

Health Care for an Aging Population

A Study of how Physicians Care for Seniors in Canada



Table of contents

Executive summary	3
Acknowledgment	5
Background	6
An aging population.....	6
Health status.....	8
Access to care	9
Why this study?	10
Methods	11
Data sources	11
Study population	12
Metrics.....	14
Limitations	15
Findings	16
Physicians’ participation in seniors’ care	16
Most of the physician workforce provides care to seniors.....	16
Volume and intensity of services	18
Seniors receive relatively more physician services	18
Family physicians provide about half of all seniors’ medical services	19
A few specialties provide most medical care to seniors	19
Some specialties are more intensively focused on care for seniors	20
Types of service delivery	21
Seniors receive more of almost every type of service, but to varying degrees	21
Discussion	23
Participation in seniors’ care varies based on patient age	23
Several disciplines supply the vast majority of seniors’ medical care.....	24
Specialties differ in terms of service volume and intensity of seniors’ care	24
Gender plays a role in delivery of services to seniors	25
Receiving the care that’s needed, where it’s needed	26
Practice reflections	27
View from the front lines: how <i>Care of the Elderly</i> family physicians care for seniors	28
View from the front lines: how geriatricians care for seniors	29
View from the front lines: how ophthalmologists care for seniors	30
Conclusion	31
References	32
Appendix 1	34
Appendix 2	35
Appendix 3	36

REPORT AUTHORS:

STEVE SLADE

Director, Health Policy and Advocacy

ARUN SHRICHAND, MPA(M)

Manager, Health Policy and Advocacy

SHANNA DIMILLO, MBNF

Senior Data and Research Analyst, Health Policy and Advocacy

SUGGESTED CITATION:

Slade, S., Shrichand, A., & DiMillo, S. 2019. *Health Care for an Aging Population: A Study of how Physicians Care for Seniors in Canada*. Ottawa, Ontario. The Royal College of Physicians and Surgeons of Canada.

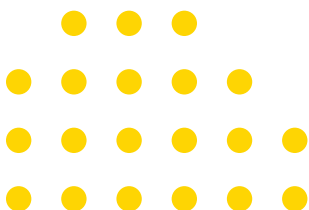
Executive summary

Canadians are living longer; but at the same time, seniors face a variety of health conditions that are oftentimes chronic, complex and require coordination across multiple caregivers. At present, there is a lack of data to study the full breadth of care that seniors receive. However, as a start and possible impetus for further research, it is possible to look at physicians' provision of medical care to seniors.

This report uses data from the Canadian Institute for Health Information's (CIHI) National Physician Database (NPDB). The NPDB contains comprehensive fee-for-service (FFS) medical service data for family medicine and specialist physicians throughout Canada. Study results feature a series of key metrics that provide an overview of how the physician workforce cares for seniors. They were achieved by analyzing more than 216 million medical services provided by almost 54,000 physicians in 2015-16.

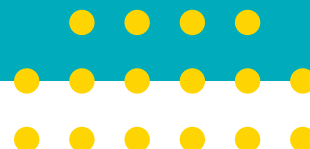
Study metrics are broken down by medical specialties and patient age groups, and focus on four main areas:

- the percentage of physicians who provide care to seniors,
- the volume of services provided to seniors,
- the intensity with which specialties focus their service delivery on seniors, and
- the types of medical care physicians provide to seniors.



Findings from this study illustrate how physicians care for seniors, outlining the unique roles specialties play in this important area of health care delivery. There are several examples:

- Across all specialty groups, the vast majority of physicians provided care to seniors (87-98%).
- Physicians were less likely to provide care to very old patients. For example, 94% of internists provided care to patients aged 65-69, but only 66% provided care to patients over the age of 94.
- Three specialty groups accounted for 85% of all medical services provided to seniors: Family Medicine (51%), Internal Medicine (23%) and Ophthalmology (11%).
- Seven specialty groups provided more than half of their medical services to seniors: Geriatric Medicine (92%), Ophthalmology (62%), Cardiovascular/Thoracic Surgery (57%), Nephrology (55%), Oncology (54%), Cardiology (53%) and Urology (52%).
- On a per capita basis, physicians provided relatively more services to men than to women, especially among progressively older patient groups. The per capita number of medical services was about the same for men and women aged 65-69. However, among the population aged 80-84, males received 15% more services per capita; and among the oldest segment of the population, those over the age of 94, males received 23% more medical services compared to women.
- Seniors use relatively more services per capita compared to the rest of the population, especially services related to diagnostic and therapeutic procedures (four times more), major surgery (five times more) and hospital care days (10 times more).



Findings from this study provide new insight on how the physician workforce provides care to seniors, but they also point to areas where future research is needed. Population demographics make it less likely for physicians to see very old patients, but health system developments, like increased investment in home care, could increase the frequency of contact between physicians and older seniors.

This study shows how physicians make unique contributions to seniors' care. At present, family physicians account for the majority of medical services provided to seniors. At the same time, other specialists — like geriatricians, oncologists and ophthalmologists — are intensively focused on the delivery of care to seniors. The simultaneous and continued evolution of population demographics, the emergence and prevalence of health conditions, investment in and development of health systems, and preventive and therapeutic practices, will impact and shape how the physician workforce optimally cares for Canada's seniors. Looking forward, service volume and intensity metrics developed through this study

could be useful in future research on the broad delivery of care to seniors, including the unique roles of specialists in the provision and coordination of care for seniors with multiple, chronic and complex health conditions.

The Royal College of Physicians and Surgeons of Canada is deeply aware of the unique contributions of a very broad range of health care providers in the delivery of care to seniors. Patients (and older adults, in particular) receive care from paid and unpaid health workers, and by regulated and unregulated health care providers. At this time, there is a lack of robust data to carry out a thorough and integrated analysis of seniors' health care needs, the unique and coordinated efforts of providers in caring for seniors, and how patients' health care experiences translate into individual health outcomes and population health status. Nevertheless, knowledge can be gained from data that is currently at hand, and we hope that this study will generate new insight and inspire future research on how Canada can care for its aging population, now and in the future.



Acknowledgment

Parts of this material are based on data and information provided by the Canadian Institute for Health Information. However, the analyses, conclusions, opinions and statements expressed herein are those of the authors and not those of the Canadian Institute for Health Information.

Background



Patient and population health needs change over time and, in response, the health care system establishes priorities to address emerging needs. In the recent past, Canada's federal-provincial-territorial (FPT) governments established the 2004 Health Accord to improve patient access to health care services, such as sight restoration, joint replacement and cancer care. At the end of the Health Accord's 10-year term, and following the 2015 federal election, new FPT bilateral agreements were negotiated to give increased attention to mental health care, palliative care and home care.

While health care priorities evolve, the aging population is of sustained interest and permeates the goals of FPT governments and other organizations. In June 2017, the Senate of Canada called on FPT governments to develop a national strategy to control spending growth while ensuring appropriate and accessible care for Canada's aging population (Senate of Canada, 2017). As recent as July 2018, the Government of Canada created the new Ministry for Seniors and Accessibility. It is mandated, in part, to address the health care needs of older adults. The Canadian Medical Association's ongoing *Demand a Plan* campaign also calls for a multifaceted effort to implement a health care system that responds to the needs of seniors. These recent developments suggest that the health of seniors — and their access to health care — will be of continued interest for years to come.

Efforts to build a more responsive health care system for an aging population must involve some initial evidence and knowledge about how seniors are being cared for today. Although a starting point, the baseline information in this report can shed light on the types of health care services that

seniors receive. It will also catalyze thinking and discussion about the effectiveness of services for older patients, particularly those with multiple, chronic and complex health conditions. As a contribution to current literature, the following analysis underscores the importance of additional research to understand the needs of seniors as a first step in addressing health care gaps, both now and in the future.

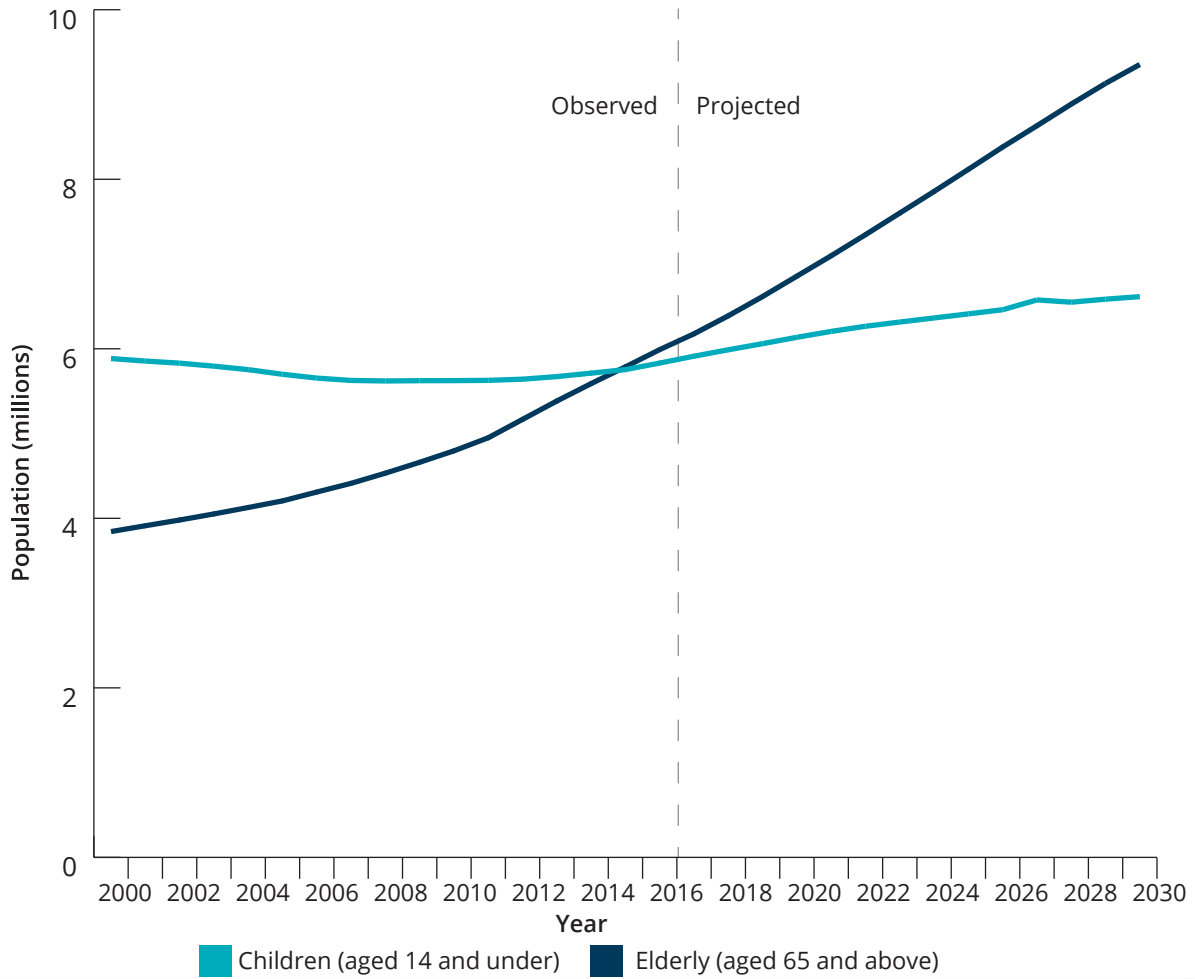
An aging population

Canada and other countries across the globe continue to witness significant growth in the proportion of seniors¹ in their populations (United Nations, 2015). Since the turn of the century, there has been a 56% increase in the population aged 65 and over in Canada. In 2016, approximately 16% of the population was 65+. As illustrated in Figure 1, the number of seniors in Canada has now surpassed that of children. Moreover, growth in the population aged 65+ is projected to accelerate at a pace that will widen this gap.

¹ For the purposes of this report "seniors" refers to the population aged 65+, unless otherwise noted. Further details as to terminology and definition of the study population are given in the Methodology section of this report.

FIGURE 1

Observed and projected population for Canadian children and seniors. *Source: Statistics Canada.*
Table 17-10-0005-01; Table 17-10-0057-01 (M1 Medium Growth scenario)

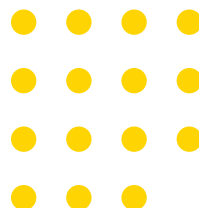


Health status

Overall, Canadians are living longer, healthier lives compared to prior generations (Canadian Institute for Health Information, 2011a). This trend is fueled by a variety of factors, such as higher socio-economic status; improved health behaviours related to diet, exercise and smoking; advances in medical technology; and general progress in the detection, diagnosis and management of disease (McColl, Shortt, Gignac, & Lam, 2011). However, the aging population is not without health risks and chronic conditions.

- Nearly 90% of new cancer cases occur among those aged 50 and over, and the highest proportion of cancer deaths (34.1%) will occur in Canadians aged 80 years and older (Canadian Cancer Society, 2018).
- Disability rates increase with age: 26% among those aged 65-74 and 43% among those over the age of 75 (Statistics Canada, 2013).
- Five to 10% of seniors will experience depression that requires treatment (Mood Disorders Society of Canada, 2010).
- Abuse affects four to 10% of older adults in Canada. Only one in five incidents of elder abuse comes to the attention of those who can help (Public Health Agency of Canada, 2012).
- As of 2016, there are an estimated 564,000 Canadians living with dementia. The prevalence is highest (42.5%) among those aged 75 or older (Chambers, Bancej & McDowell, 2016).
- Seniors accounted for nearly a quarter of all hospitalizations for opioid poisoning in 2014-15, even though this age group represented only 16% of the Canadian population (Canadian Institute for Health Information, 2016).

The prevalence of multiple chronic conditions adds an additional layer of complexity to the provision of seniors' care. Three out of four seniors report having one or more chronic conditions and about one quarter report having three or more (Canadian Institute for Health Information, 2011b). Moreover, those with three or more chronic conditions have poorer self-reported health status and use three times more health care services compared to seniors with no chronic health conditions (Canadian Institute for Health Information, 2011b). Patients with multiple chronic conditions — such as diabetes, arthritis, chronic obstructive pulmonary disease and dementia — may see a variety of caregivers simultaneously during a given time period in their lives. The prevalence of multiple health conditions among seniors underscores the need for effective inter- and intra-professional practice within the health system.

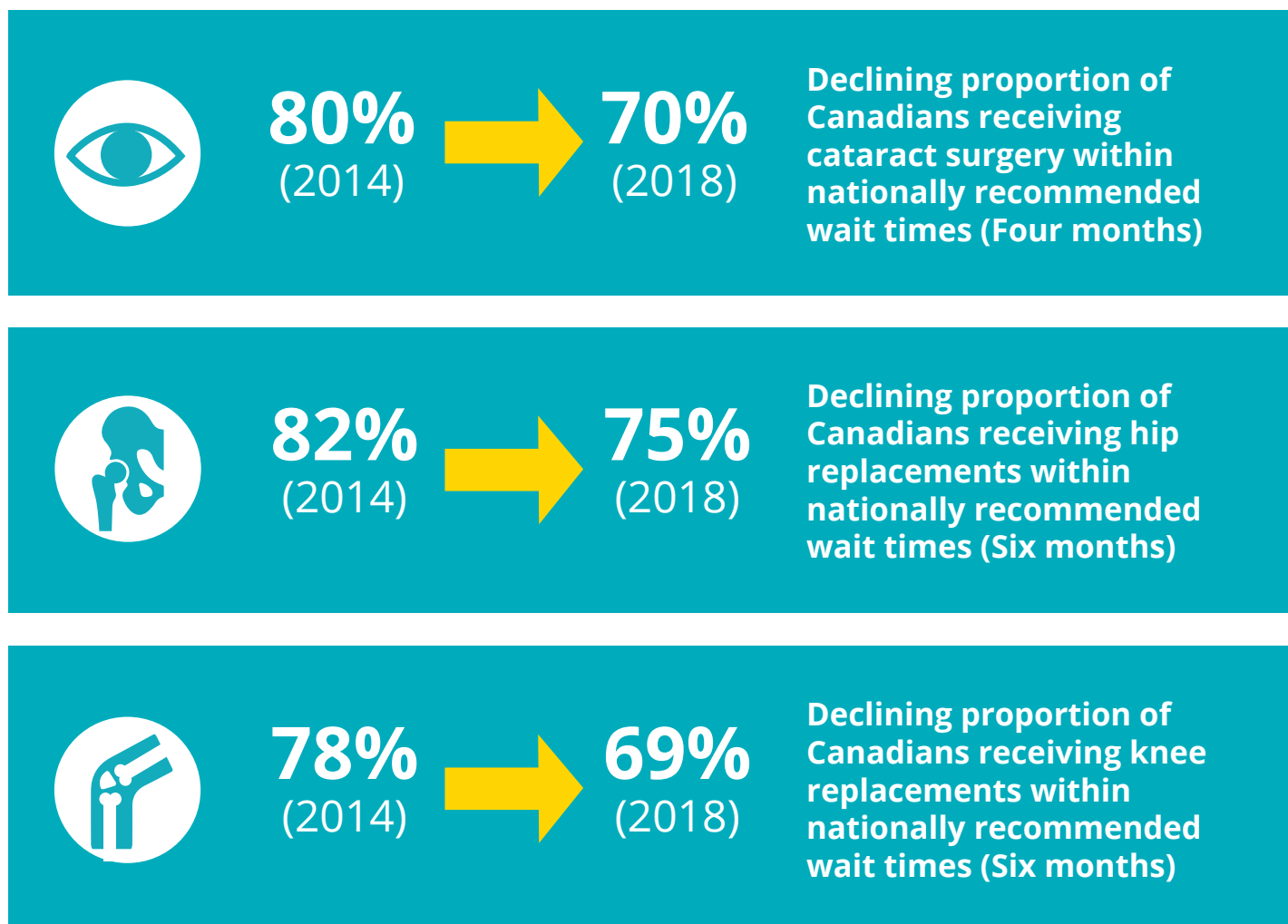


Access to care

Timely access is a significant consideration in the provision of care to Canada's aging population. In an international survey, half of older Canadians (aged 55 and above) indicated that they found it very or somewhat difficult to get medical care in the evenings, weekends or on holidays unless they went to an emergency department (Canadian Institute for Health Information, 2018a). Additionally, among the 11 countries surveyed, older Canadians were found to be less likely to have timely access to primary health care and to wait the longest to see specialist physicians.

Over half of respondents reported waiting a minimum of two days for a primary care visit and a quarter waited at least two months to see a specialist physician.

Furthermore, there are mounting concerns regarding access to interventions such as cataract surgery, and hip and knee replacements — procedures that are more common among seniors. In 2018, fewer Canadians were receiving these interventions within national wait time benchmarks compared to 2014 (Canadian Institute for Health Information, 2019). As illustrated below, Canadians are experiencing sustained access issues.



Source: Canadian Institute for Health Information, 2019.

Why this study?

Canada's population aged 65 and older has been growing steadily for decades, but there is relatively little data and information about how the health workforce cares for seniors. Some studies have looked at the provision of care to seniors by health care professionals, generally focusing on specific health care professions (Canadian Institute for Health Information, 2011a; Frank, CC, Feldman, S, & Wyman, R, 2018; Canadian Nurses Association, 2014a, 2014b, 2014c; Turcotte, M, Sawaya, C, 2015). Others have looked at care provided to seniors by family, friends and other unpaid workers (Health Quality Ontario, 2016; Turcotte, M, 2013). However, there are no comparable statistics on care of older adults by physicians, nurses, personal support workers, physiotherapists, pharmacists, social workers and other health care providers. Data is not available to describe the types of care these providers offer to older adults, how much they do and how they work together. Thus, while seniors comprise about 16% of Canada's population and account for 45% of health care spending (Canadian Institute for Health Information, 2018b), there is an absence of data to carry out a thorough analysis of health care delivery for seniors.

While there are significant data and information gaps, untapped resources can provide new insight on medical care for seniors. The Canadian Institute for Health

Information's (CIHI) National Physician Database (NPDB) contains comprehensive information about medical care services provided through provincial fee-for-service (FFS) payment systems. The NPDB offers longitudinal data that can be broken down by patient age group and type of medical service. Large gaps remain with respect to the broad spectrum of health care professionals who care for seniors, but it is possible to describe in some detail what physicians do.

As an initial step, this study makes use of available data about physicians currently caring for seniors, to inform a more optimal health care system now and in the future.

The study hones in on a series of key questions including

- which specialties are most likely to provide care to patients aged 65+,
- how intensively do physicians focus their practices on care for seniors, and
- what types of medical care do they provide?

The findings provide new insight that could spark the broader, more comprehensive research needed to understand how Canada's health system cares for seniors and how it might in the future.



Who provides most of the medical care to seniors?

Which specialists spend most of their time caring for seniors?

What types of medical services do seniors receive from physicians?

Methods

Data sources

This study uses the Canadian Institute for Health Information's (CIHI) National Physician Database (NPDB) to analyze fee-for-service (FFS) care provided to patients aged 65+ (Canadian Institute for Health Information, 2015a). All provinces and territories submit files to the NPDB on a quarterly basis and data is aggregated to produce a national summary.

An NPDB record contains the sum of payments and services for a specific fee code, for an individual physician, for a defined patient age-gender group, in a given year.

To facilitate research and analysis, CIHI maps all provincial-territorial medical service fee codes to a set of medical care areas, referred to as National Grouping System (NGS) categories (see Appendix 1). To account for cross-jurisdiction fee code variability, CIHI employs a variety of adjustment methodologies that produce standardized, national-level service counts. Finally, each individual physician within the NPDB is assigned to one of the medical specialties listed in Appendix 2. Further methodological information is available in CIHI's annual NPDB report (Canadian Institute for Health Information, 2015b).

Aggregate level NPDB data was requested from CIHI to analyze the utilization of medical services by population age groups over the time period 2002-03 to 2015-16. As an initial analysis of the data, this report focuses on the most recent data year: 2015-16.

Per capita medical service utilization rates were calculated as part of the analysis. Population estimates from Statistics Canada, stratified by age group and sex, were used to carry out this part of the analysis (see Appendix 3) (Statistics Canada, 2015).

The following inclusion/exclusion criteria were used for this study:

- Eight provinces were included in the analysis (Newfoundland and Labrador, Nova Scotia, New Brunswick, Ontario, Manitoba, Saskatchewan, Alberta and British Columbia).
- Northwest Territories and Nunavut were excluded, as physician-level data was not available for these jurisdictions.
- Prince Edward Island and Yukon were also excluded, as future research based on the requested data may cover multiple years for which these jurisdictions did not submit data.
- Quebec data could not be shared for this study because of the agreement between the Government of Quebec and CIHI.
- CIHI excludes anesthesia, radiology, laboratory and non-physician services due to data inconsistencies between different jurisdictions.
- The NPDB only covers FFS billing data. Alternative forms of reimbursement are excluded (e.g. salary, capitation). Reciprocal billing payments are included.

Study population

This study focuses on the National Physician Database (NPDB) medical services that were provided to patients aged 65 and older. For ease of reading, this patient age group is referred to using a number of terms including, but not limited to, “seniors” and “older adults.” Studies referenced in this report may or may not use age 65 as the starting point for defining seniors. If referenced studies use a different age range to describe older adults, the age range is noted when referencing the study. Furthermore, the results of other studies are not meant to be compared to this study’s results; rather, they are quoted to provide relevant context and information.

This study used age 65 as a starting point to define the senior population for a number of reasons:

- Age 65 is a commonly used starting point for research related to older adults including in many studies referenced throughout this report (Chambers, Bancej & McDowell, 2016; Canadian Institute for Health Information, 2011a).
- Sixty-five is the age at which citizens are eligible to receive the full value of their federal Canadian Pension Plan income, making it an approximate age of retirement for many Canadians — the average age of retirement was 64 years old in 2018 (Statistics Canada, 2019).
- Statistics Canada uses age 65 as a reference point for its population count and growth estimates (see Figure 1).

Finally, there is an empirical reason to use age 65 to delineate seniors when using NPDB data. When looking at the adult population, the per capita number of NPDB services generally increases for adult population age groups (see Figure 2a). However, as shown in Figure 2b, the percentage increase of per capita use of NPDB services peaks for the age group of 65-69, when consecutive age groups are compared to the previous age group (adults aged 45-94). In other words, per capita consumption of medical services increases steadily for adult populations aged 45-94, but the rate of increase peaks among those aged 65-69. Thus, this study uses age 65 as a starting point to define seniors, for both practical and empirical reasons.

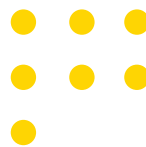


FIGURE 2A

Per capita services by adult patient age group, 2015-16. Source: *Canadian Institute for Health Information, National Physician Database, 2015-16.*

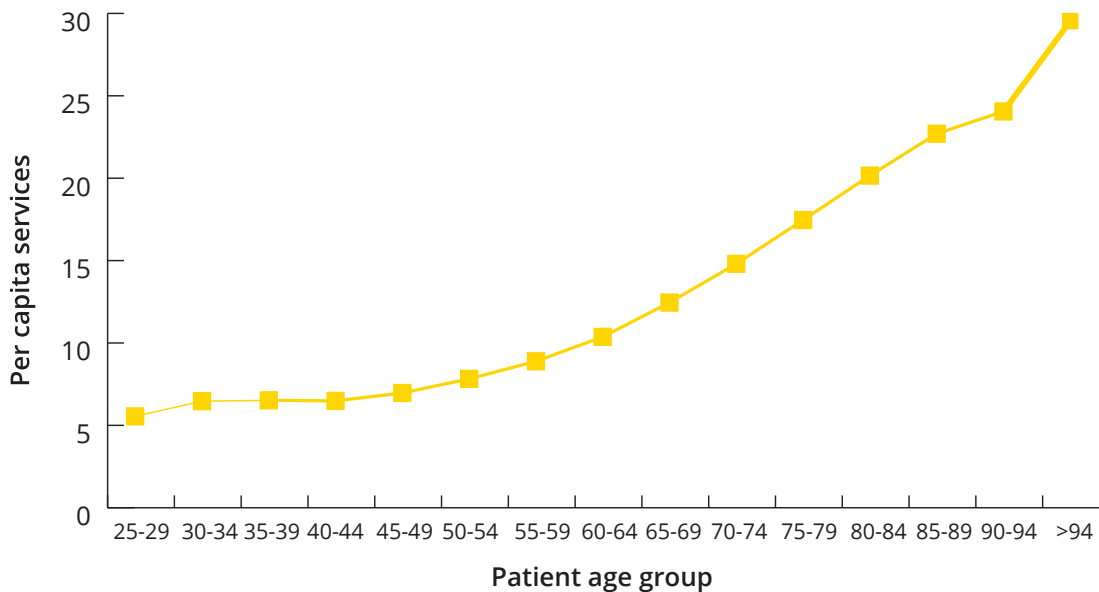
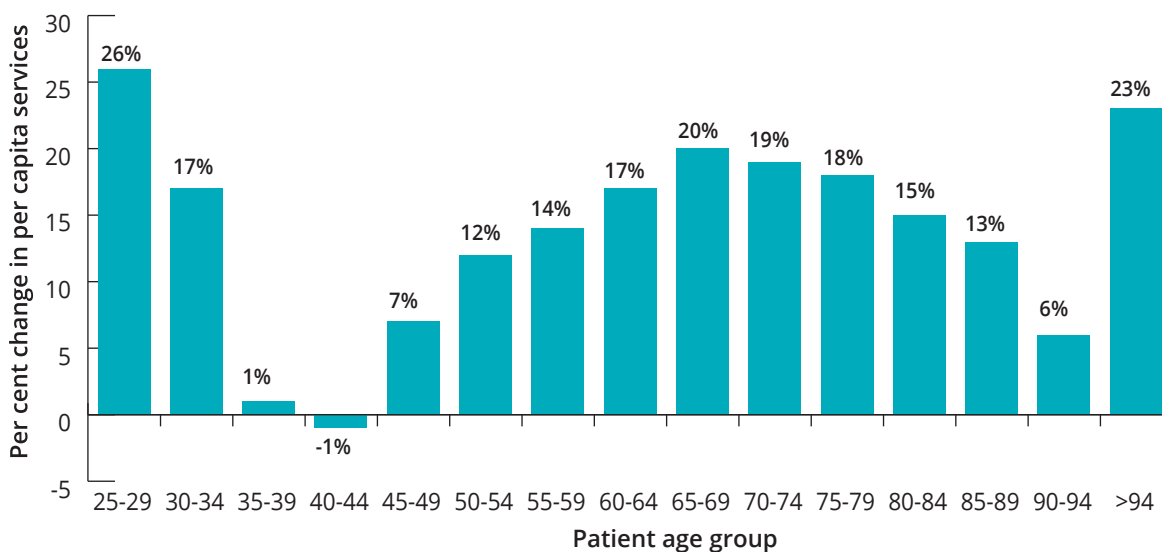


FIGURE 2B

Per cent change in per capita services compared to previous age group, by adult patient age group, 2015-16. Source: *Canadian Institute for Health Information, National Physician Database, 2015-16.*

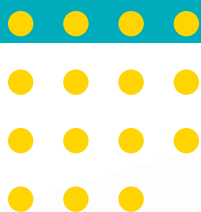


Metrics

Primary outcome measures were derived from the National Physician Database (NPDB) physician counts and the National Grouping System (NGS) adjusted service counts. Analysis was stratified by physician specialty group, aggregated five-year patient age groups (e.g. 65-69), patient gender (e.g. male, female) and service type (i.e. broad and detailed NGS categories). Physician service provision was characterized using several metrics. These included participation rates, service volumes, per capita services, intensity of service delivery and types of services.

Study metrics are defined as follows:

- **Participation rates:** The percentage of physicians within specialties who provided medical services to patients aged 65+.
- **Service volume:** The overall number and percentage of services provided to patients aged 65+.
- **Per capita services:** The number of services per-person utilized by segments of the population, defined by patient age-gender categories. This metric uses NPDB medical service counts and Statistics Canada population estimates for the eight provinces included in the study.
- **Intensity of service delivery:** This metric describes the percentage of total services a specialty subgroup provided to patients aged 65+.
- **Types of service:** Expressed as volumes, percentages and per capita rates; “type of service” metrics describe the types of care physicians provided using NGS categories (e.g. diagnostic and therapeutic services, cataract surgery).



Limitations

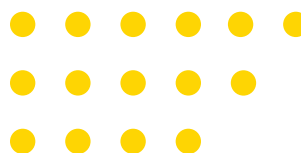
A number of limitations apply to this study. Data from the National Physician Database (NPDB) is only available to non-Canadian Institute for Health Information (CIHI) researchers at a geographically aggregated level. CIHI is not at liberty to share person-level NPDB data that identifies the individual physician's province/territory. Thus, the data does not permit a more detailed analysis of medical service trends within individual provinces and territories. While study results are based on a comprehensive pan-Canadian medical service database, aggregate-level findings may not reflect physician service provision within provinces, territories and their sub-regions.

At present, CIHI's NPDB is largely based on physician services remunerated through fee-for-service (FFS) systems. Medical service research based on the NPDB does not cover physician services paid through salary, contract, capitation and other non-FFS payment programs. As such, medical care provided to seniors outside of FFS payment systems is not reflected in the results of this study. This data gap, and the possible bias associated with it, is particularly relevant when analyzing specialty groups that provide relatively higher proportions of care outside of FFS payment systems. For example, medical services provided by physician-specialists who are paid through capitation

payment plans, including the provision of care to seniors with multiple, chronic and complex conditions, are not included in the NPDB's FFS data. However, among the eight provinces included in this study, FFS payments account for 52-87% of all clinical payments made to physicians in 2015-16 (Canadian Institute for Health Information, 2015b). Thus, the NPDB includes almost all physicians and, while it does not cover non-FFS care, the majority of physician payments are made through FFS systems.

Sourced from administrative payment systems, NPDB data reflects the *actual* provision of services by physicians. Utilization results derived from the NPDB do not necessarily reflect the adequacy or appropriateness of medical services received by patients. In terms of meeting patient needs, NPDB data may reflect under, over or optimal medical service delivery. Again, the NPDB captures *actual* utilization and does not necessarily reflect patients' need for physician services, let alone their need for the broad range of services offered by other health care providers.

In spite of these limitations, this study endeavours to make the best use of data that is at hand. While comprehensive, multi-provider data is still lacking, the study findings offer new insight on how physicians currently try to meet the health care needs of seniors.



Findings

Physicians' participation in seniors' care

Most of the physician workforce provides care to seniors

In 2015-16, most physicians provided medical care to patients aged 65+, but participation rates varied across specialties and patient age groups. For example, as shown in Figure 3, the vast majority of family physicians, internists, geriatricians and ophthalmologists provided care to patients aged 65-69 (i.e. 87-98%). Family Medicine, Internal Medicine and Ophthalmology all show declining participation rates across progressively older patient age groups. However, the downward gradient is steeper for family physicians and internists, compared to ophthalmologists: two-thirds of family physicians and internists provided care to patients over the age of 94, compared to 90% of ophthalmologists. In fact, of all four specialty groups shown in Figure 3, ophthalmologists were the most likely to provide care to patients over the age of 94.

The participation rate pattern is different for Geriatric Medicine. Increasingly higher percentages of geriatricians provided care to patient age groups ranging from 65-69 to 85-89. Eighty-seven per cent of geriatricians provided care to patients aged 65-69 and 96% provided care to patients aged 85-89.

Like the other specialties shown in Figure 3, geriatricians were increasingly less likely to provide care to patients over the age of 94. While the vast majority of physicians care for seniors, there is some variability in participation rates across specialties and in the provision of care to older patient age groups.

Physicians were also more likely to provide care to older female patients compared to male patients, especially with respect to the very aged. As shown in Figure 3, 94% of family physicians provided care to female patients aged 65-69 and 93% provided care to male patients in the same age group. However, for the oldest patient age group (those older than 94) 63% of family physicians provided care to female patients and only 45% provided care to male patients. This pattern was similar for ophthalmologists, with a lower percentage providing care to male patients over the age of 94 (80%) as compared to female patients in the same age range (90%). Again, participation rates in the provision of care to older adults varied across physician specialty groups and across patient age-gender groups.

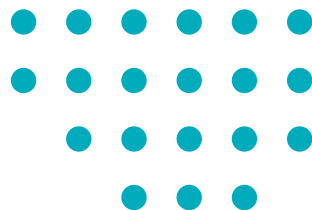
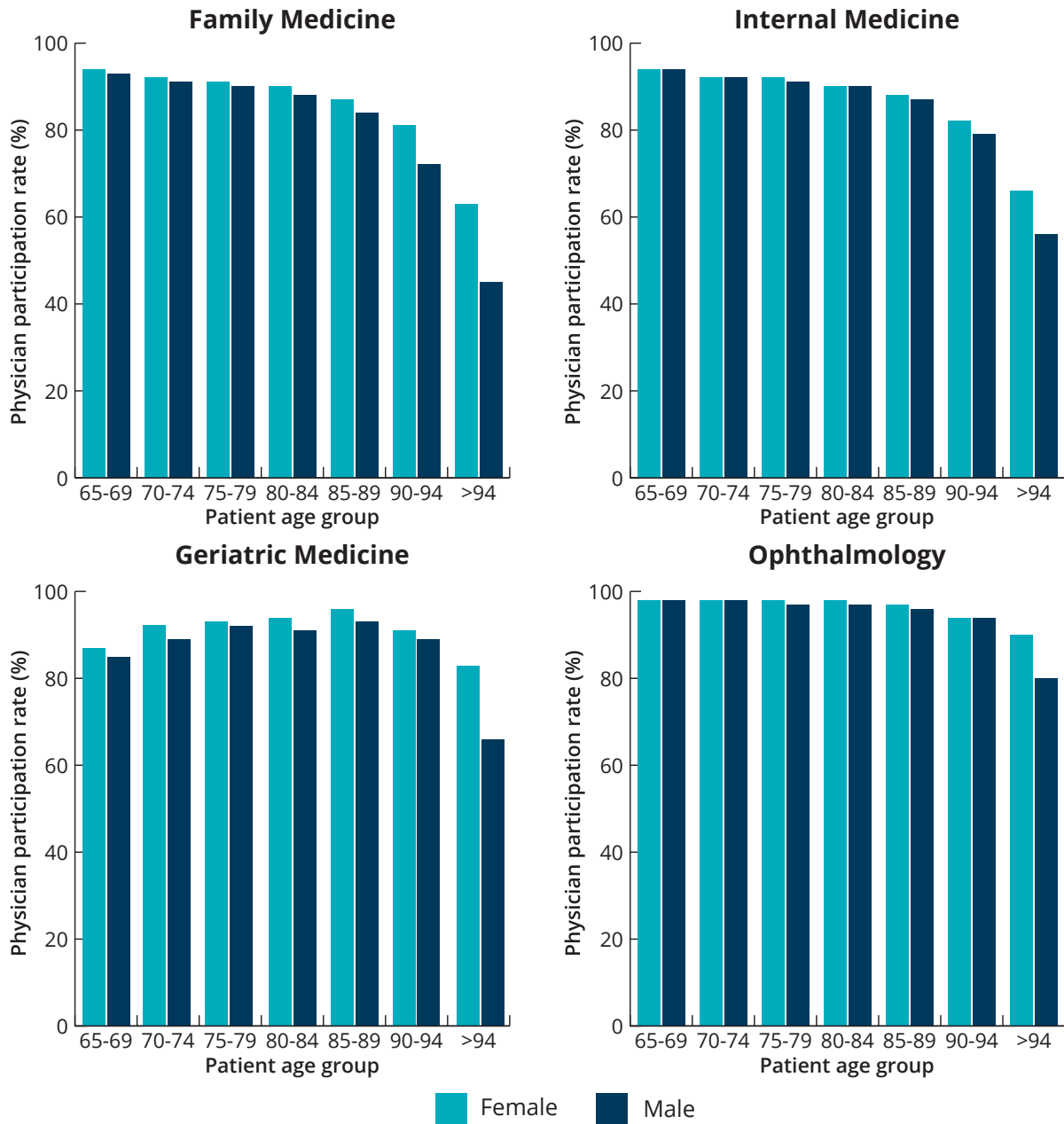


FIGURE 3

Physicians' participation rates in the care for seniors by patient age and gender: Family Medicine, Internal Medicine, Geriatric Medicine and Ophthalmology, 2015-16. Source: *Canadian Institute for Health Information, National Physician Database, 2015-16.*



Volume and intensity of services

In 2015-16, approximately 216 million physician services were delivered to Canadians in the eight provinces included in this study. Over 70 million of those services were provided to patients aged 65+.

Seniors receive relatively more physician services

On a per capita basis, seniors receive more physician services as compared to younger Canadians. In 2015-16, 16% of the population in the eight study provinces was aged 65+ and they received approximately 32% of all medical services in those provinces. The per capita number of services for patients aged 65+ was 2.6 times higher than for the population aged less than 65 (16.3 services per population versus 6.3 services per population, respectively).

Medical service utilization rates increased steadily among progressively older patient groups. As shown in Figure 4, patients over the age of 94 consumed more than twice as many services on a per capita basis compared to those aged 65-69 (29.5 services per population versus 12.5 services per population, respectively).

The data also shows that, among seniors, males received progressively more services per capita compared to females (see Figure 4).

For example, in 2015-16

- males aged 65-69 received 2% more services per capita compared to females in the same age group (12.6 versus 12.3).
- males aged 80-84 received 15% more services per capita compared to females in the same age group (21.8 versus 18.9).
- males aged over 94 received 23% more services per capita compared to females in the same age group (34.5 versus 28.1).

Seniors received about one-third of all physician services

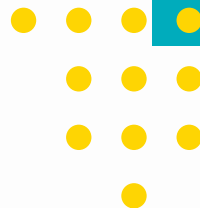
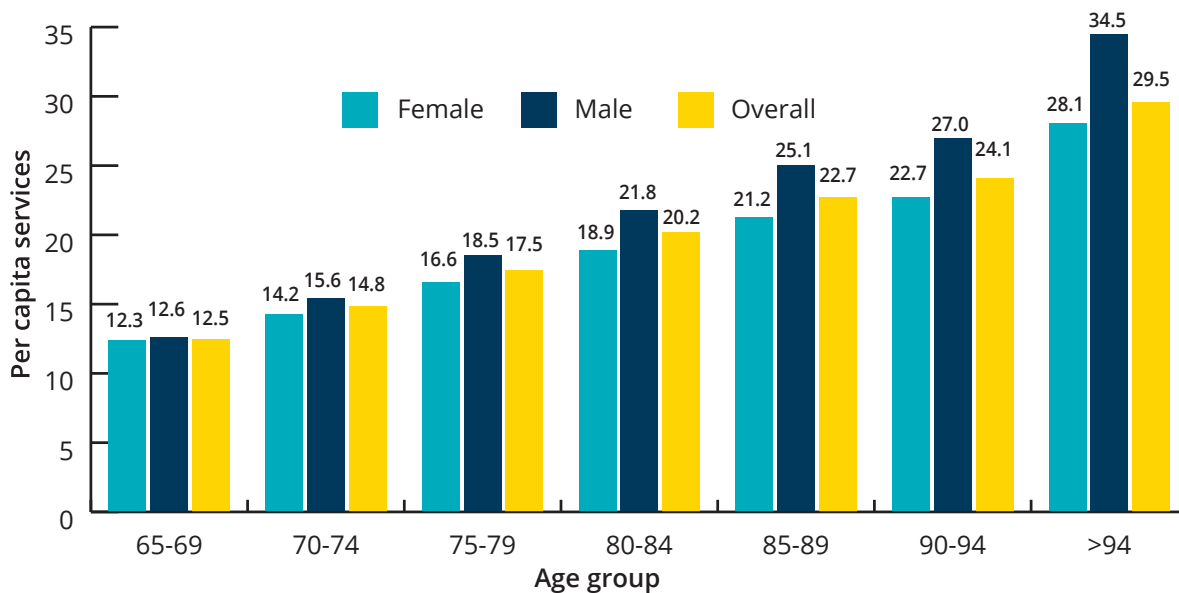


FIGURE 4

Per-capita services by patient age and gender, 2015-16. Source: *Canadian Institute for Health Information, National Physician Database, 2015-16.*



Family physicians provide about half of all seniors' medical services

As shown in Table 1, family physicians comprise 57% (n=30,515) of all physicians included in the 2015-16 study data. They also provided 57% (n=122.23 million) of all fee-for-service care in the study year. At just over 35 million services, family physicians delivered 51% of all services provided to patients aged 65+ in 2015-16. This was the highest volume of services provided to seniors among all specialty groups. Almost one-third (29%) of all family physicians' services were provided to patients aged 65+ (see Table 1).

A few specialties provide most medical care to seniors

Notwithstanding their relatively smaller workforce numbers, a few specialty groups account for most of the medical and surgical care seniors receive. In 2015-16, Internal Medicine and Internal Medicine subspecialists comprised 13% of all physicians in this study, but they provided 23% of all services received by patients aged 65+ (see Appendix 2 for a listing of Internal Medicine subspecialties). Similarly, ophthalmologists comprised 2% of the physician workforce in this study but they provided 11% of all services received by seniors in 2015-16. Together, family physicians, internists and ophthalmologists provided 85% of all physician services for seniors in 2015-16 (see Table 1).

Family physicians, internists and ophthalmologists provided 85% of all physician services for seniors in 2015-16

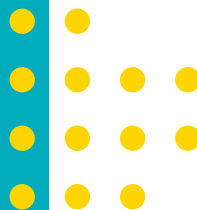


TABLE 1

Number and percentage of physicians and senior care services provided by physician specialties, 2015-16.

	Number of physicians	Per cent of physicians (%)	Total number of services (millions)	Percentage of total services (%)	Number of services provided to 65+ (millions)	Percentage of services provided to 65+ (%)	Percentage of total services provided to 65+ (%)
Family Medicine	30,515	56.8%	122.23	56.5%	35.45	50.5%	29.0%
MEDICAL SPECIALTIES							
Dermatology	418	0.8%	4.25	2.0%	1.49	2.1%	35.1%
Internal Medicine	7,184	13.4%	33.35	15.4%	15.91	22.6%	47.7%
Neurology	762	1.4%	1.85	0.9%	0.59	0.8%	31.9%
Pediatrics	2,676	5.0%	6.48	3.0%	0.07	0.1%	1.1%
Physical Medicine and Rehabilitation	383	0.7%	1.00	0.5%	0.39	0.6%	39.0%
Psychiatry	3,935	7.3%	9.12	4.2%	1.29	1.8%	14.1%
SURGICAL SPECIALTIES							
General Surgery	1,669	3.1%	5.39	2.5%	2.07	2.9%	38.4%
Neurosurgery	249	0.5%	0.36	0.2%	0.13	0.2%	36.1%
Obstetrics/Gynecology	1,725	3.2%	6.95	3.2%	0.40	0.6%	5.7%
Ophthalmology	979	1.8%	12.29	5.7%	7.63	10.9%	62.1%
Orthopedic Surgery	1,320	2.5%	4.36	2.0%	1.52	2.2%	34.9%
Otolaryngology	563	1.0%	3.61	1.7%	1.00	1.4%	27.7%
Plastic Surgery	478	0.9%	1.53	0.7%	0.45	0.6%	29.4%
CVT Surgery*	323	0.6%	0.69	0.3%	0.39	0.6%	56.5%
Urology	548	1.0%	2.83	1.3%	1.47	2.1%	51.9%
TOTAL	53,727	100%	216.29	100%	70.25	100%	32.5%

*CVT=Cardiovascular/Thoracic

Note: Subspecialists are included within their primary specialty group. For example, General Internal Medicine, Geriatric Medicine and other Internal Medicine subspecialties are included in Internal Medicine.

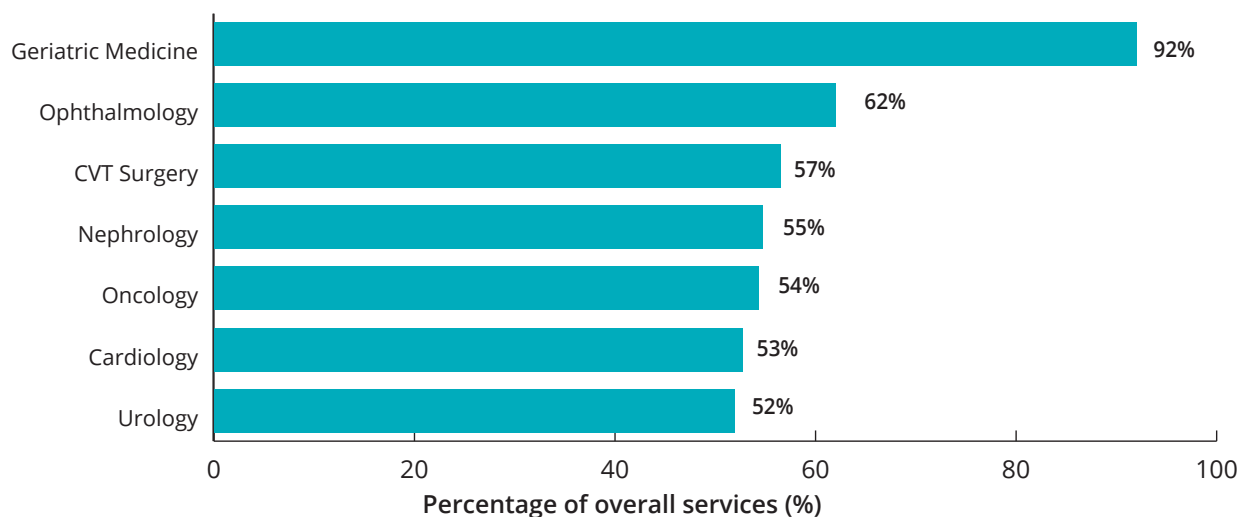
Some specialties are more intensively focused on care for seniors

Regardless of their share of the overall volume of services, some specialty groups provided most of their care to seniors. As shown in Figure 5, several specialty groups provided more than half of their services to patients aged 65+ in 2015-16. For example, 92% of all services provided by geriatricians

were given to patients aged 65+. However, the study sample included only 179 geriatricians and they accounted for less than one per cent of all services provided to seniors in that year. Thus, by virtue of their numbers, geriatricians accounted for little of the overall volume of care for older adults, but their practices were intensively focused on seniors.

FIGURE 5

Specialties and subspecialties that provided more than half of their services to patients aged 65+, 2015-16.
Source: Canadian Institute for Health Information, National Physician Database, 2015-16.



Note: CVT= Cardiovascular/Thoracic

Types of service delivery

Seniors receive more of almost every type of service, but to varying degrees

As noted previously, seniors received 2.6 times more services per capita in 2015-16 than those under the age of 65. This means that for every medical service received by the population under the age of 65, the population aged 65+ received 2.6 services. This overall figure is based on the provision of all types of services included in the study (see Appendix 1). When the overall figure is broken down into specific types of medical care, the data shows that seniors receive some physician services relatively more frequently than other services.

Figure 6a plots per capita physician services for several types of medical care and compares the population aged 65+ to the population aged under 65. For example, in 2015-16, patients over 65 received 589 psychotherapy/counselling services per 1,000 population. In comparison, patients under 65 received 487 psychotherapy/counselling services per 1,000 population. Thus, seniors received 1.2 times more per

capita psychotherapy/counselling services than the younger population (i.e. $589/487 = 1.2$) as shown in Figure 6b. With respect to psychotherapy/counselling, seniors received more services per capita compared to the population under 65, but their use of services in this clinical care area was relatively less compared to other types of medical care.

For seniors, medical care usage was much higher in areas such as diagnostic and therapeutic services, major surgery and hospital care days. As shown in Figure 6b, on a per capita basis in 2015-16, seniors received four times more diagnostic and therapeutic services compared to the population under 65 (e.g. electrocardiogram, joint injection/aspiration, colonoscopy, etc.) In the same year, seniors received five times more major surgical services (e.g. cataract surgery, hip and knee replacement, coronary angioplasty, etc.) and 10 times more hospital care days compared to the younger population. While seniors received relatively more per capita services overall, their usage was particularly intense in a number of clinical care areas.

FIGURE 6A

Comparison of per capita services for the population aged 65+ and <65, for select broad national group system (NGS) categories, 2015-16. Source: *Canadian Institute for Health Information, National Physician Database, 2015-16.*

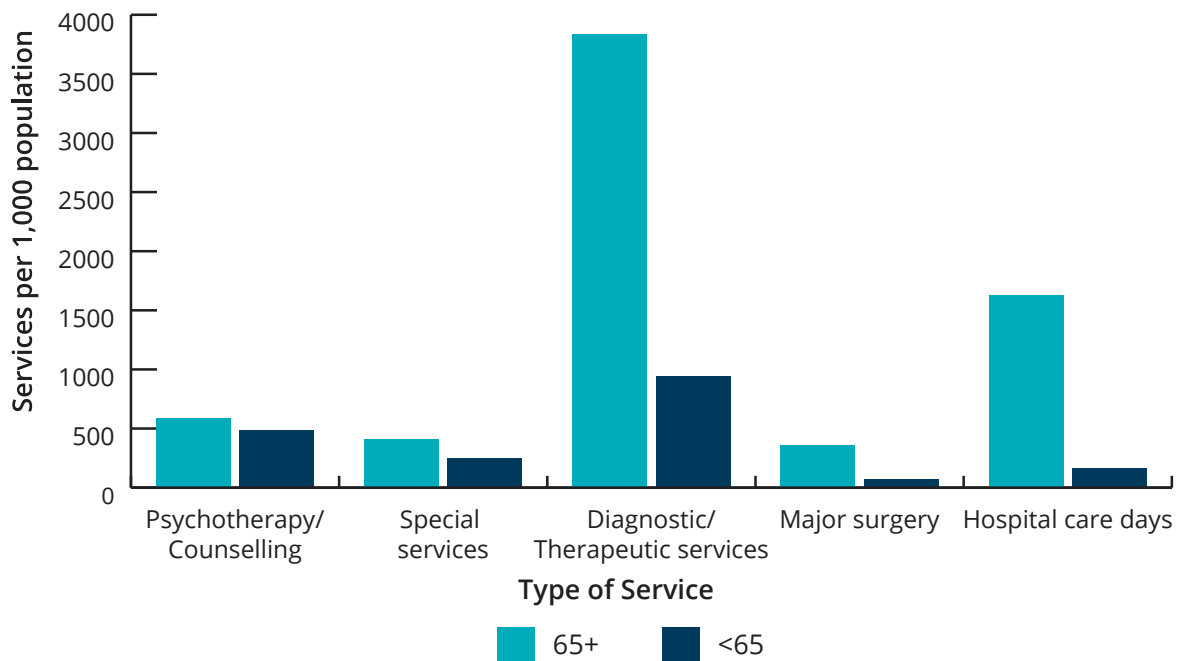
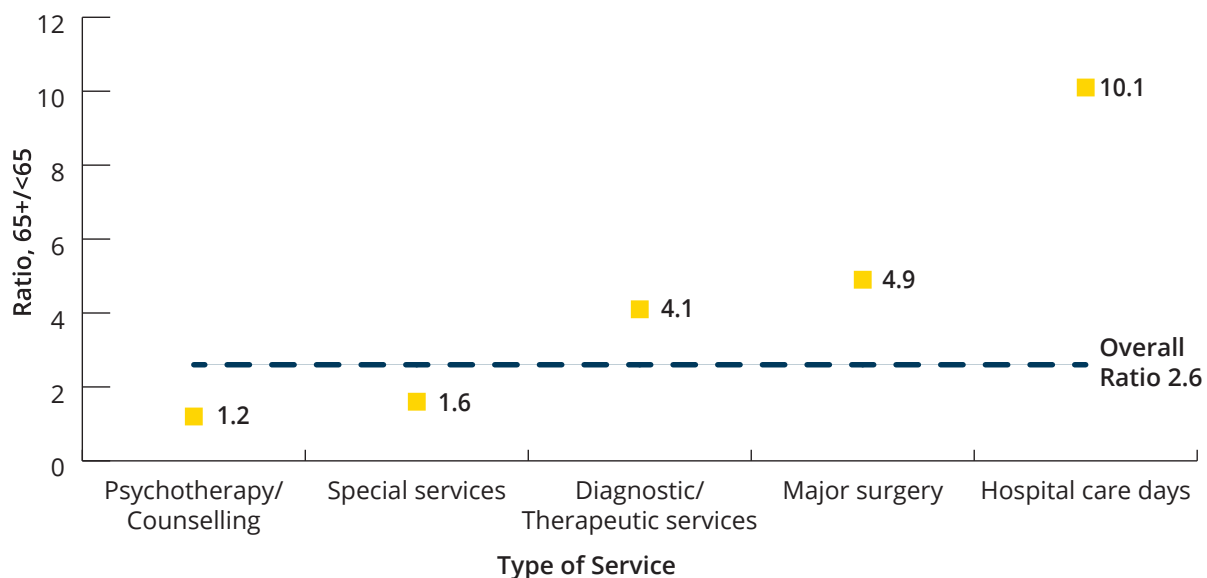
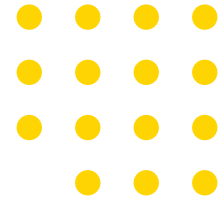


FIGURE 6B

Ratio of per-capita services for 65+, to those under 65, for select broad national group system (NGS) categories, 2015-16. Source: *Canadian Institute for Health Information, National Physician Database, 2015-16.*



Discussion



THIS REPORT OFFERS A SERIES OF METRICS ON MEDICAL CARE FOR SENIORS IN CANADA. THESE INCLUDE

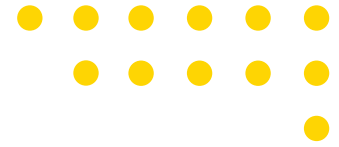
1. the percentage of physicians who care for patients aged 65+ (i.e. participation rates),
2. the volume of services provided,
3. the percentage of a given specialty's total services that are directed towards older adults (i.e. intensity of care for seniors), and
4. the types of medical care provided to patients aged 65+.

Taken together, these metrics offer a way of looking at how specialty groups uniquely contribute to the medical services senior patients receive. Although not exhaustive, what follows are a number of observations and reflections on physicians' provision of medical care to seniors.

Participation in seniors' care varies based on patient age

As shown in Figure 3, the vast majority of physicians provided care to seniors but they were generally less likely to do so for progressively older patient groups. The decline in the percentage of physicians who provide care to progressively older patients is likely due to a number of factors. For one, Canada's population demographics are such that physicians have less opportunity to care for increasingly older patients. In the eight provinces included in this study, 5% of the total population was aged 65-69 in 2015-16, while 2% was aged 80-84 and only 0.2% was aged 95+. Physicians are less likely to see very old patients simply because there are far fewer such patients to be seen. What's more, the very aged may receive most or all of their care in settings where relatively few physicians practice, such as seniors' residences, long-term care facilities, hospices and the like. However, recent efforts to bolster home care could bring physicians into more frequent contact with patients of more advanced age, including those with multiple, chronic and complex conditions. While there are practical reasons why physicians are less likely to see very old patients, health system changes (like increased investment in home care) could precipitate an upturn in the rates at which physicians provide care to older patients.

Of course, physicians may also be less likely to provide care to patients of very advanced ages because doing so is not within their scopes of practice. Dealing with multiple, chronic and complex conditions are all part of caring for older patients and this type of care may not be dominantly within the practice domain of some specialty groups. At the same time,



health conditions that are more prevalent among seniors will bring seniors into contact with specialty groups that commonly treat those conditions. For example, seniors experience higher rates of age-related macular degeneration and glaucoma and are therefore more likely to undergo cataract surgery than the general population. This, in turn, results in ophthalmologists having higher participation rates in caring for seniors. Furthermore, geriatricians are actually more likely to provide care to patients of more advanced age (e.g. 85-89) than for younger seniors (e.g. 65-69). These results point to the geriatrician's unique role as a consultant in the care of patients with complex health conditions. These observations are reflected in the seniors' care participation rates and intensity metrics shown in Figures 3 and 5.

Several disciplines supply the vast majority of seniors' medical care

This study found that family physicians, internists and ophthalmologists accounted for 85% of all physician services provided to seniors. When you add in specialists in General Surgery, Orthopedic Surgery, Urology and Dermatology, this figure increased to 93%. Thus, seven specialty groups provided almost all of the medical care seniors received from physicians. This is a significant finding for a variety of reasons. For example, it points to a well-defined and relatively small number of specialties that might become the focus of future research on health care services for older adults. Some of these specialty groups, like Ophthalmology and Orthopedic Surgery, may provide medical services that are linked to very specific health conditions (e.g. sight restoration, joint replacement).

Other specialists, like family physicians and internists, may work on a much broader range of health conditions that involve long-term and coordinated care for patients over the age of 65. Future research could shed light on the unique contributions of different specialty groups as well as how they work together in providing care for Canada's seniors.

Specialties differ in terms of service volume and intensity of seniors' care

Results from this study illustrate the difference between volume and intensity in the provision of medical care to seniors. Family physicians provided just over half of all medical services to patients aged 65 and older. As such, family physicians accounted for the largest single share of the total volume of services provided to seniors. At the same time, family physicians comprised just over half of all physicians and, therefore, their share of the total volume of medical services provided to seniors was commensurate with their share of the physician workforce.

Intensity, on the other hand, has to do with the extent to which a specialty group focuses their delivery of care on seniors. As noted, internists comprised 13% of the physician workforce in 2015-16, but they provided 23% of all services received by patients aged 65+. Similarly, ophthalmologists comprised 2% of the physician workforce, but provided 11% of all services received by seniors. Not surprisingly, geriatricians provided the vast majority of their medical services (92%) to patients aged 65+, but due to their small workforce size (179 in the eight study provinces in 2016) geriatricians accounted for very few of all medical services provided to seniors (less than 1%).

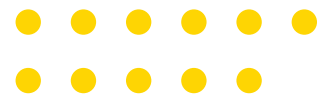
At present, the National Physician Database (NPDB) does not contain specialty designations for *Care of the Elderly*² family physicians and geriatric psychiatrists. These two subspecialty groups may profile much like geriatricians, who account for a relatively small proportion of all medical services provided to seniors, but whose practices are intensely focused on seniors' care.

The distinction between health service volume and intensity may be particularly relevant to decision-makers who are working to improve health care delivery for seniors. Results of this study suggest that some specialties provide high volumes of care to seniors, while others spend most of their time providing specific types of care to seniors (irrespective of their overall contribution to the total volume of seniors' care). As shown in Table 1 and Figure 5, with more than half of their services being directed toward seniors, some Internal Medicine subspecialists (e.g. geriatricians, nephrologists, oncologists and cardiologists) were intensively focused on seniors' care, as were ophthalmologists, cardiovascular/thoracic surgeons and urologists. Physical Medicine and Rehabilitation specialists, neurosurgeons, dermatologists and orthopedic surgeons were also relatively more focused on the provision of medical care to seniors. Future volume-intensity research could support decision-making that attempts to optimize the health system's response to seniors' day-to-day and ongoing health care needs, versus episodic and acute health care needs.

Gender plays a role in delivery of services to seniors

Results of this study show that there are gender effects associated with physicians' provision of services to seniors. As shown in Figure 3, physicians were more likely to provide care to female patients of all age groups (65 and above) compared to male patients. However, as shown in Figure 4, males received a higher number of per capita services for all patient age groups (65 and above) compared to female patients. For the population aged 65 and older, physicians were more likely to see women but they provided relatively more medical services to men.

For the population aged 65 and older, physicians were more likely to see women but they provided relatively more medical services to men.



² *Care of the Elderly* is a certificate of added competence in Family Medicine from the College of Family Physicians of Canada (CFPC).

Further research is required to fully explore the underlying gender dynamics that produce these physician participation and population medical service utilization rates. Population demographics may partially explain the differences in the percentage of physicians who provide care to male and female patients. In Canada, females represent a larger share of the older adult population (Statistics Canada, 2015); thus, due to their higher population numbers, physicians may be more likely to see female patients, as is evidenced in Figure 3.

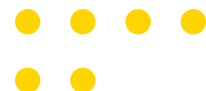
A number of other, more complex, factors may contribute to the gender-related findings of this study. These include possible gender-specific variations in disease prevalence, gender differences in disease presentation and gender-related variations in medical service utilization associated with treatment. Studies have shown that women are more likely to seek out health care services compared to men (Thompson et al., 2016; Talbot et al., 2001). Such health-seeking behaviour is consistent with the physician participation rates shown in Figure 3. At the same time, if men are less likely to seek care, then a lack of prevention and early treatment could increase the acuity of male patients' health conditions at the time of assessment. This, in turn, could lead to increased interventions and contribute to the per capita medical service utilization gap shown in Figure 4.

The scope of future gender-based research may indeed be quite broad. The significance of gender-based divisions of labour, lifetime exposures and potential effects on health status, as well as biologically based sex differences could contribute to health conditions that vary enough to account for at least some of the differences observed in this study. Future research would do well to build on results of this study and the research of others (e.g. Muratov et al., 2017; Armstrong & Pederson, 2015) to better understand and plan health care that responds to the particular needs of male and female seniors.

Receiving the care that's needed, where it's needed

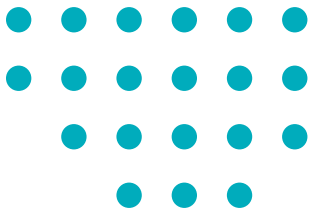
The database used for this study — the Canadian Institute for Health Information's (CIHI) National Physician Database (NPDB) — contains very rich information on the types of medical care physicians provide to patients. The results presented in Figure 6 show that seniors used certain medical services at much higher rates than the population under 65. For example, the relatively high rates of major surgery and hospital care days point to a more intensive use of hospital-based care among seniors compared to the rest of the population. Similarly, increased utilization of diagnostic and therapeutic services is consistent with research that shows higher rates of multiple, chronic health conditions among seniors (see Figures 6a and 6b).

As health service utilization rates are presented and interpreted, it is important to bear in mind their limitations. As noted earlier, NPDB data reflects *actual* medical service utilization, as opposed to appropriate or optimal utilization. The higher rates of hospital-based care we see for seniors may be entirely appropriate; at the same time, they may reflect a lack of alternative resources or more suitable facilities in which to care for seniors. Similarly, while Figures 6a and 6b show seniors' higher utilization of major surgeries, like hip and knee replacement, the utilization rates do not reflect ancillary health care utilization associated with major surgery nor do they reflect the increased health risks patients experience while waiting for major surgeries and other specialized medical care. As a longitudinal database with in-depth medical service data, the NPDB is a valuable resource but additional information is required to get a more complete picture of seniors' health care needs and how they are being addressed.



Practice reflections

Statistical results of this study provide new insight on how the medical workforce responds to the health care needs of seniors. However, there are important narratives to be told about medical care on the front line. For this additional insight, the authors asked a cross-section of specialists to reflect on their practice/discipline and to describe how they care for seniors in their daily work. The following stories peel back the high-level statistical findings of this study, offering three unique perspectives on the role of specialist physicians in caring for Canada's aging population.



View from the front lines: how *Care of the Elderly* family physicians care for seniors

Sidney Feldman, MD, CCFP (COE), FCFP

Family physicians are engaged in all elements of primary care and play a key role in the health of older adults in Canada. The long-term relationship that exists with older adults allows the family physician to have a deep and broad understanding of issues affecting older patients. Family physicians recognize the key role of social determinants of health and actively work to promote, for example, the elimination of loneliness, poverty, inadequate food and suboptimal housing.

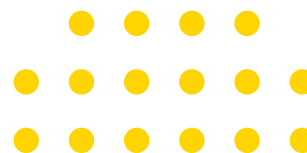
Preventive health is another critical component of care provided by family physicians. Examples include identifying opportunities to promote a healthy lifestyle, reducing behaviours that increase the risk of illness and providing evidence-based screening for conditions that have better outcomes if detected early. Ensuring older adults have received Health Canada recommended vaccinations is another part of this broad approach to prevention.

Supporting older adults with chronic diseases, such as hypertension, mental illness, COPD, diabetes and osteoarthritis, also falls within the scope of family medicine. Many seniors with multiple concurrent medical conditions (“multimorbidity”) require numerous medications as part of their treatment plan. Managing these complex patients can be challenging, including the risk of adverse drug reactions associated with polypharmacy in this population. Family physicians are well situated to take the necessary holistic perspective required when dealing with patients who have multiple health problems, ensuring that the values of the individual and

their goals are central to treatment decisions. They also play a critical role in managing the increasing burden of dementia in the health care system, as well as other common issues associated with aging, such as frailty, falls and other geriatric syndromes.

Some family physicians are eligible to receive a Certificate of Added Competence (CAC) in Care of the Elderly (COE) from the College of Family Physicians of Canada. Those family physicians with a CAC in COE will often see patients in consultation, working under the Patient’s Medical Home (PMH) model to support frail, complex patients and their families. In this model, family physicians are part of larger interdisciplinary health teams, working virtually or through integrated care models, to form a PMH that provides a range of coordinated services.

In some situations, when dealing with elderly patients and their families, the relationship family physicians have with specialist colleagues is essential to providing collaborative excellence in care. Furthermore, family physicians play a central role in ensuring that life remains meaningful and fulfilling for older adults in all care domains, including outpatient assessments, emergency department visits, long-term care, rehabilitation and palliative care, working as part of integrated multidisciplinary teams, supported by specialist colleagues.



View from the front lines: how geriatricians care for seniors

Frank Molnar, MD, FRCPC

As a Geriatric Medicine specialist, much of my practice focuses on patients who are 85 and older. In Canada, this segment of the population is expected to quadruple and it's these seniors who are most likely to have multiple interacting diseases. This is where the work of geriatricians is so important to the future health of Canada's aging population.

Geriatric Medicine is a "high touch, low tech" specialty that involves a great deal of interaction with patients who are often living with complex and chronic health conditions. The term "GERIATRIC 5Ms" was coined to capture the multi-faceted care that geriatricians provide:

1. **Mind** (geriatricians are experts in delirium and represent the only specialty specifically trained to care for medically complex and medically ill persons with dementia)
2. **Mobility** (assessment of multiple causes of falls that often span several other specialties)
3. **Medications** (experts in understanding the impact of medications on older patients, particularly frail older patients)
4. **Multi-complexity** (multiple interacting diseases that overflow traditional specialty boundaries)
5. **Matters Most** (goals of care in the context of multiple active diseases and possibly dementia)

Geriatricians are relatively few in number, making the practice of Geriatric Medicine very team-based. Our patients often receive much of their initial assessment and ongoing care from other team members, with input and guidance of a geriatrician. As specialists, geriatricians are cross-trained in other disciplines such as General Internal Medicine, Psychiatry, Physical Medicine and

Rehabilitation, and Neurology. As the number of seniors with multiple interacting medical and mental health issues grows, our cross-specialization (or hybridization) will become increasingly important to the health of the population.

The typical geriatrician provides a number of services throughout the day. Examples include:

- phone calls and eConsults to primary care providers;
- review of home visits of older patients with cognitive and mobility issues, generating recommendations to family physicians;
- triaging patients to clinics and geriatric day hospitals to prevent hospitalizations;
- consultations on inpatients to assist treating teams in managing older patients with multiple interacting diseases, including dementia and delirium;
- spending significant amounts of time with older patients and their families to find out what their actual wishes (goals of care) may be, and to thereby appropriately direct care in a person-centered manner.

Geriatricians also train residents in Family Medicine, Internal Medicine and surgery to ensure they are fully prepared to care for older patients, many of whom are frail (frailty being another area of expertise of the specialty). Finally, many geriatricians are actively engaged in health services research to find new and better ways of caring for our elders and to influence policy (e.g. the roots of patient safety are in early geriatric work on adverse effects of hospitalization). The geriatrician's practice is varied, dynamic and uniquely rewarding because of the patients and families we care for, the broad health care team we work with, and the many professional roles and activities that we're involved in.

View from the front lines: how ophthalmologists care for seniors

Lorne Bellan, MD, FRCSC

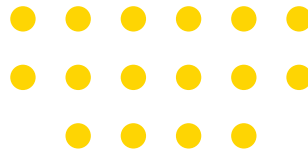
A comprehensive ophthalmologist will spend much of his or her day caring for patients with cataracts, macular degeneration, glaucoma and diabetic retinopathy. These are all conditions that have their highest prevalence at older ages so most of the care is directed toward seniors.

Cataract patients require the fewest visits, since they normally need to be seen only once or twice before and after surgery. The high success rates for cataract surgery results in high patient satisfaction, but also increases demand such that most ophthalmologists' surgical schedules are almost exclusively filled with cataract cases. In contrast, macular degeneration, glaucoma and diabetic retinopathy are all chronic diseases that require regular follow-up to prevent deterioration. Visits vary from being done on an annual basis when the patient's condition is good, to monthly visits when there is progression.

Improved technology has revolutionized our care for eye-related conditions, resulting in better outcomes. However, seniors also

have to make far more visits. For example, 30 years ago we had just a few drugs, one test beyond our clinical exam (a visual field) and one surgery (the trabeculectomy) to treat glaucoma. Now, we have multiple new classes of drugs, combination drugs and new tests that can pick up structural damage at even earlier stages, with several surgical options. Fifteen years ago, we had poor treatments for the less common but usually devastating form of macular degeneration. All we could do was slow the rate of guaranteed deterioration in limited cases. Since then, our care has been revolutionized by the use of vascular endothelial growth factor inhibitors that have a 40% rate of restoring vision, not just slowing loss. Also, in the last five years, new drugs have completely changed how we treat diabetic retinopathy and all neo-vascular conditions in the eye. It is now routine in large urban centres to have daily injection clinics with dozens of patients per day, when no treatment was being provided 15 years ago.

These advancements have all had a dramatic impact on how ophthalmologists provide care to seniors today.



Conclusion

The future demands on Canada's health care system are foreseeable in a number of ways. Population statistics show a very clear and steady trend toward an aging population. A fairly comprehensive set of health indicators are available to gauge the health status of Canada's seniors, including information on lifestyle factors. Similarly, there is a good deal of statistical information on the prevalence of illness and disease among seniors, including acute, chronic and multiple concurrent health conditions.

In light of these population trends and health statistics, this study used readily available data from the Canadian Institute for Health Information's National Physician Database to gain insight on how physicians currently care for seniors in Canada. The research tackled a series of basic questions, including which specialties are most likely to provide care to seniors, how intensively they focus their practices on seniors and what types of medical care they provide. As presented and discussed in this report, the study results outline the unique contributions specialists make in caring for Canada's aging population.

While results of this study offer new knowledge, they also point to significant information gaps. In future, it will be important to develop data and carry out analyses that integrate patient and population needs along with the models of care that are used to deliver health care services. In particular, there is a need to study collaborative models of care, focusing on seniors who live with multiple, chronic and complex conditions. Datasets that cover a broad spectrum of needs, health care providers, health service utilization and health outcomes, will be more fruitful in generating knowledge that is useful for health system improvement.



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Appendix 1 National Grouping System (NGS) categories

Broad NGS Category	Detailed NGS category
Consultations	Major Other
Major Assessments	Office Hospital Inpatient: Newborn Hospital Inpatient: Other Hospital Outpatient Hospital Unspecified Unspecified Special Eye
Other Assessments	Office Hospital Inpatient Hospital Outpatient Hospital Unspecified Unspecified Location Special Calls – Add Detention
Hospital Care Days	Hospital Care Days: Up to 28/30/31/35/42 Hospital Care Days: Over 28/30/31/35/42 Other
Special Calls	Out-of-hours/Emergency Other Regular Hours
Psychotherapy/ Counselling	Individual Psychotherapy Group/Family Psychotherapy Counselling
Major Surgery	Mastectomy and Breast Surgery Breast Tumour Excision/Biopsy Other Integumentary Fractures Disc Surgery Arthroplasty – Hip Arthroplasty – Knee Other Musc-Skeletal Sub-Mucous Resection Rhinoplasty Other Respiratory Coronary Artery Bypass/Repair Coronary Angioplasty Insertion of Pacemaker Other Heart/Pericardium Varicose Veins/Vein Repair Caroid Endarterectomy Other Cardiovascular Appendectomy Laparotomy Gallbladder and Billiary Tract Tonsillectomy Hernias Colon and Intestines (Colectomy) Rectum/Proctotomy/ Anus and Hemorrhoidectomy Other Digestive Urinary System Prostate Surgery (Male) Vasectomy Other Male Genital System Prolapse (Female) Hysterectomy Sterilization Other Female Genital System Cataract Surgery Light Coagulation Tympanoplasty Other Eye/Ear Other Major Surgery
Minor Surgery	Incision, Abscess etc. Removal Foreign Body Excision Tumour, etc. Suture Wound Excision Nail Chalazion Myringotomy Minor Fractures Other Minor Surgery
Surgical Assistance	Surgical Assistance
Obstetrical Services	Service at Delivery Delivery (Excluding C.S.) Caesarean Section Therapeutic Abortion Other Obstetrical Services
Diagnostic/ Therapeutic Services	I.C.U./Resuscitation Allergy/Hyposensitization Injection/Aspiration of Joint Electrocardiogram Esophagoscopy/Gastroscopy Laryngo/Bronchoscopy Colonoscopy Cystoscopy Sigmoidoscopy Other Endoscopy Coronary Angiography Procedures Associated with Radiology Dilatation and Curettage Electroencephalography Cryotherapy Cardiac Catheterization Biopsy Other Diagnostic/Therapeutic Services
Special Services	Injections and Immunizations Papanicolaou Smear Insertion of I.U.D.
Misc. Services	Other Identified Other Unidentified

Appendix 2 Physician specialties

Family Medicine

Internal Medicine

- General Internal Medicine
- Cardiology
- Gastroenterology
- Respiratory Medicine
- Endocrinology
- Nephrology
- Hematology
- Rheumatology
- Clinical Immunology and Allergy
- Oncology
- Geriatrics
- Tropical Medicine
- Genetics

Neurology

Psychiatry

Pediatrics

Dermatology

Physical Medicine and Rehabilitation

General Surgery

Cardiovascular/Thoracic Surgery

Urology

Orthopedic Surgery

Plastic Surgery

Neurosurgery

Ophthalmology

Otolaryngology - Head and Neck Surgery

Obstetrics/Gynecology

Appendix 3 Population estimates

**Statistics Canada, Table 17-10-0005-01,
Population estimates on July 1st, by age and sex (2015)**

	MALES	FEMALES	TOTAL
<5	749,976	712,755	1,462,731
05-09	766,299	727,412	1,493,711
10-14	748,214	707,574	1,455,788
15-19	848,009	797,218	1,645,227
20-24	979,655	922,338	1,901,993
25-29	961,178	956,244	1,917,422
30-34	951,112	967,203	1,918,315
35-39	895,929	913,672	1,809,601
40-44	897,485	911,246	1,808,731
45-49	932,639	937,249	1,869,888
50-54	1,053,820	1,050,417	2,104,237
55-59	973,579	981,970	1,955,549
60-64	822,276	848,686	1,670,962
65-69	692,633	731,026	1,423,659
70-74	478,709	526,848	1,005,557
75-79	343,163	403,426	746,589
80-84	241,346	313,616	554,962
85-89	137,183	219,798	356,981
90-94	51,791	115,002	166,793
>94	9,738	34,265	44,003
TOTAL	13,534,734	13,777,965	27,312,699

Population estimates include data from eight Canada provinces (Newfoundland and Labrador, Nova Scotia, New Brunswick, Ontario, Manitoba, Saskatchewan, Alberta and British Columbia)

