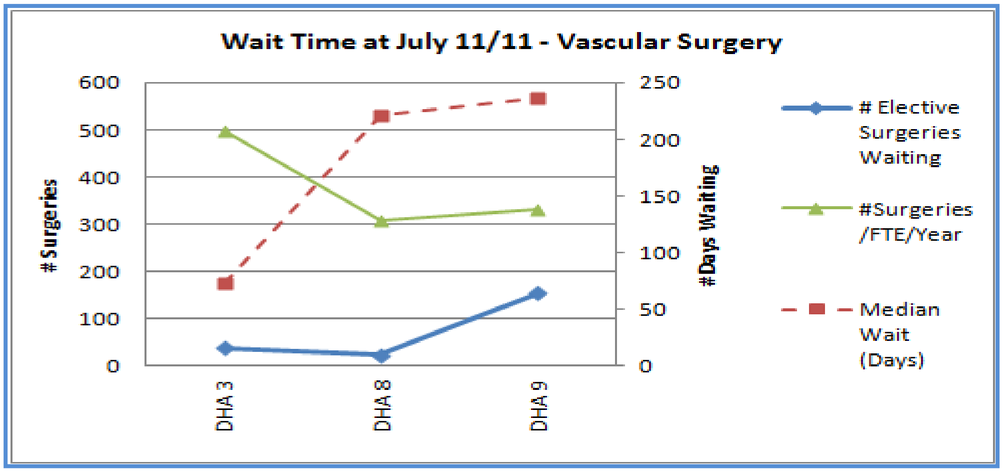
Median wait for obstetric/gynaecologic procedures substantially higher in DHA 8. Cases per FTE are lower in DHAs 1 and 7.

Figure 116 Wait Time – Urology (Source: PARNS, DAD)



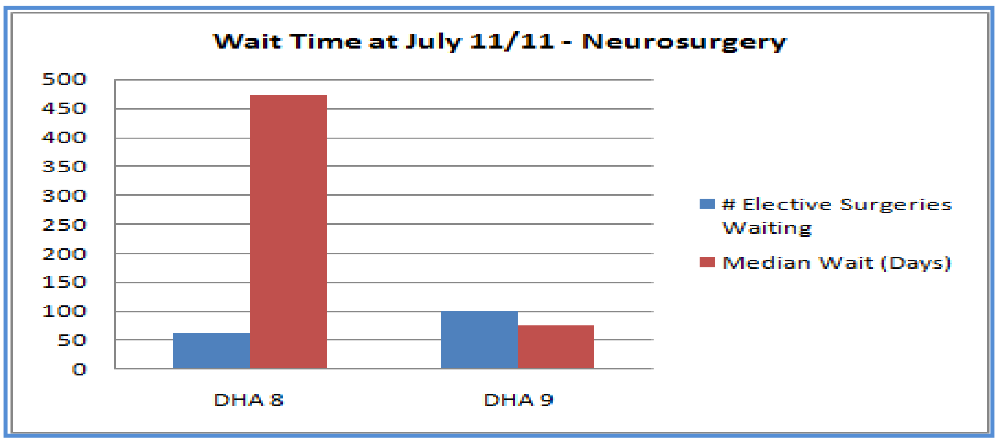
Median wait for urology procedures is highest in DHAs 8 and 9. Cases per FTE are comparable with the exception of IWK.

Figure 117 Wait Time – Vascular Surgery (Source: PARNS, DAD)



Median wait for vascular surgery is highest in DHA 9. DHAs 3 and 8 are comparable. Cases per FTE are comparable between DHAs 8 and 9 but highest in DHA 3.

Figure 118 Wait time – Neurosurgery (Source: PARNS, DAD)



Of the two DHAs offering neurosurgery, the median wait is highest in DHA 8 and lowest in DHA 9; cases per FTE are comparable across DHAs. DHA 8 will not replace its neurosurgeon upon retirement (currently age >70).

Figure 119 National Wait Time Comparison – Benchmark Procedures (Source: Wait Time Alliance of Canada)

Wait time performances based on government benchmarks

Province	Hip replace-ment	Knee replace-ment	Radiation oncology	Cataract surgery	Coronary artery bypass graft
N.L.	B	C	A	A	A
P.E.I.	B	D	A	B	n/a
N.S.	D	F	A	C	A
N.B.	B	D	A	A	A
Que.	A	A	A	A	n/a
Ont.	A	A	A	A	A
Man.	C	C	A	B	A
Sask.	B	D	A	C	A
Alta.	B	C	A	D	A
B.C.	A	B	A	B	A

Source: Wait Time Alliance report on Canadian wait times

Grade key (% of patients treated within benchmark):
A: 80% to 100% C: 60% to 69% F: less than 50%
B: 70% to 79% D: 50% to 59%

The adjacent figure is provided by the Wait Time Alliance of Canada. In its report, Nova Scotia is given a failing (knee-replacements) and poor (cataract and hip-replacement) rating in three of the five reported services.

15.2 DHA Environment - Physician Workforce

The figures in this subsection identify, by specialty, the number of FTEs per DHA using 2009/10 comprehensive payment data (see 'FTE' in opening section on Terminology for a description of the FTE methodology).

Figure 120 Number of FTE by Specialty by DHA (Source: NS MSI)

Category	DHA1 SSH	DHA2 SWNDHA	DHA3 AVH	DHA4 CEHHA	DHA5 CHA	DHA6 PCHA	DHA7 GASHA	DHA8 CBDHA	DHA9 CDHA	IWK	FTE PROVINCE	COUNT PROVINCE
Diagnostic & Therapeutic	6.8	6.6	10.8	6.7	2.5	3.8	5.4	12.9	85.2		141	151
Family Medicine/Practice*	53.6	52.0	68.1	60.3	29.8	33.4	44.1	103.8	395.6		841	940
Medical	12.5	12.7	22.5	19.5	6.8	11.1	13.5	51.8	314.0		464	519
Paediatric - Diagnostic & Therapeutic	-	-	1.0	-	-	-	-	-		15.6	17	19
Paediatric - Medical	1.2	3.1	2.7	6.2	-	1.0	3.1	7.4		96.2	121	133
Paediatric - Surgical	-	-	-	-	-	-	-	-		29.6	30	35
Surgical	16.0	14.1	31.3	16.1	7.5	11.9	12.5	36.7	228.5		375	411
TOTAL	90.1	88.5	136.4	108.8	46.7	61.3	78.6	212.5	998.5	164.8	1,988	2215

**GPs with CCFP (EM) are included under 'Medical'*

Figure 121 FTE and Count by Physician licensed speciality per 1,000 population (Source: NS MSI)

	DHA1 SSH	DHA2 SWNDHA	DHA3 AVH	DHA4 CEHHA	DHA5 CHA	DHA6 PCHA	DHA7 GASHA	DHA8 CBDHA	DHA9 CDHA	IWK	FTE PROVINCE
Population	59,782	62,097	82,028	72,222	31,485	46,093	44,106	125,829	418,881	*173,054*	942,522
Diagnostic & Therapeutic	8,742	9,371	7,589	10,780	12,374	12,196	8,190	9,788	4,916	n/a	6,696
Family Medicine/Practice*	1,116	1,194	1,205	1,198	1,057	1,378	1,001	1,212	1,059	n/a	1,121
Medical	4,768	4,898	3,652	3,695	4,604	4,135	3,276	2,431	1,334	n/a	2,030
Paediatric - Diagnostic & Therapeutic	-	-	82,028	-	-	-	-	-	-	11,079	56,712
Paediatric - Medical	-	20,129	30,465	-	-	-	-	-	-	1,799	7,800
Paediatric - Surgical	-	-	-	-	-	-	-	-	-	5,845	31,833
Surgical	3,741	4,391	2,617	4,477	4,207	3,864	3,529	3,425	1,833	n/a	2,515
TOTAL POPULATION/FTE	**663**	**701**	**602**	**664**	**675**	**752**	**561**	**592**	**419**	**1,050**	**474**

**GPs with CCFP (EM) are included under 'Medical'*

Figure 122 Number of FTE by Physician Category (Source: NS MSI)

Category	Functional_Specialty	DHA1 SSH	DHA2 SWNDHA	DHA3 AVH	DHA4 CEHHA	DHA5 CHA	DHA6 PCHA	DHA7 GASHA	DHA8 CBDHA	DHA9 CDHA	IWK	PROVINCE
Category	**Functional_Specialty**	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total
Diagnostic & Therapeut	Anatomic Pathology	1.0	0.6	2.0	1.1	-	-	1.7	2.7	15.2		24.3
Diagnostic & Therapeut	Diagnostic Radiology	4.8	6.1	7.8	4.6	2.5	3.8	3.7	7.8	37.8		78.9
Diagnostic & Therapeut	General Pathology	1.0	-	1.0	1.0	-	-	-	0.3	2.0		5.3
Diagnostic & Therapeut	Haematological Pathology	-	-	-	-	-	-	-	-	7.2		7.2
Diagnostic & Therapeut	Medical Biochemistry	-	-	-	-	-	-	-	-	2.0		2.0
Diagnostic & Therapeut	Medical Genetics	-	-	-	-	-	-	-	-	0.7		0.7
Diagnostic & Therapeut	Medical Microbiology	-	-	-	-	-	-	-	-	3.0		3.0
Diagnostic & Therapeut	Neuropathology	-	-	-	-	-	-	-	-	2.0		2.0
Diagnostic & Therapeut	Nuclear Medicine	-	-	-	-	-	-	-	-	4.2		4.2
Diagnostic & Therapeut	Radiology - Oncology	-	-	-	-	-	-	-	2.1	11.0		13.1
Diagnostic & Therapeuti	**Total**	**6.8**	**6.6**	**10.8**	**6.7**	**2.5**	**3.8**	**5.4**	**12.9**	**85.2**		**140.8**
Family Medicine/Practic	Emergency Medicine	3.1	1.3	-	-	-	-	-	-	1.7		6.2
Family Medicine/Practic	**General Practitioner** (1)	50.5	50.7	68.1	60.1	29.8	33.4	44.1	103.8	392.0		832.4
Family Medicine/Practic	Palliative Medicine	-	-	-	0.3	-	-	-	-	1.9		2.1
Family Medicine/Practic	**Total**	**53.6**	**52.0**	**68.1**	**60.3**	**29.8**	**33.4**	**44.1**	**103.8**	**395.6**		**840.7**
	(1) Includes the equivalent of 38 FTE GPs (without CCFP (EM)) who work in Emergency Departments across the DHAs.											
Medical	Cardiology	1.1	0.9	3.4	-	-	-	-	3.2	24.5		33.2
Medical	Community Medicine	-	-	-	-	-	-	-	0.3	1.5		1.8
Medical	Critical Care Medicine	-	-	-	-	-	-	-	-	12.9		12.9
Medical	Dermatology	-	-	1.2	-	-	-	1.0	2.0	13.2		17.3
Medical	Emergency Medicine	1.7	3.5	6.6	5.3	-	2.0	1.6	5.6	39.2		65.5
Medical	Endocrinology & Metabolism	-	-	-	-	-	-	-	1.0	4.3		5.3
Medical	Gastroenterology	1.3	-	-	-	-	0.3	0.4	1.4	14.1		17.5
Medical	General Internal Medicine	3.2	3.3	3.8	3.1	2.7	5.6	2.3	4.4	15.1		43.5
Medical	Geriatric Medicine	-	-	-	-	-	-	-	1.0	10.2		11.2
Medical	Haematology	-	-	-	1.3	-	-	-	1.1	8.2		10.6
Medical	Infectious Diseases	-	-	-	-	-	-	-	1.1	6.0		7.1
Medical	Medical Oncology	-	-	1.3	-	-	-	-	4.2	12.0		17.4
Medical	Nephrology	-	2.7	-	-	-	-	1.3	2.9	10.8		17.7
Medical	Neurology	-	-	-	-	0.2	-	-	2.6	18.1		20.8
Medical	Occupational Medicine	-	-	0.5	-	-	0.3	-	-	4.6		5.4
Medical	Palliative Medicine	1.0	-	0.6	1.0	1.0	1.0	-	1.5	3.0		9.1
Medical	Physical Medicine & Rehabilitat	-	-	-	-	-	-	-	1.0	10.5		11.5
Medical	Psychiatry	2.1	2.2	5.1	8.8	3.0	2.0	5.7	14.1	86.5		129.7
Medical	Psychiatry - Forensic	-	-	-	-	-	-	-	-	4.0		4.0
Medical	Respiratory Medicine	1.1	-	-	-	-	-	1.2	2.0	7.5		11.8
Medical	Rheumatology	1.0	-	-	-	-	-	-	2.4	9.0		12.4
Medical	**Total**	**12.5**	**12.7**	**22.5**	**19.5**	**6.8**	**11.1**	**13.5**	**51.8**	**314.0**		**464.4**

Continued….

Category	Functional_Specialty	DHA1 SSH	DHA2 SWNDHA	DHA3 AVH	DHA4 CEHHA	DHA5 CHA	DHA6 PCHA	DHA7 GASHA	DHA8 CBDHA	DHA9 CDHA	IWK	PROVINCE
Category	**Functional_Specialty**	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total
Paediatric - Diagnostic &	Anatomic Pathology	-	-	-	-	-	-	-	-		2.2	2.2
Paediatric - Diagnostic &	General Pathology	-	-	-	-	-	-	-	-		1.0	1.0
Paediatric - Diagnostic &	Paediatric Diagnostic Radiology	-	-	1.0	-	-	-	-	-		5.9	6.9
Paediatric - Diagnostic &	Paediatric Haematology/Oncolc	-	-	-	-	-	-	-	-		3.5	3.5
Paediatric - Diagnostic &	Paediatric Medical Genetics	-	-	-	-	-	-	-	-		3.0	3.0
Paediatric - Diagnostic &	**Total**	**-**	**-**	**1.0**	**-**	**-**	**-**	**-**	**-**		**15.6**	**16.6**
Paediatric - Medical	Paediatric Cardiology	-	-	-	-	-	-	-	-		4.2	4.2
Paediatric - Medical	Paediatric Child Health	-	-	-	-	-	-	-	-		0.8	0.8
Paediatric - Medical	Paediatric Clinical Immunology	-	-	-	-	-	-	-	-		6.0	6.0
Paediatric - Medical	Paediatric Critical Care	-	-	-	-	-	-	-	-		5.4	5.4
Paediatric - Medical	Paediatric Developmental	-	-	-	-	-	-	-	-		4.0	4.0
Paediatric - Medical	Paediatric Emergency Medicine	-	-	-	-	-	-	-	-		4.6	4.6
Paediatric - Medical	Paediatric Endocrinology & Met	-	-	-	-	-	-	-	-		3.0	3.0
Paediatric - Medical	Paediatric Gastroenterology	-	-	-	-	-	-	-	-		1.9	1.9
Paediatric - Medical	Paediatric General	-	2.1	2.7	4.0	-	1.0	3.1	4.3		25.2	42.5
Paediatric - Medical	Paediatric Haematology/Oncolc	-	-	-	-	-	-	-	-		2.0	2.0
Paediatric - Medical	Paediatric Infectious Diseases	-	-	-	-	-	-	-	-		4.8	4.8
Paediatric - Medical	Paediatric Medical Genetics	-	-	-	-	-	-	-	-		2.9	2.9
Paediatric - Medical	Paediatric Medical Microbiolog	-	-	-	-	-	-	-	-		0.7	0.7
Paediatric - Medical	Paediatric Neonatology	-	-	-	-	-	-	-	2.0		5.4	7.4
Paediatric - Medical	Paediatric Nephrology	-	-	-	-	-	-	-	-		1.0	1.0
Paediatric - Medical	Paediatric Neurology	-	-	-	-	-	-	-	-		7.0	7.0
Paediatric - Medical	Paediatric Palliative	-	-	-	-	-	-	-	-		1.7	1.7
Paediatric - Medical	Paediatric Respiratory Medicine	-	-	-	-	-	-	-	-		1.8	1.8
Paediatric - Medical	Paediatric Rheumatology	-	-	-	-	-	-	-	-		3.5	3.5
Paediatric - Medical	Psychiatry - Adolescent	1.2	1.0	-	2.2	-	-	-	1.0		10.3	15.7
Paediatric - Medical	**Total**	**1.2**	**3.1**	**2.7**	**6.2**	**-**	**1.0**	**3.1**	**7.4**		**96.2**	**120.8**
Paediatric - Surgical	Paediatric Anaesthesia	-	-	-	-	-	-	-	-		15.1	15.1
Paediatric - Surgical	Paediatric Cardiac Surgery	-	-	-	-	-	-	-	-		1.0	1.0
Paediatric - Surgical	Paediatric General Surgery	-	-	-	-	-	-	-	-		3.4	3.4
Paediatric - Surgical	Paediatric Ophthalmology	-	-	-	-	-	-	-	-		2.0	2.0
Paediatric - Surgical	Paediatric Orthopedic Surgery	-	-	-	-	-	-	-	-		2.4	2.4
Paediatric - Surgical	Paediatric Otolaryngology	-	-	-	-	-	-	-	-		2.6	2.6
Paediatric - Surgical	Paediatric Plastic Surgery	-	-	-	-	-	-	-	-		1.0	1.0
Paediatric - Surgical	Paediatric Urology	-	-	-	-	-	-	-	-		2.1	2.1
Paediatric - Surgical	**Total**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**		**29.6**	**29.6**
Surgical	Anaesthesia	5.0	4.1	8.9	4.4	3.4	3.0	2.1	8.8	69.7		109.4
Surgical	Cardiac Surgery	-	-	-	-	-	-	-	-	8.0		8.0
Surgical	Critical Care Medicine	-	-	-	-	-	-	-	-	-		-
Surgical	General Surgery	4.0	3.6	3.1	4.7	1.6	2.5	3.0	4.5	24.6		51.6
Surgical	Gynaecological Oncology	-	-	-	-	-	-	-	-	4.0		4.0
Surgical	Neurosurgery	-	-	-	-	-	-	-	-	9.1		9.1
Surgical	Obstetrics & Gynaecology	3.4	2.6	4.8	3.7	1.0	1.9	3.1	3.7	23.4		47.6
Surgical	Ophthalmology	2.5	2.8	3.5	2.1	-	2.0	2.2	5.4	26.1		46.6
Surgical	Orthopedic Surgery	-	-	5.0	-	-	2.6	-	6.0	20.3		33.9
Surgical	Otolaryngology	-	1.1	2.0	-	1.4	-	1.2	2.2	15.8		23.7
Surgical	Plastic Surgery	1.0	-	-	-	-	-	1.0	1.1	7.3		10.4
Surgical	Thoracic Surgery	-	-	-	-	-	-	-	1.2	4.3		5.5
Surgical	Urology	-	-	2.0	1.3	-	-	-	2.1	10.8		16.2
Surgical	Vascular Surgery	-	-	2.0	-	-	-	-	1.8	3.5		7.4
Surgical	**Total**	**16.0**	**14.1**	**31.3**	**16.1**	**7.5**	**11.9**	**12.5**	**36.7**	**228.5**		**374.7**
TOTAL		**90.1**	**88.5**	**136.4**	**108.8**	**46.7**	**61.3**	**78.6**	**212.5**	**998.5**	**164.8**	**1,987.6**

16 Provincial Environment – Academic Medicine

16.1 Dalhousie Faculty of Medicine Roster

The following figure is based on the May 2011 DFM roster of full- and part-time (see 'Terminology') academic appointment members. The Total FTE is calculated as described in the Terminology section.

Methodology Note: The academic FTE portion reported in this subsection and the figures below was derived based upon income and not % academic time or quantity/quality of academic work i.e. the 'Academic FTE' in the figure below is the ratio of DFM paid academic salary to total payments per FTE. Data on academic time and/or academic work is the subject of ongoing review between DFM and GNS. The Consultant Forecast Model does specifically allow for adjustment of % academic at the individual level once the review process is complete. Adjustment of % academic time will have a corresponding impact on %non-academic time.

Figure 123 Count and Academic/Clinical FTEs by Appointment Status - DFM physician members (Source: DFM, May, 2011)

LICENSED SPECIALTY*	FULL TIME	PART TIME < 50%	PART TIME > 50%	TOTAL			
	Count	Count	Count	FTE - Clinical	FTE - Academic	FTE - Total	Count
Anatomic Pathology	1.0	10.0	-	10.5	0.5	11.0	11.0
Diagnostic Radiology	-	27.0	1.0	26.6	-	26.6	28.0
General Pathology	-	2.0	-	2.0	-	2.0	2.0
Haematological Pathology	-	4.0	-	4.0	-	4.0	4.0
Medical Biochemistry	1.0	-	-	0.7	0.3	1.0	1.0
Medical Microbiology	2.0	-	-	1.3	0.7	2.0	2.0
Neuropathology	-	1.0	-	1.0	-	1.0	1.0
Nuclear Medicine	-	3.0	-	3.2	-	3.2	3.0
Radiology - Oncology	-	9.0	-	9.1	-	9.1	9.0
Diagnostic & Therapeutic -Subtotal	**4.0**	**56.0**	**1.0**	**58.4**	**1.5**	**59.9**	**61.0**
Emergency Medicine	-	1.0	-	1.1	-	1.1	1.0
General Practitioner	7.0	188.0	5.0	193.6	7.3	200.9	200.0
Palliative Medicine	1.0	2.0	-	2.1	-	2.1	3.0
Family Medicine/Practice -Subtotal	**8.0**	**191.0**	**5.0**	**196.8**	**7.3**	**204.1**	**204.0**
Cardiology	5.0	21.0	1.0	19.8	1.5	21.3	27.0
Community Medicine	2.0	-	-	-	1.5	1.5	2.0
Critical Care Medicine	2.0	6.0	-	9.0	0.3	9.4	8.0
Dermatology	-	10.0	-	11.0	-	11.0	10.0
Emergency Medicine	1.0	38.0	1.0	28.7	2.0	30.7	40.0
Endocrinology & Metabolism	1.0	3.0	1.0	4.0	0.4	4.3	5.0
Gastroenterology	3.0	9.0	-	8.8	1.2	9.9	12.0
General Internal Medicine	-	16.0	-	14.0	-	14.0	16.0
Geriatric Medicine	3.0	6.0	-	7.4	1.2	8.6	9.0
Haematology	3.0	4.0	-	4.9	1.3	6.2	7.0
Infectious Diseases	3.0	4.0	-	6.0	1.2	7.1	7.0
Medical Oncology	-	11.0	-	11.3	-	11.3	11.0
Nephrology	3.0	9.0	-	11.5	1.2	12.7	12.0
Neurology	8.0	9.0	-	13.2	3.8	17.0	17.0
Occupational Medicine	-	2.0	-	2.0	-	2.0	2.0
Palliative Medicine	-	8.0	-	6.6	-	6.6	8.0
Physical Medicine & Rehabilitation	-	8.0	-	8.0	-	8.0	8.0
Psychiatry	7.0	49.0	-	55.1	4.0	59.1	56.0
Psychiatry - Forensic	-	3.0	-	2.9	0.1	3.0	3.0
Respiratory Medicine	2.0	6.0	-	7.2	0.8	8.0	8.0
Rheumatology	1.0	6.0	-	6.3	0.5	6.8	7.0
Medical -Subtotal	**44.0**	**228.0**	**3.0**	**237.8**	**20.9**	**258.7**	**275.0**

The percentage academic in the adjacent and following figures is subject to the limitations of the described (above) methodology.

The DFM roster analysis in this subsection purposely includes only M.D.s and not those with a PhD only. It does include DFM academic appointments who reside in New Brunswick. The total income earned for these specific individuals is understated by their non-Nova Scotia income however this does not materially affect the analysis due to the relatively small numbers.

Continued…

LICENSED SPECIALTY*	FULL TIME Count	PART TIME < 50% Count	PART TIME > 50% Count	TOTAL FTE - Clinical	FTE - Academic	FTE - Total	Count
General Pathology	-	1.0	-	1.0	-	1.0	1.0
Paediatric Diagnostic Radiology	-	7.0	1.0	6.1	0.1	6.2	8.0
Paediatric Haematology/Oncology	2.0	-	-	0.9	0.3	2.0	2.0
Paediatric Medical Genetics	3.0	-	-	2.0	1.0	3.0	3.0
Paediatric - Diagnostic & Therapeutic -Subtotal	**5.0**	**8.0**	**1.0**	**10.0**	**1.5**	**12.2**	**14.0**
Paediatric Cardiology	4.0	-	-	2.6	1.4	4.0	4.0
Paediatric Clinical Immunology & Allergy	2.0	2.0	-	3.3	0.7	4.0	4.0
Paediatric Critical Care	-	3.0	-	3.4	-	3.4	3.0
Paediatric Developmental	1.0	2.0	1.0	3.2	0.8	4.0	4.0
Paediatric Emergency Medicine	-	6.0	-	3.6	-	3.6	6.0
Paediatric Endocrinology & Metabolism	3.0	-	-	2.1	0.9	3.0	3.0
Paediatric Gastroenterology	-	1.0	-	0.6	0.2	0.8	1.0
Paediatric General	6.0	15.0	-	16.9	2.1	19.0	21.0
Paediatric Haematology/Oncology	2.0	-	-	1.4	0.6	2.0	2.0
Paediatric Infectious Diseases	4.0	-	-	2.2	1.8	4.0	4.0
Paediatric Medical Genetics	3.0	-	-	2.0	1.0	2.9	3.0
Paediatric Medical Microbiology	-	1.0	-	0.7	-	0.7	1.0
Paediatric Neonatology	4.0	2.0	-	4.1	1.7	5.8	6.0
Paediatric Nephrology	1.0	-	-	0.8	0.2	1.0	1.0
Paediatric Neurology	4.0	2.0	-	4.2	1.3	5.5	6.0
Paediatric Palliative	1.0	-	-	0.5	0.5	1.0	1.0
Paediatric Respiratory Medicine	1.0	-	-	0.6	0.4	1.0	1.0
Paediatric Rheumatology	2.0	2.0	-	2.7	0.8	3.5	4.0
Psychiatry - Adolescent	1.0	6.0	-	6.5	0.4	7.0	7.0
Paediatric - Medical -Subtotal	**39.0**	**42.0**	**1.0**	**61.2**	**14.8**	**76.1**	**82.0**
Paediatric Anaesthesia	-	11.0	-	11.4	0.4	11.8	11.0
Paediatric Cardiac Surgery	-	2.0	-	1.0	-	1.0	2.0
Paediatric General Surgery	-	4.0	-	3.1	-	3.1	4.0
Paediatric Ophthalmology	2.0	1.0	-	1.8	0.3	2.0	3.0
Paediatric Orthopedic Surgery	-	4.0	-	2.4	-	2.4	4.0
Paediatric Otolaryngology	-	2.0	-	1.7	-	1.7	2.0
Paediatric Plastic Surgery	-	1.0	-	1.0	-	1.0	1.0
Paediatric Urology	2.0	-	-	0.8	0.5	1.4	2.0
Paediatric - Surgical -Subtotal	**4.0**	**25.0**	**-**	**23.2**	**1.2**	**24.4**	**29.0**
Anaesthesia	2.0	49.0	-	46.5	0.5	46.9	51.0
Cardiac Surgery	1.0	7.0	-	7.9	0.1	8.0	8.0
Critical Care Medicine	-	1.0	-	1.3	-	1.3	1.0
General Surgery	-	25.0	-	23.1	0.6	23.6	25.0
Gynaecological Oncology	2.0	-	1.0	2.6	0.4	3.0	3.0
Neurosurgery	1.0	6.0	-	6.8	0.3	7.1	7.0
Obstetrics & Gynaecology	18.0	10.0	-	21.4	4.1	25.5	28.0
Ophthalmology	5.0	13.0	-	16.0	0.5	16.6	18.0
Orthopedic Surgery	-	21.0	-	19.1	0.5	19.6	21.0
Otolaryngology	-	11.0	-	9.7	0.5	10.1	11.0
Plastic Surgery	-	6.0	-	5.6	-	5.6	6.0
Thoracic Surgery	-	4.0	-	3.5	0.3	3.8	4.0
Urology	7.0	5.0	-	11.9	1.0	12.8	12.0
Vascular Surgery	-	4.0	-	3.5	-	3.5	4.0
Surgical -Subtotal	**36.0**	**162.0**	**1.0**	**179.0**	**8.6**	**187.7**	**199.0**
Dalhousie Faculty of Medicine	**140.0**	**712.0**	**12.0**	**766.5**	**55.8**	**823.1**	**864.0**
*Exclude 4.0 FTE in 100% Leadership capacity	**16.2%**	**82.4%**	**1.4%**	**93.1%**	**6.8%**		

There are 864 active M.D. academic appointments at DFM (16.2% full-time, 1.4% other, and 82.4% part-time <50%). These include individuals from across the province and those based in New Brunswick. On an income attribution basis and pending outcome of GNS and DFM review, the equivalent of 55.8 FTE is 100% academic or 6.8% of the total FTE of 823.1. In academic medicine the percentage time spent on academic work varies widely by individual [48,49] , i.e., education, research, and leadership. Variation is a function of many factors including the ability to attract and sustain research grants, paid salary support, presence or absence of

[48] Coleman, D.L., Moran, E., et.al., Measuring Physicians' Productivity in a Veterans Affairs Medical Center, Acad. Med. 2003;78:682–689.

[49] Kearney, R.A., Lee, S.Y., Skakun, E.N., Tyrrell, L., The Research Productivity of Canadian Physicians: How the Timing of Obtaining a PhD Has an Influence, Academic Medicine, Vol. 82, No. 3 / March 2007.

academic salary, alternative payment systems that develop and/or support fields of targeted, strategically important research, and the quality of research infrastructure.

The next figure examines the ratio of full-time faculty to trainees (UG students plus PG residents). The Association of Faculties of Medicine of Canada (AFMC) report 306 full-time faculty compared to the 140 individuals in the preceding table. The difference is explained by AFMC figure including basic scientists and other non-M.D. members of faculties of medicine as well as all those with a rank of professor, associate professor, or assistant professor. DFM has 81 basic scientists on full-time appointments.

DFM ranks tenth in the ratio of full-time faculty per trainee. This table does not account for the rapidly increasing number of part-time preceptors/teachers in the community as all faculties look to distribute medical education outside the major tertiary teaching centres. If a faculty is at the lower end of this figure, it does underscore the importance of skilled, committed, long-term community preceptors.

Figure 124 Ratio of Full-time Faculty to Trainees- National Comparison (Source: AFMC, 2008/09)

Faculty of Medicine	1st Yr. Entrant Class Size 2008/09	Program Duration (Years)	Total PT Faculty	Total FT & PT Faculty	PT to FT	TOTAL UG Students	Total PG Residents	Total UG & PG	Total FT Faculty	FT Faculty per Trainee
McGill	176	4	1086	2548	0.7	695	917	1612	1462	0.91
Toronto	224	4	2229	4916	0.8	886	2507	3393	2687	0.79
Manitoba	110	4	822	1418	1.4	404	468	872	596	0.68
Western Ontario	147	4	816	1672	1.0	568	695	1263	856	0.68
Ottawa	156	4	694	1579	0.8	612	793	1405	885	0.63
Alberta	155	4	1	709	0.0	565	812	1377	708	0.51
McMaster	183	3	1800	2442	2.8	496	794	1290	642	0.50
Calgary	153	3	1281	1790	2.5	435	647	1082	509	0.47
Memorial	64	4	529	750	2.4	255	231	486	221	0.45
Dalhousie	**102**	**4**	**1316**	**1622**	**4.3**	**394**	**279**	**673**	**306**	**0.45**
Queen's	100	4	558	911	1.6	401	381	782	353	0.45
Saskatchewan	85	4	758	997	3.2	274	281	555	239	0.43
Sherbrooke	205	4	707	1140	1.6	749	494	1243	433	0.35
British Columbia	**257**	4	3407	3963	6.1	967	1236	2203	556	0.25
Laval	151	4	1674	2008	5.0	983	645	1628	334	0.21
Montréal	265	4/5	2034	2482	4.5	1240	1009	2249	448	0.20
Northern Ontario	58	4	682	712	22.7	224	64	288	30	0.10
TOTAL	**2591**				**0.74**	**10148**	**12253**	**22401**	**11265**	**0.50**

16.2 Post-Graduate Medical Education

The Association of Faculties of Medicine of Canada is in the midst of reviewing and recommending future direction for PGME in Canada[50]. All the emerging recommendations are germane to PRP but the following are particularly relevant (with italicized annotation by the Consultant):

1. Ensure the Right Mix of Physicians to meet Societal Needs

    Robustly designed, evidence and population need-based, PRP can and should inform the medical education system.

2. Align Curricula and Training Models to Evolving Health Care Needs

    The notion of the traditional 'academic ivory tower' as the centre of medical education has long departed with distributive community-based sites of education excellence emerging. This requires trained, skilled, support educators in rural and urban communities.

[50] AFMC, [DRAFT] Future of Medical Education in Canada (FMEC) Post-Graduate Project Draft Recommendations - V1: July 28/11

3. Support Clinician-Teachers through Professional Development

Recruiting, retaining, and mentoring clinician teachers are not by happenstance, but require a focused, funded, flexible approach to continuous professional development.

The following figure demonstrates the DFM PGME total number of Residents by year by specialty in 2009/10 and the percentage that graduated with an M.D. from DFM. As well, 48% of family medicine residents have an M.D. from DFM, 28% of medical Residents, 30% surgical and 19% diagnostic and lab related.

Sixty-five exited residency training programs managed by DFM in July, 2009; 48% family medicine, 34% medical, 10% surgical, and 8% laboratory medicine (52% where female and 71% of family medicine was female).

Figure 125 Dalhousie Faculty of Medicine PGME – Total #Residents by Year by Specialty in 2009/10 (and with M.D. from DFM) (Source: CAPERS)

	TOTAL # Residents 2009-10											M.D. from DAL	
	R-1	R-2	R-3	R-4	R-5	R-6	R-7	Subtotal	Other Funded	Fellow	Total	#	% **
Family Medicine	50	42	0	0	0	0	0	92	7	0	99	46	46%
Emergency Medicine (CFPC)	0	0	4	0	0	0	0	4		0	4	1	25%
Enhanced Skills: Other Fam. Med. Training	0	0	1	0	0	0	0	1	1	0	2	1	50%
FAMILY MEDICINE SUBTOTAL	**50**	**42**	**5**	**0**	**0**	**0**	**0**	**97**	**8**	**0**	**105**	**48**	**46%**
Palliative Medicine	0	0	1	0	0	1	0	2		0	2		0%
TRAINING FOLLOWING FAMILY MEDICINE OR SPECIALTY SUBTOTAL													
Anesthesiology	5	5	6	5	4	0	0	25	4	0	29	7	24%
Critical Care (Anes.)	0	0	0	0	1	0	0	1	0	0	1	1	100%
Dermatology	0	0	0	0	2	1	0	3	0	0	3	1	33%
Diagnostic Radiology	4	5	3	5	3	0	0	20	2	0	22	10	45%
Emergency Medicine (RCPSC)	2	1	1	2	0	0	0	6		0	6	3	50%
Internal Medicine	14	13	11	2	0	0	0	40	11	0	51	18	35%
Cardiology (Int.Med.)	0	0	0	2	3	3	0	8	2	0	10	2	20%
Critical Care (Int.Med)	0	0	0	0	1	0	0	1	1	0	2		0%
Endocrinology/Met. (Int.Med.)	0	0	0	0	1	0	0	1	1	0	2		0%
Gastroenterology (Int.Med.)	0	0	0	2	0	0	0	2		0	2	2	100%
Geriatric Medicine (Int.Med.)	0	0	0	1	0	0	0	1	2	0	3		0%
Hematology (Int.Med.)	0	0	0	2	0	0	0	2	1	0	3	1	33%
Infectious Diseases (Int.Med.)	0	0	0	0	1	0	0	1		0	1		0%
Medical Oncology (Int.Med.)	0	0	0	0	1	0	0	1	2	0	3	1	33%
Nephrology (Int.Med.)	0	0	0	1	1	0	0	2		0	2		0%
Respirology (Int.Med.)	0	0	0	0	1	0	0	1		0	1	1	100%
Neurology	1	1	2	0	0	0	0	4	1	0	5	2	40%
Nuclear Medicine	1	0	1	0	0	1	0	3	1	0	4	2	50%
Pediatrics	5	3	5	2	0	0	0	15	6	0	21	6	29%
Cardiology (Ped.)	0	0	0	0	0	1	0	1	1	0	2		0%
Pediatric Emergency Med. (Ped.)	0	0	0	0	1	0	0	1		0	1		0%
Neo-natal Perinatal Med. (Ped.)	0	0	0	0	0	0	0	0	5	0	5		0%
Physical Medicine & Rehab.	1	2	1	2	0	0	0	6		0	6	1	17%
Psychiatry	7	6	8	7	5	0	0	33	5	0	38	6	16%
Radiation Oncology	1	1	1	1	1	0	0	5	1	0	6	1	17%
MEDICAL SPECIALTIES SUBTOTAL	41	37	40	34	26	7	0	185	46	0	231	**65**	28%
Laboratory Med. (Undifferentiated)	3	0	0	0	0	0	0	3	1	0	4	1	25%
Anatomical Pathology	0	3	2	3	0	0	0	8	0	0	8	3	38%
General Pathology	0	1	1	1	1	0	0	4		0	4		0%
Hematological Pathology	0	0	1	2	0	0	0	3	2	0	5		0%
LAB MEDICINE SPECIALTIES SUBTOTAL	3	4	4	6	1	0	0	18	3	0	21	**4**	19%
Cardiac Surgery	1	0	0	1	0	1	0	3	1	0	4	1	25%
General Surgery	5	7	4	4	5	0	0	25	10	0	35	10	29%
Pediatric General Surgery	0	0	0	0	0	0	1	1		0	1		0%
Neurosurgery	1	1	1	1	0	2	0	6	2	0	8	1	13%
Obstetrics/Gynecology	5	6	3	5	4	0	0	23	4	0	27	8	30%
Ophthalmology	2	2	2	2	3	0	0	11	3	0	14	3	21%
Otolaryngology - Head and Neck Surgery	2	3	2	2	2	0	0	11	3	0	14	5	36%
Orthopedic Surgery	3	3	5	1	4	0	0	16	7	0	23	7	30%
Plastic Surgery	2	2	2	1	3	0	0	10	3	0	13	3	23%
Urology	3	3	2	2	1	0	0	11	2	0	13	5	38%
SURGICAL SPECIALTIES SUBTOTAL	24	27	21	19	22	3	1	117	35	0	152	**43**	28%
TOTAL	**118**	**110**	**70**	**59**	**49**	**10**	**1**	**417**	**92**	**0**	**509**	**160**	**31%**

Source: CAPERS

16.3 Undergraduate Medical Education

In recent years CaRMS has restricted and directed 50% of applicants to Family Medicine. Role modeling and experience in the generalist specialties throughout medical education and training experiences are essential to support this needed direction. The need for generalist disciplines (especially paediatrics, general surgery, family medicine, obstetrics) has been made evident.

The DFM MD entry for July 1, 2009 numbered 102 including 20 earmarked for NB applicants, 11 for non-Maritime applicants, 6 for PEI, 62 for NS, plus 1 seat for OMFS (dental/medical) and 2 for MMTP (military admission). 2009/10 also had 5 students enrolling for the second time in 1st year at the DFM for a combined total of 107 in year 1 (figure below). For July 1, 2010 there were 108 including 30 for NB applicants, 8 for non-Maritime applicants, 5 for PEI, 64 for NS, plus 1 seat for OMFS (dental/medical). In addition to the DFM MD entry, Nova Scotia also funds 3 seats each year for francophone Nova Scotians in Quebec medical schools.

Figure 126 UGME enrolment by Faculty by Year, 2009/10 (Source: AFMC 2009/10)

Enrolment in Canadian Faculties of Medicine by Sex and Years to Graduation

2009/10

Inscriptions aux facultés de médecine canadiennes selon le sexe et le nombre d'années avant l'obtention du diplôme MD

Faculty of Medicine / Faculté de médecine	Years to Graduation / Années avant l'obtention du diplôme															Total		
	V			IV			III			II			I					
	M/H	W/F	T	M/H	W/F	T	M/H	W/F	T	M/H	W/F	T	M/H	W/F	T	M/H	W/F	T
Memorial University of Nfld.	*	*	*	30	35	65	25	42	67	29	36	65	25	36	61	109	149	258
Dalhousie University	*	*	*	38	66	104	55	47	102	51	50	101	44	63	107	188	226	414
Laval, Université [1]	56	118	174	64	145	209	57	144	201	62	142	204	58	145	203	297	694	991
Sherbrooke, Université de	*	*	*	87	109	196	79	122	201	76	108	184	61	135	196	303	474	777
Montréal, Univ. de [2]	73	139	212	85	180	265	86	182	268	95	167	262	87	159	246	426	827	1253
McGill University	*	*	*	82	95	177	78	98	176	77	89	166	79	100	179	316	382	698
Ottawa, University of	*	*	*	54	103	157	59	96	155	61	94	155	53	95	148	227	388	615
Queen's University	*	*	*	54	46	100	47	55	102	56	45	101	48	53	101	205	199	404
Toronto, University of	*	*	*	101	123	224	113	118	231	99	125	224	95	128	223	408	494	902
McMaster University	*	*	*	*	*	*	74	124	198	65	118	183	69	91	160	208	333	541
Western Ontario, Univ. of	*	*	*	86	73	159	79	68	147	74	71	145	74	66	140	313	278	591
Northern Ont. Schl of Med.	*	*	*	17	41	58	15	41	56	16	43	59	23	29	52	71	154	225
Manitoba, University of	*	*	*	53	57	110	61	51	112	48	51	99	53	52	105	215	211	426
Saskatchewan, Univ. of	*	*	*	32	52	84	34	51	85	42	31	73	31	26	57	139	160	299
Alberta, University of	*	*	*	100	89	189	85	72	157	71	74	145	74	65	139	330	300	630
Calgary, University of	*	*	*	*	*	*	86	95	181	75	80	155	63	89	152	224	264	488
British Columbia, Univ. of	*	*	*	121	137	258	112	150	262	119	150	269	96	121	217	448	558	1006
Total, Canada	129	257	386	1004	1351	2355	1145	1556	2701	1116	1474	2590	1033	1453	2486	4427	6091	10518

16.4 Research

The Dalhousie Faculty of Medicine strategic research plan (January 2011) identified five priority actions. The priorities included preparation and maintenance of an ongoing inventory of current research work, increased support for translational research, health policy research, improved integration of research into the undergraduate and postgraduate curricula, and increased capacity to attract research funding.

IWK Health Centre priority research areas are family centred care, diversity, using resources wisely, knowledge transfer, and patient safety. The five areas of research align with the IWK strategic focus and priorities.

16.5 Grant Research

Figure 127 Biomedical & Health Care Research Revenue per Faculty and per Full-Time Faculty Member (Source: AFMC 2008/09)

		Biomedical & Health Care Research			Research Revenue per FT Faculty	
Faculty of Medicine	Total FT Faculty	CIHR	Other	TOTAL	ALL	CIHR (Only)
Montréal	475	64,875	103,607	168,482	$ 354,699	$ 136,579
British Columbia	556	$ 61,013	$ 229,352	$ 290,365	$ 522,239	$ 109,736
Laval	348	35,160	82,215	117,375	$ 337,284	$ 101,034
McMaster	658	36,899	243,364	280,263	$ 425,932	$ 56,078
Toronto	2829	149,578	477,155	626,733	$ 221,539	$ 52,873
Calgary	529	27,952	105,343	133,295	$ 251,975	$ 52,839
Dalhousie	**307**	**15,623**	35,264	**50,887**	**$ 165,756**	**$ 50,889**
Alberta	718	$ 34,381	$ 155,154	$ 189,535	$ 263,976	$ 47,884
Ottawa	903	41,151	82,758	123,909	$ 137,219	$ 45,571
Queen's	376	15,635	69,191	84,826	$ 225,601	$ 41,582
Sherbrooke	437	14,002	32,681	46,683	$ 106,826	$ 32,041
Western Ontario	864	25,852	109,632	135,484	$ 156,810	$ 29,921
Manitoba	585	15,431	90,532	105,963	$ 181,133	$ 26,378
McGill	1536	34,234	135,248	169,482	$ 110,340	$ 22,288
Saskatchewan	235	5,076	13,583	18,659	$ 79,400	$ 21,600
Memorial	212	3,454	7,400	10,854	$ 51,198	$ 16,292
AVERAGE					**$ 220,106**	**$ 50,036**

DFM current areas of focus, as measured by CIHR grant revenue (only), are in investigations led by physicians from in the neuroscience, geriatric, psychiatric, and population health/health outcomes specialties.

The adjacent figure compares total biomedical and health care research revenue awards by Faculty and per full-time faculty member for 2008/09 as reported in the annual statistical report of the AFMC[51]. CIHR grants are highly competitive and subject to very rigorous scientific review. For this reason the figure is rank ordered by CIHR revenue per full-time faculty member. On this basis DFM ranked seventh out of sixteen Faculties of Medicine.

DFM total research revenue (excluding industry contract research revenue) in 2008/09 was $50,887,000.

16.6 Contract Research

Contract research is typically government or industry paid and in health care is dominated by the pharmaceutical industry and government. Such research follows an industry prescribed research methodology, focus, and results reporting although the principal, contracted investigator can make a significant contribution towards the final study design.

[51] Excludes industry paid contract research and revenue. Includes all reported forms of Governmental and non-profit, charitable, and university organization paid research and revenue.

Research contracts most frequently arise from relationships between individuals and not between institutions. Institutions - universities and hospitals/health authorities - usually enter the picture after a researcher and prospective customer have already reached initial agreement on the work to be done. From that point on, universities and hospitals/health authorities can facilitate research agreements, but seldom do they initiate them.

A comprehensive 2010 study[52] sponsored by Industry Canada, CIHR, Atlantic Canada Opportunities Agency, and a number of other public institutions revealed a number of interesting findings regarding contract research in Canada and in comparison to the U.S.A. In the U.S.A. contract research is a core business of medical researchers in that many researchers require money from company and other forms of sponsored research in order to sustain their research programs and pay their salaries. In the U.S.A. it is not unusual for 50% of university or hospital researchers to be employed on “soft money” (i.e. without permanent salaried positions). The situation in Canada is quite different; nearly all full-time faculty are employed on a full-time tenure track basis. There is no requirement or even expectation to engage in contract research. This type of research is entirely discretionary. In most institutions the number of full time faculty who are engaged in contract research is quite small. The study found, among the surveyed institutions, that 21% of total research revenue was industry financed and each one million dollars research revenue created nine to ten jobs for technologists, suppliers, support personnel, etc.

16.7 Specialization

Research specialization presents difficult choices for strategic planning. A recent study[53] identified DFM areas of greatest research opportunity being in geriatrics and aging, arthritis, child health, obstetrics and gynecology, gastroenterology, and nursing. Current identified strengths included the above plus neurosciences, psychiatry, and general internal medicine.

16.8 Academic Medicine - Literature Review

The bibliography that informed the following literature review summary is provided at the conclusion of this subsection.

Summary of the Literature:

Academic Health Science Centres (AHSCs) are beyond the point of learner saturation. Expansion beyond AHSCs to regional and community teaching sites is required to absorb the continued growth in residents and has the added advantage of increasing resident exposure to generalist practice. To be successful regional and community-based teaching sites and preceptors will require access to Faculty PGME development and support resources on-site. Current Faculty PGME capacity is insufficient to support distributed learning sites and recruit and retain a supply of preceptors appropriate to the growing need.

Generalist disciplines are mandatory clerkship rotations. Research shows however, that there is a shortage of generalist preceptors in the overall RCPSC preceptor ranks particularly in general obstetrics, internal medicine, psychiatry, surgery, and paediatrics. As a consequence, residents learn disproportionately from subspecialists thus increasing their predisposition towards a subspecialist career track. An increase in generalist preceptors in distributed teaching sites in regional and community settings is needed to increase preceptor capacity and help

[52] The Impact Group, Knowledge Transfer Through Research Contracting, June 2010
[53] Dalhousie University Scientific Output, A Scientometric Analysis 2001-2009, Science-Metrix, November, 2010

reverse the trend to sub-specialization. The current supply of CFPC physician preceptors is precarious from one year to the next; growth in the supply of these preceptors is required.

A provincially standardized PGME quality evaluation framework, methodology and management information system, which can be adapted to local conditions and need, is required. This information will serve multiple purposes including assisting preceptors by targeting professional development, accurate identification of high quality preceptors, feedback on needed curriculum delivery improvements, and assessment of future preceptor supply needs

Preceptor leaders are needed in regional and community settings in order to deliver successfully professional development (PD) outside AHSCs and outside metropolitan areas (i.e., 'outreach PD'). Preceptor leaders must be identified, relationships established, and agreements made before practice location(s) can be developed as sustained teaching sites. Local leadership is essential if outreach PD is to be well attended, sensitized to local conditions, timely, and accessible. The individual should be given a fixed salary as a 'lead preceptor' in return for providing a list of specific services and for upgrading preceptor skills to a higher standard appropriate to their lead role. This model combines certain attributes of a master teacher with the concept of a ‘principal/lead’ preceptor model.

PD offerings need to be relevant, accessible, flexible, and at low or no cost to the clinical preceptor.

Preceptors should be supported professionally and administratively and (ideally) according to individual needs. Quality professional support means reliable access to expert educators, professional development, curriculum orientation, and feedback. Administrative support should include logistical, 'paperwork', and payment services. A package of essential support services should be defined and stratified by type of teaching site including metropolitan, regional, and rural hospitals and medical office practices

Recognition should extend beyond the individual to the group, site, or team (e.g., clinical teaching unit or group practice). Recognition using this approach could be extended to include the contribution of allied health professionals to teaching.

Accurate identification of those individuals and teams meriting recognition requires a more robust quality assurance methodology as noted earlier. This would also enable an evidence-based increase in the number recognized.

Physicians teach for many reasons including a sense of professional and social obligation to the next generation of physicians. Research indicates that if PGME delivers effective clinical preceptor programs of professional development, support, and recognition, then the supply of clinical preceptors will be sustained and grow over time. Research also indicates that ineffective, under-resourced clinical preceptor programs can result in declining participation, poorer quality preceptorship, and increased demands for more compensation as a means to offset the administrative burden of inefficient support programs.

The supply of clinical preceptors will increase if they are supported effectively and feel their contribution is appreciated and recognized.

An honoraria payment is a proven form of recognition and appreciation within an overall program of clinical preceptor support. Payments at full clinical income rates are unnecessary in an effective program of preceptor support and incompatible with the position of medical education leadership.

Academic Alternative Funding Plans need to regularly provide PGME offices with complete information on their funded medical education resources and deliverables. Full information sharing combined with PGME administration led joint planning will enable more effective medical education program planning, priority alignment, and increased mutual accountability.

Maintenance of Competency (MOC) compliance for licensing can be turned into a win-win situation for PGME and physicians who teach if MOC credits are given for participation in teaching professional development.

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17 Provincial Environment – What we Heard

Interviews were conducted to inform the Environmental Scan with the opinion, experience, and expertise of individuals and groups associated with key elements of the health system. Interview findings have been included in this report according to the most appropriate section under the heading "What We Heard". Interviewees representing organizations with a province-wide mandate, e.g., provincial programs have been included in this subsection – Provincial Environment – What We Heard. Interviewees representing Districts have been included in a subsequent subsection – DHA Environment – What We Heard. Interviewees representing specific specialties, or groups of specialties, have been included in an additional subsection – Individual Specialties - What We Heard.

The Consultant has made all reasonable professional effort to accurately reflect interview discussions and findings. In this context if a misinterpretation has occurred it can be remedied post-project by bringing to the attention of the Department of Health and Wellness. The appendix includes a complete list of interviewees.

17.1 College of Physicians and Surgeons of Nova Scotia (CPSNS)

The activities of the CPSNS have an impact on physician supply; the impact on population need is very limited.

Individual Practitioner Review and NS Physician Achievement Review

- Objective is to provide physicians with a snapshot of clinical practice through the eyes of colleagues, patients, and co-workers
- Focus is on communication skills, practice management, availability, use of diagnostic testing – all within the context of obtaining a reasonable reflection of performance
- Non-punitive
- Top 10% and bottom 10% are interviewed by the CPSNS
- Practice visit if indicated to clarify the report
- Is not considered to be relevant in the context of physician resource planning

International Medical Graduates

- Current physician population in NS is approximately 30% IMG, with most pre-dating the NS assessment program and most having had Canadian postgraduate training in the past
- Prior to establishing the NS assessment program, candidates were processed through the MB assessment program
- There is a general tendency for IMGs to be more difficult to license (because most do not have two years of family medicine training) and to obtain training positions
- Believes that as enrolment in medical schools increases in Canada, there will be even fewer opportunities for IMGs
- Preference is to recruit IMGs with permanent resident status, with a further requirement of being in medical practice less than 5 years prior to the assessment
- So far, six cohorts have been processed through the NS assessment program
- 20-25% of the IMGs who are assessed are considered to be practice-ready; these physicians are provided with mentorship and a restricted license
- Those in mentorship are given four years to achieve LMCC and CCFP; if successful, they receive a full and unqualified license

- 90% of those in the first cohort who achieved licensure leave Nova Scotia and, generally, return to their original province, with the resulting retention rate of 10% - however, the next cohort data appear to have improved to a retention rate of 40-50% (although the absolute number is relatively small at approximately 14)
- Therefore, the program is not considered to have significant impact in the current 10-year planning horizon

Defined Register and Temporary Register

- Defined Register lists physicians who are not eligible for full licensure; most of these are IMGs, but some are Canadian-trained physicians who failed the LMCC examination; no functional limitation to duration on the defined register
- Temporary Register lists physicians who are not eligible for full licensure but are sponsored by the Dean of Medicine due to an affiliation with Dalhousie University (all are IMGs); OR, lists the small number of IMGs sponsored by the Minister of Health and Wellness for work in the Public Service, such as Psychiatrists in a public institution
- The family physician defined licensees are expected to attain full licensure through LMCC and CCFP within four (4) years - for those that had a defined license prior to the CPSNS IMG assessment and haven't been able to pass the CCFP, the CPSNS may arrange a practice assessment every 3 years or until they have passed the CCFP - if that practice assessment is poor, their defined license may not be renewed
- The Royal College now has a Practice Eligible Route (PER) for some specialist IMGs to become certified - at the moment IMG specialists with a defined license have no functional limitation to duration on the defined register but with the advent of the Royal College's PER that could change in the future

Specialty Certification versus Functional Specialty Practice

- No CPSNS data

Future Growth of Physician Population

- IMG – minimal impact
- Dalhousie University Faculty of Medicine – significant impact but also likely to service other Maritime provinces
- Other Canadian Faculties of Medicine – some impact, particularly specialists

Patients without a Family Doctor

- No CPSNS data
- Callers are referred to Department of Health and Wellness
- Believes that numbers provided by the DHAs are inflated

Allied Health Professions and Scope of Practice

- Supports all regulated professions with legislative support for scope of practice
- Includes NPs, Pharmacists, EMS paramedics, Midwives, and delegated acts (no PAs in NS at this time)

CPSNS Data Holdings

- No tracking of international or inter-provincial movement
- Reliant on CIHI and CAPER data
- Monthly register updates provided to PHRED

- PHRED is considered accurate for head counts but not for level of activity

Supplementary Documents

- Not applicable

17.2 Doctors Nova Scotia (DNS)

Interview with Senior DNS representatives

Population Need

- Population Health
  - Methodology is based on need and population health indices
  - Methodology is not based on the extrapolation of existing utilization data
- Health System Design
  - Unknown how many Nova Scotians do not have a family doctor; related inquiries are referred to the Department of Health and Wellness, as is the case with the College of Physicians and Surgeons of Nova Scotia
  - Believes that reported numbers of patients without a family doctor are inflated
- Infrastructure
  - Community Health Boards (CHBs) are smaller units within the respective health authority
- Social-economic
  - Difficult for some patients requiring specialty care to travel long distances or, as is the case in Yarmouth and SWNDHA, in the absence of public transportation
- Project Ideology
  - Stressed importance of communication to physicians to include statement that the project is not a compensation report
  - Report is not going to be a recruitment plan or tool
  - Report best contemplated as a navigational tool for the next ten years with sensitivity to variables and, as yet, unpredicted impact; it is not intended to apply rigid and fixed numbers to physician supply by specialty and geography

PHYSICIAN SUPPLY

- Membership Demographics
  - 3,300 members, of which 2,500 are practising physicians and the remainder are medical students, residents, and retired physicians
  - Split between GPs and specialists is approximately 50:50
  - 45% of GPs are considered to be part-time, using an internal definition of a claims threshold of $150,000 annually
- Workload
  - There are no active FTE or workload measures

- Any related information is based on self-reporting; the 2011 survey will be of value in further understanding these data (see 'Submission' below).

- Project Awareness and Attitude
  - Level of project awareness is high
  - Anxiety over potential impact of the final report, especially on the freedom of choice of practice location, whether extant and future
  - Anxiety about potential linkage to APPS and AFPs and the unknown impact of expansion
  - Stressed importance of broad physician consultation and iterative feed-back loops

- Specific Disciplines
  - Many tertiary and quaternary physicians also provide secondary levels of care
  - Some secondary level care in Halifax is referred to surrounding health authorities due to waiting lists in HRM; clear example of this is Gastroenterology and endoscopy
  - Acknowledgement of the academic profile as including both clinical and non-clinical disciplines

SUPPLEMENTARY DOCUMENTS

1. Province of Nova Scotia Department of Health and Wellness Physician Resource Plan; A Submission from Doctors Nova Scotia
2. Physician Resource Plan 2011 Membership Study Final Report (July 2011) – This report has been referenced by the Consultant on a number of occasions in this Report. The key findings from the Survey are itemized in the subsection below.

Submission

Physician Resource Plan 2011 Membership Study, Final Report, July 2011

As the professional association representing all physicians, medical students and residents in the Province of Nova Scotia, a key mandate of Doctors Nova Scotia is to provide input on health-care policies and legislation so as to influence and support the development of such policies.

Doctors Nova Scotia is looking to inform the NS PRP process and influence direction on where the profession needs to be. To that end, Doctors Nova Scotia implemented an online survey to assess its members' points of view on a variety of topics. Preliminary survey objectives included to:

- Determine membership breakdown by physician descriptions (i.e., student, full/part time, when retiring, etc.);
- Understand what drives physician demand;
- Identify supply challenges facing the profession (i.e., when retiring, medical school, role of allied health professionals, etc.);
- Assess perceptions in relation to retention and recruitment (i.e., understand what drives success and failure in terms of retention and recruitment);
- Understand reactions to the Province's development of a resource plan and expectations of what they anticipate will be done with it; and
- Assess members' expectations of Doctors Nova Scotia as the plan is being developed and the aftermath.

A total of 3,503 invitations were sent, and 576 members completed the survey, representing a 16% response rate.

The following conclusions were drawn by DNS from the Detailed Analysis of the 2011 Physician Resource Plan Membership Study.

- Members' heavy workload is compounded by long work hours and few have realized any improvement in recent years. Increased workloads are largely attributed to complex diseases, too few physicians and the aging population.
- A combination of improved access to both resources and specialists, and an increased number of physicians are deemed potential ways physicians can reduce their current workload.
- Nova Scotia is susceptible to losing a number of physicians to both retirement and relocation.
- There is a perceived discrepancy between current payment methods and what general practitioners consider to be ideal.
- A shortage of resources, inadequate funding, and compensation-related issues are deemed the most pressing challenges currently facing the medical profession in Nova Scotia.
- There is strong support for the development of the Physician Resource Plan and confidence in its ability to meet the needs of the general public and physicians, though doubt is expressed in the Province acting on recommendations.
- Doctors Nova Scotia is viewed as best suited to protect the interest of doctors and medical professionals during the development of the Province's Physician Resource Plan.
- Residents and students favour a team-based environment offering good work-life balance and access to in-office technology. Urban Nova Scotia is their preferred location, though financial incentives would be considered to select a rural location.
- DNS has made the following recommendations stemming from the Detailed Analysis and Conclusions of the 2011 Physician Resource Plan Membership Study and are presented for the consideration of Doctors Nova Scotia.

- *The Physician Resource Plan must clearly address the challenges plaguing the industry, by ensuring appropriate compensation, increasing the number of physicians, and enhancing recruitment strategies.*
- *An enhanced physician recruitment strategy is imperative to sustaining and growing the Province's physician resources.*
- *Doctors Nova Scotia should actively engage members as it directs development of the Physician Resource Plan.*

17.3 Dalhousie Faculty of Medicine

Interviews with Dean of Medicine and PGME/UGME Program Directors

POPULATION NEED

- Health System Design
  - Would like to see specialists outside Halifax paired with an academic clinician in a mentoring role – should assist further in the integration of care and collaborative models
  - Sees legitimate value in a forum for exchange of needs and ideas between Dalhousie and the DHA senior management
  - AFPs are undergoing needed design review and revision. Significant improvement in clarity of deliverables and guiding principles will be valuable, needed outcome of the process.
  - Fee schedule is in need of revision
- Infrastructure
  - 15 AFPs at Dalhousie

- FFS for Obstetrics and Gynaecology (except Gynaecologic Oncology), Ophthalmology, Diagnostic Imaging, and Urology
- Issues with respect to Paediatricians are under review by Department of Health and Wellness.

- Social-economic
  - Notes adverse outcome data in Nova Scotia

PHYSICIAN SUPPLY

- Generalist Disciplines
  - General Internal Medicine has been left behind by sub-specialization – need significantly more generalists
  - Central to reform, and PRP, is better use of the primary system – including earlier return of patients to primary care physician after specialty care
  - Notes productivity gains with the Alberta Primary Care Networks
- Critical Mass
  - Some subspecialists are having increased difficulty in finding a job
  - Need to define core services at the provincial level, and then apply locally.
- Medical Education
  - Strongly supports distributive education
  - Residency programs can be changed once the Department of Health and Wellness defines needs and the mix between specialists and subspecialists
  - Can Nova Scotians training off-shore be repatriated to Dalhousie training programs with a return-of-service provision?
- Specific Disciplines
  - Numbers may be close but distribution and mix are not
  - In addition to more General Internists there are few replacements in Anaesthesia.
  - There is a need for expanded research capacity in Family Medicine and Diagnostic Imaging.
  - Need for increase education training generally.
  - Need for increased Psychiatry in context of a provincial resource.
  - Basic scientist's capacity and expertise would benefit from an increase from current 81 to approximately 100 in targeted areas of research excellence.

POST GRADUATE MEDICAL EDUCATION

- Current Status
  - Since 2006 there has been growth in PG numbers and a slow move towards allocating seats based upon population needs. DFM PGME has spoken to Maritime Provinces about their needs and communicates regularly with Department of Health and Wellness in NS.
- Key issues
  - Problematic to reduce historic numbers in a specialty by changing allocations between specialties.
  - Family Medicine is a difficult challenge in terms of getting teachers in the community.
  - Deal with 3 provinces (NS, NB, PEI) all the time discussing needs, curriculum, training, etc.
  - Academic subspecialists for research areas of excellence – voice is lacking

- Internal Medicine does well but at PGY 3 most choose subspecialty instead of GIM. Slowly building capacity outside Halifax.
- Summary – move to generalist positions is positive. Recruitment and retention of NS MDs remains a challenge. IMGs are very important. Inability to alter the historic allocation of seats by specialty is problematic.

- Local retention of NS graduates
  - Return of service – great difficulty to enforce a front-end incentive system. How about a back end incentive system with more of a recruitment strategy?
- Current and future funded positions
  - GNS has funded nine new PGME slots for July 1, 2012 and Family Medicine will be 5 of the 9 slots.
  - Use a ratio of 1.15 PG/1.00 UG for planning purposes. With the introduction of IMGs the ratio went down to 1.15.
  - A new training site is opening in Kentville July 1, 2012 for PG residency training.
  - In July 1, 2014 the number in St. John New Brunswick will increase by 10 UG and need to increase PG accordingly. There is no decision on FP/SP split as of yet.
  - Re-entry positions: Funding for 2 per year, which is unique to NS. Used for Family Medicine who wish to re-enter into specialist training. May have 6 per year who express interest. Will aim slots towards need e.g., GIM, Psychiatry, and Anaesthesia. Put in place when internship disappeared and once select program cannot go back and change path.
- Generalist Trends
  - All growth requests have been allocated to general specialties and don't foresee it changing. Psychiatry, GIM, General Surgery, Anaesthesia, Paediatrics.
  - Surgery, GIM, Paediatrics, Obstetrics often undertake further fellowship training.
  - As much as possible the training should be based in community setting.
- Surveys of Residents – FOM has not done a survey of residents.
- IMGs – potentially a very good source of recruitment/retention for DHAs in needed areas. DFM IMGs have finished and entered into practice in NS…with Return of Service. Build a social and professional relationship for IMG. Major issues regarding licensing. For DFM get 9 to 11 that go through every year successfully (30-40 try). Not sure what retention of 9 to 11 has been. On specialist side it’s harder. Don't have a good assessment methodology but are moving to Ontario model. Problematic to get a team to do an evaluation of IMG specialists to assess their competency. CEPHEA Assessment (Ontario) Tool – have prepared an examination and evaluation process which results in a 'practice ready', 'more work 2-3 years', 'start over'.

Undergraduate Medical Education

- Curriculum – renewal status
  - Curriculum renewal has been needed for some time and was a cited requirement by external program reviewers/accreditors.
  - Cornerstones of curriculum are consultative, competent, contribute to community, act professionally, become life-long learners
  - Have introduced a 'rural week' into Year 1 at the end of the year
- Seats
  - 2012, 2013, 2014 – don't know UGME seats yet.

- Halifax, other sites
  - Year 1 and 2 preclinical years do have some electives for limited clinical exposure but re confined to City since have to 'come to class'.
  - Year 3 Core Clerkship – set rotation through different specialties – Colchester has just proposed a clerkship rotation be based there.
  - $125 clerkship fee per week per preceptor.
  - Weeks in rural 3-6 (family medicine), paediatrics (6 weeks broken into 2 x 3 weeks) and psychiatry (6 weeks broken into 2 x 3 weeks), and also have rural rotations
  - New Brunswick will offer NB sites to NB students beginning July 1, 2012 and therefore NS students will have to be placed in NS

- Clerkship UG3 – Rotation schedules
  - Year 3 & 4 Elective – majority in year 4 are auditioning for a PGME specialty. Have a limit of 4 weeks in Halifax. IMGs have a total limit of 12 weeks with 4 in Halifax and 8 outside.

- Nova Scotia resident applicants
  - Training abroad
    - e.g., Dutch Antilles/SABA - very expensive programs at $50000/year requiring the student to have significant personal resources
    - Competition for seats at DAL UGME occurs every year and post MCAT entry exam results
    - 8-9 seats from out of NS, balance are from within NS
  - International Medical Graduates (IMG) hold Canadian citizenship but have taken their complete UGME abroad. The challenge is getting a PGME spot in Canada when you come back e.g., St. Georges in the Caribbean has a UGME program that accepts 300 per year. A revenue generating enterprise in the Caribbean.

- Issues
  - Undersubscribed by those of First Nations and NS of African descent – do have protected slots
  - Challenge is to educate students for a system that may or not be supportive of UGME aspirations and student aspirations
  - Year 4 - Care of elderly (3 week rotation) – 107 students, have to push all through in a 12 week span… not enough Geriatric Medicine specialists to teach and therefore use Family Medicine teachers
  - Moving to a longitudinal clerkship (NB Miramichi)… but lack some of the specialist teachers
  - International Medical Student (IMS) are Nova Scotians taking UGME abroad and come back for forth year UGME to get exposure leading up to CaRMS match… 2 slots protected in UG3 and are greatly over subscribed
  - Move to longitudinal clerkship from traditional rotating clerkship is difficult in a distributed medical education program.

17.4 Nova Scotia Health Research Foundation (NSHRF)

Interview with CEO

Population Need

- Health System Design

- Supports system-based solutions using compliant and harmonized data

- Infrastructure

  - Support for, and interest in, expansion of collaborative care models

- Mental Health

  - Mental health and addiction are not handled well at the primary care level
  - Support articulated for competency-based resources for mental health and addictions

PHYSICIAN SUPPLY

- Specialists

  - Believes there are too many visits to specialists in Nova Scotia

SUPPLEMENTARY DOCUMENTS

1. To be determined

17.5 Cancer - Cancer Care Nova Scotia (CCNS)

Medical Director Interview

POPULATION NEED

- Real concern about geographic (DHA) boundaries versus functional boundaries.
- Much data but none of it tracks outcomes versus volumes – data is not shared between and among the DHAs – CCNS seriously concerned about absence of linked data sharing – even CCNS does not get full data access.
- No tracking of chemotherapy data – there are satellite chemotherapy centres.
- Outcome data for management of cancer (overall) is the worst in the country – quality, data, and access issues
- CCNS advocates a functional integration rather than geographic boundaries.

PHYSICIAN SUPPLY

- Incorporates Surgery, Medical Oncology, and Radiation Oncology
- Program initiated as CDHA resource and now is provincial
- Critical mass

  - History of 4 centres that treat lung cancer – now 2 with the vast majority of cases handled in Halifax – Sydney thoracic surgeon has left
  - Conventional wisdom that thoracic surgery population ratio is 250,000:1 – 4 are situated in Halifax and Sydney position is open – management of these patients is multidisciplinary – cancer care demands integrated care
  - 37 hospitals in NS – 250 cases of colorectal surgery annually – surgery has been performed by 51 surgeons in 10 hospitals – average cases per surgeon is 0 to 20 annually – threshold model is 20 cases per year per surgeon – virtually nobody meets that level

SUPPLEMENTARY DOCUMENTS

- Nova Scotia's Cancer Experience – power point presentation

17.6 Diabetes – Diabetes Care Program of Nova Scotia

Program Director Interview

POPULATION NEED

- **Network of Diabetes Centres managed by DHAs are unique in Canada and are driving quality of care**
- Diabetes Centre – always have at least a nurse and dietician and a medical advisor (local, and maybe a specialist or family physician) e.g., Antigonish has a very strong GIM specialist. Have common methodology using standard case definitions. 39 Diabetes Centres (situated at hospital or community health centre, support nurse and dietician, and GP or specialist). Physician is gatekeeper.
-
- Type 1 diabetes is currently managed by specialists only if necessary. Will manifest under age 19 normally; therefore, seen by paediatric endocrinologist and Team. If patient lives in CDHA, then referred to IWK. After age 16 years, IWK will transfer to QEII endocrinology clinic. For the rest of the province, patients continue to be seen by the same team at diabetes centre.
- Type 1 should be managed by specialists
- Type 2 should be GP-managed with defined referral pathways (e.g., gestational diabetes)
- Nephrologists have done very well in creating guidelines and building relations with Districts. Guidelines clearly state... 'here are the ones . . . nephrologists need to see'…
- Canadian Diabetes Association has done a good job creating guidelines applied by Diabetes Centres
- No pressing need for telehealth services from AFP endocrinologists

- Wait times for access:
  - Perception is that the Diabetes Centre in Halifax has the longest wait list/times but do not have actual data.
  - Every DHA uses General Internal Medicine in the DHA for diabetes management, with rare referral to Halifax
  - No hard data on wait times within the DHA and would vary month to month.
  - Complex referrals to endocrinologist can wait for months, e.g., thyroid, pituitary
  - Type 1 Diabetes should have no wait
  - Type 2 are referred to Diabetes Centre to start care; even before seen by a specialist
- Electronic Medical Record - No access to provincial EMR
  - Access Meditech but not Diabetes Centre record or GP record. Diabetes Centre medical record will be available online in time.
- Priorities
  - Case Management – build around Diabetes Centre Model and staff and continue in this direction.
  - Guidelines for guidelines for LTC patients, gestational diabetes, pump protocols, and establishing when should a patient be referred to someone else?

PHYSICIAN SUPPLY

- All endocrinologists are in Halifax except one in Sydney.
- Endocrinology and Metabolism service provides short-term consultative care but significant deficiency of endocrinologists.

- Adult Endocrinology and Metabolism has a significant workforce shortage which makes it difficult to provide provincial leadership to diabetes management. In the last year Endocrinology and Metabolism has sent the message that they can no longer accept referrals (except new diabetes or persistent Hb A1C > 10 level). The leadership will need to be in a particular area since the general overall program management is going very well through the Provincial Diabetes Centre Management Model. The Program is regularly invited to speak across Canada.
- Adult Endocrinology and Metabolism – none of the six remaining subspecialists are sub-specializing in diabetes
- Alternative Funding Plan – there is a perception that productivity may have declined by Endocrinology and Metabolism
- GPs are well aware of guidelines and good knowledge. Best local knowledge is with GPs and GIM

17.7 Cardiovascular Health

Program Director Interview

Population Need

- Need for dialogue between GNS, medical leadership, DHAs on CV health resource planning
- Market forces drive current availability/distribution of CVH specialists, both FFS outside Halifax and AFP in Halifax i.e. echocardiography.
- CV Health service delivery planning and provision is patchy across the province.

- Access to Services:
  - Electrophysiology (EP) ablation (atrial especially) wait list is very long.
  - Follow up needed re- Implantation (pacemaker, ICDs) – 50% cardiac surgeons, 50% Interventional Cardiologists, catheterization, angiograms, angioplasty (PTCA/PCI), and stenting wait times.
  - Echo/Telemetry/Holter - majority of general cardiology consultation is channelled through QEII but FFS doesn't not allow echo testing or treadmill testing in a private office i.e., must be performed in hospital. Hence no one is setting up a private office, as it is not economically viable. Routine consultation to Halifax residents has to happen with QEII and Dartmouth consequently the echocardiography wait is 4-6 months. Treadmill and holter monitoring waits are 2-3 months.
  - General consultations – access is a challenge i.e., FFS remuneration considered to be inadequate for time and intensity
  - General Comment – It is often easier to see a specialist but then have to wait for a diagnostic test (e.g., echo, treadmill, holter). Suggested need to grant access in private offices to include appropriateness criteria to 'govern/manage' volume.

Physician Supply

- In Halifax
  - General Cardiology – 26 full-time who also provide majority of echocardiography services
  - Interventional Cardiology – 7 full-time with plans to go to 8
  - Electrophysiology (EP) – 5 full-time
  - Cardiac Surgery is an evolving specialty with rapidly developing less invasive techniques. Dialogue is needed with this group to contemplate the possible excess physician resources

- Interventional cardiologists shadow-bill well above AFP incomes with the shift to twice the volume of stenting procedures to coronary artery bypass procedures. Cardiac Surgery average billings are well below Surgical AFP values. Primary provider of pacemakers and ICD device procedures remains contentious between cardiac surgery and EP groups. EP is now doing 50% of pacemakers and ICDs with C/S the balance.

- Outside Halifax
  - 3 Cardiologists in Kentville, 1 in Bridgewater, 2 in Sydney (just lost 1), 2 at Dartmouth General (FFS model not under AFP). None in Truro and Antigonish where GIM covers the cardiology service.

- Infrastructure
  - EP Studies - major expansion with 2 new EP labs in last year. Do not have funding to staff full-time for skilled nursing and x-ray staff. 1 of new EP labs will only open 1 day/week.
  - Realities of infrastructure constraints impact access to services, i.e., access to booking rooms, exam rooms, and secretarial support.
  - Cardiac catheterization laboratories are appropriate and of sound quality.

- Interventional Radiology
  - Have an active Interventional radiology group but cardiology has very little interaction. They do very little carotid stenting. Surgical intervention is performed by cardiology. Peripheral vascular work is done by interventional radiology along with vascular surgeons.

- AFP and Innovation
  - Does not see AFP as funding innovation.
  - Multiple other ways could utilize allied health professionals but 'shadow-billing' constrains innovation e.g. CDHA has set up a heart function clinic for complex CHF but is seen by a nurse and not seen by Cardiologist.
  - Recently set up a Nurse Practitioner run clinic where a specialist briefly sees the patient; preliminary feedback is very positive at QEII

- The Future
  - Expect specialists to be hybrid trained e.g., vascular surgeons with catheter skills; need hybrid trained specialists for heart procedures including percutaneous valve and percutaneous implant of aortic valves i.e., teams of Cardiac Surgeons and Interventional Cardiologists
  - Fewer conventional cardiac surgeons and more with hybrid skills (no current Canadian Fellowship for hybrid skills for IVC).
  - Stenting is starting to plateau nationally however diabetes, obesity and aging will continue to drive invasive procedures.
  - Need to fix patchy access to cardiology consultation with better distribution across province.

17.8 Emergency Health Services

Medical Director Interview

PROGRAM OVERVIEW

- **Builds on a natural partnership between physicians and paramedics**

- Has progressed to be the leading edge for integrated care in Canada, using the optimal skills of physicians, nurses, and paramedics, with a progressively elevated scope of practice for the paramedics
- Underpinned by EHS physicians who are experienced and comprehend collaborative care and a single ambulance system within the Department of Health and Wellness
- Initial acute care focus has been expanding into chronic care, essentially bringing the ED to the nursing home; it will continue to expand over the next 5-10 years with advanced, seamless pre-hospital care

Collaborative Emergency Centres (CECs)

- Based on paramedic and nurse resources with online contact with an ED physician
- Expansion planning over the next 5-10 years will centre on community paramedics who provide primary care through house calls and targeted care of the elderly
- Collaborative model will become more robust over the next 5-10 years and incorporate a network of trained physicians

Population Need

- Emergency Care
  - Quantity and quality will both increase with an emphasis on access to enhanced pre-hospital care
- Health System Design
  - EHS model, as it is maturing and growing, can be envisioned as a provincial resource rather than a regional resource; this is an area that could benefit from articulated support
  - While not yet contemplated, remote areas of the province that are not well-resourced in some areas of specialty care may, in part, have needs addressed by an increased scope of practice by paramedics involved in pre-hospital care and patient transfer
- Infrastructure
  - Major infrastructure change with the greatest benefit to population health will be growth of CECs
- Social-economic
  - Growth in the elderly population, especially in rural communities, can be mitigated to some degree through enhanced care of the elderly in a home environment
- Supplementary Documents
  - Data that have been collected through the program are being made available, but have not yet been acquired.

Physician Supply

- **Program is complementary to primary care, not a threat to it**
- Impact on physician resources is likely less an issue of numbers and more of a functional evolution designed to keep patients out of hospitals and to improve morbidity and mortality rates

17.9 Organ Donation - Legacy of Life (LOL)

Program Director Interview

POPULATION NEED

- Program rooted in Clarica Project (2002-2004) and picked up as a Department of Health and Wellness initiative since then
- Started as a means to reach out to DHAs in face of decreasing referrals – successful initiatives resulted in more referrals – provincial program since 2006
- Success driver has been the leadership role of the medical advisor as the key bridge to physicians and as the main spokesperson
- Largely worked as a program of Department of Health and Wellness in support of critical care organ donation (ICU, ED, FD) – and tissue donation in collaboration with the Regional Tissue Bank (Capital Health)
- Have been engaged with Canadian Blood Services strategic plan for donation and transplantation

PHYSICIAN SUPPLY

- New legislation expected to be proclaimed in 2012, in part to address missed referrals (revealed in chart audits) – still some inability to engage physicians
- Cape Breton moved to required referral in 2010 and doubled the tissue donors
- Projections are based largely on doubling tissue donation (organ donation is generally good – only four (4) missed in 2009)
- If tissue donations grow as expected (from CBDHA experience with increase from 10 to 20 using the eligibility criteria), the new legislation could add 200 new tissue donors and achieve the highest donor rate in the country
- Banking and processing may lead to a need to increase resources the potential impacts are being explored
- Canadian Blood Services strategic goal is to double the national donor rate and this would impact the four (4) Atlantic provinces (and therefore Halifax) the potential impact of the recommendations is under review

SUPPLEMENTARY DOCUMENTS

- 2009-2011 strategic plan data
- Audit File

17.10 Renal Disease – Nova Scotia Renal Program

Program Manager Interview

POPULATION NEED

  – Use support model established in Antigonish and rolling out to rest of province
  – 3 Adult Renal Programs (Haemodialysis, Peritoneal, Home (peritoneal dialysis (PD) or home haemodialysis (HD)))
  – Cape Breton does have home peritoneal program
  – Target is 30%-35% being on home therapy (PD or HD). The only province to meet target is B.C.

- Information Management

- 1st Phase - Have identified clinical indicators that want to start collecting, build first phase registry with co-morbidity data (CORE data set)
- 2nd Phase – A provincial renal program database to enter EMR data for all patients in province.
- Data is needed for the pre-renal stage and counts by year by modality
- Promote primary identification of kidney disease with adoption of B.C. quality monitoring process i.e., identify traceable creatinine levels with total error target of 10%. Get access to laboratory data so can identify true burden.
- The eGFR is used to screen for and detect early kidney damage and to monitor kidney status. It is performed by ordering a creatinine test and calculating the eGFR. The creatinine test is ordered frequently as part of a routine Comprehensive Metabolic Panel (CMP) or Basic Metabolic Panel (BMP), or along with a Blood Urea Nitrogen (BUN) test whenever a doctor wants to evaluate the status of the kidneys. It is ordered to monitor those with known kidney disease and those with conditions such as diabetes and hypertension that may lead to kidney damage.
- Data cannot be divided into ethnic groups e.g., aboriginal
- 'Twigham' Project involves data sharing with Aboriginal Reserves.

PHYSICIAN SUPPLY

- Two paediatric nephrologists in 2011. One in 2009/10.
- Eleven adult positions with 1 vacant. 2 in Cape Breton and 2 in Yarmouth.

17.11 Reproductive Care - Reproductive Care Program of Nova Scotia (RCPNS)

Program Director Interview

POPULATION NEED

- **Birth rates have reversed downward trend and stabilized with some upswing (more in urban than rural)**
- Prenatal care is still reasonable, with the caveat that women have to travel greater distances over time to access care – postpartum care is starting to lag
- Programs and models are outcomes-focused
- Overall, a patchwork of delivery models

PHYSICIAN SUPPLY

- Role played by physicians is important but not only rate-limiting step in the provision of maternity services
- 50% IWK and 50% regional hospitals (with Glace Bay as the one exception to community centre role)
- There is a domino effect associated with physicians who stop doing deliveries. They are then more likely to stop providing antepartum, postpartum, and newborn (first 6 weeks of life) care.
- Midwifery program enabled through legislation and will expand within funding boundaries (employment model) – target will be every regional centre – foresee enhanced collaborative care model
- Midwives were most responsible for inpatient admission in 84 cases provincially in 2010.
- Significant need will be the ongoing educational opportunities for non-physicians
- Key growth area is community-based care for new families
- Need major support for each level in the spectrum of maternal and newborn care

- Discussion of Antigonish and New Glasgow – 400 delivery per site – 2 Obstetricians at each – substantial paediatrics at Antigonish and 0.5 neonatal expertise at New Glasgow – quality and lifestyle logic may dictate need to join programs – will still face community concerns – plus very real issue is the impact on those from Cape Breton who come to Antigonish
- Bridgewater model underlined – and variant in Yarmouth
- High turnover of rural physicians can weaken any model that is implemented
- Focus on change needs to occur at level of training programs, but still a lack of comprehensive family medicine
- Need more generalists overall
- Additional training is good but this also tends to keep physicians in a more urban setting upon conclusion
- Lessons from rural GP training should be picked up by rural specialty training
- Distributive education needs an infrastructure in order to be successful

Supplementary Documents

- Maternal and Newborn Demographic Trends
- Physician Attendance at Birth 1990 – 2010
- Key Points - Maternal pre-pregnancy BMI among Nova Scotia residents

17.12 Screening Programs - Nova Scotia Breast Screening Program (NSBSP)

Program Director Interview

General Comments and Data

- Origin of program was a single fixed site in Halifax- since then have grown to 11 fixed sites and 3 mobiles
- Evolved into sophisticated program that is coordinated and focused on outcomes
- Three mobile sites (Sydney – 1994; Yarmouth – 1997; Truro – 2003) to extend screening mammography to the entire province
- As of October 1, 2008 all breast imaging in the province, screening and diagnostic, is done under the umbrella of the provincial breast screening program All breast imaging in the province is centrally booked - screening and diagnostic - only province in Canada to have accomplished this
- Program started in 1991 – is part of the national Canadian Breast Cancer Screening Initiative (CBCSI) – outcomes are based on national targets but essentially autonomous
- Screening program started and persists with focus on ages 50 - 69 years, but now accepts 40 – 49 year olds
- Biennial screening recommended for women aged 50-69 unless considered high risk category; annual screening recommended for women aged 40-49
- A reduction in mortality by 30% is anticipated once province wide program has been developed for 10 years. NS became province wide in 2008; can be self-referral to the single central booking service for anywhere in NS – MD referral as well with diagnostic taking precedence over screening- all booked through a single location
- There are now 11 fixed sites and 3 mobile units. - Currently all fixed site mammography and one mobile is full field digital
- Decreasing wait times - symptomatic diagnostic mammography must have the shortest wait times; screening is asymptomatic women – acceptable to have a longer wait time
- Enhanced quality controls

Population Need

- Solid proxy for success is the absence of geographic variation in outcomes
- Wait times are followed and measured against outcomes

Patient Navigation

- Patients have been navigated through the breast screening program since it began in 1991 Since 1997, a single patient navigator for the province has been included in process and coordination of services of all breast imaging; position is based in Capital Heath as the greatest need is there due to population - but is a resource for the entire province - abnormal screening can lead to core biopsies – wait times are monitored - national target of 49 days from a screen to a core biopsy

Physician Supply

- One marker of program success has been the shared care provided by a multidisciplinary team that includes Radiologist, Pathologist, Surgeon, and Oncologist
- No significant physician resource gaps – could have been a DI gap but digital mammography and a requirement that breast imaging radiologists read 2,500 mammograms annually sustains program goals and outcomes

Supplementary Documents

- Outcome data on web site

17.13 What We Heard from Provincial Organizations

16. Key Provincial Organization Observations

    - Strong reliance on IMGs to fill recruitment vacancies in physician workforce.
    - Importance of engaging physician representatives in the project.
    - Alternate Funding Plans are undergoing needed review and revision.
    - Support for expansion of collaborative care model(s).
    - Provincial programs are focused and most are making continuous progress. Use of multi-disciplinary teams highlighted in a number of the programs.

18 DHA Environment – What We Heard

This subsection focuses on the DHAs and specifically on the information provided during extensive interviews with senior management and the physician leadership. A list of document submissions is included with specific information quoted from DHA PRP planning submissions.

18.1 South Shore Health (SSH) – Interview(s)

Population Need

- Health System Design
  - Supports smaller number of health authorities – duplicated services and artificial boundaries
  - Keep focus on outcomes and quality
  - Supports expansion of shared services models
- Infrastructure
  - Operating rooms are under-utilized with good available capacity
  - Mental Health is under served
  - High regional rate of anxiety disorders and depression – mental health services are good but require more Psychiatry – currently two (2) full-time Psychiatrists plus a part-time Psychiatrist from Halifax
  - Early response services in daytime for psychiatric emergencies but not enough resources to staff 24/7
  - All paediatric psychiatry goes to IWK
  - 10-bed inpatient service for mental health in addition to robust community services
  - Significant absence of resources to deal with dementias
  - Strong agency and leadership relationships
  - Significant financial support from the communities
- Social-economic
  - Large outmigration from rural settings to urban care
  - Significant poverty, unemployment, chronic disease management, and single parenting

Physician Supply

- Generalist Disciplines
  - Key need is primary care and a system-type approach to primary care
  - Significant number of patients do not have a family doctor
  - Older physicians with large practices such that replacements will not be 1:1 ratio
  - Seeking expanded collaborative practice support from physicians and from Department of Health and Wellness
- Critical mass
  - Less relevant with proximity to HRM
  - Variable impact provided by proximity to HRM and the shared services with AVH
- Medical Education
  - Good relationship with Dalhousie

- Specific Disciplines
  - One (1) Internist in Liverpool with very well organized GP group practice focused on outcomes and evidence-based decision-making
  - Cancer care to HRM because of proximity
  - Satellite chemotherapy in Bridgewater
  - All deliveries are at the regional hospital – exemplary obstetrical model anchored by family medicine with consultation support by the specialists
  - All surgery at regional hospital
  - Some endoscopy at Liverpool
  - Surgery and Medicine are FFS
  - Anaesthesia is APP
  - Need to resolve what services should be coming in and what services should be going out

Supplementary Documents

1. Core Business Areas
2. Our Journey to Wellness
3. SSH Clinical Services Overview with Locations
4. SSH District Profile
5. SSH Environmental Scan
6. Physician Resource Complement

Background Data

Figure 128 DHA1 - Hospitals by County – Total Days Stay (LOS) and change in RIW – 2005-2010 (NS Hospital Discharge Data)

No.	DHA	COUNTY	Institution Name	Role	2005 LOS	2010 LOS	Change %Total LOS	Change % Total RIW	Change % Avg RIW/ Patient
114	DHA 1	Lunenberg	Fishermen Memorial Hospital	Acute Care	5986	7053	17.8%	22.1%	4.7%
14	DHA 1	Lunenburg	South Shore Regional	Acute Care	23406	29750	27.1%	24.7%	28.5%
38	DHA 1	Queens	Queens General Hospital	Acute Care	7115	8372	17.7%	13.3%	17.8%
	DHA 1 Total				36507	45175	23.7%	22.3%	24.9%

18.2 South West District Health Authority (SWNDHA) – Interview(s)

Population Need

- Health System Design
  - Some APP uptake but would welcome opportunity to expand
  - New generation of physicians all want APPs but not getting support or encouragement from Department of Health and Wellness
- Infrastructure
  - Community invests significantly in recruitment initiatives with return-of-service provisions
- Mental Health
  - Mental health services inadequate – high demand from significantly large patient cohort
  - Need for Psychiatry is major priority – interest expressed by one from UK and one from US

- Good mental health infrastructure
- Psychiatry readmission rate is very high – supported by CIHI data

- Social-economic
  - Population 64,000 with wide geographic spread – is static or in marginal decline
  - Largely a rural population with significant elderly cohort and characterized as lower education, high poverty, and moderately high unemployment
  - No public transportation out of Yarmouth – difficult to travel to other communities for care – especially for a 3-minute visit to CDHA specialist
  - Sense of shift in service demand and expectations

Physician Supply

- Generalist Disciplines
  - Was 8,000 patients without family doctor and now about 5,000
  - 47 of the 84 physicians are IMGs – continuing IMG recruitment and marginal retention – but at least getting four (4) years of service before departure
  - Most urgent need is GPs who would also work in emergency department
- Critical mass
  - Not every specialty provides comprehensive on-call because of small numbers that reflect absence of a critical mass
- Medical Education
  - Physicians feel remote from Dalhousie and unsupported by academe
  - Need for generalists to be trained rather than subspecialists
  - Strong relationship and support to Clare from Sherbrooke University – 7-8 medical students from Clare at single count
- Specific Disciplines
  - Would welcome two (2) Orthopaedic Surgeons and curtail dependency on AVH – wonders if a single Orthopaedic Surgeon model with on-call relief would work
  - Full-time Pathologist required – currently contracts for 0.5 FTE from AVH
  - Needs Urologist – current flow is to AVH
  - Has good endoscopy service
  - Medical Officer of Health is a shared resource with SSH and AVH – but very few services provided to SWNDHA
  - Cancer care seems well handled – satellite chemotherapy and visiting Oncologist – good linkage with CCNS and local surgical oncology
  - One of three dialysis centres in province; thought likely to grow further
  - Obstetrics model is GP-based with consultation services from Obstetrician
  - Three (3) Ophthalmologists with two (2) exclusively office-based

Background Data

Figure 129 DHA2 - Hospitals by County – Total Days Stay (LOS) and change in RIW – 2005-2010 (NS Hospital Discharge Data)

No.	DHA	COUNTY	Institution Name	Role	2005 LOS	2010 LOS	Change %Total LOS	Change % Total RIW	Change % Avg RIW/ Patient
20	DHA 2	Digby	Digby General Hospital	Acute Care	5230	8415	60.9%	55.9%	94.7%
39	DHA 2	Shelburne	Roseway Hospital	Acute Care	6224	8708	39.9%	24.2%	61.4%
56	DHA 2	Yarmouth	Yarmouth Regional Hospital	Acute Care	36074	38067	5.5%	13.6%	9.3%
	DHA 2 Total				47528	55190	16.1%	19.1%	20.5%

18.3 Annapolis Valley Health (AVH) – Interview(s)

Population Need

- Emergency Care
  - Three active service emergency departments
  - 28,000 visits to regional hospital
  - 9,000 visits at Annapolis
  - 18,000 visits at Soldier's
- Health System Design
  - Large inflow of patients from SSH and SWNDHA – challenging in absence of funding following the patient
  - Urology, Orthopaedic Surgery, Vascular Surgery, and ENT all provide some degree of travelling services
- Infrastructure
  - Operating rooms run at 100% occupancy
- Mental Health
  - Mental health is multidisciplinary with good infrastructure – number of Psychiatrists is good and waiting times are reasonable
- Social-economic
  - Population of 80,000

Physician Supply

- Generalist Disciplines
  - Percentage of population without a family doctor varies, by site, from 2% to 10%
  - 57 family physicians with ongoing active role in hospital care – 4 of the 57 deliver babies – 40 provide home visits – 10 provide surgical assisting – 9 work in emergency department – 8 work in walk-in clinic – 22 work in outpatient clinics – average work week is 32 hours, with range of 11-70 hours seeing 10-80 patients
  - 50 GPs are FFS and 7 GPs are APP
  - Five (5) collaborative care sites, each with imaging, phlebotomy services, chronic disease management teams, some mental health, and some addiction services – each core team networks with family physicians

- Medical Education
  - Strong linkages with Dalhousie
  - Includes rotations of surgical residents
- Specific Disciplines
  - Strong participation in cancer care network and strategy
  - Ophthalmologists operate in Middleton
  - Strong roster of specialists
  - 25 surgeons and 37 surgical beds
  - Provides majority of surgical service west of HRM – vascular, orthopaedic, and urological services are only ones within the geographic locale in the province
  - Three (3) General Surgeons and two (2) vascular surgeons (75% vascular and 25% general) – one (1) does most of breast surgery and will eventually be exclusive and not part of on-call rotation
  - The two (2) vascular surgeons provide tri-county coverage
  - Vascular surgery across province has been characterized as disorganized
  - Surgical services would benefit from recommendation of formal tri-county working relationships
  - Still room for expansion of surgical services if properly resourced
  - 9 Internists (4 cardiologists, 5 general internists),
  - 5 Obstetricians – excellent on-call coverage – only four (4) GPs deliver babies – annual deliveries at regional hospital approximately 800
  - 12 Anaesthetists
  - 1 Medical Oncologist (APP)
  - Had 4 Psychiatrists – 2 older and 2 replacements coming – 1 with focus on psycho-geriatric care – 7 in total
  - Paediatricians funded through APP due to service volume that would not support all four (4)
  - No Neurosurgery or Cardiothoracic Surgery

Supplementary Documents

1. Department of Surgery Annual Report to Medical Staff
2. 2010-2015 Community Health Plan
3. Population and Literacy Profile of AVH
4. Strengthening Primary Health Care – Vision for Community Health Centres, Renovation Report
5. Letters from physicians (3)
6. AVH Leadership Information
7. AVH Physician Survey 2006, 2008, 2011
8. AVH Teaching Statistics

Submission (email) – AVH Chief of Surgery

. Expansion of our department could be undertaken if appropriate resources were allocated for that. A copy of the document[54] has been provided to you at the meeting, which summarizes our surgical services.

[54] Annapolis Valley Health, Physician Resource Plan Response, June 24, 2011

Key (selected) Challenges

- Psychiatry recruitment as part of the overall mental health strategy is essential. AVH has been able to recruit 2 British trained/academic psychiatrists this year. Part of this success can be attributed to the fact that CDHA is no longer hiring psychiatrists. Will need four more over the coming five years to replace aging psychiatrists.
- Vascular surgery is provided to the tridistrict area. Recognition for the need of and remuneration for regional vascular coverage is essential to its future.
- Urology services should be provided to the tridistrict area.
- Sustainable staffing of community emergency rooms will be difficult.
- Palliative Care services must be offered locally as close to the patient as possible and the structure of the services should be similar and the distribution of the resources fair.
- Difficulty in attracting new graduates to the more rural areas of our district (Berwick, Middleton and Annapolis). Salaried funding for FPs must be generally available (especially in areas of need).

Submission – AVH Department of Surgery, Annual Report to Medical Staff, June 7, 2011

The Department of Surgery is presently functioning with 24 members. Surgical and consultation services are provided in our district at Valley Regional Hospital and Soldiers Memorial Hospital with consultation services at Annapolis Community Health Centre. Some members also provide surgical and consultation services in Windsor (CDHA), Bridgewater (SSDHA) and Yarmouth (SWDHA).

- A new provincial wait time registry (PAR NS) has given us objective data supporting our efficiencies and wait lists compared to other areas of the province.
- **Our 2 primary areas of concern in achieving more appropriate wait times are Orthopedic Surgery and Ophthalmology**. Both specialties are significantly outside reasonable wait times for surgery. All other surgical disciplines are able to complete surgeries within or near expected timelines. This database does not presently accumulate accurate Wait-1 data (time from referral to first assessment by surgeon).
- Teaching of medical students and residents remains active. Lack of accommodations for residents is a factor preventing us from offering core community rotations.
- Two proposals presently being pursued through the Department of Health and Wellness include:
  - *Provision of Urology service at SSDHA and SWDHA sites. The hope is this will lessen the burden on AVDHA resources especially for local cystoscopy.*
  - *Creation of 6th Orthopaedic Surgery position*

Orthopedic Surgery

- *5 members (4 with full-time OR privileges, 1 semi-retired)*
- *2 replacement members interested in starting in next 9 months*
- *Creation of 6th position required to accommodate both*
- *Satellite services in CDHA, SSDHA and SWDHA*
- *365 days on call coverage for all of western NS*

Vascular Surgery

- *2 members*

- *Regional service for AVDHA, SSDHA and SWDHA*
- *Satellite services in SSDHA and SWDHA*
- *Both members participate in General Surgery call schedule*

UROLOGY

- *3 members*
- *No other Urology services provided in western NS*
- *Satellite consultations at Annapolis Community Health Centre (AVDHA)*
- *Present volume from AVDHA 50%, SSDHA 25%, SWDHA 20%, CDHA 5%*
- *Presently pursuing satellite consultation and operative services at both SSDHA and SWDHA (will likely require 4th Urologist if approved)*
- *Significant amount of primary Urology goes to Halifax from SSDHA and SWDHA*

GENERAL SURGERY

- *5 members (2 also do Vascular Surgery)*
- *365 days on call coverage*

OBSTETRICS/GYNECOLOGY

- *5 members*
- *750-850 deliveries per year at Valley Regional Hospital*
- *Satellite consultation services in Windsor, Middleton, Annapolis Royal*
- *Only obstetric centre between Halifax and Yarmouth on Highway 101*
- *65 days on call coverage*

OTOLARYNGOLOGY

- *2 members*

OPHTHALMOLOGY

- *3 members (2 operative, 1 medical only)*
- *Surgical services provided at Soldiers Memorial Hospital*

ORAL SURGERY

- *1 member*

Submission (email) – AVH Vascular and General Surgeons

Below is some supplementary information and emphasis to consider for physician resource planning, specifically from the perspective of General and Vascular Surgery.

VASCULAR SURGERY

- *There are two Vascular Surgeons here (one also works in the ICU). The catchment for vascular is unofficially and essentially Districts 1, 2 and 3*

- *We officially cover call 1 in 5 but get called about vascular consults often otherwise*
- *One travels (at his own expense) to vascular satellite clinics in Yarmouth and Lunenburg; the second has recently given this up*
- *Fairly routinely see arterial consults from the Windsor area (actually Capital District) and certainly do the lion's share of venous surgery for the province*
- *Practice is probably roughly 75% vascular and 25% general*
- *Vascular surgery is resource intensive and the ability to practice it here in a "regional" setting depends on a unique and robust set of physicians, nurses and other resources including ICU, Internal Medicine, Anaesthesia, Cardiology, Diagnostic Imaging (including 2 - 3 vascular radiologists)*
- *Provision of vascular surgery services for the province is unorganized and ad hoc*

GENERAL SURGERY

- *Five General Surgeons. General Surgery call is covered continuously.*
- *Two of the five do primarily vascular.*
- *One other does most of the breast surgery and will probably be gravitating more exclusively toward this in the next 1 - 2 years but for now participates equally in General Surgery call.*
- *The two others are bread and butter General Surgeons; mostly GI / abdominal, a bit of head and neck.*
- *We have General Surgery residents increasingly frequently from DFM and elsewhere. They are scheduled essentially continuously now for the next year or more.*

The points above about the ability to keep patients in the valley may also apply to urology and orthopaedic surgery.

Background Data

Figure 130 Medical Learner Report 2009-10 (Source: DFM)

Year	Total Rotations	Students	Residents	Observers
2010	140	71	30	8
2009	113	69	11	12

18.4 Colchester East Hants Health Authority (CEHHA) – Interview(s)

Population Need

- Health System Design
  - Management and physicians concerned about the number of DHAs
  - Supports need for funding to follow the patient
  - Deficient home care resources
  - Waitlists are manageable except for diagnostic imaging services

- Infrastructure
  - Unknown variable will be the new hospital and its ability to improve efficiencies in outpatient care and in the operating room
- Mental Health
  - Mental health services will become more acute with concerns about overuse of ED for these patients – need to recruit more Psychiatrists
  - Team-based care for child and adolescent Psychiatry
  - Deficient in available psychiatric services for adults
  - Inadequate mental health infrastructure
- Social-economic
  - Population of 73,000 with aging demographics; continues to increase slowly
  - Anticipated shift in morbidity
  - High outflow of patients, especially to HRM which is only 25 minutes away – undetermined ability to repatriate – complicated by large number of patients who also work in HRM – estimated 50:50 inflow: outflow ratio – low specialist population relative to general population, especially Internal Medicine

Physician Supply

- Generalist Disciplines
  - Minimal collaborative care model uptake other than more peripheral communities – no anticipated growth
- Critical mass
  - Physicians concerned about on-call ratios
- Medical Education
  - Relationship with Faculty of Medicine has grown over past two years as teaching and mentoring becomes more formalized – but still concerned about the absence of trained generalists
- Specific Disciplines
  - Active surgical program for breast cancer and colorectal cancer
  - Active satellite chemotherapy centre
  - Urology referral centre – needs an additional Urologist
  - Active in Ophthalmology and joint replacement
  - Supports tri-county approach to diagnostic services – two (2) young Pathologists located in Truro

Supplementary Documents

1. Physician Resource Needs Survey
2. Population Health Needs Report

Background Data

Figure 131 DHA4 - Hospitals by County – Total Days Stay (LOS) and change in RIW – 2005-2010 (NS Hospital Discharge Data)

No.	DHA	COUNTY	Institution Name	Role	2005 LOS	2010 LOS	Change %Total LOS	Change % Total RIW	Change % Avg RIW/ Patient
18	DHA 4	Colchester	Colchester Regional Hospital	Acute Care	31719	35420	11.7%	10.3%	17.9%
32	DHA 4	Colchester	Lillian Fraser Memorial Hospital	Acute Care	2733	2503	(8.4%)	(17.6%)	28.8%
	DHA 4 Total				34452	37923	10.1%	8.2%	18.8%

18.5 Cumberland Health Authority (CHA) – Interview(s)

Population Need

- Emergency Care
  - CHA would find value in a statement on the maximum on-call responsibilities
- Health System Design
  - As the smallest DHA, no ability to pay competitive locum tenens rates when competing with regional hospitals
  - No APPs have been approved for CHA
  - Challenge to capture accurate workload in a model – e.g., a 1 in 2 on-call requirement is not acceptable, but workload is diminished due to historical referral patterns to Moncton – improving but still report 20% of surgical cases are done in Moncton
- Mental Health
  - Approach to mental health services across the province needs to be modernized, including a redistribution of physician specialties and numbers
  - Patient numbers do not allow for psychological services, social work, and occupational services
  - Need to examine full range of mental health emergency, inpatient, day patient, and outpatient needs and then to site these services correctly – only then ascertain required professional resources, including physicians
  - Whether local or regional, service categories can be contemplated as one of child, young adult, adult, and psycho-geriatric
  - Priority should always be a child under age 5 years due to the pressure of time
  - Psychiatric care provided by 2 FTEs and an 0.6 FTE and a 0.5 FTE – missing full child psychiatric care – goal is two more FTE Psychiatrists – current deficiency in addiction services – there are no inpatient psychiatric beds (hence Truro dependency) – good mental health infrastructure and allied health professionals
  - GP mental health position recently filled and holds promise for additional needed care
- Social-economic
  - Population of 33,000 is actually 40,000 when including patients from southeast New Brunswick
  - Most elderly population in province with the least education and highest poverty levels
  - High burden of chronic disease management

Physician Supply

- Generalist Disciplines

- Probably the correct number of GPs but requirement is to practise in a different, integrated model
- Three (3) established and successful collaborative care practices – could grow and be the answer to physician resource shortfalls; however, ongoing resistance by many physicians who are FFS – may not change until the next generation of physicians is recruited

- Critical mass
  - Oncology services provided in Moncton and Halifax
  - Breast surgery is referred out of district
  - Thyroid surgery performed in CHA by ENT
  - Colorectal surgery performed locally – need to examine service volumes

- Medical Education
  - Relationship with Faculty of Medicine is maintained as a supportive teaching site for family medicine and cross-appointments for some specialists
  - Belief that Dalhousie has not been producing enough generalists in any discipline

- Specific Disciplines
  - Neonatal care standards need to be elevated throughout the province
  - Two (2) General Internists – requires use of locum tenens to ensure continuous coverage – expensive model – optimal coverage would be four (4) General Internists – could be three (3) FFS and a semi-retired fourth with an interest in any of Haematology, Respirology, Rheumatology
  - ICU coverage is for 24 hours, during which time that Internist does not have an office practice
  - ENT from CEHHA and PCHA comes to Amherst – without the ENT service volume, it would be very difficult to retain adequate Anaesthesia coverage in CHA
  - Urology goes to Truro
  - Orthopaedic Surgery goes to New Glasgow
  - Stable specialties are ENT (2), General Surgery (2 + 0.5), Anaesthesia (3-4), and part-time Ophthalmology (from HRM)
  - Deficient in community palliative care
  - Deficient in geriatric and psycho-geriatric care
  - Current Obstetrics complement is 1.5 with decreasing involvement by family doctors suggesting enough work for two (2) Obstetricians – current 180 deliveries will likely rise to 250 through repatriation after epidural service is introduced shortly
  - No Paediatrician in CHA and none planned – paediatric services are provided in Moncton and Truro
  - Recommend northern shared chronic pain services for CHA, CEHHA, and PCHA

Supplementary Documents

1. Letters from Dr.'s Gradstein, Moss, Szczesny
2. Physician contact list
3. CHA Strategic Plan
4. CHA Services and Population Health

Background Data

Figure 132 DHA5 - Hospitals by County – Total Days Stay (LOS) and change in RIW – 2005-2010 (NS Hospital Discharge Data)

No.	DHA	COUNTY	Institution Name	Role	2005 LOS	2010 LOS	Change %Total LOS	Change % Total RIW	Change % Avg RIW/ Patient
30	DHA 5	Cumberland	Cumberland Regional Health Care Centre	Acute Care	19930	21371	7.2%	5.7%	29.6%
35	DHA 5	Cumberland	North Cumberland Memorial Hospital	Acute Care	892	739	(17.2%)	(33.5%)	59.9%
58	DHA 5	Cumberland	Bayview Memorial Health Centre	Acute Care	435	418	(3.9%)	(11.5%)	(21.3%)
49	DHA 5	Cumberland	South Cumberland Community Care Centre	Acute Care	359	373	3.9%	0.1%	50.1%
	DHA 5 Total				21616	22901	5.9%	3.6%	30.8%

18.6 Pictou County Health Authority (PCHA) – Interview(s)

Population Need

- Infrastructure
  - Management support for consolidation of services over the next ten years – mixture of both retaining and relinquishing
  - Ten (10) ICU beds but only need six (6) – some ICU beds used for palliative care
  - Collaborative care model seen by management as the long-term solution; there are three (3) sites currently but any anticipated growth will impact on PRP, particularly in elderly community in need of chronic disease management
  - Mental health reform seen as needing improved infrastructure and team-based care with leverage of telemedicine and tertiary care access – but a barrier between rural and academic access – greatest deficiencies are psycho geriatric care plus one child/adolescent Psychiatrist – envisions a program of psychiatric care within a provincial resource model
- Mental Health
  - Mental health services not functioning optimally – long stays and suboptimal outcomes – short stay unit stabilizes non-certifiable patients – no Psychiatrist now other than 0.2 FTE plus locum tenens support – Truro is referral centre for certifiable patients
- Social-economic
  - Residents are characterized as an elderly population

Physician Supply

- Generalist Disciplines
  - 5,000 residents do not have a family doctor
  - Shared sexual assault and maternal services with GASHA
- Critical mass
  - PCHA is a Level 2 site that has struggled with core services
- Medical Education
  - Constructive and supportive relationship with Dalhousie – 30 students and residents over the past year – many bridges built as an undergraduate medical education site
- Specific Disciplines
  - Historic and ongoing difficulties with funding and staffing the emergency department
  - Cannot afford to provide all current services – sustainability requires a change in the service profile

– Prepared to redefine core services based on population need
– Management believes that the current physician complement is about right – the need is to deliver care differently and to support role optimization
– Palliative care is strong but end-of-life planning is weak
– Internal Medicine is no longer stable – ICU was closed for 6 days in 2008 – Cardiologist, Gastroenterologist, three (3) General Internists who are active plus one that is winding down and not part of the on-call roster
– Two (2) General Surgeons – stable and longstanding number
– Four (4) Anaesthetists – stable
– Two (2) Obstetricians with only one (1) family doctor doing obstetrics
– Medical Officer of Health to start in September – intention is a shared service
– ENT to Antigonish
– Urology to Truro
– Plastic Surgery to Antigonish and will likely switch to Sydney
– Cancer care has been a concern from perspective of critical mass – shortage of Pathology services may be addressed by arrangement with Antigonish
– Diagnostic services for cancer care are functioning well
– Satellite chemotherapy site is not functioning well due to the absence of GP oncological support
– Cape Breton and HRM provide radiotherapy – PCHA management supports the concept of surgical oncological services at those sites

Supplementary Documents

1. PCHA Demographics and Physician Profiles
2. 2009 Report Card on Health

Background Data

Figure 133 DHA6 - Hospitals by County – Total Days Stay (LOS) and change in RIW – 2005-2010 (NS Hospital Discharge Data)

No.	DHA	COUNTY	Institution Name	Role	2005 LOS	2010 LOS	Change %Total LOS	Change % Total RIW	Change % Avg RIW/ Patient
11	DHA 6	Pictou	Aberdeen Hospital	Acute Care	32751	36203	10.5%	2.5%	14.4%
	DHA 6 Total				32751	36203	10.5%	2.5%	14.4%

18.7 Guysborough Antigonish Strait Health Authority (GASHA) – Interview(s)

Population Need

- Health System Design

  – Some regional collaborative care with a potential for only marginal growth
  – Have not given up on shared services despite failure to sustain public health and addiction shared services with CBDHA

- Infrastructure

  – Arishat is a francophone community within the health authority boundaries but is not considered to be part of GASHA
  – Dialysis unit is run remotely from HRM

- Social-economic
  - Significant population outside of Antigonish is elderly

Physician Supply

- Generalist Disciplines
  - 95% of GASHA residents have a family doctor
  - Generally believed that family physicians tend to service a smaller number of patients more frequently and generate a false sense of access to care
- Critical mass
  - Concern expressed that comprehensive levels of care will diminish over time
- Specific Disciplines
  - Cancer care is considered a satellite of Cancer Care Cape Breton; one of the Sydney Oncologists provides a travel service to Antigonish
  - Three (3) General Surgeons with elective volumes less than ideal but protective of on-call ratio – two (2) of the surgeons are in their late 50s and are contemplating retirement
  - Single Respirologist with lower service volume than ideal; many Respirology patients prefer to go to Dartmouth for their specialty care
  - Two (2) Obstetricians with two (2) midwives and only one GP providing obstetrical services – recent successful recruitment will increase the number of Obstetricians to three (3) – 400 deliveries annually (similar to New Glasgow – 35 minutes away)
  - Paediatric APP is functioning but does not reflect the actual work being done
  - Adult Psychiatrist recently recruited
  - Orthopaedic Surgery sent to New Glasgow
  - Urology sent to Truro
  - Neurology is a visiting service from HRM
  - Three (3) Ophthalmologists
  - Three (3) Radiologists and a fourth being recruited
  - One (1) Plastic Surgeon – does very little cosmetic work – enough overall work to support a second
  - Two (2) Pathologists – considering the recruitment of a third if the service provided to New Glasgow is formalized
  - One (1) cardiorespiratory NP based at hospital in Antigonish

Supplementary Documents

1. 2006-2009 Strategic Plan and 2010-2011 budget for health promotion and protection
2. 2010-2011 payment summary
3. GASHA hospitals and services
4. Physician Survey Report 2011 and
5. GASHA Medical Staff - Specialty, Location, FTE status, Compensation model
6. Who and Where Are We?
   - Demography and Economy
   - Literacy rates
   - Health - Insurance coverage, Access to a doctor, Difficulty with medical specialists , Mental health,
   - Public Health - Physical activity levels, Chronic conditions, Stress levels., Dietary review, Second hand smoke, Alcohol use, Illicit drug use, Gambling, BMI measurements

Background Data

Figure 134 DHA7 - Hospitals by County – Total Days Stay (LOS) and change in RIW – 2005-2010 (NS Hospital Discharge Data)

No.	DHA	COUNTY	Institution Name	Role	2005 LOS	2010 LOS	Change %Total LOS	Change % Total RIW	Change % Avg RIW/ Patient
43	DHA 7	Antigonish	St. Martha's Regional Hospital	Acute Care	24353	22387	(8.1%)	3.4%	(0.3%)
27	DHA 7	Guysborough	Guysborough Memorial Hospital	Acute Care	2220	2445	10.1%	25.6%	(26.7%)
45	DHA 7	Guysborough	St. Mary's Memorial Hospital	Acute Care	1232	1511	22.6%	(4.2%)	88.6%
22	DHA 7	Guysborough	Eastern Memorial Hospital	Acute Care	949	1322	39.3%	40.5%	(13.1%)
68	DHA 7	Richmond	Strait - Richmond Hospital	Acute Care	5198	6019	15.8%	25.1%	12.9%
	DHA 7 Total				33952	33684	(0.8%)	8.3%	0.1%

18.8 Cape Breton District Health Authority (CBDHA) – Interview(s)

Population Need

- Emergency Care
  - Inadequate number of physicians (need 25) to sustain four emergency departments as 24/7 units across the district
  - Recognized by many that there will be a restructuring process that provides urgent care when most needed and closures during low volume times
  - Fewer centres are likely to have 24/7 coverage
- Health System Design
  - It is difficult to identify CDHA physicians and a particular scope of practice in order to facilitate efficient patient referral for sub-specialty care
  - Cape Breton has remote areas
  - Demand and supply change on an annual basis
  - Shared services are not a priority – previous two (Public Health; Addiction Medicine) are no longer shared services
  - No appetite for APPs among high-earning specialties – low volume, high intensity specialties are APPs
  - Collaborative care, shared EMR for a virtual group practice, and nurse practitioners are all important elements of care delivery model
  - Enhanced paramedic program not anticipated to impact on physician resource planning with possible exception of more remote communities
- Infrastructure
  - Increased supports are needed for specialty services; however, the district is well aware of budgetary constraints across the health sector
  - Public Health is no longer a shared service with GASHA
  - Cancer care is essentially based in Sydney; 90% of Cape Breton cancer care is provided within the four hospitals that constitute the Cape Breton health care complex
  - Cancer Care Cape Breton is autonomous from Cancer Care Nova Scotia; general resistance to a provincial cancer care program as this would threaten the regional program
- Mental Health
  - Current estimate of a 2-month waiting list for an urgent psychiatric consultation
  - Emergency consultations follow a defined protocol and are seen within five days

- Addiction services are no longer a shared service with GASHA

- Social-Economic
  - The district population experiences chronic high unemployment, low levels of education, a large aboriginal population, and a higher than usual, rural population
  - Overall population is declining, including out-migration of youth; anticipate an annual population decline of 1,000 for each of the next ten years
  - Exception to population trends is the first nations population, currently at 6,000 and representing 40% of the first nations population in Nova Scotia
  - History of high demand for medical services and higher than usual morbidity
  - Significant poverty
  - Second oldest population in Nova Scotia
  - Collective, the social-economic factors increase utilization significantly
  - Life expectancy is two years lower than the rest of Canada
  - Many Cape Breton residents continue to resist medical travel to HRM

Physician Supply

- Generalist Disciplines
  - Lack of generalists in comparison to subspecialists
  - Growing need for generalists outside HRM;
  - More and more subspecialists outside HRM but subspecialists often are not the physician most responsible for inpatient case management.
  - Subspecialists in the district have, of necessity, a generalist practice given the size of the population
  - Earlier adopters of telemedicine and still growing

- Critical mass
  - Importance of a sustainable on-call rota due to remote geography, distance, and need for comprehensive care
  - There are three regional programs – Cancer Care, Neonatology, Rehabilitation – none of these are full scope but are important, each demonstrating the balance between critical mass, service volume, and travel distance

- Medical Education
  - Pressing need to review and revise the Dalhousie medical education system so as to graduate physicians in disciplines and areas of declared special interest and training that align with the needs of Nova Scotians and in particular the needs residents outside of HRM
  - Revision of the academic mandate requires a multi-prong strategy that includes a strong communications plan, improved allocation of dedicated seats for qualified rural Nova Scotia applicants, longer mandatory rural rotations for both undergraduates and postgraduates
  - Cape Breton is a family medicine training site for Dalhousie; CB physicians strongly support growth in distributive education
  - There are six training positions annually and a retention rate of approximately 30%
  - Would like to see QEII provide fewer primary and secondary services and focus on tertiary and quaternary services

- Specific Disciplines

– Rural communities have ongoing shortages of primary care physicians; 96% of residents have a family physician but still a challenge of access
– Ophthalmology is based in Glace Bay
– Plastic Surgery, Dental Surgery, and Orthopaedic endoscopy based in New Waterford
– Otolaryngology, General Surgery, Gynaecology, and Urology based in Northside
– Remaining specialties are based in the regional hospital in Sydney
– Dialysis unit could not be sustained in the absence of a vascular surgeon in Sydney
– Neurosurgeon is within two years of retirement; there are no plans to replace him
– Significant is the absence of a full-time Medical Officer of Health – at the time of merger, 12 years ago, there were two but recruitment has been unsuccessful – this represents a significant physician resource gap and forces public health initiatives to be reactive rather than proactive
– Addiction and mental health services are now a single program – 14 Psychiatrists (not all hospital-based) – further support by locum tenens, social workers, psychologists – Psychiatrists provide a modest travel program and also utilize telemedicine
– Two regional methadone clinics – most drug abuse is outside Sydney

Supplementary Documents

1. 2008 Our Health
2. 2011 Physician Resource Plan
3. Cardiovascular Health Indicators Report

Background Data

Figure 135 DHA8 - Hospitals by County – Total Days Stay (LOS) and change in RIW – 2005-2010 (Source: NS Hospital Discharge Data)

No.	DHA	COUNTY	Institution Name	Role	2005 LOS	2010 LOS	Change %Total LOS	Change % Total RIW	Change % Avg RIW/ Patient
87	DHA 8	Cape Breton	Cape Breton Health Care Complex	Acute Care	119010	121923	2.4%	3.0%	15.6%
34	DHA 8	Inverness	Inverness Consolidated Hospital	Acute Care	10359	10380	0.2%	5.0%	30.0%
47	DHA 8	Inverness	Sacred Heart Hospital	Acute Care	2580	2557	(0.9%)	(4.1%)	41.7%
53	DHA 8	Victoria	Victoria County Memorial Hospital	Acute Care	3724	3379	(9.3%)	(11.7%)	38.5%
15	DHA 8	Victoria	Buchanan Memorial Hospital	Acute Care	1461	1355	(7.3%)	(11.0%)	15.2%
	DHA 8 Total				137134	139594	1.8%	2.5%	17.9%

Submission(s) - CBDHA

As with AVH, CBDHA has recently completed a physician resource plan[55]. The left hand figure is provided by CBDHA. The right hand figure is per the Consultant data FTE analysis using 2009/10 data. The values are quite comparable.

[55] CBHA Physician Resource Plan, July 2011

Figure 137 CBDHA Physicians count July 2011 (Source: CBDHA submission)

FAMILY PHYSICIANS IN CBDHA	Number	Percent
Total Family Physician Count	**114**	
Family Practice	93	82%
E.R. Only	14	12%
Part-Time E.R.	35	
Obstetrics Only	0	0%
Part-Time Obstetrics	30	
Palliative Care Only	2	2%
Part-Time Palliative Care	7	
Part-Time Addictions	4	
Geriatric Only	1	1%
Other	3	3%
Alternate Payment Plan	19	17%
Fee-for-Service	95	83%
Group/Collaborative Practice	31	27%
Solo Practice	83	73%
Nurse Practitioners	7	
Total Family Physician FTE	**104.4**	

Figure 136 CBCHA FTE and Count by Specialty July, 2011 (Source: CBDHA submission)

	Category	Speciality	Count	F.T.E.
1	Diagnostic & Therapeutic	Diagnostic Imaging	14	14
2	Diagnostic & Therapeutic	Laboratory Medicine	6	6
3	Diagnostic & Therapeutic	Physiatry	1	1
4	Diagnostic & Therapeutic	Radiation Oncology	2	2
5	Medical	Cardiology	4	4
6	Medical	Dermatology	2	2
7	Medical	Endocrinology	1	1
8	Medical	Gastroenterology	2	2
9	Medical	General Internal Medicine	5	5
10	Medical	Geriatrics	2	2
11	Medical	Hematology	1	1
12	Medical	Infectious Disease	1	1
13	Medical	Medical Oncology	4	3.2
14	Medical	Neonatology	1	1
15	Medical	Nephrology	3	3
16	Medical	Neurology	2	2
17	Medical	Pediatrics	6	4
18	Medical	Perinatal Medicine	4	4
19	Medical	Psychiatry	15	13.4
20	Medical	Respiratory	2	2
21	Medical	Rheumatology	1	1
22	Surgical	Anaesthesia	9	8
23	Surgical	Chest/Thoracic Surgery	1	1
24	Surgical	General Surgery	7	4.9
25	Surgical	Neurosurgery	1	1
26	Surgical	Ophthalmology	7	6.5
27	Surgical	Orthopedics	6	6
28	Surgical	Otolaryngology	3	3
29	Surgical	Plastic Surgery	1	1
30	Surgical	Urology	2	2
31	Surgical	Vascular Surgery	2	1.8
		Total	118	109.8

Figure 138 – CBDHA - Current Recruiting, including replacements, Needs, July, 2011 (Source: CBDHA submission)

Challenges of Recruiting Physicians in Rural Cape Breton

Location	Vacancy
Core Services	
Baddeck	1
Neils Harbor	1
Inverness	2
Cheticamp	0
Family Physician	
Glace Bay	2
New Waterford	1
Northside	1
Sydney	2
E.R. Physician	
Regional	3
Glace Bay	2
Northside	3
New Waterford	2

Recruitment

Current budgeted complement is 141 with 118 filled currently. Currently recruiting 18 FTE plus Emergency Medicine.

General Surgery – Recruiting 3.1 FTE additional to get to target complement of 8.0 FTE. Emergency Medicine – Will need to recruit an additional 7.0 FTE to meet new provincial standards in addition to 25.0 currently.

18.9 Isaac Walton Killam Health Centre (IWK) – Interview(s)

Population Need

- Health System Design
  - Raises question of whether specialties and subspecialties are being used properly
  - Need further data on travel by physicians providing care to other centres
  - Travelling specialists generally bill other jurisdictions using sessional rates – uncertain of allocation process
  - Increasing numbers of childhood cancer survivors and ex-premature babies – enhanced levels of after care
  - Envisions specialty care to be contemplated from a national perspective
  - Decisions should all be data-driven
  - Believes that care today has evolved through availability of care rather than need – consequence is that we now have a system where the wrong numbers of the wrong types of physicians practice in the wrong places
  - Allocation processes for all disciplines have followed history and local planning rather than logic, often driven by funding sources rather than need
  - Sees this PRP exercise as the beginning of a journey
- Infrastructure
  - Variable use of advanced practice nurses – especially Neonatology and some Haematology/Oncology
  - Linkage between academic care and community care is ideal but difficult to achieve and integrate
- Social-economic
  - Service provision to four provinces – mostly NS, NB, PE – hearts and kidneys from NL
  - Declining paediatric population is now a steady state – increased deliveries last year – increased number of critically ill babies
  - Age cohort to 16 years of age except mental health to 19 years

Physician Supply

- Generalist Disciplines
  - 60% of IWK deliveries are by GPs – 60-70 participating GPs who also care for healthy newborns
  - Participates in collaborative care models – North End, Child Psychiatry, Community Mental Health, Duffus Street
- Critical mass
  - Not applicable
- Medical Education
  - Will be an increased demand for teaching due to revised curriculum and increased student body
  - Relative to size, Department of Paediatrics plays a large role in education
  - Broad-based research mandate
  - Believes that all training programs for specialties should be national and subsequent physician resource planning should be national – 60 Orthopaedic Surgeons are trained annually in Canada.
- Specific Disciplines

- See sections on individual paediatric and obstetrical specialties
- Dwindling number of community Paediatricians
- Major driver of utilization over next ten (10) years will be Genetics – an undetermined and unmeasured downstream impact – also increased health promotion and prevention activity
- Blood and marrow transplants are referred out-of-province with follow up care at IWK
- Maritime paediatric obesity an increasing utilization driver
- Four (4) paediatric Orthopaedic Surgeons in Nova Scotia – this is enough – only 37 in Canada

Supplementary Documents

1. Department of Paediatrics Division/Service Summaries
2. Department of Paediatrics Clinical Academic and Research Expectations Model
3. Clinical Academic Research Expectations – Division of Haematology/Oncology
4. IWK AFP FTE – Internal Medicine
5. IWK Strategic Plan
6. IWK discharges by service and DHA or jurisdiction

Background Data

Figure 139 IWK Health Centre – Total Days Stay (LOS) and change in RIW – 2005-2010 (Source: NS Hospital Discharge Data)

No.	DHA	COUNTY	Institution Name	Role	2005 LOS	2010 LOS	Change %Total LOS	Change % Total RIW	Change % Avg RIW/ Patient
86	n/a	Halifax	IWK Health Centre	Child Health	69237	66106	(4.5%)	1.1%	(3.9%)
	IWK Total				69237	66106	(4.5%)	1.1%	(3.9%)

18.10 Capital District Health Authority (CDHA) – Interview(s)

Population Need

- Health System Design
  - Key is understanding the various stressors generated through the need for providing levels of care from primary through quaternary
  - Struggles with being a tertiary and quaternary centre that is a provincial and Maritime resource while, at the same time, is in essence a community hospital to HRM
- Social-economic
  - Sensitive to a large number of competing and overlying drivers of utilization

Physician Supply

- Generalist Disciplines
  - See supplementary documents
  - Heavily invested in primary care
- Critical mass
  - Not applicable
- Medical Education
  - Strong linkage

- Need to improve integration of academic need with populations need
- Academic mandate has driven their physician resource planning

- Specific Disciplines
  - Ongoing efforts to build spokes into the communities
  - See supplementary documents
  - See individual specialty sections of ES

Supplementary Documents

1. Key Indicators Report
2. Physician Survey Report 2011
3. Capital Health's Strategic Indicators Report 2011-08-16
4. Patient Flow Project – Halifax Infirmary
5. 2010-2013 Business Plan
6. Capital District Health Mental Health Program
7. Collaborative Care Initiative
8. Divisional Summaries of Triage and Wait Time Standards (Cardiology, Dermatology and Cutaneous Science, Endocrinology, Gastroenterology, General Internal Medicine, Geriatric Medicine, Haematology, Infectious Diseases, Medical Oncology, Nephrology, Neurology, Palliative Medicine, Physical Medicine and Rehabilitation, Respirology, Rheumatology, Palliative Medicine, Neurology, Nephrology

Background Data

Figure 140 DHA9 - Hospitals by County – Total Days Stay (LOS) and change in RIW – 2005-2010 (Source: NS Hospital Discharge Data)

No.	DHA	COUNTY	Institution Name	Role	2005 LOS	2010 LOS	Change %Total LOS	Change % Total RIW	Change % Avg RIW/ Patient
85	DHA 9	Halifax	Queen Elizabeth II Health Science Centre	Acute Care	237151	249226	5.1%	13.0%	8.5%
65	DHA 9	Halifax	Dartmouth General Hospital	Acute Care	45061	47808	6.1%	17.8%	1.7%
77	DHA 9	Halifax	Nova Scotia Hospital	Mental Health	25140	36203	44.0%	37.3%	219.5%
23	DHA 9	Halifax	Eastern Shore Memorial Hospital	Acute Care	2909	3854	32.5%	14.4%	182.0%
52	DHA 9	Halifax	Twin Oaks Memorial Hospital	Acute Care	2908	2050	(29.5%)	(28.4%)	7.1%
33	DHA 9	Halifax	Musquodoboit Valley Memorial Hospital	Acute Care	1636	1258	(23.1%)	(28.6%)	21.4%
37	DHA 9	Hants	Hants Community Hospital	Acute Care	10887	12742	17.0%	16.3%	83.3%
	DHA 9 Total				325692	353141	8.4%	14.2%	11.6%

18.11 What We Heard from DHAs

Key Observations from interviews with DHAs

- Need for improved access to quality mental health services cited by seven DHAs.
- Five DHAs cited population with high social need linked to low income, low education, and moderate to high unemployment.
- Need for generalists cited by seven DHAs.
- Opportunities to expand collaborative care model penetration cited by five DHAs.
- Majority felt that relations and engagement was generally good with DFM.
- Consensus that DFM needs to train more generalists
- All DHAs have high interest in contributing to the PRP project and most have provided substantial submissions to the Consultant.

19 PROVINCIAL & DHA – PHYSICIAN PROFILES

This section examines the current provincial and DHA physician profiles including age and gender.

19.1 Provincial

As identified earlier in the section on National Physician Profile, at an aggregated level, based upon 2008/09 CIHI data, Nova Scotia has more physician FTEs per population than the national average and more than many provinces. This is the case at an aggregate level in adult and child medical and surgical specialties. In family medicine/general practice Nova Scotia is third (997 per FTE) and just above the national average of 957. The national average is heavily weighted by Ontario at 856 population per FTE.

Figure 141 Inter-Provincial comparison of Population per Physician FTE, 2008/09 (Source: CIHI)

Population per Physician FTE (FFS plus Alternate Payments), 2008–2009	N.L.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Canada
Family/General Practice	979	1,046	997	1,136	1,027	856	1,014	981	1,117	1,011	957
% of national average	102%	109%	104%	119%	107%	89%	106%	102%	117%	106%	100%
Medical Specialties	1,986	2,532	1,460	2,424	1,609	1,875	1,947	2,814	2,847	2,377	1,945
Surgical Specialties	4,122	4,867	3,586	3,657	4,043	3,648	4,391	4,003	5,220	4,128	3,972
Total Physician FTEs	566	642	509	638	543	506	579	616	695	605	552
Total Physician - COUNT	1,213	298	2,343	1,593	16,427	24,596	2,399	1,836	6,772	9,611	67,088
Population/Physician Count	417	464	396	465	468	521	497	546	519	450	490

Figure 142 Provincial ratio of population per FTE by Functional Specialty, March 31, 2010 (Source: PHReD)

Licensed Specialty	PROVINCE TOTAL	POP Nova Scotia (All) / FTE
Anatomic Pathology	24.3	38,747
Diagnostic Radiology	78.9	11,941
General Pathology	5.3	179,525
Haematological Pathology	7.2	130,229
Medical Biochemistry	2.0	471,253
Medical Genetics	0.7	1,346,437
Medical Microbiology	3.0	314,169
Neuropathology	2.0	471,253
Nuclear Medicine	4.2	224,406
Radiology - Oncology	13.1	71,903
Diagnostic & Therapeutic - Subtotal	**140.8**	**6,696**
Emergency Medicine	6.2	152,847
General Practitioner [1]	832.4	1,132
Palliative Medicine	2.1	448,303
Family Medicine/Practice - Subtotal	**840.7**	**1,121**
Cardiology	33.2	28,415
Community Medicine	1.8	538,575
Critical Care Medicine	12.9	73,029
Dermatology	17.3	54,502
Emergency Medicine	65.5	14,381
Endocrinology & Metabolism	5.3	176,594
Gastroenterology	17.5	53,829
General Internal Medicine	43.5	21,652
Geriatric Medicine	11.2	83,943
Haematology	10.6	88,649
Infectious Diseases	7.1	131,936
Medical Oncology	17.4	54,137
Nephrology	17.7	53,268
Neurology	20.8	45,242
Occupational Medicine	5.4	176,169
Palliative Medicine	9.1	103,572
Physical Medicine & Rehabilitation	11.5	81,957
Psychiatry	129.7	7,268
Psychiatry - Forensic	4.0	235,627
Respiratory Medicine	11.8	80,173
Rheumatology	12.4	76,201
Medical - Subtotal	**465.7**	**2,024**

[1] Includes the equivalent of 38 FTE GPs (without CCFP (EM)) who work in Emergency Departments across the DHAs.

The adjacent figure presents a more refined and updated picture of the provincial population (all ages and ages 0-17 for paediatric specialties) per FTE as of March 31, 2010.

Among the generalist disciplines:

- NS family/general practice is 1 FTE per 1,121;
- NS general internal medicine is 1 FTE per 21,652;
- NS psychiatry is 1 FTE per 7,268;
- NS general paediatrics 1 FTE per 4,075 under age 18;
- NS general surgery 1 FTE per 18,258, and
- NS obstetrics & gynaecology 1 FTE per 19,818.

Physician Workforce Profile - Provincial 2009/10 (Source: MSI

PHReD, AFP data, Departmental review) cont...

Licensed Specialty	PROVINCE TOTAL	POP Nova Scotia (All) / FTE	Pop Nova Scotia <age18/ FTE	Pop Maritimes <age18/ FTE
Anatomic Pathology	2.2	433,367		158,102
General Pathology	1.0	942,506		343,846
Paediatric Diagnostic Radiology	6.9	135,716		49,512
Paediatric Medical Genetics	3.0	314,169		114,615
Paediatric - Diagnostic & Therapeutic -	**13.1**	**71,840**		**26,209**
Paediatric Cardiology	4.2	224,406	41,203	81,868
Paediatric Child Health	0.8	1,256,675	230,739	-
Paediatric Clinical Immunology & Allergy	6.0	157,084	28,842	57,308
Paediatric Critical Care	5.4	174,881	32,110	63,800
Paediatric Developmental	4.0	235,627	43,264	85,962
Paediatric Emergency Medicine	4.6	205,063	37,652	-
Paediatric Endocrinology & Metabolism	3.0	314,169	57,685	114,615
Paediatric Gastroenterology	1.9	484,319	88,926	176,690
Paediatric General	42.5	22,195	4,075	-
Paediatric Haematology/Oncology	5.5	171,365	31,464	62,518
Paediatric Infectious Diseases	4.8	197,034	36,178	71,882
Paediatric Medical Genetics	2.9	323,649	59,425	118,074
Paediatric Medical Microbiology	0.7	1,357,344	249,223	495,188
Paediatric Neonatology	7.4	126,606	23,246	46,189
Paediatric Nephrology	1.0	942,506	173,054	343,846
Paediatric Neurology	7.0	134,644	24,722	49,121
Paediatric Palliative	1.7	553,316	101,595	201,861
Paediatric Respiratory Medicine	1.8	528,467	97,032	192,796
Paediatric Rheumatology	3.5	269,287	49,444	98,242
Psychiatry - Adolescent	15.7	60,149	11,044	21,944
Paediatric - Medical - Subtotal	**124.3**	**7,580**	**1,392**	**2,765**
Paediatric Anaesthesia	15.1	62,562	11,487	22,824
Paediatric Cardiac Surgery	1.0	942,506	173,054	343,846
Paediatric General Surgery	3.4	279,874	51,388	-
Paediatric Ophthalmology	2.0	463,322	85,071	169,030
Paediatric Orthopedic Surgery	2.4	390,760	71,748	142,558
Paediatric Otolaryngology	2.6	361,414	66,360	131,852
Paediatric Plastic Surgery	1.0	942,975	173,140	344,017
Paediatric Urology	2.1	444,074	81,537	162,008
Paediatric - Surgical - Subtotal	**29.6**	**31,832**	**5,845**	**11,613**
Anaesthesia	109.4	8,618		
Cardiac Surgery	8.0	117,813		
General Surgery	51.6	18,258		
Gynaecological Oncology	4.0	234,511		
Neurosurgery	9.1	103,224		
Obstetrics & Gynaecology	47.6	19,818		
Ophthalmology	46.6	20,227		
Orthopedic Surgery	33.9	27,809		
Otolaryngology	23.7	39,760		
Plastic Surgery	10.4	90,393		
Thoracic Surgery	5.5	170,898		
Urology	16.2	58,226		
Vascular Surgery	7.4	128,069		
Surgical - Subtotal	**373.4**	**2,524**		
TOTAL	**1,987.6**	**474**		

The adjacent figure is a continuation of the proceeding and completes the provincial summary of licensed specialties to population. The provincial population of 942,522 is used in the denominator except for the paediatric specialities where the population aged 0 to 17 of 173,054 is used.

Supplementary detail on 'functional specialty' information, where available, is provided in Chapter D Sections 23 to 26.

19.1.1 Age Analysis

Workforce age is, of course, a key determinant in PRP. In 85% of the workforce count (see beginning of this Section) the actual birth date was known and for the balance the year of M.D. graduation was known. The average age at graduation was assumed to be twenty-five. The PRP forecast is for ten-years to 2022 so estimation of retirement and/or slowing productivity is an essential requirement over the ten year period.

Figure 143 Physician Count by Specialty by Age Cohort, %>age 54, and Average Age, 2009/10 (Source: DHA and DFM)

LICENSED SPECIALTY	<30	<40	<50	50-54	55-59	60-64	65-69	70+	TOTAL	55+ (Count & %)		Avg.Age
Anatomic Pathology		4	11	4	4	2	4		29	10	34.5%	50.7
Diagnostic Radiology		20	40	9	7	16	4		96	27	28.1%	48.8
Haematological Pathology		1	3			1			5	1	20.0%	45.8
Medical Biochemistry					1	1			2	2	100.0%	59.9
Medical Genetics		1	1		1	1			4	2	50.0%	50.0
Medical Microbiology			1	1	1				3	1	33.3%	51.2
Neuropathology			1	1					2	-	0.0%	49.5
Nuclear Medicine		1		3					4	-	0.0%	48.4
Pathology		1	2	2		2	1	1	9	4	44.4%	55.7
Pharmacology			1	1		2			4	2	50.0%	53.7
Radiology - Oncology		1	7	1	2	2			13	4	30.8%	49.6
Diagnostic & Therapeutic Total	**0**	**29**	**67**	**22**	**16**	**27**	**9**	**1**	**171**	53		50.0
% by Age Group	**0%**	**17%**	**39%**	**13%**	**9%**	**16%**	**5%**	**1%**	**100%**	0	31.0%	
General Practitioner	2	166	278	194	122	103	58		923	283	30.7%	
Family Medicine/Practice Total	2	166	278	194	122	103	58	0	923	283		49.9
% by Age Group	**0%**	**18%**	**30%**	**21%**	**13%**	**11%**	**6%**	**0%**	**100%**	0	30.7%	
Cardiology		12	13	8	6	4	2		45	12	26.7%	48.4
Clinical Immunology & Allergy		1							1	-	0.0%	39.6
Community Medicine			1		1	1			3	2	66.7%	54.8
Dermatology			8	1	5	2	1		17	8	47.1%	51.7
Emergency Medicine	1	20	41	15	11	5	2		95	18	18.9%	47.1
Endocrinology & Metabolism		2	4	3					9	-	0.0%	45.4
Gastroenterology		5	4	3	4		1		17	5	29.4%	47.2
Geriatric Medicine		2	3	5	3				13	3	23.1%	49.2
Haematology			4	3	1		1		9	2	22.2%	50.5
Infectious Diseases		2	1		1	1	2		7	4	57.1%	53.1
Internal Medicine		24	21	9	8	5	3		70	16	22.9%	45.8
Medical Oncology		3	8	2	1	2	1		17	4	23.5%	48.9
Nephrology		2	7	2	4				15	4	26.7%	46.9
Neurology		2	4	2	11	1	1		21	13	61.9%	53.1
Occupational Medicine		1	5		1	1	2		10	4	40.0%	52.5
Palliative Medicine			7		2	2			11	4	36.4%	50.8
Physical Medicine & Rehabilitatior		2	3	2	3	1	2		13	6	46.2%	52.5
Psychiatry		18	47	21	24	12	9		131	45	34.4%	50.6
Psychiatry - Forensic				2	2				4	2	50.0%	53.8
Respiratory Medicine			2	2	3	1	1		9	5	55.6%	56.1
Rheumatology		2	3	3	2		1		11	3	27.3%	50.2
Medical Total	**1**	**98**	**186**	**83**	**93**	**38**	**29**	**0**	**528**	160		49.0
% by Age Group	**0%**	**19%**	**35%**	**16%**	**18%**	**7%**	**5%**	**0%**	**100%**	0	30.3%	

Figure 144 Physician Count by Specialty by Age Cohort, %>age 54, and Average Age cont… (Source: DHA and DFM)

LICENSED SPECIALTY	≤30	≤40	≤50	50-54	55-59	60-64	65-69	70+	TOTAL	55+ (Count & %)		Avg.Age
Paediatric Cardiology		1	2				2		5	2	40.0%	52.3
Paediatric Clinical Immunology & /		1	1	1		2	1		6	3	50.0%	55.1
Paediatric Developmental			1	1	2				4	2	50.0%	53.4
Paediatric Emergency Medicine		1	2	2	1	1			7	2	28.6%	50.1
Paediatric Endocrinology & Metab		1	1						2	-	0.0%	41.9
Paediatric Gastroenterology			1	1					2	-	0.0%	49.0
Paediatric General		19	12	8	12	6	1		58	19	32.8%	48.2
Paediatric Infectious Diseases				1	1	1	1		4	3	75.0%	60.6
Paediatric Neonatology			1	2	2	2			7	4	57.1%	57.0
Paediatric Nephrology			1					1	2	1	50.0%	60.3
Paediatric Neurology			2	2		1	2		7	3	42.9%	56.0
Paediatric Oncology			1						1	-	0.0%	45.2
Paediatric Palliative					1				1	1	100.0%	58.5
Paediatric Respiratory Medicine						1			1	1	100.0%	64.7
Paediatric Rheumatology			2	1					3	-	0.0%	47.0
Paeditric Child Health		1							1	-	0.0%	39.8
Psychiatry - Adolescent		1	6	3	2	1	1		14	4	28.6%	50.5
Medical-Paediatric Total	0	25	33	22	21	15	8	1	125	45		50.7
% by Age Group	**0%**	**20%**	**26%**	**18%**	**17%**	**12%**	**6%**	**1%**	**100%**	0	36.0%	
Anaesthesia		25	48	17	17	15	10		132	42	31.8%	49.8
Cardiac Surgery			5	1	3	1			10	4	40.0%	50.8
General Surgery		9	21	13	6	8	3		60	17	28.3%	49.6
Neurosurgery		1	6	2			1		10	1	10.0%	47.3
Obstetrics & Gynaecology		8	23	7	6	14	1		59	21	35.6%	50.5
Ophthalmology		9	13	10	2	9	12		55	23	41.8%	52.9
Orthopedic Surgery		12	13	4	6	6	3		44	15	34.1%	48.6
Otolaryngology		5	12	5	4	2	2		30	8	26.7%	48.1
Plastic Surgery		3	3	2	3	1			12	4	33.3%	49.5
Thoracic Surgery		1	2			1	1		5	2	40.0%	52.6
Urology		1	9	2	5	1			18	6	33.3%	49.2
Vascular Surgery		2	5		1		1		9	2	22.2%	46.5
Surgical Total	0	76	160	63	53	58	34	0	444	145		49.9
% by Age Group	**0%**	**17%**	**36%**	**14%**	**12%**	**13%**	**8%**	**0%**	**100%**	0	32.7%	
Paediatric General Surgery		2	1						3	-	0.0%	
Surgical-Paediatric Total	0	2	1	0	0	0	0	0	3	-	0.0%	
PROVINCIAL TOTAL	3	396	725	384	305	241	138	2	2194	686	-	49.8
	0%	18%	33%	18%	14%	11%	6%	0%	100%	-	31.3%	

By 2022, it is expected cumulative retirements will be in the order of 59 (32%) in diagnostic and therapeutic, 283 (31%) in family practice, 154 (30%) in the medical specialties, 45 (36%) in paediatrics, and 145 (33%) in the surgical specialties. Provincially, the total is 688 or 31% of the current count. This equates to 3.1% per annum, which is typical of the Canadian physician workforce rate of retirement. It is noted that estimating retirement at age 65 is imprecise at the individual level. Also, certain specialties have a tendency to continuing working past age 65 e.g., psychiatry and ophthalmology, while surgeons tend to work at or near full capacity to the early or mid-60s then retire completely.

19.1.2 Gender

Prior Sections (8.0 and 10.0) discussed the importance of factoring gender into PRP. The following figure analyzes the provincial workforce by specialty by gender for counts and FTEs and makes a comparison to the national 2009/10 first year PGME trainees. The shaded values represent specialties with the largest cohorts.

Figure 145 Physician FTE and Count by Specialty by Gender (F-Female, M-Male) (Source: DHA and DFM)

	Female		Male		TOTAL		RATIO	Count	FTE	NATIONAL 09/10
Functional_Specialty	Count	FTE	Count	FTE	Count	FTE	Count/FTE (Female to Male)	% Female	% Female	1st Yr. PGME, % Female
Anatomic Pathology	12	11.2	14	13.1	26	24.3	1.0	46%	46%	49%
Diagnostic Radiology	23	18.8	64	60.1	**87**	**78.9**	**0.87**	**26%**	**24%**	**35%**
General Pathology	0	-	6	5.3	6	5.3	n/a	0%	0%	29%
Haematological Pathology	1	1.0	6	6.2	7	7.2	1.0	14%	14%	50%
Medical Biochemistry	0	-	2	2.0	2	2.0	n/a	0%	0%	33%
Medical Genetics	0	-	1	0.7	1	0.7	n/a	0%	0%	75%
Medical Microbiology	0	-	3	3.0	3	3.0	n/a	0%	0%	40%
Neuropathology	0	-	2	2.0	2	2.0	n/a	0%	0%	33%
Nuclear Medicine	1	1.2	3	3.0	4	4.2	1.20	25%	29%	25%
Radiology - Oncology	3	3.0	10	10.1	13	13.1	0.99	23%	23%	52%
Diagnostic & Therapeutic - Subtotal	**40**	**35.2**	**111**	**105.5**	**151**	**140.8**	**0.93**	**26%**	**25%**	
Emergency Medicine	3	1.9	5	4.3	8	6.2	0.73	38%	31%	
General Practitioner	426	348.9	503	483.4	**929**	**832.4**	**0.85**	**46%**	**42%**	**63%**
Palliative Medicine	3	2.1	0	-	3	2.1	n/a	100%	100%	
Family Medicine/Practice - Subtotal	**432**	**352.9**	**508**	**487.7**	**940**	**840.7**	**0.85**	**46%**	**42%**	
Cardiology	5	3.8	36	29.4	41	33.2	0.93	12%	11%	
Community Medicine	1	0.8	2	1.0	3	1.8	1.50	33%	43%	47%
Critical Care Medicine	1	1.1	9	10.4	10	11.6	0.98	10%	10%	
Dermatology	8	7.6	9	9.7	17	17.3	0.87	47%	44%	63%
Emergency Medicine	22	13.3	71	52.3	**93**	**65.5**	**0.82**	**24%**	**20%**	**41%**
Endocrinology & Metabolism	3	2.3	3	3.0	6	5.3	0.76	50%	43%	
Gastroenterology	3	2.3	18	15.2	21	17.5	0.91	14%	13%	
General Internal Medicine	12	8.9	36	34.6	**48**	**43.5**	**0.78**	**25%**	**21%**	**52%**
Geriatric Medicine	7	6.1	5	5.1	12	11.2	0.85	58%	54%	
Haematology	4	3.9	7	6.8	11	10.6	1.00	36%	36%	
Infectious Diseases	2	2.0	5	5.1	7	7.1	0.97	29%	28%	
Medical Oncology	6	6.3	11	11.2	17	17.4	1.03	35%	36%	
Nephrology	4	3.8	14	13.9	18	17.7	0.94	22%	21%	
Neurology	3	2.6	18	18.3	21	20.8	0.84	14%	12%	49%
Occupational Medicine	3	1.5	7	3.9	10	5.4	0.91	30%	28%	
Palliative Medicine	3	2.1	8	7.0	11	9.1	0.80	27%	23%	
Physical Medicine & Rehabilitation	5	5.0	8	6.5	13	11.5	1.23	38%	43%	38%
Psychiatry	59	55.0	72	74.6	**131**	**129.7**	**0.90**	**45%**	**42%**	**60%**
Psychiatry - Forensic	2	2.0	2	2.0	4	4.0	1.00	50%	50%	
Respiratory Medicine	2	2.0	10	9.8	12	11.8	1.03	17%	17%	
Rheumatology	9	8.0	4	4.4	13	12.4	0.81	69%	65%	
Medical - Subtotal	**164**	**140.2**	**355**	**324.2**	**519**	**464.4**	**0.94**	**32%**	**30%**	**53%**

42.1% of Family Practice FTEs are female however 63% of PGME 1st year trainees are female. The adult medical specialties are 30% female now and this ratio will continue to change towards 53% in time. Interestingly the ratio of female to male Family Practice FTE is 0.85 FTE female per 1.0 FTE male and 0.94 for medical specialties. This is a higher ratio than expected based upon earlier conceptual model review in this report. The actual experience in Nova Scotia will be applied in the Forecast Model. The Forecast Model will assess and incorporate the rate and impact of gender change to 2022.

Figure 146 Physician FTE and Count by Specialty by Gender cont…

	Female		Male		TOTAL		RATIO	Count	FTE	NATIONAL 09/10
Functional_Specialty	Count	FTE	Count	FTE	Count	FTE	Count/FTE (Female to Male)	% Female	% Female	1st Yr. PGME, % Female
Anatomic Pathology	2	2.2	0	-	2	2.2	n/a	100%	100%	
General Pathology	1	1.0	0	-	1	1.0	n/a	100%	100%	
Paediatric Diagnostic Radiology	7	5.2	2	1.7	9	6.9	0.88	78%	76%	
Paediatric Haematology/Oncology	2	1.5	2	2.0	4	3.5	0.75	50%	43%	
Paediatric Medical Genetics	2	2.0	1	1.0	3	3.0	1.00	67%	67%	
Paediatric - Diagnostic & Therapeutic - Sub	**14**	**11.9**	**5**	**4.7**	**19**	**16.6**	**0.91**	**74%**	**72%**	
Paediatric Cardiology	0	-	5	4.2	5	4.2	n/a	0%	0%	
Paediatric Child Health	1	0.8	0	-	1	0.8	n/a	100%	100%	
Paediatric Clinical Immunology & Allergy	0	-	6	6.0	6	6.0	n/a	0%	0%	
Paediatric Critical Care	1	1.0	4	4.4	5	5.4	0.91	20%	19%	
Paediatric Developmental	4	4.0	0	-	4	4.0	n/a	100%	100%	
Paediatric Emergency Medicine	4	2.6	4	2.0	8	4.6	1.30	50%	56%	
Paediatric Endocrinology & Metabolism	3	3.0	0	-	3	3.0	n/a	100%	100%	
Paediatric Gastroenterology	0	-	3	1.9	3	1.9	n/a	0%	0%	
Paediatric General	32	29.4	15	13.1	**47**	**42.5**	**1.06**	**68%**	**69%**	**78%**
Paediatric Haematology/Oncology	0	-	2	2.0	2	2.0	n/a	0%	0%	
Paediatric Infectious Diseases	3	2.8	2	2.0	5	4.8	0.93	60%	58%	
Paediatric Medical Genetics	1	0.9	2	2.0	3	2.9	0.90	33%	31%	
Paediatric Medical Microbiology	0	-	1	0.7	1	0.7	n/a	0%	0%	
Paediatric Neonatology	1	0.8	7	6.7	8	7.4	0.78	13%	10%	73%
Paediatric Nephrology	0	-	1	1.0	1	1.0	n/a	0%	0%	
Paediatric Neurology	3	2.8	5	4.3	8	7.0	1.08	38%	39%	
Paediatric Palliative	2	1.7	0	-	2	1.7	n/a	100%	100%	
Paediatric Respiratory Medicine	0	-	2	1.8	2	1.8	n/a	0%	0%	
Paediatric Rheumatology	3	2.8	1	0.8	4	3.5	1.22	75%	79%	
Psychiatry - Adolescent	5	5.1	10	10.6	15	15.7	0.95	33%	32%	
Paediatric - Medical - Subtotal	**63**	**57.4**	**70**	**63.4**	**133**	**120.8**	**1.01**	**47%**	**48%**	
Paediatric Anaesthesia	5	5.2	9	9.9	14	15.1	0.95	36%	34%	
Paediatric Cardiac Surgery	1	0.5	1	0.5	2	1.0	1.00	50%	50%	
Paediatric General Surgery	1	0.8	4	2.6	5	3.4	1.18	20%	23%	
Paediatric Ophthalmology	1	0.8	2	1.3	3	2.0	1.22	33%	38%	
Paediatric Orthopedic Surgery	0	-	4	2.4	4	2.4	n/a	0%	0%	
Paediatric Otolaryngology	1	0.7	2	1.9	3	2.6	0.76	33%	27%	
Paediatric Plastic Surgery	0	-	1	1.0	1	1.0	n/a	0%	0%	
Paediatric Urology	1	0.6	2	1.5	3	2.1	0.75	33%	27%	
Paediatric - Surgical - Subtotal	**10**	**8.5**	**25**	**21.1**	**35**	**29.6**	**1.01**	**29%**	**29%**	
Anaesthesia	24	22.3	92	87.1	**116**	**109.4**	**0.98**	**21%**	**20%**	**46%**
Cardiac Surgery	0	-	8	8.0	8	8.0	n/a	0%	0%	29%
Critical Care Medicine	1	1.3	0	-	1	1.3	n/a	100%	100%	
General Surgery	10	7.2	47	44.4	**57**	**51.6**	**0.77**	**18%**	**14%**	**41%**
Gynaecological Oncology	2	2.0	2	2.0	4	4.0	0.99	50%	50%	
Neurosurgery	1	1.0	8	8.1	9	9.1	0.98	11%	11%	23%
Obstetrics & Gynaecology	29	23.1	26	24.5	**55**	**47.6**	**0.85**	**53%**	**49%**	**84%**
Ophthalmology	7	7.1	45	39.5	**52**	**46.6**	**1.16**	**13%**	**15%**	**39%**
Orthopedic Surgery	4	3.1	36	30.8	40	33.9	0.91	10%	9%	24%
Otolaryngology	1	0.9	26	22.8	27	23.7	1.08	4%	4%	44%
Plastic Surgery	0	-	11	10.4	11	10.4	n/a	0%	0%	44%
Thoracic Surgery	0	-	6	5.5	6	5.5	n/a	0%	0%	
Urology	0	-	16	16.2	16	16.2	n/a	0%	0%	24%
Vascular Surgery	1	1.1	8	6.2	9	7.4	1.43	11%	15%	
Surgical - Subtotal	**80**	**69.3**	**331**	**305.5**	**411**	**374.7**	**0.94**	**19%**	**18%**	**45%**
Provincial Total	**804**	**676.1**	**1411**	**1,315.3**	**2215**	**1,991.4**	**0.90**	**36%**	**34%**	**56%**

Paediatrics is 48% female and this is expected to increase over time to 50%-55%. Surgical specialties are 18% female currently and this is expected to increase towards 45% overall with substantial variation by individual specialty. Overall 34% of FTE are female compared to 56% of 1st year PGME trainees.

19.1.3 Medical School of Graduation

The next figure analyzes where the current physician workforce obtained the M.D. degree according to the continent, country, and/or province where the medical school was located. The figure is further broken down by DHA of the physician location (March, 2010) and FTE equivalent. Of note, 47% of the current provincial workforce, including 48% of the generalist specialties, are graduates of the Dalhousie medical school. At a DHA level only DHA 2, DHA 5, and IWK have a percentage of Dalhousie graduates at less than 45%. Europe and Ontario medical schools are the next most frequent locations at 11% and 10% respectively.

Figure 147 Continent, Country, or Province of M.D. Medical School Location – By DHA and Total FTE

Continent/ Country/ Province	1	2	3	4	5	6	7	8	9	IWK	Total FTE	%
Canada												
Alberta	2.2	1.3	6.6	3.1	0.0	1.3	1.2	4.2	33.9	5.3	59.0	3.0%
British Columbia	2.6	1.1	4.7				1.3	0.6	15.2	1.3	26.7	1.4%
Manitoba		1.0	6.6		0.0		1.9	3.5	15.5	0.0	28.5	1.4%
Newfoundland	8.3	3.1	6.1	9.4	2.8	2.5	5.0	5.5	61.0	8.4	112.1	5.7%
Nova Scotia	47.7	22.7	73.7	56.2	17.5	28.8	41.4	99.4	495.6	40.5	923.4	46.8%
Ontario	4.2	3.0	11.7	5.7	2.1	4.1	3.7	8.3	135.1	19.5	197.3	10.0%
Quebec	1.9	2.2	0.4	2.1	0.5	1.0	3.6	7.3	28.6	6.3	53.9	2.7%
Saskatchewan	0.0	0.0	1.0	0.0	0.0	0.0	0.0	3.4	4.0	0.5	9.0	0.5%
Canada Subtotal	**66.9**	**34.4**	**110.7**	**76.5**	**22.9**	**37.6**	**57.9**	**132.2**	**788.9**	**81.7**	**1409.9**	**71.4%**
Africa	2.1	12.3		2.1	2.0	5.8	1.2	10.7	21.7	3.5	61.3	3.1%
Asia	2.6	2.8	1.0	2.4	1.2		1.2	5.7	6.1	0.0	23.1	1.2%
Australia		1.2				0.2	1.1		1.7	0.0	4.2	0.2%
Caribbean	1.2	1.8	4.7	0.5		1.4	0.1	2.3	8.4	0.0	20.4	1.0%
Europe	9.5	13.6	17.7	16.7	6.5	11.7	3.0	28.3	94.0	15.9	216.9	11.0%
Far East		0.0	0.9			1.0		1.0	10.7	0.0	13.7	0.7%
India	0.0	7.8	1.9	4.8	6.8	2.3	4.8	14.2	25.7	2.2	70.5	3.6%
Middle East	2.9	6.6	2.4	3.6	2.8	4.7	5.7	13.1	26.5	3.4	71.7	3.6%
Pakistan		1.0			0.9		3.3	7.4	5.9	1.0	19.6	1.0%
South America					7.2			0.2	13.3	0.0	20.7	1.0%
Unknown	2.4	0.0	0.0	0.9	1.0	0.0	1.0	2.8	8.3	1.0	17.5	0.9%
USA	0.0	4.5	1.0	1.0	0.6			2.2	8.1	6.5	24.0	1.2%
Other Subtotal	**20.6**	**51.8**	**29.5**	**32.1**	**29.0**	**26.9**	**21.5**	**87.9**	**230.6**	**33.6**	**563.5**	**28.6%**
TOTAL	**88**	**86**	**140**	**109**	**52**	**65**	**79**	**220**	**1019**	**115**	**1973**	**100.0%**
% Nova Scotia	*54%*	*26%*	*53%*	*52%*	*34%*	*45%*	*52%*	*45%*	*49%*	*35%*	*47%*	*47%*
% Europe	*11%*	*16%*	*13%*	*15%*	*13%*	*18%*	*4%*	*13%*	*9%*	*14%*	*11%*	*11%*
% Ontario	*5%*	*3%*	*8%*	*5%*	*4%*	*6%*	*5%*	*4%*	*13%*	*17%*	*10%*	*10%*

The preceding and next figures underscore the importance of the Dalhousie Faculty of Medicine M.D. program to the provincial and DHA workforce now, and in the future.

The next figure reveals 48% of generalist specialties to be graduates of Dalhousie medical school with a low of 30% in general internal medicine and a high of 54% among general practitioners.

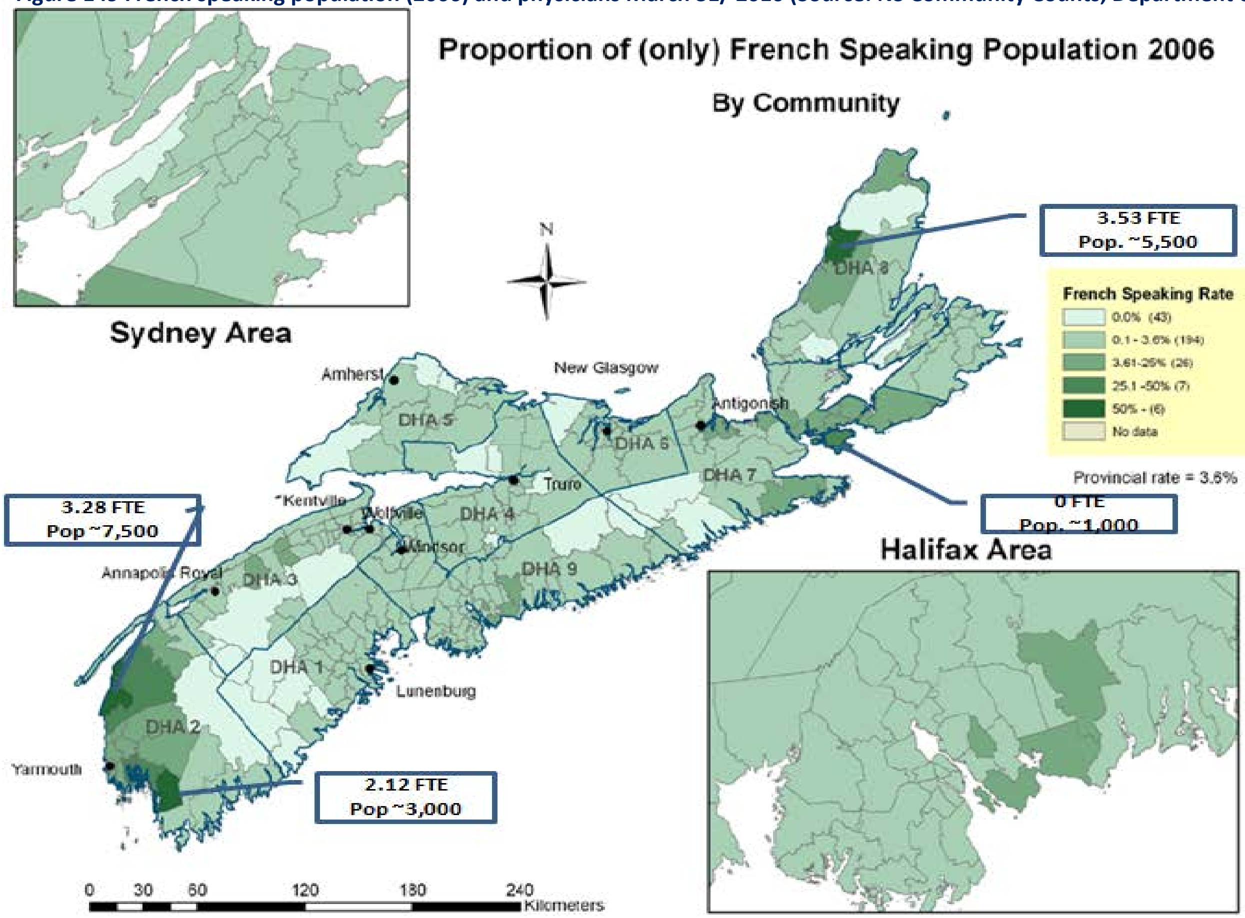
Figure 148 Continent, Country, or Province of M.D. Medical School Location – Generalist Specialties, Total FTE

Continent/ Country/ Province	Anaesthesia	Diagnostic Radiology	Emergency Medicine	General Practitioner	General Surgery	Internal Medicine	Obstetrics & Gynaecology	Paediatric General	Psychiatry	Psychiatry - Adolescent	TOTAL
Canada											
Alberta	2.7	2.1	1.0	18.4	1.2	1.4	4.3		8.5		39.5
British Columbia	3.0	2.1	0.0	11.1	0.6		3.4		1.0		21.2
Manitoba	2.5	3.0		8.2	2.0		1.0		2.9		19.6
Newfoundland	4.5	11.7	3.0	42.0	3.0	5.9	2.1	1.7	4.5	2.2	80.6
Nova Scotia	53.6	42.8	36.0	445.8	26.7	18.3	15.9	20.4	41.2	4.3	705.0
Ontario	9.3	5.3	9.4	67.7	8.0	5.5	7.9	10.9	11.5	1.1	136.8
Quebec	2.1	1.6	2.6	15.5	0.0	1.0	1.3	4.6	3.1		32.0
Saskatchewan	0.8	0.0	0.5	2.1		1.0					4.4
Canada Subtotal	**78.5**	**68.6**	**52.5**	**610.7**	**41.6**	**33.1**	**36.1**	**37.6**	**72.7**	**7.6**	**1039.0**
Africa	4.5	0.0	2.6	24.6	2.0	3.9	0.7	1.7	5.6		45.6
Asia	2.2	1.9		12.7	1.1	1.2					19.1
Australia				3.2							3.2
Caribbean		1.0		12.3	0.0	1.2	1.1				15.6
Europe	31.4	5.7	5.0	64.7	6.9	14.4	9.0	4.6	29.4	5.2	176.4
Far East	1.1	0.0		6.3					1.0		8.4
India	3.3	1.3	1.5	36.7	0.0	2.8	1.7	1.7	6.7		55.6
Middle East	1.9	1.2	1.6	32.8	2.8	2.7	2.1	2.4	6.5	1.0	55.1
Pakistan	1.0	6.1		3.1		1.1		1.0	3.6	0.0	16.1
South America	1.1			14.6					1.0		16.7
Unknown	2.4		0.0	5.0	0.1	0.0	1.0	1.0	0.0	0.0	9.5
USA	1.8	8.0	1.8	3.3				2.0	3.1	1.0	21.0
Other Subtotal	**50.8**	**25.3**	**12.4**	**219.3**	**12.9**	**27.4**	**15.5**	**14.6**	**57.0**	**7.2**	**442.4**
TOTAL	**129.3**	**93.9**	**64.9**	**830.1**	**54.5**	**60.5**	**51.6**	**52.2**	**129.7**	**14.8**	**1481.3**
% Nova Scotia	*41%*	*46%*	*55%*	*54%*	*49%*	*30%*	*31%*	*39%*	*32%*	*29%*	*48%*
% Europe	*24%*	*6%*	*8%*	*8%*	*13%*	*24%*	*17%*	*9%*	*23%*	*35%*	*12%*
% Ontario	*7%*	*6%*	*15%*	*8%*	*15%*	*9%*	*15%*	*21%*	*9%*	*7%*	*9%*

19.1.4 Language – French

The following figure examines the relationship between geographic distribution of French (only) speaking population and physicians declaring fluency in French to CPSNS. The map on the left side of the figure flags four geographic areas having the highest concentration of French only speaking population along with the number of French fluent physician FTE e.g. Digby – Church Point/Meteghan with 3.28 FTE for a local population of approx. 7,500. The table on the right side of the figure lists all (173.32 FTE) the French fluent FTEs by county, community, and GP/Specialist status. The Isle Madame area with a population of approx. 1,000 did not have a French fluent physician as of March 31, 2010.

Figure 149 French speaking population (2006) and physicians March 31/ 2010 (Source: NS Community Counts, Department of



DHA	PC-COUNTY	COMMUNITY	GP	SP	TOTAL
1	LUNENBURG	Bridgewater	3.32	3.21	6.53
1	QUEENS	Greenfield	2.35	0.00	2.35
2	DIGBY	Church Point	1.05	0.00	1.05
2	DIGBY	Meteghan	2.23	0.00	2.23
2	YARMOUTH	Amiraults Hill	2.12	0.00	2.12
2	YARMOUTH	Yarmouth	2.17	1.75	3.92
3	ANNAPOLIS	Kentville	1.00	0.00	1.00
3	KINGS	Berwick	0.93	1.07	2.00
3	KINGS	Coldbrook		1.00	1.00
3	KINGS	Kentville		4.31	4.31
3	KINGS	New Minas	1.00	0.00	1.00
3	KINGS	Wolfville		1.00	1.00
4	COLCHESTER	Brookfield	1.19	0.00	1.19
4	COLCHESTER	Truro	0.87	4.65	5.52
5	CUMBERLAND	Amherst	0.00	1.96	1.96
6	PICTOU	New Glasgow		1.00	1.00
7	ANTIGONISH	Antigonish	1.13	3.90	5.03
7	GUYSBOROUGH	Melrose	1.27	0.00	1.27
7	INVERNESS	Port Hawkesbury	1.06	0.00	1.06
8	CAPE BRETON	Glace Bay	2.18	0.74	2.92
8	CAPE BRETON	Louisbourg	0.49	0.00	0.49
8	CAPE BRETON	New Waterford	1.47	0.00	1.47
8	CAPE BRETON	North Sydney	1.34	0.62	1.96
8	CAPE BRETON	Sydney Mines	1.18	0.00	1.18
8	CAPE BRETON	Sydney Northwest	0.19	1.20	1.39
8	CAPE BRETON	Sydney River		2.42	2.42
8	CAPE BRETON	Sydney Southeast		2.03	2.03
8	VICTORIA	Baddeck	3.53	0.00	3.53
9	HALIFAX	Beaver Bank	0.71	0.00	0.71
9	HALIFAX	Bedford	2.01	1.00	3.01
9	HALIFAX	Chezzetcook	0.85	0.00	0.85
9	HALIFAX	Clayton Park	5.44	0.00	5.44
9	HALIFAX	Cole Harbour	1.00	0.00	1.00
9	HALIFAX	Dartmouth East	6.18	1.13	7.31
9	HALIFAX	Dartmouth North	1.00	4.11	5.11
9	HALIFAX	Dartmouth South	5.90	5.96	11.86
9	HALIFAX	Fairview	0.64	1.00	1.64
9	HALIFAX	Fall River	0.62	0.00	0.62
9	HALIFAX	Halifax Chebucto	2.61	0.66	3.27
9	HALIFAX	Halifax Citadel	7.75	55.56	63.30
9	HALIFAX	Halifax Needham		1.00	1.00
9	HALIFAX	Hatchet Lake		0.53	0.53
9	HALIFAX	Lake Echo	1.00	0.00	1.00
9	HALIFAX	Sackville North		1.20	1.20
9	HALIFAX	Sackville South	0.00	1.82	1.82
9	HALIFAX	Spryfield	0.58	0.00	0.58
			68.50	104.82	173.32

19.2 DHA and County Physician Profiles

The Appendix includes a subsection that looks at each DHA physician workforce by county, by DHA, population per FTE, and their Net (Export)/Import percentages; all by specialty. This level of detail is necessary to drill PRP from the provincial to DHA and County levels. Note that those currently over age 69 have been removed from the analysis. Out-of-province (export)/import of services have been separately included in the CDHA and IWK analysis within the Appendix.

[See Appendix]

20 Key Observations - Provincial & DHA Levels

Provincial

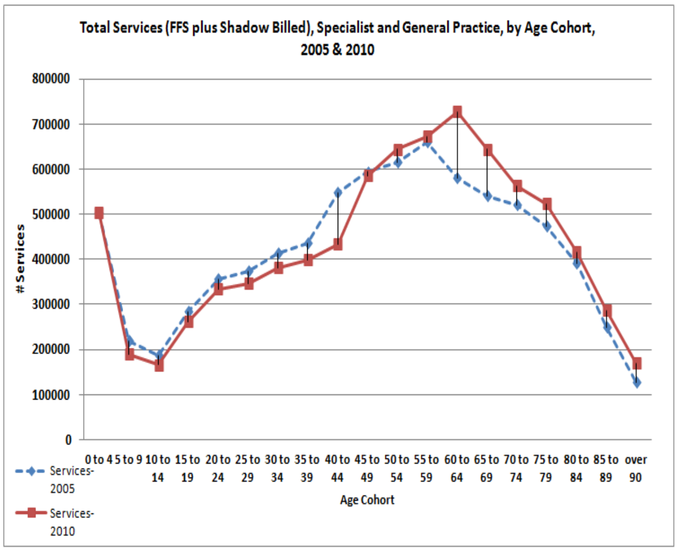
1. The population will not increase for the forecast period to 2021. DHA population will decrease slightly with the exception of CDHA, which will increase by 17,500 by 2021. The average population age is forecast to increase 6% from 41.3 in 2011 to 43.9 in 2021. The age cohort 60+ will increase from 23.4% to 30.5%.
2. Population Rurality and Remoteness – Nova Scotia has a population density three times the national average (excluding the Northwest Territories, Yukon Territory, and Nunavut). In this context remoteness and rurality are not significant factors for provincial physician resource planning in Nova Scotia. They are, however significant factors for subsequent clinical service planning since many people live in rural areas and some live in communities that are both rural and remote.
3. Population diversity – A physician resource plan must be able to serve the population with sensitivity to its characteristics and demography. 4% (approximately 37,000) of Nova Scotians have French as their first language and 2.5% are First Nations aboriginal. Among visible minorities, those of African descent are by far the largest group at 2.5%. Very few of African descent enter medical school in the province and those that do then leave to practice elsewhere
4. Chronic Disease - The prevalence of chronic disease in Nova Scotia is at or near the highest among Canadian provinces (Source: Public Health Agency of Canada, Community Health Survey). For example the following are all higher than the national average:
   - Arthritis - 61% higher (i.e., Nova Scotia 24.5%, Canada 15.2%);
   - Asthma - 14% higher (i.e., Nova Scotia 9.2%, Canada 8.1%);
   - Chronic obstructive pulmonary disease - 67% higher (i.e., Nova Scotia 7%, Canada 4.2%);
   - Diabetes - 28% higher (i.e., Nova Scotia 7.7%, Canada 6%);
   - Heart disease 33% higher (i.e., Nova Scotia 6.4%, Canada 4.8%); and
   - Hypertension 27% higher (i.e., Nova Scotia 21.5%, Canada 16.9%).
5. Cancer - The incidence and prevalence of most female and male cancer types in Nova Scotia is or is near the highest in Canada. Combined cancer incidence is 12% higher than the Canadian average. The rate of change in cancer incidence has been slight.
   - The female age-standardized incidence rate (ASIR) of various cancers has increased 4.2% between the period of 2000-2004 and 2011 with significant variation by type of cancer. Non-Hodgkin's lymphoma and malignant melanoma account for the increase, while ovarian, cervical, and colorectal cancers have declined. ASIR overall is 7% higher in the province (396.0) compared to the national average (369.0).
   - The male ASIR of various cancers has increased slightly at 1.2% between the period of 2000-2004 and 2011 with significant variation by type of cancer. Bladder cancer and malignant melanoma account for the increase while lung, oral, and colorectal cancers have declined. ASIR overall is 16% higher in the province compared to the national average.
6. Mental Health - It is estimated that 11.6% of Canadians suffer from some form of mental health disorder in comparison to 15% of Nova Scotians. 15% of Nova Scotians suffering from a mental health disorder are seen by a psychiatrist, 42% by a family practitioner, 10% by a psychologist, and 10% by a

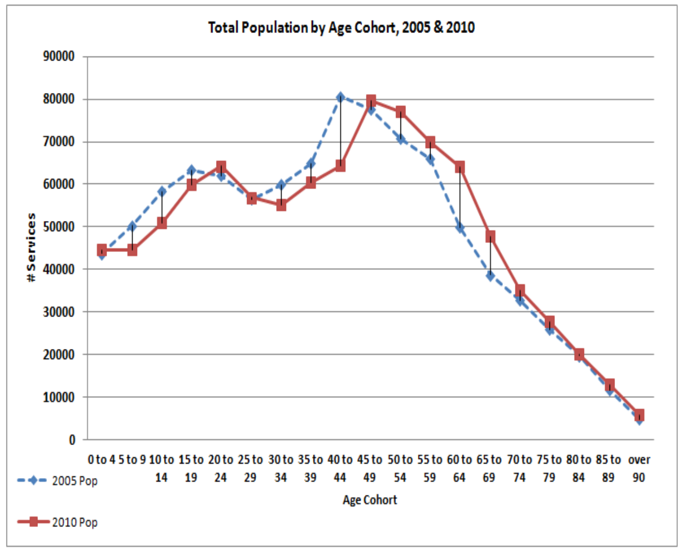
social worker. These figures exclude neurologic disorders most frequently associated with aging, such as the dementias.

7. Provincial Programs – selected key findings

- *Cancer Care – Patient outcomes appear to be poor in comparison to other provinces.*
- *Diabetes Care - The network of Diabetes Centres is unique in Canada and appears to be a significant factor in improved quality of care albeit with less evidence of this improvement in Halifax.*
- *Cardiovascular Health – Expect specialists that are hybrid trained with fewer cardiac surgeons, and increasing collaboration and integration among cardiology, interventional radiology, cardiac and vascular surgery.*
- *Renal Disease – Increased numbers of Nova Scotians are diagnosed with kidney disease, resulting in a 6% growth in demand for renal replacement therapy annually.*
- *Reproductive Care - Birth rates have reversed downward trend and stabilized with some upswing (more in urban than rural)..*

8. Between 2005 and 2010 provincial population over age 59 increased from 20% to 23.4% with little increase in total population. The following graphs illustrate the decreases and increases in total





physician service utilization between the two time periods by age groups. Most notable are the decreased total utilization by the age 30 to 50 age cohorts and the increases from age 50 onward and particularly ages 60 to 70. This trend can be significantly attributed to the aging population and illustrative (in a status quo delivery system) of what can be expected over the next ten years as the population goes from 23.4% over age 59 to 30.5% by 2022.

9. Adjusting DHA population for relative physician utilization rates based on DHA age cohorts has the effect of lowering the population of DHAs 5 and 6 by (15%) and (17%) respectively while DHAs 1, 7 and 8 would be increased by 5%, 5%, and 8% respectively. PRP planning needs to adjust for relative age/gender of populations as the impact is very significant and relevant.

10. In the absence of PRP based health system planning, policy, and implementation, the status quo will prevail. Across Canada, the status quo means a largely demand-based system of growth and change in physician workforce needs. The aging Nova Scotia population will place continued pressure on health services between 2011 and 2022.

11. Out-of-province (OOP) adult inpatients represent 8% of total admissions and 6% of total inpatient days stay at QEII. OOP paediatric inpatients represent 7.5% of total admissions and 14% of total inpatient days stay at IWK. 20% of all patients (inpatient, outpatient, and travelling clinics) at IWK are OOP.

Based upon detail MSI and shadow-bill data and supplementary IWK data on travel clinics delivered outside the province a reliable estimate of 19% to 23% of services provided and patients seen by IWK Department of Medicine full-time members are OOP residents. This includes patients and services provided in NB and PEI.

Academic Medicine

12. The AFMC has reaffirmed that PGME should reflect the right mix of physicians to meet societal needs, curricula and training models must be aligned to evolving health care needs, and Faculties must provide support to clinician-teachers through professional development.
13. 40% of DFM undergraduate seats are allocated to out-of-province Canadian students i.e. New Brunswick 28%, P.E.I. 5%, and other provinces 7%.
14. 47% of the current provincial physician workforce, including 48% of the generalist specialties, graduated from Dalhousie medical school. At a DHA level only DHA 2, DHA 5, and IWK have a percent Dalhousie graduates less than 45%. Europe and Ontario medical schools are the next most frequent locations at 11% and 10% respectively among the current provincial physician workforce.
15. DFM senior leadership ascertain:
    - General Internal Medicine has been left behind by sub-specialization
    - Need more generalists.
    - Numbers of specialists may be close but distribution and mix are not.
    - Need to define core services at the provincial level then apply locally.
    - Strong distributive undergraduate education and post-graduate training is critical
    - DFM residency programs can be changed once the Department of Health and Wellness defines needs and the mix between specialists and subspecialists.
    - The AFP review and design revision is needed.
16. There are 864 active M.D. academic appointments at DFM (16.2% full-time, 1.4% part-time >50%, and 82.4% part-time <50%). These include individuals from across the province and those based in New Brunswick. On an income attribution basis and in the absence of further data on workload, the equivalent of 55.8 FTE is 100% academic or 6.8% of the total FTE of 820. In academic medicine the percentage time spent on academic work varies widely by individual [56],[57] i.e., educator, researcher, and leadership. Variation is a function of many factors including ability to attract and sustain research grant paid salary support, presence or absence of academic salary, alternate payment systems that develop and/or support fields of targeted strategically important research, and the quality of research infrastructure.
17. DFM ranks tenth nationally in the ratio of full-time faculty per trainee. This ratio does not account for the rapidly increasing number of part-time preceptors/teachers in the community as all faculties look to distribute medical education outside the major tertiary teaching centres.
18. Research specialization presents difficult choices for strategic planning. A recent commissioned study identified DFM areas of greatest research opportunity being in geriatrics and aging, arthritis, child

[56] Coleman, D.L., Moran, E., et.al., Measuring Physicians' Productivity in a Veterans Affairs Medical Center, Acad. Med. 2003;78:682–689.

[57] Kearney, R.A., Lee, S.Y., Skakun, E.N., Tyrrell, L., The Research Productivity of Canadian Physicians: How the Timing of Obtaining a PhD Has an Influence, Academic Medicine, Vol. 82, No. 3 / March 2007.

health, obstetrics and gynaecology, gastroenterology, and nursing. Current identified strengths included the above plus neurosciences, psychiatry, and general internal medicine.

19. DFM current areas of research focus, as measured by CIHR grant revenue (only), are in investigations led by physicians originating in the neuroscience, geriatric, psychiatric, and population health/health outcomes specialties. DFM total research revenue (excluding industry contract research revenue) in 2008/09 was $50,887,000.

District Health Authorities

20. Significant productivity differences exist across DHAs for the same specialty. Productivity is a function of many factors including infrastructure, distance, call-duty, volume of local demand, etc., etc. Productivity does not consider the quality of services provided.
21. DHA local residents will commute outside their county and DHA to receive care and physicians will also commute outside of their primary location to other communities to deliver care. This '(export)'/import (see Terminology) behaviour is commonplace in health systems. Export/import behaviour provides valuable insight for service planning. For example, residents of DHAs 1 and 4 access 6% and 9% of general practice services outside their DHA. This may represent a PRP service gap. Similar examples exist in the data regarding generalist services such as internal medicine, general surgery, and obstetrics.
22. Surgical wait lists and times are tracked comprehensively. Wait lists are growing in most surgical services with significant variance across DHAs. Productivity per surgeon also varies significantly across DHAs.
23. There were 1,988 FTE in 2009/10 in the province with a count of 2,215.
24. Variance in population per Family/General practice FTE ranges from 1,001 in DHA7/GASHA to 1,378 is DHA6/PCHA.

Physician Profiles

25. Generalist ratios – NS family/general practice is 1 FTE per 997 is comparable to the national average of 1 FTE per 947. NS internal medicine is 1 FTE per 21,652 (CIHI data not comparable). NS psychiatry is 1 FTE per 7,268 (9,016 nationally). NS general paediatrics 1 FTE per 4,075 under age 18 (CIHI data not comparable). NS general surgery 1 FTE per 18,258 (17,481 nationally) and NS obstetrics & gynaecology 1 FTE per 19,818 (18,335 nationally).
26. 31% of the current workforce will retire by 2021. This rate is consistent with national averages.
27. Gender shift will continue in all specialties and in general practice, medical, and diagnostics in particular. Female physicians work less as physicians over the course of their careers than males. 42.1% of Family Practice FTEs are female however 63% of PGME 1st year trainees are female. The adult medical specialties are 32% female now and this ratio will continue to change towards 53% in time. Paediatrics is 48% female and this will change somewhat over time to 50%-55%. Surgical specialties are 18% female currently and this will increase towards 45% overall with significant variation by surgical specialty.
28. IMGs – Postgraduate trainee positions for Canadian citizens and permanent residents have increased 57% (4,011 positions) nationally since 2000. This will have a dramatic effect on IMG positions and need.

Section 4. Individual Specialties

A REVIEW BY INDIVIDUAL SPECIALTY OF THE LITERATURE, THE NOVA SCOTIA WORKFORCE, AND NOVA SCOTIA SPECIALTY INPUT

21 METHODOLOGY NOTE

The benchmarks cited in the subsections were identified through the literature search and data analysis phase of the project. Specific sources vary widely e.g. from national data (i.e. CIHI), Consultant researched data from recent prior specialty-specific PRP projects, specialty-specific peer-reviewed journals, and international sources i.e. limited to the USA, U.K., Australia, and New Zealand. The international sources, with the exception of the USA, are rarely peer-reviewed literature and most frequently are grey literature publications from authoritative bodies (e.g. Royal Colleges, National Health Services, England NHS Centre for Workforce Intelligence). No ‘counts’ per population have been used in the benchmarks; these are unacceptable. In some cases, no benchmarks are available. Wherever possible activity workload related benchmarks have been cited and FTE per population.

Assessment of MSI data (see prior Section on out-of-province workload) has identified a wide range of workload arising from non-Nova Scotia patients e.g. paediatric haematology/oncology at 36% of workload to generalist specialties at less than 5%. Non-Nova Scotia patient MSI reported workload is significant in numerous paediatric subspecialties, as well as cardiac surgery and ophthalmology. This workload has been taken into consideration when comparing to benchmarks however, in the case of subspecialties, the benchmarks most often also include a significant referral workload, as is the nature of subspecialty services.

22 Family Medicine

22.1.1 National

In Nova Scotia family/general practice represents 51% of physician FTEs. The national average is 58% with a high of 63% in Saskatchewan and the low is Nova Scotia.

Figure 150 Family Medicine FTE – Interprovincial comparison, 2008/09 (Source: CIHI)

Physician FTE (FFS plus Alternate Payments) by Physician Specialty and Selected Provinces/Territories, 2008–2009											
	N.L.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Total
Family/General Practice	517	132	930	652	7,485	14,970	1,177	1,022	3,148	4,274	34,307
as a % of total Provincial FTE	58%	61%	51%	56%	53%	59%	57%	63%	62%	60%	58%

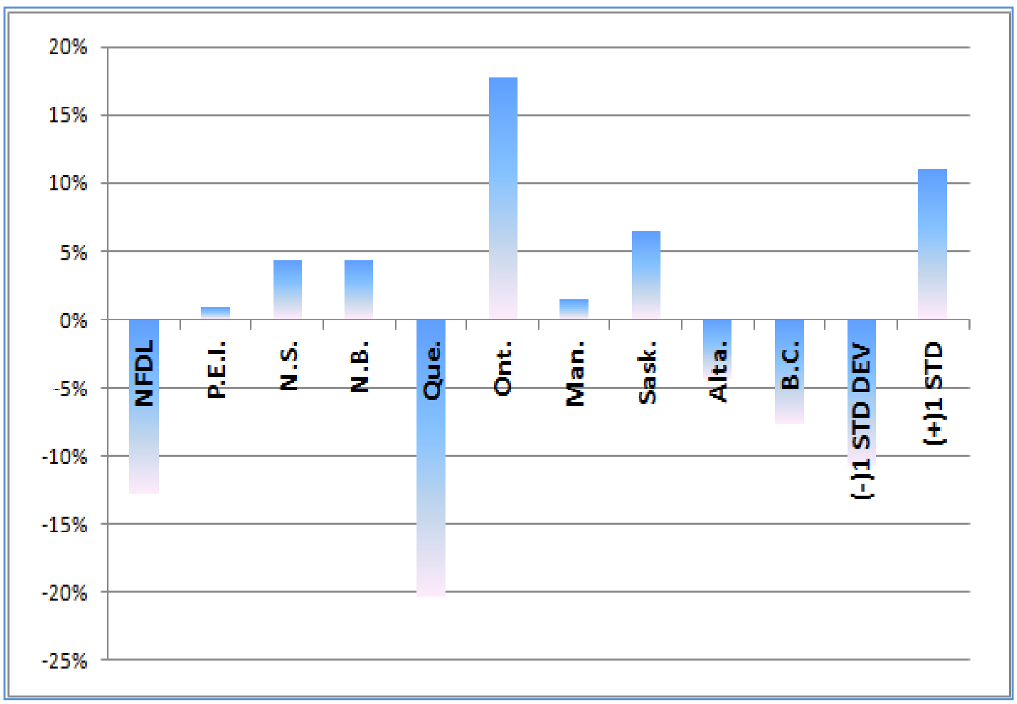
The national average population per 1.0 FTE family/general practitioner is 957. New Brunswick is the highest at 119% (1,136) of the national average and Ontario the lowest 89% (856). Nova Scotia is third lowest at 997.

Figure 151 Population per Family Medicine FTE - Interprovincial comparison, 2008/09 (Source: CIHI)

	N.L.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Canada
Family/General Practice	979	1,046	997	1,136	1,027	856	1,014	981	1,117	1,011	957
% of national average	102%	109%	104%	119%	107%	89%	106%	102%	117%	106%	100%

The next two figures compare the total number of FFS paid services per 1.0 FFS FTE for family medicine/GP by province. Ontario and Quebec represent 65% of the total national FTEs. Alternative payment plan service data and FTEs are not included. The impact of non-FFS paid services and related FTEs being excluded is significant and caution must be exercised in interpreting the CIHI data.

Figure 152 Graph - National Comparison – Family Medicine/GP, Services per 1.0 FTE, 2007/08 (Source: CIHI)



25%-30% of GP payments and FTEs in Nova Scotia in 2007/08 were non-FFS.

Nova Scotia at 7,027 FFS services per FFS FTE is 4.3% above the national average of 6,739 total services (consultations, visits, and procedures) per 1.0 FTE.

Quebec, Newfoundland, and Ontario were more than one standard deviation from the national average.

Figure 153 Table - National Comparison – Family Practice, Services per 1.0 FTE, 2007/08 (Source: CIHI)

	N.L.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	National
FTE (FFS plus Alternate Payments), 08/09	**398**	**97**	**612**	**450**	**5,532**	**8,298**	**756**	**756**	**2,761**	**3,722**	23,383
CONSULTATIONS & VISITS											
						(Count)					
Total Consultations	123	7,547	14,218	19,826	666,933	287,559	28,415	25,216	481,542	123,267	1,654,646
Total Major Assessments	29,795	39,292	60,100	73,772	2,067,537	3,514,949	463,002	264,130	1,261,765	11,239,341	19,013,683
Total Other Assessments	1,911,797	320,390	3,229,449	2,026,559	22,162,489	34,226,630	3,158,991	3,627,080	11,646,449	6,671,413	88,981,248
Total Hospital Care Days	130,669	74,477	260,349	234,014	404,907	1,956,292	518,247	330,878	902,194	837,085	5,649,112
Total Special Calls	35,981	18,326	50,426	25,153	439,936	2,427,313	116,876	79,813	514,204	727,211	4,435,239
Total Psychotherapy/Counselling	37,096	23,019	67,206	71,467	2,021,625	3,683,254	53,614	142,101	800,490	406,043	7,305,913
Total Consultations and Visits	2,145,461	483,051	3,681,748	2,450,791	27,763,426	46,095,997	4,339,145	4,469,218	15,606,644	20,004,360	127,039,841
PER FTE	5,387	4,962	6,014	5,447	5,019	5,555	5,738	5,914	5,652	5,374	5,433
VARIANCE to National Average	(0.9%)	(8.7%)	10.7%	0.3%	(7.6%)	2.2%	5.6%	8.8%	4.0%	(1.1%)	0.0%
PROCEDURES											
Total Major Surgery	968	1,843	1,669	597	11,507	50,054	31,342	6,506	38,526	12,999	156,011
Total Minor Surgery	29,842	1,455	15,120	3,885	236,519	612,674	38,788	63,282	202,652	191,994	1,396,211
Surgical Assistance	191	3,110	15,497	11,882	13,669	211,753	15,636	30,037	163,049	146,367	611,191
Total Obstetrical Services	1,150	40	5,790	2,457	79,574	64,585	8,676	6,232	74,673	41,276	284,453
Total Diagnostic/Therapeutic Services	84,973	128,124	128,977	161,966	801,838	6,147,077	231,817	259,291	824,202	1,229,275	9,997,541
Total Special Services	80,949	42,344	427,577	233,313	38,691	5,383,294	274,566	140,714	815,853	570,596	8,007,897
Total Miscellaneous Services	0	1,988	25,291	297,741	745,991	7,269,902	229,336	449,128	84,333	982,209	10,085,919
Total Procedures	198,073	178,904	619,921	711,841	1,927,789	19,739,339	830,161	955,190	2,203,288	3,174,716	30,539,223
PER FTE	497	1,838	1,013	1,582	349	2,379	1,098	1,264	798	853	1,306
VARIANCE to National Average	(61.9%)	40.7%	(22.5%)	21.1%	(73.3%)	82.1%	(15.9%)	(3.2%)	(38.9%)	(34.7%)	0.0%
Total Services	2,343,534	661,955	4,301,669	3,162,632	29,691,216	65,835,337	5,169,305	5,424,407	17,809,932	23,179,077	157,579,064
PER FTE	5,884	6,800	7,027	7,029	5,368	7,934	6,836	7,177	6,450	6,227	6,739
VARIANCE to National Average	(12.7%)	0.9%	4.3%	4.3%	(20.4%)	17.7%	1.4%	6.5%	(4.3%)	(7.6%)	0.0%

THE MEDICAL HOME – U.S.A.

The concept of a "medical home" is gaining momentum in the U.S.A. The College of Family Physicians Canada defines the medical home as a patient centred medical care setting that includes the following features (as defined by the CFPC):

A medical office or clinic where each patient would have:

- Her or his own family doctor
- Other health professionals working together as a team with the patient's own family doctor
- Timely appointments for all visits with the family doctor and with other primary care team members
- Arrangement and coordination of all other medical services, including referrals to consulting specialists
- An electronic medical record

The medical home would include:

- Appropriate funding and resources
- Necessary system supports for ongoing evaluation and quality management

PRIMARY HEALTH CARE TRANSFORMATION – U.K.

Transforming primary and community health care is the focus of the England National Health Service vision for 'High Quality Care for All'[58]. The local governance is a fully enabled Primary Healthcare Trust Board. Some of the results achieved, to date, are described in the earlier section on Collaborative Care where we saw the focus on the primary care team including practice nurses providing 35% of all patient consultations.

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[58] England NHS, Transforming Community Services: Enabling new patterns of provision, 2009

PRIMARY CARE NETWORK – COORDINATED CARE - ALBERTA

Since 2005, Alberta has launched 40 primary care networks (PCN). The purpose is to coordinate care between a group of family doctors and the local health region. A PCN is not necessarily a bricks and mortar building – it is a network of doctors and other health providers such as nurses, dieticians and pharmacists working together to provide primary health care to patient. Advantages of PCNs include access to new funding to reward better chronic disease management, opportunity to formalize relationships with specialty care providers through service agreements, and teams can proactively address the comprehensive needs of a person and overall health rather than the management of a single disease. Disadvantages or weaknesses of the current PCNs include lack of accountability and performance systems, duplication of service between PCN and Alberta Health Services, lack of incentives to support team-based practice, and questionable cost effectiveness (e.g., to date PCNs have not changed the ratio of patients per GPs).

ENHANCED PRIMARY CARE NETWORK - ALBERTA

Alberta is examining variations on the PCN model. One such variation is an 'enhanced primary care network'. Inherent in the enhanced PCN model is an opportunity for broader integration and accountability for the delivery of primary care services. The model enhances integration by deploying all community-based services around the primary care needs of an identifiable population of patients. This means embedding core services such as home care, public health (e.g. immunizations, perinatal care, and developmental care), mental health, and chronic disease management programming within a PCN. The enhanced PCN model has not be piloted to date.

FAMILY HEALTH TEAMS - ONTARIO

In Ontario Family Health Teams (FHTs) are interdisciplinary teams with size and composition based on community needs and provider availability. Led by family physicians, FHTs are generally composed of 10 primary care physicians and seven other health care providers. There are currently 150 FHTs in Ontario.

OTHER

In Manitoba about 9% of family doctors have joined newly formed physician integrated networks. In B.C. interdisciplinary primary health care teams, ranging in size from three to 20 providers, are typically led by a family physician and are comprised of a variety of health care providers.

IN COMPARISON

The England NHS initiative redefines all aspects of primary health care delivery including governance (Primary Health Trust), funding (capitation), accountability (defined detailed contract and metrics), human resources (mandated multi-disciplinary roles), and services (comprehensive prevention, promotion, treatment, rehabilitation, etc.). In comparison the initiatives in Canada focus more on improving integration (e.g., coordination, networking, interdisciplinary collaboration, etc.) within the current model of family/general practice.

NATIONAL PHYSICIAN SURVEY

The national physician survey (NPS) provides some insight as to the uptake of the medical home concept in Canada. At the time of this report, the NPS had released preliminary information from its 2010 survey. A family practitioner today is able to choose from numerous career options ranging from a patient-centred (medical home) full scope practice, to hospital-based, or special interests, e.g., sports medicine, psychotherapy, and others.

The NPS asked family/general practitioners whether they had a special (narrower) focus to their practice and 16.1% nationally gave a positive response compared to 17.2% in Nova Scotia. This result (based, however, on an 18% national response rate) would seem to indicate almost one in five do have a narrower scope of practice while 80% or more do not.

Figure 155 National Physician Survey - Special Focus to Practice - 2010

Which of these best describes you? Please check only one.	CANADA	NS	NL	PE	NB	PQ	ON	MB	SK	AB	BC	NT/YT/NV
Family physician/General Practitioner	31.00%	28.70%	40.30%	39.30%	37.00%	27.50%	31.00%	31.20%	32.30%	31.40%	34.10%	**
FP/ GP with a special focus to my practice	16.10%	17.20%	11.10%	9.50%	13.90%	19.50%	14.10%	15.90%	18.40%	16.10%	15.40%	**
Medical/ surgical/ lab specialist	49.90%	50.90%	47.70%	47.50%	47.80%	49.20%	52.00%	49.20%	45.80%	50.50%	46.70%	**
Physician working exclusively in a non-clinical setting	1.70%	1.60%	0.40%	3.70%	0.50%	2.50%	1.40%	1.50%	2.40%	1.20%	1.80%	**
Other	0.90%	1.00%	0.00%	0.00%	0.30%	0.80%	0.90%	1.90%	0.70%	0.70%	1.40%	**
NR	0.50%	0.60%	0.60%	0.00%	0.50%	0.40%	0.60%	0.20%	0.40%	0.10%	0.50%	**
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	**
Total n	66383	2273	1101	247	1536	16313	24134	2357	1746	7076	9469	130
N Reporting	12076	452	174	50	303	2665	4481	471	314	1418	1722	26
% Respondents	18%	20%	16%	20%	20%	16%	19%	20%	18%	20%	18%	20%
Source: 2010 National Physician Survey												

The NPS inquired of family/general practitioners what specific services were offered. Twenty-nine services were identified in the responses. Those rated lowest within the family practice service grouping were intra-partum care at 11% of respondents and rehabilitation at 15%. Provision of other medically insured and 3rd party insured services was generally higher in NS than the national average. This is potentially significant in terms of access to community-based family practice in NS.

Figure 154 National Physician Survey - Family/General Practitioner Scope of Services - 2010

	Q15 Please indicate if you OFFER the following to your patients. Check all that apply												
#	FAMILY PRACTICE	CANADA	NS	NL	PE	NB	PQ	ON	MB	SK	AB	BC	NT/YT/
1	Mental health care	60%	60%	62%	61%	58%	59%	60%	61%	60%	59%	64%	**
2	Pain management	57%	62%	58%	48%	60%	55%	55%	62%	63%	58%	60%	**
3	Well child care	55%	57%	52%	57%	59%	45%	61%	53%	63%	52%	55%	**
4	Gynecology	52%	50%	53%	46%	54%	53%	51%	55%	57%	50%	52%	**
5	Psychotherapy/counseling	49%	52%	48%	58%	54%	49%	51%	48%	47%	44%	48%	**
6	Palliative medicine	46%	54%	48%	39%	57%	41%	43%	50%	53%	47%	51%	**
7	Liaison to Homecare	44%	47%	30%	39%	43%	38%	45%	46%	54%	46%	47%	**
8	Housecalls	42%	55%	47%	37%	41%	39%	46%	36%	30%	33%	48%	**
9	Pre-natal care	42%	46%	54%	30%	42%	18%	53%	55%	63%	51%	39%	**
10	Infectious disease	41%	47%	47%	49%	39%	34%	39%	50%	51%	43%	50%	**
11	Nutritional counseling	38%	50%	41%	48%	42%	27%	41%	43%	38%	40%	43%	**
12	Emergency medicine	36%	36%	47%	40%	40%	36%	29%	47%	59%	39%	38%	**
13	Ante-natal care	33%	41%	44%	23%	33%	14%	41%	44%	53%	37%	33%	**
14	In-patient hospital	31%	38%	33%	52%	59%	25%	26%	42%	56%	34%	36%	**
15	Substance abuse	30%	37%	35%	49%	34%	16%	31%	37%	38%	35%	40%	**
16	Rehabilitation	15%	19%	15%	15%	16%	12%	12%	19%	18%	17%	20%	**
17	Intrapartum care	11%	12%	13%	0%	12%	8%	8%	14%	27%	14%	13%	**
	OTHER MEDICALLY INSURED SERVICES												
1	Community medicine/public health	30%	36%	42%	45%	37%	20%	30%	38%	42%	36%	33%	**
2	Sports medicine	25%	28%	23%	33%	22%	15%	24%	29%	30%	32%	37%	**
3	Hospitalist care	21%	26%	16%	30%	35%	27%	18%	25%	27%	19%	17%	**
4	Surgical assisting	14%	19%	15%	12%	19%	3%	15%	20%	25%	12%	23%	**
5	Day Surgery	11%	19%	24%	6%	13%	4%	8%	23%	30%	13%	17%	**
6	Surgery	8%	11%	13%	12%	6%	6%	6%	15%	19%	9%	8%	**
7	Anesthesia	5%	6%	8%	6%	7%	3%	4%	9%	8%	7%	5%	**
	3rd PARTY INSURED SERVICES												
1	Dermatology	46%	43%	48%	38%	41%	42%	47%	50%	51%	44%	49%	**
2	Travel/tropical	27%	35%	25%	31%	34%	17%	28%	27%	31%	31%	31%	**
3	Occupational/industrial medicine	16%	20%	25%	24%	19%	13%	13%	20%	26%	20%	22%	**
4	Cosmetic medicine	5%	6%	6%	6%	7%	3%	6%	6%	7%	5%	6%	**
5	Alternative/complementary medicine	7%	8%	11%	5%	7%	4%	7%	10%	11%	8%	10%	**
6	Legal/ medico-legal	9%	17%	13%	12%	7%	4%	8%	10%	13%	12%	16%	**
7	Other service	10%	12%	10%	6%	11%	14%	8%	8%	7%	8%	8%	**
	NR	6%	9%	8%	12%	6%	4%	6%	6%	6%	7%	8%	**
	RESPONSES												
	Total Members	33233	1193	676	153	940	7857	11403	1189	1023	3743	4958	96
	Number Respondents	6337	257	115	33	194	1432	2219	250	164	752	902	19
	% Respondents	19%	22%	17%	22%	21%	18%	19%	21%	16%	20%	18%	20%
	Source: 2010 National Physician Survey												

The response to the question of patients seen in a typical week would seem to mitigate the concern for community-based family practice. NS responses indicate 43.1% seen more than 100 patients per week compared to the national average of 39.5%. This finding is corroborated by the DNS July, 2011 survey.

Figure 156 National Physician Survey - Family/General Practitioner Patient Visits per Week - 2010

Q14d Please estimate the number of patients you see in a TYPICAL WEEK, EXCLUDING patient visits while you are on-call (on-call is defined as time outside of regularly scheduled activity during which you are available to patients).

	CANADA	NL	PE	NS	NB	PQ	ON	MB	SK	AB	BC	NT/YT/NV
Up to 25	**7.00%**	7.90%	0.00%	**7.80%**	6.10%	9.90%	5.20%	7.70%	8.30%	7.60%	5.80%	**
More than 25, up to 50	**13.70%**	15.00%	14.90%	**11.80%**	10.40%	20.80%	11.50%	14.30%	13.50%	14.10%	8.40%	**
More than 50, up to 75	**12.00%**	15.20%	5.40%	**11.40%**	9.40%	17.20%	9.20%	11.20%	6.30%	11.70%	11.90%	**
More than 75, up to 100	**19.40%**	15.80%	11.90%	**14.70%**	25.20%	21.70%	20.00%	14.80%	18.70%	16.40%	18.60%	**
More than 100, up to 125	**11.00%**	4.00%	9.20%	**13.80%**	11.70%	9.60%	11.60%	9.60%	6.60%	12.60%	12.20%	**
More than 125, up to 150	**12.60%**	14.90%	30.90%	**12.80%**	10.10%	7.30%	15.50%	12.00%	13.10%	11.80%	15.00%	**
More than 150, up to 175	**3.60%**	5.00%	3.50%	**3.70%**	6.90%	1.10%	3.60%	4.10%	2.80%	4.00%	6.50%	**
More than 175, up to 200	**7.20%**	10.70%	3.00%	**8.60%**	6.00%	2.30%	9.50%	11.60%	8.20%	7.70%	7.90%	**
More than 200	**5.00%**	5.50%	3.50%	**4.20%**	5.50%	1.20%	6.40%	6.40%	13.30%	5.50%	5.10%	**
NR	**8.40%**	6.10%	17.60%	**11.20%**	8.60%	9.00%	7.50%	8.30%	9.10%	8.70%	8.70%	**
Total	**100%**	100%	100%	**100%**	100%	100%	100%	100%	100%	100%	100%	**
Total Members	**33233**	676	153	**1193**	940	7857	11403	1189	1023	3743	4958	96
Number Respondents	**6337**	115	33	**257**	194	1432	2219	250	164	752	902	19
% Respondents	**19%**	17%	22%	**22%**	21%	18%	19%	21%	16%	20%	18%	20%
Source: 2010 National Physician Survey												
Up to 100	**52.1%**	53.9%	32.2%	**45.7%**	51.1%	69.6%	45.9%	48.0%	46.8%	49.8%	44.7%	0.0%
More than 100	**39.5%**	40.0%	50.2%	**43.1%**	40.3%	21.4%	46.6%	43.7%	44.1%	41.5%	46.6%	**
NR	**8.4%**	6.1%	17.6%	**11.2%**	8.6%	9.0%	7.5%	8.3%	9.1%	8.7%	8.7%	**

One research study, focusing on Ontario GPs and using 1990 FFS billing data, concluded that the variation in total billings across physicians is dominated by variation in billings per hour rather than variation in hours of direct patient care per week[59]. This pattern held when subgroups by practice location, practice type, physician gender, and years since graduation. This study implies, on average, a pattern of shorter patient visits rather than longer hours. Average hours of direct patient care per week were 41.3 with females (35.0) providing 18% fewer direct care hours than males (42.9).

22.1.2 Provincial

The population per FTE is 1,121 with a range of 1,001 in GASHA (+10%) to 1,378 (-23%) in PCHA. This is higher than the 997 reported in the early National section and is a result of a timing (0809 vs. 0910) difference.

Figure 157 Provincial Family Medicine Clinical and Academic FTE – 2009/10 (Source: Department of Health and Wellness and MSI)

Functional_Specialty	DHA1 SSH	DHA2 SWNDHA	DHA3 AVH	DHA4 CEHHA	DHA5 CHA	DHA6 PCHA	DHA7 GASHA	DHA8 CBDHA	DHA9 CDHA	IWK	PROVINCE
General Practitioner [1]	50.5	50.7	68.1	60.1	29.8	33.4	44.1	103.8	392.0		832.4
Population/FTE	**1,116**	**1,194**	**1,205**	**1,198**	**1,057**	**1,378**	**1,001**	**1,212**	**1,059**	**n/a**	**1,121**

[1] Includes the equivalent of 38 FTE GPs (without CCFP (EM)) who work in Emergency Departments across the DHAs.

The following figure is derived from the DNS Member Survey, July 2011 i.e. Members were asked to approximate the amount of time they spend in a given week on specific activities.

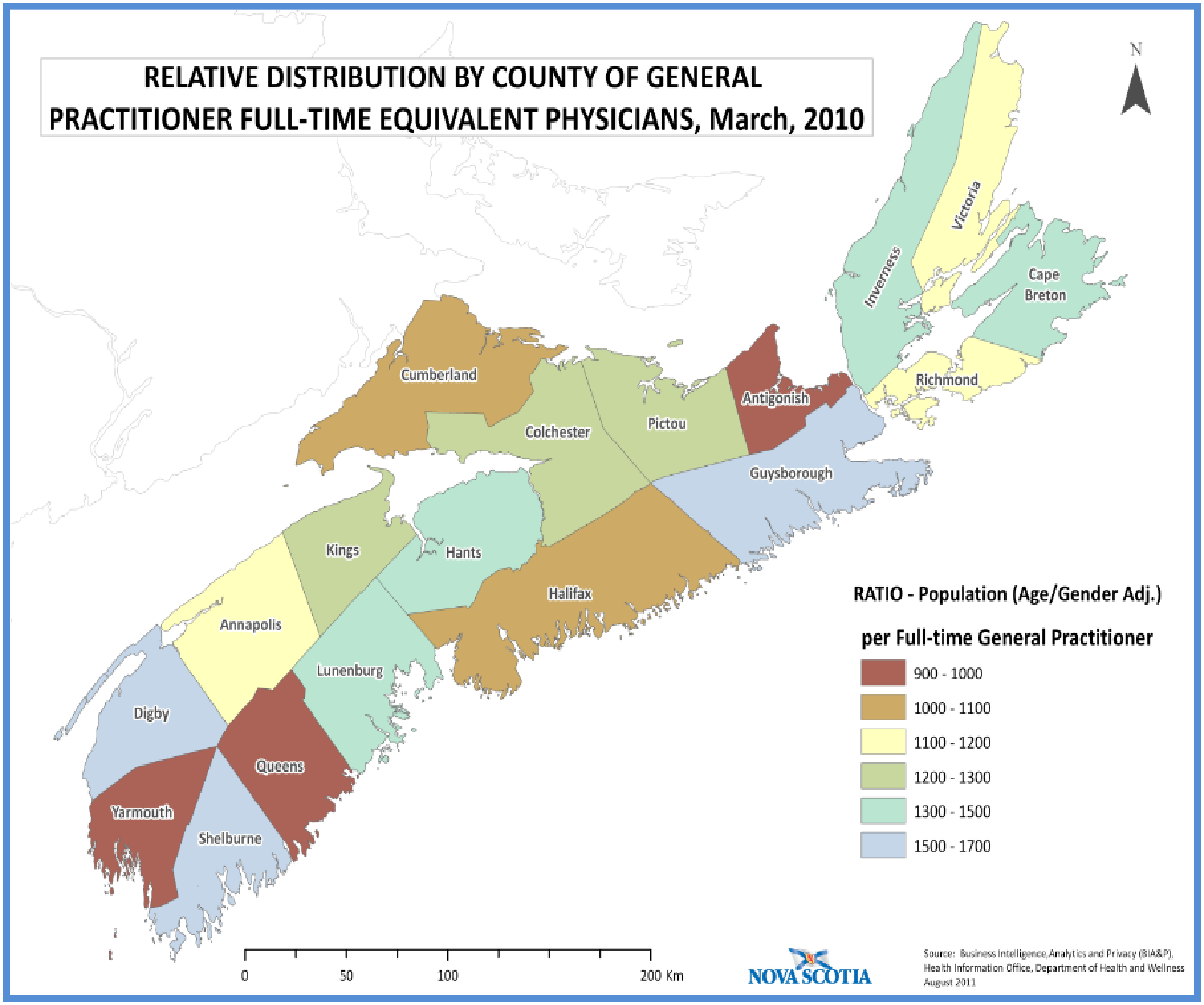
59 Jeon, S.H., Hurley, J., The Relationship Between Physician Hours of Work, Service Volume, and Service Intensity, Canadian Public Policy, Vol XXXIII, Supplement 2007

Figure 158 Provincial Family Medicine – By Practice Category with Estimated Hours/Week (Source: MSI, DNS 2011 Survey)

Category	Functional Discipline	AVG. AGE	FTE-Clinical	Office	Hospital	Other	TOTAL
Family Medicine	General Practitioner	51	831	536	92	203	831
	Percentage			64%	11%	24%	100%
	Estimated Hours per Week			29	5	11	45

DNS noted that, not surprisingly, the vast majority (90%) of practitioners report spending at least some of their time on office visits. In contrast, only a small minority of general practitioners work in obstetrics, ER coverage, surgical assistance, palliative care, or teaching. The responses on ER coverage and palliative care differ significantly from the 2010 NPS survey results in the preceding figures.

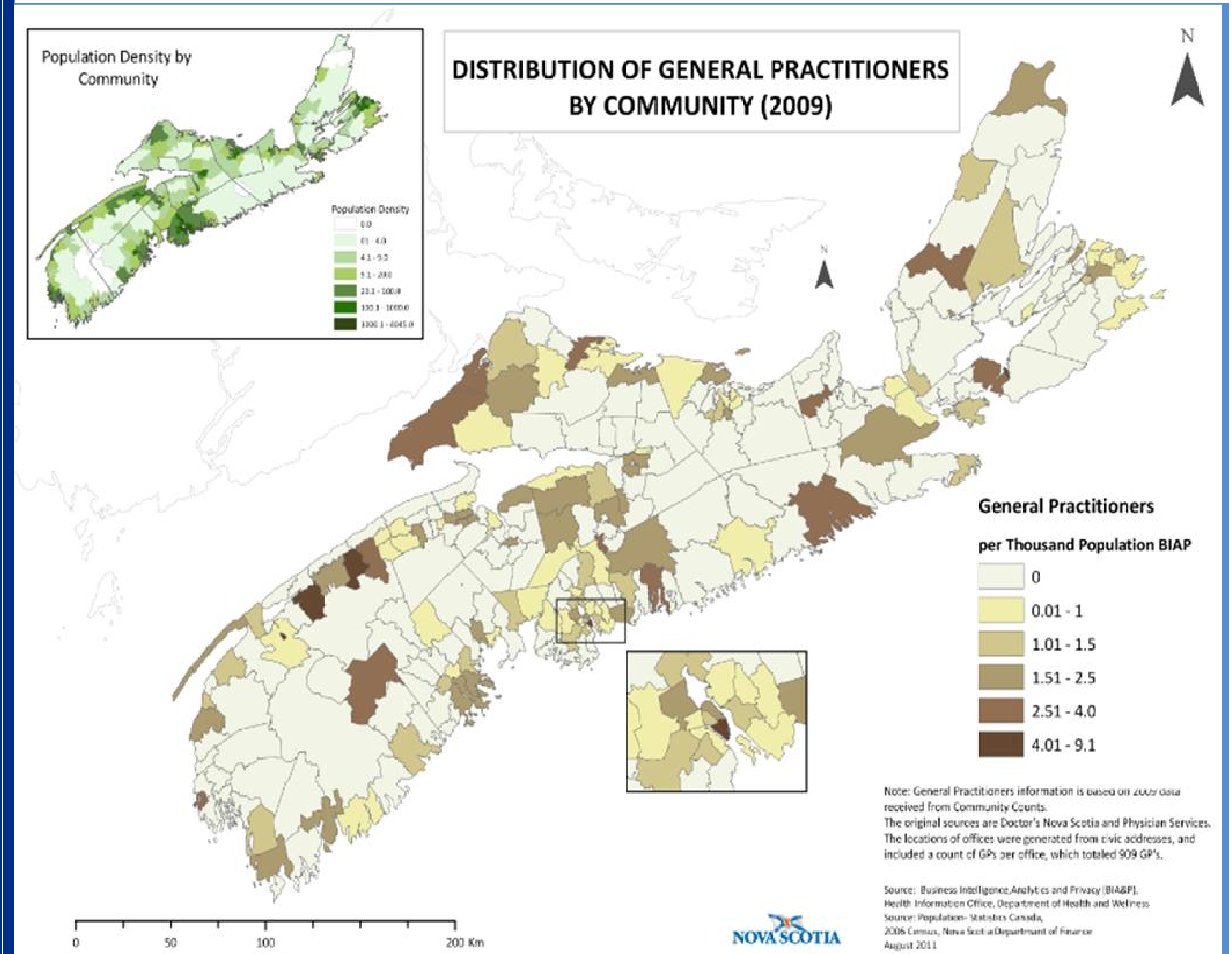
Figure 159 Relative Distribution by County of General Practitioner FTE, March 2010 (Source: MSI)



The adjacent map was generated by the Consultant based on the practice postal code as reported to the CPSNS and recorded in the Department of Health and Wellness PHReD database.

The Consultant notes that up to four postal codes exist for an individual physician i.e. mailing postal code, office practice postal code, home postal code, and MSI registration postal code.

Figure 160 Distribution by Community of General Practitioner Count, March 2009 (Source: Department of Health and Wellness Business Analytics and Privacy)



The adjacent map was generated by Department of Health and Wellness using 2009 'community counts' data that mapped each general practitioner to their community of practice location based upon postal code of practice.

The map must be interpreted carefully as some distortion occurs in small population areas such as Inverness County. The map also does not account for situations where a single practitioner may cover a number of communities spread over a relatively large distance.

23 Medical Disciplines

23.1 National

Figure 161 Medical Specialty Physician FTE 2008/09 – Interprovincial Comparison (Source: CIHI)

Physician FTE (FFS plus Alternate Payments) by Physician Specialty and Selected Provinces/Territories, 2008–2009	N.L.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Total
Family/General Practice	517	132	930	652	7,485	14,970	1,177	1,022	3,148	4,274	34,307
Medical Specialties	255	55	635	305	4,778	6,833	613	356	1,235	1,818	16,883
Internal Medicine	106	20	212	124	1,867	3,144	279	156	410	720	7,039
Neurology	11	-	21	13	233	301	18	16	39	105	758
Psychiatry	56	17	160	94	1,531	1,839	165	96	476	585	5,019
Pediatrics	54	5	114	39	635	1,081	102	52	223	300	2,606
Dermatology	12	-	14	8	163	191	13	4	48	48	502
Physical Medicine	-	4	13	84	146	14	4	21	48	309	644
Anesthesia	16	13	102	23	265	131	20	28	-	28	625
Total Physician - FTEs	510	113	1,271	690	9,619	13,534	1,215	730	2,480	3,914	34,075

Figure 162 Medical Specialty Physician Population per FTE 2008/09 – Interprovincial Comparison (Source: CIHI)

Population per Physician FTE (FFS plus Alternate Payments), 2008–2009	N.L.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Canada
Medical Specialties	1,986	2,532	1,460	2,424	1,609	1,875	1,947	2,814	2,847	2,377	1,945
Internal Medicine	4,763	6,764	4,383	5,984	4,118	4,074	4,272	6,450	8,568	6,003	4,667
Neurology	48,174	u/a	43,607	58,589	32,972	42,572	64,902	61,205	90,576	40,968	43,355
Psychiatry	9,048	8,216	5,812	7,863	5,023	6,967	7,221	10,428	7,386	7,383	6,545
Pediatrics	9,296	28,595	8,108	18,863	12,118	11,855	11,681	19,164	15,753	14,407	12,606
Dermatology	42,165	u/a	65,760	88,978	47,032	66,921	89,763	257,841	73,009	90,616	65,380
Physical Medicine	u/a	34,600	70,217	8,813	52,668	915,036	298,225	47,762	72,501	13,985	51,027
Anesthesia	u/a	u/a	u/a	u/a	u/a	u/a	u/a	u/a	u/a	u/a	u/a

23.2 Specialty Specific

Figure 163 Adult Medicine - Physician FTE 2009/10 - Nova Scotia (Source: MSI and DFM)

Functional_Specialty	PROVINCE	Avg Age	Count	Pop/FTE
Functional_Specialty	Total			
Cardiology	33.2	48.2	41	28,415
Community Medicine	1.8	54.8	3	538,575
Critical Care Medicine	12.9	46.8	10	73,029
Dermatology	17.3	51.7	17	54,502
Emergency Medicine	65.5	47.2	93	14,381
Endocrinology & Metabolism	5.3	44.5	6	176,594
Gastroenterology	17.5	45.1	21	53,829
General Internal Medicine	43.5	50.1	48	21,652
Geriatric Medicine	11.2	45.8	12	83,943
Haematology	10.6	48.0	11	88,649
Infectious Diseases	7.1	49.8	7	131,936
Medical Oncology	17.4	48.9	17	54,137
Nephrology	17.7	45.7	18	53,268
Neurology	20.8	53.1	21	45,242
Occupational Medicine	5.4	52.5	10	176,169
Palliative Medicine	9.1	50.8	11	103,572
Physical Medicine & Rehabilitat	11.5	52.5	13	81,957
Psychiatry	129.7	50.6	131	7,268
Psychiatry - Forensic	4.0	53.8	4	235,627
Respiratory Medicine	11.8	54.1	12	80,173
Rheumatology	12.4	49.1	13	76,201
Total	464.4	49.3	519	2,030

23.2.1 Cardiology

Currently, and in comparison to, Nova Scotia:

- There are 33.2 Cardiologist specialist FTEs or 1.0 FTE per 28,415 population in Nova Scotia.
- Benchmark(s)
    - British Columbia has 1.0 FTE per 41,000 (source: CIHI).
    - The U.K. British Cardiovascular Society estimates that the UK requires one consultant cardiologist per 25,000 to 28,500 people to provide comprehensive cardiac services[60].
    - Australia in 1999 had one cardiologist per 30,180 people[61].
    - A benchmark of 26,750 population per FTE was applied to the Base Case forecast in the Final Report. The benchmark incorporates relative disease incidence and prevalence in Nova Scotia.

Service Groupings

The following are the primary service groupings for each of the main areas comprising a comprehensive cardiology service.

- Electrophysiology Services
    - Sentinel Service indicators: Inpatient and Outpatient subdivided into invasive, non-invasive, ICD, and pacemaker procedures and procedure follow-up visits.
    - Maintenance of Competency: The American College of Cardiology notes that as with many other procedures, a minimum number of cases is necessary to ensure continued proficiency in quality of care. A cardiologist performing diagnostic electrophysiology studies (EPS) should participate in greater than or equal to 100 diagnostic EPS per year to maintain skills and should attend greater than or equal to 30 h of formal CME (Level 1 category) every 2 years to remain abreast of changes in knowledge and in technology. These cases can include the diagnostic portions of ablation procedures[62].
    - An EP Study (EPS and ablations combined) is used to gather information about the arrhythmias or irregular heartbeats. Arrhythmias may be treated with a variety of medications, cardioversion (electric shock), radio frequency ablation, insertion of pacemakers or an implantable atrial defibrillator depending on the severity of the arrhythmia.
- Cardiac Catheterization Service
    - Sentinel Service indicators: Cardiac catheterization and coronary angiogram procedures
    - Maintenance of Competency: Diagnostic cardiac catheterization and coronary angiography – An experienced coronary angiographer should: Perform at least 100 cases per year, participate in regular case and coronary angiogram image review, and participate in auditing of angiogram quality and complications.
    - A cardiac catheterization is a special x-ray study of the heart for the purposes of detecting pressures and patterns of blood flow. A thin, flexible plastic tube or catheter is place into a vein or artery in the upper leg (groin area) and is guided through the blood vessel into a heart chamber or

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[60] British Cardiac Society, BCS Working Group on Cardiology Workforce Requirements, Hackett, D., May 2003

[61] Australian Medical Workforce Advisory Committee, The Specialist Cardiology Workforce In Australia, Supply And Requirements, 1998 - 2009

[62] American College of Cardiology/American Heart Association 2006 Update of the Clinical Competence Statement on Invasive Electrophysiology Studies, Catheter Ablation, and Cardioversion

a coronary artery. Special x-ray dye or contrast is passed into the catheter, allowing the cardiologist to see the chambers, valves or coronary arteries on an x-ray screen.

- Echocardiography Service
  - Sentinel Service indicators: Echocardiogram, Doppler Ultrasound, Contrast Echo, Stress Echo
  - Maintenance of competency:
    - Transthoracic 200 studies / year, Transoesophageal 25/ year, Stress echo 100 / year[63]
- Angioplasty Service
  - Sentinel Service indicators: Percutaneous Coronary Intervention (PCI), Percutaneous Transluminal Coronary Angioplasty (PTCA), Insertion of Intracoronary Stents
  - Maintenance of competency:
    - Individual – 75 PCIs per year is the recommended minimum including 11 cases per year involving primary PCI (PPCI) for ST elevation myocardial infarction if the operator participates in a routine PPCI service.
    - Centre – at least 200 interventions per year with an ideal minimum of 400 interventions per year, including 35 PPCI cases per year if the centre offers a PPCI service.
- Nuclear Cardiology Service
  - Sentinel Service indicators: Cardiac perfusion scan, stress radionuclide cardiac imaging studies, gated cardiac scan
  - Maintenance of Competency: 100 cardiac imaging studies per year (source: American College Cardiology)
- General cardiology Service
  - Sentinel Service indicators: Consultations, follow-up, half-day clinics, Exercise ECG Tests
  - Maintenance of Competency: 25 exercise ECG tests per year (source: American College Cardiology)
- Cardiac critical care Service
  - average daily patient count, hours on service (in-hospital and 1st call)

23.2.2 Critical Care Medicine

Currently, and in comparison to, Nova Scotia:

- QEII Level 1 ICU is 1,340 clinical and 450 academic scheduled hours, plus 104 hours on 1st call over and above scheduled hours for a total of 1,894 hours on service per year.

- Benchmark(s)
  - Average Level I (only) ICU intensivist annual hours on service (scheduled hours in-house plus hours on 1st call) is 1,898 across the seven surveyed Level I adult CCUs. The 40th and 60th percentiles were 1,659 and 1,826 respectively.
  - Outreach hours (formal, separately scheduled, separately staffed and paid) are integral to service. Most centres provide night outreach service via a cross-coverage model where the attending on night call covers in-house and outreach services.

[63] The Cardiac Society of Australia and New Zealand, Training Guidelines in Adult Echocardiography, Nov 2009

- A benchmark of 1,807 hours on service (scheduled hours in-house plus hours on 1st call) per FTE was applied to the Base Case forecast in the Final Report.

PHYSICIAN SUPPLY

An intensivist is a physician certified by the Royal College of Physicians and Surgeons (RCPSC) in critical care medicine. Typically an intensivist completes primary training (three years or more) in medicine, surgery, or anaesthesia, as well as two to three years of training in critical care medicine. Adult ICUs are divided into three levels, Level 1 being the highest and seeing the most acute and complex patients, Level 2 being secondary or large community hospital ICUs, and Level 3 being the lowest with the least complex patients. Level I ICUs are almost always located in tertiary level hospitals.

There are seven parameters that dictate to a large extent the intensivist staffing levels in Level 1 adult ICUs.

1. Intensivist Coverage (Parameter 1) – The mix between intensivist and non-intensivist physician staffing is an integral decision in staffing Level 1 adult ICUs.
   - Research strongly supports Level 1 ICUs operating as closed units whereby an intensivist is responsible for day-to-day management of the patients, including all admissions and discharges, orders, and clinical management. Level 2 and 3 ICUs operate as open units with day-to-day management decisions taken by the primary physicians. In open units there may be no full-time intensivist or intensivists may be involved in the patients' care at the discretion of the primary physicians.
   - Research shows a measureable improvement in patient ICU and hospital mortality rates when Level 1 ICUs operate as closed rather than open units. This means Level 1 ICUs physician staffing should only be intensivists and junior and senior trainees (clerks, residents, and fellows) accountable to intensivists.
   - Numerous studies64 show that continuous 24/7 in ICU intensivist presence is not associated with a lower standardized mortality rate (SMR) in comparison to a model of a full-time intensivist led daytime staffing and a system of in-house senior and/or junior trainees supported by an intensivist on first call during night time hours.
   - Studies have shown that standardized mortality rate does not vary between day and night time or weekend hours in closed Level 1 ICUs.
2. Beds per Intensivist and Population (Parameter 2) – Level 1 adult ICUs are intended to work with a very specific type of acutely ill, complex patient and are consequently expensive units to operate. Research shows to operate in a safe, quality, and cost effective manner a maximum 14 beds per intensivist is required[65].
   - In a hospital with a Level I ICU, ICU and hospital mortality and ICU, lengths of stay (LOS) are constant across intensivist to patient ratios up to 14 beds assuming comparable case acuity, support team capacity and expertise.
   - Halifax QEII has 8.0 Level I ICU beds per 100,000 population (greater metropolitan), Ottawa 6.2, Hamilton 8.7, Edmonton, 8.8 and Calgary 5.6. How the difference manifests is undetermined due to the complexity of variables involved e.g., outreach service staffing and effectiveness of use, use of step-down acute medical/surgical beds, trauma incident rate, ICU occupancy, etc.

[64] Levy MM, Rapoport J, Lemeshow S, et al., Association Between Critical Care Physician Management And Patient Mortality In The Intensive Care Unit. Ann Intern Med 2008, 148:801–809.
[65] Saqib, I., Dara, R., Afessa, B., Intensivist-to-Bed Ratio*Association With Outcomes in the Medical ICU, CHEST August 2005 vol. 128 no. 2 567-572.

- Within CDHA the Dartmouth General Hospital are considered to be a high functioning Level 2 ICU. Other Level 2 units are Cape Breton Regional and Valley Regional hospitals.

3. Outreach (Parameter 3) – ICU outreach service is an ICU intensivist responding to urgent calls for patient care outside the ICU on the wards. Outreach service is proven in research to reduce ICU admissions, improve survival to discharge from hospital, and reduce hospital LOS[66].

   – Outreach service earns less per hour than ICU attending service consequently, in a FFS environment; ICU Directors have had to mandate the minimum number of weeks on outreach service per annum per intensivist.

4. Senior Trainee (Parameter 4) – With a senior trainee working in the ICU at night the night hour demand for the attending intensivist on-call drops significantly. This includes both phone calls and call backs.

   – The maximum hours of work allowed by trainees per week is declining, reducing their availability for ICU service work.
   – Many Level I ICUs do not always have a senior trainee in the ICU at night. The reason is the size of the trainee program, which limits the number of trainee positions.
   – Exceptions include Toronto Sunnybrook and London Health Sciences Centre, which regularly have two senior trainees in the ICU at nights. Sunnybrook pays a salary of $90,000 per annum to foreign trained fellows e.g., U.K., Brazil, Gulf States who will then work nights in the ICU. Salary funding comes from a combination of hospital funding and intensivist group practice levy.

5. ICU Quality Indicators (Parameter 5) - The Canadian Collaborative on Improving Patient Care and Safety in the ICU is now in its fifth year. At certain times there have been in excess of 50 teams across Canada in this Collaborative. The focus of the Collaborative has been on the following goals over the years:

   – To improve appropriateness of red blood cells transfusions by 80%.
   – To reduce harm from the administration of selected high-risk medications by 90%.
   – To reduce mortality rates from sepsis by 10% using approaches to prevent/ provide early management of sepsis.
   – To reduce the incidence of ventilator-associated pneumonia (VAP) by 50%.
   – To reduce in-hospital cardiac arrests by 50% using Medical Emergency Teams (MET).
   – To reduce the overall incidence of catheter-related infections by 50%.
   – To deliver the best possible end-of-life care to critically ill patients and their families.

6. Full-Time Equivalency (Parameter 7) – Full-time equivalency (FTE) for an intensivist in adult ICU is defined in terms of hours on service (hours in-house plus hours on first call).

   – Average intensivist annual hours on service is 1910 across the seven surveyed Level I adult CCUs. QEII CCU is 1,340 clinical and 450 academic for a total of 1,790 hours per year.
   – Outreach hours (formal, separately scheduled, separately staffed and paid) are integral to service. Most centres provide night outreach service via a cross-coverage model where the attending on night call covers in-house and outreach services.

Figure 164 Consultant Survey in Canada - Average Attending plus Outreach Hours On-Service (7 Tertiary CCM ICU Services)

SITE	SITE	UNIT	BEDS	HOURS	Hrs/ Bed	Week Day: Beds per Intensivist	Nights: #Senior Trainees	Average Hours/ Full-Time Intensivist		
								Attending	Outreach	Total
ALL SITES										
PERCENTILE		40TH	*19*		605	1:10	0	1,472	222	1,659
		60TH	*23*		638	1:14	1	1,661	279	1,826
MEAN			*26.03*		**598**			**1,583**	**298**	**1,881**
MEDIAN			*20.0*		**632**	**1:13**		**1,572**	**261**	**1,730**

7. Entering Practice – Supply and Demand (Parameter 6) – no reliable count of full-time intensivists could be found in the research.

   – A crude estimate of annual supply and demand for intensivists appears to indicate an imbalance between supply (32) and demand (27 to 41) ranging from a surplus of (+5) to a deficit of (-7) intensivists.

Figure 165 Critical Care Medicine Residency positions 2007/08-2009/10 (Source: CAPERS)

		2007/08			2008/09			2009/10			3Yr
(source: CAPERS)		PGY4+	FELLOW	TOTAL	PGY4+	FELLOW	TOTAL	PGY4+	FELLOW	TOTAL	Avg.
UofC	Internal Medicine	4	2	6	4	2	6	6	2	8	7
	Anaesthesia	2	1	3	2	1	3			0	2
	Surgery	1		1	1		1	2		2	1
	Total	**7**	**3**	**10**	**7**	**3**	**10**	**8**	**2**	**10**	**10**
UofA	Internal Medicine	2		2	2		2	1		1	2
	Anaesthesia	1	1	2		1	1			0	1
	Surgery		1	1	2	1	3	3		3	2
	Total	**3**	**2**	**5**	**4**	**2**	**6**	**4**	**0**	**4**	**5**
UBC	Internal Medicine	5		5	5		5	3	1	4	5
(VGH)	Anaesthesia			0			0			0	-
	Surgery		1	1	1	1	2			0	1
	Total	**5**	**1**	**6**	**6**	**1**	**7**	**3**	**1**	**4**	**6**
McMaster	Internal Medicine	5	2	7	5	4	9	2	4	6	7
(HHSC)	Anaesthesia	1	2	3	1		1	1		1	2
	Surgery	0	0	0			0			0	-
	Total	**6**	**4**	**10**	**6**	**4**	**10**	**3**	**4**	**7**	**9**
UofT	Internal Medicine	9	26	35	11	20	31	13	29	42	36
(Shared:	Anaesthesia	1	1	2			0			0	1
Metro	Surgery	2	1	3	2	1	3			0	2
Toronto	**Total**	**12**	**28**	**40**	**13**	**21**	**34**	**13**	**29**	**42**	**39**
Western	Internal Medicine	2	3	5	3	5	8	2	5	7	7
(LHSC)	Anaesthesia	2	0	2	2		2	1		1	2
	Surgery	2	0	2	1		1	2		2	2
	Total	**6**	**3**	**9**	**6**	**5**	**11**	**5**	**5**	**10**	**10**
Dalhousie	Internal Medicine			0	1	0	1	1	1	2	1
(QEII)	Anaesthesia	*no program*		0			0	1		1	0
	Surgery			0	0	0	0			0	-
	Total	**0**	**0**	**0**	**1**	**0**	**1**	**2**	**1**	**3**	**1**
OTHER	Internal Medicine	11	7	18	12	0	12	12	7	19	16
	Anaesthesia	8	3	11	1	1	2	4	2	6	6
	Surgery	6	0	6	7	0	7	7	1	8	7
	Total	**25**	**10**	**35**	**20**	**1**	**21**	**23**	**10**	**33**	**30**
TOTAL	Internal Medicine	38	40	78	43	31	74	40	49	89	80
	Anaesthesia	15	8	23	6	3	9	7	2	9	14
	Surgery	11	3	14	14	3	17	14	1	15	15
	Total	**64**	**51**	**115**	**63**	**37**	**100**	**61**	**52**	**113**	**109**

23.2.3 Emergency Medicine

Currently, and in comparison to, Nova Scotia:

- The “Better Care Sooner: the plan to improve emergency care, Department of Health and Wellness, December 2010” report provides a detailed roadmap and action plan for Emergency Services in the Province. The Consultant PRP Forecast Model allows for flexibility in adapting to government policy as it is translated to clinical service delivery and resource planning. Thusly the Emergency Medicine Forecast in this Final Report can be adjusted as GNS policy evolves to detail clinical service planning based upon their response to the ‘Ross Report’.

- Nova Scotia 1.0 clinical FTE is 1,344 clinical hours annually.
- Benchmark(s)
  - For tertiary Emergency Department physicians in Canada the mean and median hours on service per 1.0 FTE in direct patient care are 1,319, and 1,340 respectively.
  - The average is 2.1 to 2.4 visits seen per hour for tertiary EDs.
  - QEII had 63,000 visits in 2009/10 with 76 hours/day coverage or 2.27 visits/hour[67].

The following national survey was conducted by the Consultant in 2010 based upon 2008/09 data.

Figure 166 Consultant Survey (2008/09) of ED Department Heads - Average Direct Patient Care Hours per FTE (Tertiary ER Services)

SOURCE	NAME	DEFINITION
Calgary (3) & Edmonton (4) EDs	Metro EDs - 'WORKED HOURS'	Six to eleven hours per shift with an average of nine to ten hours Explanatory note: All 7 ED Site Directors communicated that an EP will rarely leave at the end of their scheduled (predominantly 8 scheduled hours in length) shift and will most often work one, two, or three hours more in order to safely complete patient care and transfer of care. An 8 hour shift is equivalent to 1152hours, 9 hour shift is 1296 hours, 10 hour shift is 1440 hours, and 11 hours is 1584 hr/annum.
Calgary (3) & Edmonton (4) EDs	Metro EDs – 'SCHEDULED HOURS'	1,152 hours per annum. 12 clinical shifts per 4-week period, 8 hours per shift, for 48 weeks.
B.C. MoH	ALL Emergency Physicians (EPs)	1,340 hours of direct active patient consultation per annum and, up to, 340 indirect non-patient consultation hours per annum.
Sask. MoH	ALL EPs	1,440 hours of direct active patient consultation per annum.
Manitoba MoH	Tertiary EDs	1,369 hours of direct active patient consultation per annum. Community EDs are 1,400 hours per annum.
Ontario MoH	Tertiary EDs	1,296 hours of direct active patient consultation per annum. Community EDs are 1,452 hours per annum.
Alberta MoH	STANDARD	1,296 hours of direct active patient consultation per annum – for planning purposes only.

The low, high, mean, and median values are 1,152, 1,440, 1,319, and 1,340 respectively. Six of the seven definitions are within 6% of each other from 1,296 to 1,340 hours.

Burnout is serious risk factor for shift workers as 73% of work is outside weekday hours. This is the single most important reason a standard EP full-time hours are around 60% of annual worked hours reported by other specialist physicians (1,300 compared to 2,200). The 2,200 hours (excluding hours on-call) for a full-time Clinical FTE is typically comprised of 85% clinical and 15% non-clinical work. The EP profession and service requires a safe transfer of patient care between EPs during shift changes.

The following are comparators from other tertiary EDs. The range is from 2.1 visits to 2.4 visits per hour.

[67] CDHA, Quality Committee of the Board Emergency Update, Capital District Emergency Services, September 2011

- Winnipeg Health Sciences Centre (WHSC ex. Children's Hospital) – 2.40 visits per hour i.e., 51.0 scheduled hours per day for 44,639 adult visits per annum.
- Vancouver General Hospital (VGH) ED – 2.10 visits per hour i.e., 88.0 scheduled hours per day and 67,000 visits (06/07) (BCMA & MOH, September 21, 2007).
- St. Paul's Hospital (SPH) ED – 2.2 visits per hour i.e., 77 scheduled hours per day and 62,000 visits per annum (BCMA & MOH, September 21, 2007).

In a single site detailed study the strongest EP workload predictor variables in order were: procedure required, CTAS triage level, arrival by ambulance, Glasgow Coma Scale score, age, any comorbidity, and number of prior visits. (Innes, Stenstrom, et.al., 2005).

Functional Specialty

Figure 167 Emergency Medicine - Functional FTE

DHA	RCPSC	CCFP(EM)	FP	TOTAL
1 Total		2.93	4.78	7.71
2 Total		3.00	2.15	5.15
3 Total	1.00	6.31	-	7.31
4 Total		6.80	1.50	8.30
5 Total			5.06	5.06
6 Total	2.00	1.04	3.25	6.29
7 Total		1.64	2.85	4.49
8 Total		6.50	14.21	20.71
9 Total	15.00	18.55	-	33.55
IWK Total	1.00	3.00	3.90	7.90
PROVINCE - TOTAL	19.00	49.77	37.70	106.47
	18%	47%	35%	100%

The adjacent figure summarizes the number of functional FTE by certification by DHA. 18% are RCPSC certificants, 47% are CCFP Emergency Medicine certificants, and the balance are family practitioners.

23.2.4 Endocrinology and Metabolism

In the prior section on population health the data indicate Nova Scotians report prevalence of chronic disease significantly above the Canadian average. With respect to nephrology in particular, diabetes is 28% higher and high blood pressure 27% higher than the national average. The crude prevalence of diabetes increased 19% between 2004 and 2009 (3.8% per annum) and the standardized prevalence increased 14% (2.8% per annum) over the same time period.

Currently, and in comparison to, Nova Scotia:

  - There are 5.6 FTE Endocrinology and Metabolism specialist FTEs or 1.0 FTE per 176,594 population.
- Benchmark(s)
  - In B.C. there is 1.0 per 123,000 excluding 8.0 paediatric subspecialists. In Alberta there is 1.0 per 94,000 excluding paediatric subspecialists.
  - The U.K. England NHS recommends 1.0 per 83,333 population (Source: England NSH Centre for Workforce Intelligence).

- The Health Maintenance Organization, Kaiser Permanente Mid-Atlantic Division has 560,000 registrants and five adult endocrinologists or 1.0 per 112,000[68]. The Kaiser registrants were atypical in that only 1% age 65+ compared to the national population of 12% age 65+. When age standardized based upon Medicare utilization data, the ratio changed to 1.0 per 99,300. Standardization is consistent with increased prevalence of diabetes over age 65.
- A benchmark of 112,000 population per FTE was applied to the Base Case forecast in the Final Report. The benchmark incorporates relative disease incidence and prevalence in Nova Scotia.

23.2.5 Gastroenterology

Currently, and in comparison to, Nova Scotia:

  - There are 17.5 FTE Gastroenterology specialist FTEs or 1.0 FTE per 53,765 population in Nova Scotia.
- Benchmark(s):
  - There is 1.0 FTE per 42,000 in Alberta.
  - There is 1.0 FTE per 64,500 population in B.C
  - The England Royal College of Physicians (RCP) estimates that 1.0 FTE consultants in Gastroenterology are required for a population 42,000 (Source: England NSH Centre for Workforce Intelligence). This is based upon an assessed population need of 12,000 to 13,600 hours of direct service required per 250,000 people. This figure includes the addition of 50 WTEs (4% increase to Gastroenterology WTEs) to deliver a colorectal cancer screening programme.
  - In England in 2008 there was 1.0 FTE per 51,500 in 2008.
  - There was 1.0 full-time gastroenterologist per 47,400 population in Australia in 1999[69]. On average gastroenterologists worked 52.4 total hours per week and spent 44.7 of those hours on direct patient care. 65% worked more than 50 hours per week.
  - A benchmark of 51,500 population per FTE was applied to the Base Case forecast in the Final Report.

A study[70] based upon 2002 CIHI data found gastroenterologists performed 53% of all colonoscopies and 59% of all gastroscopies nationally. Gastroenterologists averaged 516 colonoscopies, an average 317 were performed by surgeons, and 203 by other physicians.

The impact of colonoscopy screening guidelines is potentially very significant. Assuming each male in compliance (assume 35% compliance) with the guideline undergoes at least two colonoscopy screens after age 50 then the annual impact in NS will be 4,000-4,500 procedures each year for individuals reaching age 50 and the same or larger volume for those already over age 50 for a total of 5,000-6,000 procedures per year. At 45 minutes per procedure this equates to 7,000 hours or 3.5 clinical FTE per annum. Many assumptions are implicit in this calculation e.g. compliance rate, facilities, equipment, etc.

There are 618 nurses working in clinical gastroenterology across the UK. These include 221 nurse endoscopists, 167 nurse practitioners, 201 nurse specialists (including IBD, liver, hepatitis and alcohol liaison nurses) and 17 nurse consultants. At least 339 nurses perform regular endoscopy (median 2 sessions per week).

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[68] Rizza, R.A., Hogan, P.F., et.al., A Model to Determine Workforce Needs for Endocrinologists in the United States Until 2020, J Clin Endocrinol Metab, May 2003, 88(5):1979–1987

[69] Australian Medical Workforce Advisory Committee, The Specialist Gastroenterology Workforce In Australia Supply And Requirements 1999 – 2010, August 2000.

[70] Hilsden, R., Rabeneck, L, et.al., Who Provides Gastrointestinal Endoscopy in Canada? Can J Gastro Vol 21 No 12, Dec-07

23.2.6 (General) Internal Medicine

Currently, and in comparison to, Nova Scotia:

- There are 43.5 GIM specialist FTEs or 1.0 GIM FTE per 21,652 population in Nova Scotia.
- Benchmarks:
  - In 2007 there was 1.0 GIM FTE per 14,058 Canada-wide[71].
  - A customized detailed study by the Consultant of clinical GIM specialists (excluding subspecialists) in large urban centres in Alberta (pre-Alternate Funding Plan) and British Columbia revealed the following in terms of workload:
    - An average 50 to 55 hour work week plus hours on call and a forty six week work year;
    - A range of 2,950-3,300 billed services per annum per 1.0 FTE;
    - Nova Scotia GIM specialists performed an average 2,566 services (FFS plus shadow billed) per 1.0 FTE (Section 16). Inter-provincial comparison is difficult without normalizing the fee code data;
    - A weighted (population and workload/FTE) benchmark of 18,290 population per FTE was applied to the Base Case forecast in the Final Report.

General internal medicine (GIM) specialists in the Canadian health care system are a core service to inpatient acute medical services, foundational teaching programs across virtually all resident programs, and provide inpatient consultation and attending physician services to patients of internal medicine including most subspecialties. General internists are specialists trained in the diagnosis and treatment of a broad range of diseases involving all organ systems and are skilled in the management of patients who have undifferentiated or multi-system disease processes. Acute medical wards and/or clinical teaching units are the location of choice for undifferentiated patient admissions referred to GIM by a variety of physicians, mainly Emergency Physicians (EPs), but also family physicians and other specialists (i.e. Rheumatology, Endocrinology, Neurology, Gastroenterology etc.). GIM specialists also staff hospital-based ambulatory clinics to facilitate rapid access/urgent assessments. GIM specialists are preceptors and educators to the undergraduate clerkship year students and years one to three postgraduate residents. In tertiary and large secondary care hospitals, GIM will provide a 24/7 service to inpatients through a combination of ward attending coverage and inpatient consultation service[72].

General internal medicine (GIM) training in Canada, until December 2010 did not have a separate certification independent of core internal medicine. A four-year GIM training program had been an extension of the three-year core internal medicine program. In Quebec in 2000 the Collège des médecins du Quebec (CMQ) mandated a five-year GIM program and abolished double certification. For the first time the GIM program became a distinct program at the same level as other medical subspecialty programs such as cardiology, respirology, and haematology.

23.2.7 Nephrology

Currently, and in comparison to, Nova Scotia:

- There are 17.7 licensed nephrologist specialists or 1.0 FTE per 53,268 population in Nova Scotia. Functionally there are 14.2 FTE assuming those outside Halifax deliver a significant amount of GIM services. On a functional basis there would be 1.0 FTE per 66,374 population.

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[71] Canadian Society of GIM - CMAJ February 12, 2008 vol. 178 no. 4 doi: 10.1503/cmaj.080028

[72] Canadian Society of Internal Medicine, Care-Fully: Defining a Plan for General Internal Medicine for Canada, Oct/05

- Benchmark(s):
  - Australian survey of nephrologists reported 1.0 FTE per 75,800 population.
  - Population ratio per FTE is not an ideal benchmark and in the case of Nephrology other benchmarks are available.
  - Nova Scotia is currently at 1.0 FTE functional nephrologist per 48 patients on renal replacement therapy (RRT).
  - NHS England recommends 1.0 FTE functional nephrologist per 56 patients on (RRT). See subsequent discussion on FTEs and RRT.
  - A benchmark of 56 patients on active renal replacement therapy per FTE was applied to the Base Case forecast in the Final Report. The benchmark incorporates relative disease incidence and prevalence in Nova Scotia.

The rate of incident renal replacement therapy rose 41% (4.5% per annum) in Canada, from 112 per million population in 1995 to 158 per million population in 2004. The demand for renal replacement therapy has increased 6% per annum between 2004 and 2009.

Persons at risk of developing chronic kidney disease are those with: diabetes mellitus; hypertension; heart failure; atherosclerotic coronary, cerebrovascular or peripheral vascular disease; unexplained anemia; a family history of ESRD; and 1st Nations peoples. The crude prevalence of diabetes in Nova Scotia increased 19% between 2004 and 2009 (3.8% per annum) and the standardized prevalence increased 14% (2.8% per annum) over the same time period.

A comprehensive Australian survey of nephrologists reported 1.0 FTE per 75,800 population with a regional range per 1.0 FTE of 58,000 to 109,000. The same survey found 25% performed vascular access procedures and 50% performed renal biopsy procedures[73].

Figure 168 Nephrology - International Comparison, 2007

	United States Of America [a] 2005	Canada [b] 2004	United Kingdom [c] 2005	Australia 2005	Australia 2007 survey (this research)
Number of pts requiring dialysis (number per million population)	341 319	18 827	20 000	8 528 (420)	9642 [i] (459)
Number of ESKD	485 012	30 924	38 000 (638)	15 067 (741)	16 751 [i] (797)
Annual growth in ESKD (%)	3.9	4.5	5	5.9 [e]	6.5 [i]
Number of practicing nephrologists	4900[g]	366	359	171[f]	278
ESKD/neph	99.0	84.5	105.8	88.1	60.3
Number of Specialist Advanced trainees (Renal)	340[g]	unavailable	301[h]	33[k]	50[k]

[a] US Renal Data System (USRDS) 2007 report
[b] Canadian Organ Replacement Register, 1995-2004 (2006 Annual Report)
[c] The UK Renal Registry Eight Annual Report.Bristol.2005
[d] Federation of the Royal College of Physicians of the UK. Census of consultant physicians in the UK, 2005: Data and commentary. London: RCP, 2006

The adjacent figure taken from the survey findings reports, for 2004-05, a range from 60.3 to 105.8 patients with end stage kidney disease per nephrologist. Nova Scotia has 17.7 licensed and 14.2 functional nephrologist FTEs at approximately 1.0 FTE functional nephrologist per 48 patients on RRT, or viewed another way, Nova Scotia had between 80 and 100 patients with end stage kidney disease (ESKD) per FTE. Nova Scotia had 1,422 patients with ESKD in 2009 (Source: Canadian Organ Replacement Register).

Nova Scotia in 2009/10 had 18 licensed nephrologists, 11 in CDHA and 7 in other DHAs (2 of 7 worked less than 0.25 FTE each). Functionally the remaining five outside CDHA also practice general internal medicine. A review of the NS Renal Program data (prior Section on Population Health)

[73] Australian and New Zealand Society of Nephrology, Australian Nephrology Workforce Survey, 2007

reveals a significant difference between the place of residence and location of dialysis with many living outside CDHA seeking dialysis in CDHA. **This observation will require further investigation to determine optimal service delivery when the NS PRP is linked to clinical service delivery planning.**

From a PRP population need basis there are 17.7 licensed nephrologist FTE or 1.0 FTE per 53,000 population and 1.0 FTE per 39 patients on active renal replacement therapy. This ratio is consistent between CDHA and the other DHAs based upon location of dialysis and location of nephrologist i.e. 39.4 and 38.2 respectively. Discounting for relative academic work will change the ratio approximately +/- 6.0.

In 2009/10 in Nova Scotia, there were 690 patients on active renal replacement therapy (RRT) and 1,055 identified as pre-dialysis. This is consistent with Nova Scotia having the second highest prevalence of ESRD in Canada at 1,318 per million population. England has 1.0 Whole Time Equivalents (WTE) per 66,000 population (Source: NHS England Centre for Workforce Intelligence) with forty percent lower ESKD prevalence (800 per million population). More importantly England plans for 1.0 WTE per 119 patients on active renal replacement therapy. The service delivery model in England is premised upon a defined mix of Junior Doctors (44%) and Consultants (56%) and enhanced multidisciplinary team model that includes nursing, counselling, pharmacy, health care technology, diabetologists, general practitioners, dieticians, and psychology. The Joint Service Committee on England nephrology workforce is recommending a ratio of 1.0 WTE Consultant to 100 patients[74]. This recommendation does not contemplate any change in other clinical scope of practice. This recommendation includes renal transplant patients. Assuming a 56% Consultant 44% Junior Doctor (e.g. general practitioner) ratio then the recommendation is 1.0 WTE Consultant per 56 patients. Nova Scotia is currently at 1.0 FTE licensed nephrologist per 39 patients on RRT and approximately 1.0 FTE functional nephrologist per 48 patients on RRT. Both the England and Nova Scotia ratios assume a percent academic/non-clinical workload.

The 2006 England Royal College of Physicians member survey reported nephrologists working an average 55.3 hours per week based upon a 53% response rate, of whom 58.9% responded to the >48hr question.

23.2.8 Neurology

Currently, and in comparison to, Nova Scotia:

- There are 20.8 neurology specialist FTEs or 1.0 FTE per 45,242 population in Nova Scotia.
- Benchmark(s):
  - In Canada there is 1.0 FTE per 43,355 (source: CIHI).
  - Royal College of Physicians Assoc. of British Neurologists recommend 1.0 FTE per 43,500 (see below).
  - A benchmark of 43,500 population per FTE was applied to the Base Case forecast in the Final Report.

Disorders of the nervous system are common. Some neurological conditions are inherited like Huntington's disease and to a lesser extent Alzheimer's disease with others related to smoking, alcoholism, trauma, infection or autoimmune dysfunction. People with diabetes are more likely to develop neurological problems compared with those without diabetes. Researchers highlight that diabetic patients have a three- to ten fold increased

[74] British Renal Association, JSC for Renal Medicine, 08.24, 5 June 2008, WORKFORCE REQUIREMENTS FOR NEPHROLOGY OVER THE NEXT 5-10 YEARS, Draft document from the Workforce Group, (Baker, R., Barker, L., Mason P. Chair)

risk of thromboembolic strokes than the non-diabetic population, and stroke-related mortality and morbidity are increasing in the diabetic population[75].

Of all the identified modifiable risk factors for stroke, hypertension appears to be the most important, owing to its high prevalence and its associated three- to fivefold increase in stroke risk. Based on epidemiological data, approximately 50 percent of strokes could be prevented if hypertension were eliminated (Source: NHS England Centre for Workforce Intelligence).

England NHS workforce planning for neurologists uses a broad parameter of neurologists having an average of three clinics per week with five new patients per clinic, then this equates to one neurologist per 125,000 population. Currently there is one neurologist per 150,000 in the United Kingdom.

The Royal College of Physicians Association of British Neurologists conducted a detailed programmatic based review of neurology workforce requirements[76]. The review projected neurologist requirements for a comprehensive service including acute care (emergency care), scheduled outpatient care, and long-term conditions (e.g. MS, epilepsy and movement disorders. The provision of a adult neurology service requires one FTE consultant neurologist per 70,000 population. The broader target of one FTE per 43,500 population includes stroke (stroke subspecialists), neurophysiology and neurorehabilitation.

23.2.9 Palliative Medicine

The NS approach to palliative care is based on a service model which includes palliative care physician(s) in each DHA. This role is integral to the function of established district specialist palliative care teams which are resources to primary care providers in a shared care model. This is secondary and shared care for patients with advanced illness, often in their homes. The necessary resources required for this model are local[77].

23.2.10 Respirology

Currently, and in comparison to, Nova Scotia:

- There are 11.8 respirology specialists or 1.0 FTE per 80,173 population in Nova Scotia.
- Benchmark(s):
  - The U.K. Royal College of Physicians' 2005 Consultant physicians working with patients report estimates a requirement of 1.0 FTE respiratory medicine consultants per 37,000 head of population[78]. The Sentinel Services are the incidence of lung disease, in particular asthma and chronic obstructive pulmonary disease (COPD).
  - In 2009/10 British Columbia had 75 adult respirologist FTE or 1.0 per 59,400 with an average of 7,200 services per 1.0 FTE.
  - Nova Scotia in 2009/10 has 11.8 FTE or 1.0 per 80,173 performing an average 2,059 FFS and shadow-bill services per 1.0 FTE.
  - A report to the Canadian Thoracic Society Education Committee included a recommendation from PGME Respirology Directors of 1.0 FTE per 50,000. The RCPSC 1988 recommendation was 1.0 respirologist per 81,000, which is equivalent to about 1.0 FTE per 73,000 population. This

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[75] Sood, M.M., Bueti, J., et.al., The Intersection of Risk and Benefit: Is Warfarin Anticoagulation Suitable for Atrial Fibrillation in Patients on Hemodialysis?, CHEST October 2009 vol. 136 no. 4 1128-1133

[76] U.K. RPCS, Assoc. British Neurologists, Local adult neurology services for the next decade, June 2011

[77] NS Department of Health and Wellness, Provincial Hospice Palliative Care Project", Final Report & Recommendations in October, 2005

[78] U.K. NHS Centre for Workforce Intelligence, August 2010

recommendation either predated or occurred at the same time as the advent of public insured sleep study services[79].

- A benchmark of 59,400 population per FTE was applied to the Base Case forecast in the Final Report. The benchmark incorporates relative disease incidence and prevalence in Nova Scotia.

None of the above studies are based upon a methodological assessment of population need. The prevalence in Nova Scotia of COPD has declined (36.5%) between 2003 and 2009 while asthma has remained essentially constant. Nova Scotia prevalence of both chronic conditions is highest in Nova Scotia when compared nationally.

23.2.11 Rheumatology

Currently, and in comparison to, Nova Scotia:

- There are 12.4 Rheumatology specialist FTEs or 1.0 FTE per 76,201 population in Nova Scotia.
- Benchmark(s):
  - There is 1.0 FTE Rheumatologist per 76,201 population in Nova Scotia with arthritis prevalence of 23.3%.
  - There is 1.0 adult rheumatology FTE per 111,000 in B.C. with an arthritis prevalence of 15.3%.
  - There is 1.0 adult rheumatologist FTE per 99,000 in Alberta with an arthritis prevalence of 16.9%
  - Weighting B.C. and Alberta for relative prevalence of arthritis changes their ratios to 1.0 FTE per 72,554.
  - There was 1.0 FTE per 129,000 population in the United Kingdom in 2007[80] with a range from 125,000 in England to 170,000 in Scotland.

Figure 169 Rheumatologist FTE in United Kingdom 2005-2007

	Count		FTE		Pop/FTE	
	2005	2007	2005	2007	2005	2007
England	479	507	100	27	134000	125000
Scotland	40	45	113	511	204000	170000
Wales	26	28	106	321	141000	129000
North Ireland	14	15	115	533	191000	157000
UK	559	595	101	736	139000	129000

  - The U.K. Royal College of Physicians (2008) estimated a need for 1.0 FTE consultant per 86,000 population (Source: England NSH Centre for Workforce Intelligence). Osteoarthritis is the most common type of osteoporosis in the UK.
  - A benchmark of 72,554 population per FTE was applied to the Base Case forecast in the Final Report. The benchmark incorporates relative disease incidence and prevalence in Nova Scotia.
- Major types of arthritis include Osteoarthritis (OA) [national prevalence 10% of adults], Rheumatoid Arthritis (RA) [national prevalence 1% of adults], Systemic Lupus Erythematosus (SLE) [national prevalence 0.05% of adults], Ankylosing Spondylitis [national prevalence 0.75% of adults], and Gout

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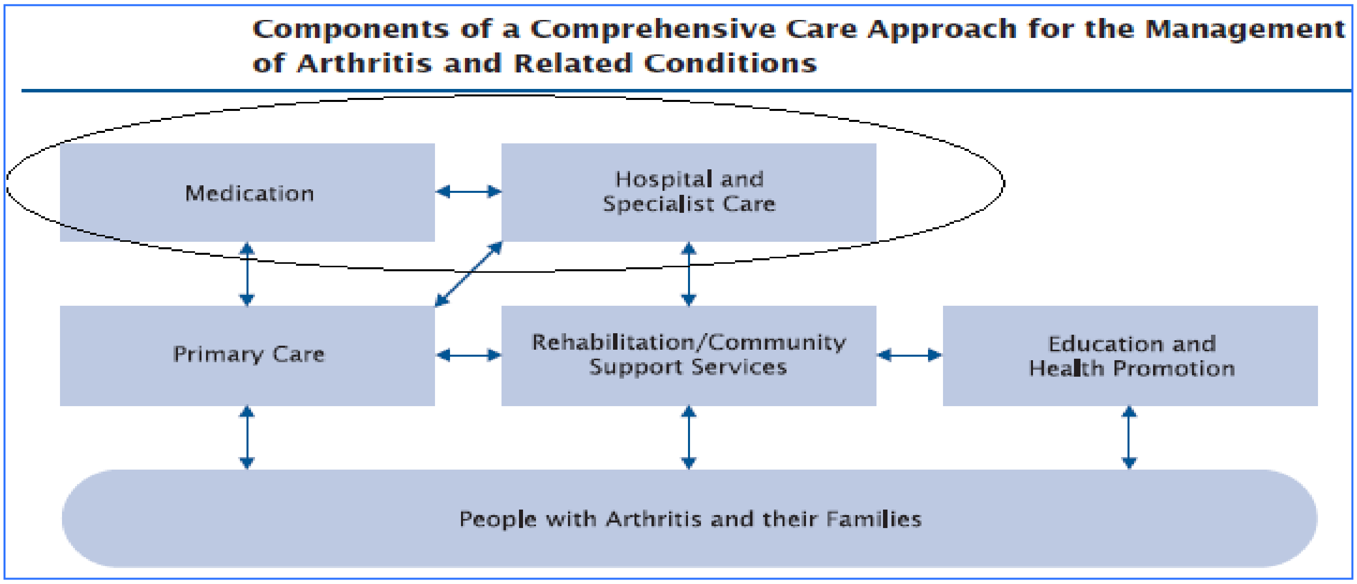
[79] Cockcroft, D.W., Wensley, D., Respirology Manpower in Canada, A Report to the Canadian Thoracic Society Education Committee, Can Respir J Vol 7 No 6 Nov-Dec 2000

[80] Harrison, M.J., Deighton, C., Symmons, D.P.M., An update on UK rheumatology consultant workforce provision: the BSR/ARC Workforce Register 2005–07: assessing the impact of recent changes in NHS provision

[national prevalence 3% of adults]. The prevalence of arthritis/rheumatism increases sharply with age[81].

- Arthritis overall has a 16% standardized prevalence. Nova Scotia is 23.3%, which is substantially higher than the next highest prevalence, which is Saskatchewan at 19.6%.

Figure 170 Care Approach to Arthritis Management (Source: Arthritis Society 2003)



23.2.12 Psychiatry

Currently, and in comparison to, Nova Scotia:

- There are 129.7 adult, 4.0 forensic, and 15.7 paediatric psychiatrist FTEs (149.4 FTE total) or 1.0 FTE per 6,311 population in Nova Scotia.

- Benchmark(s)
  - In 2008/09 in Canada there was 1.0 FTE per 9,016 population (Source: CIHI).
  - In 2008/09 in Canada, assuming a similar distribution between adult, forensic, and paediatrics, there was 1.0 FTE per 10,382 and 336,748 population for adult and forensic respectively and 18,631 (<age18) for paediatric.
  - The State of Georgia developed the Average Requirement Benchmark of 1.0 FTE per 12,346 (8.1 per 100,000) population.
  - The USA GMENAC standard is 1.0 FTE per 6,494 (15.4 per 100,000) population.
  - The USA Kaiser Permanente standard is 1.0 FTE per 26,316 population (3.8 per 100,000).
  - A benchmark of 8,546 population per FTE was applied to the Base Case forecast in the Final Report. The benchmark incorporates relative disease incidence and prevalence in Nova Scotia.

PRP for psychiatry includes multiple complexities some of which require policy direction on access to service relative to measurable population need. On this count, program service delivery planning will inform psychiatry PRP to a great degree e.g. what is an acceptable wait time for a GP referral psychiatric consultation for a frail elderly with a chronic cognitive disorder versus a adolescent with suicidal behaviour?

[81] Health Canada and Arthritis Society, Arthritis in Canada: An On Going Challenge, 2003

Figure 171 Psychiatrist & Psychologist comparative work profile, 2002

Variable[a]	Psychiatrists (N=92) Mean	SE	Psychologists (N=386) Mean	SE
Hours per week				
Direct patient care	24.9	.9	22.5	.7
Consultation	5.4	.8	4.3	.3
Patient care administration	7.1	1.0	7.6	.3
Non–patient care administration	3.7	1.0	3.1	.3
Research	1.6	.5	1.4	.2
Other professional activities	3.6	.6	4.0	.3
Total hours worked	46.5	1.6	41.6	.8
Patients per week with indicated diagnosis				
Childhood disorders*	11.7	2.1	12.2	1.2
Substance use disorders***	8.0	1.1	7.6	0.7
Mood disorders	35.3	2.9	35.3	1.3
Anxiety disorders***	14.3	2.0	20.3	0.9
Personality disorders***	8.7	1.4	9.7	0.8
Schizophrenia or psychotic disorders***	15.7	1.9	3.9	0.7
Other disorders***	6.7	0.7	9.7	1.0

A study[82] in California provided a detailed analysis of clinical practice including hours of work, distribution of work, and caseload (figure opposite). Their most relevant findings to PRP were:

- Psychiatrists treated 33.2 patients per week and psychologists 21.7.
- Psychiatrists worked an average 46.5 hours per week and psychologists 41.6 including 30.3 and 26.8 spent in direct patient care/consultation respectively.

The US Veterans Health Administration standard is fewer than 500 cases per psychiatrist per year. Goldman and associates[83], using a rational methodology for developing workforce requirements, concluded that a community mental health outpatient psychiatrist could manage ten new patients a week and a caseload of 165 to 323 patients, depending on the acuteness of the patients' illnesses and the level of service they required.

The Average Requirement Benchmark of 8.1 per 100,000 population was developed by the State of Georgia in 1996. The Average Requirement Benchmark represents an average of benchmark rates ranging from the high GMENAC standard of 15.4 psychiatrists per 100,000 population to the low benchmark of 3.8 per 100,000 found in a proposals by Kaiser Permanente[84].

Roos, et.al. observed that 45% of adults only see a family physician (FP) for a mental health disorder. Adults with major or minor mental health disorders were found to visit an FP on average 9.1 and 6.9 times yearly, respectively[85].

A need based approach was described by the Dean, School of Medicine, University of South Carolina as a progression that entails five determinants: (1) number of people with mental health problems,(2) number of people needing mental health treatment, (3) number of people needing psychiatric treatment, (4) amount of psychiatric time required to meet patient needs, and (5) amount of time psychiatrists have available to provide direct patient care[86]. The article did not cite examples where the approach had been applied.

In the U.K. where the NHS has conducted or facilitated numerous detailed workforce studies, one Health Trust reports the average annual case-load of a general adult consultant psychiatrist in a North-West London trust is

[82] Pingitore, D.P., West, J., et.al., Comparison of Psychiatrists and Psychologists in Clinical Practice, Psychiatr Serv 53:977-983, August 2002 © 2002 American Psychiatric Association
[83] Goldman CR, Faulkner LR, Breeding KA: A method for estimating psychiatrist staffing needs in community mental health programs. Hospital and Community Psychiatry45:333-337, 1994
[84] Eveland, A.P., Rumpf, M., et. al., Analysis of Health Service Areas: Another Piece of the Psychiatric Workforce Puzzle, Psychiatr Serv 49:956-960, July 1998
[85] Watson, D., Katz, A., Population-Based Use of Mental Health Services and Patterns of Delivery Among Family Physicians,1992-01,
[86] Faulkner, L.R., Implications of a Needs-Based Approach to Estimating Psychiatric Workforce Requirements, Academic Psychiatry, 27:4, Winter 2003 241

between 200 and 300 patients, of whom two-thirds have severe mental illness[87]. The article goes on to opinion that "…Clearly the psychiatrist cannot be offering much in the way of personal support to such a large number of patients. This, therefore, highlights the question, what is the role they are trying to fulfil…?"

The psychiatry specialty in Canada is 38% female and 44% in Nova Scotia. Residency programs are 65% female. The gender shift will continue and directly impact PRP. The subspecialty practice preference of female versus male psychiatrists requires careful consideration to ensure the spectrum of mental health disorders can be appropriately treated.

Nova Scotia

In 2009/10 there was 129.7 adult, 4.0 forensic, and 15.7 paediatric psychiatrists for a total of 149.3 FTE. This is equivalent to 1.0 FTE psychiatrist per 6,311 residents in Nova Scotia or 1 FTE child/adolescent psychiatrist per 11,044 residents under age 18 and 1 FTE adult psychiatrist per 5,933 residents over age 17.

A Nova Scotia provincial review of recruitment issues in psychiatry identified the following concerns with respect to a psychiatric human resource plan[88]:

- Develop a psychiatric human resource plan in the context of mental health teams that is driven by the needs of specific mental health populations including but not limited to:
  - Seriously persistently mentally ill
  - Developmentally delayed children and adolescents
  - Seniors with behavioural problems and dementia
  - Children and adolescents with ADHD and children and adolescents with conduct disorders
  - Adolescents and young adults with new onset psychoses
  - Patients of all ages with mental health crises presenting to emergency departments
  - Patients requiring admission to inpatient units both adult and child
  - Adults and adolescents with concurrent addictions and mental illness
  - All ages with episodic mental illness
  - Organization of inpatient care is an important issue in the Mental Health Strategy
  - Benchmarks from around the world range from 3.5 psychiatrists per hundred thousand in the United Kingdom to 3.8–4.8 in managed care settings in America to 8.8 in Australia and 10–12.5 in Canada (one per 8,000-10,000) and 12 in Holland and 15.8 FTE psychiatrists per hundred thousand (one per 6,330) estimated in America by GMENAC 198089.
  - Convene a meeting of relevant stakeholders to discuss collaborative multi-disciplinary teams and roles:
    - Priority roles for community psychiatrists in team based and private practice for all ages
    - Involvement of family physicians in mental health services as well as involvement of general community paediatricians, child psychiatrists and other mental health providers for children.

Other selected review findings focused on recruitment issues i.e.:

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[87] Mynors-Wallis, L., Case-loads to workloads — the role of the general adult psychiatrist, Editorials, The Psychiatrist (2001) 25: 1-2 doi: 10.1192/pb.25.1.1.

[88] Nova Scotia Department of Health and Wellness, Issues Of For Recruiting Psychiatrists To Nova Scotia District Health Authorities Outside Capital Health - Report To The Master Agreement Steering Group Physician Services Master Agreement 2008-2013, D. Gass, Jan/11.

[89] Sargeant, SK, Dada, N., et.al., Psychiatric Human Resources Planning in Canada. The Canadian Journal of Psychiatry, 2010. 55: p. 1-20.

Figure 172 Psychiatrist FTEs March 31, 2010 (Source: CPSNS and Department Psychiatry)

DHA	GROUPING	PROGRAM	FTE-Mar31/10
IWK	Age Strata	Child and Adolescent	14.30
CDHA	Age Strata	Geriatric (Seniors)	5.13
CDHA	Age Strata	Seniors/ECT	-
	Age Strata Total		19.43
CDHA	Disorder	Mood Disorders	3.95
CDHA	Disorder	Mood Disorders Psychiatry	-
CDHA	Disorder	Personality Disorders	-
CDHA	Disorder	Sleep Disorders	0.90
CDHA	Disorder	Addictions	0.80
CDHA	Disorder	Adult Anxiety Disorders	-
CDHA	Disorder	Adult Intellectual Disabilities/Autism	-
CDHA	Disorder	Disruptive Behaviour	-
CDHA	Disorder	Early Psychosis	3.85
CDHA	Disorder	Eating Disorders	0.50
	Disorder Total		10.00
CDHA	Facility	Day Hospital	1.25
CDHA	Facility	Emergency	1.00
CDHA	Facility	Inpatients	7.50
CDHA	Facility	Outpatients	15.25
CDHA	Facility	Short Stay	1.00
	Facility Total		26.00
CDHA	Other	Administration	4.20
CDHA	Other	Education	0.40
	Other Total		4.60
CDHA	Outreach	Community Focused Living	0.40
CDHA	Outreach	Connections/SCOT Team	3.00
CDHA	Outreach	Student Health	-
	Outreach Total		3.40
CDHA	Service	Consult / Liaison	3.35
CDHA	Service	Ctr for Emotions & Health	1.45
CDHA	Service	Developmental	1.28
IWK	Service	Forensics (Adolescent)	0.20
CDHA	Service	Forensics (Adult)	4.25
CDHA	Service	Health Services	-
CDHA	Service	Recovery & Integration	2.00
CDHA	Service	Reproductive Care	1.20
CDHA	Service	Shared Care	0.20
CDHA	Service	Traveling & Telehealth	0.60
	Service Total		14.53
	SUBTOTAL	CDHA/IWK - AFP	77.97
OTHER	Service	OUTSIDE AFP (in CDHA & other DHAs)	71.38
	TOTAL	PROVINCE	149.35

- Work together to ensure all psychiatry residents' curricula include 6 months of community-based general psychiatry outside of Halifax Dartmouth and Saint John by the beginning of the 2013-14 academic year.
- Develop an implementation strategy for the Shared Care Model of Collaborative Mental Health Care.
- Subsequent discussions should focus on models of care of other high need groups requiring ongoing care such as the seriously persistently mentally ill and developmentally delayed children, adolescents and adults.

The adjacent figure reconciles AFP FTEs to the total number of psychiatrist FTE in the province. At March 31, 2010 there was 77.97 FTE in the AFP and 71.38 outside the AFP. The program sorting is provided by the Department of Psychiatry. The 71.38 FTE are located across all DHAs including the CDHA.

23.2.13 Other Specialities

The following specialties will be addressed in the forecast modeling, scenario development, and final report and recommendations:

- Clinical Immunology and Allergy
- Community Medicine
- Dermatology
- Haematology
- Infectious Diseases
- Maternal-Fetal Medicine
- Medical Oncology
- Neonatal-Perinatal Medicine
- Occupational Medicine
- Physical Medicine and Rehabilitation

The Consultants' prior work in psychiatry PRP led to the clinical (includes concurrent teaching, excludes didactic teaching and clinical research) psychiatrist model illustrated below. The model is premised upon a fifty-hour work week, forty six work weeks per year, 6.5 consultation hours per day, and 1.45 consultants per hour. Hours on call are additional and as required. Prevalence is divided into the major disorder groupings. The estimated consultations per FTE based upon the preceding assumptions was calculated as 2,178 over 46 work weeks. Inpatient work is separate and was calculated at 15-20 cases[90] per psychiatrist per day.

Figure 173 Adjusted Population Need Based Model - Psychiatry Workforce

	PREDOMINANT DISORDER GROUPINGS																		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
DATA	MOOD			ANXIETY				Schizo phrenia	EATING DISORDER	Problematic Substance Abuse		DEVELOPMENTAL (age 0-14)			PERSONALITY & COGNITIVE				TOTAL
% Prevalence - Nova Scotia *(Source Col's 1-11 2002 Community Health Survey - Analysis by Canadian Collaborative Mental Health Initiative, 2006)*	3.6%	1.0%	1.0%	1.5%	3.3%	0.5%	0.5%	0.8%	1.1%	3.2%	0.6%	9.0%	0.9%	5.0%	**	8.0%	**	4.0%	19%
DISORDERS	*Depressive*	*Dysthymic & Other*	*Bi-polar*	*Panic, OCD*	*Social*	*PTSD*	*Generalized e.g. Psycho somatic*			*Alcohol*	*Drugs, Gambling, Other*	*Learning & Other*	*Pervasive (e.g. Autism spectrum)*	*ADHD*	*Borderline*	*Dementia (age>64) (Source: Cdn Study Health & Aging, 1994,*	*Antisocial*	*Alzheimer (age>64)*	ALL
Prevalence/ 100000	3,640	960	1,000	1,500	3,300	500	500	800	1,100	3,200	600	9,000	900	5,000		8,000		4,000	**44,000**
Total prevalence	29,216	7,705	8,026	12,040	26,487	4,013	4,013	6,421	8,829	25,684	4,816	12,588	1,259	6,994		12,093		6,046	**176,231**
% Seen by Psychiatrist	*30%*	*10%*	*75%*	*30%*	*10%*	*30%*	*10%*	*100%*	*25%*	*20%*	*20%*	*10%*	*75%*	*75%*		*30%*		*30%*	**29%**
Patient	*4.0*	*2.0*	*6.0*	*3.0*	*1.0*	*3.0*	*1.00*	*6.0*	*6.0*	*6.0*	*6.0*	*4.0*	*3.0*	*4.0*		*3.0*		*3.0*	**1.27**
Psychiatrist Consultations pe	35,059	1,541	36,119	10,836	2,649	3,612	401	38,526	13,243	30,821	5,779	5,035	2,832	20,981		10,884		5,442	**223,760**
Consultations/FTE per Year	*[based upon the median of two studies, study 1 - California 2002, Alberta 2006 i.e. 1.45 consultations/hour, 6.5 consultation hours/day, 46 weeks per year]*																		**2,178**
FTE and Current Pop. Need	*16.1*	*0.7*																	
PLUS: Hospitalization (150/100000; 30 day ALOS, 19 cases/FTE/Day)																			

The model has a number of discretionary, policy and service delivery planning dependant, variables. For example the "percentage seen by psychiatrist" is highly dependant upon available FTEs, access time targets, functioning of collaborative care, % seen by GP, multidisciplinary roles, etc..

[90] Yager, J., Caseloads in Public Psychiatric Hospitals, Journal Watch Psychiatry *May 1, 1996*

23.3 Paediatrics

23.3.1 Nova Scotia

The following figure lists paediatric specialties and the ratio of provincial NS population per FTE, NS population under age 18 per FTE, NS population under age 18 per FTE net of out-of-province (OOP) workload, and Maritime population under 18 per FTE.

Figure 174 Paediatrics – Physician FTEs 2009/10 – Nova Scotia (Source: MSI)

Category	Functional_Specialty	All DHAs	IWK	PROVINCE	% OOP Workload	NET FTE	NS Pop <18/ FTE
Paediatric - Diagnostic &	Anatomic Pathology	-	2.2	2.2	14%	1.87	92,524
Paediatric - Diagnostic &	General Pathology	-	1.0	1.0	0%	1.00	173,054
Paediatric - Diagnostic &	Paediatric Diagnostic Radiology	1.0	5.9	6.9	14%	5.97	28,975
Paediatric - Diagnostic &	Paediatric Haematology/Oncology	-	-	-	-	-	-
Paediatric - Diagnostic &	Paediatric Medical Genetics	-	3.0	3.0	u/a	u/a	57,685
Paediatric - Diagnostic &	**Paediatric - Diagnostic & Therapeutic**	**1.0**	**12.1**	**13.1**	**33%**	**8.84**	**19,570**
Paediatric - Medical	Paediatric Cardiology	-	4.2	4.2	30%	2.94	58,862
Paediatric - Medical	Paediatric Child Health	-	0.8	0.8	8%	0.69	250,803
Paediatric - Medical	Paediatric Clinical Immunology & All	-	6.0	6.0	7%	5.58	31,013
Paediatric - Medical	Paediatric Critical Care	-	5.4	5.4	27%	3.93	43,986
Paediatric - Medical	Paediatric Developmental	-	4.0	4.0	2%	3.92	44,147
Paediatric - Medical	Paediatric Emergency Medicine	-	4.6	4.6	2%	4.50	38,420
Paediatric - Medical	Paediatric Endocrinology & Metaboli	-	3.0	3.0	14%	2.58	67,075
Paediatric - Medical	Paediatric Gastroenterology	-	1.9	1.9	26%	1.44	120,171
Paediatric - Medical	Paediatric General	17.2	25.2	42.5	n/a	42.47	4,075
Paediatric - Medical	Paediatric Haematology/Oncology	-	5.5	5.5	36%	3.52	49,163
Paediatric - Medical	Paediatric Infectious Diseases	-	4.8	4.8	23%	3.68	46,984
Paediatric - Medical	Paediatric Medical Genetics	-	2.9	2.9	u/a	u/a	59,425
Paediatric - Medical	Paediatric Medical Microbiology	-	0.7	0.7	u/a	u/a	249,223
Paediatric - Medical	Paediatric Neonatology	2.0	5.4	7.4	16%	6.25	27,674
Paediatric - Medical	Paediatric Nephrology	-	1.0	1.0	25%	0.75	230,739
Paediatric - Medical	Paediatric Neurology	-	7.0	7.0	11%	6.23	27,778
Paediatric - Medical	Paediatric Palliative	-	1.7	1.7	28%	1.23	141,104
Paediatric - Medical	Paediatric Respiratory Medicine	-	1.8	1.8	17%	1.48	116,906
Paediatric - Medical	Paediatric Rheumatology	-	3.5	3.5	29%	2.49	69,640
Paediatric - Medical	Psychiatry - Adolescent	5.4	10.3	15.7	1%	15.51	11,156
Paediatric - Medical	**Paediatric - Medical -Subtotal**	**24.6**	**99.7**	**124.3**	**12%**	**109.19**	**1,585**
Paediatric - Surgical	Paediatric Anaesthesia	-	15.1	15.1	14%	12.96	13,357
Paediatric - Surgical	Paediatric Cardiac Surgery	-	1.0	1.0	14%	0.86	201,226
Paediatric - Surgical	Paediatric General Surgery	-	3.4	3.4	16%	2.83	61,176
Paediatric - Surgical	Paediatric Ophthalmology	-	2.0	2.0	19%	1.65	105,026
Paediatric - Surgical	Paediatric Orthopedic Surgery	-	2.4	2.4	13%	2.10	82,469
Paediatric - Surgical	Paediatric Otolaryngology	-	2.6	2.6	6%	2.45	70,595
Paediatric - Surgical	Paediatric Plastic Surgery	-	1.0	1.0	11%	0.89	194,540
Paediatric - Surgical	Paediatric Urology	-	2.1	2.1	13%	1.85	93,720
Paediatric - Surgical	**Paediatric - Surgical -Subtotal**	**-**	**29.6**	**29.6**	**14%**	**25.58**	**6,766**
TOTAL	**TOTAL**	**25.6**	**141.4**	**167.1**	**14%**	**143.62**	**1,205**

There are 167.1 FTE less 23.48 FTE for OOP workload leaves an adjusted FTE of 143.62 for the NS population under age 18 (173,054). There are 1.0 net diagnostic FTE per 19,570, 1.0 net medical FTE per 1,585, and 1.0 net surgical FTE per 6,766 population.

Currently, and in comparison to, Nova Scotia:

A. Paediatric Medical - All

- There are 108.60 (124.3 less 15.7 adolescent psychiatry) gross medical FTE or 1.0 FTE per 1,594 population under age 18 in Nova Scotia. There are 1.0 FTE per 1,847 population under age 18 in NS on a 'net' (of OOP) basis.
- There are 42.5 general paediatrician FTE or 1.0 per 4,075 under age 18 in Nova Scotia.

- Benchmark(s)
  - Nationally in Canada in 2008/09 there was 1.0 medical gross FTE per 2,848 population (i.e. 1,700 FFS plus 1,150 AFP, total FTE 2,848). This ratio excludes paediatric surgical, diagnostic, and adolescent psychiatry specialists. This ratio also is gross of OOP services.
  - The Royal College of Paediatrics and Child Health (RCPCH) England requirement of 2,765 medical consultant paediatricians and 1,383 general paediatricians or 1.0 medical FTE per 4,155 and 8,309 respectively under age 18 (Source: U.K. NHS Centre for Workforce Intelligence, Aug/2010).
  - The average academic paediatric workforce (appointments at a medical school), excluding general paediatricians, increased from 1:7,800 child population in 2003/04 to 1:6,550 in 2005/06. Substantial regional variability exists, with 4-fold differences in academic paediatrician workforce among the low-supply provinces (Saskatchewan, British Columbia, and Ontario) and high-supply provinces for both total workforce and subspecialists[91]. Nova Scotia DFM has 48 full-time academic paediatric appointments (prior Section on DFM) or 1:3,605.
  - A benchmark of 7,287 population under age 18 per FTE was applied to the Base Case forecast in the Final Report.

B. Paediatric Cardiology

- There is 4.2 paediatric cardiologist FTEs or 1.0 per 81,868 under age 18 in the Maritimes. There are no paediatric cardiologists in NB or PEI.
- There is 1.0 paediatric medical cardiologist FTE per 78,621 under age 18 in Canada (Source: Cdn. Pediatric Cardiology Assoc.).
- There was 1,701 clinical pediatric cardiologist FTE in the USA in 2006 or 1.0 per 43,446 under age 18 (Source: American Academy Pediatrics).
- England NHS and Department of Health (2003) report from the Paediatric and Congenital Cardiac Services Review Group recommended two paediatric cardiology consultants per million population or 1.0 WTE per 100,000-125,000 under age 18 (Source: U.K. NHS, August 2010)

C. Paediatric Nephrology

- There is 1.0 paediatric nephrologist FTE per 343,846 under age 18 in the Maritimes. There are no paediatric nephrologists in NB or PEI.
- There is 1.0 paediatric nephrologist per 150,685 under age 18 in the USA, gross of OOP services[92].
- A benchmark of 150,685 population under age 18 per FTE was applied to the Base Case forecast in the Final Report.

D. Paediatric Neurology

- There is 7.0 paediatric nephrologist FTEs or 1.0 per 49,121 under age 18 in the Maritimes. There are no paediatric neurologists in NB or PEI.
- There is 1.0 paediatric nephrologist per 93,362 under age 18 in Canada[93].

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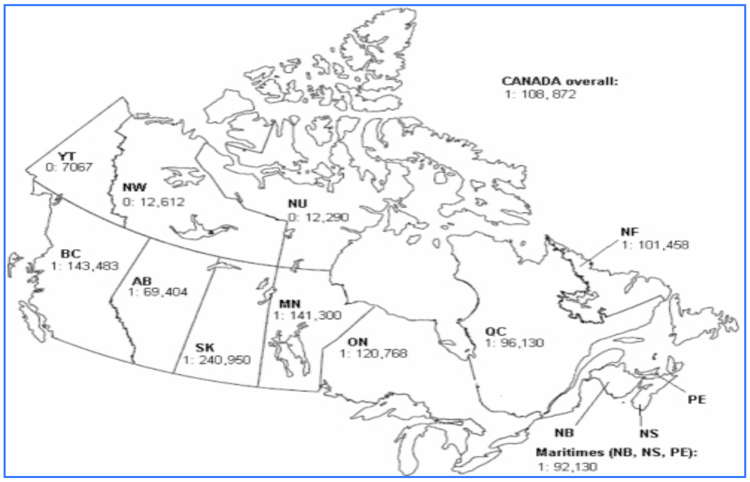
[91] Filler G, Piedboeuf B; Paediatric Chairs of Canada., Variability of the pediatric subspecialty workforce in Canada. J. Pediatr. 2010 Nov;157(5):844-7.e1. Epub 2010 Jun 17.

[92] Althouse, L.A., Tockman, J.A., Pediatric Workforce: A Look At Pediatric Nephrology Data From The American Board Of Pediatrics, J Pediatr 2006;148:575-6.

[93] Keene, D.L., Humphreys, P., Can J Neurol Sci. 2005 Aug;32(3):306-10. Inventory of pediatric neurology "manpower" in Canada.

- A benchmark of 93,362 population under age 18 per FTE was applied to the Base Case forecast in the Final Report.

Figure 175 Paediatric Gastroenterology - Ratio per FTE in Canada 2005



D. Paediatric Gastroenterology

– There is 1.0 paediatric gastroenterologist FTE per 176,331 under age 18 in the Maritimes. There are no paediatric gastroenterologists in NB or PEI.

– There was 1.0 paediatric gastroenterologist FTE per 120,000 under age 18 in Canada in 2005, gross of OOP services94. Alberta demonstrates the highest and Saskatchewan the lowest ratios (1:69,404 versus 1:240,950, respectively).

– A benchmark of 120,000 population under age 18 per FTE was applied to the Base Case forecast in the Final Report.

23.3.2 Maritimes

The following figures list paediatric medical 'functional' specialties and the ratio of Maritime population per FTE and population under age 18 FTE.

Figure 176 Paediatric Medicine - Services by province of patient residence 2009/10 (Source: MSI)

Functional_Specialty	FTE-TOTAL	NS	% NS	NB	PE	% NB + PE	Subtotal Maritimes	% Maritimes	NF	Other	TOTAL
Paediatric Cardiology Total	4.00	3,189	70%	945	286	27%	4,420	97%	132	25	4,577
Paediatric Child Health Total	0.75	288	92%	17	6	7%	312	99%	-	2	314
Paediatric Clinical Immunology & Allergy Total	5.00	10,832	93%	451	289	6%	11,577	99%	39	63	11,679
Paediatric Critical Care Total	5.38	3,628	73%	997	251	25%	4,880	98%	78	24	4,982
Paediatric Developmental Total	4.00	1,098	98%	13	8	2%	1,123	100%	2	(3)	1,122
Paediatric Diagnostic Radiology Total	5.25	1,085	78%	226	63	21%	1,380	99%	12	4	1,396
Paediatric Emergency Medicine Total	1.00	79	93%	6	-	7%	86	101%	-	(1)	85
Paediatric Endocrinology & Metabolics Total	3.00	2,021	86%	202	107	13%	2,333	100%	2	7	2,342
Paediatric Gastroenterology Total	1.95	2,971	74%	792	224	25%	3,989	100%	9	(1)	3,997
Paediatric General Total	22.76	28,229	96%	566	273	3%	29,090	99%	22	342	29,454
Paediatric General Surgery Total	3.37	5,158	84%	717	214	15%	6,093	99%	39	36	6,168
Paediatric Haematology/Oncology Total	5.50	3,379	64%	1,626	270	36%	5,279	99%	9	21	5,309
Paediatric Infectious Diseases Total	4.00	1,477	77%	295	105	21%	1,880	98%	39	(2)	1,917
Paediatric Neonatology Total	5.44	11,104	84%	763	1,083	14%	12,955	98%	193	11	13,159
Paediatric Nephrology Total	1.00	1,343	75%	332	56	22%	1,732	97%	47	4	1,783
Paediatric Neurology Total	5.50	3,179	89%	234	116	10%	3,534	99%	5	17	3,556
Paediatric Opthalmology Total	2.04	7,128	81%	1,110	374	17%	8,614	97%	143	82	8,839
Paediatric Orthopedic Surgery Total	2.18	4,297	87%	517	125	13%	4,942	100%	8	8	4,958
Paediatric Otolaryngology Total	2.61	13,619	94%	551	182	5%	14,355	99%	55	48	14,458
Paediatric Palliative Total	1.70	349	72%	52	78	27%	481	99%	7	(2)	486
Paediatric Plastic Surgery Total	1.00	2,673	89%	228	85	10%	2,987	99%	3	25	3,015
Paediatric Respiratory Medicine Total	1.78	1,142	83%	176	17	14%	1,337	98%	26	6	1,369
Paediatric Rheumatology Total	3.50	1,944	71%	628	140	28%	2,715	100%	3	3	2,721
Paediatric Urology Total	2.12	3,375	87%	354	135	13%	3,867	100%	6	11	3,884
Psychiatry - Adolescent Total	2.49	578	99%	2	-	0%	582	99%	-	4	586
TOTAL - ALL	**98.00**	**114,165**	86%	**11,800**	**4,487**	12%	**130,540**	99%	**879**	**737**	**132,156**
TOTAL - Department of Medicine (inc. 5.5 GenP)	**57.45**	**55,595**	84%	**7,038**	**2,996**	15%	**65,630**	99%	**525**	**260**	**66,415**

[94] Morinville, V., Jacboson, K., et.al., Canadian pediatric gastroenterology workforce: current status, concerns and future projections. Can J Gastroenterol. 2007 Oct;21(10):653-64.

23.3.3 Paediatrics – Psychiatry

The child and adolescent psychiatrist works with children, adolescents and their families, in a hospital and in a variety of settings such as schools, courts, universities, private offices, social agencies and other community organizations. Some become specialized experts in a particular age group (such as infants or adolescents), a particular diagnosis (such as anxiety or eating disorders), or a particular treatment modality (such as paediatric psychopharmacology or custody evaluations).

Epidemiological studies suggest the prevalence of childhood emotional and behavioural disorders as 15 - 20%[95]. It is recommended that child psychiatry consultation in rural centers be provided through outreach rather than locating one physician for a region (i.e. population < 25,000)[96].

The U.K. Royal College of Psychiatrists recommends 1.5 FTE child psychiatrists per 100,000 total population (equivalent to 1.0 FTE per 13,400 age 0 to 17) under age 18[97]. It also recommends a further 0.75 FTE for full services up to the patients' eighteenth birthday along with the appropriate balanced multidisciplinary team.

In 2000 Kim reported to the American Academy of Child and Adolescent Psychiatry (according to the American Medical Association physician master file), had 7.51 child and adolescent psychiatrists per 100,000 under age 18 with a range of 1.32 to 17.53[98]. A ratio of 7.51 in Nova Scotia would equate to a count of 12.9 child and adolescent psychiatrists or about one per 14,000 under age 18.

Currently there are 14.8 child and adolescent psychiatrist FTE in Nova Scotia or 1.0 FTE per 11,900 under age 18.

COGME (Specialty Physician Workforce, September 2000) observed a striking inverse relationship between the density of psychiatrists and the percentage of children living in poverty. They also noted 'no easy standard emerges for this analysis'.

- A benchmark of 13,400 population under age 18 per child and adolescent psychiatrist FTE was applied to the Base Case forecast in the Final Report.

23.3.4 Other Specialties

The following specialties will be addressed in the forecast modeling, scenario development, and final report and recommendations:

- Developmental Paediatrics
- Paediatric Emergency Medicine
- Paediatric Haematology/Oncology

[95] Breton JJ, Bergeron L, et al. Quebec Child Mental Health Survey: prevalence of DSM III-R Mental Health Disorders. J Child Psychology and Psychiatry 1999;40(3);375-384.
[96] Canadian Academy of Child Psychiatry, Child Psychiatry In Canada: Physician Resources Position Statement, Canadian Academy of Child Psychiatry Physician Resource Committee, January 22, 2002
[97] U.K. DOH, Medical Specialty Workforce Factsheet, Child And Adolescent Psychiatry, Aug/2010
[98] Kim, W.J, Child and Adolescent Psychiatry Workforce: A Critical Shortage and National Challenge, The American Academy of Child and Adolescent Psychiatry, Task Force on Workforce Needs, Academic Psychiatry, 27:4, Winter 2003

24 Surgical Disciplines

24.1 National

The following figure quantifies the number of surgical specialty FTEs by province. The figure adjusts FTEs for non-FFS payments to allow reasonable inter-provincial comparison. This analysis is a significant improvement on the traditional population per count of physicians.

Figure 177 Surgical Specialty Physician FTE 2008/09 – Interprovincial Comparison (Source: Adapted from CIHI)

	N.L.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Total
Surgical Specialties	123	28	259	202	1,902	3,512	272	251	674	1,047	8,269
General Surgery	35	10	53	42	473	783	74	64	138	201	1,872
Thoracic/Cardiovascular	3	-	10	8	43	114	16	9	22	49	275
Urology	8	-	21	20	153	273	14	12	44	71	616
Orthopaedic	11	-	28	31	276	536	44	39	110	174	1,249
Plastic	-	-	7	13	78	182	17	16	46	55	415
Neurosurgery	-	-	10	1	39	72	-	8	3	37	170
Ophthalmology	16	5	54	32	288	507	31	38	106	178	1,255
Otolaryngology	14	1	17	17	169	253	16	16	48	87	639
Obstetrics/Gynecology	36	13	57	38	383	792	60	48	157	194	1,778
Total Physician - FTEs	895	215	1,823	1,160	14,165	25,315	2,061	1,629	5,057	7,139	59,459

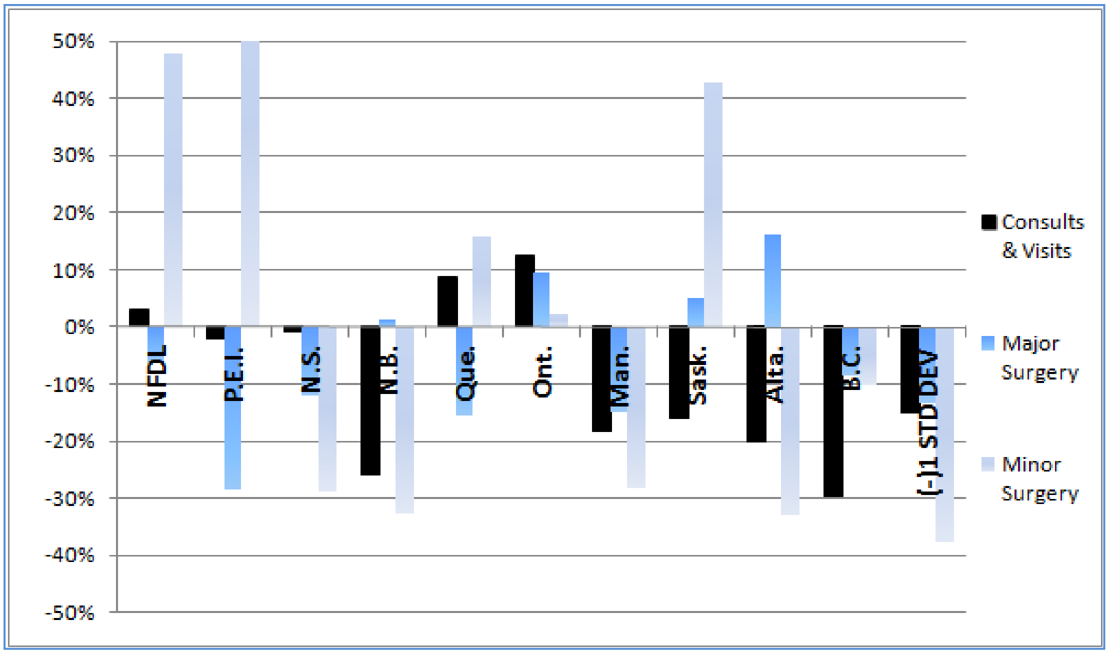
The next figure identifies the ratio of population per 1.0 surgeon FTE. Ontario and Nova Scotia have the lowest ratio of population per 1.0 surgeon FTE. The Nova Scotia ratio is significantly higher than the national average for orthopaedics and plastic surgery and significantly lower for thoracic/cardiovascular, neurosurgery, and ophthalmology.

Figure 178 Surgical Specialty Physician Population per FTE 2008/09 – Interprovincial Comparison (Source: CIHI)

Population per Physician FTE (FFS plus Alternate Payments), 2008–2009	N.L.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Canada
Surgical Specialties	4,122	4,867	3,586	3,657	4,043	3,648	4,391	4,003	5,220	4,128	3,972
General Surgery	14,423	13,360	17,547	17,459	16,257	16,364	16,189	15,768	25,533	21,514	17,542
Thoracic/Cardiovascular	188,253	u/a	94,506	89,625	180,462	112,019	72,429	109,978	158,956	87,622	119,544
Urology	64,327	u/a	44,490	36,402	50,244	46,975	84,264	83,294	80,423	60,585	53,317
Orthopaedic	46,516	u/a	33,066	24,160	27,810	23,915	27,240	25,478	31,967	24,773	26,291
Plastic	u/a	u/a	124,175	56,685	98,155	70,360	70,795	61,952	77,057	78,104	79,159
Neurosurgery	u/a	u/a	89,148	831,798	197,623	177,899	u/a	129,587	1,229,406	116,892	193,462
Ophthalmology	31,203	30,619	17,024	22,942	26,683	25,253	38,702	26,478	33,158	24,331	26,166
Otolaryngology	35,039	138,400	53,256	44,815	45,507	50,656	73,986	61,426	72,888	49,910	51,440
Obstetrics/Gynecology	14,225	11,023	16,185	19,450	20,102	16,180	19,952	20,776	22,353	22,230	18,479

The next two figures compare the total number of FFS services per 1.0 FFS FTE for all surgical specialties (i.e. Cardiac, General, Neurosurgery, O&G, Ophthalmology, Orthopaedic, Otolaryngology, Plastic, Thoracic, Urology, and Vascular Surgery combined) by province. Ontario and Quebec represent 65% of the total national surgical FTEs. Alternate payment paid services and related FTEs are not included. The impact of non-FFS paid services and related FTEs being excluded is significant and caution must be exercised in interpreting the CIHI data. For Nova Scotia in 2008/09 only 12% of total payments to surgeons were non-FFS related and 27% of those payments were for one specialty. Ontario and Quebec, the two provinces representing 65% of FTEs, were 9.8% and 14.2% respectively in terms of the percentage of total payments made to surgeons via alternate, non-FFS, methods.

Figure 179 Graph - National Comparison – Surgical Specialties, Services per 1.0 FTE, 2007/08 (Source: CIHI)



Nova Scotia is (0.8%), (12%), and (28.8%) below the national average per 1.0 FTE for consults/visits, major, and minor surgery respectively

Nova Scotia was within one standard deviation on each service indicator.

Figure 180 Table - National Comparison – Surgical Specialties, Services per 1.0 FTE, 2007/08 (Source: CIHI)

	N.L.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Total
FFS FTEs, 2007/08	96	21	175	179	1,668	2,996	240	221	653	886	7,134
	(Count of Services)										
Total Consultations	116,148	20,554	184,003	201,654	1,533,761	2,639,030	159,445	226,036	644,304	1,118,209	6,843,144
Total Major Assessments	70,144	6,001	65,211	15,574	2,055,213	1,714,595	140,076	48,850	280,182	128,500	4,524,346
Total Other Assessments	107,600	31,001	285,541	195,708	2,163,044	5,516,603	219,074	270,095	675,675	618,889	10,083,230
Total Hospital Care Days	23,750	7,601	23,919	10,151	84,018	617,069	69,972	30,269	64,149	51,564	982,461
Total Special Calls	*	1,253	1,602	3,642	15,265	265,471	42,688	23,164	11,082	92,518	456,685
Total Psychotherapy/Counselling	0	135	0	1,104	2,119	124,180	1,932	1,851	10,810	271	142,402
Total Consultations and Visits	317,642	66,545	560,276	427,833	5,853,420	10,876,948	633,187	600,265	1,686,202	2,009,951	23,032,268
PER FTE	3,324	3,157	3,201	2,393	3,509	3,630	2,636	2,715	2,583	2,270	3,228
Variance to National Average	3.0%	(2.2%)	(0.8%)	(25.9%)	8.7%	12.4%	(18.3%)	(15.9%)	(20.0%)	(29.7%)	0.0%
Total Major Surgery	36,073	6,093	62,176	72,997	568,156	1,323,763	82,378	93,796	306,256	326,883	2,878,571
PER FTE	377	289	355	408	341	442	343	424	469	369	403
Variance to National Average	(6.5%)	(28.4%)	(12.0%)	1.2%	(15.6%)	9.5%	(15.0%)	5.2%	16.3%	(8.5%)	0.0%
Total Minor Surgery	12,255	3,094	10,816	10,425	167,361	265,453	14,990	27,376	37,890	69,131	618,791
PER FTE	128	147	62	58	100	89	62	124	58	78	87
Variance to National Average	47.8%	69.2%	(28.8%)	(32.8%)	15.7%	2.1%	(28.0%)	42.8%	(33.1%)	(10.0%)	0.0%
Total Surgery Cases per FTE	506	436	417	467	441	530	405	548	527	447	490
Variance to National Average	3.2%	(11.1%)	(14.9%)	(4.8%)	(10.1%)	8.2%	(17.3%)	11.8%	7.6%	(8.8%)	0.0%

* Cardiac, General, Neuro, O&G, Opthalmology, Orthopaedic, Otolaryngology, Plastic, Thoracic, Urology, and Vascular surgery.

For Nova Scotia total surgical cases per FTE of 417 in the figure above are quite consistent with earlier analysis of surgical procedures per FTE found in the section on Provincial Environment - Access to Services, lending to the reasonability of the results of the above analysis.

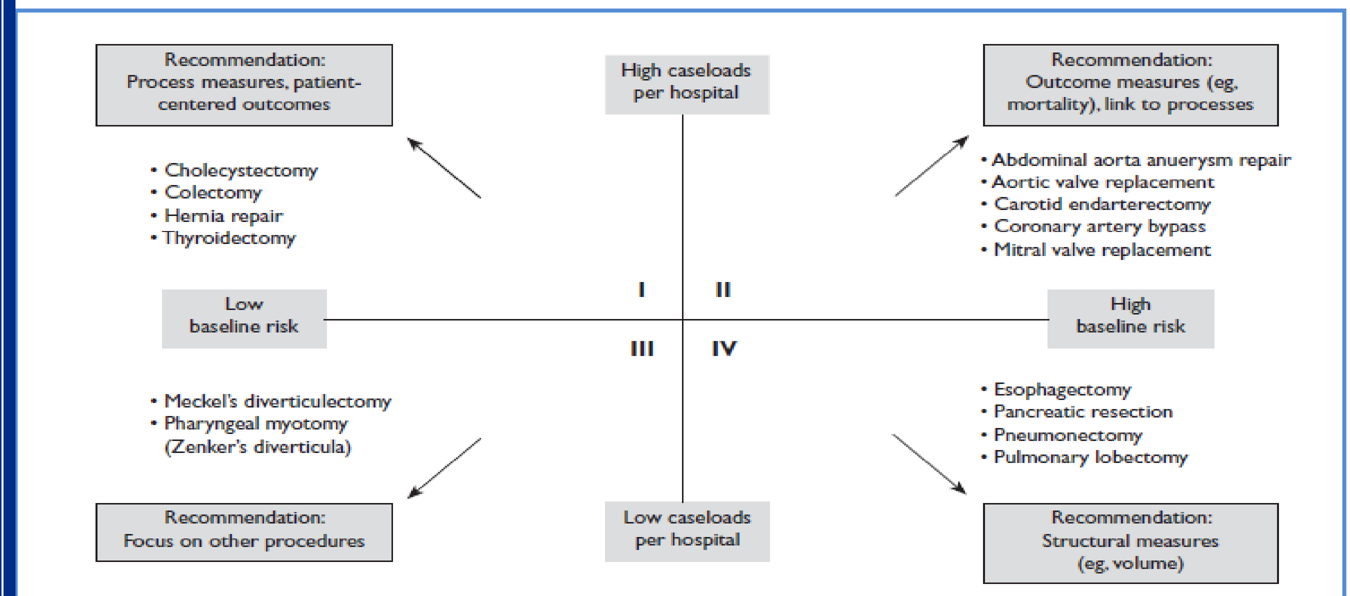
The above analysis suggests latent major and minor surgical procedure capacity exists within the current Nova Scotia surgical workforce. This observation is consistent with the earlier analysis on access to services where a wide variation in the volume of surgical procedures per FTE was observed across the DHAs.

24.2 Literature

The American Board of Surgery recently updated its ongoing record of surgical volumes per general surgeon. Findings for the period 2007 to 2009 found an average 533 surgical cases per full-time general surgeon (n of 3,362 general surgeon detailed operative logs)[99]. This finding adds further support to the preceding Canadian national analysis of CIHI data which found an average 490 cases per general surgeon FTE. The American Board of Surgery further found surgical subspecialties performed 15-33% of all core general surgery procedures. Conversely; general surgeons performed 46% of all vascular, 16% of thoracic, 30% of pediatric, and 33% of plastic surgery operations. Rural surgeons performed far more endoscopic and gynaecologic procedures and fewer abdominal, alimentary tract, and laparoscopic procedures than urban counterparts.

Structural measures such as procedure volume provide an indirect measure of surgical quality. In some cases, procedure volume may provide an adequate proxy for outcome, as is seen with coronary-artery bypass graft, abdominal aortic aneurysm repair, coronary angioplasty, esophagectomy, and carotid endarterectomy (CEA)[100] where mortality is reduced through increased volume per surgeon. For other procedures, the relationship between procedure volume (either for the hospital or the surgeon) and outcome is much less clear[101]. The following figure (Birkmeyer, 2004) distinguishes between high/low caseload hospitals and high/low baseline risk associated with the surgical procedure.

Figure 181 High/low caseload hospitals and high/low baseline risk associated with the surgical procedure (Birkmeyer, 2004)



Recommendations for when to focus on structure, process, or outcome measures. (Adapted from Birkmeyer JD, Dimick JB, Birkmeyer NJ. Measuring the quality of surgical care: structure, process, or outcomes? J Am Coll Surg 2004;198:631. Copyright 2004, with permission from Elsevier.)

[99] Valentine, R.J., Jones, A., et.al., General Surgery Workloads and Practice Patterns in the United States, 2007-2009: A 10-Year Update from the American Board of Surgery.
[100] Birkmeyer JD, Finlayson EV, Birkmeyer CM, Volume standards for high-risk surgical procedures: potential benefits of the Leapfrog initiative, Surgery. 2001 Sep;130(3):415-22.
[101] Webb, A.L., Fink, A.S., Approaches to Assessing Surgical Quality of Care, Hospital Physician February 2008, 29-37.

In Veteran's Hospital U.S.A., the procedure and surgical specialty volume in eight[102] prevalent operations of intermediate complexity are not associated with risk-adjusted 30-day mortality rate from these operations, or with the risk-adjusted 30-day stroke rate from CEA[103].

24.3 Specialty Specific

Figure 182 Surgical FTEs 2009/10 – Nova Scotia (Source: MSI)

Functional_Specialty	DHA1 SSH	DHA2 SWNDHA	DHA3 AVH	DHA4 CEHHA	DHA5 CHA	DHA6 PCHA	DHA7 GASHA	DHA8 CBDHA	DHA9 CDHA	PROVINCE	NS Pop/ FTE
Anaesthesia	5.0	4.1	8.9	4.4	3.4	3.0	2.1	8.8	69.7	109.4	8,618
Cardiac Surgery	-	-	-	-	-	-	-	-	8.0	8.0	117,813
General Surgery	4.0	3.6	3.1	4.7	1.6	2.5	3.0	4.5	24.6	51.6	18,258
Gynaecological Oncology	-	-	-	-	-	-	-	-	4.0	4.0	234,511
Neurosurgery	-	-	-	-	-	-	-	-	9.1	9.1	103,224
Obstetrics & Gynaecology	3.4	2.6	4.8	3.7	1.0	1.9	3.1	3.7	23.4	47.6	19,818
Ophthalmology	2.5	2.8	3.5	2.1	-	2.0	2.2	5.4	26.1	46.6	20,227
Orthopedic Surgery	-	-	5.0	-	-	2.6	-	6.0	20.3	33.9	27,809
Otolaryngology	-	1.1	2.0	-	1.4	-	1.2	2.2	15.8	23.7	39,760
Plastic Surgery	1.0	-	-	-	-	-	1.0	1.1	7.3	10.4	90,393
Thoracic Surgery	-	-	-	-	-	-	-	1.2	4.3	5.5	170,898
Urology	-	-	2.0	1.3	-	-	-	2.1	10.8	16.2	58,226
Vascular Surgery	-	-	2.0	-	-	-	-	1.8	3.5	7.4	128,069
Total	**16.0**	**14.1**	**31.3**	**16.1**	**7.5**	**11.9**	**12.5**	**36.7**	**227.1**	**373.4**	**2,524.3**

24.3.1 Anaesthesia

Currently, and in comparison to, Nova Scotia:

- There are 109.4 Anaesthetist specialist FTEs or 1.0 FTE per 8,618 population in Nova Scotia. In NS it is 109/264 or 0.41 per surgeon (inc. O&G) FTE.
- Benchmark(s)
  - In southern Alberta in 2006 there was a ratio of 0.50 Anaesthetist FTE per surgeon (inc. O&G). The southern Alberta ratio is consistent with the Ryten study for the Assoc. of Canadian University Departments of Anaesthesia.
  - A New Zealand study reported an average number of cases per FTE anaesthetist per year of 738.3 with a range of 350-1500[104]. 236,000 total cases were performed with 320 anaesthetist FTE. In NS surgeons performed 73,000 major and minor procedures in 2007/08 (Source: CIHI) which equates to 667 cases per FTE anaesthetist.
  - A benchmark of 0.44 Anaesthetist FTE per surgeon (inc. O&G) FTE was applied to the Base Case forecast in the Final Report.

Engen, et.al.[105], based on a national survey of hospitals, concluded that there is a substantial current and worsening future shortage of anesthesia providers in Canada. Their study did not extend beyond a simple

[102] i.e. Nonruptured abdominal aortic aneurysmectomy, vascular infrainguinal reconstruct, carotid endarterectomy (CEA), lung lobectomy/pneumonectomy, open and laparoscopic cholecystectomy, partial colectomy, & total hip arthroplasty
[103] Khuri, S.F., Stremple J.F., et. al., Relation of surgical volume to outcome in eight common operations: results from the VA National Surgical Quality Improvement Program, Ann Surg. 1999 Sep;230(3):414-29
[104] King, S.Y., Anaesthesia Medical Workforce in New Zealand, Anaesth Intensive Care 2006; 34: 261-265.
[105] Engen, D.A., Morrewood, G.H., Ghazar, N.J., et.al., A Demand-based assessment of the Canadian Anaesthesia workforce – 2002-2007, Can J Anesth 2005; 52:18-25

opinion survey. The Ryten report[106] employed a detailed methodology to forecast anesthesia demand based on billing data for the Province of Quebec (1999/2000). A special committee[107] in Ontario relied upon the Ryten report and did not examine other models or update the Ryten billing data-based study data.

The key driver of the need for anesthesia services is the provision of surgical services anesthetic support in the acute facilities main ORs and in contracted surgical facilities. Anesthesia acts hand-in-hand with surgeons and obstetricians/gynecologists in the provision of services. One of the most relevant proxies of the need for anesthesia services is the examination of the physician resource plans for these services. In southern Alberta the ratio is 0.50 per surgeon (inc. O&G) and 0.65 per surgeon FTE (ex. O&G). In NS it is 109/264 or 0.41 per surgeon (inc. O&G) FTE and 0.51 per surgeon (ex. O&G) FTE. The southern Alberta ratio is consistent with the Ryten study for the Assoc. of Canadian University Departments of Anaesthesia.

A Clinical Assistant Program can mitigate the recruitment needs for anaesthetists by providing supervised anesthesia services that would leverage the workload of anaesthesiologists. Anaesthesia assistants are specifically trained professionals whose activity focuses on assisting the anesthesiologist in the delivery of patient care during the intra-operative and the immediate post partum period. The anaesthesia assistant is an emerging new professional in the Canadian healthcare system[108].

24.3.2 Cardiac Surgery

Currently, and in comparison to, Nova Scotia:

- There are 8.0 Cardiac Surgeon FTEs or 1.0 FTE per 117,813 population in Nova Scotia. Eleven percent of MSI reported workload is for non-Nova Scotians.
- Benchmark(s)
    - The national average is 1.0 FTE per 200,000 population (Source: CIHI). Weighting for relative ACS incidence (NS 27% higher than national average) changes the ratio to 1.0 FTE per 157,480.
    - In 2002 the national average coronary artery bypass (CABG) procedures per surgeon was 135. In NS the average in 2009/10 was 68 per 1.0 FTE.
    - In 2002 the national average procedures per surgeon was 200. In NS the average in 2009/10 was 150 per 1.0 FTE.
    - A benchmark of 157,480 population per FTE was applied to the Base Case forecast in the Final Report. The benchmark incorporates relative disease incidence and prevalence in Nova Scotia. The benchmark also incorporates academic time and Atlantic province referral workload.

Presently, there are no research data linking an individual surgeon's surgical volume with mortality rate. There are, however, data to suggest an annual volume of 100 to 125 open heart procedures (including coronary artery bypass procedures, valve replacements, and other operations requiring the use of cardiopulmonary bypass) per hospital is the minimum requirement from a quality standpoint and that there is a greater variation in adjusted mortality rates for teams doing lower volumes of procedures as compared with those doing a high volume[109]. In 2002 the national average coronary artery bypass (CABG) procedures per surgeon was 135[110].

[106] Ryten, E., A Physician Workforce Planning Model for the specialty of Anesthesia: theoretical and practical considerations, Association of Canadian University Departments of Anesthesia, 2000.
[107] Ontario MOHLTC, "Transforming the Delivery of Operative Anesthesia Services in Ontario", a report of the Operative Anesthesia Committee (2006), J. Kitts Chair.
[108] Canadian Anaesthesiologists Society, Position Paper on Anesthesia Assistants (June 2006)
[109] American College of Surgeons, Guidelines For Standards in Cardiac Surgery, Bulletin, Vol. 82, No. 2, February 1997
[110] Canadian Cardiovascular Society, Cardiovascular Specialist Physician Workforce Project, FINAL REPORT, Aug20/2002.

Nova Scotia cardiac surgeons operated on 1,400 surgical cases in 2005 (700 CABG and 700 other cases) and 1,350 surgical cases in 2009/10 (500 CABG and 850 other cases).

In a large study[111], the average age of patients operated on was found to have increased from 60 to 63 in a nine-year span, consistent with increasing life expectancy.

Leapfrog Group volume standards for 5 high-risk surgical procedures. Of the procedures, volume standards would save the most lives with coronary-artery bypass graft (1486), followed by abdominal aortic-aneurysm repair (464), coronary angioplasty (345), esophagectomy (168), and carotid endarterectomy (118). In their estimates of the number of lives saved, they considered assumptions about how many patients would be affected and the effectiveness of volume standards (i.e., strength of underlying volume-outcome relationships with each procedure)[112].

24.3.3 Colorectal Surgery

The relationship between volume and long-term outcomes (i.e. mortality, permanent colostomy, and use of adjuvant radiation therapy) was studied in California and concluded greater surgeon and hospital volumes were associated with improved outcomes for patients undergoing surgery for colorectal cancer[113]. The study found differential outcomes in hospitals that performed at least 84 colorectal operations over a four-year period.

24.3.4 General Surgery

Currently, and in comparison to, Nova Scotia:

- There are 51.6 General Surgeon FTEs or 1.0 FTE per 18,258 population in Nova Scotia.
- Benchmark(s)
    - The national average is 1.0 FTE per 17,466 population (Source: CIHI).
    - The England RCPS target is 1:25,000 (includes vascular, transplant, & colorectal)
    - The range in the USA is 1:17,289 to 1:23,502
    - A range of 12.0-15.0 operating theatre hours per week (46 weeks/year) is typical (Canada, USA, England) with an average 10.0 hours per week in NS.
    - A benchmark of 17,466 population per FTE was applied to the Base Case forecast in the Final Report.

The specialty of General Surgery embraces the principles and techniques of safe and effective surgical care of the whole person of any age, and is the parent of all surgical specialties. A resident in general surgery is a surgical specialist whose practice deals mainly with the ***alimentary tract, trauma and critical care, endocrine and breast diseases, cancer surgery and endoscopy***. By virtue of training, special interest, or circumstance, the practice of general surgery may be focused narrowly or may extend to diseases or injuries affecting virtually any system of the body. Modern general surgical practice includes expertise in communication and

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[111] Abramov, D, Tamariz M.G., et.al, Trends in coronary artery bypass surgery results: 9-year study, Ann Thoracic Surg. 2000 Jul; 70(1):84-90

[112] Birkmeyer JD, Finlayson EV, Birkmeyer CM , Volume standards for high-risk surgical procedures: potential benefits of the Leapfrog initiative, Surgery. 2001 Sep;130(3):415-22.

[113] Rogers SO Jr, Wolf RE, Zaslavsky AM, Wright WE, Ayanian JZ., Relation of surgeon and hospital volume to processes and outcomes of colorectal cancer surgery, Ann Surg. 2006 Dec;244(6):1003-11.

collaboration, teaching and research, health care management and continuing professional development (RCPSC, 2008).

The following table provides comparisons between the current Divisional workforce and separate reports by the Canadian Institute for Health Information (CIHI), Canadian Medical Association surveys, and independent USA-based researchers.

Figure 183 General Surgery – Survey

Indicator	Nova Scotia	Alberta	Canada	U.K.	USA
1. Median expected retirement age		65.0 (model)		62 (Royal College Surgeons)	65.0[114]
2. Total # Hours worked/wk/surgeon		55	58 (CMA 2004)	Budget of 50.0	62.0[115] (SSO)
3. # Hours per week per surgeon by category		38 - clinical 12 - administration 2 - research 3 - teaching	44 - clinical 10 - administration 2 - research 2–teaching (CMA-2004)	34 - clinical 6 – administration 10 – teach, research, leadership	
4. # Surgery hours per week per surgeon	10 hours/week (8.1 blocks/mo @5hr/block) – 2 to 7 inpatient cases/week, average of 3/week.	15 hours (5 inpatient and 3 ambulatory cases per week)	13.1 hours (Ontario Orthopedic Survey[116])	12 hours direct in OR/week (3 program units x 4 hours) plus 3 hours indirect.	
5. Population per FTE	17,487	25,533	17,542 (All Canada, CIHI FFS plus AFP)	25,000 (target U.K.[117], includes vascular, transplant, & colorectal)	17,289 to 23,502[118]

Three of the above indicators are noteworthy. In the first indicator, the use of age 65 for surgeons as the expected retirement age is based on three sources of information: U.K. and U.S.A. survey data and discussions with surgeons, indicating that they tend to work at or near full capacity up to retirement rather than gradually slowing down. The American survey data reported only 19% worked part-time prior to retirement.

The number of operating hours per week per surgeon (indicator #4) is a good indicator of access to OR when viewed in context of wait times. Physicians in the American system average three more cases and four more hours per week in the operating room.

114 Farley F.A., Kramer, J., Work Satisfaction and Retirement Plans of Orthopaedic Surgeons 50 Years of Age and Older, Sept. 07, Clinical General Surgery and Related Research.
115 Kuerer, H.M., et.al, Career Satisfaction, Practice Patterns and Burnout among Surgical Oncologists: Report on the Quality of Life of Members of the Society of Surgical Oncology, Annals of Surgical Oncology 14(11):3043-3053
116 University Research Network - in collaboration with Ont. Orthopedic Assoc, 2006 Survey of Orthopedic Surgeons in Ontario, March 2007
117 England RCPS, 2003
118 Jonasson, O,, Kwakwa, F., and Sheldon, G.F., Calculating the workforce in general surgery, JAMA Vol. 274 No. 9, September 6, 1995

Nova Scotia data analysis indicates a range from 6.2 to 13.3 five-hour blocks per month with CDHA average 6.8, equivalent to a range of 8 to 16 hours per week per full-time general surgeon.

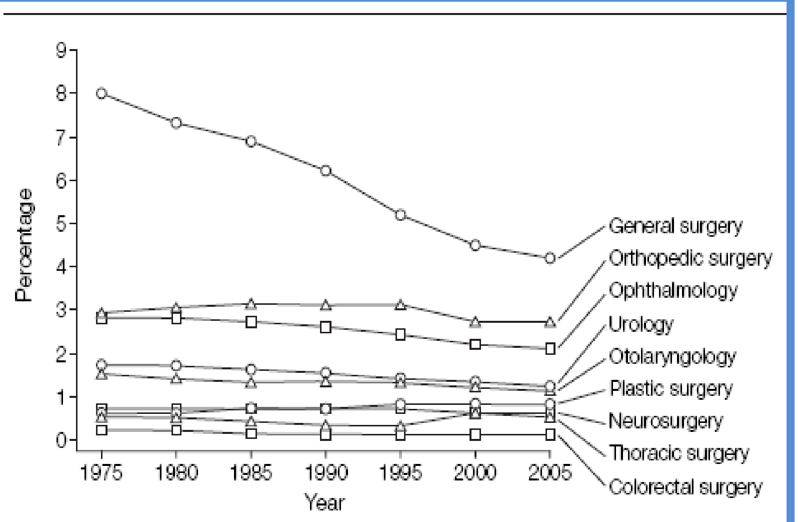
Specialization

Increasing specialization has affected the GS workforce. In the USA, approximately 70% of graduating surgical residents pursue specialized surgery training, and this percentage may be increasing (119). Currently in Canada, 70% of graduating residents pursue specialization.

"Today, medical students' chief concerns regarding selection of specialty are controllable lifestyle and intellectual challenge"; report Stockinger, et.al[120]. "General surgery in particular has been knocked for its "lacked breadth in expertise, limitations over stress, control over one's time, regularity of schedule, adequacy of leisure time, and income commensurate to workload. "Other specialties considered to have a "poor lifestyle" are also decreasing in popularity. Yet, despite this trend, most general surgeons say they would choose this same specialty again".

Specialization is a threat that further undermines the GS workforce. The preceding subsection figure has adjusted the practice entry estimates for specialization within GS for vascular, paediatric, transplantation, surgical oncology, and thoracic surgery. The figure has not adjusted for GS fellowships that may further specialization e.g., minimally invasive surgery and breast surgery[121.] When surgeons complete fellowships, they narrow the spectrum of services provided. Consequently, as the phenomenon of progressive specialization evolves, a larger surgical workforce will be needed to provide the breadth of services encompassed by the primary components of general surgery.

Figure 184 Specialty as a Percentage of Total Physician Workforce - USA



Source: *Physician Characteristics and Distribution in the US, 2007*.[18]

Strategies to strengthen and sustain GS as a core specialty and as a career track are required.

The key physician workforce planning issues and strategies are:

- Increase in OR capacity per surgeon could increase productivity per surgeon by up to 20%;
- Minimally invasive and robotic surgical technology will have a very minimal impact going forward;
- Change in gender ratio is ongoing but not pronounced;
- Specialization has undermined GS. Strategies to strengthen GS as a core specialty and career track are needed.
- No change in scope of practice within GS or between GS and other surgical specialties.

[119] Fischer, J.E., The Impending Disappearance of the General Surgeon, JAMA, November 14, 2007–Vol 298, No. 18
[120] Zsolt T., Stockinger, MD, Ellis, M.S., Residents and medical students in the 21st century: Better, Worse, or Just Different?, Bulletin of the American College of Surgeons, Nov-2004
[121] Stitzenberg, K.B., Sheldon, G.F., Progressive specialization within general surgery: adding to the complexity of workforce planning. J Am Coll Surg. 2005;201(6):925-932

Figure 186 General Surgery – FTE and Case Volume, 2009/10 Nova Scotia by DHA (Source: PARNS)

	DHA9	DHA8	DHA7	DHA6	DHA5	DHA4	DHA3	DHA2	DHA1	IWK	TOTAL
General Surgery FTE	27.8	6.7	4.2	2.5	2.1	3.5	3.1	3.3	4.0	2.5	59.7
Inpatient Cases	3,390	2,417	230	383	358	306	399	364	409	358	8,614
OR Theatre Min/Case	160	144	144	144	144	144	144	144	144	144	144
OR Hours per Week per FTE	7.1	18.8	2.9	8.1	8.7	4.6	6.8	5.8	5.3	7.5	7.5
Day Surgical Cases	6,245	4,398	431	1,403	1,001	3,097	1,574	1,811	2,673	720	23,353
OR Theatre Min/Case	90	81	81	81	81	81	81	81	81	81	81
OR Hours per Week per FTE	7.3	19.3	3.0	16.6	13.7	25.9	15.0	16.1	19.4	8.5	11.5
Total Cases	9,635	6,815	661	1,786	1,359	3,403	1,973	2,175	3,082	1,078	31,967
Cases/FTE/Week (46 week/yr)	7.5	22.1	3.5	15.6	13.8	21.1	13.9	14.3	16.6	9.4	11.6
OR Hours per Week per FTE	14.4	38.1	5.9	24.6	22.5	30.5	21.8	21.8	24.7	15.9	19.0
Wait List Change (April/10-May/11)	(4%)	19%	27%	71%	282%	(59%)	(15%)	21%	68%	42%	5%
# on Wait List May/11	802	704	109	159	42	102	105	111	52	104	2,290

Figure 185 General Surgeon procedures per FTE by DHA & Hospital, 2009/10

		-------------GENERAL SURGERY (Inpatient only) --------------				
HOSPITAL	**DHA**	**PROCEDURES**	**CASES**	**FTE**	**Proc/FTE**	**Cases/FTE**
Aberdeen Hospital Total	DHA6	434	383	2.48	175	154
Cape Breton Health Care Complex Total	DHA8	1322	948	6.00	220	158
Colchester Regional Hospital Total	DHA4	442	306	4.55	97	67
Cumberland Regional Health Care Centre T	DHA5	482	358	1.64	294	218
Dartmouth General Hospital Total	DHA9	896	583	5.00	179	117
Inverness Consolidated Hospital Total	DHA8	190	147	1.00	190	147
IWK Health Centre Total	IWK	474	358	2.50	190	143
Queen Elizabeth II Health Science Centre T	DHA9	4315	2807	19.40	222	145
South Shore Regional Total	DHA1	517	409	4.04	128	101
St. Martha's Regional Hospital Total	DHA7	288	230	2.98	97	77
Valley Regional Hospital Total	DHA3	588	399	3.08	191	130
Yarmouth Regional Hospital Total	DHA2	478	364	3.60	133	101
TOTAL		10426	7292	53.76	194	136
		Volume/Week/FTE (@46weeks/yr)			4.2	2.9

24.3.5 General Surgical Oncology

In Nova Scotia, General Surgical Oncology is included within General Surgery.

The increasing complexity of the cancer problem has made imperative the multidisciplinary team approach to the management of the cancer patient. Within this team belong general surgeons with special training, interest and expertise in oncology who also have the skills to be teachers and leaders in the field of cancer treatment (RCPSC, 2001).

The scope of general surgical oncology generally includes:

- Upper GI, Hepatobiliary, Endocrine, Colorectal, and Breast Surgical Oncology
- Upper GI cancers i.e., upper digestive system - oesophagus, stomach and duodenum;
- Hepatobiliary (liver, pancreas, and bile ducts) system cancer;
- Endocrine (thyroid, parathyroid, pancreas, ovaries, testes, adrenal, pituitary and hypothalamus) system cancer;
- Colon (large bowel) and rectum cancer;
- Breast cancer;
- Bone reconstruction;
- Gynaecological cancers e.g., cervix, ovarian, uterus;
- Head & Neck Cancer (Surgical oncology of the nose, throat, sinuses, skull base, neck and adjacent structures). Also includes major benign tumours (glomus, carotid body, etc);
- Skin cancer (Surgical oncology – Dermatology);

- Reconstructive surgery (Surgical oncology – Plastic surgery, Otolaryngology – Head and Neck Surgery (H&N reconstruction).

24.3.6 Neurosurgery

Currently, and in comparison to, Nova Scotia:

- There are 9.1 Neurosurgeon FTEs or 1.0 FTE per 103,224 population in Nova Scotia.
- Benchmark(s)
    - The national average is 1.0 FTE per 130,455 population (Source: CIHI).
    - USA (NERVES) and United Kingdom (SBNS) information suggests mean surgical procedures per year per FTE of 328 (see next figure for a detail breakdown of the 328 procedures by type) and 215 respectively. Minor procedures e.g. ulnar nerve at elbow and carpal tunnel comprise 2.5% of the total.
    - Nova Scotia neurosurgeons perform an average 131 cases per FTE per annum with substantial variation per surgeon.
    - A benchmark of 130,455 population per FTE was applied to the Base Case forecast in the Final Report. The benchmark incorporates academic time and Atlantic province referral workload.

Neurosurgical clinical outputs (not outcomes) are typically measured in terms of consultations, minor and major procedures, assisted and unassisted procedures, and case complexity/acuity. System constraints, e.g., operating theatre time and bed capacity, will affect elective workload and outputs.

Figure 187 USA - Procedures per Neurosurgeon FTE (source: USA NERVES)

CPT	Code	# Respond	Mean # Proc.	Work RVU/ Proc	RVUs
22554	Neck spine fuse	291	41	19	769
63030	Low back disk surgery	296	52	12	625
22612	Lumbar spine fuse	228	25	21	527
61793	Focus radiation beam	86	31	17	526
63047	Removal of spinal lamina	289	34	15	504
22630	Lumbar spine fuse	179	23	21	480
61700	Brain aneurysm repr , simple	154	8	51	379
61510	Remove brain lesion	272	11	28	304
63042	Laminotomy, single lumbar	271	17	17	292
61559	Excision of skull/sutures	23	5	33	161
61512	Remove brain lining lesion	244	4	35	149
63056	Decompress spinal cord	140	7	20	142
63020	Neck spine disk surgery	199	10	15	141
62223	Establish brain cavity shunt	250	9	13	111
63012	Removal of spinal lamina	117	7	15	110
61343	Incise skull (press relief)	172	3	30	97
61548	Removal of pituitary gland	142	4	22	96
63045	Removal of spinal lamina	226	6	17	96
61583	Craniofacial approach, skull	48	2	36	87
63200	Release of spinal cord	55	4	19	81
61584	Orbitocranial approach/skull	48	2	35	79
62230	Replace/revise brain shunt	197	6	11	68
64721	Carpal tunnel surgery	189	12	4	52
61600	Resect/excise cranial lesion	37	1	26	39
64718	Revise ulnar nerve at elbow	145	3	6	17
			328	**18**	**5,932**

USA (NERVES) and United Kingdom (SBNS) information suggest mean surgical procedures per year per FTE of 328 (see next figure for a detail breakdown of the 328 procedures by type) and 215 respectively. Minor procedures e.g. ulnar nerve at elbow and carpal tunnel comprise 2.5% of the total.

Nova Scotia neurosurgeons perform 1,000-1,200 cases in total per annum. Approximately 4%-7% were out-of-province patients. Approximately 45% of patients arrived via the emergency department (e.g. trauma or perhaps this is the more efficient path for admission to hospital).

Factors qualifying the preceding workload analysis include operating theatre access for elective procedures e.g. chronic back pain, case-mix complexity e.g. carpal tunnel versus major procedures, inter-disciplinary trauma case protocols, level of academic activity, and quality of billing data.

The mean actual reported neurosurgeon FTE to population ratio in Canada according to CIHI in 2004 was one FTE per 201,000. Currently in Nova Scotia there is about one FTE per 94,000. The United Kingdom (SBBS) recommends one neurosurgeon FTE per 240,000 population[122]. Ontario studies (Wright et.al. 2003) recommend one per 150,000. Currently (2008/09 CIHI) Ontario has 1:225,000 and Alberta have 1:250,000.

24.3.7 Obstetrics and Gynaecology

Currently, and in comparison to, Nova Scotia:

- There are 47.6 Obstetric/Gynaecology specialist FTEs or 1.0 FTE per 19,818 population in Nova Scotia.
- Benchmark(s)
    - The national average is 1.0 FTE per 18,394 population (Source: CIHI) or approximately 1.0 FTE per 2,950 women aged 15 to 39.
    - A benchmark of 20,487 population per FTE was applied to the Base Case forecast in the Final Report. The benchmark is net of adjustments for Nova Scotia birth rates, women aged 15-39, and the higher relative obesity rate.

The demands on Obstetrics and Gynaecology will vary depending on the care needs of mother and/or baby during pregnancy and birth[123]. Demand for Obstetrics and Gynaecology care is driven by:

- An increase in the number of pregnant women aged over 40 and under 20
- An increase in the number of assisted conceptions, multiple births
- An increase in the number of women admitted to specialist care being at 25 week of gestation or less
- An increase in incidents of obesity and diabetes

The U.K. NHS 2007 Department of Health report on Gynaecology proposed that a transition towards delivering more gynaecology services in the community, and envisaging of the future roles of many consultant gynaecologists as leading, managing and delivering care in a community setting as part of a multi-disciplinary team, according to the needs of the local community. The report states that gynaecological practice is changing as there are now therapeutic options instead of major surgery for many conditions. For example hysterectomy rates for excessive menstrual bleeding have fallen since 2000 and early termination of pregnancy and management of miscarriage can be given as an outpatient care instead of through surgery.

Nova Scotia

Annual births are projected to decline 4% over the forecast period from 8,900 to 8,500.

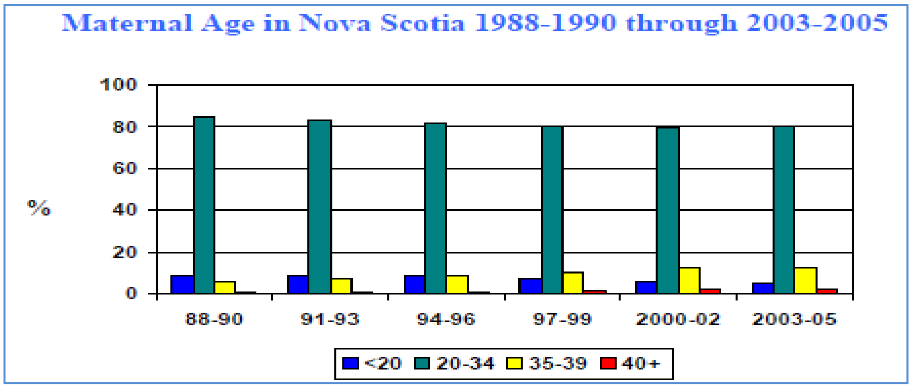
- The provincial population of females aged 15 to 39 will decline by 8.7% over the 10-year forecast period.
- C-Section rate at 27% in 2006, national average 29%.

Figure 188 Nova Scotia Population Child Bearing Years, 2011-2022 (Source: DOF)

YEAR	Female Age 15-39	Change	%Change
2011	300,619		
2012	298,009		
2013	295,414		
2014	292,838		
2015	290,772		
2016	288,278		
2017	286,204		
2018	283,867		
2019	281,809		
2020	279,032		
2021	276,569		
2022	274,595	-26,024	-8.7%

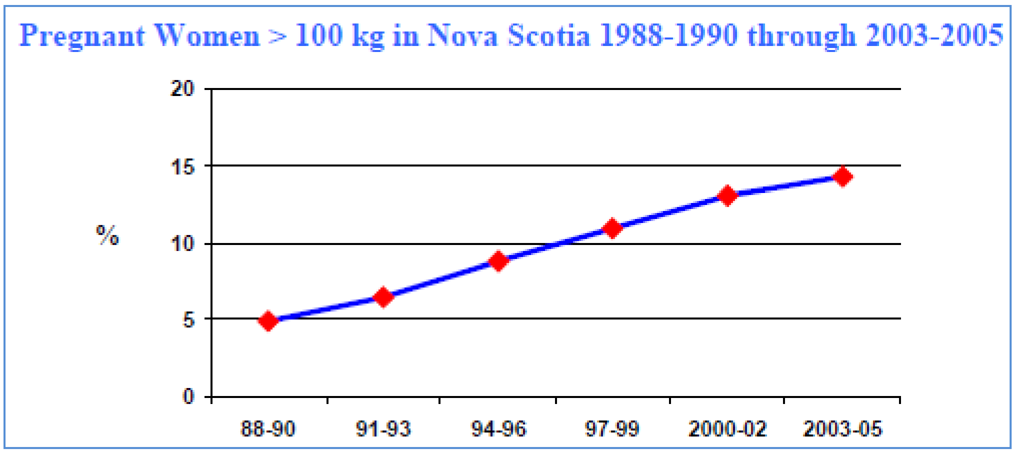
[122] Society of British Neurological Surgeons, Report on the British Neurosurgical Workforce Plan 2000-2015, April 2000
[123] U.K. NHS Centre for Workforce Intelligence, August 2010

Figure 189 Maternal Age by DHA of Residence, 1988-2009 (Source: Reproductive Care Provincial Program)



- Percentage births of mothers age 35+ increased to 2000 and leveled since. Those under age 20 declining.

Figure 190 Pregnant Women >100kg 1988 to 2005 (Source: Reproductive Care Provincial Program)



- BMI>30 at higher risk of congenital abnormalities. Nova Scotia prevalence of obesity 24.3% compared to national average of 17.9%.

Nova Scotia Physician Supply

Figure 191 Obstetric/Gynaecology Specialists by DHA and Population, 2009/10 (Source: MSI & PHReD)

DHA	FTE	Pop/FTE	Female Pop. Age 15-39/ 1.0 FTE		Net % (Export) /Import
DHA1	3.43	17,286	2,281	72%	(30.0%)
DHA2	2.64	23,097	3,397	107%	(22.4%)
DHA3	4.81	17,017	2,469	78%	11.5%
DHA4	3.69	19,653	4,036	127%	(27.4%)
DHA5	1.00	31,485	3,892	123%	(32.3%)
DHA6	1.85	25,578	3,998	126%	(13.6%)
DHA7	3.11	14,110	1,660	52%	21.0%
DHA8	3.67	34,609	5,459	172%	(19.2%)
IWK	23.36	17,950	3,018	95%	21.0%
Total	**47.56**	**19,841**	**3,165**	**100%**	**100%**

Currently, and in comparison to, Nova Scotia:

- There are 47.6 FTE obstetric/gynaecology specialists or 1.0 FTE per 19,841 population. Nationally there was 1.0 FTE per 18,479 in 2008/09 (source: CIHI).
- There are 3,165 women aged 15-39 per 1.0 FTE in Nova Scotia and 3,170 women aged 15-39 per 1.0 FTE nationally in 2008/09.
- DHAs 3, 7, and 9 are net import service providers.
- DHA8 has the highest female population aged 15 to 39 per 1.0 FTE and is a net exporter of service, probably to DHAs 7 and 9.
- 21 (35.6%) O&G specialists are age 55+ and will retire over the forecast period to 2022. In 2009-10 85% of O&G post-graduate residents in Canada are female.

24.3.8 Ophthalmology

Currently, and in comparison to, Nova Scotia:

- There are 46.6 FTE or 1.0 FTE per 20,227 population in Nova Scotia. Ten percent of MSI reported workload is for non-Nova Scotians.
- Benchmark(s)
  - The national average is 1.0 FTE per 26,298 population (Source: CIHI).
  - In 2004 Ontario had 1.0 FTE per 29,400 population (Rachmiel.et.al., 2007).
  - B.C. in 2010 had 1.0 FTE per 23,000 population performing 8,800 billable services each.
  - Alberta in 2010 had 1.0 FTE per 38,000 population.
  - The U.K. England NHS recommends 1.0 FTE per 50,000 population (Source: England NSH Centre for Workforce Intelligence). Added review for model of care is required to ascertain role of allied health professionals in the NHS model.
  - A benchmark of 26,298 population per FTE was applied to the Base Case forecast in the Final Report. The benchmark incorporates relative disease incidence and prevalence in Nova Scotia.

The most prevalent eye conditions include cataracts, glaucoma, and age-related macular degeneration. Primary Open Angle Glaucoma (POAG) is the most common form of glaucoma in the Western world, accounting for over 90% of all glaucoma diagnoses in Canada[124]. Glaucoma is a disease in which damage to the optic nerve leads to progressive, irreversible vision loss. Glaucoma is the second leading cause of blindness after cataracts.

Glaucoma - At least 300,000 Canadians (0.9% prevalence) are affected with glaucoma, with 50 per cent of patients unaware of their disease.

Age-related Macular Degeneration - Recent surveys estimate that nearly 80,000 Canadians (0.2% prevalence) are currently affected with AMD and as Canadians age, that number is growing at a rate of 10,000 per year[125].

Cataracts – Incidence increases with age[126]. One Australian epidemiologic based study calculated a 10% prevalence of clinically significant cataract[127] in either eye of whom 19% had previously undergone cataract surgery.

Figure 192 Ophthalmology – FTE and Case Productivity, 2009/10 Nova Scotia by DHA (Source: PARNS)

DISCIPLINE	DHA9	DHA8	DHA7	DHA6	DHA5	DHA4	DHA3	DHA2	DHA1	TOTAL
Opthalmology										
FTE	27.9	5.4	2.2	2.0	u/a	2.1	3.5	2.8	2.5	-
Cases/FTE/Year	222.6	228.8	273.3	396.0	u/a	425.7	418.1	204.9	290.4	-
Cases/FTE/Month	18.6	19.1	22.8	33.0	u/a	35.5	34.8	17.1	24.2	-
Avg. OR (open to close) Hrs/ Case	0.5	0.5	0.5	0.5	u/a	0.5	0.5	0.5	0.5	-
#OR Hours/week/FTE	2.32	2.38	2.85	4.13	u/a	4.43	4.36	2.13	3.03	3.37
Wait List Change (April/10-May/11)	36.3%	137.3%	23.5%	0.0%	u/a	27.7%	29.1%	#DIV/0!	16.0%	0.0%
# on Wait List May/11	2,552.0	121.0	147.0	97.0	u/a	235.0	1,194.0	351.0	311.0	-

124 Leblanc,R.P., The Canadian Glaucoma Strategy, for the Canadian Glaucoma Strategy Forum, 2002
125 Lee, P.P., Parke, D.W., Access to Care Eye Care Provider Workforce Considerations in 2020, Arch Ophthalmol. 2007;125(3):406-410.
126 Rachmiel, R., Buys, Y.M., et.al., Cataract Surgery Rates in Ontario, Canada, from 1992 to 2004: more surgeries with fewer ophthalmologists, Can J Ophthalmology – Vol 42, No.4, 2007
127 Similar definitions for the three cataract types were used in the two studies (nuclear >/= grade 4, posterior sub-capsular >/= 1 mm, cortical >/= 10% lens area or >/= 25% circumference).

24.3.9 Orthopaedic Surgery

Currently, and in comparison to, Nova Scotia:

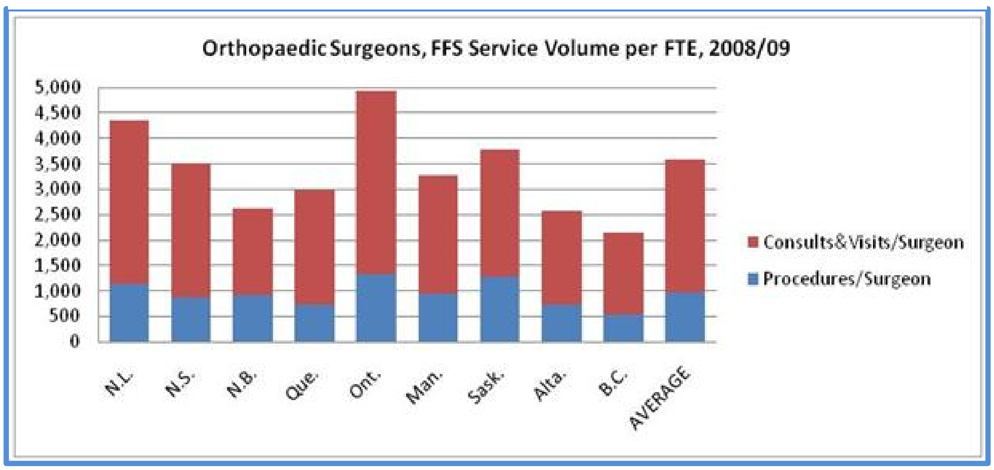
- There are 33.9 Orthopaedic Surgeon FTEs or 1.0 FTE per 27,809 population in Nova Scotia.
- Benchmark(s)
    - The national average is 1.0 FTE per 25,988 population (Source: CIHI).
    - In Ontario, in 2006, there was 1.0 FTE per 35,000 population.
    - The England RCPS recommends 1.0 WTE per 25,000 population.
    - A benchmark of 25,988 population per FTE was applied to the Base Case forecast in the Final Report.

Current – Nova Scotia & National

Figure 193 Orthopaedic Surgery – FTE and Case Productivity, 2009/10 Nova Scotia by DHA (Source: PARNS)

DISCIPLINE	DHA9	DHA8	DHA7	DHA6	DHA5	DHA4	DHA3	DHA2	DHA1	TOTAL
Orthopaedic Surgery										
FTE	22.7	6.0	-	2.6	-	-	5.0	-	-	36.3
Cases/FTE/Year	215.9	203.9	-	215.0	-	-	175.2	-	-	208.2
Cases/FTE/Month	18.0	17.0	-	17.9	-	-	14.6	-	-	17.4
Avg. OR (open to close) Hrs/ Case	2.0	2.0	-	2.0	-	-	2.0	-	-	2.0
#OR Hours/week/FTE	11.2	10.6	-	11.2	-	-	9.1	-	-	10.8
Wait List Change (April/10-May/11)	18.3%	0.6%	0.0%	27.1%	0.0%	0.0%	-32.5%	0.0%	0.0%	9.7%
# on Wait List May/11	3,752.0	1,120.0	-	441.0	-	-	704.0	-	-	6,017.0

Figure 194 Orthopaedic Surgeons - Service Volume/FTE, 2008/09 [Source: CIHI]



In Ontario, in 2006, there were 2.86 orthopaedic surgeons per 100,000 population[128]. This number varied by Local Health Integration Network (LHIN) from 1.57 per 100,000 in Waterloo Wellington to 5 per 100,000 in Toronto Central. In NS in 2010 there were 3.86 per 100,000 population or 1.0 per 25,900. The amount of orthopaedic surgeon provision across Ontario per 100,000 population in 2006 was similar to that in 2000 and 1997. These findings were based upon a self-reported survey with a 90%+ response rate.

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[128] University Health Network and Ontario Orthopaedic Assoc., 2006 Survey Of Orthopaedic Surgeons In Ontario March 2007, Arthritis Community Research & Evaluation Unit (Acreu)

International

The Royal College of Surgeons of England (January 2005), recommends a ratio of one full time equivalent (FTE) consultant per 25,000 population. The U.K. NHS recognizes that spinal surgery activity is undertaken in both the trauma/orthopaedics and neurosurgery specialties. In order to address current demands, the Spinal Taskforce for the Department of Health (March 2010) report recommends that a lead centre or centres are set up for the provision of specialist spinal surgery to the local population.

In the U.S.A., a report[129] raises the concern of increasing sub-specialization in orthopaedics. In 2006 55% of post-graduate residents declared general orthopaedics as their subspecialty, 11% spine, 11% sports medicine, 3% paediatric, 20% other areas. In 2010 it is estimated that at least 90% of all orthopaedic surgery residents take at least one additional year for accredited or unaccredited fellowships.

A 1995 study of 22,500 primary and revision arthroplasties concluded high mortality and costs were associated with low volume hospital doctors (i.e. less than 10 cases per year)[130].

Many previous studies have demonstrated a relation between surgeon and hospital volume for total knee replacement (TKR) and total hip replacement (THR) and outcomes such as mortality, complications, infection, and reoperation rates. Virtually all associations have demonstrated improved outcomes with increased surgical volume[131].

The association between greater hospital procedure volumes and improved patient outcomes has been well established with respect to a variety of procedures and treatments. However, this association in orthopaedics has not been summarized systematically. One study reviewed existing literature on associations between hospital and surgeon procedure volume and patient outcomes in orthopaedic surgery. The patient outcomes examined were mortality, hip dislocation, infection, revision, complications, functional outcome, and satisfaction. Of the 26 articles reviewed, most examined outcomes after primary joint arthroplasties (predominantly hip arthroplasties) with a relatively limited number of studies examining revision arthroplasties, hip fractures, spine, or general orthopaedics. No studies evaluated any other subspecialties. Association was found between higher hospital volumes and lower rates of mortality and hip dislocation. Association was also found between higher surgeon volume and lower rates of hip dislocation. All other associations were negative or inconclusive. In addition, surgeon volume had a greater effect on patients than hospital volume for primary and revision joint arthroplasties, whereas hospital volume was more strongly related to outcome than surgeon volume for the other procedures examined[132].

The median retirement age is expected to be 65, with 19% working part-time prior to retirement (Farley et.al[133]).

24.3.10 Other Specialties

The following specialties will be addressed in the forecast modeling, scenario development, and final report and recommendations:

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[129] Goodman E.S., Salsberg, A.G., et.al., An AOA Critical Issue. Future Physician Workforce Requirements: Implications for Orthopaedic Surgery Education, J Bone Joint Surg Am. 2008;90:1143-1159. doi:10.2106/JBJS.G.01305
[130] Lavernia, C., Guzman, J., Relationship of Surgical Volume to Short-Term Outcome Mortality, Morbidity, and Hospital Charges in Arthroplasty, Jrl Arthoplasty, Vol 10, No.2, April 1995
[131] Lyman, S; Sherman, S; Dunn, W, Advancements in the Surgical and Alternative Treatment: Volume-Outcome Relations in Orthopedics, Current Opinion in Rheumatology, March 2005; 17 (2):129-133.
[132] Shervin, N; Rubash, H; Katz,J.N; Orthopaedic Procedure Volume and Patient Outcomes: A Systematic Literature Review, Clinical Orthopaedics & Related Research: April 2007 - Volume 457 - Issue - pp 35-41
[133] Farley, F.A., Kramer, J., Watkins-Castillo, S., Work Satisfaction and Retirement Plans of Orthopaedic Surgeons 50 Years of Age and Older, Clin Orthop Relat Res (2008) 466:231–238

- Gynaecologic Reproductive Endocrinology & Infertility
- Gynaecologic Oncology
- Plastic Surgery

24.3.11 Paediatric General Surgery

Currently, and in comparison to, Nova Scotia:

- There are 3.4 net general surgical FTE or 1.0 FTE per 61,176 population under age 18 in Nova Scotia.
- There are 2.1 net orthopaedic surgical FTE or 1.0 FTE per 82,469 population under age 18 in Nova Scotia.
- Benchmark(s)
    - In 2009 in the USA there was 1,150 paediatric surgeons or 1.0 per 64,500 (24% of 309m in 2009 under age 18)[134].
    - In 2006 the Royal College of Paediatrics and Child Health (RCPCH) estimated an England requirement of 1.0 paediatric surgeon per 53,000 under age 18.
    - The American Orthopedic Association recommended 1:400,000 pediatric orthopaedic surgeons in 2005[135]. There is 1:449,000 in Nova Scotia.

24.3.12 Otolaryngology

Currently, and in comparison to, Nova Scotia:

- There are 23.7 Otolaryngology FTEs or 1.0 FTE per 39,760 population in Nova Scotia.
- Benchmark(s)
    - The national average is 1.0 FTE per 50,459 population (Source: CIHI).
    - The England RCPS recommends 1.0 WTE (Consultant plus Staff and Associate Specialist (SAS) doctors) per 44,200 population.
    - A benchmark of 50,459 population per FTE was applied to the Base Case forecast in the Final Report. The benchmark incorporates relative disease incidence and prevalence in Nova Scotia.

Figure 195 Otolaryngology – FTE and Case Productivity, 2009/10 Nova Scotia by DHA (Source: PARNS)

DISCIPLINE	DHA9	DHA8	DHA7	DHA6	DHA5	DHA4	DHA3	DHA2	DHA1	TOTAL
Otolaryngology										
FTE	18.40	2.23	1.17	-	1.41	-	2.00	1.05	-	26.27
Cases/FTE/Year	86.03	337.11	u/a	-	266.59	-	306.66	u/a	-	150.79
Cases/FTE/Month	7.17	28.09	u/a	-	22.22	-	25.56	u/a	-	12.57
Avg. OR (open to close) Hrs/ Case	1.50	1.50	u/a	-	1.50	-	1.50	u/a	-	1.50
#OR Hours/week/FTE	3.36	13.17	u/a	-	10.41	-	11.98	u/a	-	5.89
Wait List Change (April/10-May/11)	25.2%	53.7%	u/a	0.0%	233.3%	0.0%	75.5%	u/a	0.0%	30.6%
# on Wait List May/11	1,131.00	255.00	u/a	-	42.00	-	168.00	u/a	-	1,679.00

Otolaryngology (OTO) is the speciality that deals with disorders and diseases of the ear, nose and throat, previously referred to as ENT. Otolaryngology services include otology (e.g. ear, hearing), neuro-otology and

[134] Nakayama, D.K., Burb, R.S., Newman, B., Pediatric surgery workforce: supply and demand, Journal of Pediatric Surgery (2009) 44, 1677–1682

[135] Salsberg, E.S., Goodman, D.C., et.al., Future Physician Workforce Requirements: Implications for Orthopaedic Surgery Education, The Journal of Bone & Joint Surgery d JBJ S .ORG Vol 90-A d No.d May 2008.

skull based surgery, rhinology, laryngology and head and neck surgery (e.g. cancer), thyroid and parathyroid surgery, sleep disorders, cosmetic facial surgery, and additional areas of subspecialization within the preceding services.

General practitioners with special interest (GPwSI) in ear, nose, throat (ENT) services fulfill a key role in the National Health Service in England. These individuals are GPs who have gained extra skills to provide a variety of extended services more commonly provided in secondary care, in a primary care setting. To date there is no real agreed structure in training and accreditation for GPwSI in ENT.

The options for a Consultant-based service (1080 whole time equivalents[136] plus an additional estimated 300 workforce of SAS doctors and senior trainees or Consultant-led and supported service (720 WTEs plus an additional FTE 700 SAS doctors and senior trainees) were outlined[137]. SAS are fully qualified specialists, but are not working at the consultant level; they are in NHS posts which do not require them to be on the specialist register. The Consultant-based service is equivalent to 1.0 WTE (Consultant plus SAS doctors) per 44,200 population.

24.3.13 Thoracic Surgery

Currently, and in comparison to, Nova Scotia:

- There are 5.5 Thoracic surgeon FTEs or 1.0 FTE per 170,898 population in Nova Scotia.
- Benchmark(s)
    - The national average is 1.0 FTE per 250,000 population (Source: CIHI).
    - One of the two thoracic programs in Alberta averages 155 to 170 lung resections and 32 to 37 complex esophageal procedures per annum. The program serves a catchment area of 1.7 million residents with an average of 425,000 population per surgeon. Each thoracic surgeon averages 47 to 52 lung and esophageal resections per annum, which is less than the Ontario study recommendation of 55 to 60 per annum. Lung resection is a sentinel measure for thoracic surgery.
    - Alberta recorded 1,530 actual new lung cancer cases (ASR 55 per 100,000) in 2004. Nova Scotia had 800. Approximately one in five new cases required a lung resection as part of the Alberta treatment plan. This would equate to 160 new lung resection cases per annum for Nova Scotians plus an 10% case weighted adjustment of non-Nova Scotian cases, equivalent to 3.2 FTE.
    - It is likely, based upon a summary review of inpatient surgical data, the difference between the current 5.5 FTE and the benchmark of 3.2 FTE is spent performing general surgical workload.
    - A benchmark of 55 lung resections per FTE was applied to the Base Case forecast in the Final Report. The benchmark incorporates relative disease incidence and prevalence in Nova Scotia.

Thoracic surgery in the Canadian healthcare system is a tertiary/quaternary level clinical service. Thoracic Surgery is a seven-year residency (general or cardiac surgery plus two additional years) with Royal College of Physicians and Surgeons of Canada (RCPSC) examination and certification. Thoracic Surgery is that branch of surgery concerned with diagnosis and management of congenital and acquired diseases of the chest wall, mediastinum, lungs, trachea, pleura, esophagus and diaphragm. There are 5.50 FTE (count of 6) thoracic surgeons in Nova Scotia. One of the six is not active in the operating theatre.

[136] Whole Time Equivalent (WTE) is twelve, four-hour, programmed blocks with 80% direct patient time and 20% indirect care, leadership, and other responsibilities. On-call service and hours is separate from a 1.0 WTE.
[137] England RCPS, AN ENT WORKFORCE FOR THE FUTURE - WHO, WHERE AND HOW? Report of a consensus meeting held on 4th Sept 2008

The following describes in general terms the Thoracic Surgeon scope of services. Thoracic surgeons provide comprehensive care to patients with non-cardiac thoracic conditions including the following:

- Lung cancer: diagnosis, staging, and treatment, including coordinating multimodality therapy.
- Manage with proficiency and expertise, thoracic surgical emergencies including trauma.
- Pulmonary resection for cancer, including bronchial or double sleeve resections.
- Pancoast tumour resection, other extended resections for lung cancer, including resections of the superior vena cava.
- Haemoptysis: diagnosis and management.
- Pneumothorax: primary and secondary.
- Empyema.
- Pleural effusions: malignant, hemothorax, chylothorax, empyema, parapneumonia
- Bullous lung diseases, including surgery for giant bullae, diffuse emphysema (lung volume reduction).
- Septic lung disease: fungal and mycobacterial disease (including increased role of surgery for multidrug-resistant tuberculosis), lung abscess, bronchiectasis.
- Chest wall tumours, primary (including sarcomas) and secondary.
- Mediastinal tumours, including neurogenic, germ-cell and thymic tumours.
- Surgery for myasthenia gravis.
- Gastroesophageal reflux disease via transabdominal approaches (including laparoscopic) and transthoracic repairs, assessment (including endoscopy), 24-hour pH testing and esophageal manometry.
- Esophageal motility disorders (achalasia, Nutcracker esophagus, diffuse esophageal spasm): diagnosis, including manometry; management with balloon dilatation; and surgical myotomy, including laparoscopic approaches.
- Esophageal cancer, including esophagectomy & palliative approaches, laser & photodynamic therapy.
- Tracheal diseases/tumours: assessment, resection, stents.
- Pulmonary transplantation.
- Thoracic outlet syndrome.

Practice Setting

The practice setting requires a critical mass of thoracic surgery to maintain the skills of surgeons in typically complex cancer and thoracic surgery (e.g., tracheal resections, major chest wall resections, etc.). This is also balanced against geographic realities and patient transportation.

Level 1

A Level 1 thoracic surgical care program is the primary source to manage the most complex cases. To facilitate this goal, there should ideally be three or more thoracic surgeons on staff to provide intra-operative assistance and postoperative care, and weekend, holiday and emergency coverage.

This number of surgeons is needed to provide the capacity for tertiary clinical care in addition to the other requirements and responsibilities of a multidisciplinary cancer care facility, including teaching, research, quality improvement and program advancement.

A team approach is understood to improve the quality of surgery in complex cases and the judgment required to manage complications.

LEVEL 2

A Level 2 program is appropriate in some regions of the province where volumes do not support a Level 1 thoracic centre. In these regions, a Level 2, or secondary care unit, may be established to serve the basic thoracic surgery needs of the population.

A Level 2 program should have a minimum of 1 thoracic surgeon performing routine thoracic procedures. A formal relationship with a Level 1 tertiary centre is needed to which the thoracic surgeon may refer complex thoracic cases. Level 1 program backup in the event of the Level 2 thoracic surgeons' absence is required.

OTHER

Hospitals not meeting Level 1 or 2 criteria should establish formal relationships with a Level 1 or Level 2 centre to facilitate consultation, appropriate management and referral of patients with thoracic malignancies.

MINIMUM COMPETENCY REQUIREMENTS

In 2005 an expert panel in Ontario (the 'Ontario Study'), after extensive research and deliberation, defined certain standards relevant to maintenance of competency[138].

Level 1 programs should have surgical volumes in the range of 20 esophagectomy cases per unit per year and 150 anatomic pulmonary resections per unit per year. This **minimum volume** is sufficient to maintenance of competency for three thoracic surgeons each performing a minimum of **60 complex lung and esophageal resections per year**.

Level 2 programs should have surgical volumes in the range of 7 esophagectomy cases per unit per year and 50 anatomic pulmonary resections per unit per year. This volume is appropriate for one thoracic surgeon with backup support from a Level 1 program.

Further to the preceding Ontario study recommendations, the following figure[139] prepared by the Canadian Association of Thoracic Surgeons identifies the average number of surgical procedures and mean days waiting (and ranges), by type of centre, in Canada.

Figure 196 Average number of surgical procedures and mean days waiting (and ranges), by type of centre, in Canada, 2003 (Source: Canadian Assoc. Of Thoracic Surgeons)

	All settings		University centres		Community centres	
Type of surgery	Procedures/yr	Wait time, d	Procedures/yr	Wait time, d	Procedures/yr	Wait time, d
Lung resection	128 (20–325)	29 (14–60)	168 (20–325)	30 (14–60)	66 (30–100)	27 (17–60)
Esophageal resection	19 (0–70)	28 (7–90)	27 (0–70)	31 (7–90)	7 (0–12)	24 (8–60)
Mediastinal resection	13 (0–50)	27 (5–60)	18 (4–50)	26 (5–60)	5 (0–8)	27 (17–48)
HH repair	20 (0–60)	155 (21–600)	23 (0–60)	126 (21–540)	14 (3–40)	203 (21–600)
Lung volume reduction	1.6 (0–8)	153 (18–600)	2.5 (0–8)	153 (18–600)	0	0

The annual volume of lung and esophageal resections per centre in Non-university (community centres) hospital-based programs, university hospital-based programs, and all settings, are 73, 195, and 147 respectively.

One of the two thoracic programs in Alberta averages 155 to 170 lung resections and 32 to 37 complex esophageal procedures per annum. The program serves a catchment area of 1.7 million residents with an

[138] Cancer Care Ontario, Evidence-based series on thoracic surgical oncology standards, Program in evidence-based care, September 9, 2005
[139] Darling, et.al, Can J Surg, Vol. 47, No. 6, December 2004

average of 425,000 population per surgeon. Each thoracic surgeon averages 47 to 52 lung and esophageal resections per annum, which is less than the Ontario study recommendation of 55 to 60 per annum. The average workweek is forty-eight to fifty hours including time when called back to the hospital while on-call. The fifty-hour workweek also includes administration and delivery of the thoracic surgeon residency program. The program does not do lung transplantation and currently has excess clinical capacity to meet growth in clinical need. Alberta has a lower lung cancer incidence (55 ASR versus 63 ASR nationally) than the national average. Alberta recorded 1,530 actual new lung cancer cases (ASR 55 per 100,000) in 2004. Approximately one in five new cases required a lung resection as part of their treatment plan. Five-year survival rates in Alberta based on 2001-2003 data was 13% compared to 15% nationally.

The Ontario study made an extensive review of the peer-reviewed published literature and concluded that in every citing, 30-day mortality was reported to be lower in higher volume centres when compared with the lower volume centres. That difference in 30-day mortality was reported to be statistically significant in 16 of the 27 comparisons.

The General Assemblies of the European Association for Cardio-thoracic Surgery (EACTS) and the European Society of Thoracic Surgeons (ESTS) Working Group[140] on Structures in Thoracic Surgery recommends one dedicated thoracic surgeon equivalent **per 150 major thoracic procedures per year.** To achieve this volume a surgeon would require two blocked operating theatre days per week. From this ESTS recommendation one can infer that the Ontario study recommendation of 60 complex lung and esophageal resections procedures per surgeon per year being a minimum requirement.

Figure 197 National Survey Thoracic Surgery 2009

Measure per Surgeon 1.0 FTE	Canada	Alberta	Nova Scotia	Ontario
1. #Hours worked/ week (includes call-back time)		50.0 (ex. hours on-call but includes call-back hours)		
2. # Lung & esophageal resections/FTE	65	47-52		55-60 (min. of 13 oesophageal)
3. # Complex Major procedures/FTE	79.0	77.0-82.0		75.0-80.0
4. Call Rotation	1 in 3 when not sharing call with General Surgery.	1 in 4 with General Surgery and 1 in 3 without General Surgery		1 in 3 or 1 in 4.
5. # OR days per week	9.0 to 16.0 OR hours per week and 2-3 endoscopy hr/week.	10 OR hours per week. Will also assist in 1 in 10 cases e.g., esophagectomy.		
6. Population per FTE	**Actual range is 1:150,000 to 1:500,000. Recommended**	1:400,000 in Alberta (9 & 3.5m). Includes	1:157,000 (6 surgeons)	1:300,000

[140] Klepetko, W., Torkel, H.J., Aberg, A., et. al., Structure of General Thoracic Surgery in Europe By The EACTS/ESTS Working Group on Structures in Thoracic Surgery, Eur J Cardiothorac Surg 2001;20:663-668.

	range is 1:300,000 to 1:500,000. University-based thoracic practices have an average of 2.4 FTE per centre (range 2–5).	managing a PG Resident program and Lung Transplantation Program.		[B.C. 1:345,000 or 13 for 4.5m*, MB. 1:300,000 or 4 for 1.2m*]
7. Thoracic Program	Should be at least 2, and ideally 3, thoracic surgeons per program.	4 per program and 1:400,000 population.		

PRACTICE PROFILE

An Association of American Medical Colleges study suggested that the average age of retirement for cardiothoracic surgeons is 61 years and that 60% of physicians fully retire from clinical practice by age 65. [141] In 2008 in Canada there were 332 cardiothoracic surgeons practicing in Canada. Of these 2% are under the age of 35, with the majority (57%) aged 35-54. Thirty-nine percent were aged 55 or older. An overwhelming 91% of CVT surgeons are male and only 9% are female. (Source: 2008 CMA Master File).

PREVALENCE AND INCIDENCE

In 2002 20,800 new cases of lung cancer were recorded nationally of whom 88% died. In 2008 23,900 new cases (ASR 59 per 100,000) were recorded of whom 85% died. Annual growth in volume of cases is 2.5% nationally.

1. In males, rising incidence and mortality rates began to level off in the mid-1980s (97 per 100,000) and have been declining ever since (70 per 100,000 in 2004). Rates have dropped significantly by 2.5% per year since 1999 for incidence and by 2.1% per year for mortality over the period 1995-2004.
2. In females, incidence and mortality rates have been increasing since at least 1979 (20 per 100,000), and continue to do so by 1.2% per year for both incidence and mortality (42 per 100,000).
3. Males continue to have higher incidence and mortality rates than females (67 per 100,000 versus 51 per 100,000 and 59 per 100,000 versus 40 per 100,000, respectively). These patterns reflect the drop in tobacco consumption that began for males in the mid 1960's and much later – in about the mid-1980's – for females.
4. Risk of lung cancer continues after smoking cessation.

Surgery is a key component of treatment for patients diagnosed with tumors of the thoracic region (i.e., lung and esophageal cancers). For many patients diagnosed with lung or esophageal cancer, the prognosis is poor. In 2004, it is estimated that in Canada 21,700 patients will be newly diagnosed with lung cancer and 18,900 deaths will occur in the same timeframe. The death-to new-cases ratio of 0.87 is one of the highest of all the cancer disease sites. While not as prevalent as lung cancer, esophageal cancer will cause an estimated 1,400 new cases in 2004, and esophageal cancer has an even higher death-to-new-cases ratio than lung cancer at 1.14. The incidence of lung cancer is expected to increase by approximately 8779 cases by 2014.

RESIDENCY PROGRAMS

Residency programs currently graduate 6 Thoracic Surgeons into practice per year. Medical school expansion is expected to increase this to 8 per year by 2011.

The current national workforce of 200 requires about 7 replacement surgeons per year at 3.5% rate of replacement. National population growth requires another 1 to 2 surgeons per year at 1 per 300,000 growth in

[141] Shemin, R., Dziuban, S., Kaiser, L., et.al., Thoracic surgery workforce: snapshot at the end of the twentieth century and Implications for the new millennium, Ann Thorac Surg, 2002;73:2014–32.

population. Total annual requirements are therefore about 9 surgeons per year leaving a shortfall of 1 surgeon per year to be filled by foreign recruitment or further increase in residency positions. This assumes status quo on division of practice between interventional radiology, cardiac surgery, interventional cardiology, and thoracic surgery specialties.

KEY OBSERVATIONS

1. The complexity of major thoracic surgical procedures requires a minimum number of complex cases to (a) maintain competence, and (b) optimize patient outcomes i.e., 30-day mortality, etc.
2. The primary driver of thoracic surgery workload is lung and oesophageal cancer. For these types of cancer Nova Scotia has a slightly (3.4%) higher age standardized rate (ASR) than the national average.
3. To maintain competence in complex thoracic procedures, the literature, including the Canadian Society of Thoracic Surgeons, recommends 300,000 to 500,000 people per surgeon.
4. Call rotation should be the equivalent of 1 week in 3 or less frequent if shared with General Surgery.
5. Operating Theatre blocked time should be appropriate to referral population morbidity incidence and prevalence.

24.3.14 Urology

Currently, and in comparison to, Nova Scotia:

- There are 16.2 Urologist FTEs or 1.0 FTE per 58,226 population in Nova Scotia.
- Benchmark(s)
  - The national average is 1.0 FTE per 53,317 population (Source: CIHI).
  - The England RCPS recommends 1.0 WTE per 50,000 population (Source: U.K. NHS Centre for Workforce Intelligence) made up of a mixture of urologists and urological surgeons. Currently there is 1:63,000.

Urology service trends in the England NHS include:

- Increasing centralisation of complex urological surgery, particularly urological oncology serving populations over 1 million. This trend is increasingly applying to other areas of specialist urology.
- ‘Office urology’ is evolving. This involves work in clinics and day-case procedures, with much use of endoscopy but no open theatre cases.
- Open major surgery is becoming increasingly laparoscopic or robotic.
- It is likely that the emphasis towards greater specialisation will continue, especially in the sphere of elective practice.
- Robotic surgery is just gaining a foothold in the UK, particularly in the field of radical prostatectomy. This trend is likely to continue. In the USA fellowship training is required in urology robotic surgery.
- Medical therapy for many urological conditions (including lower urinary tract symptoms, incontinence, prostate cancer and erectile dysfunction) has been introduced over the past ten years. It is likely that ever more medical therapies will be developed for the whole range of urological diseases.
- A benchmark of 53,317 population per FTE was applied to the Base Case forecast in the Final Report.

Screening programs

The UK National Screening Committee (NSC) does not recommend screening men for prostate cancer. This policy was recently reviewed as part of the UK NSC's regular review cycle of all policies. The U.S. Preventative Services Task Force (USPSTF) concludes that for men younger than age 75 years, the benefits of screening for prostate cancer are uncertain and the balance of benefits and harms cannot be determined. For men 75 years or older, there is moderate certainty that the harms of screening for prostate cancer outweigh the benefits.

24.3.15 Vascular Surgery

Currently, and in comparison to, Nova Scotia:

- There are 7.4 Vascular Surgeon FTEs or 1.0 FTE per 128,069 population in Nova Scotia.
- Benchmark(s)
    - The national average is 1.0 FTE per 200,000 population (Source: CIHI).
    - A benchmark of 200,000 population per FTE was applied to the Base Case forecast in the Final Report. The benchmark incorporates relative disease incidence and prevalence in Nova Scotia.

The intent of the following is to describe in general terms the Vascular Surgeon scope of services. Vascular surgeons provide comprehensive care to patients with non-cardiac vascular conditions including the following[142]:

- The anatomy, physiology, and pathophysiology of the circulatory system in health and disease, including arterial wall and cell biology, hemodynamics, and ischemia-related organ dysfunction.
- Biostatistics and epidemiology as they relate to vascular surgery.
- The differing patterns of disease, natural history, and responses to treatment of vascular disease in men and women and in different racial and cultural groups.
- Aneurysms of the aorta and other vessels
- Chronic lower extremity arterial occlusive disease
- Acute and chronic visceral ischemia including renal artery occlusive disease
- Extracranial cerebrovascular disease
- Intrathoracic non-coronary vascular disease
- Chronic upper extremity occlusive disease
- Thoracic outlet syndrome
- Acute arterial occlusion.
- Local and systemic complications of vascular therapy.
- Vascular trauma
- Aortic dissections
- Venous thromboembolic disease
- Chronic venous diseases
- Lymphedema
- Amputations
- Endovascular therapy
- Risk stratification and risk factor modification in vascular disease
- Coagulation disorders
- Vasospastic disorders
- Non-atherosclerotic vascular disease

[142] Canadian Assoc. of Vascular Surgeons

- Arterial venous malformations
- Hemoaccess
- Noninvasive and invasive diagnosis and radiation safety
- Biological and synthetic grafts and complications.

Workload Parameters

The scope of pathology seen by most vascular surgeons obligates them to provide far more vascular medicine to outpatients than surgical care. In most regions of the country fewer than 25%[143] of all newly referred vascular patients are ever brought to surgery. The vast majority are treated medically, with advice given by vascular surgeons to patients and referring physicians regarding management of atherosclerosis and risk factor reduction. Included in this group are patients assessed then brought to outpatient percutaneous interventions (angioplasty and stenting) by interventional radiologists. The vascular surgeons assess and recommend percutaneous interventions to patients, and provide all aftercare to this cohort.

The overall annual incidence of intermittent claudication is 4.1–12.9/1000 in men and 3.3–8.2/1000 in women. The symptoms of intermittent claudication can resolve spontaneously, remain stable over many years, or progress rapidly to critical limb ischaemia. About 15% of people with intermittent claudication eventually develop critical limb ischaemia, which endangers the viability of the limb. The annual incidence of critical limb ischaemia in Denmark and Italy in 1990 was 0.25–0.45/1000 people. Data reveal that the extrapolated incidence of critical lower limb ischaemia in Great Britain and Ireland was 21,450 limbs in 20,000 patients, equating to a prevalence of 1 in 2500 of the population annually[144].

Scheduled hours per week in the operating theatre per surgeon are consistently in the one to one and a half day per week range and 350-525 hours per year.

Inpatient surgical volume grows in proportion to population growth per annum while annual growth in diagnostic, therapeutic, and ambulatory procedures is in the order of 3% per annum in line with the growth in complex peripheral vascular disease cases.

Call schedules are typically one in four with one in three being tolerable for only short periods of time. A single site model for city or regional call service is sustainable while a two site model requires double the surgeons.

Inter-Specialty Review

Vascular surgery evolved in Canada from cardiovascular surgery in 1980 when the RCPSC formally recognized vascular surgery as a separate specialty. This was in response to the increased volume and complexity of cases.

With the advancements in technology, the scope of practice between various specialties is starting to overlap. The new technologies transcend the traditional barriers between radiology, cardiology, cardiac surgery and vascular surgery, but organizational structures, professional credentialing and funding methodologies do not .

Recent inter-disciplinary discussion has focused on two issues; whether cardiac surgery training should be broadened and the increasing transference of certain interventional radiology procedures from radiologists to vascular surgeons. In the absence of convergence of professional credentialing, organization structures, and funding methodologies, the major challenges to the future of vascular surgery were felt to be competition from cardiology (82%) or radiology (30%) and a lack of an independent board (29 %)[145].

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[143] Interview opinion reconfirmed with another interviewee.
[144] Vascular Surgical Society of Great Britain and Ireland, Critical limb ischaemia: management and outcome. Report of a national survey. Eur J Vasc Endovasc Surg. 1995 Jul;10(1):108-13.
[145] Cardiac Care Network of Ontario, A Cardiac Care Network of Ontario Panel Discussion Paper, Nov-06

Regarding interventional radiology (IR) the RCPSC in 2003 twice (initial and appeal) denied the Canadian Interventional Radiologist Assoc. application for subspecialty recognition indicating it did not meet the criteria for a distinct subspecialty[146] . 7.8% of radiologists subspecialize in IR.

Vascular surgeons are performing an increasing proportion of surgical and interventional radiology worldwide. An increasing proportion of minimally invasive procedures are performed by vascular surgeons compared to radiologists e.g., hybrid open endovascular procedures.

The Society for Vascular Surgery/International Society for Cardiovascular Surgery (SVS/ ISCVS) Ad Hoc Committee on Endovascular Surgery Credentialing and Training for Vascular Surgeons recommended that at least 50 diagnostic and therapeutic angiograms (may include operative angiography) and 10 to 15 balloon dilations (includes percutaneous and operative approaches) be required for individual credentialing for endovascular surgery privileges[147]. These minimum procedure numbers are far less than the 50 to 200 angiograms and 25 to 50 balloon dilations recommended for the same purpose by the Society of Cardiovascular and Interventional Radiology, the Society for Cardiac Angiography and Interventions, the American College of Cardiology, and the American Heart Association for their respective members.

Figure 198 Endovascular Credentialing & Competency (Source: Society for Vascular Surgery/Int'l Society for CV Surgery, 1999)

Number of catheterizations and interventions

	SCVIR	*SCAI*	*ACC**	*AHA**	*SVS/ISCVS* (1993)*	*SVS/ISCVS* (1998)*
Catheterizations/angiograms	200	100/50†	100	100	50†	100/50†
Interventions	25	50/25†	50/25†	50/25†	10 to 15†	50/25†
Live demonstration	yes	yes	yes	yes	yes	yes

SCVIR, Society of Cardiovascular and Interventional Radiology; *SCAI*, Society for Cardiac Angiography and Interventions; *ACC*, American College of Cardiology; *AHA*, American Heart Association; *SVS/ISCVS*, Society for Vascular Surgery/International Society for Cardiovascular Surgery.
*Includes knowledge of thrombolysis or thrombolytic therapy.
†As primary interventionist.

The International Society of Endovascular Surgery view is that training of vascular surgeons, interventional radiologists, and cardiologists in peripheral endovascular interventions is distinctly different. Not only are the pathways through the training process disparate, but even more importantly, the final product varies greatly. When properly trained in endovascular interventions, vascular surgeons are in the unique position to execute these manoeuvres by both percutaneous and open routes. This single difference offers the vascular surgeon myriad opportunities in revascularization that are unavailable to non-surgeon interventionists. The vascular surgeon also has the capability to immediately address any complication that may occur as a result of an endovascular procedure. The RCPSC requirements specifically include endovascular therapy and interventions as core requirements.

The McGill medical program states that "vascular surgery should be situated within a center for the multidisciplinary treatment of vascular conditions i.e., the treatment of complications of atherosclerosis. The workload of the vascular surgeon is the evaluation and treatment of vascular lesions. In North America in 2004, that means atherosclerosis. Interventions, whether through open surgery or endovascular techniques, risk factor treatment, and non-invasive assessments of peripheral vascular lesions take up the bulk of a vascular surgeons clinical time. That is where our focus needs to be".

[146] Baerlocher, M.O., Owen, R., Poole, A., Interventional Radiology Deserves Formal Recognition as a Distinct Medical Subspecialty: A Statement from the Canadian Interventional Radiology Association, J.Vasc Interv Radiol 2008; 19:9–12.
[147] White, R.A., Hodgson, K.J., et.al., Endovascular interventions training and credentialing for vascular surgeons, J. Vascular Surgery, 177-186,January, 1999.

Residency Programs

Residency programs currently graduate 6 Vascular Surgeons (next figure) into practice outside Quebec per year. Medical school expansion is expected to increase this to 8 per year by 2011.

The current national workforce of 200 requires about 7 replacement surgeons per year at 3.5% rate of replacement. National population growth requires another 3 surgeons per year at 1 per 175,000 growth in population. Total annual requirements are therefore about 10 surgeons per year leaving a shortfall of 2 surgeons per year to be filled by foreign recruitment or further increase in residency positions. This assumes status quo on division of practice between interventional radiology, cardiac surgery, interventional cardiology, and vascular surgery specialties.

Figure 199 Inter-Provincial Profile - Vascular Surgeons

JURISDICTION	B.C. LOWER MAINLAND & VICTORIA	ALBERTA	NOVA SCOTIA	MANITOBA	METRO-TORONTO
1. Total # Hours worked/week/ surgeon	55.0-60.0 plus hours on call.	65.0-70.0 plus hours on call. Each FTE averages 89 major and 49 minor procedures along with 1,280 consults/ dx/ therapeutic visits		50.0-55.0 plus hours on call. Endovascular service is resource constrained at the Health Authority.	60.0-65.0 plus hours on call. Each FTE averages 2000 consults/year (+/- 10%) and 150-200 O.R. cases.
2. Call Rotation		1 in 5 1st call and 1 in 5 2nd call. Combined- 1:2.5 call		1 in 4 call	1 in 4 call
3. # OR days per week per surgeon	u/a	1.5 days per week (12 hours x 46 weeks)		1.5 days per week (12 hours x 46 weeks)	1.25 days per week (10 hours x 44 weeks)
4. Population per FTE	1:195,000 23 FTE surgeons (province-wide)	1:330,000 10.5 FTE surgeons (province-wide)	1: 128,000 (9 surgeons; excludes 1 >age70) 7.4 FTE	1:200,000 6 FTE surgeons (province-wide)	1:250,000.. 23 surgeons (Metro Toronto only)
5. Resident Program	1 resident per year.	1 resident every other year UofA/ UofC combined.	No program	No program	2 residents per year.
6. Surgical Program		Delivered in 2 centres for the Province	Delivered in 3 centres for the Province	Delivered in 1 centre for the Province	

25 Diagnostic & Therapeutic Disciplines

25.1 Discipline-Specific

Figure 200 Diagnostic and Therapeutic FTEs – Nova Scotia – 2009/10 (Source: MSI)

Functional_Specialty	DHA1 SSH	DHA2 SWNDHA	DHA3 AVH	DHA4 CEHHA	DHA5 CHA	DHA6 PCHA	DHA7 GASHA	DHA8 CBDHA	DHA9 CDHA	PROVINCE
Functional_Specialty	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total
Anatomic Pathology	1.0	0.6	2.0	1.1	-	-	1.7	2.7	15.2	24.3
Diagnostic Radiology	4.8	6.1	7.8	4.6	2.5	3.8	3.7	7.8	37.8	78.9
General Pathology	1.0	-	1.0	1.0	-	-	-	0.3	2.0	5.3
Haematological Pathology	-	-	-	-	-	-	-	-	7.2	7.2
Medical Biochemistry	-	-	-	-	-	-	-	-	2.0	2.0
Medical Genetics	-	-	-	-	-	-	-	-	0.7	0.7
Medical Microbiology	-	-	-	-	-	-	-	-	3.0	3.0
Neuropathology	-	-	-	-	-	-	-	-	2.0	2.0
Nuclear Medicine	-	-	-	-	-	-	-	-	4.2	4.2
Radiology - Oncology	-	-	-	-	-	-	-	2.1	11.0	13.1
Total	**6.8**	**6.6**	**10.8**	**6.7**	**2.5**	**3.8**	**5.4**	**12.9**	**85.2**	**140.8**

25.1.1 Laboratory Medicine and Pathology

Currently, and in comparison to, Nova Scotia:

- There are 26.50 Anatomic Pathologist FTEs (2.2 paediatric, 24.3 adult) or 1.0 FTE per 35,566 population in Nova Scotia.
- Benchmark(s)
  - Anatomic Pathology residing in the CDHA processes 2,200-2,400 surgical cases or X specimens per month (2010).
  - The United Kingdom Royal College benchmark is 2,800 surgical cases (4,000 specimens) per FTE.
  - A large Canadian regional and provincially centralized lab system is able to process 3,200-3,400 surgical cases (4500-4800 specimens) per FTE based upon a workforce mix of 27% full-time academic pathologists and 73% clinical pathologists.
  - A benchmark of 2,800 surgical cases per FTE was applied to the Base Case forecast in the Final Report.

A larger regionalized laboratory medicine and pathology service conducted an extensive workload and workforce analysis of its professional (M.D., PhD, M.D./PhD only) staff. The regionalized service provides 95%+ of all laboratory medicine and pathology service needs to a geographically dispersed regional population of 1.5 million. The key findings from the study are relevant to PRP for laboratory medicine and pathology.

The percentage work time spent in each activity area was as follows: clinical direct 50.6%; administration, 18.5%; clinical indirect, 9.5%; research, 8.2%; learning/continuing education, 5.3%; teaching, 4.9%; and quality assurance, 3.1% (next figure). These percentages varied significantly by laboratory medicine subspecialty and by type of academic appointment. The findings confirmed that activities not directly involved with patient care, such as administration, quality assurance, teaching, research, and professional development, typically occupy

40% to 50% of a laboratory physician's time[148]. The division of microbiology in the study was heavily academic

Figure 201 Study Results - Percentage Time Distribution - Laboratory Medicine & Pathology

Time Distribution for Major Task Categories by Laboratory Discipline*

	All Divisions	Anatomic Pathology	General Laboratory	Hematology	Chemistry	Microbiology
Clinical, direct	50.6	57.5	60.9	31.4	6.9	28.7
Administration	18.5	14.7	25.2	21.1	33.4	24.6
Clinical, indirect	9.5	8.8	6.1	12.4	32.3	9.1
Research	8.2	7.2	0.3	8.6	7.7	24.9
Learning	5.3	5.1	3.9	5.9	3.6	8.0
Teaching	4.9	5.8	2.2	3.8	5.0	3.5
Quality assurance	3.1	1.0	1.4	16.9	11.0	1.2

* Data are given as percentages. On-call tasks and leave of absence time excluded from the major task categories

(50% of time) which explains the atypical distribution of time in comparison to the other divisions.

The next figure specifies the clinical workload during the study period for selected disciplines and workload indicators. The case volumes are very large and are a reflection of a Department of Laboratory Medicine and Pathology that has centralized processing at a single location for a region (115,000 sq.km.) roughly twice the size of the province of Nova Scotia (55,000 sq.km.). The service model is enabled by an essential and efficient collection and transport system.

Figure 202 Study Results - Clinical Workload Volumes by Discipline, Laboratory Medicine & Pathology, 2004

Clinical Workload Volumes During the Time Study

	Mean Monthly Workload			
Discipline	November/December 2003	November/December 2004	Mean 2004	November/December 2004 Increase Over Mean 2004 (%)
Surgical pathology				
Specimens	11,800	12,270	11,750	4
Cases	6,900	8,572	8,300	3
Cytopathology				
Cases	17,000	20,000	18,800	6
Hematology				
Total tests	210,000	226,000	222,500	2
Chemistry				
Total tests	730,000	845,500	825,000	2
Microbiology				
Total tests	45,500	47,600	47,500	0

In comparison Anatomic Pathology residing in the CDHA processes 3,300-3,400 surgical cases per month (2010) and 8,600-9,000 cytopathology cases per month.

Figure 203 Study Results - Time Distribution Full-time academic and Clinical specialists

Time Distribution for Major Task Categories by University Appointment*

	Academic Appointment	
	Geographic Full Time	Clinical
Clinical, direct	36.8	60.5
Administration	22.5	15.4
Clinical, indirect	12.0	8.5
Research	14.6	3.0
Learning	4.8	5.7
Teaching	8.4	2.1
Quality assurance	1.0	4.8

* Data are given as percentages. On-call tasks and leave of absence time excluded from the major task categories (see text).

The distribution of time between what was termed 'geographic full-time' (full, salaried assistant, and associate professors) and clinical FTEs is significantly different and underscores the importance of both recognizing academic work and being particularly careful regarding describing the need for and

of Clinical and Nonclinical Workload in Pathology and required deliverables of full academic positions prior to their creation.

Anatomical Pathology

The most frequently cited benchmark for anatomic pathology is specimens per FTE. The United Kingdom Royal College benchmark is 4,000[149] specimens per FTE. A large Canadian regional and provincially centralized lab system is able to process 4,500-4,800 specimens per budgeted FTE[150] or approximately 3,200-3,400 surgical cases per clinical FTE. This average throughput was achieved with a mix of 27% full-time academic pathologists and 73% clinical pathologists. The academic pathologists averaged 30% less clinical time per week than their clinical pathologist colleagues. This degree of throughput is a combination of efficiencies in centralized throughput, subspecialization, and system integration. The throughput of specimens is provided in an environment were the average work week per FTE is 53.5 hours. The findings were further validated through the detailed time study analysis cited in the prior paragraph.

General Pathology

Currently, and in comparison to, Nova Scotia:

- There are 6.25 adult and paediatric General Pathologist FTEs or 1.0 FTE per 150,801 population in Nova Scotia.
- Benchmark(s)
    - In Calgary in 2006 there was 1:149,333 serving a city population of 1,120,000.

Greater outpatient focus has seen an ongoing shift from inpatient surgery and procedures to outpatient procedures and short-stay surgery. The impact on regional lab services has been to increase the demand for rapid results and point-of-care testing. While much of the impact of this is absorbed through new technology, the demand for evening, night and weekend coverage is increasing.[151] (turn-around times) are a key indicator of internal performance and they are assessed and reported on a monthly basis.

Test processing in Chemistry, Haematology and Microbiology are largely automated and or performed by technologists, and therefore require little direct physician intervention or supervision. The issues for these departments for technology relate more to the development and assessment of new tests and new technologies to determine how to implement them and how to address new diseases. This is evident in looking at the research efforts ongoing within the CLS physicians.

One of the core technologies for laboratory efficiency and effectiveness is the easiest to overlook. That is a unified and integrated patient-centred information system.[152]

Another key impact of technology is the development, assessment and application of new diagnostic tests in response to increased incidence of certain diseases. The increase in the number of hospital-acquired infections and methicillin-resistant Staphylococcus aureus (MRSA) cases in Canada are increasing. This affects service delivery requirements in two ways; firstly, it significantly increases the amount of research and development expended to identify the cause, accurately test and analyze, and then automate the testing process.

[149] U.K. Royal College of Pathologists, Guidelines on staffing and workload for histopathology and cytopathology departments, July, 2003.
[150] SSM Inc., PRP for Pathology and Laboratory Medicine, 2006.
[151] Ontario Hospital Association, Laboratory Service System Issues for Ontario Report, An OHA Discussion Paper, August 2000
[152] Bayne, Lillian, BC Laboratory Services Review Report, July 2003

Medical Biochemistry

The Royal College of Pathologists (2010) response to the NHS call for Reconfiguration of NHS Pathology Services identified a current and target ratio of chemical pathologists (medical biochemists) of 1:355,263 and 1:491,000 (Source: U.K. NHS Centre for Workforce Intelligence, August 2010)

Currently in NS there is 1:314,169 population.

Medical Microbiology

The impact of globalization on disease is increasingly being felt[153]. New Canadians are immigrants from diverse wide-ranging countries. Some examples of the effect of globalization on the spread of disease include:

- The emergence of HIV/AIDS, which originated in Africa, as the number one killer of young men aged 15-45 in the United States;
- Mosquitoes capable of carrying west Nile virus and other infectious diseases introduced to North America through tires imported from Asia.
- Pesticides banned in North America have been found on imported food; high levels of lead found in crayons from China, cosmetics from India and canned food from Latin America.

25.1.2 Other Specialties

The following specialties will be addressed in the forecast modeling, scenario development, and final report and recommendations:

- Clinical Pharmacology
- Haematological Pathology
- Medical Genetics
- Neuropathology
- Transfusion Medicine

25.1.3 Radiation Oncology

Currently, and in comparison to, Nova Scotia:

- There are 13.1 Radiation Oncologists FTEs or 1.0 FTE per 71,900 population in Nova Scotia. Out-of-province workload is estimated at 10%-14%.

- Benchmark(s)
  - In Australia one radiation oncologist is expected to treat 250 new patients per year.
  - In Ireland a national workforce review recommended reducing individual caseloads per consultant to 350 new cases per radiation oncologist.
  - In Nova Scotia it is estimated there will be 6,100 new cancer cases in 2011 (Source: Canada Cancer 2011) which at a 50% treatment rate translates to 3,050 new cases or 12.2 FTE radiation oncologists.
  - In the USA it is estimated there is 1.0 FTE per 16,234 population over age 65[154] or 1:126,000 total population.

[153] Lee, Jong-Wha, McKibbin, Warwick J., Globalization and Disease: The Case of SARS, Brookings Institution, May 20, 2003.
[154] Aneja, S., Yu, J.B., et.al., Geographic analysis of the Radiation Oncology Workforce, Int. J. Radiation Oncology Biol. Phys., doi. 10.1016., pp. 1–7, 2011

- A benchmark of 250 newly diagnosed cancer patients per year per FTE was applied to the Base Case forecast in the Final Report (i.e., 6,100 times 50% treatment rate divided by 13 FTE). The benchmark incorporates relative disease incidence and prevalence in Nova Scotia.

In Australia one radiation oncologist is expected to treat 250 new patients per year. The number of radiation oncologists required is thus determined by calculating the number of patients with newly diagnosed cancer during that year and dividing the assumed treatment rate (i.e. 50%) by 250[155]. In Ireland a national workforce review recommended reducing individual caseloads per consultant to 350 new cases per radiation oncologist, and subsequently to achieve staffing ratios that more closely approximate the international norm of one consultant radiation oncologist per 250 new patients.

In Nova Scotia it is estimated there will be 6,100 new cancer cases in 2011 (Source: Canada Cancer 2011) which at a 50% treatment rate translates to 3,050 new cases or 12.2 FTE radiation oncologists. As at March 2010 there was 13.1 FTE. In Nova Scotia and elsewhere the rate of referral will be appropriately captured in the Sentinel Services population-need measures of cancer incidence and prevalence. Technology changes may impact need for services. We note Stereotactic Body Radiation Treatment (SBRT) is a well established protocol[156].

[155] Morgan G, Wigg D, Childs J: Projected requirements for radiation oncologists and trainees in Australia and New Zealand to 2007. Australas Radiol 2000, 44:88-97

[156] Tipton, K.N., Schoelles, K.M., et.al., Stereotactic Body Radiation Therapy, Comparative Effectiveness Technical Briefs, No. 6, ECRI Institute Evidence-based Practice Center, Rockville (MD): Agency for Healthcare Research and Quality (US); May 2011. Report No.: 10(11)

26 Individual Specialties – What We Heard

26.1 Family Medicine

Interview 1 - Family Physician – HRM, Past President of Doctors Nova Scotia

Population Need

- Health System Design
  - Main urban problem is access to specialist consultations and care – more specialists are needed outside HRM but still within region
  - AFPs have diminished access significantly
  - Supports a model of visiting specialists
- Infrastructure
  - Inevitable growth of family practice nurses plus additional allied health professionals can stabilize the GP workforce – still significant funding barriers

Physician Supply

- Generalist Disciplines
  - Caution over DNS definition of part-time because of important and unmeasured non-clinical service
  - Demand on family doctor is exacerbated by role as patient navigator – no sign of relief and getting worse
  - Fees and schedule do not reflect the professional day
  - Medical Education
  - Caution not to undervalue the importance of research roles undertaken by family physicians

Interview 2 - Family Physician – rural, Past-President of Doctors Nova Scotia

Population Need

- Health System Design
  - Middleton is a collaborative practice with – 3 physicians – 3 sites – 9,000 patients
- Infrastructure
  - Collaborative care should grow but Department of Health and Wellness not assisting the process through expanded funding – model is expensive but provides real value with integrated care that focuses on outcomes rather than outputs
  - Supports concept of travelling specialty care
- Social-economic
  - Supports application of social determinants of health to define population health needs
  - Aging rural population requires priority planning attention over urban patients
  - Increasing retirements to rural NS will exacerbate the current problems

Physician Supply

- Generalist Disciplines
  - Currently ten GPs in Middleton area – two (2) are 54 years; three (3) mid-40s; and remainder more than 55 years – significant implications to a 10-year horizon and declining interest in family medicine, and especially in a rural setting.
- Critical mass
  - Supports shared services across counties
  - Envisions specialty care seen as provincial resources
- Medical Education
  - Tension between the academic mandate and the realities of rural care
- Specific Disciplines
  - Most referrals are well handled in Kentville
  - Kentville not able to provide adequate coverage of Plastic Surgery
  - Too many subspecialty interests, such as Orthopaedic Surgery with a focus on shoulders – non-academic settings need generalists
  - AVH cataracts are all done in Middleton – significant operating room capacity for ophthalmologists and supports rural anaesthesia

Interview 3 - Family Medicine, Chief of Department, CDHA Family Medicine

Population Need

- Health System Design
  - Gaps will be assisted by expanded roles and use of the family practice nurse and through collaborative care models
  - Physicians continue to misunderstand the collaborative care model
  - Role optimization is an appropriate and necessary goal
- Infrastructure
  - Overall, wait lists are stable – probably the right supply of VDHA specialists but too many inefficiencies – exceptions where more specialists are required are Neurology, Geriatrics, Gastroenterology, and especially General Internal Medicine

Physician Supply

- Generalist Disciplines
  - Accepts the DNS part-time definition and estimate of 40% - neither time nor scope will be comprehensive and the 40% figure will continue
  - Worst gap of family physicians today is the Eastern Passage – population in excess of 15,000 without a family physician
  - Physician cohort in Windsor is aging and population is growing – in evidence of relief
- Medical Education

- Newly trained family physicians have no interest in comprehensive care – difficult to quantify impact but certainly significant

- Specific Disciplines
  - Specialist access in CDHA is most difficult for Orthopaedic Surgery, General Surgery, and Plastic Surgery (especially endoscopy by General Surgeons)

SUPPLEMENTARY DOCUMENTS

1. Summary of department by type of practice, community, funding model, age, gender, and interests (CDHA database)

Interview 4 - Family Medicine - Department of Family Medicine (CDHA)

POPULATION NEED

- Health System Design
  - Hospitalists feel orphaned – no home for them at Department of Health and Wellness or DNS
  - Need will grow – with the growth will be need for expanded funding either as APP or hybrid model, as exists today in Dartmouth
- Infrastructure
  - Dartmouth hospitalists are FFS plus on-call stipend paid by CDHA
  - QE II has 36-bed community health unit – acuity growing but not to level of Dartmouth
  - ALC is being renamed Subacute Medicine Unit – 75 beds and need for about 4 FTEs
- Social-economic
  - Significant challenge in matching supply and need

PHYSICIAN SUPPLY

- Generalist Disciplines
  - Responsible for hospitalist programs at Dartmouth, QE II, VG – Dartmouth distinguished by particularly high acuity levels
  - Stresses need for planning the family physician roles to evolve
  - Hospitalist is a new functional specialist
  - Current need is seen as 5-6 FTE hospitalists for day coverage at DGH and 3 as weekend "rounders" – night coverage is incorporated with that provided by Department of Family Medicine
  - 5-year horizon seen as 8-9 and 10-year horizon uncertain as the number of GPs maintaining some sort of hospital practice is dropping dramatically
- Critical mass
  - Not applicable

Submissions (email)

1. Family Physician Amherst

POPULATION NEED

There is a need for improved care for neonates in centres that offer obstetrical care. The standard of care has gone up considerably in the last few years, but the training of physicians and nurses, and appreciation of the specialized skills and knowledge base involved, has not changed. This is perhaps evident in the fact that our mortality rates are double those of countries with similar health care systems.

PHYSICIAN SUPPLY

Family Practice Residents that train to practice obstetrics are not necessarily given the training they need to care for the compromised neonate, even though they are far more likely to have obstetrical back-up than neonatal back-up, and neonatal compromise is more common and difficult to predict. They are the neonatologists in smaller centres, even though they usually have no required training other than a one day course (NRP) in neonatal care. This is vastly deficient. The consequence is that family physicians are less likely to start (and especially continue) providing obstetrical care.

2. Family Physician - AVH

PHYSICIAN SUPPLY

Practice patterns – Experience outside NS is that specialists can be very good on the phone for giving advice and helping to manage patients using their knowledge to make sense and help elucidate the information available

In NS, my experience is somewhat different. I have now called several specialists with a very complete story about a patient asking for some help with the decision. Specialists keep those patients who should be sent back to make room for those that really DO need to be seen might help reduce wait lists . . . but specialists have to be compensated for that. Dealing with nothing but hard cases all the time (and not having any 'bread and butter' left) is a threat to earning under FFS .

The wonderful thing about being a generalist these days (everywhere except NS anyway) is that there is a lot of flexibility to check out various different parts of the country if you're so inclined.

Doctors themselves are responsible for storing the physical chart and having it accessible/scan-able/fax-able for 7 years. This is the burden I was referring to; none of the other places I've worked have this issue and I think that should be offloaded. It's a lot of commitment and a barrier to people 'signing up' to come on in a new place. Again, if people like a place they will stay; you need to reduce the barriers to them 'trying it out' (by making residency training, locums and 'short term' work more easily accessible) and in doing so you'll find more people who are a 'good fit' for the long term

26.2 Adult Medicine

Interview - DFM Department Chair Internal Medicine

POPULATION NEED

- Health System Design

- All tertiary care in the province defaults to CDHA – no community alternative
- Linkage with communities is thin when considering a hub and spoke design or model – with exceptions of Cardiology, Oncology, and Nephrology
- There are primary and secondary community care services that are provided at CDHA but could be done in the communities if they were better resourced – examples to be provided

- Social-economic
  - Biggest utilization drivers will be complex co-morbidity, aging, multisystem disease – will require both generalists and subspecialists – likely to be a progressively significant issue over time

PHYSICIAN SUPPLY

- Generalist Disciplines
  - Generalists are in a deficit position that is getting worse
- Critical mass
  - Not applicable
- Medical Education
  - Low number of generalists needs improvement – biggest recruiting priority is General Internal Medicine
- Specific Disciplines
  - Stressed quaternary functions, such as transplantation
  - Oncologists at CDHA are fully occupied – plus 2.6 FTE in Sydney; o.8 FTE in Kentville – argument can be made for 1.0 FTE in Yarmouth – some travelling Oncology clinics but complex chemotherapy outside of CDHA is unsafe
  - Eight (8) Radiation Oncologists in CDHA and one (1) in Sydney – Sydney wants a second – overall, the current numbers are stable
  - 4.5 of the 7.6 General Internists at CDHA are < 65 years old and the youngest is > 50 years – a looming problem over the next decade, especially if there are few generalists being produced
  - Details to come from divisions – see appropriate sections of ES

SUPPLEMENTARY DOCUMENTS

1. Physician FTE summary over time and by specialty
2. Excerpt from DOM external review
3. 5 and 10 year divisional projections
4. Details to come from divisions – Details from our Division Heads to help inform NS_PRP process.

a. FTE numbers with respect to our AFP physician complement by specialty from 2000 – present. (This is updated from the version I provided to you at our meeting).

b. Second document summarizes, by medical specialty, the existing physician complement as well as each Division Head's perception of additional physician resource requirements over the next five years and 5 – 10 year periods, with explanations. For many specialties, information regarding the physician resources available for the province is included. There is also back-up detail from each Division available. Due to volume of this information, it will be forwarded by regular mail.

CONSULTANT NOTATION – Because of the volume, detail, and timing of the information a summary only is provided in the Appendix under 'Detailed Submissions'.

Figure 204 DFM – Department of Medicine – FTE Summary 2000 to 2010/11 by Division

Department of Medicine
Physician FTE Summary

DoM AFP	2010/11	2009/10	2008/09	2007/08	2006/07	2005/06	2005	2004	2003	2002	2001	2000
Division:												
Administration	0.95	0.95	0.95	0.95	1.05	0.75	0.68	1.00	1.00	0.75	0.75	0.75
Cardiology	27.65	27.39	26.59	26.89	26.33	26.65	27.30	26.30	24.97	21.86	22.06	22.76
Dermatology	3.76	3.74	3.73	3.75	3.80	3.78	3.79	3.90	3.53	3.75	3.83	3.34
Endocrinology	4.50	4.40	4.25	4.34	5.05	6.38	6.21	5.41	5.45	5.03	4.40	4.73
Gastroenterology	11.08	10.87	9.44	8.41	8.15	9.58	9.97	9.87	10.40	10.65	10.15	9.65
General Medicine	7.89	8.30	9.97	10.30	11.49	12.36	12.28	14.08	12.81	12.22	12.09	11.33
Hematology	7.80	8.01	7.90	7.51	7.07	6.65	6.22	6.93	6.85	7.34	7.92	8.18
Infectious Diseases	4.30	4.35	4.15	4.15	4.15	4.00	4.00	4.00	4.00	4.50	4.50	3.50
Nephrology	10.25	10.75	9.75	9.40	10.53	11.00	11.00	11.00	10.21	8.96	8.04	8.28
Neurology	11.91	12.05	12.05	11.14	10.55	10.80	10.99	11.15	11.08	10.98	10.71	10.20
Physical Medicine	6.15	6.13	6.19	6.35	5.80	5.55	5.84	5.94	6.05	5.55	5.67	5.95
Respirology	6.25	6.25	6.43	6.47	6.33	6.85	6.91	7.02	7.45	7.45	7.45	7.45
Rheumatology	5.79	5.73	5.74	5.58	5.42	4.50	4.41	4.41	4.43	4.08	3.88	3.39
Sub-total FTEs	**108.28**	**108.92**	**107.13**	**105.24**	**105.72**	**108.85**	**109.60**	**111.01**	**108.23**	**103.12**	**101.45**	**99.51**
% Change in FTE's from previous year	-0.59%	1.67%	1.80%	-0.45%	-2.87%	-0.69%	-1.27%	2.57%	4.96%	1.65%	1.95%	
Geriatric Medicine	10.60	10.02	8.60	8.33	7.88	8.38	8.31	8.25	7.75	7.50	7.50	7.50
Medical Oncology	14.15	14.40	15.11	15.00	13.18	11.55	11.30	10.71	9.46	10.30	9.77	8.30
Palliative Care	4.65	5.07	4.79	4.61	4.65	5.00	5.00	5.00	4.28	3.78	3.39	1.30
Sub-total FTEs	**29.40**	**29.49**	**28.49**	**27.94**	**25.71**	**24.93**	**24.61**	**23.96**	**21.49**	**21.58**	**20.66**	**17.10**
% Change in FTE's from previous year	-0.31%	3.51%	1.97%	8.67%	3.15%	1.28%	2.71%	11.49%	-0.42%	4.45%	20.82%	
Total FTEs	**137.68**	**138.41**	**135.62**	**133.18**	**131.43**	**133.77**	**134.21**	**134.97**	**129.72**	**124.70**	**122.11**	**116.61**
Percentage Change in Total FTEs from Previous Year	-0.53%	2.06%	1.83%	1.33%	-1.75%	-0.33%	-0.56%	4.05%	4.03%	2.12%	4.72%	

(FTEs include filled positions and temporarily unfilled positions receiving a revenue share)

Interview - Chief of Division of Cardiology

POPULATION NEED

- Emergency Care
- Lower threshold for intervention significant utilization driver

Health System Design

- Historically, PRP has simply tracked the term of the extant AFP
- Wait lists improved since 2009/2010, due in part to NP clinic managing propriety of consultations – new consultations decreased from 1,200 annually to 700-800

Infrastructure

- No cardiac catheterization other than CDHA
- Echocardiography limited to hospitals – without a change, recruitment will be impeded
- Echocardiography, and stress tests are provided in CDHA, Dartmouth, and Cobequid

- CVSNS is more a monitoring program than an operational program – this needs to change and be a Department of Health and Wellness program

Social-economic

- Cardiovascular disease is the number one cause of mortality in Nova Scotia
- Service provider from PE, as well – look at reciprocal billing data
- Aging population is a significant utilization driver

Physician Supply

- Critical mass
  - Growing need for interventional care
  - Using billings, ECG numbers, and catheterizations as proxies for service, the Cardiology workload has increased by 20% since 2005
- Specific Disciplines
  - Currently 18.0 FTE Cardiologists constituted by 30 Cardiologists in total
  - Eight (8) of the Cardiologists are interventionalists who work 1 in 8 and steadily when on call
  - Average age of interventionalist group is 45 years – usually stop at 55 years
  - Require one additional interventionalist now and another two over the next five years
  - Coronary incidents had mortality rate of 20% in the 1980s – fell to 12% in the 1990s with the use of thrombolytics – fell to 4% in 2005 with lower intervention thresholds and improved techniques for angioplasty and stents
  - Two Cardiologists in Dartmouth – most communities are served by Internists with an interest in Cardiology

Supplementary Documents

1. Department of Medicine Survey Committee – Report from Cardiology 2010
2. Department of Medicine Quarterly Report, Division of Cardiology March 2011
3. Universal Access, but When? Wait time benchmarks for cardiovascular services and procedures
4. Nova Scotia Manpower Resource Plan for Physicians 2011Submission

Summary

- Division provides primary and secondary cardiology to CDHA and the Province
- Division provides tertiary cardiology to the Province and PEI.
- Provide quaternary care services in highly specialized areas such as advanced Electrophysiology, congenital heart disease, structural heart disease, heart transplantation and ventricular assist devices for the entire Atlantic Provinces.
- MSI requires all advanced cardiac electrodiagnostics such as echocardiography and stress testing need to be provided within the walls of a recognized hospital institution.
- Open heart surgery wait times remain within standard; however, wait times for cardiac catheterization and PCI have drifted above standard.
- The addition of the NP Clinic has had a substantial impact on the wait times for new Cardiology consults.
- The situation in Nova Scotia is accentuated by the lack of qualified general internists or Cardiology subspecialists working in the community and dealing with everyday bread and butter patients with cardiovascular disease.
- Specific recruitment requirements by subspecialty are identified in the Detailed Submission.

Detail – See Appendix – Detailed Submissions

26.2.1 Critical Care Medicine

Interview - Head of CCM Division, CDHA

POPULATION NEED

- Health System Design
  - DGH is a high-functioning Level 2 ICU – the other two Level 2 units are Cape Breton Regional and the Valley Regional
  - To expand services to include ICU consult service for the QE II site from 08:00 to 17:00 daily would require an additional 3.25 FTE – this service could follow recent ICU discharges and to assess new patients – intent would be to reduce readmission rate and the attendant increased mortality (readmission rates are low at <5% but the target is 0).
  - Initial discussions regarding running the CDHA IMCUs
  - Preliminary discussions with IWK regarding the three (3) Paediatric ICU staff brought into Division of Critical Care Medicine – recommending 4.0 FTE for clinical care and 1.0 FTE for academic growth plus 0.2 FTE for site Chief = total IWK complement of 5.2 FTE
  - As a provincial program, earlier work at Department of Health and Wellness has stalled and the supporting database has not been populated – a provincial program would oversee quality issues across all ICUs – a provincial chair would be a 0.75 FTE position
  - Technology permissive of e-ICU type of platform – staffing would require 2 intensivists, 4 critical care nurses, and 2 pharmacists on a 24/7 availability – FTE impact on Intensivists would be additional 13.0 FTE – possible offset of Level 3 ICU closures

PHYSICIAN SUPPLY

- Critical mass
  - All Attending staff at the QEII HSC are trained Critical Care physicians
- Specific Disciplines
  - DGH has a stable critical care group of eight (8) Internists with an interest in Critical Care with one on extended health leave
  - At QE II, there are eleven (11) physicians covering two Level I ICUs – three recent departures have created a shortage (ideal FTE complement deemed to be 13.7) – Kirby review recommended 13.0 FTEs in 20005 – administrative responsibilities increases to 13.75 – new positions increases to 14.15

26.2.2 Emergency Medicine

Interview - Head and Interim Head of Division, CDHA

POPULATION NEED

- Health System Design
  - Block funding has supplanted FFS – convinced that hybrid is the preferred model
  - Pre-hospital care and "treat and release"
  - Targets for LOS and wait times in Better Care Sooner are problematic based upon the Murray formula that weights CTAS and service volumes – relationship between time and waiting is not

linear – therefore, queuing theory holds more logic). Murray formula includes questionable assumptions about wait times. Need revised/improved formula.

- Demand is still a big factor at least as important as population health needs – i.e. public access to ED is an essentially unfettered entry point to the system
- ED plays a conflicting role as a co-existent entry point and gatekeeper
- ED care in NS can succeed as a network of physicians and in this context sees three tiers of ED:
  - 1 - CDHA and IWK – FRCPS plus CCFP (EM) (he believes that CCFP (EM) with years experience = same skillsets as FRCPS)
  - 2 - Regional – CCFP (EM) leadership at a minimum (or FRCPS if available) plus well trained and competent GPs who maintain competence. CCFP (EM) from regions should rotate through CDHA for skill maintenance
  - 3 - Community - competent GPs who maintain competence

- Social-economic
  - Rising acuity index
  - Frail elderly cohort common in Nova Scotia

Physician Supply

- Most shifts are 8 hours except overnight shift tends to be 6 hours in most places – built into this is about an hour for receiving and passing on existing patients
- FTE is consistent with BC model = 1,344 clinical hours annually

- Medical Education
  - Production of emergency physicians is about one (1) FRCP and four (4) CCFP(EM) annually
  - About 4 CCFP (EM) trained for each FRCPS
  - Emergency physician is still defined by where you work

- Specific Disciplines
  - Short-term need can lead to long-term stability

26.2.3 Geriatric Medicine

Interview - Geriatrician

Population Need

- Health System Design
  - Medical model has been built around patients fragmented into pieces of illness – compelling need for individualizing patients and managing complexity
  - New models of care are characterized by multidisciplinary teams that are mobile and focused on the frail elderly – team includes Geriatrician, NP, social worker, physiotherapist, pharmacist, and access to Geriatric Psychiatrist

- Infrastructure
  - Current outreach programs are fundamental and should continue

- Social-economic
  - Focus is on older adults who have multiple, interacting medical and social problems

PHYSICIAN SUPPLY

- Generalist Disciplines
  - Geriatric role has been undervalued and underutilized
  - Supportive of GPs with additional geriatric interest and training
  - Overall, essential need is for more generalists
- Medical Education
  - Geriatrics only has 1 out of 15 spots in the medicine training program
- Specific Disciplines
  - Most are over-specialized without a proper geriatric focus
  - Over next 10 years will need 20 Geriatricians in HRM and 12 in communities, as follows: two (2) in each of Sydney, Antigonish and New Glasgow, Amherst, Kentville, and Yarmouth

SUPPLEMENTARY DOCUMENTS

- See CMAJ article by Dr. Rockwood – through PubMed

Submission – Letter Geriatrician

Supports engaging in ***more than extrapolation from current physician/population ratios.*** *That exercise, which has informed past policy, does nothing to address future need, and reinforces existing discrepancies, such as the clear over-supply of cardiac surgeons against a clear under-supply of interventional cardiologists. That case shows something important about lag times: we have built for the technology of the 1990s; it is time to catch up (and changing remuneration structures is one way to do that, but I digress).*

In the area of geriatric medicine, it is worth considering the importance role of the geriatrician to deal with older adults who have multiple, interacting medical and social problems. ***The role has of the geriatrician has been undervalued and underutilized.*** *Extrapolation from current data shows that the real crisis in respect to population aging is that there are not enough old people to go around. In other words, if one simply extrapolates form the current number of cardiologists to future heart disease estimates, and the same for nephrologists in relation to the growing burden of kidney disease, and respirologists in relation to the growing burden of age-related lung disease, we already have more diseases than people, and that is with only 3 systems considered.*

And that is the rub – when older people have multiple, interacting medical (and social) problems they are frail and when they are frail, ***the single system disease approach no longer works.*** *That is why there is a great (if often unrecognized) need for geriatricians and for family physicians with extra training in the care of older adults. Just as much of family medicine was designed for the needs of the post world war two population (hence the great emphasis on pediatrics and obstetrics and gynecology in the traditional curriculum) we now need to prepare doctors for the patients whom they will encounter.*

Last year, only 1 of 17 graduates in urology went right into practice, with the others opting for the US, additional fellowship trainings, etc. and that much the same was true in ENT and other highly remunerative specialties. Those doctors are paid so well to do procedures that it makes more sense for them to do that than to take a history and in consequence, we have many people who are harmed by a single-minded focus on a single problem, with no one looking at the big picture. That is another *competence of the geriatrician, and an essential one as we move forward. Nothing would shorten wait list as quickly as a comprehensive review to see who actually might benefit from a procedure and who is likely to be harmed. The Division of Geriatric Medicine has developed new models of care that bring frailty into focus, thereby changing the paradigm for decision-making. Expansion of these models will at once improve care, increase efficiency and decrease costs. In essence, by doing the right thing, many of the ills of the current health system can be improved. In order to move forward, however, the next iteration of human resource planning will require priority resourcing of geriatric services so that these models can expand.*

Submission (email)

Physician Consultant in Geriatrics, Colchester East Hants Health Authority

Everyone seems to understand the clear data showing the "silver tsunami" we are just starting to experience in our province/country. However, few people really seem to grasp the gravity of this fact. I challenge any of us to name an area of our health care system that will not be ***affected by the changing demographics****.* ***Older people mean greater complexity of care****. Longer GP office visits mean GPs will take on fewer patients in their practice and see the same patients more often. Orthopaedic Surgeons will be busier with urgent and elective joint replacements and fracture care. General surgeons will deal with more bowel cancer surgeries, diverticulitis, breast cancers, etc. Urologists will see more patients for prostate surgery, cancer, and incontinence issues. Oncologists and Radiation oncologists will be in higher demand. Internists will have more MI's, CHF, renal failure and dialysis, COPD, afib, etc. to deal with. Vascular and cardiovascular surgeons will deal with more AAA, bypass surgeries, amputations secondary to PVD, etc. Neurologists, internists, etc, will deal with more DM2, stroke disease and the devastating costs (monetary and QOL) of its morbidity. Hospitals will face more patients that require longer recovery times (necessitating more rehab specialists, and allied health like PT, OT and dietary), and many more that require alternate levels of care (see CMA June 21st, 2011, "Patients 'languishing' in hospital beds key to wait-time problem: report"). With more patients and more MDs required, more nursing support then ever will be needed as well.*

*There are a few of "us" scattered throughout the province but we are arguably the most multidisciplinary with an OT, Geriatric Nurse Consultant, Social Worker and 1.5 FTEs in MDs trained through the Dalhousie Care of the Elderly program. Since the fall of 2010, there has been considerable concern that the funding to the MDs would be cut altogether, as it is being paid for at the district level (CEHHA is running a large deficit) and no APPs are being given by the province. We see people from the community in our clinic and at home, in Nursing homes and in hospital for a variety of complaints. Most often they include dementia, falls, capacity issues, driving, polypharmacy, delirium and behavioural and psychological symptoms of dementia. We strive to keep people in their homes when possible, and facilitate further care when not. We believe (as do our clients) that we provide a valuable service to our community. Unfortunately, gathering good data to support our belief is somewhat difficult****. We see fewer patients due to the lengthy assessments,*** *and it is hard to quantify the quality of life benefit to patients and caregivers who feel they have been heard, and have good explanations for their issues. They feel they have somewhere to go when they need someone to talk to who understands and can help. We have the "luxury" of time (compared with your average GP office visit) to do a comprehensive geriatric assessment and really see the "big picture" of our patients and their families and caregivers. Ongoing support and links to community resources are given. Despite our belief in the relevance of our clinic, and our physicians, the GNS does not currently see it as something worth funding. Though there are clear personal implications in terms of job security at play* *here for me, the **bigger concern is the perceived lack of acknowledgement that programs like ours (even if not ours in particular) are going to be a necessity in our province's future.** One need look no further than the Department of Geriatrics at Capital Health (trying to get geriatricians to go to FFS payments instead of AFP despite the obvious lack of feasibility given the nature of what they do and how long it takes to do it) to see a staggering lack of foresight.*

26.2.4 Nephrology

Submission (Letter)

Chief Division of Nephrology

PHYSICIAN SUPPLY

- Specific Disciplines
  - In-centre haemodialysis statistics (Dickson and DGH)
  - 2011 - 2012 – tracking 2% increase, to date
  - 2010 - 2011 – 3% increase (service volume 40,250)
  - 2009 - 2010 – 1% increase
  - 2008 - 2009 – 8% increase
  - 2007 - 2008 – 7% increase
  - 2006 - 2007 – 3% increase (service volume 33,639)
  - Service volume increase, therefore, is 19.65% between 2006 – 2007 and 2010 - 2011

SUPPLEMENTARY DOCUMENTS

1. Nephrology Provincial Physician Resources
2. External Review Report
3. Provincial Physician Resource Plan for Nephrology

Submission – Co-Director Provincial Renal Program

Presently there are 17 nephrologists in the province; Yarmouth 2, Sydney 3, IWK 2, and Halifax adult nephrology 10. Yarmouth will need 1 additional nephrologist within 5 years Sydney will need 1 additional nephrologist within 5 years IWK needs one paediatric nephrologist now, another within 5 years, and one to replace a retiring physician. Halifax needs one nephrologist now, 3 within 5 years, and one to replace a retiring nephrologist. Eventual complement; Yarmouth 3, Sydney 4, Qe2 14, IWK 4, Total 25 within 5 years.

26.2.5 Palliative Medicine

Interview Medical Director, Palliative Care, CEHHA

POPULATION NEED

- Health System Design
  - Palliative care in Nova Scotia is disjointed and lacks provincial direction
  - Referenced supplementary document is somewhat dated but still provides a foundation for development and growth

PHYSICIAN SUPPLY

- Critical mass
  - 7,000 people die each year in Nova Scotia – 70% of those would benefit with some contact with palliative services
  - Demand will grow, as will the need for 24/7 care and a focus on the provision of palliative services in the home
- Medical Education
  - No or limited education in palliative care provided in medicine or other health care professionals
- Specific Disciplines
  - Cross reference with notes from CDHA palliative care information

SUPPLEMENTARY DOCUMENTS

1. Provincial Hospice Palliative Care Project 2005
2. APP proposal to expand services at Capital Health Integrated Palliative Care Service 2008
3. 2011 Physician Resource Plan: Palliative Medicine (CDHA)

26.2.6 Psychiatry

Interview DFM, Chief of Department, Psychiatry

POPULATION NEED

- Health System Design
  - Multiple partner agencies such as Schizophrenia Society
  - AFP in existence for ten (10) years and functioning well – supports 126,700 hours of service (plus 23%) – currently, about 120,000 hours are utilized
- Infrastructure
  - Advocates for improved funding – 3.6% of health budget goes to mental health and 0.9% to addictions
  - Recruitment a challenge and infrastructure essential
  - Provincial programs are housed at CDHA
  - Growing use of telepsychiatry will improve the stress on waiting lists
  - Ideal model foresees clustering of services and resources that can be functionally seamless
- Mental Health
  - Psychiatry is envisioned as a provincial resource but not treated as one – more informal than formal
  - Wait lists are classified as urgent (1 week), 1 month, and 3 months – current wait list for children numbers about 1,000
  - Access to "deep brain stimulus" is going to grow as will referrals and access – likely to be the main driver of utilization of mental health services
- Social-economic
  - Seniors' mental health dimensions are greatly underestimated and likely to worsen due to the growing age cohort – seven (7) geriatric Psychiatrists in HRM (about 5.0 FTE) – play multiple roles

PHYSICIAN SUPPLY

- Medical Education
  - Child and adolescent services all linked to the department – available resource pool limited with one (1) new Child Psychiatrist completing training every 4 years
  - Clinical: Academic ratio is currently 81:19 with a goal of 70:30
  - Dalhousie the Atlantic training centre for seniors, children, and forensic
- Research
  - The addition of excellent younger faculty with a keen interest in research and education, both in CDHA and at the IWK Health Centre, has had a positive effect. This cadre of younger faculty is beginning to develop independent and joint research activities that hold great promise for the future, if the Department can help develop their potential with mentorship from senior clinician-researchers, protected research time, and the space and facilities needed to develop their research programs.
  - The Brain Repair Centre initiative, in which Department faculty members have been active participants, has the potential to transform research and clinical care in the Department. But future progress in this initiative for the Department depends on having nationally recognized researchers and clinician-researchers with sufficient time committed to research.
- Specific Disciplines
  - Implemented 6 or 7 new positions over past 5 years
  - Six (6) new Psychiatrists scheduled to arrive over next six months
  - Ratio analyses would support a cohort of 40-50 Child Psychiatrists in Nova Scotia – they have 19 – IWK and CDHA funding is AFP – none in Yarmouth and 0.5 in Sydney
  - Forensic Psychiatry all in CDHA with 5.0 FTE – this is about the correct number – these five also handle the Psychiatry ICU
  - Geriatric – would like to expand to 8
  - Three (3) acute care units (7.0 Psychiatrists) – one (1) short stay unit – one (1) ED Psychiatry service – one (1) mobile crisis team

The Department AFP reports 74.97 FTE at July, 2011 in CDHA (59.92) and IWK (15.05). The Consultant analysis provided earlier calculated 86.5 FTE at March 31, 2010. The difference may be attributable to a combination of three causes; timing, members in/out of the AFP, and some, usually community-based, psychiatrists not associated with the DFM.

Figure 205 Psychiatrist FTEs – CDHA and IWK at July, 2011

CDHA Psychiatrists

Psychiatrists	57.68
GPPs	2.24
Total	59.92

Total Profile	Clinical	Teaching	Research	Admin	Other Academic		TOTAL
FTE	48.74	3.90	3.83	2.83	0.61		59.91
Percent of Total	81%	7%	6%	5%	1%		100%

IWK Psychiatrists

Psychiatrists	15.05
	15.05

Total Profile	Clinical	Teaching	Research	Admin	Other Academic		TOTAL
FTE	10.52	0.72	1.48	0.94	1.40		15.05
Percent of Total	70%	5%	10%	6%	9%		100%

SUPPLEMENTARY DOCUMENTS

1. Hub and spoke Psychiatry service diagram

2. A Framework for a Mental Health Strategy for Canada
3. Child Psychiatry in Canada: Physician Resources
4. Issues for Recruiting Psychiatrists to NS DHAs Outside Capital Health
5. Other: Psychiatry Complement 2011, CDHA Seniors' Mental Health Program 2011, Department of Psychiatry: Notes on Programs and Services 2011, suggestions from DFM Department of Psychiatry on Developing a Physician Resource Plan for Nova Scotia, and Funding Mental Health in Europe

26.3 Diagnostic Services

26.3.1 Pathology

Interview DFM Chair Department of Pathology

POPULATION NEED

- Health System Design
  - Starting from a position of scepticism founded in past history and inertia in planning laboratory services in the province
- Infrastructure
  - IWK and CDHA had engaged earlier regarding a shared services model and unified laboratory infrastructure and governance – planning process was unsuccessful and discussions concluded – makes contemplating the specialty as a provincial resource even more challenging

PHYSICIAN SUPPLY

- Specific Disciplines
  - One key issue is a single Pathologist in Dartmouth doing 9,000 surgical cases annually, mostly in isolation – not logical and makes succession planning difficult – why isn't there an integration with CDHA?

Submission (Document) - Chair of Department, Approach to PRP (August, 2011)

Provided by Godfrey Heathcote as a collective submission on behalf of colleagues who head anatomic pathology (Laurette Geldenhuys), haematopathology (Irene Sadak), medical biochemistry (Bassam A. Nassar), medical microbiology (Kevin Forward), &paediatric pathology (Tim Mailman).

Principles

1. In the current fiscal climate some degree of rationalization of laboratory services within the province seems advisable in order to promote long-term sustainability.
2. Participation by all pathologists and laboratory physicians in appropriate internal and external quality assurance schemes is necessary to guarantee high quality services.
3. There should be transparency about workload and remuneration.
4. The number of adult tissue pathologists in any site should be based on workload figures, the simplest of which are derived from the Royal College of Pathologists UK:

- 1800-2400 surgical pathology cases per annum for a teaching-hospital pathologist;
- 3000-3500 surgical pathology cases per annum for a community pathologist.

Pre-requisites

1. There needs to be an interface between the 3 provincial laboratory information systems (Cerner, Meditech Client Server and Meditech Magic).
2. There should be sufficient subspecialty expertise in anatomical pathology in the academic centre to provide a prompt consultation service for regional hospitals.
3. Laboratory physicians &/or scientists providing support to regional laboratories need to be based in the academic centre to maintain their expertise. Their provincial role should focus on quality assurance, standardization of practice, guidance and problem-solving, and utilization management.
4. There needs to be dedicated personnel for External Quality Assurance in general surgical pathology with adequate secretarial support.
5. Digital pathology needs to be supported, where appropriate, e.g., Cellavision for digital peripheral blood smear consultations.

Possible Approaches

1. The possibility of a provincial remuneration plan for pathologists, laboratory physicians and scientists should be explored (Ontario model).
2. Consolidation of medical staff in 4 Regional (adult) Laboratories in 4 centres could occur:

   - Sydney
   - Truro (incorporating Amherst, New Glasgow and Antigonish)
   - Kentville (incorporating Yarmouth and possibly Bridgewater)
   - Halifax (incorporating Dartmouth and possibly Bridgewater).

3. One paediatric laboratory with a Maritime mandate should be maintained in the academic centre.
4. Develop joint HR strategy for CDHA and IWK laboratories (proposal submitted 09/27/2010 to Department of Health and Wellness).
5. Sydney, because of its size and distance from Halifax, as well as the presence of a regional cancer centre, should have 1.0 FTE haematopathologist and 1.0 FTE clinical chemist (new positions), in addition to the 1.0 FTE microbiologist currently in place.
6. There could be 1.0 FTE with haematopathology and blood transfusion experience (new position), either shared between Kentville and Truro or based in Halifax to provide provincial support.
7. The role of the Medical Director of PPHLN could be expanded beyond exclusively public health matters (0.5 FTE new position) to provide provincial support for microbiology.
8. There should be a 1.0 FTE clinical chemist (new position) to provide provincial support.
9. Gynaecological cytopathology (Pap screening) could be concentrated in one location (B.C. model) to enhance quality and facilitate introduction of new standards and testing methodology. Currently 62% of the caseload is screened in Halifax.

Data – Test Volume

The following data provides a summary of province-wide annual workload for 2008/09.

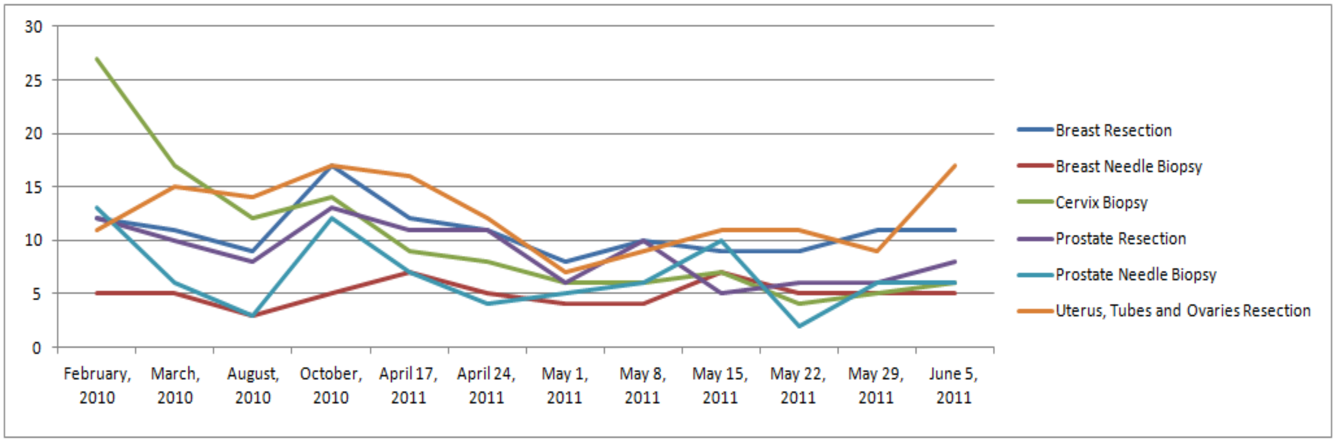
Figure 206 Province-Wide Workload Volume 2008/09 - Laboratory Medicine & Pathology

	Number of orderable tests/year				
	CDHA	**IWK**	**DHA 1-8**	**TOTAL**	**Test Specific Rules**
Core Lab					
Routine Chemistry	4,291,267	352,194	5,249,926	9,893,387	Includes blood gases. Counted as one test - Electrolytes, 24 hr urine tests (volumes to be counted separately, Electrophoresis, Immunofixation, Fluid panels
Endocrinology	667,855	35,650	595,871	1,299,376	Includes serum HCG, T4, TSH
Toxicology	41,074	0	41,940	83,014	Includes therapeutic and substance of abuse. Count semi quantitative drug screens as one test (both urine &
Hematology & Coagulation	1,004,874	126,135	1,286,412	2,417,421	Counted as one test - CBC incl. a differential, INR's, Peripheral Blood Smears and Bone Marrow Interpretations, Flow cytometry and cell markers,
Urinalysis	130,431	12,870	287,492	430,793	Counted as one test - Urinalysis incl. macro and micro, Sperm Counts
Immunology	315,150	15,523	85,659	416,332	Count as one test - syphilis serology, Hepatitis, HIV, RA, Mono
Total	**6,450,651**	**542,372**	**7,547,300**	**14,540,323**	
Microbiology					
Bacteriology	143,844	41,745	289,065	474,654	A culture including workup and sensitivity. Includes strep screens, gram stains
Urine Cultures	60,780			60,780	
Mycobacteriology	2,529	0	0	2,529	Count as one test - TB cultures and smears
Mycology	4,176	157	105	4,438	Includes KOH, dermatophyte tests
Parasitology	1,830	596	2,929	5,355	Includes wet preps
Virology	73,755	1,008	401	75,164	Count as one test - RSV, Influenza A/B
Total	**286,914**	**43,506**	**292,500**	622,920	
Transfusion Medicine					
ABO and Rh	43,049	24,541	10,788	78,378	Do not count products or units
Crossmatch	32,252	1,871	3,454	37,577	
Ab detection (screen)	28,884	24,556	9,865	63,305	Includes maternal/prenatal
Ab Identification **includes CBS work being transferred to**	2,400	1,153	277	3,830	For DHA 1-8 Labs that are not yet live on Transfusion Medicine module manual numbers are reported.
DAT's	4,179	5,635	286	10,100	
Ab Verification (done on units	15,902	1,969		17,871	
Antigen typing	15,197	589		15,786	
Cold Agglutinins	60	12		72	
Total	**141,923**	**60,326**	**24,670**	226,919	
Anatomic Pathology					
Surgical	72,870	4,227	55,154	132,251	A case or procedure code which could include multiple blocks and stains. Includes frozen sections, oral and dermapathology, immuno staining and EM.
Autopsy	135	115	159	409	Include Medical Legal cases
Autopsy for ME	750			750	**ME autopsies show increasing trend.**
Cytology		0			CDHA Surgical = 72,870 Cases which equals 33,900 Cases
Gynecological	95,580	0	60,484	156,064	
Non Gynecological	7,908	0	4,093	12,001	
Consults	2,652	98	23	2,773	
Total	**179,895**	**4,440**	**119,913**	304,248	
HLA/Tissue typing					All tissue typing panels to be counted as one test.
Total	2,243	0	0	2,243	
Molecular Genetics					
PCR for Microbiology	19,803	1,222	3,742	24,767	
Other Molecular testing	86,825	1,894	0	88,719	Count specimens and/or procedures
Total	**106,628**	**3,116**	**3,742**	113,486	
Cytogenetics					
All tests		2,617		2,617	
Total	0	2,617	0	2,617	
Newborn Metabolic Screening					Count the newborn metabolic screening panel as one test
All tests		18,330	1,511	19,841	
Total	**0**	**18,330**	**1,511**	19,841	
Environmental					For DHA Labs not yet on the Meditech LIS for this type of testing manual numbers will be reported
Water	99,198		2,117	101,315	
Other	1,086			1,086	
Total	**100,284**	**0**	**2,117**	102,401	
Referred Out of Province					Count all orderable tests that are referred to a laboratory outside the province of NS.
All tests	19,784	5,637	10,956	36,377	
Total	**19,784**	**5,637**	**10,956**	36,377	
GRAND Totals	**CDHA**	**IWK**	**DHA 1-8**	**TOTAL**	
	7,288,322	**680,344**	**8,002,709**	**15,971,375**	

Data – Access – Test Turnaround Time (TAT)

The following graph reports the average number of days from when the specimen is accessioned in the lab and verified (return of reported result) for selected cancer related diagnostic tests ordered.

Figure 207 CDHA Lab Pathology - Selected Average Days Test Turnaround Times, Feb10-Jun11



SUPPLEMENTARY DOCUMENTS

1. Pathology CDHA and IWK Conjoint Medical HR Plan
2. Provincial Physician Human Resource Planning Consultation 2011: Provincial Laboratory System Enhancement

26.3.2 Diagnostic Imaging

Interview DFM Department Chair, Radiology

POPULATION NEED

- Health System Design
  - Supports PRP as long overdue and acknowledges parallel stream of clinical services plan
- Infrastructure
  - Functional relationship exists among community Radiologists
  - Can foresee some diffusion of DI services in a more collaborative model developed over a 5 to 10 year horizon
  - Large cardiac radiology centre can require the commitment of 3-4 Radiologists per day
- Social-economic
  - Radiology utilization drivers include multiple regional hospitals, each with fully functioning DI departments and MRI facilities

PHYSICIAN SUPPLY

- Critical mass
  - Questionable number of services because of well-equipped regional hospitals
- Medical Education

- Interventional Radiology services will impact the number of Vascular Surgeons – Radiologists-in-training are disproportionately interested in interventional training – can end up treating more patients in shorter periods of time and with better outcomes
  39% time commitment at university for teaching and research

- Specific Disciplines
  - CDHA does Nuclear Medicine for CBDHA
  - Infrequent requests for second opinion
  - Nova Scotia differs from most provinces in that Nuclear Medicine and Radiology are additive rather than separate

SUPPLEMENTARY DOCUMENTS

- None provided

26.4 Paediatric Medicine

Interview - Chair of Department, Paediatrics, IWK

POPULATION NEED

- Health System Design
  - Envisions expansion of level 2 paediatric services outside of HRM – is part of a vision for Paediatrics as a provincial resource – would require additional resources from Department of Health and Wellness and likely from NB and PE
- Infrastructure
  - Developing plans and proposals for improved liaison among IWK, community Paediatricians, and HRM family physicians
  - Wait lists are measured and mitigated to some degree using a community-wide scheduling system
- Social-economic
  - Paediatric population is not decreasing after the past 5-year trend lines – supported by data from Statistics Canada

PHYSICIAN SUPPLY

- Generalist Disciplines
  - IWK provides care from primary through quaternary levels
  - Many non-IWK, community Paediatricians are funded through APP program distinct from IWK AFP
- Critical mass
  - Concern raised that Department of Health and Wellness not fully aware of scope of unique services provided at IWK, especially through the subspecialties – Department of Health and Wellness has indicated that there are too many Paediatricians, but IWK believes that the service counts used to draw this conclusion not sensitive to actual population served
  - IWK serves a population of 1.8 million plus NL (500,000) for Cardiac Surgery, Respirology, Nephrology
  - IWK physicians provide outreach clinics to parts of NS, PE, and NB

- Medical Education
  - Believes that Department of Health and Wellness not fully aware of the intensity of paediatric teaching, research, and administration
  - Supports growth of distributive learning, including, as an example, a paediatric Haematology/Oncology network (APPHON – Atlantic Provinces Paediatric Haematology Oncology Network
  - Teaching program produces both generalists and subspecialists annually
- Specific Disciplines
  - No evidence presented to demonstrate over-staffing in any division
  - Postl report recommended three (3) additional positions – not accepted by Department of Health and Wellness and recommendation removed from final report
  - Increasing percutaneous cardiologic interventions

Supplementary Documents

1. IWK Resource Plan
2. Refer to IWK supplementary documents
3. IWK Travel Clinics

26.4.1 Paediatrics – Psychiatry

Interview Child Psychiatrist (Truro, Amherst, New Glasgow)

Population Need

- Health System Design
  - NORCAP is a team-based approach with additional support from Paediatrician
  - Real issue is the need for a provincial booking and triage system
- Infrastructure
  - Tri-county shared services model
  - No safety valve arrangements with IWK despite requests – requires a provincial resources approach
- Mental Health
  - Twenty (20) patients in Wood Street Centre – provincial secure care centre (only one) – protects unstable youth – step-down unit planned for next year
  - Child Psychiatry waiting list in tri-county catchment is about 75 (some in excess of one year)

Physician Supply

- Critical mass
  - Not an issue
- Medical Education
  - Current Chair is first academic chief to be thinking provincial in scope and mandate
- Specific Disciplines
  - Truro needs two (2) FTE Child Psychiatrists
  - HRM has 17 Child Psychiatrists – some are research and teaching only

- Windsor has one (1) part-time Child Psychiatrist
- Bridgewater uses IWK
- Sydney has two (2) Child Psychiatrists – Antigonish and New Glasgow shared services
- Part-time Child Psychiatrist in Kentville
- One (1) Child Psychiatrist in Yarmouth – also sees adults

26.5 Surgical Services

Interview DFM Chair Department of Surgery

POPULATION NEED

- Health System Design
  - PRP has been a patchwork approach without a clear strategy
  - Can envision a provincial system with formal linkages between Dalhousie and communities with services and infrastructure assembled in a meaningful way that reflects patient movement and need
- Infrastructure
  - Acknowledges tension between the academic mandate and the DHAs
  - Highest per capita cancer rate in Canada but no meaningful cancer centre – rather, there is a virtual network – what is needed is a flagship cancer centre that is freestanding and comprehensive with network capacity across the province – driven by standards and evidence-based outcomes
- Social-economic
  - Surgical population served is 1.8 million because of in-migration from other Maritime and Atlantic provinces

PHYSICIAN SUPPLY

- Critical mass
  - Cohorts of patients with sentinel conditions should be managed at centres that can sustain high volumes for malignancies of oesophagus, pancreas, and colorectum
- Medical Education
  - Notes the jarring paradox of wait lists of as long as four years for some specialists and surgical clinics while, at the same time, there are well-trained surgeons who can't find work – all a reflection of resource allocation
  - Preference is that academic centres provide tertiary and quaternary services and not primary or secondary services
- Specific Disciplines
  - One identified gap is the need for bariatric surgery program – Nova Scotia arguably has the highest prevalence of obesity in the country with all of the attendant multiple and extensive morbidities

26.5.1 Anaesthesia

Interview DFM Department Chair Anaesthesia

POPULATION NEED

- Emergency Care
  - Question of sustainability of on-call schedule greater than 1 in 3 – 1 in 3 may work in a rural setting but needs to be 1 in 4 if urban and more intense, including one 14-hour call shift, day off before, and day off after – all factors of time and intensity
- Infrastructure
  - Not possible to separate compensation from workload in Anaesthesia
  - Workload is a reasonable definition of population need in the model
  - Variable is number of operating rooms that are kept open as a consequence of resource availability and allocation
  - Work plan is based on 44-week year with 6-weeks' vacation and 2-weeks CME – generally a 47-50 hour work week (varies by geography) – think of a 47-50 hour workload as one (1.0) FTE

PHYSICIAN SUPPLY

- Generalist Disciplines
  - 50-60% of CDHA cases are tertiary and quaternary
  - No data on ASA or modifiers
- Medical Education
  - No GPAs
  - Train 5-6 Anaesthetists per year – not unusual to lost to other provinces because of more favourable fee schedules
- Specific Disciplines
  - There are 11 current deficiencies and 13 close to retirement
  - Usual planning horizon for Anaesthesia is one year

26.5.2 Obstetrics and Gynaecology

Interview 1 - DFM Department Chair, Obstetrics and Gynaecology

POPULATION NEED

- Health System Design
  - Risks associated with the changing maternal demographics and characteristics (see below) raises question whether subspecialists are being used optimally (need to sustain some normal obstetrics as well due to the FFS model) – this would change, likely, with transfer to an AFP – essential question is whether subspecialists can stay within their boundaries of special expertise
  - Favours the Bridgewater model that is GP-based with obstetrical consultants with APP arrangement
  - Further system variables with impact on obstetrical PRP are:
  - Midwives (difficult to quantify impact)
  - Medical management supplanting surgical management for certain conditions
  - Presence or absence of an AFP

- Social-economic
  - While the current obstetrical complement is stable, the provincial and HRM birth rates are rising again – current demands can still be managed through careful planning
  - Changing demographics will increase demand and need for specialty care (and therefore Obstetricians and Gynaecologists) – maternal age > 35 years has increased from 5% to 20% - maternal obesity, with the attendant morbidity and risks has increased from 5% to 15%

PHYSICIAN SUPPLY

- Generalist Disciplines
  - IWK deliveries are 50% GPs, who also provide care to healthy newborns
  - GP obstetrics is practised mostly by young, female physicians
- Critical mass
  - Not applicable except in context of obstetrical subspecialists (see note below where these subspecialists also do normal obstetrics)
- Specific Disciplines
  - Believes that the health authorities are generally well-served today for OBGYN resources
  - 23 full-time OBGYN at IWK
  - 5 part-time and in private practice
  - 11 are generalists and each of the others is a subspecialist
  - Includes 7.5 FTE Maternal-Foetal, 3 Urogynaecology, 4 Gynaecological Oncology, and 3 Reproductive Endocrinology
  - Only notable waiting list is Urogynaecology – this problem will become worse due to an aging population
  - Will likely be an increased need for office gynaecological procedures

SUPPLEMENTARY DOCUMENTS

1. Request submitted for gap analysis today and in a 5-10 year horizon, thinking of both HRM and the province as a whole
2. Refer to separate notes and documents in the section on the Reproductive Care Program

Interview 2 - Obstetrician and Gynaecologist, Community, Past President of Doctors Nova Scotia

POPULATION NEED

- Health System Design
  - Not enough resources to satisfy everyone – therefore, need for careful decision-making throughout planning model
  - Decision-making that is rational can be un done by political interference
  - Some Cape Breton maternal care comes to Antigonish
- Infrastructure
  - Better way to use resources – 400 deliveries annually at each of Antigonish and New Glasgow – each with two Obstetricians (Antigonish has just recruited third) – 35 minutes apart – currently 0.5 neonatal care in New Glasgow and a stronger Paediatric cohort at Antigonish
  - Better to redesign and consolidate – also permits better Anaesthesia and Paediatric care plus Obstetricians would work 1 in 4 – indifferent to which site is chosen

- Social-economic
  - Aging patient population

PHYSICIAN SUPPLY

- Generalist Disciplines
  - No Antigonish GPs do obstetrics except one (low volume)
  - Replacement ratios will not be 1:1
- Specific Disciplines
  - Aging a significant problem in GASHA

Interview 3 - Chief of Division, CDHA, Gynecologic Oncology

POPULATION NEED

- Health System Design
  - Specialty will always be based at CDHA and funded through an AFP
- Social-economic
  - Impact of aging population and obesity will be significant for incidence of ovarian cancer and endometrial cancer, respectively,
  - Current caseloads are endometrial cancer (140 cases annually) and ovarian Cancer (70 cases annually)
  - Distinguishing feature of the specialty is that they provide both the surgery and the chemotherapy
  - Access issues and system design predicated on seeing a new patient with malignant gynecological disease within 10 days and initiating chemotherapy within 2 weeks of the consultation – problem is subsequent access to operating time – not uncommon to wait 6 weeks or more – current waiting list is 55 cases and the single limiting factor is access to OR time and post-operative care
  - Realistic answer likely to be centred on VG in absence of freestanding cancer centre and to shift resources accordingly (both operating and chemotherapy)
  - Sees a definite role to add a model of GP Oncology to work with the surgeons

PHYSICIAN SUPPLY

- Specific Disciplines
  - 3.8 FTEs currently – seven years ago were 2.0 FTE
  - As caseload grows at a predictable rate, the resource requirements will also grow at a rate of 0.2 FTE annually – the 2.0 FTEs required on a ten-year horizon will likely be staged best at 1.2 anytime over next two years and then up to another FTE two years after that

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Submission (email), Department Head, Obstetrics and Gynaecology, AVH

We are a department of 5 physicians, and our wait times for Gynecologic surgery are not very long, especially when compared to some of our surgical colleagues. However, in order to provide 24/7 coverage of the Obstetric service, a critical number is necessary to make it sustainable. For us, 5 work well. Another factor is the fact that there is a relatively small Family Practice presence in Labor and Delivery, such that we provide primary care to upwards of 95% of laboring patients. Our hospital has approximately 800 births per year.

26.5.3 Ophthalmology

Interview 1 - Chief of Division, CDHA, Ophthalmology

POPULATION NEED

- Health System Design
  - All Ophthalmology is FFS – believes that a move to an AFP at Dalhousie would require double the number of academic Ophthalmologists
  - Not shackled by the artificial boundaries of the DHAs
  - Envisions a provincial department of Ophthalmology and a provincial chief as a true resource that matches need and capacity (similar to Ontario cardiac care network)
- Infrastructure
  - Reasonable benchmark for cataract surgery is 16 weeks from diagnosis by Ophthalmologist to actual procedure – previous adherence to this target was 10% and is now 50% of cases
  - Still a question of the access to the original consultation – inconsistent approach to consultation triage by NS Ophthalmologists
- Social-economic
  - Impact of aging population, especially in rural NS

PHYSICIAN SUPPLY

- Generalist Disciplines
  - Changing landscape for Ophthalmology in Nova Scotia
  - Federal pressure to deal with cataract waiting lists – Nova Scotia identified as needing improved services
- Specific Disciplines
  - Ophthalmology in HRM is a resource to Maritime provinces – retinal surgery from NB, PE, and some NL – similarly orbital plastic procedures, corneal transplants, and glaucoma surgery – need tracking data from reciprocal billing file
  - Believes there is an undue focus on cataracts – as a result, AMD, glaucoma, and diabetic care receive less attention
  - Based on need, can justify a 3rd and 4th retinal surgeon in the province (CDHA)
  - Supports earlier threshold for cataract intervention

Interview 2 - Rural Ophthalmologist with Academic cross-appointment

POPULATION NEED

- Infrastructure
  - Unique perspective as a community specialist with an academic role
  - IV agents for AMD are not properly funded and therefore are under-utilized
  - Biggest problem in Halifax is access to operating time
- Social-economic
  - Patients who can't see are frequently immobile and the required care needs to come to them
  - Aging population will increase demand and need for most aspects of ophthalmological care

PHYSICIAN SUPPLY

- Generalist Disciplines
  - Ophthalmology is fairly well covered in Nova Scotia – most centres have one or two – exception is Yarmouth where there are three but only one who operates – an additional operating Ophthalmologist would make sense
- Specific Disciplines
  - Only Ophthalmologist between Amherst and Truro – probably enough work there for 1.25 FTE.
  - HRM Ophthalmologists tend to be older.

26.5.4 Orthopaedic Surgery

Interview DFM Chief of Division, Orthopaedic Surgery

POPULATION NEED

- Health System Design
  - CDHA needs to publish and use performance metrics – currently only output data and not outcome data
  - CDHA needs to define goals of the system by department
  - Challenge is to define an FTE
- Infrastructure
  - Focus on interventions that work and have measurable outcomes

PHYSICIAN SUPPLY

- Generalist Disciplines
  - Numbers of Orthopaedic Surgeons are fine – the processes of care are not
- Specific Disciplines
  - Need to define community needs for Orthopaedic Surgery – sprains, fractures, basic orthopaedic and musculoskeletal care – linked to referral guidelines for GPs and self-care manuals for patients – avoid medicalization
  - Every community needs access to this basic orthopaedic service – starting point of Orthopaedic Surgery PRP
  - Subspecialty Orthopaedic Surgery services should be restricted to academe and subject to same metrics and goals

26.5.5 Urology

Interview DFM Chief of Division, Urology

POPULATION NEED

- Emergency Care
  - Not only is there a question of critical mass in Yarmouth, but there are a limited number of urological emergencies and these can be handled by a General Surgeon – suprapubic catheter

placement and cystoscopic evacuation of clots – as well, an Interventional Radiologist can place a nephrostomy tube

- Health System Design
  - Consideration of Urology as a provincial resource with coordinated, integrated care could mitigate the inconvenience of on-call sign-outs to CDHA without notification
  - Consideration of one (1) Urologist in Yarmouth that would be part of a shared call model – but lacks the critical mass, as above – also see comments in section on emergency care
  - Traditional ratio analysis suggests 1:40-50,000 population, based on a normal population and age distribution curve – however, the age variable in NS makes a ratio approach less relevant
  - FFS today but interest expressed in a provincial APP
- Infrastructure
  - Recruitment should be at the provincial level and not the DHA level – this would include the appropriate diffusion of technology
- Social-economic
  - Aging population diminishes traditional ratio analysis – need based on population health indices exceeds a simple computation
  - Only 4 of the CDHA Urologists are < 50 years – 2/3 in AVH; both in Truro; and neither in Sydney – requires consideration in 10-year plan
  - Utilization drivers include age, large number of stone producers, prostate disease, and bladder cancer

Physician Supply

- Generalist Disciplines
  - Department of Urology supports innovative delivery models, physician assistants, and GPs with special interest and training in urological disease (and with a mentoring link to a Urologist)
- Critical mass
  - Not applicable except for call issues noted in section below
  - Significant issue in Yarmouth but equally significant is the geographic isolation
- Specific Disciplines
  - Eight (8) adult Urologists in Halifax – had been nine (9) – ten (10) ideal to satisfy both academic and clinical mandates (had been ten (10) until 2000) – SSH patients go to Halifax for urological services
  - Two (2) in Dartmouth – argument put forward to support three (3)
  - Three (3) at IWK
  - Two (2) in Sydney – ideal call system would have three (3) – or should this be a regional issue and a shared service
  - Two (2) in Truro – tri-county referral site - ideal call system would have three (3)
  - Best model when considered as a provincial resource is VDHA (10); Dartmouth (3); IWK (3); Kentville (3); Sydney (2); Truro (2)
  - Therefore, overall, province requires 23 Urologists as a stable and sustainable provincial specialty resource – as long as there is attention to distribution and access to technology

Submission (email), Chief of Division

- Current counts are 3 in Kentville, 2 in Sydney and 2 in Truro. Sydney had 3 and requires additional now. Kentville is fine. The south shore (Shelburne to Bridgewater) flows to Halifax.
- Halifax currently 8 adult in Halifax. Previously 9 and requires additional now. 3 paediatrics at IWK. Dartmouth has 2 adult.
- Generally 1 to 40-50K of normal population distribution. NS is quite top heavy in the age distribution. Also the age of the practicing urologists in Halifax is only 4 under 50
- Support 3 per centre for call purposes:
  - Kentville 3
  - Truro 3
  - Dartmouth 3
  - Sydney 3
  - Halifax
- Paediatrics 2-3 (best for call but currently rotating with Paediatric surgery and some cross coverage from the adult guys)
- Adult - 10 FTE to allow some academic commitment

26.5.6 Vascular Surgery

Interview Co-Director, Provincial Cardiovascular Health Program

- Interventional radiology will not have an impact on vascular surgery (unlike cardiac surgery)
- Important difference between cardiac and vascular is that cardiac referrals come from only cardiologists – hence, operative: consultation ratio is much higher for cardiac surgeons
- Market place confusion over who does varicose veins
- Currently, overall numbers are about right:
- CDHA – 3.0 FTE plus 2.0 cardiac surgeons who do some vascular plus 1.0 locum tenens vascular surgeon from PE
- Kentville – two 0.75 FTE with balance being general surgery – one of the vascular surgeons still does travel clinics (Yarmouth and Lunenburg)
- Sydney – 1.5 FTE
- Need will change if one or both Kentville surgeons goes full-time vascular (spin-off effect on general surgery) plus the provincial impact of aging
- AVH tends to keep patients with higher acuity rather than transfer to CDHA
- Bridgewater vascular work goes to both CDHA and AVH

- Need for organizational change (not FTE change until variables above come into play:
  - Dollars follow patients
  - Province should have "vascular boundaries" that define who goes where and includes obligations for travel clinics for all sites – travel clinic time requires payment for time and mileage as well
  - Therefore, CDHA. CBDHA, AVH

Advances in technology have also led to increasing overlap between the traditionally distinct specialties of interventional radiology, cardiology, cardiac surgery and vascular surgery. Interventional cardiology, cardiac surgery, vascular surgery, and interventional radiology exhibit an ever-increasing degree of overlap among the type of patients and conditions treated, and the tools used in diagnosis and treatment.

Section 5. APPENDICIES

27 APPENDIX

27.1 Table of Figures

27.2 Acronyms

General

- AAFP Academic Alternative Funding Plan
- AFP Academic Funding Plan
- AHSC Academic Health Science Centre
- ANS Nova Scotians of African Descent
- APP Alternative Payment Plan
- ASIR Age-standardized incidence rate
- CanMEDS Canadian Medical Education Directives for Specialists
- CAPERS Canadian Post-M.D. Education Registry Service
- CaRMS Canadian Resident Matching Service
- CCFP (EM) Canadian College of Family Physicians (Emergency Medicine)
- CIHI Canadian Institute for Health Information
- CFPC College of Family Physicians Canada
- CMA Canadian Medical Association
- COGME The US Council on Graduate Medical Education
- CPSNS College of Physicians and Surgeons of Nova Scotia
- CSAs Canadians studying abroad
- DAD Discharge Abstract Database
- DHA District Health Authority
- FFS Fee-for-service
- FM Family medicine
- FP Family Physician
- FTE Full-Time Equivalent
- GMENAC Graduate Medical Education National Advisory Committee

- GNS Government of Nova Scotia
- HHR Health Human Resource
- HTA Health Technology Assessment
- IMG International Medical Graduate
- IMS International Medical Student
- LOS Length of Stay
- MD Medical Doctor
- MOC Maintenance of Competency
- MS Medical specialty
- MSI Medical Services Insurance
- NACRS National Ambulatory Care Reporting System
- NB New Brunswick
- NP Nurse Practitioner
- NS Nova Scotia
- PA Physician Assistant
- PAC Project Advisory Committee
- PD Professional Development
- PEI Prince Edward Island
- PGME Post-graduate medical education
- PHReD Physician Health Resource Database (Department of Health and Wellness)
- PRP Physician Resource Planning
- RCPSC Royal College of Physicians and Surgeons of Canada
- RIW Resource Intensity Weight
- SAS Specialist and Associate Specialist doctor (NHS England)
- S-Bill Shadow-bill
- SS Surgical specialty
- TWG Technical Working Group
- UGME Undergraduate medical education
- VA Veterans Affairs (U.S. Department of)
- WTE Whole-time equivalent

Conditions, Diseases, Devices

- ACS Acute Coronary Syndrome
- ASIR Age-standardized incidence rate
- CABG Coronary artery bypass graph
- CHF Congestive Heart Failure
- COPD Chronic Obstructive Pulmonary Disease
- ESKD End stage kidney disease
- ICD Implantable cardiac defibrillator
- IR incidence Rate
- PTCA Percutaneous transluminal coronary angioplasty
- RRT Renal replacement therapy
- SMR Standardized mortality rate

Organizations and Facilities – Nova Scotia

- AVH Annapolis Valley Health
- CBDHA Cape Breton District Health Authority

- CDHA Capital District Health Authority
- CEHHA Colchester East Hants Health Authority
- CHA Cumberland Health Authority
- CHBs Community Health Boards
- CRNNS College of Registered Nurses of Nova Scotia
- CVHNS Cardio-Vascular Health Nova Scotia
- DFM Dalhousie Faculty of Medicine
- DNS Doctors Nova Scotia
- Department of Health and Wellness Department of Health and Wellness (Nova Scotia)
- GASHA Guysborough Antigonish Strait Health Authority
- IWK Izaak Walton Killam Health Centre
- NSHRF Nova Scotia Health Research Foundation
- PARNS Patient Access Registry Nova Scotia
- PCHA Pictou County Health Authority
- PHRED Physician Health Resource Database
- SSH South Shore Health
- SWNDHA South West District Health Authority
- QEII Queen Elizabeth II

Physician Services

- AP Anatomic Pathology
- C/S Cardiac Surgery
- CCM Critical Care Medicine
- E&M Endocrinology and Metabolism
- ED Emergency Department
- ENT Ear, Nose, Throat (Otolaryngology)
- EP Electrophysiology
- GIM General Internal Medicine
- GP General Practitioner
- GPwSI General Practitioner with Special Interest (NHS England)
- GS General Surgery
- O&G Obstetrics & Gynaecology
- PMR Physical Medicine & Rehabilitation

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27.4 Project Advisory Committee – Membership

- Project Lead and Chair, Department of Health and Wellness Carmelle d'Entremont, Executive Director Health System Workforce
- CEO Urban, Anne McGuire, President and CEO, IWK Health Centre
- CEO Rural, Kevin MacDonald, CEO, Guysborough Antigonish Strait Health Authority
- VP Medicine, Rural, Lynne Harrigan, Annapolis Valley Health
- VP Medicine, Urban, Brendan Carr, Capital Health
- Dalhousie University, Tom Marrie, Dean, Faculty of Medicine
- Doctors Nova Scotia, Doug Clarke, CEO
- CPSNS, Cameron Little, Registrar and CEO
- Department of Health and Wellness Physician Services, Angela Purcell, Director
- Department of Health and Wellness Physician Resources, Linda Campbell, Manager
- Department of Health and Wellness Program Standards & Quality, Paula English, Chief
- Department of Health and Wellness Health System Workforce, David Gass
- Consultants
  - Project Manager, Consultant Nick Tait, Social Sector Metrics Inc.
  - Project Senior Consultant, David Peachey, Health Intelligence Inc.

27.5 Interviews

27.5.1 Individuals

Individuals								
No.	Subject	Date	Organization	Department	Title	Last Name	First Name	Notes
1	Interview and data acquisition	13-Jun	Dalhousie Faculty of Medicine (DFM)	Emergency Medicine	Chief of Department, CDHA	Yoon	Phillip	Teleconference
2	Interview	14-Jun	DFM and Amherst		Ophthalmologist	Orr	Andrew	Teleconference
3	Interview	15-Jun	Doctors Nova Scotia (DNS)		Past President DNS-Family Physician	Forbes	Cynthia	Teleconference
4	Interview	15-Jun	DNS		Past President DNS-Obstetrician	Westcott	Don	Teleconference
5	Interview	16-Jun	DNS		Past President DNS-Family Physician	Brooks	Jane	Teleconference
6	Interview and data acquisition	20-Jun	DFM	Anaesthesia	Chief of Department, CDHA	Shukla	Romesh	
7	Interview and data acquisition	21-Jun	DFM	Cardiology	Chief of Division, CDHA	Kells	Catherine	
8	Interview and data acquisition	21-Jun	DFM	Urology	Chief of Division, CDHA	Bell	David	
9	Interview and data acquisition	21-Jun	DFM	Orthopaedic Surgery	Chief of Division, CDHA	Gross	Mike	
10	Letter of Information	21-Jun	CEHHA	Palliative Care	Medical Director	Henderson	David	Letter
11	Interview and data acquisition	23-Jun	DFM	Paediatrics	Chair of Department, IWK	Bernstein	Mark	Dr. Wade Watson
12	Interview and data acquisition	23-Jun	DFM	Medicine	Chair of Department, CDHA	Anderson	David	

13	Interview and data acquisition	24-Jun	DFM	Psychiatry	Chief of Department, CDHA	Delva	Nick	
14	Follow up data interview	24-Jun	CCNS	Cancer Care NS	Chief Medical Director	Giacomantonio	Carman	
15	Interview and data acquisition	29-Jun	DFM	Radiology	Chair of Department, CDHA	Barnes	David	Teleconference
16	Interview and data acquisition	29-Jun	DFM	Geriatric Medicine	Professor	Rockwood	Ken	Teleconference
17	Interview and data acquisition	30-Jun	DFM	Family Medicine	Chief of Department, CDHA	Gibson	Rick	Teleconference
18	Interview and data acquisition	30-Jun	DFM	Hospital Care	Director of Hospital Care; Chief Family Practice	Savvopoulos	Stavros	
19	Interview	01-Jul		Ophthalmology	Retired	Sapp	George	Teleconference
20	Interview and data acquisition	11-Jul	DFM	Surgery	Chair of Department, CDHA	Park	Adrian	Teleconference
21	Interview and data acquisition	12-Jul	DFM	Obstetrics	Chair of Department, IWK	Armson	Tony	Teleconference
22	Interview	15-Jul	DFM	Ophthalmology	Chief of Division, CDHA	Cruess	Alan	Teleconference
23	Interview and data acquisition	15-Jul	DFM	Pathology	Chair of Department, CDHA	Heathcote	Godfrey	Teleconference
24	Interview	20-Jul	CEHHA	Psychiatry	Chair of Department, CEHHA	de Boer	Cornelis	Teleconference
25	Letter of information	22-Jul	DFM	Palliative Care	Chair of Division, CDHA	McIntyre	Paul	Letter
26	Letter of Information	22-Jul	DFM	Nephrology	Chair of Division, CDHA	West	Kenneth	Letter
27	Follow up interview	16-Aug	DFM	Orthopaedic Surgery	Chief of Division, CDHA	Gross	Mike	Teleconference

28	Interview	16-Aug	Department of Health and Wellness	Diversity, Social Inclusion and Cultural Competence	Special Advisor	Davis-Murdoch	Sharon	Teleconference
29	Follow up interview	19-Aug	AVH	Vascular Surgery	Deputy Head, Department of Surgery	Davidson	Dion	Teleconference
30	Interview and data acquisition	22-Aug	DFM	Obstetrics	Chair of Department, IWK	Armson	Tony	Teleconference
31	Letter of Information	23-Aug	DFM	Critical Care	Chair of Division, CDHA	Patrick	Ward	
32	Interview and data acquisition	25-Aug	DFM	Gynaecologic Oncology	Chair of Division, CDHA	Bentley	Jim	Teleconference
33	Follow up interview	29-Aug	DFM	Pathology	Chair of Department, CDHA	Heathcote	Godfrey	Teleconference
34	Interview	29-Sept	DFM	Emergency Medicine	Interim Chief Department of EM	Petrie	David	Teleconference

27.5.2 DHAs

DHAs

No.	Subject	Date	Organization	Title	Last Name	First Name	Notes
1	Preliminary meeting for information	06-Jun	CBDHA	Chief Executive Officer	Malcom	John	Dr. M. A.Naqvi
2	Preliminary meeting for information	06-Jun	GASHA	VP Medicine	Hillyard	Jeremy	
3	Preliminary meeting for information	06-Jun	GASHA	Medical Staff			General meeting of medical staff
4	Preliminary meeting for information	07-Jun	PCHA	VP Health Services	Kaffer	Janice	Dr. Nicole Boutilier

5	Preliminary meeting for information	07-Jun	CHA	Chief Executive Officer	Quigley	Bruce	Dr. Celina White
6	Preliminary meeting for information	07-Jun	CHA	Medical Staff			General meeting of medical staff
7	Preliminary meeting for information	08-Jun	CEHHA	Chief Executive Officer	MacKinnon	Peter	
8	Preliminary meeting for information	08-Jun	AVH	Chief Executive Officer	Knox	Janet	Dr. Lynn Harrigan
9	Preliminary meeting for information	08-Jun	AVH	Medical Staff			General meeting of medical staff
10	Preliminary meeting for information	09-Jun	SWNDHA	Chief Executive Officer	MacNeil	Blaise	Dr. Ed Janke
11	Preliminary meeting for information	10-Jun	SSH	Chief Executive Officer	Leverman	Alice	
12	Preliminary meeting for information	10-Jun	IWK	Chief Executive Officer	McGuire	Anne	
13	Preliminary meeting for information	20-Jun	CDHA	Chief Executive Officer	Power	Chris	Dr. Brendan Carr
14	Preliminary meeting for information	21-Jun	CEHHA	Medical Staff			General meeting of medical staff
15	Preliminary meeting for information	22-Jun	CBDHA	Medical Staff			Videoconference medical staff
16	Preliminary meeting for information	22-Jun	PCHA	Medical Staff			General meeting of medical staff
17	Preliminary meeting for	22-Jun	SWNDHA	Medical Staff			General meeting of medical staff

	information						
18	Preliminary meeting for information	23-Jun	IWK	MAC			MAC meeting
19	Preliminary meeting for information	24-Jun	CDHA	Clinical Affairs Committee			
20	Preliminary meeting for information	11-Jul	IWK	VP Medicine	Hyndman	Joe	
21	Secondary meeting for information	29-Aug	SSH	Chief Executive Officer	Leverman	Alice	Dr. Peter Vaughan

27.5.3 Organizations

Organizations							
No.	**Subject**	**Date**	**Organization**	**Title**	**Last Name**	**First Name**	**Notes**
1	Preliminary meeting for information	10-May	Department of Health and Wellness	Project Manager	d'Entremenont	Carmelle	
2	Preliminary meeting for information	10-May	Department of Health and Wellness	Deputy Minister	McNamara	Kevin	
3	Preliminary meeting for information	10-May	Department of Health and Wellness	Associate Deputy Minister	Martin	Francis	
4	Preliminary meeting for information	10-May	Department of Health and Wellness	Director of Projects	Goldring	Victoria	
5	Preliminary meeting for information	10-May	Department of Health and Wellness	Director, Physician Services	Purcell	Angela	
6	Preliminary meeting for information	10-May	Department of Health and Wellness		Campbell	Lynda	
7	Preliminary	11-May	Department of		Harvie	Barb	

	meeting for information		Health and Wellness				
8	Preliminary meeting for information	11-May	Department of Health and Wellness	Chief, Partnerships and Physician Services	Hubbard	Eleanor	
9	Preliminary meeting for information	11-May	Department of Health and Wellness	Chief Public Health Officer	Strang	Robert	
10	Preliminary meeting for information	11-May	Department of Health and Wellness	Executive Director, Acute and Tertiary Care	Christie	Sandy	
11	Preliminary meeting for information	11-May	Department of Health and Wellness	Director, System Planning and Liaison, Continuing Care	Cheek	Lynn	Joanne Collins, Caroline Maxwell
12	Preliminary meeting for information	11-May	Department of Health and Wellness	Executive Director, Emergency Health Services and Primary Care	Bower	Ian	Bob Van Dine, Lisa Grandy
13		12-May	Department of Health and Wellness	Acting Executive Director, Mental Health, Children's Services & Addiction Treatment	Murray	Pat	
14	Preliminary meeting for information	13-May	Department of Health and Wellness	Executive Director, Wait Time Improvement	MacDonald	MJ	
15	Preliminary meeting for information	24-May	Department of Health and Wellness	Chief, Programs Standards and Quality	English	Paula	
16	Preliminary meeting for information	24-May	CPSNS	Registrar	Little	Cam	
17	Preliminary meeting for information	25-May	DNS	Chief Executive Officer	Clarke	Doug	Kevin Chapman, Jane Brooks
18	Preliminary meeting for information	25-May	CNNS	Executive Director	Denney	Donna	
19	Preliminary meeting for information	26-May	Dalhousie FOM	Dean	Marrie	Tom	

20	Preliminary meeting for information	26-May	CCNS	Chief Medical Director	Giacomantonio	Carman	
21	Preliminary meeting for information	26-May	DHAs	VPs of Community Health	Peach	Lindsay	VPs of Community Health
22	Preliminary meeting for information	26-May	EHS	Medical Director	Travers	Andrew	
23	Preliminary meeting for information	27-May	NSHRF	Chief Executive Officer	Connell	Krista	
24	Preliminary meeting for information	14-Jul	LOL	Program Manager	Corning	Corinne	Teleconference
25	Preliminary meeting for information	15-Jul	NSBSP	Program Manager	Foley	Theresa	Teleconference
26	Preliminary meeting for information	22-Jul	NSRCP	Program Manager	Attenborough	Rebecca	Teleconference

27.6 DHA and County Level – Physician Workforce Analysis

The following subsection looks at each DHA physician workforce FTEs by specialty, County, and DHA. A second figure looks at the DHA Net (Export)/Import percentages for selected higher volume specialties and the third figure looks at the age distribution of the workforce in the DHA. Note that those currently over age 69 have been removed from the analysis.

27.6.1 South Shore (SSH)

Figure 208 Physician Workforce Profile – DHA1 SSH 2009/10 (Source: MSI, PHReD, AFP data, Departmental review)

Category	Functional_Specialty	LUNENBURG	QUEENS	DHA1 TOTAL
Diagnostic & Therapeutic	Anatomic Pathology	1.0		1.0
Diagnostic & Therapeutic	Diagnostic Radiology	4.8		4.8
Diagnostic & Therapeutic	General Pathology		1.0	1.0
Diagnostic & Therapeutic	Haematological Pathology			
Diagnostic & Therapeutic	Radiology - Oncology			
Diagnostic & Therapeutic	**Subtotal**	**5.8**	**1.0**	**6.8**
Family Medicine/Practice	Emergency Medicine	3.1		3.1
Family Medicine/Practice	General Practitioner	35.7	14.8	50.5
Family Medicine/Practice	Palliative Medicine			
Family Medicine/Practice	**Subtotal**	**38.8**	**14.8**	**53.6**
Medical	Cardiology	1.1		1.1
Medical	Community Medicine			
Medical	Critical Care Medicine			
Medical	Dermatology			
Medical	Emergency Medicine	1.7		1.7
Medical	Endocrinology & Metabolism			
Medical	Gastroenterology	1.3		1.3
Medical	General Internal Medicine	2.2	1.0	3.2
Medical	Geriatric Medicine			
Medical	Haematology			
Medical	Infectious Diseases			
Medical	Medical Oncology			
Medical	Nephrology			
Medical	Neurology			
Medical	Occupational Medicine			
Medical	Palliative Medicine	1.0		1.0
Medical	Physical Medicine & Rehabilitation			
Medical	Psychiatry	2.1		2.1
Medical	Psychiatry - Forensic			
Medical	Respiratory Medicine	1.1		1.1
Medical	Rheumatology	1.0		1.0
Medical	**Subtotal**	**11.5**	**1.0**	**12.5**
Paediatric - Diagnostic & Therapeutic	Paediatric Diagnostic Radiology			
Paediatric - Diagnostic & Therapeutic	**Subtotal**			
Paediatric - Medical	Paediatric General			
Paediatric - Medical	Paediatric Neonatology			
Paediatric - Medical	Psychiatry - Adolescent	1.2		1.2
Paediatric - Medical	**Subtotal**	**1.2**		**1.2**
Surgical	Anaesthesia	4.8	0.2	5.0
Surgical	Cardiac Surgery			
Surgical	Critical Care Medicine			
Surgical	General Surgery	4.0		4.0
Surgical	Gynaecological Oncology			
Surgical	Neurosurgery			
Surgical	Obstetrics & Gynaecology	3.4		3.4
Surgical	Ophthalmology	2.5		2.5
Surgical	Orthopedic Surgery			
Surgical	Otolaryngology			
Surgical	Plastic Surgery	1.0		1.0
Surgical	Thoracic Surgery			
Surgical	Urology			
Surgical	Vascular Surgery			
Surgical	**Subtotal**	**15.8**	**0.2**	**16.0**
	TOTAL	**73.1**	**17.0**	**90.1**

Figure 209 DH1 SSH Detail Physician Workforce Profile – (Export)/Import of Services (Source: MSI)

LICENSED SPECIALTY DESCRIPTION (Alphabetic by Category)	STATUS	DHA1-Total$
General Practitioner	By Patient Pcode	11,915,703
General Practitioner	By Provider Pcode	11,253,814
General Practitioner	NET (Export)/Import	(661,889)
General Practitioner	NET % (Export)/Import	-6%
Internal Medicine	By Patient Pcode	749,740
Internal Medicine	By Provider Pcode	608,426
Internal Medicine	NET (Export)/Import	(141,313)
Internal Medicine	NET % (Export)/Import	-19%
Psychiatry	By Patient Pcode	70,916
Psychiatry	By Provider Pcode	7,462
Psychiatry	NET (Export)/Import	(63,454)
Psychiatry	NET % (Export)/Import	-89%
Paediatric General	By Patient Pcode	184,109
Paediatric General	By Provider Pcode	89,272
Paediatric General	NET (Export)/Import	(94,837)
Paediatric General	NET % (Export)/Import	-52%
Anaesthesia	By Patient Pcode	1,662,280
Anaesthesia	By Provider Pcode	483,833
Anaesthesia	NET (Export)/Import	(1,178,448)
Anaesthesia	NET % (Export)/Import	-71%
General Surgery	By Patient Pcode	1,546,173
General Surgery	By Provider Pcode	1,488,951
General Surgery	NET (Export)/Import	(57,222)
General Surgery	NET % (Export)/Import	-4%
Obstetrics & Gynaecology	By Patient Pcode	835,281
Obstetrics & Gynaecology	By Provider Pcode	585,074
Obstetrics & Gynaecology	NET (Export)/Import	(250,207)
Obstetrics & Gynaecology	NET % (Export)/Import	-30%
Opthalmology	By Patient Pcode	1,809,329
Opthalmology	By Provider Pcode	1,110,220
Opthalmology	NET (Export)/Import	(699,109)
Opthalmology	NET % (Export)/Import	-39%
Orthopedic Surgery	By Patient Pcode	1,036,803
Orthopedic Surgery	By Provider Pcode	72,630
Orthopedic Surgery	NET (Export)/Import	(964,173)
Orthopedic Surgery	NET % (Export)/Import	-93%

Figure 210 DH1 SSH Detail Physician Workforce Profile – Age Profile (Source: MSI)

	DHA1						
LICENSED SPECIALTY	≤40	≤50	50-54	55-59	60-64	65-69	Total
Diagnostic Radiology	2	2			1		5
General Surgery		2	1		1		4
Internal Medicine	1	1	2	1	1	1	7
Obstetrics & Gynaecology		2		1	1		4
Ophthalmology			1		1	1	3
Orthopedic Surgery							0
Paediatric General							0
Psychiatry		2				1	3
SUBTOTAL	3	9	4	2	5	3	26
% By Age Group	12%	35%	15%	8%	19%	12%	100%
% Age 55+							38%
General Practitioner	7	23	8	10	7	4	59
% By Age Group	12%	39%	14%	17%	12%	7%	100%
% Age 55+							36%

27.6.2 South West District Health Authority (SWNDHA)

Figure 211 Physician Workforce Profile – DHA2 SWNDHA 2009/10 (Source: MSI, PHReD, AFP data, Departmental review)

Category	Functional_Specialty	DIGBY	SHELBURNE	YARMOUTH	DHA2 TOTAL
Diagnostic & Therapeutic	Anatomic Pathology			0.6	0.6
Diagnostic & Therapeutic	Diagnostic Radiology			6.1	6.1
Diagnostic & Therapeutic	General Pathology				
Diagnostic & Therapeutic	Haematological Pathology				
Diagnostic & Therapeutic	Radiology - Oncology				
Diagnostic & Therapeutic	**Subtotal**			**6.6**	**6.6**
Family Medicine/Practice	Emergency Medicine			1.3	1.3
Family Medicine/Practice	General Practitioner	13.3	8.9	28.5	50.7
Family Medicine/Practice	Palliative Medicine				
Family Medicine/Practice	**Subtotal**	**13.3**	**8.9**	**29.9**	**52.0**
Medical	Cardiology			0.9	0.9
Medical	Community Medicine				
Medical	Critical Care Medicine				
Medical	Dermatology				
Medical	Emergency Medicine			3.5	3.5
Medical	Endocrinology & Metabolism				
Medical	Gastroenterology				
Medical	General Internal Medicine			3.3	3.3
Medical	Geriatric Medicine				
Medical	Haematology				
Medical	Infectious Diseases				
Medical	Medical Oncology				
Medical	Nephrology			2.7	2.7
Medical	Neurology				
Medical	Occupational Medicine				
Medical	Palliative Medicine				
Medical	Physical Medicine & Rehabilitation				
Medical	Psychiatry			2.2	2.2
Medical	Psychiatry - Forensic				
Medical	Respiratory Medicine				
Medical	Rheumatology				
Medical	**Subtotal**			**12.7**	**12.7**
Paediatric - Diagnostic & Therapeutic	Paediatric Diagnostic Radiology				
Paediatric - Diagnostic & Therapeutic	**Subtotal**				
Paediatric - Medical	Paediatric General			2.1	2.1
Paediatric - Medical	Paediatric Neonatology				
Paediatric - Medical	Psychiatry - Adolescent			1.0	1.0
Paediatric - Medical	**Subtotal**			**3.1**	**3.1**
Surgical	Anaesthesia			4.1	4.1
Surgical	Cardiac Surgery				
Surgical	Critical Care Medicine				
Surgical	General Surgery			3.6	3.6
Surgical	Gynaecological Oncology				
Surgical	Neurosurgery				
Surgical	Obstetrics & Gynaecology			2.6	2.6
Surgical	Ophthalmology			2.8	2.8
Surgical	Orthopedic Surgery				
Surgical	Otolaryngology			1.1	1.1
Surgical	Plastic Surgery				
Surgical	Thoracic Surgery				
Surgical	Urology				
Surgical	Vascular Surgery				
Surgical	**Subtotal**			**14.1**	**14.1**
	TOTAL	**13.3**	**8.9**	**66.4**	**88.5**

Figure 213 DHA2 SWNDHA Detail Physician Workforce Profile – Age Profile (Source: MSI)

LICENSED SPECIALTY DESCRIPTION (Alphabetic by Category)	STATUS	DHA2-Total$
General Practitioner	By Patient Pcode	10,225,870
General Practitioner	By Provider Pcode	9,734,541
General Practitioner	NET (Export)/Import	(491,328)
General Practitioner	NET % (Export)/Import	-5%
Internal Medicine	By Patient Pcode	1,238,613
Internal Medicine	By Provider Pcode	1,048,261
Internal Medicine	NET (Export)/Import	(190,352)
Internal Medicine	NET % (Export)/Import	-15%
Psychiatry	By Patient Pcode	31,885
Psychiatry	By Provider Pcode	106,901
Psychiatry	NET (Export)/Import	75,015
Psychiatry	NET % (Export)/Import	235%
Paediatric General	By Patient Pcode	344,099
Paediatric General	By Provider Pcode	287,399
Paediatric General	NET (Export)/Import	(56,700)
Paediatric General	NET % (Export)/Import	-16%
Anaesthesia	By Patient Pcode	1,369,946
Anaesthesia	By Provider Pcode	328,119
Anaesthesia	NET (Export)/Import	(1,041,827)
Anaesthesia	NET % (Export)/Import	-76%
General Surgery	By Patient Pcode	1,538,066
General Surgery	By Provider Pcode	1,386,154
General Surgery	NET (Export)/Import	(151,912)
General Surgery	NET % (Export)/Import	-10%
Obstetrics & Gynaecology	By Patient Pcode	1,071,801
Obstetrics & Gynaecology	By Provider Pcode	831,957
Obstetrics & Gynaecology	NET (Export)/Import	(239,844)
Obstetrics & Gynaecology	NET % (Export)/Import	-22%
Opthalmology	By Patient Pcode	2,345,856
Opthalmology	By Provider Pcode	1,295,671
Opthalmology	NET (Export)/Import	(1,050,185)
Opthalmology	NET % (Export)/Import	-45%
Orthopedic Surgery	By Patient Pcode	716,540
Orthopedic Surgery	By Provider Pcode	89,981
Orthopedic Surgery	NET (Export)/Import	(626,559)
Orthopedic Surgery	NET % (Export)/Import	-87%

Figure 212 DHA3 AVH Detail Physician Workforce Profile – Age Profile (Source: MSI)

	DHA2						
LICENSED SPECIALTY	<40	<50	50-54	55-59	60-64	65-69	Total
Diagnostic Radiology	2	1	1	1	1		6
General Surgery	1	2				1	4
Internal Medicine	2	1	1	1			5
Obstetrics & Gynaecology		1			2		3
Ophthalmology	2		1		1		4
Orthopedic Surgery							
Paediatric General		1		1			2
Psychiatry	1		1	1			3
SUBTOTAL	8	5	4	3	4	1	25
% By Age Group	32%	20%	16%	12%	16%	4%	100%
% Age 55+							32%
General Practitioner	7	17	14	6	8	3	55
% By Age Group	13%	31%	25%	11%	15%	5%	100%
% Age 55+							31%

27.6.3 Annapolis Valley Health (AVH)

Figure 214 Physician Workforce Profile – DHA3 AVH 2009/10 (Source: MSI, PHReD, AFP data, Departmental review)

Category	Functional_Specialty	ANNAPOLIS	KINGS	DHA3 TOTAL
Diagnostic & Therapeutic	Anatomic Pathology		2.0	2.0
Diagnostic & Therapeutic	Diagnostic Radiology		7.8	7.8
Diagnostic & Therapeutic	General Pathology		1.0	1.0
Diagnostic & Therapeutic	Haematological Pathology			
Diagnostic & Therapeutic	Radiology - Oncology			
Diagnostic & Therapeutic	**Subtotal**		**10.8**	**10.8**
Family Medicine/Practice	Emergency Medicine			
Family Medicine/Practice	General Practitioner	15.2	52.8	68.1
Family Medicine/Practice	Palliative Medicine			
Family Medicine/Practice	**Subtotal**	**15.2**	**52.8**	**68.1**
Medical	Cardiology		3.4	3.4
Medical	Community Medicine			
Medical	Critical Care Medicine			
Medical	Dermatology		1.2	1.2
Medical	Emergency Medicine	0.9	5.7	6.6
Medical	Endocrinology & Metabolism			
Medical	Gastroenterology			
Medical	General Internal Medicine		3.8	3.8
Medical	Geriatric Medicine			
Medical	Haematology			
Medical	Infectious Diseases			
Medical	Medical Oncology		1.3	1.3
Medical	Nephrology			
Medical	Neurology			
Medical	Occupational Medicine		0.5	0.5
Medical	Palliative Medicine		0.6	0.6
Medical	Physical Medicine & Rehabilitation			
Medical	Psychiatry		5.1	5.1
Medical	Psychiatry - Forensic			
Medical	Respiratory Medicine			
Medical	Rheumatology			
Medical	**Subtotal**	**0.9**	**21.6**	**22.5**
Paediatric - Diagnostic & Therapeutic	Paediatric Diagnostic Radiology		1.0	1.0
Paediatric - Diagnostic & Therapeutic	**Subtotal**		**1.0**	**1.0**
Paediatric - Medical	Paediatric General		2.7	2.7
Paediatric - Medical	Paediatric Neonatology			
Paediatric - Medical	Psychiatry - Adolescent			
Paediatric - Medical	**Subtotal**		**2.7**	**2.7**
Surgical	Anaesthesia		8.9	8.9
Surgical	Cardiac Surgery			
Surgical	Critical Care Medicine			
Surgical	General Surgery		3.1	3.1
Surgical	Gynaecological Oncology			
Surgical	Neurosurgery			
Surgical	Obstetrics & Gynaecology		4.8	4.8
Surgical	Ophthalmology		3.5	3.5
Surgical	Orthopedic Surgery		5.0	5.0
Surgical	Otolaryngology		2.0	2.0
Surgical	Plastic Surgery			
Surgical	Thoracic Surgery			
Surgical	Urology		2.0	2.0
Surgical	Vascular Surgery		2.0	2.0
Surgical	**Subtotal**		**31.3**	**31.3**
	TOTAL	**16.1**	**120.3**	**136.4**

Figure 215 DHA3 AVH Detail Physician Workforce Profile – (Export)/Import of Services (Source: MSI)

LICENSED SPECIALTY DESCRIPTION (Alphabetic by Category)	STATUS	DHA3-Total$
General Practitioner	By Patient Pcode	14,467,088
General Practitioner	By Provider Pcode	13,907,713
General Practitioner	NET (Export)/Import	(559,375)
General Practitioner	NET % (Export)/Import	-4%
Internal Medicine	By Patient Pcode	789,207
Internal Medicine	By Provider Pcode	650,207
Internal Medicine	NET (Export)/Import	(139,001)
Internal Medicine	NET % (Export)/Import	-18%
Psychiatry	By Patient Pcode	694,121
Psychiatry	By Provider Pcode	715,841
Psychiatry	NET (Export)/Import	21,721
Psychiatry	NET % (Export)/Import	3%
Paediatric General	By Patient Pcode	486,365
Paediatric General	By Provider Pcode	467,547
Paediatric General	NET (Export)/Import	(18,818)
Paediatric General	NET % (Export)/Import	-4%
Anaesthesia	By Patient Pcode	2,471,800
Anaesthesia	By Provider Pcode	2,490,095
Anaesthesia	NET (Export)/Import	18,295
Anaesthesia	NET % (Export)/Import	1%
General Surgery	By Patient Pcode	1,328,463
General Surgery	By Provider Pcode	1,157,358
General Surgery	NET (Export)/Import	(171,104)
General Surgery	NET % (Export)/Import	-13%
Obstetrics & Gynaecology	By Patient Pcode	1,746,811
Obstetrics & Gynaecology	By Provider Pcode	1,947,865
Obstetrics & Gynaecology	NET (Export)/Import	201,053
Obstetrics & Gynaecology	NET % (Export)/Import	12%
Opthalmology	By Patient Pcode	2,360,817
Opthalmology	By Provider Pcode	2,520,295
Opthalmology	NET (Export)/Import	159,478
Opthalmology	NET % (Export)/Import	7%
Orthopedic Surgery	By Patient Pcode	1,387,592
Orthopedic Surgery	By Provider Pcode	2,041,344
Orthopedic Surgery	NET (Export)/Import	653,752
Orthopedic Surgery	NET % (Export)/Import	47%

	DHA3						
LICENSED SPECIALTY	<40	<50	50-54	55-59	60-64	65-69	Total
Diagnostic Radiology	1	3	1	1	1	1	8
General Surgery			2		1		3
Internal Medicine	1	2		1	1		5
Obstetrics & Gynaecology	2	1	1		2		6
Ophthalmology	1	1			2		4
Orthopedic Surgery		1		3		1	5
Paediatric General	2	1					3
Psychiatry	1	1		1			3
SUBTOTAL	6	9	4	6	7	2	34
% By Age Group	18%	26%	12%	18%	21%	6%	100%
% Age 55+							44%
General Practitioner	8	24	19	8	10	4	73
% By Age Group	11%	33%	26%	11%	14%	5%	100%
% Age 55+							30%

27.6.4 Colchester East Hants Health Authority (CEHHA)

Figure 216 Physician Workforce Profile – DHA4 CEHHA 2009/10 (Source: MSI, PHReD, AFP data, Departmental review)

Category	Functional_Specialty	COLCHESTER	HANTS	DHA4 TOTAL	PROVINCE TOTAL
Diagnostic & Therapeutic	Anatomic Pathology	1.1	-	1.1	24.3
Diagnostic & Therapeutic	Diagnostic Radiology	4.6	-	4.6	78.9
Diagnostic & Therapeutic	General Pathology	1.0	-	1.0	5.3
Diagnostic & Therapeutic	Haematological Pathology	-	-	-	7.2
Diagnostic & Therapeutic	Radiology - Oncology	-	-	-	13.1
Diagnostic & Therapeutic	**Subtotal**	**6.7**	-	**6.7**	**140.8**
Family Medicine/Practice	Emergency Medicine	-	-	-	6.2
Family Medicine/Practice	General Practitioner	45.2	14.9	60.1	832.4
Family Medicine/Practice	Palliative Medicine	0.3	-	0.3	2.1
Family Medicine/Practice	**Subtotal**	**45.4**	**14.9**	**60.3**	**840.7**
Medical	Cardiology	-	-	-	33.2
Medical	Community Medicine	-	-	-	1.8
Medical	Critical Care Medicine	-	-	-	11.6
Medical	Dermatology	-	-	-	17.3
Medical	Emergency Medicine	5.3	-	5.3	65.5
Medical	Endocrinology & Metabolism	-	-	-	5.3
Medical	Gastroenterology	-	-	-	17.5
Medical	General Internal Medicine	3.1	-	3.1	43.5
Medical	Geriatric Medicine	-	-	-	11.2
Medical	Haematology	1.3	-	1.3	10.6
Medical	Infectious Diseases	-	-	-	7.1
Medical	Medical Oncology	-	-	-	17.4
Medical	Nephrology	-	-	-	17.7
Medical	Neurology	-	-	-	20.8
Medical	Occupational Medicine	-	-	-	5.4
Medical	Palliative Medicine	1.0	-	1.0	9.1
Medical	Physical Medicine & Rehabilitation	-	-	-	11.5
Medical	Psychiatry	8.8	-	8.8	129.7
Medical	Psychiatry - Forensic	-	-	-	4.0
Medical	Respiratory Medicine	-	-	-	11.8
Medical	Rheumatology	-	-	-	12.4
Medical	**Subtotal**	**19.5**	-	**19.5**	**464.4**
Paediatric - Diagnostic & Therapeutic	Paediatric Diagnostic Radiology	-	-	-	6.9
Paediatric - Diagnostic & Therapeutic	**Subtotal**	-	-	-	**16.6**
Paediatric - Medical	Paediatric General	4.0	-	4.0	42.5
Paediatric - Medical	Paediatric Neonatology	-	-	-	7.4
Paediatric - Medical	Psychiatry - Adolescent	2.2	-	2.2	15.7
Paediatric - Medical	**Subtotal**	**6.2**	-	**6.2**	**120.8**
Surgical	Anaesthesia	4.4	-	4.4	109.4
Surgical	Cardiac Surgery	-	-	-	8.0
Surgical	Critical Care Medicine	-	-	-	1.3
Surgical	General Surgery	4.7	-	4.7	51.6
Surgical	Gynaecological Oncology	-	-	-	4.0
Surgical	Neurosurgery	-	-	-	9.1
Surgical	Obstetrics & Gynaecology	3.7	-	3.7	47.6
Surgical	Ophthalmology	2.1	-	2.1	46.6
Surgical	Orthopedic Surgery	-	-	-	33.9
Surgical	Otolaryngology	-	-	-	23.7
Surgical	Plastic Surgery	-	-	-	10.4
Surgical	Thoracic Surgery	-	-	-	5.5
Surgical	Urology	1.3	-	1.3	16.2
Surgical	Vascular Surgery	-	-	-	7.4
Surgical	**Subtotal**	**16.1**	-	**16.1**	**374.7**
	TOTAL	**94.0**	**14.9**	**108.8**	**1,987.6**

Figure 217 DHA4 CEHHA Detail Physician Workforce Profile – (Export)/Import of Services (Source: MSI)

LICENSED SPECIALTY DESCRIPTION (Alphabetic by Category)	STATUS	DHA4-Total$
General Practitioner	By Patient Pcode	13,471,310
General Practitioner	By Provider Pcode	12,220,432
General Practitioner	NET (Export)/Import	(1,250,878)
General Practitioner	NET % (Export)/Import	-9%
Internal Medicine	By Patient Pcode	770,141
Internal Medicine	By Provider Pcode	365,121
Internal Medicine	NET (Export)/Import	(405,020)
Internal Medicine	NET % (Export)/Import	-53%
Psychiatry	By Patient Pcode	441,599
Psychiatry	By Provider Pcode	428,686
Psychiatry	NET (Export)/Import	(12,912)
Psychiatry	NET % (Export)/Import	-3%
Paediatric General	By Patient Pcode	412,693
Paediatric General	By Provider Pcode	302,632
Paediatric General	NET (Export)/Import	(110,061)
Paediatric General	NET % (Export)/Import	-27%
Anaesthesia	By Patient Pcode	2,130,082
Anaesthesia	By Provider Pcode	1,039,579
Anaesthesia	NET (Export)/Import	(1,090,502)
Anaesthesia	NET % (Export)/Import	-51%
General Surgery	By Patient Pcode	1,923,864
General Surgery	By Provider Pcode	1,839,604
General Surgery	NET (Export)/Import	(84,260)
General Surgery	NET % (Export)/Import	-4%
Obstetrics & Gynaecology	By Patient Pcode	1,461,817
Obstetrics & Gynaecology	By Provider Pcode	1,060,626
Obstetrics & Gynaecology	NET (Export)/Import	(401,191)
Obstetrics & Gynaecology	NET % (Export)/Import	-27%
Opthalmology	By Patient Pcode	1,984,587
Opthalmology	By Provider Pcode	1,388,496
Opthalmology	NET (Export)/Import	(596,091)
Opthalmology	NET % (Export)/Import	-30%
Orthopedic Surgery	By Patient Pcode	1,023,964
Orthopedic Surgery	By Provider Pcode	16,288
Orthopedic Surgery	NET (Export)/Import	(1,007,676)
Orthopedic Surgery	NET % (Export)/Import	-98%

Figure 218 DHA4 CEHHA Detail Physician Workforce Profile – Age Profile (Source: MSI)

	DHA4						
LICENSED SPECIALTY	<40	<50	50-54	55-59	60-64	65-69	Total
Diagnostic Radiology		2	1		1		4
General Surgery		2	1		1	1	5
Internal Medicine	1	1					2
Obstetrics & Gynaecology	1		1	1	2		5
Opthalmology		1				1	2
Orthopedic Surgery							
Paediatric General	1	1	1	1	1		5
Psychiatry	2	4		2	1		9
SUBTOTAL	4	10	3	3	5	2	27
% By Age Group	15%	37%	11%	11%	19%	7%	100%
% Age 55+							37%
General Practitioner	8	21	14	10	4	3	60
% By Age Group	13%	35%	23%	17%	7%	5%	100%
% Age 55+							28%

27.6.5 Cumberland Health Authority (CHA)

Figure 219 Physician Workforce Profile – DHA5 CHA 2009/10 (Source: MSI, PHReD, AFP data, Departmental review)

Category	Functional_Specialty	CUMBERLAND	DHA5 TOTAL	PROVINCE TOTAL
Diagnostic & Therapeutic	Anatomic Pathology	-	-	24.3
Diagnostic & Therapeutic	Diagnostic Radiology	2.5	2.5	78.9
Diagnostic & Therapeutic	General Pathology	-	-	5.3
Diagnostic & Therapeutic	Haematological Pathology	-	-	7.2
Diagnostic & Therapeutic	Radiology - Oncology	-	-	13.1
Diagnostic & Therapeutic	**Subtotal**	**2.5**	**2.5**	**140.8**
Family Medicine/Practice	Emergency Medicine	-	-	6.2
Family Medicine/Practice	General Practitioner	29.8	29.8	832.4
Family Medicine/Practice	Palliative Medicine	-	-	2.1
Family Medicine/Practice	**Subtotal**	**29.8**	**29.8**	**840.7**
Medical	Cardiology	-	-	33.2
Medical	Community Medicine	-	-	1.8
Medical	Critical Care Medicine	-	-	11.6
Medical	Dermatology	-	-	17.3
Medical	Emergency Medicine	-	-	65.5
Medical	Endocrinology & Metabolism	-	-	5.3
Medical	Gastroenterology	-	-	17.5
Medical	General Internal Medicine	2.7	2.7	43.5
Medical	Geriatric Medicine	-	-	11.2
Medical	Haematology	-	-	10.6
Medical	Infectious Diseases	-	-	7.1
Medical	Medical Oncology	-	-	17.4
Medical	Nephrology	-	-	17.7
Medical	Neurology	0.2	0.2	20.8
Medical	Occupational Medicine	-	-	5.4
Medical	Palliative Medicine	1.0	1.0	9.1
Medical	Physical Medicine & Rehabilitation	-	-	11.5
Medical	Psychiatry	3.0	3.0	129.7
Medical	Psychiatry - Forensic	-	-	4.0
Medical	Respiratory Medicine	-	-	11.8
Medical	Rheumatology	-	-	12.4
Medical	**Subtotal**	**6.8**	**6.8**	**464.4**
Paediatric - Diagnostic & Therapeutic	Paediatric Diagnostic Radiology	-	-	6.9
Paediatric - Diagnostic & Therapeutic	**Subtotal**	-	-	**16.6**
Paediatric - Medical	Paediatric General	-	-	42.5
Paediatric - Medical	Paediatric Neonatology	-	-	7.4
Paediatric - Medical	Psychiatry - Adolescent	-	-	15.7
Paediatric - Medical	**Subtotal**	-	-	**120.8**
Surgical	Anaesthesia	3.4	3.4	109.4
Surgical	Cardiac Surgery	-	-	8.0
Surgical	Critical Care Medicine	-	-	1.3
Surgical	General Surgery	1.6	1.6	51.6
Surgical	Gynaecological Oncology	-	-	4.0
Surgical	Neurosurgery	-	-	9.1
Surgical	Obstetrics & Gynaecology	1.0	1.0	47.6
Surgical	Ophthalmology	-	-	46.6
Surgical	Orthopedic Surgery	-	-	33.9
Surgical	Otolaryngology	1.4	1.4	23.7
Surgical	Plastic Surgery	-	-	10.4
Surgical	Thoracic Surgery	-	-	5.5
Surgical	Urology	-	-	16.2
Surgical	Vascular Surgery	-	-	7.4
Surgical	**Subtotal**	**7.5**	**7.5**	**374.7**
	TOTAL	**46.7**	**46.7**	**1,987.6**

Figure 220 DHA5 CHA Detail Physician Workforce Profile – Age Profile (Source: MSI)

LICENSED SPECIALTY DESCRIPTION (Alphabetic by Category)	STATUS	DHA5-Total$
General Practitioner	By Patient Pcode	5,279,412
General Practitioner	By Provider Pcode	5,053,243
General Practitioner	NET (Export)/Import	(226,170)
General Practitioner	NET % (Export)/Import	-4%
Internal Medicine	By Patient Pcode	790,365
Internal Medicine	By Provider Pcode	852,669
Internal Medicine	NET (Export)/Import	62,304
Internal Medicine	NET % (Export)/Import	8%
Psychiatry	By Patient Pcode	61,532
Psychiatry	By Provider Pcode	3,464
Psychiatry	NET (Export)/Import	(58,068)
Psychiatry	NET % (Export)/Import	-94%
Paediatric General	By Patient Pcode	78,106
Paediatric General	By Provider Pcode	437
Paediatric General	NET (Export)/Import	(77,669)
Paediatric General	NET % (Export)/Import	-99%
Anaesthesia	By Patient Pcode	688,030
Anaesthesia	By Provider Pcode	383,062
Anaesthesia	NET (Export)/Import	(304,968)
Anaesthesia	NET % (Export)/Import	-44%
General Surgery	By Patient Pcode	942,357
General Surgery	By Provider Pcode	886,586
General Surgery	NET (Export)/Import	(55,770)
General Surgery	NET % (Export)/Import	-6%
Obstetrics & Gynaecology	By Patient Pcode	420,660
Obstetrics & Gynaecology	By Provider Pcode	284,591
Obstetrics & Gynaecology	NET (Export)/Import	(136,069)
Obstetrics & Gynaecology	NET % (Export)/Import	-32%
Opthalmology	By Patient Pcode	899,733
Opthalmology	By Provider Pcode	790,717
Opthalmology	NET (Export)/Import	(109,016)
Opthalmology	NET % (Export)/Import	-12%
Orthopedic Surgery	By Patient Pcode	221,239
Orthopedic Surgery	By Provider Pcode	848
Orthopedic Surgery	NET (Export)/Import	(220,390)
Orthopedic Surgery	NET % (Export)/Import	-100%

Figure 221 DHA5 CHA Detail Physician Workforce Profile – (Export)/Import of Services (Source: MSI)

	DHA5						
LICENSED SPECIALTY	≤40	≤50	50-54	55-59	60-64	65-69	Total
Diagnostic Radiology	2	1	1		1		5
General Surgery			1	1			2
Internal Medicine	1	1	1	1			4
Obstetrics & Gynaecology		1					1
Ophthalmology							
Orthopedic Surgery							
Paediatric General							
Psychiatry		3		1	2		6
SUBTOTAL	3	6	3	3	3	-	18
% By Age Group	17%	33%	17%	17%	17%	0%	100%
% Age 55+							33%
General Practitioner	1	10	6	7	4	2	30
% By Age Group	3%	33%	20%	23%	13%	7%	100%
% Age 55+							43%

27.6.6 Pictou County Health Authority (PCHA)

Figure 222 Physician Workforce Profile – DHA6 PCHA 2009/10 (Source: MSI, PHReD, AFP data, Departmental review)

Category	Functional_Specialty	PICTOU	DHA6 TOTAL	PROVINCE TOTAL
Diagnostic & Therapeutic	Anatomic Pathology	-	-	24.3
Diagnostic & Therapeutic	Diagnostic Radiology	3.8	3.8	78.9
Diagnostic & Therapeutic	General Pathology	-	-	5.3
Diagnostic & Therapeutic	Haematological Pathology	-	-	7.2
Diagnostic & Therapeutic	Radiology - Oncology	-	-	13.1
Diagnostic & Therapeutic	**Subtotal**	**3.8**	**3.8**	**140.8**
Family Medicine/Practice	Emergency Medicine	-	-	6.2
Family Medicine/Practice	General Practitioner	33.4	33.4	832.4
Family Medicine/Practice	Palliative Medicine	-	-	2.1
Family Medicine/Practice	**Subtotal**	**33.4**	**33.4**	**840.7**
Medical	Cardiology	-	-	33.2
Medical	Community Medicine	-	-	1.8
Medical	Critical Care Medicine	-	-	11.6
Medical	Dermatology	-	-	17.3
Medical	Emergency Medicine	2.0	2.0	65.5
Medical	Endocrinology & Metabolism	-	-	5.3
Medical	Gastroenterology	0.3	0.3	17.5
Medical	General Internal Medicine	5.6	5.6	43.5
Medical	Geriatric Medicine	-	-	11.2
Medical	Haematology	-	-	10.6
Medical	Infectious Diseases	-	-	7.1
Medical	Medical Oncology	-	-	17.4
Medical	Nephrology	-	-	17.7
Medical	Neurology	-	-	20.8
Medical	Occupational Medicine	0.3	0.3	5.4
Medical	Palliative Medicine	1.0	1.0	9.1
Medical	Physical Medicine & Rehabilitation	-	-	11.5
Medical	Psychiatry	2.0	2.0	129.7
Medical	Psychiatry - Forensic	-	-	4.0
Medical	Respiratory Medicine	-	-	11.8
Medical	Rheumatology	-	-	12.4
Medical	**Subtotal**	**11.1**	**11.1**	**464.4**
Paediatric - Diagnostic & Therapeutic	Paediatric Diagnostic Radiology	-	-	6.9
Paediatric - Diagnostic & Therapeutic	**Subtotal**	-	-	**16.6**
Paediatric - Medical	Paediatric General	1.0	1.0	42.5
Paediatric - Medical	Paediatric Neonatology	-	-	7.4
Paediatric - Medical	Psychiatry - Adolescent	-	-	15.7
Paediatric - Medical	**Subtotal**	**1.0**	**1.0**	**120.8**
Surgical	Anaesthesia	3.0	3.0	109.4
Surgical	Cardiac Surgery	-	-	8.0
Surgical	Critical Care Medicine	-	-	1.3
Surgical	General Surgery	2.5	2.5	51.6
Surgical	Gynaecological Oncology	-	-	4.0
Surgical	Neurosurgery	-	-	9.1
Surgical	Obstetrics & Gynaecology	1.9	1.9	47.6
Surgical	Ophthalmology	2.0	2.0	46.6
Surgical	Orthopedic Surgery	2.6	2.6	33.9
Surgical	Otolaryngology	-	-	23.7
Surgical	Plastic Surgery	-	-	10.4
Surgical	Thoracic Surgery	-	-	5.5
Surgical	Urology	-	-	16.2
Surgical	Vascular Surgery	-	-	7.4
Surgical	**Subtotal**	**11.9**	**11.9**	**374.7**
	TOTAL	**61.3**	**61.3**	**1,987.6**

Figure 223 DHA6 PCHA Detail Physician Workforce Profile – (Export)/Import of Services (Source: MSI)

LICENSED SPECIALTY DESCRIPTION (Alphabetic by Category)	STATUS	DHA6-Total$
General Practitioner	By Patient Pcode	6,457,161
General Practitioner	By Provider Pcode	6,504,018
General Practitioner	NET (Export)/Import	46,857
General Practitioner	NET % (Export)/Import	1%
Internal Medicine	By Patient Pcode	1,248,206
Internal Medicine	By Provider Pcode	1,327,421
Internal Medicine	NET (Export)/Import	79,215
Internal Medicine	NET % (Export)/Import	6%
Psychiatry	By Patient Pcode	140,958
Psychiatry	By Provider Pcode	90,718
Psychiatry	NET (Export)/Import	(50,241)
Psychiatry	NET % (Export)/Import	-36%
Paediatric General	By Patient Pcode	191,619
Paediatric General	By Provider Pcode	147,177
Paediatric General	NET (Export)/Import	(44,442)
Paediatric General	NET % (Export)/Import	-23%
Anaesthesia	By Patient Pcode	1,058,643
Anaesthesia	By Provider Pcode	707,396
Anaesthesia	NET (Export)/Import	(351,248)
Anaesthesia	NET % (Export)/Import	-33%
General Surgery	By Patient Pcode	1,263,352
General Surgery	By Provider Pcode	1,254,972
General Surgery	NET (Export)/Import	(8,380)
General Surgery	NET % (Export)/Import	-1%
Obstetrics & Gynaecology	By Patient Pcode	819,596
Obstetrics & Gynaecology	By Provider Pcode	708,118
Obstetrics & Gynaecology	NET (Export)/Import	(111,478)
Obstetrics & Gynaecology	NET % (Export)/Import	-14%
Opthalmology	By Patient Pcode	1,232,180
Opthalmology	By Provider Pcode	1,117,830
Opthalmology	NET (Export)/Import	(114,350)
Opthalmology	NET % (Export)/Import	-9%
Orthopedic Surgery	By Patient Pcode	694,811
Orthopedic Surgery	By Provider Pcode	1,248,867
Orthopedic Surgery	NET (Export)/Import	554,056
Orthopedic Surgery	NET % (Export)/Import	80%

Figure 224 DHA6 PCHA Detail Physician Workforce Profile – Age Profile (Source: MSI)

	DHA6							
LICENSED SPECIALTY	<30	<40	<50	50-54	55-59	60-64	65-69	Total
Diagnostic Radiology		1	2					3
General Surgery			1	1		1		3
Internal Medicine		1	3			1		5
Obstetrics & Gynaecology			1	1	1			3
Ophthalmology						1	1	2
Orthopedic Surgery		2	1	1				4
Paediatric General					1			1
Psychiatry		1	1					2
SUBTOTAL	#	5	9	3	1	3	1	30
% By Age Group		17%	30%	10%	3%	10%	3%	100%
% Age 55+								17%
General Practitioner	1	10	8	5	7	7	4	42
% By Age Group		24%	19%	12%	17%	17%	10%	100%
% Age 55+								43%

27.6.7 Guysborough Antigonish Strait Health Authority (GASHA)

Figure 225 Physician Workforce Profile – DHA7 GASHA 2009/10 (Source: MSI, PHReD, AFP data, Departmental review)

Figure 226 DHA7 GASHA Detailed Physician Workforce - (Export)/Import \Profile (Source: MSI)

Category	Functional_Specialty	ANTIGONISH	GUYSBOROUGH	INVERNESS	RICHMOND	DHA7 TOTAL	PROVINCE TOTAL
Diagnostic & Therapeutic	Anatomic Pathology	1.7	-	-	-	1.7	24.3
Diagnostic & Therapeutic	Diagnostic Radiology	3.7	-	-	-	3.7	78.9
Diagnostic & Therapeutic	General Pathology	-	-	-	-	-	5.3
Diagnostic & Therapeutic	Haematological Pathology	-	-	-	-	-	7.2
Diagnostic & Therapeutic	Radiology - Oncology	-	-	-	-	-	13.1
Diagnostic & Therapeutic	**Subtotal**	**5.4**	-	-	-	**5.4**	**140.8**
Family Medicine/Practice	Emergency Medicine	-	-	-	-	-	6.2
Family Medicine/Practice	General Practitioner	23.6	7.1	5.9	7.6	44.1	832.4
Family Medicine/Practice	Palliative Medicine	-	-	-	-	-	2.1
Family Medicine/Practice	**Subtotal**	**23.6**	**7.1**	**5.9**	**7.6**	**44.1**	**840.7**
Medical	Cardiology	-	-	-	-	-	33.2
Medical	Community Medicine	-	-	-	-	-	1.8
Medical	Critical Care Medicine	-	-	-	-	-	11.6
Medical	Dermatology	1.0	-	-	-	1.0	17.3
Medical	Emergency Medicine	1.6	-	-	-	1.6	65.5
Medical	Endocrinology & Metabolism	-	-	-	-	-	5.3
Medical	Gastroenterology	0.4	-	-	-	0.4	17.5
Medical	General Internal Medicine	2.3	-	-	-	2.3	43.5
Medical	Geriatric Medicine	-	-	-	-	-	11.2
Medical	Haematology	-	-	-	-	-	10.6
Medical	Infectious Diseases	-	-	-	-	-	7.1
Medical	Medical Oncology	-	-	-	-	-	17.4
Medical	Nephrology	1.3	-	-	-	1.3	17.7
Medical	Neurology	-	-	-	-	-	20.8
Medical	Occupational Medicine	-	-	-	-	-	5.4
Medical	Palliative Medicine	-	-	-	-	-	9.1
Medical	Physical Medicine & Rehabilitation	-	-	-	-	-	11.5
Medical	Psychiatry	5.7	-	-	-	5.7	129.7
Medical	Psychiatry - Forensic	-	-	-	-	-	4.0
Medical	Respiratory Medicine	1.2	-	-	-	1.2	11.8
Medical	Rheumatology	-	-	-	-	-	12.4
Medical	**Subtotal**	**13.5**	-	-	-	**13.5**	**464.4**
Paediatric - Diagnostic & Therapeutic	Paediatric Diagnostic Radiology	-	-	-	-	-	6.9
Paediatric - Diagnostic & Therapeutic	**Subtotal**	-	-	-	-	-	**16.6**
Paediatric - Medical	Paediatric General	3.1	-	-	-	3.1	42.5
Paediatric - Medical	Paediatric Neonatology	-	-	-	-	-	7.4
Paediatric - Medical	Psychiatry - Adolescent	-	-	-	-	-	15.7
Paediatric - Medical	**Subtotal**	**3.1**	-	-	-	**3.1**	**120.8**
Surgical	Anaesthesia	2.1	-	-	-	2.1	109.4
Surgical	Cardiac Surgery	-	-	-	-	-	8.0
Surgical	Critical Care Medicine	-	-	-	-	-	1.3
Surgical	General Surgery	3.0	-	-	-	3.0	51.6
Surgical	Gynaecological Oncology	-	-	-	-	-	4.0
Surgical	Neurosurgery	-	-	-	-	-	9.1
Surgical	Obstetrics & Gynaecology	3.1	-	-	-	3.1	47.6
Surgical	Ophthalmology	2.2	-	-	-	2.2	46.6
Surgical	Orthopedic Surgery	-	-	-	-	-	33.9
Surgical	Otolaryngology	1.2	-	-	-	1.2	23.7
Surgical	Plastic Surgery	1.0	-	-	-	1.0	10.4
Surgical	Thoracic Surgery	-	-	-	-	-	5.5
Surgical	Urology	-	-	-	-	-	16.2
Surgical	Vascular Surgery	-	-	-	-	-	7.4
Surgical	**Subtotal**	**12.5**	-	-	-	**12.5**	**374.7**
	TOTAL	**58.0**	**7.1**	**5.9**	**7.6**	**78.6**	**1,987.6**

Figure 227 DHA7 GASHA Detailed Physician Workforce - Age Profile (Source: MSI)

LICENSED SPECIALTY DESCRIPTION (Alphabetic by Category)	STATUS	DHA7-Total$
General Practitioner	By Patient Pcode	8,468,104
General Practitioner	By Provider Pcode	8,228,707
General Practitioner	NET (Export)/Import	(239,398)
General Practitioner	NET % (Export)/Import	-3%
Internal Medicine	By Patient Pcode	881,123
Internal Medicine	By Provider Pcode	735,046
Internal Medicine	NET (Export)/Import	(146,076)
Internal Medicine	NET % (Export)/Import	-17%
Psychiatry	By Patient Pcode	166,946
Psychiatry	By Provider Pcode	155,285
Psychiatry	NET (Export)/Import	(11,661)
Psychiatry	NET % (Export)/Import	-7%
Paediatric General	By Patient Pcode	293,693
Paediatric General	By Provider Pcode	328,460
Paediatric General	NET (Export)/Import	34,767
Paediatric General	NET % (Export)/Import	12%
Anaesthesia	By Patient Pcode	1,000,599
Anaesthesia	By Provider Pcode	311,769
Anaesthesia	NET (Export)/Import	(688,829)
Anaesthesia	NET % (Export)/Import	-69%
General Surgery	By Patient Pcode	1,090,694
General Surgery	By Provider Pcode	908,692
General Surgery	NET (Export)/Import	(182,002)
General Surgery	NET % (Export)/Import	-17%
Obstetrics & Gynaecology	By Patient Pcode	920,191
Obstetrics & Gynaecology	By Provider Pcode	1,113,249
Obstetrics & Gynaecology	NET (Export)/Import	193,058
Obstetrics & Gynaecology	NET % (Export)/Import	21%
Opthalmology	By Patient Pcode	1,416,829
Opthalmology	By Provider Pcode	1,241,910
Opthalmology	NET (Export)/Import	(174,919)
Opthalmology	NET % (Export)/Import	-12%
Orthopedic Surgery	By Patient Pcode	673,145
Orthopedic Surgery	By Provider Pcode	-
Orthopedic Surgery	NET (Export)/Import	(673,145)
Orthopedic Surgery	NET % (Export)/Import	-100%

27.6.8 Cape Breton District Health Authority (CBDHA)

	DHA7						
LICENSED SPECIALTY	≤40	≤50	50-54	55-59	60-64	65-69	Total
Diagnostic Radiology	3	1					4
General Surgery		1		1	1		3
Internal Medicine	1	1					2
Obstetrics & Gynaecology	1				2		3
Ophthalmology		1			1		2
Orthopedic Surgery							
Paediatric General		1	1	1			3
Psychiatry		2	2	1		1	6
SUBTOTAL	5	6	2	2	4	1	20
% By Age Group	25%	30%	10%	10%	20%	5%	100%
% Age 55+							35%
General Practitioner	4	9	16	6	6	3	44
% By Age Group	9%	20%	36%	14%	14%	7%	100%
% Age 55+							34%

Figure 228 Physician Workforce Profile – DHA8 CBDHA 2009/10 (Source: MSI, PHReD, AFP data, Departmental review)

Category	Functional_Specialty	CAPE BRETON	INVERNESS	VICTORIA	DHA8 TOTAL	PROVINCE TOTAL
Diagnostic & Therapeutic	Anatomic Pathology	2.7	-	-	2.7	24.3
Diagnostic & Therapeutic	Diagnostic Radiology	7.8	-	-	7.8	78.9
Diagnostic & Therapeutic	General Pathology	0.3	-	-	0.3	5.3
Diagnostic & Therapeutic	Haematological Pathology	-	-	-	-	7.2
Diagnostic & Therapeutic	Radiology - Oncology	2.1	-	-	2.1	13.1
Diagnostic & Therapeutic	**Subtotal**	**12.9**	-	-	**12.9**	**140.8**
Family Medicine/Practice	Emergency Medicine	-	-	-	-	6.2
Family Medicine/Practice	General Practitioner	88.7	4.7	10.4	103.8	832.4
Family Medicine/Practice	Palliative Medicine	-	-	-	-	2.1
Family Medicine/Practice	**Subtotal**	**88.7**	**4.7**	**10.4**	**103.8**	**840.7**
Medical	Cardiology	3.2	-	-	3.2	33.2
Medical	Community Medicine	0.3	-	-	0.3	1.8
Medical	Critical Care Medicine	-	-	-	-	11.6
Medical	Dermatology	2.0	-	-	2.0	17.3
Medical	Emergency Medicine	5.6	-	-	5.6	65.5
Medical	Endocrinology & Metabolism	1.0	-	-	1.0	5.3
Medical	Gastroenterology	1.4	-	-	1.4	17.5
Medical	General Internal Medicine	4.4	-	-	4.4	43.5
Medical	Geriatric Medicine	1.0	-	-	1.0	11.2
Medical	Haematology	1.1	-	-	1.1	10.6
Medical	Infectious Diseases	1.1	-	-	1.1	7.1
Medical	Medical Oncology	4.2	-	-	4.2	17.4
Medical	Nephrology	2.9	-	-	2.9	17.7
Medical	Neurology	2.6	-	-	2.6	20.8
Medical	Occupational Medicine	-	-	-	-	5.4
Medical	Palliative Medicine	1.5	-	-	1.5	9.1
Medical	Physical Medicine & Rehabilitation	1.0	-	-	1.0	11.5
Medical	Psychiatry	14.1	-	-	14.1	129.7
Medical	Psychiatry - Forensic	-	-	-	-	4.0
Medical	Respiratory Medicine	2.0	-	-	2.0	11.8
Medical	Rheumatology	2.4	-	-	2.4	12.4
Medical	**Subtotal**	**51.8**	-	-	**51.8**	**464.4**
Paediatric - Diagnostic & Therapeutic	Paediatric Diagnostic Radiology	-	-	-	-	6.9
Paediatric - Diagnostic & Therapeutic	**Subtotal**	-	-	-	-	**16.6**
Paediatric - Medical	Paediatric General	4.3	-	-	4.3	42.5
Paediatric - Medical	Paediatric Neonatology	2.0	-	-	2.0	7.4
Paediatric - Medical	Psychiatry - Adolescent	1.0	-	-	1.0	15.7
Paediatric - Medical	**Subtotal**	**7.4**	-	-	**7.4**	**120.8**
Surgical	Anaesthesia	8.8	-	-	8.8	109.4
Surgical	Cardiac Surgery	-	-	-	-	8.0
Surgical	Critical Care Medicine	-	-	-	-	1.3
Surgical	General Surgery	4.5	-	-	4.5	51.6
Surgical	Gynaecological Oncology	-	-	-	-	4.0
Surgical	Neurosurgery	-	-	-	-	9.1
Surgical	Obstetrics & Gynaecology	3.7	-	-	3.7	47.6
Surgical	Ophthalmology	5.4	-	-	5.4	46.6
Surgical	Orthopedic Surgery	6.0	-	-	6.0	33.9
Surgical	Otolaryngology	2.2	-	-	2.2	23.7
Surgical	Plastic Surgery	1.1	-	-	1.1	10.4
Surgical	Thoracic Surgery	1.2	-	-	1.2	5.5
Surgical	Urology	2.1	-	-	2.1	16.2
Surgical	Vascular Surgery	1.8	-	-	1.8	7.4
Surgical	**Subtotal**	**36.7**	-	-	**36.7**	**374.7**
	TOTAL	**197.4**	**4.7**	**10.4**	**212.5**	**1,987.6**

Figure 229 DHA8 CBDHA Physician Workforce – (Export)/Import Profile (Source: MSI)

LICENSED SPECIALTY DESCRIPTION (Alphabetic by Category)	STATUS	DHA8-Total$
General Practitioner	By Patient Pcode	23,392,567
General Practitioner	By Provider Pcode	23,475,014
General Practitioner	NET (Export)/Import	82,446
General Practitioner	NET % (Export)/Import	0%
Internal Medicine	By Patient Pcode	2,250,891
Internal Medicine	By Provider Pcode	2,177,756
Internal Medicine	NET (Export)/Import	(73,135)
Internal Medicine	NET % (Export)/Import	-3%
Psychiatry	By Patient Pcode	1,782,364
Psychiatry	By Provider Pcode	1,849,022
Psychiatry	NET (Export)/Import	66,657
Psychiatry	NET % (Export)/Import	4%
Paediatric General	By Patient Pcode	1,176,950
Paediatric General	By Provider Pcode	1,124,514
Paediatric General	NET (Export)/Import	(52,436)
Paediatric General	NET % (Export)/Import	-4%
Anaesthesia	By Patient Pcode	3,938,711
Anaesthesia	By Provider Pcode	3,194,523
Anaesthesia	NET (Export)/Import	(744,188)
Anaesthesia	NET % (Export)/Import	-19%
General Surgery	By Patient Pcode	2,882,213
General Surgery	By Provider Pcode	2,819,628
General Surgery	NET (Export)/Import	(62,585)
General Surgery	NET % (Export)/Import	-2%
Obstetrics & Gynaecology	By Patient Pcode	1,496,269
Obstetrics & Gynaecology	By Provider Pcode	1,208,755
Obstetrics & Gynaecology	NET (Export)/Import	(287,513)
Obstetrics & Gynaecology	NET % (Export)/Import	-19%
Opthalmology	By Patient Pcode	3,457,462
Opthalmology	By Provider Pcode	2,826,269
Opthalmology	NET (Export)/Import	(631,193)
Opthalmology	NET % (Export)/Import	-18%
Orthopedic Surgery	By Patient Pcode	2,502,925
Orthopedic Surgery	By Provider Pcode	2,560,722
Orthopedic Surgery	NET (Export)/Import	57,797
Orthopedic Surgery	NET % (Export)/Import	2%

Figure 230 DHA8 CBDHA Workforce - Age Profile (Source: MSI)

	DHA8						
LICENSED SPECIALTY	<40	<50	50-54	55-59	60-64	65-69	Total
Diagnostic Radiology	3	4			1	1	9
General Surgery			2	1	1		4
Internal Medicine	2	3	1	1		1	8
Obstetrics & Gynaecology		3				1	4
Ophthalmology		3				3	6
Orthopedic Surgery	2	2	1	1			6
Paediatric General	1	1	1		2		5
Psychiatry		3	2	4	3	1	13
SUBTOTAL	7	18	6	7	5	7	50
% By Age Group	14%	36%	12%	14%	10%	14%	100%
% Age 55+							38%
General Practitioner	25	30	24	10	14	6	109
% By Age Group	23%	28%	22%	9%	13%	6%	100%
% Age 55+							28%

27.6.9 Capital District Health Authority (CDHA)

Figure 231 Physician Workforce Profile – DHA9 CDHA 2009/10 (Source: MSI, PHReD, AFP data, Departmental review)

Category	Functional_Specialty	HALIFAX	HANTS	DHA9 TOTAL	PROVINCE TOTAL
Diagnostic & Therapeutic	Anatomic Pathology	15.2	-	15.2	24.3
Diagnostic & Therapeutic	Diagnostic Radiology	37.3	0.5	37.8	78.9
Diagnostic & Therapeutic	General Pathology	2.0	-	2.0	5.3
Diagnostic & Therapeutic	Haematological Pathology	7.2	-	7.2	7.2
Diagnostic & Therapeutic	Medical Biochemistry	2.0	-	2.0	2.0
Diagnostic & Therapeutic	Medical Genetics	0.7	-	0.7	0.7
Diagnostic & Therapeutic	Medical Microbiology	3.0	-	3.0	3.0
Diagnostic & Therapeutic	Neuropathology	2.0	-	2.0	2.0
Diagnostic & Therapeutic	Nuclear Medicine	4.2	-	4.2	4.2
Diagnostic & Therapeutic	Radiology - Oncology	11.0	-	11.0	13.1
Diagnostic & Therapeutic	**Subtotal**	**84.7**	**0.5**	**85.2**	**140.8**
Family Medicine/Practice	Emergency Medicine	1.7	-	1.7	6.2
Family Medicine/Practice	General Practitioner	376.6	15.4	392.0	832.4
Family Medicine/Practice	Palliative Medicine	1.9	-	1.9	2.1
Family Medicine/Practice	**Subtotal**	**380.2**	**15.4**	**395.6**	**840.7**
Medical	Cardiology	24.5	-	24.5	33.2
Medical	Community Medicine	1.5	-	1.5	1.8
Medical	Critical Care Medicine	12.9	-	12.9	11.6
Medical	Dermatology	13.2	-	13.2	17.3
Medical	Emergency Medicine	39.2	-	39.2	65.5
Medical	Endocrinology & Metabolism	4.3	-	4.3	5.3
Medical	Gastroenterology	14.1	-	14.1	17.5
Medical	General Internal Medicine	13.3	1.9	15.1	43.5
Medical	Geriatric Medicine	10.2	-	10.2	11.2
Medical	Haematology	8.2	-	8.2	10.6
Medical	Infectious Diseases	6.0	-	6.0	7.1
Medical	Medical Oncology	12.0	-	12.0	17.4
Medical	Nephrology	10.8	-	10.8	17.7
Medical	Neurology	18.1	-	18.1	20.8
Medical	Occupational Medicine	4.6	-	4.6	5.4
Medical	Palliative Medicine	3.0	-	3.0	9.1
Medical	Physical Medicine & Rehabilitation	10.5	-	10.5	11.5
Medical	Psychiatry	85.5	1.0	86.5	129.7
Medical	Psychiatry - Forensic	4.0	-	4.0	4.0
Medical	Respiratory Medicine	7.5	-	7.5	11.8
Medical	Rheumatology	9.0	-	9.0	12.4
Medical	**Subtotal**	**311.1**	**2.9**	**314.0**	**464.4**
Surgical	Anaesthesia	69.7	-	69.7	109.4
Surgical	Cardiac Surgery	8.0	-	8.0	8.0
Surgical	Critical Care Medicine	-	-	-	1.3
Surgical	General Surgery	23.7	1.0	24.6	51.6
Surgical	Gynaecological Oncology	4.0	-	4.0	4.0
Surgical	Neurosurgery	9.1	-	9.1	9.1
Surgical	Obstetrics & Gynaecology	-	-	-	47.6
Surgical	Ophthalmology	26.1	-	26.1	46.6
Surgical	Orthopedic Surgery	20.3	-	20.3	33.9
Surgical	Otolaryngology	15.8	-	15.8	23.7
Surgical	Plastic Surgery	7.3	-	7.3	10.4
Surgical	Thoracic Surgery	4.3	-	4.3	5.5
Surgical	Urology	10.8	-	10.8	16.2
Surgical	Vascular Surgery	3.5	-	3.5	7.4
Surgical	**Subtotal**	**202.8**	**1.0**	**203.8**	**374.7**
	TOTAL	**978.8**	**19.8**	**998.5**	**1,987.6**

Figure 232 DHA9 CDHA Physician Workforce Profile (Source: MSI)

LICENSED SPECIALTY DESCRIPTION (Alphabetic by Category)	STATUS	DHA9-Total$
General Practitioner	By Patient Pcode	70,957,894
General Practitioner	By Provider Pcode	76,572,470
General Practitioner	NET (Export)/Import	5,614,576
General Practitioner	NET % (Export)/Import	8%
Internal Medicine	By Patient Pcode	4,145,023
Internal Medicine	By Provider Pcode	5,177,497
Internal Medicine	NET (Export)/Import	1,032,474
Internal Medicine	NET % (Export)/Import	25%
Psychiatry	By Patient Pcode	2,802,985
Psychiatry	By Provider Pcode	2,970,310
Psychiatry	NET (Export)/Import	167,325
Psychiatry	NET % (Export)/Import	6%
Paediatric General	By Patient Pcode	2,454,993
Paediatric General	By Provider Pcode	3,171,591
Paediatric General	NET (Export)/Import	716,598
Paediatric General	NET % (Export)/Import	29%
Anaesthesia	By Patient Pcode	10,904,696
Anaesthesia	By Provider Pcode	18,542,573
Anaesthesia	NET (Export)/Import	7,637,877
Anaesthesia	NET % (Export)/Import	70%
General Surgery	By Patient Pcode	5,740,518
General Surgery	By Provider Pcode	7,275,584
General Surgery	NET (Export)/Import	1,535,066
General Surgery	NET % (Export)/Import	27%
Obstetrics & Gynaecology	By Patient Pcode	7,222,156
Obstetrics & Gynaecology	By Provider Pcode	6,511,902
Obstetrics & Gynaecology	NET (Export)/Import	(710,253)
Obstetrics & Gynaecology	NET % (Export)/Import	-10%
Opthalmology	By Patient Pcode	9,973,510
Opthalmology	By Provider Pcode	14,944,355
Opthalmology	NET (Export)/Import	4,970,845
Opthalmology	NET % (Export)/Import	50%
Orthopedic Surgery	By Patient Pcode	5,411,371
Orthopedic Surgery	By Provider Pcode	8,088,658
Orthopedic Surgery	NET (Export)/Import	2,677,287
Orthopedic Surgery	NET % (Export)/Import	49%

CDHA (export)/import includes analysis of out-of-province (O.O.P.) (export)/import of services.

Figure 233 DHA9 CDHA Physician Workforce Profile - (Export)/Import – Diagnostic & Therapeutic (Source: MSI)

LICENSED SPECIALTY DESCRIPTION	STATUS	DHA9-Total$
Anatomic Pathology	By Patient Pcode	52,750
Anatomic Pathology	By Provider Pcode	139,522
Anatomic Pathology	NET (Export)/Import	86,772
Anatomic Pathology	NET % (Export)/ Import	164%
Diagnostic Radiology	By Patient Pcode	1,241,333
Diagnostic Radiology	By Provider Pcode	2,279,280
Diagnostic Radiology	NET (Export)/Import	1,037,946
Diagnostic Radiology	NET % (Export)/Import	84%
Haematological Pathology	By Patient Pcode	38,865
Haematological Pathology	By Provider Pcode	107,525
Haematological Pathology	NET (Export)/Import	68,660
Haematological Pathology	NET % (Export)/Import	177%
Medical Genetics	By Patient Pcode	48,360
Medical Genetics	By Provider Pcode	124,772
Medical Genetics	NET (Export)/Import	76,412
Medical Genetics	NET % (Export)/Import	158%
Medical Microbiology	By Patient Pcode	41,070
Medical Microbiology	By Provider Pcode	78,919
Medical Microbiology	NET (Export)/Import	37,849
Medical Microbiology	NET % (Export)/Import	92%
Nuclear Medicine	By Patient Pcode	109,405
Nuclear Medicine	By Provider Pcode	259,553
Nuclear Medicine	NET (Export)/Import	150,147
Nuclear Medicine	NET % (Export)/Import	137%
Neuropathology	By Patient Pcode	1,218
Neuropathology	By Provider Pcode	5,445
Neuropathology	NET (Export)/Import	4,227
Neuropathology	NET % (Export)/Import	347%
Pathology	By Patient Pcode	21,683
Pathology	By Provider Pcode	52,777
Pathology	NET (Export)/Import	31,095
Pathology	NET % (Export)/Import	143%
Pharmacology	By Patient Pcode	67,108
Pharmacology	By Provider Pcode	198,917
Pharmacology	NET (Export)/Import	131,809
Pharmacology	NET % (Export)/Import	196%
Physical Medicine & Rehabilitation	By Patient Pcode	713,268
Physical Medicine & Rehabilitation	By Provider Pcode	1,171,244
Physical Medicine & Rehabilitation	NET (Export)/Import	457,976
Physical Medicine & Rehabilitation	NET % (Export)/Import	64%
Radiology - Oncology	By Patient Pcode	293,875
Radiology - Oncology	By Provider Pcode	561,892
Radiology - Oncology	NET (Export)/Import	268,017
Radiology - Oncology	NET % (Export)/Import	91%

Figure 234 DHA9 CDHA Physician Workforce Profile - (Export)/Import - Medicine (Source: MSI)

LICENSED SPECIALTY DESCRIPTION	STATUS	DHA9-Total$
Cardiology	By Patient Pcode	4,233,008
Cardiology	By Provider Pcode	8,042,883
Cardiology	NET (Export)/Import	3,809,875
Cardiology	NET % (Export)/Import	90%
Clinical Immunology & Allergy	By Patient Pcode	292,266
Clinical Immunology & Allergy	By Provider Pcode	423,575
Clinical Immunology & Allergy	NET (Export)/Import	131,309
Clinical Immunology & Allergy	NET % (Export)/Import	45%
Dermatology	By Patient Pcode	3,175,807
Dermatology	By Provider Pcode	4,005,741
Dermatology	NET (Export)/Import	829,934
Dermatology	NET % (Export)/Import	26%
Emergency Medicine	By Patient Pcode	3,798,632
Emergency Medicine	By Provider Pcode	4,393,758
Emergency Medicine	NET (Export)/Import	595,126
Emergency Medicine	NET % (Export)/Import	16%
Endocrinology & Metabolism	By Patient Pcode	456,832
Endocrinology & Metabolism	By Provider Pcode	625,338
Endocrinology & Metabolism	NET (Export)/Import	168,507
Endocrinology & Metabolism	NET % (Export)/Import	37%
Gastroenterology	By Patient Pcode	3,134,504
Gastroenterology	By Provider Pcode	3,741,947
Gastroenterology	NET (Export)/Import	607,443
Gastroenterology	NET % (Export)/Import	19%
Geriatric Medicine	By Patient Pcode	789,502
Geriatric Medicine	By Provider Pcode	877,835
Geriatric Medicine	NET (Export)/Import	88,333
Geriatric Medicine	NET % (Export)/Import	11%
Haematology	By Patient Pcode	949,424
Haematology	By Provider Pcode	1,974,151
Haematology	NET (Export)/Import	1,024,727
Haematology	NET % (Export)/Import	108%
Infectious Diseases	By Patient Pcode	313,439
Infectious Diseases	By Provider Pcode	450,381
Infectious Diseases	NET (Export)/Import	136,942
Infectious Diseases	NET % (Export)/Import	44%

Figure 235 DHA9 CDHA Physician Workforce Profile - (Export)/Import - Medicine (Source: MSI)

LICENSED SPECIALTY DESCRIPTION	STATUS	DHA9-Total$
Internal Medicine	By Patient Pcode	4,145,023
Internal Medicine	By Provider Pcode	5,624,440
Internal Medicine	NET (Export)/Import	1,479,417
Internal Medicine	NET % (Export)/Import	36%
Medical Oncology	By Patient Pcode	578,457
Medical Oncology	By Provider Pcode	848,720
Medical Oncology	NET (Export)/Import	270,263
Medical Oncology	NET % (Export)/Import	47%
Nephrology	By Patient Pcode	3,039,740
Nephrology	By Provider Pcode	4,452,388
Nephrology	NET (Export)/Import	1,412,648
Nephrology	NET % (Export)/Import	46%
Neurology	By Patient Pcode	1,752,166
Neurology	By Provider Pcode	2,837,469
Neurology	NET (Export)/Import	1,085,304
Neurology	NET % (Export)/Import	62%
Occupational Medicine	By Patient Pcode	657,215
Occupational Medicine	By Provider Pcode	766,305
Occupational Medicine	NET (Export)/Import	109,090
Occupational Medicine	NET % (Export)/Import	17%
Palliative Medicine	By Patient Pcode	274,163
Palliative Medicine	By Provider Pcode	300,390
Palliative Medicine	NET (Export)/Import	26,226
Palliative Medicine	NET % (Export)/Import	10%
Psychiatry	By Patient Pcode	2,802,985
Psychiatry	By Provider Pcode	2,970,310
Psychiatry	NET (Export)/Import	167,325
Psychiatry	NET % (Export)/Import	6%
Psychiatry - Forensic	By Patient Pcode	159,312
Psychiatry - Forensic	By Provider Pcode	176,214
Psychiatry - Forensic	NET (Export)/Import	16,902
Psychiatry - Forensic	NET % (Export)/Import	11%
Rheumatology	By Patient Pcode	548,995
Rheumatology	By Provider Pcode	830,974
Rheumatology	NET (Export)/Import	281,979
Rheumatology	NET % (Export)/Import	51%

Figure 236 DHA9 CDHA Physician Workforce Profile - (Export)/Import – Surgery (Source: MSI)

LICENSED SPECIALTY DESCRIPTION	STATUS	DHA9-Total$
Anaesthesia	By Patient Pcode	10,904,696
Anaesthesia	By Provider Pcode	18,542,573
Anaesthesia	NET (Export)/Import	7,637,877
Anaesthesia	NET % (Export)/Import	70%
Cardiac Surgery	By Patient Pcode	1,236,056
Cardiac Surgery	By Provider Pcode	3,561,221
Cardiac Surgery	NET (Export)/Import	2,325,164
Cardiac Surgery	NET % (Export)/Import	188%
General Surgery	By Patient Pcode	5,740,518
General Surgery	By Provider Pcode	7,275,584
General Surgery	NET (Export)/Import	1,535,066
General Surgery	NET % (Export)/Import	27%
Neurosurgery	By Patient Pcode	729,895
Neurosurgery	By Provider Pcode	1,842,108
Neurosurgery	NET (Export)/Import	1,112,213
Neurosurgery	NET % (Export)/Import	152%
Ophthalmology	By Patient Pcode	9,973,510
Ophthalmology	By Provider Pcode	15,221,204
Ophthalmology	NET (Export)/Import	5,247,694
Ophthalmology	NET % (Export)/Import	53%
Orthopedic Surgery	By Patient Pcode	5,411,371
Orthopedic Surgery	By Provider Pcode	8,088,658
Orthopedic Surgery	NET (Export)/Import	2,677,287
Orthopedic Surgery	NET % (Export)/Import	49%
Otolaryngology	By Patient Pcode	4,445,010
Otolaryngology	By Provider Pcode	6,508,740
Otolaryngology	NET (Export)/Import	2,063,730
Otolaryngology	NET % (Export)/Import	46%
Plastic Surgery	By Patient Pcode	1,939,754
Plastic Surgery	By Provider Pcode	2,724,556
Plastic Surgery	NET (Export)/Import	784,801
Plastic Surgery	NET % (Export)/Import	40%
Thoracic Surgery	By Patient Pcode	457,842
Thoracic Surgery	By Provider Pcode	902,121
Thoracic Surgery	NET (Export)/Import	444,279
Thoracic Surgery	NET % (Export)/Import	97%
Urology	By Patient Pcode	4,307,811
Urology	By Provider Pcode	6,616,688
Urology	NET (Export)/Import	2,308,876
Urology	NET % (Export)/Import	54%
Vascular Surgery	By Patient Pcode	647,598
Vascular Surgery	By Provider Pcode	1,039,331
Vascular Surgery	NET (Export)/Import	391,733
Vascular Surgery	NET % (Export)/Import	60%

Figure 237 DHA9 CDHA Workforce - Age Profile (Source: MSI)

	DHA9							
LICENSED SPECIALTY	**≤30**	**≤40**	**≤50**	**50-54**	**55-59**	**60-64**	**65-69**	**Total**
Diagnostic Radiology		6	24	5	5	10	2	52
General Surgery		6	13	5	3	2	1	30
Internal Medicine		14	8	4	3	2	1	32
Obstetrics & Gynaecology		4	14	4	3	5		30
Ophthalmology		5	7	8	2	3	6	31
Orthopedic Surgery		8	9	2	2	6	2	29
Paediatric General		15	7	5	8	3	1	39
Psychiatry		13	31	16	14	6	6	86
SUBTOTAL	**#**	**56**	**##**	**44**	**32**	**34**	**18**	**336**
% By Age Group		17%	32%	13%	10%	10%	5%	100%
% Age 55+								25%
General Practitioner	1	94	134	87	58	43	29	446
% By Age Group		21%	30%	20%	13%	10%	7%	100%
% Age 55+								29%

27.6.10 Issac Walton Killam Childrens Hospital (IWK)

Functional Specialty Profile

The following profiles are based upon functional specialty and include the population of the Maritimes in total and under age 18.

Figure 238 Physician Workforce Profile – IWK 2009/10 (Source: MSI, PHReD, AFP data, Departmental review)

Category	Functional_Specialty	IWK TOTAL	POP Maritimes (All) / FTE	Pop Maritimes <age18/ FTE
Paediatric - Diagnostic & Therapeutic	Anatomic Pathology	2.2		
Paediatric - Diagnostic & Therapeutic	General Pathology	1.0		
Paediatric - Diagnostic & Therapeutic	Paediatric Diagnostic Radiology	5.9		
Paediatric - Diagnostic & Therapeutic	Paediatric Haematology/Oncology	3.5		
Paediatric - Diagnostic & Therapeutic	Paediatric Medical Genetics	3.0		
Paediatric - Diagnostic & Therapeutic	**Subtotal**	**15.6**	**118,045**	**22,014**
Paediatric - Medical	Paediatric Cardiology	4.2	439,004	81,868
Paediatric - Medical	Paediatric Child Health	0.8	2,458,421	458,462
Paediatric - Medical	Paediatric Clinical Immunology & Allergy	6.0	307,303	57,308
Paediatric - Medical	Paediatric Critical Care	5.4	342,118	63,800
Paediatric - Medical	Paediatric Developmental	4.0	460,954	85,962
Paediatric - Medical	Paediatric Emergency Medicine	4.6	401,163	74,811
Paediatric - Medical	Paediatric Endocrinology & Metabolism	3.0	614,605	114,615
Paediatric - Medical	Paediatric Gastroenterology	1.9	947,470	176,690
Paediatric - Medical	Paediatric General	25.2	73,089	13,630
Paediatric - Medical	Paediatric Haematology/Oncology	2.0	921,908	171,923
Paediatric - Medical	Paediatric Infectious Diseases	4.8	385,456	71,882
Paediatric - Medical	Paediatric Medical Genetics	2.9	633,151	118,074
Paediatric - Medical	Paediatric Medical Microbiology	0.7	2,655,361	495,188
Paediatric - Medical	Paediatric Neonatology	5.4	338,664	63,156
Paediatric - Medical	Paediatric Nephrology	1.0	1,843,816	343,846
Paediatric - Medical	Paediatric Neurology	7.0	263,402	49,121
Paediatric - Medical	Paediatric Palliative	1.7	1,082,447	201,861
Paediatric - Medical	Paediatric Respiratory Medicine	1.8	1,033,835	192,796
Paediatric - Medical	Paediatric Rheumatology	3.5	526,805	98,242
Paediatric - Medical	Psychiatry - Adolescent	10.3	179,511	33,476
Paediatric - Medical	**Subtotal**	**96.2**	**19,166**	**3,574**
Paediatric - Surgical	Paediatric Anaesthesia	15.1	122,389	22,824
Paediatric - Surgical	Paediatric Cardiac Surgery	1.0	1,843,816	343,846
Paediatric - Surgical	Paediatric General Surgery	3.4	547,515	102,104
Paediatric - Surgical	Paediatric Ophthalmology	2.0	906,394	169,030
Paediatric - Surgical	Paediatric Orthopedic Surgery	2.4	764,440	142,558
Paediatric - Surgical	Paediatric Otolaryngology	2.6	707,032	131,852
Paediatric - Surgical	Paediatric Plastic Surgery	1.0	1,844,733	344,017
Paediatric - Surgical	Paediatric Urology	2.1	868,737	162,008
Paediatric - Surgical	**Subtotal**	**29.6**	**62,273**	**11,613**
Surgical	Anaesthesia			
Surgical	Cardiac Surgery			
Surgical	Critical Care Medicine			
Surgical	General Surgery			
Surgical	Gynaecological Oncology			
Surgical	Neurosurgery			
Surgical	Obstetrics & Gynaecology	23.4		
Surgical	Ophthalmology			
Surgical	Orthopedic Surgery			
Surgical	Otolaryngology			
Surgical	Plastic Surgery			
Surgical	Thoracic Surgery			
Surgical	Urology			
Surgical	Vascular Surgery			
Surgical	**Subtotal**	**23.4**		
	TOTAL	**164.8**		
	TOTAL ex. O&G	**141.4**	**13,037**	**2,431**

For an analysis of services provided by IWK physicians to out-of-province patients see Sections 16.1 and 16.2.

27.7 Detailed Submissions

The following are detailed submissions who's length prohibited their inclusion verbatim in this Report.

27.7.1 CBHA

"CBHA Physician Resource Plan, July 2011.pdf"

27.7.2 IWK

"July, 2011- IWK Physician Resource Plan.pdf"

27.7.3 DFM - Chair Department of Medicine

"July, 2011 DFM Department of Medicine, NS PRP SUBMISSION.pdf"

27.7.4 DFM – Department of Medicine – Chief, Division of Cardiology

"July, 2011-DFM Department of Medicine – Chief, Division of Cardiology.pdf"

27.7.5 DFM - Chair Department of Psychiatry

"Suggestions from the Dalhousie Department of Psychiatry on developing a Physician Resource Plan for Nova Scotia (Considerations Regarding the Optimal Number of Psychiatrists for CDHA, IWK and the Maritimes) July 6, 2011.pdf"

27.7.6 DFM – Chair Department of Emergency Medicine

"July, 2011, Dr. David Petrie, Physician Resource Planning in Nova Scotia, Emergency Medicine.pdf"