



Primary Care in Ontario



ICES Atlas

November 2006





Editors

Liisa Jaakkimainen, Lead, MD, MSc, CCFP Ross E. G. Upshur, Lead, MA, MD, MSc, CCFP, FRCPC Julia E. Klein-Geltink, MHSc Alan Leong, BSc (Hons.) Sarah Maaten, MSc

Susan E. Schultz, ма, мsc

Li Wang, мD, MSc

Publication Information

Published by the Institute for Clinical Evaluative Sciences (ICES) © 2006

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without the proper written permission of the publisher.

Canadian cataloguing in publication data

Primary Care in Ontario: ICES Atlas

Includes bibliographical references.

ISBN: 0-9738553-4-7

i.	Jaakkimainen, Liisa	1963
ii.	Upshur, Ross E.G.	1958
iii.	Klein-Geltink, Julia E.	1978
iv.	Maaten, Sarah	1978
iv.	Schultz, Susan E.	1957
iv.	Leong, Alan	1983
iv.	Wang, Lee	1972

How to cite this publication

The production of *Primary Care in Ontario: ICES Atlas* was a collaborative venture. Accordingly, to give credit to individual authors, please cite individual chapters and title, in addition to editors and book title.

For example:

Guttman A, Schultz SE, Jaakkimainen L. Primary Care for Children. In: Jaakkimainen L, Upshur R, Klein-Geltink JE, Leong A, Maaten S, Schultz SE, Wang L, editors. Primary Care in Ontario: ICES Atlas. Toronto: Institute for Clinical Evaluative Sciences; 2006.

Institute for Clinical Evaluative Sciences (ICES) G1 06, 2075 Bayview Avenue Toronto, ON M4N 3M5 Telephone: 416-480-4055 www.ices.on.ca

	Authors' Affiliations
	Acknowledgmentsvii
	About the Institute for Clinical Evaluative Sciences (ICES)
	Overview—Executive Summary and Introductionix
	History and definition of primary carexiii
	Changes and transformations in primary care within Canada and Ontario xiv
	Map of Local Health Integration Networks in Ontario 2005/06xv
	Using billing data to measure utilization of physician services
	Percent distribution of GP/FPs by practice billing type
Chapter 1.	Primary Care in the Health Care System1
	Douglas G. Manuel, мд, мsc, frcpc, Sarah Maaten, мsc, Deva Thiruchelvam, мsc, Liisa Jaakkimainen, мд, мsc, ссгр, and Ross E.G. Upshur, ма, мд, мsc, ссгр, frcpc
Chapter 2.	Care of Women During Pregnancy and Childbirth
Chapter 3.	Primary Care for Children
Chapter 4.	Ambulatory Physician Care for Adults
Chapter 5.	Patterns of Primary and Secondary Prevention
Chapter 6.	Primary Care for Respiratory Diseases
Chapter 7.	Physician Care of Patients with Congestive Heart Failure
Chapter 8.	Primary Care in Disadvantaged Populations
Chapter 9.	Primary Mental Health Care
Chapter 10.	Physician Care of Cancer Patients
Chapter 11.	Characteristics of Primary Care Practice

1

2

Mohammad M. Agha, PhD Senior Research Associate Centre for Research on Inner City Health, St. Michael's Hospital

Jan Barnsley, BSc, MES, PhD Associate Professor Department of Health Policy, Management and Evaluation, University of Toronto

Jennifer Bethell, MSc Doctoral Candidate Department of Public Health Sciences, University of Toronto

Research Coordinator Suicide Studies Unit St. Michael's Hospital

Susan J. Bondy, PhD Assistant Professor Department of Public Health Sciences, University of Toronto

Adjunct Scientist Institute for Clinical Evaluative Sciences

Zhongliang Chen, MD, MSc *Biostatistician* Institute for Clinical Evaluative Sciences

Lisa Del Guidice, MD, MSc, CCFP Assistant Professor Department of Family and Community Medicine, University of Toronto

Staff Physician Department of Family and Community Medicine, Sunnybrook Health Sciences Centre

Richard H. Glazier, MD, MPH, CCFP, FCFP Senior Scientist Institute for Clinical Evaluative Sciences

Staff Physician Department of Family and Community Medicine, St. Michael's Hospital

Scientist Centre for Research on Inner City Health, St. Michael's Hospital

Associate Professor Departments of Family and Community Medicine and Public Health Sciences, University of Toronto

Yanyan Gong, MSc

Past Data Analyst Institute for Clinical Evaluative Sciences

Senior Research Associate Cancer Care Ontario

Astrid Guttmann, MDCM, MSc, FRCPC Scientist Institute for Clinical Evaluative Sciences

Staff Physician Division of Paediatric Medicine, The Hospital for Sick Children

Assistant Professor Departments of Paediatrics (primary appointment), and Health Policy, Management and Evaluation (cross appointment), University of Toronto

Manavi Handa, RM, MHSc Association of Ontario Midwives Joint Center for Bioethics

Liisa Jaakkimainen, MD, MSc, CCFP Scientist Institute for Clinical Evaluative Sciences

Assistant Professor Department of Family and Community Medicine, University of Toronto

Julia E. Klein-Geltink, MHSc Epidemiologist Institute for Clinical Evaluative Sciences

Alexander Kopp, BA Senior Analyst Institute for Clinical Evaluative Sciences

Kelvin Lam, MSc Analyst Institute for Clinical Evaluative Sciences

Alan Leong, BSc (Hons.) Research Assistant Primary Care Research Unit, Sunnybrook Health Sciences Centre

Jin Luo, MD, MSc Analyst Institute for Clinical Evaluative Sciences

Sarah Maaten, MSc Epidemiologist Institute for Clinical Evaluative Sciences

ation N L Author

Douglas G. Manuel, MD, MSc, FRCPC Senior Scientist Institute for Clinical Evaluative Sciences

Associate Professor Department of Public Health Sciences, University of Toronto

Associate Manitoba Centre for Health Policy

Rahim Moineddin, PhD Assistant Professor Departments of Family and Community Medicine and Public Health Sciences, University of Toronto

Anne E. Rhodes, MSc, PhD Adjunct Scientist Institute for Clinical Evaluative Sciences

Research Scientist Suicide Studies Unit & Centre for Research on Inner City Health, St. Michael's Hospital

Assistant Professor Departments of Psychiatry and Public Health Sciences, University of Toronto

Refik Saskin, MSc Senior Analyst Institute for Clinical Evaluative Sciences

Susan E. Schultz, MA, MSc Epidemiologist Institute for Clinical Evaluative Sciences

Joshua Tepper, MD, MPH, CCFP Past Associate Scientist Institute for Clinical Evaluative Sciences

Assistant Professor Department of Family and Community Medicine, University of Toronto

Deva Thiruchelvam, MSc Analyst Institute for Clinical Evaluative Sciences

Karen Tu, MD, MSc, CCFP, FCFP Scientist Institute for Clinical Evaluative Sciences

Staff Physician Toronto Western Hospital Family Medicine Centre, University Health Network

Assistant Professor Department of Family and Community Medicine, University of Toronto Ross E. G. Upshur, MA, MD, MSc, CCFP, FRCPC Director Primary Care Research Unit, Sunnybrook Health Sciences Centre

Associate Professor Departments of Family and Community Medicine, and Public Health Sciences, University of Toronto

Adjunct Scientist Institute for Clinical Evaluative Sciences

Canada Research Chair in Primary Care Research

Li Wang, MD, MSc Research Coordinator Primary Care Research Unit, Sunnybrook Health Sciences Centre

Brandon Zagorski, MS Analyst Institute for Clinical Evaluative Sciences The authors wish to thank the following individuals and organizations for their contributions to the success of this project, and apologize in advance for any inadvertent omissions.

Editing

Susan Garfinkel Evelyne Michaels Institute for Clinical Evaluative Sciences

Layout

Laura Benben Institute for Clinical Evaluative Sciences

in partnership with Philip Sung Design & Associates

Printing

Continental Press

Internal Review

Andreas Laupacis Thérèse Stukel Doug Manuel Camille Marajh Paula McColgan Lawrence Paszat Teresa To Institute for Clinical Evaluative Sciences

External Review

Janusz Kaczorowski Inese Grava-Gubins Louise Naismith Elizabeth Badley Debra Butt

Internal Coordination

Julie Dowdie Cleo Surace Paulina Carrion Institute for Clinical Evaluative Sciences

Funding Support

The Primary Health Care Transition Fund (PHCTF) A joint program of Health Canada and the Ministry of Health and Long-Term Care (MOHLTC)

Content Support

Sarah Knox and Wendy Katherine Ontario Midwifery Program at the Ministry of Health and Long-Term Care

ments 0 Acknowled

About the Institute for Clinical Evaluative Sciences (ICES)

Ontario's resource for informed health care decision-making

ICES (Institute for Clinical Evaluative Sciences) is an independent, non-profit organization that conducts health services evaluations on a broad range of topical issues to enhance the effectiveness of health care for Ontarians. Internationally recognized for its innovative use of population-based health information, ICES knowledge provides evidence to support health policy development and changes to the organization and delivery of health care services.

Unbiased ICES evidence offers fact-based measures of health system performance; a clearer understanding of the shifting health care needs of Ontarians; and a stimulus for discussion of practical solutions to optimize scarce resources.

Key to ICES' work is our ability to link anonymous population-based health information on an individual patient basis, using unique encrypted identifiers that ensure privacy and confidentiality. This allows scientists to obtain a more comprehensive view of specific health care issues than would otherwise be possible. Linked databases reflecting 12 million of 30 million Canadians allow researchers to follow patient populations through diagnosis and treatment, and to evaluate outcomes.

ICES brings together the best and the brightest talent under one roof. Many of our faculty are not only internationally recognized leaders in their fields, but are also practising clinicians who understand the grassroots of health care delivery, making ICES knowledge clinically-focused and useful in changing practice. Other team members have statistical training, epidemiological backgrounds, project management or communications expertise. The variety of skill sets and educational backgrounds ensures a multi-disciplinary approach to issues management and creates a real-world mosaic of perspectives that is vital to shaping Ontario's future health care.

ICES collaborates with experts from a diverse network of institutions, government agencies, professional organizations and patient groups to ensure that its findings are relevant.

Executive Summary

The delivery of primary care services in Ontario has been in transition over the past decade. We are moving from an era where primary care services were delivered by physicians—either in solo or group practices—to one with a vision of more integrated and interdisciplinary care.

The goal of *Primary Care in Ontario* is to provide descriptive information about patterns of primary care utilization between 1992/93 and 2002/03. It provides valuable baseline information about primary care in Ontario prior to the implementation of many new primary care reform initiatives, most of which began after 2002. The focus is on health services delivered by primary care physicians. The report also provides cross-sectional descriptive information about Ontarians who are receiving primary care services.

Key Findings

- General practitioner/family physicians (GP/FPs) have been, and continue to be, the main source for health care for Ontarians.
- This is true across the life course and for individuals with serious health conditions such as congestive heart failure, mental health problems or respiratory disease.
 GP/FPs are also the main providers of primary care for people diagnosed with breast, lung, colorectal and prostate cancer.
- Solo practice remains the most common venue for care, although this is changing, especially among younger physicians.
- Although the total number of GP/FPs increased by approximately 10% over the study period from 1992/93 to 2002/03, the number of GP/FPs per 10,000 population fell slightly. Also, the GP/FP population continues to age, with an increasing proportion of them aged 55 years and older.
- The total annual number of GP/FP visits did not change over the study period, despite the growth and aging of the population. This suggests that the current system is at full capacity and has been for some time.

- Because the system is at capacity, the increasing demand for care by Ontarians in older age groups has resulted in adjustments in other areas:
 - The proportion of children and young adults in Ontario who did not see any primary care provider during a given year increased;
 - GP/FP practice has become almost exclusively office-based, with a dramatic decrease in the proportion of GP/FPs involved in obstetrical care; and,
 - The amount of obstetrical primary care provided by midwives has increased and the amount of primary care provided by specialists such as paediatricians is growing.
- Improvements are needed in the provision of preventive care and in the management of some chronic diseases such as congestive heart failure.
- Access to primary preventive care such as cancer screening and immunization continues to be a challenge for Ontarians in certain geographic regions and for those in lower socioeconomic groups.

Implications

- The lack of an increase in the supply of GP/FPs between 1992/93 and 2002/03, as measured either by the number of fulltime equivalents or the number of physicians per population, is a concern. Also worrisome is the fact that an increasing proportion of the GP/FP pool is nearing retirement age. Although both medical school enrolments and the number of Family Medicine residency positions have been increased in recent years, there is still a tendency for medical students to prefer specialty medicine rather than primary care. Stronger incentives may be needed to attract students to primary care medicine.
- Delivery of primary care services is becoming increasingly complex. Along with new models of practice that incorporate a variety of interdisciplinary services, there is also a substantial amount of shared care involving both GP/FPs and specialists, and also more than one GP/FP. Such shared care is important both from a quality of care perspective and to help take some of the pressure off GP/FPs who are managing an increasing number of complex cases. Policy makers should make sure that the current system does not penalize physicians for sharing patient care.
- Greater efforts are needed to identify populations, whether by geographic region or by socioeconomic group, who do not have equal access to services, such as paediatrician care for children or preventive care services (e.g., immunization and cancer screening).

Introduction

Primary care is the foundation of many health care systems globally. The World Health Organization has endorsed the approach of 'building health through the creation of broadly accessible primary care systems'. Still, the role of primary care varies substantially across the developed world. For some nations, such as Great Britain and Denmark, primary care essentially drives the health care system. Other countries, such as the United States and Switzerland, have virtually no identifiable primary care system. Compared with other OECD* nations, Canada is above average in integrating primary care into the broader health care system, but remains behind jurisdictions such as Scandinavia, United Kingdom, Italy, Spain and Australia.¹

Research evidence indicates that health outcomes for populations are better in those jurisdictions that have more integrated primary care. Mortality rates are lower and health outcomes are more equitably distributed in systems with well functioning primary care systems. In a recent systematic review of the literature, Starfield et al.² identified mechanisms by which primary care benefits population health. Primary care facilitates greater access to needed health services; provides better quality of care; places a strong focus on prevention; allows access for early management of health problems; and, reduces unnecessary specialist care.²

The overall goal of *Primary Care in Ontario* is to provide descriptive information about patterns of primary care utilization in Ontario between the years 1992/93 and 2002/03. The focus is on describing health services delivered by primary care physicians—predominantly general practitioners and family physicians (GP/FPs)—and on describing those who receive care. The findings will be of relevance to any recent evaluation and reform initiatives related to primary care services. It is hoped that this analysis can highlight areas where performance is appropriate, as well as provide indications of where improvements are required.

This Atlas is in many ways reminiscent of the first Practice Atlas³ published by the Institute for Clinical Evaluative Sciences (ICES), as it ventures into a territory that has been poorly explored to date. It is the first large-scale and detailed analysis of the biggest component of the health care system in Ontario. As a result, many more questions will be raised than can be answered, but it is hoped that this effort provides the necessary stimulus for generating further primary care health services research. For example, future research will need to address issues of data quality and availability so that policy makers, practitioners and the general public are able to see the impact of reforms being made in the delivery of primary care in Ontario.



Specific objectives of the Atlas

The specific objectives of *Primary Care in Ontario* are to:

- Describe ambulatory/office-based primary care and preventive care services received by the population of Ontario overall and by age group and gender. This includes data on:
 - obstetrical care for women of childbearing age;
 - paediatric care for children from birth to 18 years of age;
 - primary care for adult men and women; and,
 - primary care for those over 65 years of age.
- Describe ambulatory/office-based primary care and preventive care services for patients with specific chronic diseases;
- Assess whether patterns of primary care in Ontario have changed over the 10-year time period studied (1992/93– 2002/03) and whether they vary according to neighbourhood socioeconomic status and/or geographic regions;
- Describe the kinds of primary health care services that were provided by primary care providers (e.g., physicians and midwives) in Ontario, according to type of provider and timing of care;
- Describe the practice settings of Ontario GP/FPs and identify any differences in either the population served or the services provided;
- Describe primary care practice with respect to a variety of service indicators; and,
- Highlight specific areas where more or better data are needed.

^{*} The Organization for Economic Co-operation and Development (OECD) is a group of 30 member countries sharing a committment to democratic government and the market economy.

Contents of the Atlas

The Atlas focuses on a number of themes related to primary care: primary care provision across the life course; primary care for people with selected conditions/circumstances; characteristics of primary care practice; and, indicators of primary care. Each of these theme areas comprise one or more chapters that use a variety of data sources to examine primary care from a unique perspective. Each chapter is formatted similarly, is built around data exhibits and key messages, and concludes with a discussion that includes recommendations for primary care practice and policy.

The results from chapters 1–10 indicate that the provision of primary care was in transition during the decade from 1992/93–2002/03. Primary care physicians provided the majority of medical care in Ontario. They were and still are the foundation of medical care in the Ontario health care system and carry the heaviest workload. This point cannot be emphasized enough. However, practice demographics and patterns are changing. While many primary care physicians still provide comprehensive care, the concept of what constitutes comprehensiveness has been dramatically changing.

This is best illustrated by the transition in obstetrical care. Primary care physicians have moved away from complete care in pregnancy, with fewer physicians opting to deliver babies and more opting for shared care models. Obstetricians now deliver the majority of babies in Ontario and midwives are playing an increasing role in the provision of low-risk deliveries. In general, the picture is now one of increased choice for women in Ontario.

Similar transitions are seen in the provision of care to children. While primary care physicians provide substantial paediatric care, paediatricians play a previously poorly recognized but important primary care role. There is a concerning increase in the number of children who appear to not be receiving care at all.

Primary care providers contribute the majority of care in respiratory disease, mental health and congestive heart failure, and play a pivotal role in the care of patients with cancer. These conditions are commonly seen and managed in primary care contexts. The data provided here establish a baseline for analysis. They also provide a context within which to move towards looking at how outcomes of care vary by type of physician providing care (specialist or GP/FPs), geographic location of care (Local Health Integration Network) and socioeconomic status, as well as important traditional dimensions such as age and sex.

Use of the health care system has a J-shaped curve when one looks at utilization as a function of age—there is increased care at very young ages, it dips low in early and



mid-adulthood and then reaches its peak in old age. There are many physician visits in childhood associated with preventive care and childhood viral illness. Adolescence and young adulthood are periods of low health system access. Young males continue to be the sector that accesses health care the least on a regular basis, though they are at highest risk for trauma. Young women access health services more frequently than young men, largely because of issues related to reproductive health and cervical cancer screening.

Seniors, however, access the health care system frequently and for a variety of reasons. As they represent the fastest growing segment of the population, planners should take note of the surge of health service needs that will be associated with an aging population. The data on preventive behaviours indicate that the population of Ontario may be moving into the later years at significant disadvantage owing to suboptimal fitness levels.

Aside from age, the greatest vulnerability in Ontario seems to be associated with socioeconomic status. Unmet needs and poor outcomes in health measures can be partially addressed by primary care. All evaluations of primary care should include assessments by socioeconomic status and other measures of disadvantage in order to determine whether the health care system is creating or remediating preventable inequities.

The first part of the Atlas (chapters 1–10) explores sources and utilization of primary care by specific groups within the population. The second part (chapters 11 and 12) looks specifically at primary care physicians: how many there are; what types of practices they work in; who they serve; and, what services they provide. With the exception of the examination of the supply of primary care physicians, this analysis is limited to GP/FPs.

The results show that in 2003/04, although the majority of GP/FPs belonged to some type of practice group, solo practice

was still the main venue for primary care in Ontario. There was notable variation in practice venue by physician age but the relative patterns were similar across geographic areas.

One practice venue that has generated much controversy and debate in recent years is the walk-in or after hours clinic. While we could not identify all such clinics in the Province because many do not have group billing numbers, we did compare those we could identify with solo and group practices. We found important differences in the populations who accessed care in the different venues as well as in the services they received.

Chapter 12, which addresses the last of the themes outlined above, is the most exploratory of the Atlas, and represents preliminary research investigating benchmarks and indicators of care in Ontario. Along with reforming primary care delivery in Ontario, there is a growing emphasis on the need to evaluate how primary care services are delivered and received by the population. While the measurement of primary care indicators is still in its infancy in Canada, various structures, processes and outcome indicators have now been developed. These indicators are based on a combination of evidence-based medicine and consensus among primary care practitioners on what is deemed "appropriate care". Methods used to measure these indicators include provider and patient interviews and surveys, data abstraction from paper charts or electronic patient records and administrative data.

The overall goal of this chapter is to determine the feasibility of, and to measure, indicators of primary care medicine, which are based on Ontario administrative data. Choosen indicators were previously based on chart-based assessments of primary care practice and could be measured using administrative data. We specifically looked at: chronic disease management of diabetes mellitus (DM), congestive heart failure (CHF) and asthma care; preventive care with cervical cancer screening, colorectal cancer screening and childhood vaccinations; and, acute disease management of acute low back pain. We also examined continuity of care provided by individual GP/FPs in Ontario. We determined these indicators at a population level by patient age, sex, neighbourhood socioeconomic status and Local Health Integration Network (LHIN).

We show that, according to administrative data, rates of practice can be improved in some areas (cervical and colorectal cancer screening, spirometry testing among asthmatics and immunizations among young children), reiterating recent findings elsewhere. Other levels of practice match recommended guidelines fairly closely (ophthalmological testing and prescriptions among people diagnosed with DM) or are desirably low (ordering X-rays, computerized tomography, magnetic resonance imaging and electromyography in the case of acute low back pain). Still other practices (care of patients with CHF) lack clear benchmark levels so it is difficult to compare our findings with what is recommended. Nonetheless, continuity of care is shown to be high across the board.

We caution that administrative data cannot, without improvements, be used to comment on actual quality of care. We do, however, establish benchmark information to which we will compare rates calculated as a follow-up exercise in the future. We also suggest what data improvements are needed so that in the future, quality of care can be more accurately measured using administrative data.

Concluding thoughts

The data presented in this ICES Atlas indicate that primary care physicians provide a considerable amount of health services within the Ontario health care system. Indeed, they provide substantially more direct services than any other health care provider and are indirectly involved in a large proportion of other services. Primary care physicians are clearly invaluable health human resources.

However, the findings of the Atlas in conjunction with prevailing demographic and social trends indicate vulnerability in the system. In medicine, the current atmosphere is moving away from primary care and from "generalism". Attracting medical students into primary care careers has proven difficult, and each year the number of graduating students choosing careers in family medicine declines. The physician workforce is aging at the same time as the population. There is a looming potential crisis with a disparity between the supply of physicians and the population of older persons with increasingly complex chronic diseases. For many of these diseases the applicability of scientific evidence is limited and the effectiveness of various interventions is uncertain. Preventive care is becoming complex, requiring more deliberation and discussion between doctor and patient to understand the nuances of various screening modalities. Thinking to the future, policy makers and practitioners must consider uncertainty and complexity as part of the delivery of health services.

References

- Macinko J, Starfield B, Shi L. The contribution of primary care systems to health outcomes within Organization for Economic Cooperation and Development (OECD) countries, 1970–1998. *Health Services Research* 2003; 38:831–65.
- 2. Starfield B, Shi L, Macinko J. Contribution of primary care to health systems and health. *Milbank Quarterly* 2005; 83:457–502.
- Goel V, Naylor D, Anderson G. Patterns of health care in Ontario, 1st edition: ICES Practice Atlas. Toronto: Institute for Clinical Evaluative Sciences, 2004.

History and definition of "Primary Care"

There are important differences between "primary health care" (PHC) and "primary care" that should be recognized. These are captured in the following definitions:

Primary health care (PHC)—incorporates personal care with health promotion, the prevention of illness and community development. The philosophy of PHC includes the interconnecting principles of equity, access, empowerment, community self-determination and inter-sectoral collaboration. It encompasses an understanding of the social, economic, cultural and political determinants of health.

Primary care—is more clinically focused, and can be considered a sub-component of the broader PHC system. Primary care is considered to be health care provided by a medical professional that is a patient's first point of entry into the health system. Primary care is practiced widely in nursing and allied health, but predominately in general practice.¹

The term primary care was popularized in North America by White et al. who discuss the "primary, continuing medical care" that patients in the United States (US) receive from a specialist. They also note the difference in composition of patient populations between those with "primary, continuing medical care" versus centres accepting predominantly physicianreferred patients.²

The Millis Commission report (1966) furthered the concept of continuing and comprehensive care by primary physicians by stating that the role of the primary physician is to be the primary medical resource and counsellor to an individual or a family. The primary physician should also make referrals when patients are in need of hospitalization, the services of other medical specialists or other medical or paramedical assistance, while maintaining the responsibilities of continuous and comprehensive care.³

Similarly, Alpert and Charney suggested that the three fundamental roles of primary care physicians are: to provide first-contact care in contrast to referrals; to assume responsibility for the patient over time regardless of the presence or absence of disease; and, to serve as the integrating agent for care.⁴

In 1978, the Institute of Medicine (IOM) in the US defined the "essence" of primary care as accessible, comprehensive, coordinated and continual care delivered by accountable providers of personal health services.⁵ Also in 1978, the World Health Organization (WHO) conference in Alma-Ata, Union of Socialist Soviet Republics (USSR), defined primary health care as "essential health care based on practical,

scientifically sound and socially acceptable methods and technology made universally accessible to individuals and families in the community through their full participation and at a cost that the community and country can afford to maintain...in the spirit of self-reliance and self-determination."⁶ The WHO definition of primary care, however, understands the term in the context of public health services rather than the IOM's focus of the term on the delivery of personal health services.

The current definition of primary care adopted by the IOM is understood as "the provision of integrated, accessible health care services by clinicians who are accountable for addressing a large majority of personal health care needs, developing a sustained partnership with patients and practicing in the context of family and community."⁷

References

- 1. Martin C, Sturmberg J. General practice—chaos, complexity and innovation. *Medical Journal of Australia* 2005; 183:106–109.
- 2. White KL, Williams TF, Greenberg BG. The ecology of medical care. *New England Journal of Medicine* 1961; 265:885–892.
- 3. Millis JS. The Graduate Education of Physicians. Report of the Citizens' Commission on Graduate Medical Education. Chicago: American Medical Association; 1966.
- Alpert JJ, Charney E. The education of physicians for primary care. Washington, D.C.: Bureau of Health Services Research; 1973. DHEW publication no. (HRA): 74–3113.
- 5. Institute of Medicine. A Manpower Policy for Primary Health Care: Report of a Study. Washington, D.C.: National Academy Press; 1978.
- WHO (World Health Organization). Alma-Ata 1978: Primary Health Care. Report of the International Conference on Primary Health Care, Alma-Ata, Union Of Soviet Socialist Republics, 6–12 September 1978. Geneva: World Health Organization; 1978.
- Institute of Medicine. Primary Care. America's Health in a New Era. Donaldson MS, Yordy KD, Lohr KN, and Vanselow NA, editors. Washington, D.C. National Academy Press; 1996.

Changes and transformations in Primary Care within Canada and Ontario

In the 1970s, jurisdictions in Canada shifted from conventional solo and group general practice to alternative organization and funding models. This led to the emergence of Centres Locaux de Services Communautaires (CLSCs)/Local Community Services Centres in Quebec, as well as Health Service Organizations (HSOs) and Community Health Centres (CHCs) in Ontario. All of these transitions involved a change in funding and/or remuneration methods, as well as changes in delivery arrangements and organization.

CLSCs in Quebec were introduced in 1972 to provide primary medical and social services to geographically defined populations. Some CLSCs, especially those in rural areas, are vertically integrated with acute care hospitals and long-term care institutions.

HSOs in Ontario emerged between the late 1970s and early 1990s. These were physician-led, capitation-funded group practices providing medical care to rostered populations. The chief goal of this program was to shift physicians out of a feefor-service payment system. However, program expansion halted in the early 1990s due to a growing government concern that the program had failed to reduce health care costs while maintaining or improving health care quality. As a complementary program to HSOs, Ontario's CHCs emerged in the late 1970s. These are community-governed, globallyfunded primary health care organizations designed to improve access to health care for socially disadvantaged and hardto-serve populations.

The mid-1980s led to a broadening of primary care providers. The pursuit of cost control and response to advocacy by professional and consumer groups led several provinces to set policy supporting an expanded role for non-physician primary care providers. For example, midwives were integrated into the health care system of Ontario in 1994, followed soon after by British Columbia and Quebec. The role of nurse practitioners in primary care delivery was proclaimed in Ontario in 1998.

The mid-1990s saw all Canadian provinces undertaking primary care reform pilot and demonstration projects. As a result of the dramatic downsizing and restructuring in the hospital sector during the early 1990s, primary health care reform was aimed at pursuing a variety of innovations (e.g., organization/ governance, funding/remuneration and delivery arrangements). In Ontario, primary care reform led to the introduction of Family Health Teams (FHTs), the expansion of the role of nurse practitioners, and a strengthened role of CHCs and HSOs. FHTs are groups of physicians who work together, and offer nurse-staffed, after-hours telephone advisory service to provide primary care services to their patients at any time. The Ontario government spent more than \$250 million to make FHTs the mainstream model of primary care delivery. The number of nurse practitioners has also been increased to meet the demands of a growing and aging population who seek primary care.

Currently, the Ontario Ministry of Health and Long-Term Care has initiated a three-year transformation of the health care system that would include:

- Local Health Integration Networks (LHINs) that plan, coordinate and fund the delivery of health care services to specific local health care needs;
- FHTs to ensure that patients receive the services they need in a coordinated and integrated manner;
- Reduced waiting times for cancer services, total hip and knee replacements, selected cardiac services, cataract surgery, as well as magnetic resonance imaging and computerized tomography scans; and,
- An information management framework to make the government more accountable to the public (by informing Ontarians of the performance and evidence-based decisions of this health care transformation).

Local Health Integration Networks (LHINs) in Ontario, 2005/06



Source: Ministry of Health and Long-Term Care (Version 11)

A note about using billing data to measure utilization of physician services Physicians in Ontario work in a variety of settings with a wide range of compensation packages and payment methods:

Physician compensation models

Fee-for-service (FFS)—The physician bills the Ontario Health Insurance Plan (OHIP) for each service he or she performs according to a standard fee system. This is the normal practice for physicians in solo private practice, although some group practitioners are also paid in full or in part by FFS (see below).

Alternative payment plan (APP)—Physicians who practice in groups may be paid by salary, by capitation (i.e., they are paid a set amount for each patient) or by a combination of salary and capitation. In almost all cases, physicians who are on APPs must submit "shadow billings", meaning they submit billings as if they were billing FFS. The exception to this is physicians who work in Community Health Centres (CHCs) or Health Service Organizations (HSOs). These physicians are not paid by FFS and are not required to shadow bill.

The OHIP database of physicians' billings includes encrypted identifiers for: the physician providing the service; the person receiving the service; the type of service; the diagnosis; the date of service; and the amount paid for each service performed. The OHIP database comprises both FFS and shadow billings.

Most of the analyses conducted for *Primary Care in Ontario* were done using OHIP data. When we considered the key question, "Where are Ontario patients going for primary care?", we found that for a significant proportion of the population, there were no billings for physician office visits in the OHIP data.

Interpreting "no physician visit billings"

This raises an important question: did these people in fact visit physicians on APPs who did not submit shadow billings? Or did they truly have no physician visits at all during the time period studied? This is of particular relevance given that over the past decade, the Ontario government has been encouraging physicians to move away from a strict FFS payment model.

Even so, 78% of Ontario physicians were still paid solely through FFS in 2002/03 (see Exhibit 1.1). Another 17% had some involvement in non-FFS settings, but are still considered "mainly FFS." This leaves just over 5% of physicians who were primarily non-FFS; in fact, nearly three-quarters of this group still submitted some billings to OHIP.

We realize that our data are not complete. However, based on what we know, we suggest that the proportion of physicians with no OHIP billing data is not large enough to account for the fact that one in four Ontarians did not show any physician visit billings through OHIP in 2002/03. The bottom line is that, in the majority of cases, "no visit billings" should be interpreted to mean "no visits."

We must add one caveat: the situation did vary substantially across Local Health Integration Networks (LHINs). Exhibit 1.1 shows how physician payment methods vary by LHIN. This should be taken into account when looking at findings and exhibits in *Primary Care in Ontario*. Readers should take care—especially when interpreting results from the South East, North East, Waterloo Wellington and Hamilton Niagara Haldimand Norfolk LHINs. These regions contain large HSOs and CHCs, and physicians working in these organizations do not have to submit shadow billings to OHIP.

Exhibit 1.1	1.1 Percent distribution of general practitioner/family physician by practice/billing type, by Local Health Integration Network (LHIN), and for the Province of Ontario, 1992/93–2002/03											
LHIN	Practice/billing type (% of physicians)	1992/ 1993	1993/ 1994	1994/ 1995	1995/ 1996	1996/ 1997	1997/ 1998	1998/ 1999	1999/ 2000	2000/ 2001	2001/ 2002	2002/ 2003
1. Erie	FFS only	100	90	90	96	96	91	92	92	86	81	78
St. Clair	Mainly FFS, but with some non-FFS involvement	<.5	9	8	2	3	8	8	7	13	17	20
	Non-FFS	<.5	2	2	1	1	1	<.5	1	1	2	2
2. South	FFS only	100	88	89	95	97	92	94	94	67	62	60
West	Mainly FFS, but with some non-FFS involvement	<.5	9	8	2	2	4	3	3	31	34	37
	Non-FFS	1	3	3	3	2	4	3	3	3	4	3
3. Waterloo	FFS only	100	78	76	80	79	78	78	77	73	70	61
Wellington	Mainly FFS, but with some non-FFS involvement	<.5	11	8	7	7	7	6	5	14	15	24
	Non-FFS	1	11	16	14	14	16	16	18	13	15	15
4. Hamilton	FFS only	98	81	78	85	82	82	83	83	81	77	75
Niagara	Mainly FFS, but with some non-FFS involvement	<.5	8	9	3	5	6	5	7	11	16	18
Brant	Non-FFS	2	11	14	13	12	12	12	10	9	7	7
5. Central	FFS only	100	96	97	99	99	97	97	97	92	91	90
West	Mainly FFS, but with some non-FFS involvement	<.5	3	3	1	1	2	2	2	8	8	9
	Non-FFS	<.5	1	<.5	1	1	2	1	1	<.5	1	1
6. Mississauga	FFS only	99	96	96	99	99	99	98	98	92	91	86
Halton	Mainly FFS, but with some non-FFS involvement	<.5	3	3	1	1	1	1	1	7	8	13
	Non-FFS	1	1	1	1	<.5	1	1	1	1	1	1
7. Toronto	FFS only	98	89	88	89	91	86	89	89	90	85	83
Central	Mainly FFS, but with some non-FFS involvement	<.5	4	4	4	4	6	4	4	7	7	10
	Non-FFS	2	8	8	7	6	8	7	7	4	8	7
8. Central	FFS only	100	94	94	97	98	96	97	97	97	96	96
	Mainly FFS, but with some non-FFS involvement	<.5	4	4	2	1	2	2	2	2	3	3
	Non-FFS only	1	3	2	2	1	1	1	1	1	1	1
9. Central	FFS only	99	93	94	96	98	97	97	97	94	92	89
East	Mainly FFS, but with some non-FFS involvement	<.5	6	4	2	1	1	2	2	6	8	10
	Non-FFS	1	2	2	2	1	2	1	1	1	1	1
10. South	FFS only	98	84	82	91	93	88	87	87	79	71	60
EdSL	Mainly FFS, but with some non-FFS involvement	<.5	10	10	5	3	4	4	4	13	18	25
	Non-FFS	2	6	8	5	4	8	8	9	9	11	14
11. Champlain	FFS only	99	90	90	94	94	92	92	93	91	84	81
	Mainly FFS, but with some non-FFS involvement	<.5	5	5	2	2	3	3	3	7	11	13
	Non-FFS	1	5	5	4	4	5	5	5	3	6	6
12. North	FFS only	99	84	86	96	98	94	94	95	97	92	89
Muskoka	Mainly FFS, but with some non-FFS involvement	<.5	12	9	2	1	3	2	2	2	6	9
12. No	Non-FFS	1	4	5	2	1	3	4	3	<.5	2	2
East	FFS only	98	65	64	/5	81	/5	/1	/1	5/	53	46
	New FFS	1	2/	26	16	11	15	19	19	34	3/	43
14 North		1	8	10	9	8	10	10	10	9	11	12
West	FFS OFFICE but with some new FFC involvement	9/	68	68	80	83 15	74	71	74	46	4/	40
			24	23	15	15	20	22	21	4/	4/	10
		2	ŏ	9	6	5	6	6	5	/	6	70
	Height FFC but with some new FFC in the	99	87	87	91	92	90	90	90	85	81	/8
	IVIAITING FFS, but with some non-FFS involvement	<.5		1	4	3	5	4	5	11	14	1/
	NOU-LL2	1	5	6	5	4	6	5	5	4	5	5

FFS = Fee-for-service

1

Note: Estimates rounded to the nearest integer. Percent distributions may not add up to 100%.

Primary Care in Ontario

INSIDE

Executive Summary Introduction List of Exhibits Exhibits and Findings Discussion Appendix 1.A How the research was done

References



Primary Care in the Health Care System

Douglas G. Manuel, MD, MSc, FRCPC, Sarah Maaten, MSc, Deva Thiruchelvam, MSc, Liisa Jaakkimainen, MD, MSc, CCFP, and Ross Upshur, MA, MD, MSc, CCFP, FRCPC



Executive Summary

Issue

Primary care is the foundation of our health care system. This chapter examines the contribution of primary care to Ontario's health care system.

Study

Data from the Ontario Health Insurance Plan (OHIP), Canadian Institute for Health Information Discharge Abstract database (CIHI-DAD), and the Ontario Drug Benefit (ODB) Program database were used to assess how the services of general practitioner/family physicians (GP/FPs) fit within the landscape of Ontario's health care system between 1992/93 and 2002/03. GP/FP services were examined over time and compared to other types of health care services.

Key Findings

- Between 1992/93 and 2002/03, GP/FPs were a substantial source of health care sought by Ontarians.
- Approximately 140,000 people had a GP/FP office visit each day. This is equivalent to about four annual visits for each Ontarian under 65 years of age and seven annual visits for those aged 65 years and over. It was estimated that the average person in Ontario will make several hundred visits to a GP/FP in their lifetime.
- Despite Ontario's growing and aging population, there was no change in the overall amount of visits to GP/FPs between 1992/93 and 2002/03.
- GP/FPs were involved in the delivery of many different types of health care services that increased substantially between 1992/93 and 2002/03.

Implications

- Because of its central role, any changes to the primary care system will affect both the lives of Ontarians and the overall health care system.
- We don't know how many primary health care services Ontarians should use or how many they actually need. A better assessment of the level and type of primary care services that Ontarians require and would most benefit from is needed.

Introduction

This chapter describes the amount of health care that is provided by general practitioner/family physicians (GP/FPs) in Ontario and describes primary care services relative to other types of health care including: specialist care, hospital care, drug prescribing, laboratory services, and diagnostic imaging (e.g., X-rays). Rates of computerized tomography (CT) and magnetic resonance imaging (MRI) scans, and hip and knee replacements—high priority initiatives of the Ministry of Health and Long-Term Care—are presented for comparison.

Primary care in Ontario is increasingly emphasizing care provided by teams of health care professionals (e.g., nurse practitioners and midwives, in addition to physicians). Because the transition to multidisciplinary teams began fairly recently, it is too early to evaluate their impact on patient care and clinical outcomes. Limited data sources restrict our evaluation of the primary care setting to the role of physicians only.

This chapter presents primary care from four different perspectives:

- A day—We describe the number of various health care services that were provided in a typical day in Ontario in 2002/03.
- A year—We present the average number of days per year that a person accessed different types of health care services in Ontario in 2002/03.
- A decade—We show changes in the use of primary care and other health services in Ontario over the decade from 1992/93 to 2002/03.
- A lifetime—We estimate the amount of care a person will receive over the course of his or her lifetime, assuming the current level of health care continues.



Chapter 1—List of Exhibits

Exhibit 1.1 Average number of various health care services accessed each day, in Ontario, 2002/03

Exhibit 1.2 Average number of days per year in which a visit was made to the health care system, per person, by type of service, in Ontario, 2002/03

Exhibit 1.3 Percent change in number of health care services delivered, in Ontario, 1992/93 to 2002/03

Exhibit 1.4 Expected number of days with a visit to the health care system, from birth and from 65 years of age, by service type, in Ontario





*Values rounded to the nearest thousand with the exception of hip and knee replacements, which were rounded to the nearest 10.

©Institute for Clinical Evaluative Sciences

Findings

- In 2002/03, approximately 140,000 people in Ontario—about 1% of the total population of 12 million—visited a general practitioner/family physician (GP/FP).
- There was also a large daily volume of specialized care (e.g., hospital care and visits to specialists) but it was much lower than the number of visits to GP/FPs.
- Each day, there were over 2,500 times more GP/FP visits than there were hip and knee replacements.



Findings

- In 2002/03, the average person under 65 years of age in Ontario visited a general practitioner/family physician (GP/FP) four times. Those Ontarians aged 65 years and older made seven visits in that same year.
- Compared to the number of visits to GP/FPs, there were approximately half as many visits to specialists and 10% as many visits to the emergency department.



- The annual number of visits to GP/FPs did not change over the 10-year time period between 1992/93 and 2002/03.
- In contrast, there were large increases in the number of prescribed drugs, computerized tomography and magnetic resonance imaging scans ordered, and hip and knee replacements performed during the same time period.
- Of all of the health services examined, only the number of hospital admissions declined.





GP/FP = General practitioner/family physician

*Using mortality and health service rates from 2002/03.

©Institute for Clinical Evaluative Sciences

V Findings

- Women will visit a general practitioner/family physician (GP/FP) 410 times over the course of their lives, whereas men will make 300 GP/FP visits, given the current use of health care and current life expectancy (data not shown).
- People will visit a specialist nearly 140 times during their lifetime.
- A person will undergo lab tests on 116 days (nearly four months) in their lifetime.

Discussion

Ontarians use a lot of primary health care services—a signature of Canada's health care system

Almost all Ontarians are familiar with the basic role of general practitioners/family physicians (GP/FPs); however, many people are not aware that in our health care system GP/FPs do much more than in many other countries. In fact, GP/FPs contribute to the delivery of most health care services in Ontario. Examples of this role include:

- Eighty-five percent of prescriptions for seniors are written by GP/FPs;
- When Ontarians have a new health problem they usually visit a GP/FP;
- There are almost 54,000 specialist visits each day, which, for the vast majority start with a referral from a GP/FP;
- After hospital discharge, 59% of the time a GP/FP is the first doctor seen; and,
- When a patient sees a doctor in the emergency department, 80% of the time this doctor is a GP/FP.

In Canada, GP/FPs are the "point of entry" or "gatekeeper" for most health care services. This is different from many other countries where individuals decide for themselves what sort of doctor they are going to see. In Ontario, GP/FPs provide the vast majority of care for common health problems. In cases where the GP/FP cannot diagnose or address health problems, then a referral is made to the most appropriate specialist. GP/FPs also deliver preventive care and provide education and health promotion. Other chapters in this Atlas will show that GP/FPs provide a large amount (often the majority) of care for children, preventive services, management for chronic conditions (e.g., heart disease, cancer and mental health), and end-of-life care.

GP/FPs play an even larger role in the delivery of primary care in countries such as Denmark, Finland, the Netherlands, Spain and the United Kingdom. It has been suggested that countries that emphasize primary care have better overall health and more efficient health care systems.¹

The volume of primary care has not changed over the past decade. It is not clear what this means for the health and quality of care of Ontarians.

The overall volume of primary care has not changed. Some experts are concerned that the current volume of GP/FPs is too low to meet present demands, wheras others feel that good quality care can be provided within the current health human resource capacity.

On the worrisome side, many people report difficulty finding a GP/FP.² The fact that the number of emergency department visits is increasing may reflect, in part, that people have a hard time getting a regular office appointment with their GP/FP.

Also, Ontario's population is increasing and aging, but there have not been corresponding increases in the volume of visits to GP/FPs. Other chapters in this Atlas show that paediatricians, obstetricians and midwives are providing more primary care. Although Telehealth*, nurse practitioner and midwife services have increased, together these comprise a small part of primary care delivery compared to the role of physicians.²

Furthermore, despite fewer visits per person, GP/FPs appear to be doing more at each visit. For example, Ontarians take more medications, have more tests and when acutely ill, are more often treated in the community setting (rather than in hospital). GP/FPs are the most common physician type to prescribe medications and order tests, and are typically involved in care in the community setting. This increased level of care—to the larger and older population—has taken place without increasing annual visit rates to GP/FPs.

On the reassuring side, the quality of primary care continues to improve—particularly according to measures that relate to health outcomes and service performance. Health outcomes such as life and health expectancy are improving in Ontario.³ Similarly, death and disease rates for most chronic diseases are decreasing and these decreases are mostly continuing, aside from a few notable exceptions such as diabetes and obesity.⁴ Good primary care is associated with low rates of death and emergency department visits for specific conditions such as asthma. The rates of poor outcomes for these conditions continue to decline and are much lower than in the United States.³ The good health of Ontarians is often overlooked during periods of increased criticism of the health care system. Because people with better health generally use less health care, the overall improving health of people in Ontario will, in part, lessen the demands for primary care.

^{*} Telehealth Ontario is a telephone service offering free health advice from a Registered Nurse.

Currently, a typical Ontarian sees a GP/FP hundreds of times over their lifetime. Is this enough?

A first glance, hundreds of GP/FP visits over a lifetime would seem to be more than sufficient to meet the health needs of a typical person; however, concerns remain that even this level of care is not good enough. We need to better understand what level of primary care services will most efficiently and effectively provide a reasonable level of care.

A recent study examining childhood immunization in Ontario suggested that children are receiving inadequate preventive care, despite frequently being seen by doctors.⁵ Ontario children typically had about 20 visits to GP/FPs and/or paedia-tricians during their first two years of life. Yet, only two-thirds received recommended immunizations. It seems likely that the current level of childhood vaccination in Ontario could be achieved, or even improved upon, with fewer visits to the doctor.

On the other hand, current levels of primary care are insufficient to fully implement all recommended guidelines for care. A recent study estimated that current clinical practice guidelines for only 10 chronic diseases require services that take more time than GP/FPs have available for patient care overall.⁶ Considering that there are dozens of additional guidelines and recommended services for other conditions, it is not surprising that there is tension arising between the care that is recommended and that which is being provided. It is not known how many primary health care services Ontario's population should use or actually need.

Conclusions

GP/FPs in Ontario provide a large amount of health care. Over the past 10 years, the volume of care provided by GP/FPs has not changed despite a growing and aging population as well as large increases in the provision of other services (e.g., prescription drugs, X-rays and priority procedures like hip and knee replacement surgery).

Both the quality of care and the health of Ontarians continue to improve and GP/FPs should be acknowledged for providing more and better care, without an increase in the overall number of patient visits.

Fundamentally, the actual level of primary health care that is appropriate to meet the health needs of Ontarians is not known. A better understanding of how much and what sorts of care should be provided will more effectively and efficiently benefit the health of all Ontarians.



Appendix 1.A

How the research was done

Data sources

The study cohort consisted of persons identified in the Registered Persons Database (RPDB) who were alive and eligible for Ontario Health Insurance Plan (OHIP) benefits in fiscal years 1992/93, 1997/98 and 2002/03. The RPDB overestimates the number of people living in Ontario for multiple reasons. Although improvements have been made in recent years, the RPDB still contains a substantial number of individuals who are deceased or no longer living in Ontario. For some parts of Ontario, the difference between the RPDB and Statistics Canada population counts can be as high as 10%.7 To ensure that rates and estimates are correct, a methodology has been developed to adjust the RPDB so that population counts by age and sex match estimates from Statistics Canada.⁸ The Institute for Clinical Evaluative Sciences (ICES) Physician Database (IPDB) was used to identify physician specialty.

Variable definitions

The following variables were calculated for each time period and for all patients in the cohort.

General practitioner/family physician (GP/FP) visits:

All OHIP fee codes claimed by GP/FPs were reviewed to identify home and office-based consultations, examinations and procedures. Fee codes for inpatient care, nursing home care, laboratory testing and radiological examinations were excluded. Remaining fee codes were then used to extract claims from the OHIP database and to calculate primary care visits made to GP/FPs.

Specialist visits:

Office visits to specialists were based on consultation fee code claims which included an A or K prefix. Nursing home visits, inpatient visits, laboratory tests, surgical procedures and radiological exams were excluded. All visits to pathology, microbiology, clinical biochemistry, diagnostic radiology, clinical immunology and nuclear medicine were excluded. For all physician types, multiple fee codes billed by the same physician on the same day were counted as one visit.

Emergency department visits:

Emergency department visits were obtained from OHIP data. Using one or two of the procedure codes listed in Table 1.1, visits located in the emergency department were extracted:

Table 1.1	Procedure codes used to identify emergency department visits			
1 procedure code ONLY		2 procedure codes needed		
H1, H055, H065, H40		K007 or K013 and any A code		
A00, A88, A77, A990				
G521-G523, G395, G391				
K990-K997				

Hospital admissions:

Using data from the Canadian Institute for Health Information (CIHI), we counted all unique hospital admissions per person.

Days in hospital:

Using CIHI data we calculated the total number of days spent in hospital. For each individual hospital visit we calculated the length of stay by subtracting the date of discharge from the date of admission and summed up all the days in hospital in each time period.

Total drug costs:

Using the Ontario Drug Benefit (ODB) Program database we calculated the total amount paid by the Ontario Pharmacare Program for every prescription filled. Ontarians who are receiving social assistance or who are 65 years of age or older, are eligible for the ODB Program. These data are particularly useful when examining pharmacy costs in seniors.

Total pills taken:

The total number of pills taken was calculated by summing the total quantity of pills dispensed with each prescription in each time period.

MRI/CT scans:

Diagnostic codes from the OHIP database were used to identify magnetic resonance imaging (MRI) or computerized tomography (CT) scans, limited to one scan per patient per day.

Table 1.2	OHIP consultation fee codes used to identify magnetic resonance imaging (MRI) or computerized tomography (CT) scans				
Diagnostic	OHIP consultation fee code				
MRI	X421, X431, X441, X451, X461, X471, X488, X490, X493, X496				
СТ	X188, X400-X410, X412-X416 X124-X128, X231- X233, X412				

Hip and knee replacements:

Diagnostic codes and consultation fee codes from the OHIP and CIHI database analysis were used to identify hip or knee replacements, limited to one per person per month.

Table	e 1.3	Diagnostic codes used to	t surgery				
Ontario Health Insurance F (OHIP) consultation fee co		tario Health Insurance Plan IIP) consultation fee code	International Classification of Diseases, Tenth Revision- Canadian Classification of Health Interventions (ICD 10-CCI)	International Classification of Diseases, Ninth Revision-Canadian Classification of Diagnostic, Therapeutic, and Surgical Procedures (ICD 9–CCP)			
Hip	R	440, R241, R553, A065, A066, C065, C066	1VA53LAPN, 1VA53LAPNA, 1VA53LAPNK, 1VA53LAPNN, 1VA53LAPNQ, 1VA53PNPN, 1VA53PNPNA, 1VA53PNPNK, 1VA53PNPNN, 1VA53PNPNQ	93.51, 93.59, 93.52, 93.53, 93.65, 93.66, 93.67, 93.68			
Knee	R	441, R244, R248, A065, A066, C065, C066	1VG53LAPM, 1VG53LAPMA, 1VG53LAPMK, 1VG53LAPMN, 1VG53LAPMQ, 1VG53LAPN, 1VG53LAPNA, 1VG53LAPNK, 1VG53LAPNN, 1VG53LAPNQ, 1VG53LAPP, 1VG53LAPPA, 1VG53LAPPK, 1VG53LAPPN, 1VG53LAPPQ, 1VG53LASLN	93.41, 93.40			

X-rays:

OHIP X-ray codes were chosen from a list of procedure codes, including all diagnostic X-rays, but excluding MRI and CT scans. For analysis at the individual level (Exhibits 1.2 and 1.4), the count was limited to one X-ray per person per day.

Diagnostic laboratory tests:

All OHIP consultation fee codes beginning with "L" were included in the analysis. In some cases where laboratory procedures or tests have changed over time, some codes were omitted. For analysis at the individual level (Exhibits 1.2 and 1.4), the count was limited to one laboratory procedure or test per person per day.

Analyses

The visits to different sectors of the health care system were aggregated in different ways to allow an assessment of individual and system-wide health care use.

Within each health care sector:

- 1. All visits in each fiscal year were summed. The total number of visits in 1997/98 and 2002/03 were compared to 1992/93 to estimate the percent change over the decade.
- 2. All visits in 2002/03 were summed and then divided by 365 days to get the average daily number of visits.
- 3. Age- and sex-specific visit rates were generated using 2002/03 data to estimate the average number of visits that each person made in that year.
- 4. A lifetime perspective of health care was generated using an actuarial life table approach.⁴ This is the way in which the life expectancy of Ontarians is estimated, except that in this case life expectancy was divided into the proportion of life that is spent in different parts of the health care system (using the most recent rate of health care use). Life tables were first created using the mortality rate from Statistics Canada for Ontario men and women in 2002/03 for 20 age groups (<1, 1–4, 5–9, 10–14, ...,90+ years). Next, the proportion of life spent in different parts of the health care system was estimated using age- and sex-specific health care use.

Limitations

There are limitations to the findings in this chapter.

First, not all providers of the services in Ontario's health care system were described. Important primary care services that were not presented include:

- Telehealth—this telephone health advice service provided by nurses was not available 10 years ago.
- Nurse practitioner services—the proportion of primary care services provided by nurse practitioners is growing, but is still small compared to physician services.
- Other primary care providers such as optometrists, chiropractors, nurses, alternative and complementary clinicians ("traditional", naturopaths, etc.).

Second, there are important recent changes to the primary care system (e.g., encouraging physicians to work in teams) that are not reflected in the latest data available for this Atlas.

Lastly, not all parts of the health care system were included. This chapter is intended to provide a snapshot of health care, not a comprehensive portrait of the entire system. Nonetheless, the overwhelming majority of health care services are provided within the primary care system.

References

- 1. Starfield B, Shi L. Policy relevant determinants of health: an international perspective. *Health Policy* 2002; 60(3):201–18.
- 2. Health Results Team for Information Management. A primary health care scorecard for Ontario confidential draft not for distribution. Toronto: Ontario Ministry of Health and Long-Term Care; 2006.
- 3. Manuel D, Mao Y. Avoidable mortality in Canada and the United States: 1980–1996. *American Journal of Public Health* 2001; 92(9):1481–4.
- 4. Manuel DG, Schultz SE. Adding life to years and years to life: life and health expectancy in Ontario: ICES Atlas Report. Toronto: Institute for Clinical Evaluative Sciences; 2001.
- Guttmann A, Manuel D, Dick PT, To T, Lam K, Stukel TA. Volume matters: physician practice characteristics and immunization coverage among young children insured through a universal health plan. *Pediatrics* 2006; 117(3):595-602.
- 6. Ostbye T, Yarnall KS, Krause KM, Pollak KI, Gradison M, Michener JL. Is there time for management of patients with chronic diseases in primary care? *Annals of Family Medicine* 2005; 3(3):209–14.
- Glazier RH, Creatore MI, Agha MM, Steele LS, Inner City Toronto Time Trends Working Group. Socioeconomic misclassification in Ontario's Health Care Registry. *Canadian Journal of Public Health* 2003; 94(2): 140–3.
- 8. Chan BTB, Schultz SE. Supply and utilization of general practitioner and family physician services in Ontario. ICES Investigative Report. Toronto: Institute for Clinical Evaluative Sciences; 2005.

INSIDE

Executive Summary Introduction List of Exhibits Exhibits and Findings Discussion Appendix 2.A How the research was done

References



Care of women during pregnancy and childbirth

Sarah Maaten, MSc, Astrid Guttmann, MDCM, MSc, FRCPC, Alexander Kopp, BA, Manavi Handa, RM, MHSc, and Liisa Jaakkimainen, MD, MSc, CCFP





Executive Summary

Issue

With a large number of prenatal visits per pregnancy, this period in women's lives is a time of high health services utilization. It is therefore important to understand how primary care services are used during pregnancy and childbirth since this represents a large proportion of care in the population.

Study

Three groups of women aged 12–54 years who had given birth in an Ontario hospital in 1993/94, 1998/99 and 2003/04, were identified using data from the Canadian Institute for Health Information (CIHI). Prenatal care for these women was described using physician billing data from the Ontario Health Insurance Plan (OHIP) for the 40 weeks prior to delivery. Additionally, prenatal and intrapartum (the period covering labour and birth) services provided by midwives between 2001 and 2004, using data from the Ontario Midwifery Program, Ministry of Health and Long-Term Care was studied.

Key Findings

- The demographics of women giving birth in Ontario changed from 1992/93 to 2003/04. There was a trend towards fewer teenage girls having children, more older mothers, and a greater number of multiple births.
- The number of babies born and the birth rate among women of child-bearing age declined, while the proportion of Caesarean births increased substantially.
- The profile of providers of prenatal and intrapartum care has changed over time. Fewer women received prenatal care exclusively from general practitioners/ family physicians (GP/FPs). The majority of deliveries were performed by obstetricians, and this trend has continued over time. Midwives provided an increasing amount of prenatal and intrapartum services, although the number of births attended by this group of care providers was proportionally small over the period of time covered by this study.
- In northern Local Health Integration Networks (LHINs), GP/FPs and midwives provided a greater proportion of prenatal and intrapartum care than in other LHINs.

Implications

- Models of care for pregnant women are changing. GP/FPs are providing less care on their own, opting instead for shared care arrangements with obstetricians. Registered midwives are providing a small but increasing proportion of prenatal and intrapartum care.
- Primary care reform policy makers should consider how to incorporate these newer models of care into primary care practice to ensure continuity and coordination of care. This might include more formal arrangements for shared care or formal affiliations between obstetricians, GP/FPs, midwives and other providers.
- Primary care physician remuneration plans that discourage sharing of patients between GP/FPs need to account for the unique circumstances of prenatal care. GP/FPs who provide this care may be acting, in essence, as "consultants" for other GP/FPs.
Introduction

Fewer general practitioners/family physicians (GP/FPs) are involved in maternity care than ever before.¹ This trend has emerged in Canada over the last two decades.² The number of obstetrical services performed by each GP/FP is also declining in both urban and rural areas.³

Several factors have been suggested to explain this shift by GP/FPs away from maternity care, and especially from deliveries: physicians' office schedules are disrupted because labour and delivery are unpredictable; providing care "around the clock" interferes with home life; GP/FPs are not trained sufficiently to provide all types of obstetrical care; and, physicians who provide these services must pay a very high rate for malpractice insurance.^{4,5} At the same time, a new group of providers appeared on the scene in 1994, when registered midwives began practicing in Ontario.⁶

Also, the practice of maternity care has had to adapt to many factors. More older women are giving birth, with a concomitant increase in "high-risk" deliveries. The higher risk owes to the fact that there are more multiple births (e.g., twins, triplets) which occur as the result of certain fertility treatments and also more medically complicated pregnancies. Changes in prenatal screening have added to the complexity of care during this period. More women are undergoing first trimester ultrasound scans, and newer blood tests are available to detect genetic and other abnormalities in the fetus. There has also been a rise in the proportion of Caesarean sections in Canada—the rate increased from 18% in 1994/95 to 22% in 2000/01.⁷

The purpose of this chapter is to describe the characteristics of women giving birth in Ontario and to identify who is providing their care during pregnancy and delivery. The analysis was done by Local Health Integration Network (LHIN), by women's socioeconomic status and over time. Data on the characteristics of physicians providing maternity care is included in subsequent chapters of this ICES Atlas.

A note about women with few or no visit billings

The analyses of prenatal care by physicians were done using the Ontario Health Insurance Plan (OHIP) database of physician billings. Each billing includes an encrypted identifier for the physician providing the service, the person receiving the service, the type of service, diagnosis, date and the amount paid. For physicians paid on a fee-for-service (FFS) basis, the data offer an accurate reflection of the services provided. Approximately 93% of GP/FPs and 96% of obstetricians are paid on a FFS basis. Of those who aren't, a large proportion are still required to submit "shadow billings," so that a record of their services is captured and available.



However, a small proportion of doctors are salaried and do not submit shadow billings. This includes all physicians who work in Community Health Centres (CHCs), those in Health Service Organizations (HSOs), and those working under specialty alternate payment plans such as obstetricians in the Southeastern Ontario Academic Medical Organization (SEAMO) in Kingston. No OHIP data exist for these physicians, or for registered midwives who deliver babies, as they are paid under a separate funding program.

For this reason, caution must be used when interpreting data about prenatal care for women in the category "no billings." This group comprises a mix of women who are cared for by physicians for whom there is no billing data, by midwives or by nurse practitioners; whereas some are women who have had fewer than four prenatal visits to a health care provider.

Existing OHIP data was supplemented with information from the database of the Ontario Midwifery Program (Ministry of Health and Long-Term Care), which documents care provided by midwives. The group of women extracted from the Midwifery Program database was limited to include only those with valid Ontario health card numbers. The initial intent was to link these records to other health administrative records, but unfortunately this was not possible. Without linkage through patient identifiers, women in the "Less than Four Billings" category who had been cared for by midwives could not be identified; therefore, data from the Ontario Midwifery program are presented separately.

Note: Exhibits for midwife-assisted births and midwifedelivered prenatal care follow the exhibits for physicianattended births and physician-delivered prenatal care.

Chapter 2—List of Exhibits

I. Physician-attended births

Exhibit 2.1 Proportion and rate of births per 1,000 women aged 12–54 years, by delivery type and physician/provider type, in Ontario, 1993/94, 1998/99 and 2003/04

Exhibit 2.2 Proportion of women receiving prenatal care, by physician type, in Ontario, 1993/94, 1998/99 and 2003/04

Exhibit 2.3 Proportion of women receiving prenatal care, by physician type, Local Health Integration Network, and for the Province of Ontario, 2003/04

Exhibit 2.4 Number and proportion of women receiving prenatal care, by physician type and neighbourhood income quintile, in Ontario, 2003/04

Exhibit 2.5 Average number of prenatal visit billings, per pregnancy, by provider type, in Ontario, 1993/94, 1998/99 and 2003/04

Exhibit 2.6 Average number of visits per 1,000 women to internal medicine specialists and paediatricians/geneticists during the prenatal period, in Ontario, 1993/94, 1998/99 and 2003/04

Exhibit 2.7 Distribution of physicians attending deliveries, by provider type, Local Health Integration Network, and for the Province of Ontario, 2003/04

II. Midwife-assisted births

Exhibit 2.8 Number and proportion of midwife-assisted births, by age and location of birth (home or hospital), in Ontario, 2000/01–2003/04

Exhibit 2.9 Number and proportion of midwife-assisted births, by Local Health Integration Network, in Ontario, 2003/04

Exhibit 2.10 Number and proportion of women receiving prenatal and intrapartum care from midwives, by neighbourhood income quintile, in Ontario, 2003/04

2

Exhibits and Findings

I. Physician-attended births

Exhibit 2.1	Proport physicia	ortion and rate of births per 1,000 women aged 12–54 years, by delivery type and ician/provider type, in Ontario, 1993/94, 1998/99 and 2003/04								
			1993/94	1998/99	2003/04					
Total number of women delivering (live births)			139,101	124,177	123,192					
			Pi	roportion of women (%	5)					
Type of delivery	,	Caesarean Section	18	19	26					
		Vaginal	82	81	74					
Age group (year	rs)	12–14	<.5	<.5	<.5					
		15–19	6	5	4					
		20–34	82	78	76					
		35–44	12	17	20					
		45–54	<.5	<.5	<.5					
Type of birth		Singleton	99	99	98					
		Multiple (e.g., twins)	1	1	2					
Type of		GP/FP	22	17	13					
physician/provi	number of women deliv of delivery group (years) of birth of sician/provider udes midwives and r physicians births in women aged 1 group (years)	OB	64	71	78					
		GP/FP and OB	12	9	5					
includes midwive other physicians	es and	Other	1	3	4					
				Rate per 1,000 women						
Live births in w	omen aged	12–54 years	42	35	32					
Age group (year	rs)	12–14	<.5	<.5	<.5					
		15–19	23	18	12					
		20–34	87	78	74					
		35–44	20	22	23					
		45–54	<.5	<.5	<.5					

GP/FP = General practitioner/family physician

OB = Obstetrician

©Institute for Clinical Evaluative Sciences

- The demographics of women having babies in Ontario changed between 1993/94 and 2003/04. Over time, there were fewer births to teenage mothers and more births to women aged 35 years and older.
- The proportion of deliveries by Caesarean section increased, and there was a small increase in the proportion of multiple births.
- The rate of live births among Ontario women dropped from 42 per 1,000 women in 1993/94 to 32 per 1,000 women in 2003/04.
- The involvement of general practitioners/family physicians in delivering babies decreased over the same period of time.

Exhibit 2.2 Proportion of women receiving prenatal care, by physician type, in Ontario, 1993/94, 1998/99 and 2003/04



- * This includes women whose physician did not bill the Ontario Health Insurance Plan (OHIP), those who were seen predominantly by midwives or nurse practitioners and those who received little or no prenatal care (<4 visits).
- ** Some women receive the majority of their prenatal care (≥75% of their OHIP visits) from GP/FPs while others receive the majority of their care (≥75% of their OHIP visits) from OBs. In other women, prenatal care is "shared" more evenly between OBs and GP/FPs.

GP/FP = General practitioner/family physician

OB = Obstetrician

©Institute for Clinical Evaluative Sciences

V Findings

- The proportion of women receiving a large percentage (≥75%) of their prenatal care exclusively from an obstetrician increased over time.
- From 1993/94 to 2003/04 the proportion of women who received the majority of their prenatal care from a general practitioner/family physician decreased, while the proportion of shared prenatal care arrangements with obstetricians increased slightly.



- The profile of physicians who provided prenatal care to women in Ontario varied by Local Health Integration Network (LHIN).
- In the North East, North West and North Simcoe Muskoka LHINs there was a large proportion of women who received at least 75% of their prenatal care from general practitioners/family physicians.

Exhibit 2.4 Number and proportion of women receiving prenatal care, by physician type and neighbourhood income quintile*, in Ontario, 2003/04

		Neigh	bourhood in	come quinti	le	
	Q1 (lowest income)	Q2	Q3	Q4	Q5 (highest income)	
Number of women	25,224	23,792	24,258	25,358	21,623	
Proportion of women (%)						
No Billings**	12	12	12	12	13	
≥ 75% of visits to GP/FP	17	18	17	17	17	
≥ 75% of visits to OB	41	41	42	43	44	
Visits shared between GP/FP and OB***	30	29	29	29	26	

* See Appendix 2.A for a description of neighbourhood income quintile calculation.

** This includes women whose physician did not bill the Ontario Health Insurance Plan (OHIP), those who were seen predominantly by midwives or nurse practitioners and those who received little or no prenatal care (<4 visits).

*** Some women receive the majority of their prenatal care (≥75% of their OHIP visits) from GP/FPs while others receive the majority of their care (≥75% of their OHIP visits) from OBs. In other women, prenatal care is "shared" more evenly between OBs and GP/FPs.

GP/FP = General practitioner/family physician

OB = Obstetrician

©Institute for Clinical Evaluative Sciences

- There were relatively small variations in providers of prenatal care to women according to their socioeconomic status (as reflected by neighbourhood income quintile).
- In general, women living in lower income neighbourhoods were more likely to have shared care between general practitioners/family physicians and obstetricians than women living in the highest income neighbourhoods.
- Women living in wealthier neighbourhoods were slightly more likely to have received the majority of their prenatal care from an obstetrician compared to women living in poorer neighbourhoods.



- * This includes women whose physician did not bill the Ontario Health Insurance Plan (OHIP), those who were seen predominantly by midwives or nurse practitioners and those who received little or no prenatal care (<4 visits).
- ** Some women receive the majority of their prenatal care (≥75% of their OHIP visits) from GP/FPs while others receive the majority of their care (≥75% of their OHIP visits) from OBs. In other women, prenatal care is "shared" more evenly between OBs and GP/FPs.

GP/FP = General practitioner/family physician

OB = Obstetrician

©Institute for Clinical Evaluative Sciences

- Women whose prenatal care was shared between general practitioners/family physicians (GP/FPs) and obstetricians had more visits during their pregnancies than those whose care was provided mainly by one type of provider. (It should be noted that physician visits included all consultations and educational visits to GP/FPs, as well as visits coded for prenatal care.)
- The average number of visits made to midwives was slightly higher than the average number of visits made to physicians in 2003/04. Women who saw midwives may have also had additional visits to physicians. (These data are not captured in this exhibit.)

Exhibit 2.6 Average number of visits per 1,000 women to internal medicine specialists and paediatricians/ geneticists during the prenatal period, in Ontario, 1993/94, 1998/99 and 2003/04



©Institute for Clinical Evaluative Sciences

V Findings

- Over time, the number of visits made by pregnant women to specialists increased. This included visits to specialists who provide genetic counselling/testing (paediatricians and geneticists) or to internal medicine specialists who help manage complicated medical problems (e.g., general internists or other medical subspecialists such as endocrinologists).
- Although the overall numbers were small, the number of prenatal visits for genetic counselling/testing doubled between 1993/94 and 2003/04.



2

Exhibit 2.7	Proportion of physician-att and for the Province of Or	ended deliveries, by provider type, Local Health Integration Network, tario, 2003/04							
		Provider type							
		GP/FP Only	OB Only	Both GP/FP and OB*	Other**				
Total number of o	deliveries	15,482	96,505	5,986	5,219				
Local Health In	tegration Network		Proportion of de	eliveries (%)					
1. Erie St. Clai	r	7	84	7	2				
2. South West		18	73	4	5				
3. Waterloo W	3. Waterloo Wellington		77	3	9				
4. Hamilton Nia	4. Hamilton Niagara Haldimand Brant		11 75 8		6				
5. Central Wes	t	12	83	3	2				
6. Mississauga	a Halton	9	79	9	3				
7. Toronto Cer	itral	10	82	3	5				
8. Central		6	91	1	2				
9. Central Eas	t	13	82	3	2				
10. South East		17	75	4	4				
11. Champlain		14	76	5	6				
12. North Simco	be Muskoka	22	57	17	4				
13. North East		23	65	4	8				
14. North West		39	44	4	14				
All Ontario		13	78	5	4				

* Both GP/FP and OB listed as attending physician on the hospital record.

** Includes midwives and physician other than GP/FP and OB.

GP/FP = General practitioner/family physician **OB** = Obstetrician

©Institute for Clinical Evaluative Sciences

Findings

• Obstetricians performed the vast majority of deliveries in Ontario in 2003/04.

• The greatest proportion of deliveries attended by general practitioners/family physicians occurred among women in the North East, North West and North Simcoe Muskoka Local Health Integration Networks.

II. Midwife-assisted births

Exhibit 2.8	Numl hospi	ber and proportion of midwife-assisted births*, by age and location of birth (home or ital), in Ontario, 2000/01–2003/04								
					Fiscal yea	ar				
			2000/01	2001/02	2002/03	2003/04				
Number of women delivering (midwife-assisted births)			N/A	N/A	N/A	7,362				
Proportion of women (%):										
Age (years	s)**	≥ 35 years	N/A	N/A	N/A	28				
		<19 years	N/A	N/A	N/A	<.5				
Number of ba	abies bor	n (midwife-assisted births)	5,953	6,476	7,148	7,398				
Location of birth (%):										
		Home, with midwives***	28	25	24	24				
		Hospital, with midwives	72	75	76	76				

* Birth is considered a live or stillbirth at greater than 20 weeks gestation or 500g.

** Not all records have a birth date. The sample for age analysis is 7,339

*** Birth at home category may include small number of births that occurred in a location other than home or hospital.

©Institute for Clinical Evaluative Sciences

- There was a steady increase in the number of babies born to Ontario women giving birth under the care of midwives, 2000/01 to 2003/04.
- The proportion of midwife-assisted births that took place in-hospital increased slightly from 2000/01 to 2003/04.



- Midwife-assisted hospital births, where the midwife was the most responsible provider, outnumbered home births in all parts of the province. However, the ratio of midwife-assisted home births to midwife-assisted hospital births varied by Local Health Integration Network (LHIN).
- The largest number of midwife-assisted births took place in the Toronto Central, Hamilton Niagara Haldimand Brant and Waterloo Wellington LHINs.
- The largest proportion of midwife-assisted births (as a proportion of all births) took place in the North East, North West and North Simcoe Muskoka LHINs. Midwives assisted 20% of all births in the North West LHIN and 16% of all births in the North Simcoe Muskoka LHIN.

Exhibit 2.10 Number and proportion of women receiving prenatal and intrapartum care from midwives, by neighbourhood income quintile*, in Ontario, 2003/04

		Neighbourhood income quintile							
		Q1 (lowest income)	Q2	Q3	Q4	Q5 (highest income)	Quintile n/a**		
	Total number of women	Proportion of women (%)							
Women receiving care from midwives	7,667	15	19	19	23	21	3		
Births in hospital	5,556	15	19	19	23	21	3		
Births at home	1,806	16	20	20	22	19	4		

* See Appendix 2.A for a description of neighbourhood income quintile calculation.

** Information unavailable.

©Institute for Clinical Evaluative Sciences

- There was some variation in the proportion of women who received prenatal or intrapartum (labour and delivery) care from midwives, according to their socioeconomic status (as reflected by neighbourhood income quintile).
- Women who lived in the two highest neighborhood income quintiles were slightly more likely to choose to receive prenatal and intrapartum care from midwives.

Discussion

Like many other jurisdictions, Ontario has seen changes in prenatal and intrapartum care. These include changes in the demographics of women giving birth, and changes in the providers of care during pregnancy and delivery.²

More older women are giving birth than ever before; there are growing numbers of multiple births (i.e., twins, triplets); and rates of Caesarean section have increased. At the same time, the birth rate in teenage girls dropped by almost half between 1993/94 and 2003/04.

Ontario's prenatal and intrapartum care provider pool has also changed. The proportion of women who received intrapartum care from general practitioners/family physicians (GP/FPs) decreased between 1993/94 and 2003/04. There was also a small but increasing proportion of the population obtaining midwifery services for both prenatal and intrapartum care. For the most part, however, maternity care has become more specialized. Today it is delivered predominantly by obstetricians, and to a small but increasing degree by midwives.

Providers of prenatal and intrapartum care varied across Ontario's 14 Local Health Integration Networks (LHINs). This is not surprising, given the currently uneven distribution of specialists across the Province. There was also little difference in women's use of prenatal and intrapartum care across the socioeconomic spectrum. However, without a more complete assessment of whether differences in medical risk factors exist according to women's socioeconomic status or by region, it is difficult to draw any meaningful conclusions about access to appropriate care from these findings.

There were large regional variations in the mix of caregivers who provided prenatal and intrapartum care to Ontario women. In many other parts of the world, particularly in European countries, obstetricians provide care predominantly to high-risk women, while midwives and GP/FPs provide a larger proportion of the care to low-risk women.⁵

According to national guidelines, there is no optimal number of prenatal visits indicated for pregnant women. Instead, the physical and psychosocial needs of the woman and her unborn baby should determine the frequency of visits.⁸ The average number of prenatal visits by pregnant women in the current study was comparable to rates in other developed countries: women typically make between 11 and 14 visits for prenatal care.⁹ This is also similar to rates observed in Manitoba.¹⁰

Women in shared care* arrangements with GP/FPs and obstetricians had the greatest number of prenatal visits over the study period. This could indicate that women who see multiple providers receive uncoordinated and potentially unnecessary care. However, the issue of whether or not Ontario women were receiving adequate prenatal care could not be fully investigated. Further research should explore whether the differences in visit rates by women might reflect problems in either access to or coordination of appropriate care.

Additional research is also needed to examine patterns of prenatal visits to different provider groups. Such investigation might help determine whether Ontario women are accessing prenatal visits at appropriate intervals, starting in the first trimester of pregnancy. This, in addition to the total number and content of health care visits, will provide the most reliable indicator of adequate and high quality prenatal care.

Implications for primary care practice and policy

Fewer family physicians in Ontario are providing maternity care; indeed, many are eliminating deliveries from their scope of practice altogether.^{1,3} Some observers have predicted that there will be a shortage of family physicians able and willing to provide complete maternity care.²

The role of family medicine in providing obstetrical care could be re-emphasized by addressing professional barriers to adopting this focus (e.g., concerns about interruption of office duties, interference with home life, insufficient training, and high malpractice insurance costs) and by encouraging interested residents to incorporate intrapartum services into their practices.^{4,5,11}

Primary care renewal in Ontario has seen the implementation of incentive programs to encourage family doctors to work in groups. However, remuneration models may hinder those wishing to provide prenatal and intrapartum services to patients. If women are rostered** to one physician or one group of providers, fee negation prevents other GP/FPs from being adequately remunerated for providing care during pregnancy to these patients.

^{*} Some women receive the majority of their prenatal care (≥75% of their OHIP visits) from GP/FPs while others receive the majority of their care (≥75% of their OHIP visits) from OBs. In other women, prenatal care is "shared" more evenly between OBs and GP/FPs.

^{**} Under a rostering system, a patient commits to seek care only from a specific physician within a specific primary care group, except in extraordinary circumstances. Physicians, in turn, commit to provide "round the clock" access to care.

Primary care remuneration models must account for GP/FPs who share the care of pregnant patients with one another, with obstetricians and, in some cases, with midwives. These shared care models should be acknowledged and processes put into place to ensure coordination and continuity of care for women both during and after pregnancy.

Future research and evaluation questions

Further research should explore how changes in the nature of prenatal and intrapartum care providers relate to health outcomes, particularly in the areas of access and appropriateness of care.

Along with many others, we have documented an important increase in rates of delivery by Caesarean section (C-section).^{7,12} It was beyond the scope of this chapter to explore the appropriateness of C-sections or the proportion that were done due to expanded indications such as breech presentation,¹³ but we believe this remains an important topic for further research and professional activity.

Additional research should also be done to explore the impact that access to appropriate services for high-risk pregnant women has on maternal and fetal health outcomes.

Data needs

Further analysis is essential to our understanding of how care is delivered to all pregnant women in the Province. It is important to more accurately describe the population of pregnant women in Ontario who receive little or no prenatal or intrapartum care.

Linking of midwife and physician services data in research provides an excellent opportunity to examine care across the spectrum of providers. It is important to consider data from all professions involved in providing prenatal and intrapartum care in Ontario. This includes midwives, nurse practitioners and registered nurses who attend many births in Ontario, particularly in rural and remote regions where care is more likely to be delivered by non-physicians. This should be done using individual-level midwifery, registered nurse and nurse practitioner data. The goal is to link such data with information existing in other health administrative databases and with missing shadow billing claims for physicians who do not bill the Ontario Health Insurance Plan (OHIP).



How the research was done

Data sources

Ontario health administrative data were used to compile information on women receiving prenatal and obstetrical care in Ontario; these data also provided information about the physicians who provided services to these women during pregnancy and delivery.

Discharge abstracts from the Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD) describe women who were admitted to hospital for delivery in the three cross-sectional time periods covered by our study: April 1, 1993 to March 31, 1994; April 1, 1998 to March 31, 1999; and April 1, 2003 to March 31, 2004. Information about the specialty of physicians providing intrapartum care to women was taken from the CIHI database.

The Ontario Health Insurance Plan (OHIP) Physician Services File was used to gather information about prenatal visits and type of delivery (see specific codes below for specification of prenatal visit and delivery type). The specialty of the physician providing prenatal care to pregnant women was derived from the Institute for Clinical Evaluative Sciences (ICES) Physician Database (IPDB).

Neighbourhood income is calculated by Statistics Canada and is updated every five years when new census data become available. For 1996, income estimates were available by enumeration area (EA). In 2001, EAs were replaced by dissemination areas (DA). Ontario neighbourhoods are then classified into one of five approximately equal-sized groups (quintiles), ranked from poorest to wealthiest, where Q1 is the poorest and Q5 is the wealthiest. These income quintiles are used as a proxy for overall socioeconomic status, which has been shown to be related to population health status and levels of health care utiliization. Individual geographic information from Institute for Clinical Evaluative Sciences databases was used to define the best known postal code for each woman on July 1st of each year (available from 1991 to 2004). Postal codes were then used to assign the women to EAs and DAs (using the Postal Code Conversion File from Statistics Canada) and thus to one of the income quintiles.

All midwife data were extracted from the Client Tracking Sheet Database 2003/04. This database resides at the Ontario Midwifery Program (Ontario Ministry of Health and Long-Term Care). Women included in the analysis had valid OHIP numbers and postal codes, had made at least three prenatal visits to a midwife and had given birth at more than 20 weeks gestation. Records without a specified birth location were removed from this analysis. The total number of registered midwives included all those with active registration. This cohort represented approximately 92% of the total population of women who received prenatal care from midwives during the study period, and over 95% of women who had midwife-assisted births.

All estimates were rounded to the nearest integer for presentation in exhibits. As a result, proportional distributions may not add up to 100%.

Table 2.1	Codes for identificat Canadian Institute fo	Codes for identification of stillbirths, abortive deliveries and type of delivery from the Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD)								
	ICD-9	ICD-10-CA	CCI							
Inclusion										
C-Section	N/A	N/A	860, 861, 868, 869	5MD60						
Multiple Births	V272, V275, V276 (mult birth, some live)	Z372, Z375, Z376 (mult birth, some live)	N/A	N/A						
Exclusions										
Stillbirths	V271, V274, V277	Z371, Z374, Z377	N/A	N/A						
Abortive Delivery	N/A	N/A	863, 864, 870, 871,872	5CA93EM, 5CA93EQ, 5CA88, 5CA89, 5MD60KF, 5MD60RE, 5MD60RF						

Definition of prenatal care and delivery

Delivery—The main patient service code indicating obstetrical delivery (51) in the CIHI data was used to identify mothers. Mothers without a valid OHIP billing number at time of delivery or who were ineligible for OHIP coverage in the 40 weeks preceding the delivery date were removed from the analysis. Also excluded were: records where the woman's age was missing; where the woman's age was greater than 54 years; where the pregnancy resulted in a stillbirth; and where an abortive delivery procedure was used.

Each woman's encrypted OHIP number and date of delivery was used to link to physician claims in the OHIP physician services database. If there was no link to OHIP data, the patient was not included in the analysis.

Prenatal care—All OHIP records occurring in the 40 weeks prior to delivery date were selected for the women who gave birth. Prenatal visits were determined by limiting one record per person per doctor per day. Only visits to GP/FPs and obstetricians for the following fee codes were included:

Table 2.2	OHIP	fee codes
OHIP Fee co	odes	Description
А		Consultation or Assessment
К		Psychotherapy
P003		First Prenatal
P004		Other Prenatal
P005		Prenatal Prev. Ass.

Women who received at least four visits over the 40-week period were then classified by the type of physician who provided the majority of their prenatal care. In order to understand who was delivering the majority of prenatal care to women, we devised the following rule:

- GP/FP only: At least 75% of prenatal visits made to a GP/FP
- Obstetrician only: At least 75% of prenatal visits made to an obstetrician
- Shared care: Less than 75% of prenatal visits made to both GP/FPs and obstetricians

The number of women consulting with internists, geneticists or paediatricians who provided genetic counselling and services was determined using the following codes for specialists:

Table 2.3	Fee codes for specialists					
Specialists	Specialty	OHIP Fee Codes				
Internists	Specialty of Internist as defined by CPDB OHIP specialty variable	All codes beginning with A or K				
Geneticists/ Paediatricians	Any specialty	A225, A325, A226, K016, K222, K223, A265, A665, A565, A266				

Limitations

The main limitation of this analysis relates to data for service delivery by physicians who took part in alternative payment plans during the time periods covered by our study. Visits by women who received care from physicians who were not paid by the fee-for-service (FFS) system did not appear in the OHIP claims database. This biases the number of prenatal visits downwards for women who received care from physicians practicing within Health Service Organizations, Community Health Centres, or from physicians involved in other alternate payment models.

There may be some other limitations in the findings:

- Deliveries by obstetricians in parts of the province such as Kingston, where a large number of specialists are part of the Southeastern Ontario Academic Medical Organization (SEAMO) group and do not bill OHIP, may be underestimated.
- It was not possible to determine lengths of women's pregnancies and thus a length of 40 weeks was assumed for all women.
- Including general consultation codes for GP/FPs and obstetricians, may have caused an overestimation of the number of visits that were directly related to prenatal care—particularly for those women who had pregnancies shorter than 40 weeks in length and who saw their physicians in the period before conception.
- Finally, identifying women using CIHI records limited the ability to capture those who gave birth outside of hospital and those who had no OHIP cards at the time they gave birth. Fortunately, the data could be complemented somewhat by linking to information from the Ontario Midwifery Program database. This source captures patients in Ontario with valid health card numbers who gave birth in or out of hospital attended by midwives.

References

- Chan B, Schultz S. Supply and utilization of general practitioner and family physician services in Ontario. ICES Investigative Report. Toronto: Institute for Clinical Evaluative Sciences; 2005.
- Kaczorowski J, Levitt C. Intrapartum care by general practitioners and family physicians: Provincial trends from 1984–85 to 1994–95. *Canadian Family Physician* 2000; 46:587–97.
- 3. Tepper J. The evolving role of Canada's family physicians: 1992–2001. Toronto: Canadian Institute for Health Information; 2004.
- Buckle D. Obstetrical practice after a family medicine residency. Canadian Family Physician 1994; 40:261–8.
- 5. Wiegers T. General practitioners and their role in maternity care. *Health Policy* 2003; 66:51–59.
- 6. Hawkins M, Knox S. The Midwifery Option: A Canadian guide to the birth experience. Toronto: HarperCollins Publishers; 2003.
- Liu S, Rusen ID, Joseph KS, Liston R, Kramer MS, Wen SW et al. Recent trends in caesarean delivery rates and indications for caesarean delivery in Canada. *Journal of Obstetrics and Gynaecology of Canada* 2004; 26(8):735–42.
- Public Health Agency of Canada/Care During Pregnancy. In: Family-Centred Maternity and Newborn Care: National Guidelines. Last Updated: 2002-09-02. Accessed may 2, 2006 at http://www.phac-aspc. gc.ca/dca-dea/publications/fcmc04_e.html
- Villar J, Carroli G, Khan-Neelofur D, Piaggio G, Gulmezoglu M. Patterns of routine antenatal care for low-risk pregnancy. *Cochrane Database of Systematic Reviews* 2001; 4:CD000934.
- Mustard C, Roos N. The relationship of prenatal care and pregnancy complications to birthweight in Winnipeg, Canada. *American Journal* of Public Health 1994; 84(9):1450–7.
- Rudderman J, Holzapfel S, Carroll J, Cummings S. Obstetrics anyone? How family medicine residents' interest changed. *Canadian Family Physician* 1999; 45:638–40, 643–7.
- Declercq E, Menacker F, MacDorman, M. Rise in "no indicated risk" primary caesareans in the United States, 1991–2001: cross sectional analysis. *British Medical Journal* 2005; 330(7482):71–2.
- Hannah ME, Hannah WJ, Hewson SA, Hodnett ED, Saigal S, Willan AR. Planned caesarean section versus planned vaginal birth for breech presentation at term: a randomised multicentre trial. *Lancet* 2000; (356):1375–83.

INSIDE

Executive Summary Introduction Exhibits and Findings Discussion Appendix 3.A How the research was done

References



Primary Care for Children

Astrid Guttmann, MDCM, MSc, FRCPC, Kelvin Lam, MSc, Susan E. Schultz, MA, MSc, and Liisa Jaakkimainen, MD, MSc, CCFP





Executive Summary

Issue

Although primary care reform in Ontario has focused on family physicians and allied health professionals, paediatricians also provide primary care services for children. Very little is known about primary care services for children, including which children receive primary care from paediatricians and whether such patterns vary by region and over time.

Study

This study assessed the delivery of primary care services to Ontario children (defined as those who were younger than 18 years at the start of each study period) using physician billing data. These data covered three two-year time periods between 1992/93 and 2003/04. Children were assigned to a "regular primary care provider" (RPCP), defined as the physician providing the majority of each child's preventive or primary care. If no single provider was responsible for more than 50% of a child's care, then no RPCP was assigned. Based on these definitions, the proportion of children cared for by general practitioners/family physicians (GP/FPs) and paediatricians was described. Changes in sources of primary care over time and variarions by Local Health Integration Network (LHIN) were analysed. The access to paediatric care in children with increased health needs (i.e., due to complex medical conditions) was also described.

Key Findings

- For the time periods covered by our analyses, more than 60% of Ontario children under 18 years of age had a general practitioner/family physician (GP/FP) as their "regular primary care provider."
- Over time, there was a decrease in the average number of primary care visits by children to both GP/FPs and paediatricians, and an increasing proportion of children with no primary care visits in a two-year period.
- Paediatricians provided a substantial and increasing amount of primary care to children in Ontario, which needs to be taken into account in any primary care reform plans.
- Primary care paediatricians were located predominantly in large urban centres. Children with complex and chronic health conditions and children from higher income neighbourhoods were more likely than all children to have paediatricians as their regular primary care providers.
- There was regional variation in the rates of primary care visits by children.
- The data show an inverse relationship at the LHIN level between rates of primary and preventive care visits and emergency department (ED) visits—that is, across LHINs, as the average number of preventive and primary care visits per child decreased, the average number of ED visits increased.

Implications

- While GP/FPs continued to provide the majority of primary care to children in Ontario, between 1992/93 and 2003/04 the amount of primary care provided by paediatricians was substantial (particularly for children with complex medical problems) and was increasing. If primary care reform seeks to discourage paediatricians from practicing primary care, plans must be made to fill the resulting human resources gap.
- There needs to be discussion of ways to integrate paediatricians and other health care providers into newer models of primary care delivery to best serve the needs of children with chronic conditions.
- Finally, further work is needed to explore the growing number of children who never visit a physician for primary care. This includes identifying some of the current barriers to appropriate health care in childhood.

Introduction

Primary care is the cornerstone of health care for children. The major areas of need in the paediatric population are for preventive and acute care. There is good evidence that continuity of care with a primary care provider is associated with improved outcomes in both these areas.^{1–4}

For young children, primary care is the venue for immunizations, one of the most effective health care interventions, and for anticipatory guidance on a range of important developmental and health problems. There is also evidence that primary prevention is effective in protecting children from a variety of negative health outcomes.⁵ Among a small but growing group of children with chronic health conditions, primary health care needs are more complex. For these children, having a "medical home" is of particular importance in ensuring coordination of care.^{6,7}

In Ontario, primary care for children is currently delivered both by paediatricians and general practitioners/family physicians (GP/FPs). Very little is known about the physicians who provide primary care for children, with the exception of information presented in an earlier report about Ontario's community paediatricians.⁸ Information is also lacking about which children access paediatricians for primary care, how many visits they make, and whether this varies by region and over time. Finally, it is unknown whether the current maldistribution of primary care physicians⁹ has had an impact on children's access to primary care.

The goal of this chapter is to describe the primary care that Ontario children received from 1992/93 to 2003/04 and to document any changes that occurred over the past decade. We also describe how paediatric care—whether primary or secondary—was accessed in various regions of the Province, including by children with a range of chronic diseases.

A note about the "no visit billings" category

The proportion of Ontario physicians who work in settings where they are not paid on a fee-for-service (FFS) basis has grown over the past decade. However, the majority of these physicians are still required to submit shadow billings to the Ontario Health Insurance Plan (OHIP) for the services they provide. It is therefore reasonable to conclude that, in the majority of cases, "no visit billings" for Ontario children means no office-based contact with a physician. Further information is available on page xvi in the preliminary section of this Atlas.



Chapter 3—List of Exhibits

Exhibit 3.1 Regular primary care provider (RPCP) for children aged 0–17 years, by physician specialty type and age group, in Ontario, 1992–94, 1997–99 and 2002–04

Exhibit 3.2 Number of physician visits per year per 100 children aged 0–17 years, by age group and visit type, in Ontario, 1992–94, 1997–99 and 2002–04

Exhibit 3.3 Regular primary care provider (RPCP) for children aged 0–17 years, by physician specialty type, Local Health Integration Network, and for the Province of Ontario, 2002–04

Exhibit 3.4 Number of physician visits per year per 100 children aged 0–17 years, by visit type and physician specialty type, in Ontario, 1992–94, 1997–99 and 2002–04

Exhibit 3.5 Relationship between preventive care and emergency department visits in children aged 0–17 years, across Local Health Integration Networks, in Ontario, 2002–04

Exhibit 3.6 Regular primary care provider (RPCP) for children aged 0–17 years, living in London, Ottawa, Toronto and Windsor, by physician specialty type and neighbourhood income quintile, 2002–04

Exhibit 3.7 Proportion of children aged 0–17 years with higher health risks/needs, living in London, Toronto, Ottawa and Windsor, whose regular primary care provider (RPCP) was a paediatrician, by age group, 2002–04

Exhibit 3.8 Number of paediatrician visits per year and proportion of those who visited a paediatrician, for children with higher health risks/needs, and for all children aged 0–17 years, by Local Health Integration Network, in Ontario, 2002–04

Findings

Exhibit	: 3.1 Regular primary care provi age group**, in Ontario, 1	der (RPCP)* for children age 1992–94, 1997–99 and 2002	ed 0–17 years, by physicia –04	an specialty type and
Age gro	oup (years)	1992–94	1997–99	2002–04
0–1	Total number in age group	141,818	134,345	130,619
		74	70	60
	GF/FF Boodiatrician	74	13	09
	No regular provider assigned	22	23	21
	No regular provider assigned	2	2	2
	No visit billings	6	2	<u> </u>
2–3	Total number in age group	435,498	435,118	398,693
	RPCP (% of children)	00	04	00
	GP/FP Description	66	64	62
		18	20	23
	No regular provider assigned	12	11	10
	No visit billings***	4	5	5
4–9	Total number in age group	828,221	910,912	910,683
	RPCP (% of children)			
	GP/FP	62	60	58
	Paediatrician	13	14	16
	No regular provider assigned	17	16	15
	No visit billings***	8	11	12
10–13	Total number in age group	521,488	589,540	655,726
		65	61	50
	GF/FF Boodiatrician	00	0	59 10
	No regular provider assigned	8	5 16	10
	No visit hillings***	11	15	17
	No Mar Dillinga	11	10	17
14–17	Total number in age group RPCP (% of children)	521,541	563,025	630,355
	GP/FP	71	68	67
	Paediatrician	4	4	5
	No regular provider assigned	16	15	14
	No visit billings***	10	13	15

* Assigned RPCP is the physician to whom the individual made more than 50% of his/her visits. If no physician was responsible for more than 50% of visits, then no RPCP was assigned. See Appendix 3.A for more detail.

** The study comprised three two-year time periods. Age refers to the child's age at the beginning of each period.

*** See note about interpretation of the "no visit billings" category on page 37.

GP/FP = General practitioner/family physician

©Institute for Clinical Evaluative Sciences

- General practitioners/family physicians were most frequently the regular primary care provider (RPCP) for children in all age groups.
- Young children were more likely than older children to have a paediatrician as their RPCP.
- The percentage of children with a paediatrician as their RPCP increased over time in all age groups.
- There was a steady increase over time in the percentage of children with no primary care visit billings in all but the youngest age groups.

Exhibit 3.2 Number of physician visits per year per 100 children aged 0–17 years, by age group* and visit type, in Ontario, 1992–94, 1997–99 and 2002–04



* The study comprised three two-year time periods. Age refers to the child's age at the beginning of each period.

** Preventive care visits were defined as well-baby exams, annual health exams and visits that included immunization.

©Institute for Clinical Evaluative Sciences

- There was a steady decline in the total number of primary care visits among children in all age groups between 1992–94 and 2002–04.
- The visit rates for preventive care remained relatively stable within each age group over this time period.
- Mean visit rates were highest in the first three years of life and lowest among children aged 10 years or older.



Regular primary care provider (RPCP)* for children aged 0–17 years**, by physician specialty type, Local Health Integration Network, and for the Province of Ontario, 2002–04



* Assigned RPCP is the physician to whom the individual made more than 50% of his/her visits. If no physician was responsible for more than 50% of visits, then no RPCP was assigned. See Appendix 3.A for more detail.

** Age refers to the child's age at the beginning of the two-year time period.

*** See note about interpretation of the "no visit billings" category on page 37.

GP/FP = General practitioner/family physician

©Institute for Clinical Evaluative Sciences

- In all Local Health Integration Networks (LHINs), the majority of children under 17 years of age had general practitioners/ family physicians as their regular primary care providers (RPCP).
- There was significant variation across LHINs in the proportion of children whose RPCP was a paediatrician.
- The Toronto Central, Central and Champlain LHINs had the highest proportion of children with paediatricians as their RPCPs. The three northern LHINs (North East, North West and North Simcoe Muskoka) had the lowest proportions of children who received most of their care from paediatricians.
- Overall in Ontario, 12% of all children had no primary care physician visit billings in a two-year period. The North East, North West and Waterloo Wellington LHINs had the highest proportion of children with no primary care physician billings.

Exhibit 3.4 Number of physician visits per year per 100 children aged 0–17 years*, by visit type and physician specialty type, in Ontario, 1992–94, 1997–99 and 2002–04



* The study comprised three two-year time periods. Age refers to the child's age at the beginning of each period.

** Preventive care visits were defined as well-baby exams, annual health exams and visits that included immunization.

GP/FP = General practitioner/family physician

©Institute for Clinical Evaluative Sciences

V Findings

- The rate of visits by children to general practitioners/family physicians (GP/FPs) for all types of primary care fell by almost one-third over time.
- Paediatrician visit rates for all types of primary care remained almost constant between 1992/93 and 2003/04.
- In contrast, rates for preventive care visits to both types of physicians—GP/FPs and paediatricians—increased over the study period.



* Preventive care visits were defined as well-baby exams, annual health exams and visits that included immunization.

©Institute for Clinical Evaluative Sciences

- For the most part, Local Health Integration Networks (LHINs) with relatively low rates of preventive care visits among children had relatively high rates of emergency department (ED) visits.
- A similar inverse relationship exists between primary care visits and ED visits (data not shown).
- It cannot be determined whether the excess ED visits by these children were minor in nature and interchangeable with a primary care visit, or if they were more serious and possibly the result of poor access to ongoing primary care.

^{**} Age refers to the child's age at the beginning of the two-year time period.

Exhibit 3.6

Regular primary care provider (RPCP)* for children aged 0–17 years**, living in London, Ottawa, Toronto and Windsor, by physician specialty type and neighbourhood income quintile[‡], 2002–04

		Neighbourhood income quintile							
	Q1 (lowest income)	Q2	Q3	Q4	Q5 (highest income)	Quintile n/a [†]			
Number of children in group	287,593	277,604	296,986	316,240	307,466	24,373			
RPCP (% of children)									
GP/FP	61	62	61	59	54	60			
Paediatrician	15	15	16	19	24	17			
No RPCP assigned	13	13	13	13	13	13			
No visit billings [¥]	12	11	10	9	9	10			

* Assigned RPCP is the physician to whom the individual made more than 50% of his/her visits. If no physician was responsible for more than 50% of visits, then no RPCP was assigned. See Appendix 3.A for more details.

- ** Age refers to the child's age at the beginning of the two-year time period.
- ‡ See Appendix 3.A for a description of neighbourhood income quintile calculation.
- † Information unavailable.
- ¥ See note about interpretation of the "no visit billings category on page 37.

GP/FP = General practitioner/family physician

©Institute for Clinical Evaluative Sciences

Findings

Data about children living in four Ontario cities where access to paediatricians is greatest (as measured by the proportion of children served by paediatricians), was analysed to explore which children had paediatricians as their regular primary care providers (RPCPs).

- The probability of children having a paediatrician as an RPCP increased with neighbourhood income.
- The probability of children having no primary care visit billings was inversely related to neighbourhood income. As neighbourhood income decreased, the proportion of children with no visit billings increased.



- * Assigned RPCP is the physician to whom the individual made more than 50% of his/her visits. If no physician was responsible for more than 50% of visits, then no RPCP was assigned. See Appendix 3.A for more details.
- ** Age refers to the child's age at the beginning of the two-year time period.
- ‡ Low birthweight children are those who weighed less than 2,500 grams at birth.
- + Low socioeconomic status (SES) comprises the lowest two neighbourhood income quintiles (see Appendix 3.A for description of neighbourhood income quintile calculation).
- ¥ Complex chronic conditions include cerebral palsy, cystic fibrosis, etc.

©Institute for Clinical Evaluative Sciences

- Children with high medical needs were more likely to receive their primary care from paediatricians than children in the general population.
- However, even in large cities with a relatively high supply of paediatricians, the regular primary care provider (RPCP) for most children with high medical needs was not a paediatrician.
- Children from low income neighbourhoods, who may be at greater risk of poor health, were less likely to receive their primary care from a paediatrician.

Exhibit 3.8

Number of paediatrician visits per year and proportion of those who visited a paediatrician, for children with higher health risks/needs, and for all children aged 0–17 years*, by Local Health Integration Network, in Ontario, 2002–04

	Proportion who visited a paediatrician (%)		Average number of paediatrician visits per year						
Local Health Integration Network	All children aged 0–17 years	Low birthweight children**	Children with asthma	Children with complex chronic conditions [‡]	All children aged 0–17 years	Low birthweight children**	Children with asthma	Children with complex chronic conditions [‡]	
1. Erie St. Clair	22	57	31	47	2	3	3	3	
2. South West	18	45	24	43	2	3	2	2	
3. Waterloo Wellington	16	46	26	41	2	3	2	2	
4. Hamilton Niagara Haldimand Brant	22	54	33	46	2	3	2	2	
5. Central West	24	59	33	41	2	4	2	2	
6. Mississauga Halton	27	67	36	39	2	4	2	2	
7. Toronto Central	38	73	49	58	3	4	3	3	
8. Central	35	70	46	57	3	5	3	3	
9. Central East	24	60	32	51	2	4	2	3	
10. South East	19	45	27	37	2	3	2	2	
11. Champlain	29	62	38	50	2	4	2	3	
12. North Simcoe Muskoka	13	38	20	36	1	2	1	2	
13. North East	15	40	23	37	2	2	2	2	
14. North West	15	41	24	39	1	2	2	2	

* Age refers to the child's age at the beginning of the two-year period.

** Low birthweight children are those who weighed less than 2,500 grams at birth.

[‡] Complex chronic conditions include cerebral palsy, cystic fibrosis, etc.

©Institute for Clinical Evaluative Sciences

- There was marked variation by Local Health Integration Network (LHIN) in the proportion of children with higher health needs who accessed care from paediatricians. This included primary care as well as other kinds of ambulatory care (e.g., referral from a general practitioner/family physician for consultation).
- There was also marked variation by LHIN in the average number of visits made to paediatricians by children who were seeking their services.
- In many areas, fewer than 50% of children with asthma or complex chronic conditions visited a paediatrician during the study period.
- In general, children living in the Greater Toronto Area and Ottawa area LHINs had the highest proportions and highest mean numbers of paediatrician visits per year. Those who lived in northern LHINs (North East, North West and North Simcoe Muskoka) had the lowest proportions of paediatrician visits and lowest mean number of visits.

Discussion

In this chapter a number of trends in the provision of primary care to Ontario children between 1992/93 and 2003/04 were documented.

The first trend was a small increase in the average number of preventive care visits per year. This was most likely due, in large part, to the availability of newly licensed and funded childhood vaccinations which translated into more preventive visits for immunizations.

On the other hand, there was also an overall trend toward fewer primary care visits for children, including a greater proportion of children who had no visits in a two-year period. This trend was greater in rural areas and among children from lower income neighbourhoods. The finding is consistent with previous research⁹ and most likely represents a real decrease in visits.

Several findings in this chapter suggest that access to regular primary care for children may be an issue in some parts of Ontario and among certain populations. For example, the proportion of children with no visit billings increased as socioeconomic status (SES) decreased. Such an SES gradient may indicate that barriers to care exist. This is of concern because low SES can place children at higher risk of poor health.

Also, there were higher rates of emergency department utilization in Local Health Integration Network (LHIN) areas with relatively low visit rates for primary and preventive care. This suggests that a shift away from regular, preventionoriented primary care toward episodic care has occurred and may still be occurring in some parts of Ontario. Again, one possible explanation for such a shift is lack of access to regular care.¹⁰

In Canada, the term "primary care physician" is usually interpreted to mean a general practitioner/family physician (GP/FP). While our analyses found that during the study period most Ontario children were cared for by GP/FPs, this proportion declined over the decade. Over the same time period, the proportion of children receiving regular care from paediatricians increased.

Data from the United States suggest a similar trend in that country,¹¹ where paediatricians are more likely to assume the role of primary care provider. Several factors may contribute to an increase in the proportion of children in the Province who have paediatricians as their regular primary care providers (RPCPs). For example, fewer GP/FPs in Ontario are performing deliveries and thus making contact with newborns; also, the supply of GP/FPs has not kept pace with growth in the population.⁹ Another explanation may be that there are increasing numbers of children with complex chronic diseases

whose families seek out or are encouraged to seek out more specialized primary care for their children.

For the purposes of this study, a child's RPCP was defined as the physician who saw the child for the majority of preventive or primary care visits. As reported elsewhere⁷, we found that most children with paediatrician RPCPs lived in larger cities. We also found that access to paediatrician care within those cities was better for children living in high income neighbourhoods. This finding has been reported elsewhere in Canada.¹²

However, children with greater health needs (i.e., those with a variety of chronic health problems) were also more likely to access care from paediatricians—although this varied significantly across LHINs for both primary and secondary care. To date no analysis has been done in Ontario to measure what impact these variations in care might have on children's health outcomes.

Relevance to primary care policy

This chapter confirms that, while most Ontario children received regular primary care from a GP/FP, the proportion of children with paediatricians as their RPCPs was substantial and increased over the time period studied. However, access to paediatricians for primary care is unequal in Ontario, limited predominantly to large urban centres. Within these urban centres, children from higher income neighbourhoods are more likely to have a paediatrician as their RPCP. Paediatricians also play an important role in providing primary care to children who need more—or more complex—care.

Current discussions about primary care reform in Ontario have not yet focused on how to fit "specialized" primary care physicians such as paediatricians into care models. Many financial incentives exist today which are aimed at encouraging physicians to provide comprehensive and continuous primary care. But most incentives have only been offered to GP/FPs.

Many jurisdictions in Canada and abroad have primary care systems in which paediatricians act as consultants only. A 1999 report by the Canadian Paediatric Society recommended a consulting focus for paediatricians practicing in communities with few such physician resources.¹³

If primary care reform seeks to discourage paediatricians from practicing primary care, plans must be made to fill the resulting human resources gap. There must also be careful articulation of primary care models which best reflect the needs of children with chronic conditions who are currently served by primary care paediatricians.

Data needs

Researchers who study access to care must have data which is as current and complete as possible. Currently in Ontario, no data exist which capture the practices of salaried primary care physicians who do not submit shadow bills. Nor do we have any data on the work of nurse practitioners and other allied health professionals. To obtain a truly accurate picture—not only of primary physician care, but of primary health care in the broader sense—we need complete and expanded data sources.

Another deficiency in the area of primary care data involves patient rosters*. Such rosters exist in Ontario, but data showing which children are being cared for by physicians within this practice model were not available for this study. Instead, children were assigned to physicians based on their visit patterns. Although this is not an ideal method, it was the only option available in the absence of roster data. Current reform strategies that include rostering patients should ensure that roster data will be available for research purposes and are compatible with existing administrative data.

Finally, as different models of care and physician remuneration are introduced in Ontario, useful data collection methods must be encouraged—e.g., the data should allow researchers to link physicians with their practice models, with individual patients and with patient health outcomes. This will improve the ability to evaluate different care models and will also help to inform policies for effective primary care delivery.

Future research

Future research should focus on:

- Factors that influence the growing proportion of Ontario children with no physician visit billings;
- Reasons why more children are seeing paediatricians rather than GP/FPs for primary care; and,
- Whether the differential access to paediatrician care in Ontario, especially among children with increased health needs, is having an impact on health outcomes.

^{*} Under a rostering system, a patient commits to seek care only from a specific physician within a specific primary care group, except in extraordinary circumstances. Physicians, in turn, commit to provide "round the clock" access to care.



Appendix 3.A

How the research was done

Time frame

The analyses in this chapter focused on three two-year time periods: April 1, 1992 to March 31, 1994; April 1, 1997 to March 31, 1999; and April 1, 2002 to March 31, 2004. Although each analysis included two years of data, the rates reported are per single year.

Data sources

The Ontario Health Insurance Plan (OHIP) database of physician billings was used to identify general practitioner/family physician (GP/FP) and paediatrician office visits and all emergency department (ED) visits made by children who were aged 0–17 years at the beginning of each time period.

The Registered Persons Database (RPDB), which contains demographic information about all Ontario health card holders, was used to determine patients' age, sex and place of residence. Statistics Canada postcensal and intercensal population estimates were used to calculate RPDB adjustment weights. Physician information was obtained from the OHIP Corporate Provider Database.

RPDB adjustment

Because there is currently no regular mechanism for updating residence information for individuals with old (red and white) health cards, the RPDB contains data about individuals who are no longer Ontario residents or who are deceased. Without adjusting for this, visit rates calculated using population estimates from the RPDB would be underestimates of the true situation due to the inflated denominator. To correct for this, individuals who had no physician contact in a given year were downweighted so that the total population for a given age/sex/county group matched the Statistics Canada estimate.

Assignment of primary care physicians

We used the RPDB to define populations of children who were aged 2–19 years on April 1st (in 1994, 1999 and 2004) and who had been eligible for Ontario health care benefits during the previous two years.

We used OHIP data to assess the primary care billings of these children for the previous two years. Preventive care billings included all billings for well-baby exams, annual health exams and any visits which included an immunization billing. Primary care visits were defined as preventive visits and all other non-consultative outpatient visits.

We assigned children to physicians using an algorithm which assigned each child a regular primary care provider (RPCP). This was based (first) on the physician who provided the majority (more than 50%) of preventive care. If there was a tie between physicians, we assigned the one who provided the majority of primary care as the child's RPCP. If there was still a tie between physicians, the subjects were classified as "unassigned." For children with no preventive care billings, we assigned the physician who provided the majority of primary care. If there was a tie between physicians, the subjects were classified as "unassigned."

We used the physician specialty code from the OHIP billings to distinguish between GP/FPs and paediatricians. Out of all of the physicians we looked at, fewer than 15 had billings with both a GP/FP and paediatrician designation. Those physicians were assigned as paediatricians; it is likely that they were physicians who practiced as GP/FPs prior to completing a paediatric residency.

Assessing access to paediatricians as regular primary care providers

This analysis was limited to areas of Ontario where paediatricians could be expected to provide primary care in addition to acting as consultants. A preliminary analysis determined that this was most likely to occur in certain larger centres. Using Statistics Canada's Census Metropolitan Area definitions, this limited our analysis to four cities: Toronto, London, Ottawa and Windsor.

High-risk groups

To describe whether children with greater health needs or those at greater health risk were accessing paediatricians, we examined four groups.

• The first high-risk group included children born with low birthweight (LBW), defined as those weighing < 2,500 grams at birth. Using birthweight data from the Canadian Institute for Health Information (CIHI), we analyzed patterns of care for children from birth to three years of age (and assessed the subsequent two years of visits). This limited analysis was based on the fact that children are most vulnerable to the negative health effects of LBW during the first few years of life.

- The second high-risk group included older children (aged 4–17 years). We used hospital records from April 1999 to March 2002 to identify those with complex chronic conditions (CCC). This classification is used by researchers in the United States. researchers to identify the most medically fragile children.¹⁴
- The third high-risk group included children with asthma (who are not part of the CCC classification), using group definitions previously defined and validated at the Institute for Clinical Evaluative Sciences (ICES).¹⁵
- The fourth high-risk group was selected based on children's socioeconomic status. Neighbourhood income is calculated by Statistics Canada and is updated every five years when new census data become available. For 1996, income estimates were available by enumeration area (EA). In 2001, EAs were replaced by dissemination areas (DA). Ontario neighbourhoods are then classified into one of five approximately equal-sized groups (guintiles), ranked from poorest (Q1) to wealthiest (Q5). These income quintiles are used as a proxy for overall socioeconomic status, which has been shown to be related to population health status and levels of health care utilization. Individual geographic information is available from ICES databases which were used to define the best known postal code for each child on July 1st of each year (available from 1991 to 2004). Children's postal codes were then used to assign them to EAs and DAs (using the Postal Code Conversion File from Statistics Canada) and thus to one of the income quintiles.

References

- Christakis DA, Mell L, Wright JA, Davis R, Connell FA. The association between greater continuity of care and timely measles-mumps-rubella vaccination. *American Journal of Public Health* 2000; 90(6):962–965.
- Christakis DA, Mell L, Koepsell TD, Zimmerman FJ, Connell FA. Association of lower continuity of care with greater risk of emergency department use and hospitalization in children. *Pediatrics* 2001; 107(3):524–529.
- 3. Irigoyen M, Findley SE, Chen S, Vaughan R, Sternfels P, Caesar A et al. Early continuity of care and immunization coverage. *Ambulatory Pediatrics* 2004; 4(3):199–203.
- Guttmann A, Manuel D, Dick PT, To T, Lam K, Stukel TA. Volume matters: physician practice characteristics and immunization coverage in young children insured by a universal health plan. *Pediatrics* 2006; 117(3):595–602.
- Canadian Task Force on the Periodic Health Examination. Canadian guide to clinical preventive health care. Ottawa: Supply & Services Canada; 1994.
- 6. Starfield B, Shi L. The medical home, access to care, and insurance: a review of evidence. *Pediatrics* 2004; 113(5 Suppl):1493–1498.
- Medical home initiatives for children with special needs project advisory commitee, The American Academy of Pediatrics. The medical home. *Pediatrics* 2002; 110:184–186.
- Issenman RM. Community paediatrics in Ontario: 1996 paediatric physician resource study. *Paediatrics and Child Health* 1998; 3(4): 235–239.
- Chan BTB, Schultz SE. Supply and utilization of general practitioner and family physician services in Ontario. ICES Investigative Report. Toronto: Institute for Clinical Evaluative Sciences; 2005.
- Johnson WG, Rimsza ME. The effects of access to pediatric care and insurance coverage on emergency department utilization. *Pediatrics* 2004; 113:483–487.
- 11. Freed GL, Nahra TA, Wheeler JR. Which physicians are providing health care to America's children? Trends and changes during the past 20 years. Archives of Pediatrics and Adolescent Medicine 2004; 158:22–26.
- Mustard CA, Mayer T, Black C, Postl B. Continuity of pediatric ambulatory care in a universally insured population. *Pediatrics* 1996; 98(6 Pt 1): 1028–1034.
- Canadian Paediatric Society. CPS recommends collaborative approach to child health care. News Release, November 4, 1997. Accessed July 15, 2006 at http://www.cps.ca/english/media/NewsReleases/DecliningNumbers.htm
- Feudtner C, Christakis DA, Connell FA. Pediatric deaths attributable to complex chronic conditions: a population-based study of Washington State, 1980-1997. *Pediatrics* 2000; 106(1 Pt 2):205–209.
- To T, Dell S, Dick PT, Cicutto L, Harris J, MacLusky IB et al. Case verification of children with asthma in Ontario. *Pediatric Allergy and Immunology* 2006; (1):69–76.
INSIDE

Executive Summary Introduction Exhibits and Findings Discussion Appendix 4.A • How the research was done

References



Ambulatory Physician Care for Adults

Liisa Jaakkimainen, MD, MSc, CCFP, Susan E. Schultz, MA, MSc, Julie Klein-Geltink, MHSc, Deva Thiruchelvam, MSc, and Alexander Kopp, BA





Executive Summary

Issue

Primary medical care is the first point of contact with the health care system and is the place where the coordination of care across different health care sectors and providers occurs. Most primary care is provided in the community; generally by physicians in an office setting. Information is lacking on who currently sees office-based physicians, what types of physicians are seen and how often people see these physicians. More descriptive information is needed in order to anticipate potential shifts in the need for care.

Study

This study examined office-based physician visits for adults aged 20 years and older. Physician sources of office-based care were divided into the following four categories:

- General practitioners/family physicians (GP/FPs) only;
- GP/FPs and one of a select group of specialist physicians (general internal medicine specialists, geriatricians and obstetrician/ gynecologists);
- GP/FPs and either more than one of the select group of specialist physicians listed above, or any other specialist physician(s); and,
- Specialist physicians only.

Key Findings

- Most adults in Ontario visited a GP/FP at least once a year. The exception to this was men 20–39 years of age, one-third of whom had no GP/FP visit billings in 2002/03.
- Over the 10 years studied, the proportion of the population with no visit billings in a one-year period increased for adults aged 20–39 years but decreased among older adults.
- For both women and men and for all age groups, lower visit rates were seen among those who saw one physician type exclusively. Visit rates doubled when seeing a GP/FP plus a specialist physician, and increased even more when multiple specialists are seen in addition to a GP/FP.
- Especially among younger adults, individuals with diabetes mellitus, congestive heart failure (CHF) or who had a previous heart attack had more office visits and were more likely to be cared for by a combination of GP/FPs and specialist physicians.
- For adults, there were few differences in the source of ambulatory physician care across SES groups. Among younger adults, the proportion with no physician visit billings decreased slightly with increasing SES level.
- For both younger and older adults, the LHINs with the lowest proportion of GP/FP only care also had the highest proportion of GP/FP plus specialist care.

These visits were described with respect to patient age, sex, socioeconomic status (SES), certain chronic medical conditions, and by Local Health Integration Networks (LHINs). Trends in the patterns of utilization of these categories of officebased care were also examined over the 10-year time period from 1992/93 to 2002/03.

Implications

- Given that the population over the age of 65 years is increasing, ambulatory care physicians should anticipate working in practices that have a higher proportion of older patients.
- Taking care of older patients will result in increased visit rates which may limit the size of physician practices.
- The transfer of care from hospitals to the community, along with the predicted increases in the prevalence of various chronic diseases, will also increase the need for care from office-based physicians.
- Models for primary care reform need to anticipate an increase in both the proportion of older adults requiring care and adults living with a variety of comorbidities.

Introduction

Recently there has been a strong emphasis on the role of primary care and the need for primary care reform in Ontario.1-3 Primary medical care, delivered in the community, is the first point of contact into the health care system and is where the responsibility lies for the coordination of care through different health care sectors and providers. General practitioners and family physicians (GP/FPs) are the main providers of physician primary care services in Ontario. In the United States, a significant number of ambulatory visits are provided by general internal medicine specialists (GIMs), geriatricians, and obstetrician/ gynecologists (OBGYNs), who also provide primary care.⁴ Some research on ambulatory care provided by GP/FPs is starting to become available, especially for disease-specific conditions.⁵ However, few studies have examined which types of physicians are seen in the population for ambulatory care. Specifically, the proportion of ambulatory visits provided by GP/FPs versus specialist physicians such as GIMs, geriatricians or OBGYNs who may also provide some primary care has not been described in Ontario. In addition, there is little information on how often people see physicians for ambulatory care.

The population in Ontario is getting older. Between 1991 and 2001, the population 80 years of age and older increased by nearly 40% and is expected to increase by a further 50% between 2001 and 2011.⁶ Along with this aging population, the prevalence of many chronic diseases is expected to increase.⁷ This will have a significant impact on the health care system through increased need for prescription medications, hospital care, home care, allied health care and physician services.⁸

This chapter examines physician sources of office-based care in Ontario provided to young adults aged 20 to 64 years and to older adults over the age of 65 years. For young adults, some primary care may be provided by GIMs or OBGYNs (for women). For older adults, primary care may be provided by GIMs or geriatricians. Therefore, office-based visits provided by these specialist physicians were examined separately from consultant specialists such as dermatologists, ophthalmologists, medicine subspecialists (e.g., cardiologists, neurologists) and surgeons. Physician sources of care were described with respect to patient age, sex, comorbidity, socioeconomic status and Local Heath Integration Networks. Proportional distribution of each type of physician office-based care was determined, as were changes over a 10-year time frame, from 1992/93 to 2002/03.



Chapter 4—List of Exhibits

Exhibit 4.1 Age- and sex-specific distribution of adults aged 20 years and older seen for office-based care, by physician specialty type, in Ontario, 1992/93, 1997/98 and 2002/03

Exhibit 4.2 Age- and sex-specific distribution of adults aged 20 years and older seen for office-based care, by physician specialty type, in Ontario, 2002/03

Exhibit 4.3 Age- and sex-specific proportion of adults aged 20 years and older with no physician office visit billings, in Ontario, 1992/93, 1997/98 and 2002/03

Exhibit 4.4 Age- and sex-specific number of physician office visits per person per year, in adults aged 20 years and older, by physician specialty type, in Ontario, 1992/93, 1997/98 and 2002/03

Exhibit 4.5 Age- and sex-specific distribution of office-based physician care for adults aged 20 years and older, by number of visits per year and physician specialty type, in Ontario, 2002/03

Exhibit 4.6 Population of Ontarians aged 20 years and older, by age and sex, 2002/03

Exhibit 4.7 Age-specific distribution of adults aged 20 years and older seen for office-based care, by physician specialty type and neighbourhood income quintile, in Ontario, 2002/03

Exhibit 4.8 Age-specific number of physician office visits per 100 adults aged 20 years and older per year, by physician specialty type and neighbourhood income quintile, in Ontario, 2002/03

Exhibit 4.9 Age-specific distribution of adults aged 20 years and older seen for office-based care, by physician specialty type and chronic condition, in Ontario, 2002/03

Exhibit 4.10 Age-specific number of physician office visits per year for adults aged 20 years and older with selected chronic conditions, in Ontario, 2002/03

Exhibit 4.11 Number of physician office visits per year for adults aged 20 years and older, by physician specialty type and Local Health Integration Network, in Ontario, 2002/03

Exhibit 4.12 Proportion of adults aged 20 years and older seen for office-based care, by physician specialty type and Local Health Integration Network, in Ontario, 2002/03



Exhibits and Findings

Exhibit 4.1

Age- and sex-specific distribution of adults aged 20 years and older seen for office-based care, by physician specialty type, in Ontario, 1992/93, 1997/98 and 2002/03

		Women			Men	
Younger adults	1992/93	1997/98	2002/03	1992/93	1997/98	2002/03
20–39 years Number	1,816,204	1,785,845	1,804,782	1,768,157	1,730,213	1,743,649
Physician type (% of adults)						
GP/FP only	44	45	46	46	45	44
GIM or OBGYN only	2	1	1	0	1	1
GP/FP + 1 specialist (GIM or OBGYN only CD/FD + other openialist(a)	13	13	13	2	2	2
Other specialist(s)	20	20	24	21	19	10 3
No physician visit billings	11	14	15	27	30	33
tto priyololari tion billingo			10			
40–64 years Number	1,490,941	1,727,808	1,975,935	1,454,139	1,670,175	1,908,223
Physician type (% of adults)						
GP/FP only	36	38	40	38	39	41
GIM or OBGYN only	1	1	1	1	1	1
GP/FP + 1 specialist (GIM or OBGYN only	8	8	8	3	3	4
GP/FP + other specialist(s)	39	38	3/	33	32	31
No physician visit billings	4	3 12	10	20	4 01	4 20
No physician visit binnigs	12	12	12	20	21	20
Older Adults						
65–74 years Number	442,241	469,361	471,528	361,389	399,030	415,427
Physician type (% of adults)						
GP/FP only	29	28	30	27	26	27
GIM or geriatrician only	1	0	0	1	1	0
GP/FP + 1 specialist (GIM or genatrician only) 4	4	5	4	4	4
GP/FP + other specialist(s)	54	50	28	53	57	59
No physician visit billings	8	5	5	9	5	4
No physician visit binings	U	0	0	5	,	Ū
75–84 years Number	214,849	249,488	287,787	135,199	160,208	189,006
Physician type (% of adults)						
GP/FP only	26	25	26	23	21	21
GIM or geriatrician only	1	1	0	1	1	0
GP/FP + 1 specialist (GIM or genatrician only) 4	4	5	4	4	4
GP/FP + other specialist(s)	57	60	61	59	63	66
Other specialist(s) only	6 7	5	3	7	6	4
No physician visit billings	'	0	5	1	0	5
85 years and older Number	68,120	79,924	94,004	25,589	31,793	39,643
Physician type (% of adults)		,		,		
GP/FP only	35	34	34	29	26	25
GIM or geriatrician only	1	1	1	1	1	1
GP/FP + 1 specialist (GIM or geriatrician only) 4	5	5	5	5	5
GP/FP + other specialist(s)	43	46	48	50	53	56
Other specialist(s) only	6	5	3	6	5	3
No physician visit billings	11	10	9	10	11	11

GP/FP = General practitioner/family physician; **GIM** = General internal medicine specialist; **OBGYN** = Obstetrician/gynecologist **Other specialists** includes all specialists except GIMs, OBGYNs and geriatricians.

©Institute for Clinical Evaluative Sciences

- Between 1992/93 and 2002/03, nearly half of the Ontario population aged 20–39 years saw general practitioner/family physicians (GP/FPs) exclusively for their ambulatory care. This proportion declined with increasing age for both men and women.
- The proportion of adults who received ambulatory care from specialists alone was small (between two and five percent). This low proportion was seen with both specialists who may provide some ambulatory primary care (general internal medicine specialists, obstetrician/gynecologists and geriatricians) and specialists who provide consultative care.
- As age increased, so did the proportion of Ontario adults who received ambulatory care from both GP/FPs and consultant specialists. For example in 2002/03, this proportion was only 19% among men aged 20–39, but 66% among men aged 75–84 years.



• The top five consultant specialists seen by both women and men were psychiatrists, dermatologists, general surgeons, orthopaedic surgeons and ophthalmologists (data not shown).

Primary Care in Ontario





©Institute for Clinical Evaluative Sciences

- Between 1992/93 and 2002/03, the proportion of young adults (20–39 years) with no physician office visit billings rose from 11% to 15% for women and from 27% to 33% for men.
- During the same period, the proportion of adults aged 65 years and older with no visit billings decreased from approximately eight percent to five percent for women and from eight percent to six percent for men (aggregated data not shown).

	and older, by phy	and older, by physician specialty type, in Ontario, 1992/93, 1997/98 and 2002/03							
			Women			Men			
Younger adults		1992/93	1997/98	2002/03	1992/93	1997/98	2002/03		
20–39 years									
Physician type (% of adults)								
GP/FP	only	5	5	5	4	3	3		
GIM or	r OBGYN only	2	2	2	2	2	2		
GP/FP	+ 1 specialist		0	•	•	•	-		
(GIN	I or OBGYN only)	9	9	9	8	8	1		
GP/FP	+ other specialist(s)	13	12	12	10	9	9		
Others	specialist(s) only	4	4	4	4	3	3		
40-04 years	% of adulta)								
GP/FP		5	5	5	5	5	А		
GIM or		2	2	2	3	3	3		
GP/FP	+ 1 specialist	2	2	2	U	U	0		
(GIN	f or OBGYN only)	10	9	9	10	10	9		
GP/FP	+ other specialist(s)	14	14	14	13	13	12		
Others	specialist(s) only	5	5	5	4	4	4		
Older adults									
65–74 years									
Physician type (% of adults)								
GP/FP	only	6	6	6	6	6	6		
GIM or	geriatrician only	4	4	5	5	4	5		
GP/FP	+ 1 specialist								
(GIN	I or geriatrician only)	12	12	11	12	12	12		
GP/FP	+ other specialist(s)	14	15	14	14	15	14		
Other s	specialist(s) only	5	5	5	6	6	6		
75–84 years	0/								
Physician type (% of adults)	0	0	7	0	0	0		
GP/FP	only conistricion only	0	0	1	0	0 7	0		
GINI OF		0	5	0	0	1	9		
(GIN	f or geriatrician only)	13	13	13	15	15	14		
GP/FP	+ other specialist(s)	14	15	14	16	17	16		
Other s	specialist(s) only	6	6	6	6	7	7		
85 years and older									
Physician type (% of adults)								
GP/FP	only	9	9	8	9	10	9		
GIM or	r geriatrician only	6	6	8	9	9	12		
GP/FP	+ 1 specialist				10	4.5			
(GIN	i or geriatrician only)	14	14	14	16	15	15		
GP/FP	+ other specialist(s)	15	15	15	16	17	17		
Other s	specialist(s) only	5	5	6	6	7	8		

GP/FP = General practitioner/family physician; **GIM** = General internal medicine specialist; **OBGYN** = Obstetrician/gynecologist **Other specialists** includes all specialists except GIMs, OBGYNs, geriatricians and consultant specialists.

©Institute for Clinical Evaluative Sciences

V Findings

- For both women and men, older adults have more physician office visits per year than younger adults.
- Both women and men have fewer office visits per year when only one physician type is consulted.
- The number of visits per year doubled for both women and men and in all adult age groups, when seeing a GP/FP plus one specialist physician regardless of specialty. If more than one specialist physician was seen in addition to a GP/FP, the rate was even higher.
- Between 1992/93 and 2002/03, visit rates for younger adults decreased slightly while for older adults they increased slightly.
- For young adults, ambulatory visit rates tend to be higher among women than men, whereas among older adults visit rates for women and men are similar.



GP/FP = General practitioner/family physician; **GIM** = General internal medicine specialist; **OBGYN** = Obstetrician/gynecologist **Other specialists** includes all specialists except GIMs, OBGYNs and geriatricians.

Findings

Exhibit 4.5 is a graphic representation of the impact of different groups of ambulatory physicians on office-based visit rates. Each 'block' represents the 'amount' of care received from a particular physician group by the Ontario population in a specific age/sex group. As the height of the blocks increases, so does the average number of visits that individuals made. The width of the blocks reflects the proportion of the population that is getting their care from this combination of physician types.

• As adult women and men age, there is an increase in the proportion seeing both general practitioners/family physicians





Proportion of men (%)

©Institute for Clinical Evaluative Sciences

(GP/FPs) and other consultant specialists, along with an increase in the number of annual visits per person.

- While the proportion of adults seeing a GP/FP alone decreased with age, the mean number of office-based visits increased for older adults.
- The proportion of adults who saw any specialist alone was small (less than four percent). Nevertheless, there still was an increase in the mean number of office visits for older adults.





©Institute for Clinical Evaluative Sciences

Findings

• This exhibit is provided as an accompaniment to Exhibit 4.5, putting the latter results in context. For example, it shows that while the population aged 65 years and older use substantially more physician services than younger adults, they represent a much smaller proportion of the total population.



GP/FP = General practitioner/family physician; **GIM** = General internal medicine specialist; **OBGYN** = Obstetrician/gynecologist **Specialists** comprise all specialists including GIMs, OBGYNs and consultant specialists.

*See Appendix 4.A for a description of neighbourhood income quintile calculation

©Institute for Clinical Evaluative Sciences

- There were few differences in the source of ambulatory physician care in adults, according to neighbourhood socioeconomic status (SES).
- Among younger adults the proportion of the population with no physician visit billings decreased slightly with increasing SES.
- The proportion of older adults who saw only general practitioners/family physicians (GP/FPs) increased with declining SES groups, accompanied by a decrease in the proportion of those seeing GP/FPs plus specialists.





GP/FP = General practitioner/family physician; **GIM** = General internal medicine specialist; **OBGYN** = Obstetrician/gynecologist **Specialists** comprise all specialists including GIMs, OBGYNs and geriatricians.

*See Appendix 4.A for a description of neighbourhood income quintile calculation

©Institute for Clinical Evaluative Sciences

- Among younger adults between 20 to 64 years of age, the office visit rate was higher for lower neighbourhood socioeconomic status (SES) and followed a similar pattern for all types of physician care.
- The relationship between physician office visit rates and SES groups was less clear for older adults.



• Only a small proportion of the population with DM, CHF or who were post-MI received care only from specialists.

Primary Care in Ontario





GP/FP = General practitioner/family physician; **GIM** = General internal medicine specialist; **OBGYN** = Obstetrician/gynecologist **Specialists** comprise all specialists including GIMs, OBGYNs and geriatricians.

©Institute for Clinical Evaluative Sciences

🔻 Findings

- Individuals with diabetes mellitus, congestive heart failure (CHF) or who had a previous heart attack or acute myocardial infarction had more physician visits than the population as a whole.
- Ontarians with CHF at a young age had the highest visit rates of any group.

Exhibit 4.11 Number of physician office visits per year for adults aged 20 years and older, by physician specialty type and Local Health Integration Network, in Ontario, 2002/03

Younger adults (20–64 years)	Physician type						
Local Health Integration Network	GP/FP only	GP/FP + GIM/OBGYN	GP/FP + specialists	Specialist only			
1. Erie St. Clair	4	8	11	3			
2. South West	4	9	11	3			
3. Waterloo Wellington	4	8	11	3			
4. Hamilton Niagara Haldimand Brant	4	8	11	3			
5. Central West	5	10	13	3			
6. Mississauga Halton	4	9	12	3			
7. Toronto Central	4	9	13	5			
8. Central	4	9	13	4			
9. Central East	4	9	12	3			
10. South East	4	8	11	3			
11. Champlain	4	8	12	4			
12. North Simcoe Muskoka	4	9	12	3			
13. North East	4	8	11	3			
14. North West	4	7	10	3			

Older adults (65 years and older)

Physician type						
GP/FP only	GP/FP + GIM/geriatricians	GP/FP + specialists	Specialist only			
7	13	14	6			
7	13	14	5			
6	11	13	5			
6	11	14	6			
7	13	16	9			
7	12	15	7			
7	13	16	7			
7	13	16	8			
7	13	15	6			
7	12	13	5			
7	12	14	7			
7	14	15	4			
7	12	14	4			
6	11	13	5			
	GP/FP only 7 7 6 6 6 7 7 7 7 7 7 7 7 7 7 7 7 7 7	GP/FP only GP/FP + GIM/geriatricians 7 13 7 13 6 11 6 11 7 13 7 13 7 13 7 13 7 13 7 13 7 13 7 13 7 13 7 13 7 13 7 13 7 13 7 14 7 12 6 11	GP/FP only GP/FP + GIM/geriatricians GP/FP + specialists 7 13 14 7 13 14 6 11 13 6 11 14 7 13 14 6 11 13 6 11 14 7 13 16 7 13 16 7 13 16 7 13 16 7 13 16 7 13 16 7 13 16 7 13 15 7 12 13 7 12 14 7 14 15 7 12 14 6 11 13			

GP/FP = General practitioner/family physician; **GIM** = General internal medicine specialist; **OBGYN** = Obstetrician/gynecologist **Specialists** comprise all specialists including GIMs, OBGYNs, geriatricians and consultant specialists.

©Institute for Clinical Evaluative Sciences

Findings

• In younger adults, there was little variation in physician office visit rates by Local Health Integration Networks (LHINs). There were small variations in physician office visits rates by LHIN in older adults.

Exhibit 4.12 Proportion of adults aged 20 years and older seen for office-based care, by physician specialty type and Local Health Integration Network, in Ontario, 2002/03



GP/FP = General practitioner/family physician; **GIM** = General internal medicine specialist; **OBGYN** = Obstetrician/gynecologist **Specialists** comprise all specialists including GIMs, OBGYNs and geriatricians.

©Institute for Clinical Evaluative Sciences

- For both younger and older adults, the Local Health Integration Networks (LHINs) with the lowest proportion of general practitioner/family physician (GP/FP) only care also had the highest proportion of GP/FP plus specialist care.
- Compared with older adults, young adults had higher proportions of no physician visit billings for all LHINs. There was slightly more variation for no physician visit billings among younger adults and little or no variation among older adults.
- Toronto Central LHIN had the lowest proportion of adults seeing GP/FPs only in both the 20–39 year age group (37%) and in those 65 years and older (22%). The South East LHIN had the highest proportion of adults seeing GP/FPs only at 49% among 20–39 year olds, and 37% for those aged 65 years and older.

Proportion of adults aged 20 years and older seen for office-based care, by physician specialty type and Local Health Integration Network, in Ontario, 2002/03



Aged 65 years and older

GP/FP = General practitioner/family physician; **GIM** = General internal medicine specialist; **OBGYN** = Obstetrician/gynecologist **Specialists** comprise all specialists including GIMs, OBGYNs and geriatricians.

©Institute for Clinical Evaluative Sciences

Discussion

In Ontario, the majority of adults saw a general practitioner/family physician (GP/FP) for an office visit at least once per year, indicating that they had front line access to the health care system. GP/FPs provide most of the primary care services used by adults. We also looked separately at general internal medicine specialists (GIMs), geriatricians and obstetrician/gynecologists (OBGYNs) because they may also deliver primary care to selected populations. In 2002/03, the proportion of young adults seeing a GIM or an OBGYN alone was less than two percent and less than one percent among older adults. This is contrary to the case in the United States (US) where a higher proportion of primary care used by adults is provided by GIMs and OBGYNs.⁴ The proportion of women in Ontario between 20 and 39 years of age seeing both a GP/FP and either a GIM or OBGYN was approximately 13%. This may in part reflect maternity care delivered to this group. Meanwhile, the proportion of men and older women seeing a GP/FP and either a GIM or OBGYN was less than five percent. As adults age, the proportion seeing both GP/FPs and specialists increased, reflecting the increasing medical needs of people as they get older.

The proportion of adults aged 20 to 39 years having no Ontario Health Insurance Plan (OHIP) billings increased over the 10 years included in this report (1992/93 to 2002/03), while this proportion decreased among older adults. Caution is required in interpreting the no OHIP billing category because visit data may be missing from physicians participating in alternative funding payment programs (including Health Service Organizations and Community Health Centres). Yet, this cannot totally account for the observed changes in the proportion with no billings in adults since less than 8% of Ontario physicians participated in alternative funding payment programs in 2002/03.⁹

The proportion of the population with no visit billings was lower in women compared with men. One reason for this is that there are fewer preventive care recommendations for men than women between the ages of 20 to 39 years.¹⁰ Young men do not seek medical care for various individual reasons including: perceived good health; the belief that problems are not important enough to see a physician; and, feeling embarrassed talking about health problems.¹¹ By comparison, birth control needs, pregnancy care and more preventive care screening such as Papanicolaou (Pap) testing require women to seek medical care. Aside from these reasons, women are still more likely to seek medical care.¹²

The proportion of young women with no OHIP visit billings also increased over the 10 years of this study. Some women may have received birth control care via non-physician providers such as nurse practitioners. But the number of non-physician providers whose jurisdiction it is to provide prescriptions in Ontario is quite small and therefore is not likely to fully explain this trend. It may be that young adults in general experienced increased difficulty with accessing GP/FPs. Further research is required to determine why this was occurring.

The proportion of older adults having no OHIP billings actually decreased. Since older adults tend to age with their physician, this declining trend may partially be explained by the finding that older physicians see more patients per day than younger physicians.¹³ This may improve access for some older adults and explain the lower proportion having no physician visit billings. The proportion of adults aged 85 years and older with no visit billings was stable at about 10%. However, this is likely an overestimate since adults in this age group are more likely to reside in long-term care facilities and therefore are likely to access primary care that is not office-based.

For young adults, the average number of physician office visits per person has slightly decreased over 10 years, while for older adults they have tended to remain stable. This time trend contrasts physician office visit rates seen in the US.⁴ The average office visit rates were higher in older adults which reflects more health care needs in this population—they are more likely to suffer from one or more chronic diseases. The average office visit rates were also higher in those who saw both GP/FPs and specialist physicians. Further work is required to describe this population with respect to whether these high visit rates reflect increased health care needs or represent other reasons why people seek physician care.

The proportion of individuals living with one or more chronic medical conditions such as diabetes mellitus (DM), asthma, congestive heart failure (CHF), angina, arthritis and mental illness is expected to increase.⁷ When compared with the general population of adults in Ontario, the average number of office visits for those with DM, CHF or post-myocardial infarction (post-MI) was higher across all physician provider type categories. In addition, the proportion seeing both GP/FPs and specialists was higher for this group. This is not surprising given that the management of these conditions commonly includes referrals to specialist physicians (e.g., ophthalmologists) as recommended by disease-specific consensus guidelines.^{14,15}

A slightly larger proportion of adults in the highest socioeconomic (SES) group, assessed by neighbourhood income quintile, saw both GP/FPs and specialists. Young adults in the lowest income quintiles had larger visit volumes. Increased health care needs by lower SES groups may reflect these increased office visit rates. Higher utilization by higher SES groups for specialist care has been demonstrated in other Ontario-based studies.^{16,17} However, there does not appear be an influence of SES on access to office-based primary physician care.

Access to office-based specialist physicians may explain why

areas in Ontario with a higher proportion of care provided by only GP/FPs, also had a lower proportion of GP/FP plus specialist care. The Toronto Central and Mississauga Halton Local Health Integration Networks demonstrated a high proportion of no OHIP billings for adults. This may reflect barriers in accessing care encountered by new citizens living in these areas.

Relevance to primary care practice

GP/FPs are the main point of first contact with the health care system in Ontario. With the aging of the "baby boom" generation and increases in longevity, primary care physicians will be taking care of older patients with more complex chronic disease profiles. This will result in increased visit rates and visit volumes. These factors, combined with adherence to new practice guidelines and management of persons with multi-comorbidity, will increase the work load for primary care providers in the future and potentially cause them to limit their practice sizes.

Relevance to primary care policy

Funding models for primary care reform need to anticipate increases in workload and demand for care outlined in the section above. Current funding models financially support taking care of patients with diabetes or who are over 70 years of age.¹⁸ However, taking care of medically complex adults who will be seeing a physician more often is not well compensated. New reform models that roster patients tend instead to promote preventive care of younger adults, from a financial perspective. As yet, there are no financial incentives for taking care of complex elderly patients. This may result in young and healthy adults having better access to office-based care.

Also, physician resource planning should consider that increased visit volumes may reduce practice sizes and therefore affect access to primary care physicians.

Data needs

The Registered Persons Database (RPDB) needs to accurately reflect which people in Ontario are eligible for health care. This includes up-to-date address information that is necessary for detailed geographic analyses.

Health services data from non-physician providers such as nurses, home care providers, rehabilitation providers, and nutritionists should be routinely and accurately collected. Currently, there are approximately 700 extended class nurses in Ontario with about half of them involved in primary care.^{19,20}

Efforts should be made to ensure that primary care encounter data are complete. This means including data from nonshadow billing alternative funding payment models as well as making sure that shadow billings are as accurate as fee-forservice billings. Also, the content and complexity of care provided during an office visit could not be assessed with current administrative data, which only permits one diagnosis per visit.

Future research

Future research should focus on:

- Physicians participating in alternative funding programs as well as non-physician providers of primary health care;
- Not only where people get their primary care but also the quality of the primary care individuals receive in different settings;
- The costs associated with the provision of primary care and models of potential changes in costs with an aging population.
 In addition, comorbidity and its impact on primary care should be examined in more detail;
- Reasons why young adults are not seeking care needs to be addressed further; and finally,
- Home care and nursing home care (not examined in this chapter) should be given priority in research, because of the expected increase in the older adult population.

Conclusions and next steps

In Ontario, as the population gets older and the prevalence of chronic conditions increases, so will the need for office-based care. This will impact office-based visit rates and access to both primary and specialist physicians. Further analysis is necessary to understand the impact that multiple comorbidity will have on office-based care. This work should include accurate and current data that describes not only care provided by primary care physicians, but also care provided by nurses and nurse practitioners, home care and interdisciplinary primary care models.



Appendix 4.A

How the research was done

Study cohort

The study cohort consisted of persons identified in the Registered Persons Database (RPDB) who were alive and eligible for Ontario Health Insurance Plan (OHIP) benefits in fiscal years 1992/93, 1997/98 and 2002/03. Only persons aged 20 years and older were included in this chapter. The RPDB overestimates the number of people living in Ontario for several reasons. Although improvements have been made in recent years, the RPDB still contains a substantial number of individuals who are deceased or no longer living in Ontario. For some areas in Ontario, the difference between the RPDB and Statistics Canada population counts can be as high as 10%.²¹ To ensure that rates and estimates are correct, a methodology has been developed to adjust the RPDB so that regional population counts by age and sex match estimates from Statistics Canada.⁹

The Institute for Clinical Evaluative Sciences (ICES) Physician Database (IPDB) was used to identify physician specialty. Some specialist physicians may also provide primary care for their patients. For this reason, general internal medicine specialists (GIMs) and obstetrician/gynecologists (OBGYNs) were examined separately from all other consultant specialists in young adults. In older adults, GIMs and geriatricians were examined separately from all other consultant specialists.

All estimates were rounded to the nearest integer for presentation in exhibits. As a result, proportional distributions may not add up to 100%.

Physician office visits

All OHIP fee codes claimed by general practioner/family physicians (GP/FPs) were reviewed to identify home and officebased consultations, examinations and procedures (fee code list available). Fee codes for inpatient care, nursing home care, laboratory testing and radiological examinations were excluded. These fee codes were then used to extract claims from the OHIP database and used to calculate primary care visits made to GP/FPs.

For GIMs, geriatricians and OBGYNs, it is not possible to differentiate primary care visits from specialty consultative visits by examining fee codes. Therefore, office visits made to GIMs, geriatricians and OBGYNs were based on consultation fee code claims which include an A or K prefix. Nursing home visits, inpatient visits, laboratory tests, surgical procedures and radiological exams were excluded. For OBGYNs, the A935 code was also excluded because this represents a surgical consultation and would not be a primary care visit.

Office visits to other specialists were based on consultation fee code claims which include an A or K prefix. Again, nursing home visits, inpatient visits, laboratory tests, surgical procedures and radiological exams were excluded. For all physician types, multiple fee codes billed by the same physician on the same day were counted as one visit.

Socioeconomic status (SES)

Neighbourhood income is calculated by Statistics Canada and is updated every five years when new census data become available. For 1996, income estimates were available by enumeration area (EA). In 2001, EAs were replaced by dissemination areas (DA). Ontario neighbourhoods are then classified into one of five approximately equal-sized groups (quintiles), ranked from poorest to wealthiest, where Q1 is the poorest and Q5 is the wealthiest. These income quintiles are used as a proxy for overall SES, which has been shown to be related to population health status and levels of health care utilization. Individual geographic information from ICES databases was used to define the best known postal code for each person on July 1st of each year (available from 1991 to 2004). Postal codes were then used to assign people to EAs and DAs (using the Postal Code Conversion File from Statistics Canada) and thus to one of the income guintiles.

Diabetes mellitus, congestive heart failure and post-myocardial infarction disease cohorts

Algorithms have been developed and validated to identify disease-based cohorts using Ontario administrative data. The Ontario Diabetes Database (ODD) uses OHIP and Canadian Institute for Health Information (CIHI) data to identify people with diabetes in Ontario, and these data were used in the *Diabetes Practice Atlas.*²² Congestive heart failure and post-myocardial infarction databases have been developed and used at ICES based on similar OHIP and CIHI algorithms.

C Nata

References

- Commission on the Future of Health Care in Canada. Building on values: The future of health care in Canada—final report. November 2002.
- 2. Standing Senate Committee on Social Affairs, Science and Technology. The health of Canadians—the federal role. Final report on the state of the health care system in Canada: Volume Six: Recommendations for reform. 2002.
- Lamarche P, Beaulieu MD, Pineault R, Contandriopoulos AP, Denis JL, Haggerty J. Choices for Change: The path for restructuring primary healthcare services in Canada. Report submitted to the Canadian Health Services Research Foundation. November 2003.
- Woodwell DA, Cherry DK. National Ambulatory Medical Care Survey: 2002 summary. Advance Data 2004; 346:1–44.
- Power J, Perruccio AV, Desmeules M, Lagace C, Badley EM. Ambulatory physician care for musculoskeletal disorders in Canada. *Journal of Rheumatology* 2006; 3(1):133–139.
- 6. Statistics Canada. 2001 Census Analysis Series—Profile of the Canadian population by age and sex: Canada ages. Catalogue: 96F0030XIE2001002.
- Haydon E, Roerecke M, Giesbrecht M, Rehm J, Kobus-Matthews M. Chronic Disease in Ontario and Canada: Determinants, risk factors and prevention priorities. Summary of Full Report. March 2006. Prepared for the Ontario Chronic Disease Prevention Alliance and the Ontario Public Health Association.
- Rapoport J, Jacobs P, Bell NR, Klarenbach S. Refining the measurement of the economic burden of chronic disease in Canada. *Chronic Diseases* in Canada 2004; 25 (1):13–21.
- 9. Chan BTB, Schultz SE. Supply and utilization of general practitioner and family physician services in Ontario. ICES Investigative Report. Toronto: Institute for Clinical Evaluative Sciences; 2005.
- Canadian Task Force on Preventive Health Care Men 21–64 Years of Age Quick Table: All Relevant Recommendations & Women 21–64 Years of Age Quick Table: All Relevant Recommendations. Accessed May 15, 2006 at http://www.ctfphc.org
- 11. Galdas PM, Cheater F, Marshall P. Men and help-seeking behaviour: literature review. *Journal of Advanced Nursing* 2005; 49(6):616–623.
- Kazanjian A, Morettin D, Cho R. Health care utilization by Canadian women. *BMC Women's Health* 2004; 4(Suppl 1):51–533.
- Watson D, Katz A, Redi RJ, Bogdanovic B, Roos N, Heppner P. Family physician workloads and access to care in Winnipeg: 1991 to 2001. *Canadian Medical Association Journal* 2004;17(4):339–342.
- 14. Clinical Practice Guidelines Expert Committe. Canadian Diabetes Association 2003 practice guidelines for the prevention and management of diabetes in Canada. *Canadian Journal of Diabetes* 2003; 27(Suppl 2):S21–S23.
- Arnold JM, Liu P, Demers C, Dorian P, Giannetti N, Haddad H, et al. Canadian Cardiovascular Society consensus conference recommendations on heart failure 2006: Diagnosis and management. *Journal of Cardiology* 2006; 22(1):23–45.
- Van Doorslaer E, Masseria C, Koolman X. In access to medical care by income in developed countries. *Canadian Medical Association Journal* 2006; 174(2):177–183.

- 17. Quan H, Fong A, DeCoster C, Wang J, Musto R, Noseworthy TW, et al. Variation in health services utilization among ethnic populations. *Canadian Medical Association Journal* 2006; 174(6):787–791.
- Ontario Ministry of Health and Long-Term Care. Schedule of Benefits for Physician Services Under the *Health Insurance Act.* April 1, 2006.
- 19. College of Nurses of Ontario membership statistics snapshot. Accessed May 13, 2006 at http://www.cno.org/about/stats/snapshot.htm
- 20. Nurse Practitioner Association of Ontario. Accessed May 13, 2006 at http://www.npao.org/phcnp/aspx
- Glazier RH, Creatore MI, Agha MM, Steele LS; Inner City Toronto Time Trends Working Group. Socioeconomic misclassification in Ontario's Health Care Registry. *Canadian Journal of Public Health* 2003; 94(2):140–3.
- Hux J, Booth G, Slaughter PM, Laupacis A. Diabetes in Ontario: ICES Practice Atlas. Toronto: Institute for Clinical Evaluative Sciences; 2003.

INSIDE

Executive Summary Introduction Exhibits and Findings Discussion Appendix 5.A How the research was done References



Patterns of Primary and Secondary Prevention

Ross E. G. Upshur, MA, MD, MSc, CCFP, FRCPC, Li Wang, MD, MSc, Sarah Maaten, MSc, and Alan Leong, BSc (Hons.)



Executive Summary

Issue

It has been estimated that 70% of diseases commonly seen in primary care are preventable. Information related to health behaviours in both the primary and secondary prevention domains is relevant to the structure of health services delivery. Such information also serves to illuminate areas of concern in the realm of public health policy. It is therefore essential to understand the dimensions of prevention in primary care.

Study

The purpose of this chapter is to highlight certain key issues in preventive health care as reported by respondents to Statistics Canada's 2000/01 Canadian Community Health Survey (CCHS).

Self-reported data about exercise, smoking and body mass index (BMI) are described. Data concerning secondary prevention measures, specifically influenza vaccination, Papanicolaou (Pap) testing and mammography, are also presented.

Key Findings

- In 2000/01, a large percentage of adult Ontario women reported that they had received preventive primary care such as Pap tests, clinical breast exams and mammograms.
- Individuals were more likely to receive primary and secondary preventive care if they had a regular physician.
- Indicators of primary prevention were suboptimal.
 For example, fewer than half of Ontarians reported a BMI considered to be within a healthy range.
 Self-reported levels of physical activity and vaccination were low, and the high rate of tobacco use is a cause for concern.

Implications

- Improvements can be made in both primary and secondary prevention efforts.
- There is concern regarding low physical activity levels and high BMI measures, which are linked to poor health outcomes such as increased rates of diabetes and cardiovascular disease.
- The delivery of effective screening can be improved.
- Providing information technology to primary care providers will assist in ensuring such services are offered.
- Primary care providers also have an important role in the provision of counselling with respect to risk factor modification.
- The broader determinants of health that enhance prevention of disease can be addressed by public policy initiatives that support health promotion and disease prevention.

Introduction

Preventive health care is the cornerstone of modern primary care. It has been estimated that 70% of diseases commonly seen in primary care are preventable.¹ Primary care services are increasingly oriented to the prevention of disease before its onset through a variety of strategies aimed at different risk factors throughout the life course. Ministries of Health are setting performance targets for the achievement of prevention goals. Consequently, understanding the dimensions of prevention in primary care is essential.

Prevention is conceptually associated with three distinct but related approaches²:

- Primary prevention is aimed at preventing disease before it occurs, thereby reducing the incidence of disease. Examples of primary prevention include immunization against infectious diseases, eating a healthy diet, being physically active on a regular basis, avoiding tobacco consumption and using seat belts and other protective devices.
- Secondary prevention involves the early detection of disease while it is asymptomatic and before it progresses. It also includes treatment which is given subsequent to early detection. Examples of secondary prevention include mammography to detect breast cancer, Papanicolaou (Pap) testing to detect cervical cancer, and fecal occult blood tests to detect colon cancer.
- Tertiary prevention attempts to reduce complications of disease by treatment and rehabilitation within the health care system. This prevention modality will not be addressed in this chapter.

This classification of preventive approaches informs this chapter looking at prevention in primary care. Successful prevention requires both individual effort and supportive public health policy. Because primary care involves both primary and secondary prevention efforts, we report on selected elements of both. Many preventive interventions are delivered or recommended by primary care physicians during office visits.

A comprehensive approach to preventive health care has been promoted in primary care, and Canada has shown tremendous leadership in this regard with the Canadian Task Force on Preventive Health Care (Task Force).³ This consensus group uses systematic techniques of structuring recommendations on the basis of strength of evidence published in the scientific literature. Since 1994, the Task Force has published 115 summary reports. The Task Force makes recommendations, based on review of scientific evidence, as to which preventive interventions



should be included or excluded from periodic health examinations.

It would be a daunting task to provide evidence about Ontario's population with respect to all 115 topics. Therefore, we have selected only certain measures for analysis. This chapter will examine preventive measures that the Task Force recommends should be included in periodic health examinations, as well as some which the Task Force says should be excluded.

The purpose of this chapter is to highlight key issues in preventive health care using the results of Statistics Canada's Canadian Community Health Survey (CCHS) – Cycle 1.1 carried out in 2000/01. The survey included household populations aged 12 years and older in all provinces and territories, except persons residing on Indian reserves, on Canadian Forces bases, and in certain remote areas. The overall response rate was 85%; the sample size was 131,535. There were a total of 37,681 respondents in Ontario; 32,751 were aged 20 years and older.

We will outline several aspects of primary prevention captured in the CCHS, including self-reported data about exercise, smoking and body mass index (BMI). We also present data regarding secondary prevention measures, specifically influenza vaccination, Papanicolaou (Pap) testing to detect cervical cancer and mammography to detect breast cancer.

Chapter 5—List of Exhibits

Exhibit 5.1 Proportion of the population reporting preventive screening, by presence or absence of a regular physician, in Ontario, 2000/01

Exhibit 5.2 Overall and age-specific proportion of men aged 40 years and older reporting prostate-specific antigen (PSA) testing, in Ontario, 2000/01

Exhibit 5.3 Proportion of women reporting cervical cancer screening and breast cancer screening, by Local Health Integration Network, and for the Province of Ontario, 2000/01

Exhibit 5.4 Overall and age- and sex-specific proportion of the population aged 12 years and older reporting influenza vaccination and blood pressure checks, in Ontario, 2000/01

Exhibit 5.5 Age- and sex-specific distribution of self-reported physical activity and smoking behaviours for those aged 12 years and older, in Ontario, 2000/01

Exhibit 5.6 Age- and sex-specific distribution of self-reported body mass index (BMI), by BMI category, in Ontario, 2000/01

Exhibit 5.7 Proportion of adults aged 65 years and older who reported receiving influenza vaccination within the previous two years, by Local Health Integration Network, and for the Province of Ontario, 2000/01



5

Exhibits and Findings



Exhibit 5.2 Overall and age-specific proportion of men aged 40 years and older reporting prostate-specific antigen (PSA) testing, in Ontario, 2000/01

			Reasons for having the PSA test					
Age group (years)	Ever had a PSA test (%)	PSA test in previous 2 years (%)	Family history of prostate cancer (%)	Regular check-up/ routine screening (%)	Other Reason (%)			
40–64	38	31	7	72	20			
65–74	68	56	4	69	27			
75 and older	65	43	2	62	36			
All ages	45	36	6	70	24			

©Institute for Clinical Evaluative Sciences

- In 2000/01, fewer than half of men (aged 40 years and older) reported ever having a prostate-specific antigen (PSA) test to detect prostate cancer.
- The percentage of men having a PSA test was higher in the older age groups, peaking among those aged 65–74 years.
- Nearly three-quarters of men said they had undergone PSA testing as part of their regular check-up.

5

Exhibit 5.3

Proportion of women reporting cervical cancer screening and breast cancer screening, by Local Health Integration Network, and for the Province of Ontario, 2000/01

	Proportion of women (%)*								
Local Health Integration Network	Ever had Pap test	Ever had mammogram (age 35–49 years)	Ever had mammogram (age 50 years and over)	Ever had breast exam by HCP	Ever had breast exam by self				
1. Erie St. Clair	88	55	90	76	82				
2. South West	90	35	80	86	84				
3. Waterloo Wellington	91	38	85	87	85				
4. Hamilton Niagara Haldimand Brant	90	40	79	83	83				
5. Central West	80	34	76	74	n/a**				
6. Mississauga Halton	82	39	86	83	62				
7. Toronto Central	85	45	78	82	n/a**				
8. Central	82	44	83	83	n/a**				
9. Central East	86	51	82	81	n/a**				
10. South East	93	37	84	88	84				
11. Champlain	90	41	85	89	83				
12. North Simcoe Muskoka	92	43	82	87	87				
13. North East	92	40	84	83	85				
14. North West	92	48	87	84	84				
All Ontario	87	42	83	83	n/a**				

*Age-standardized to the 1991 Canadian census of population. ** More than 50% answered not applicable. Note: Restricted to those aged 18 years and older unless otherwise specified.

Pap = Papanicolaou **HCP** = Health care professional

©Institute for Clinical Evaluative Sciences

- In 2000/01, more than 85% of women aged 18 years and older reported ever having a Papanicolaou (Pap) test to detect cervical cancer.
- In Ontario, 42% of women aged 35–49 years and 83% of those aged 50 years and older reported ever having a mammogram to detect breast cancer.
- Most women (83%) said they had undergone a clinical breast exam performed by a health care professional (HCP) at least once.
- The Central West Local Health Integration Network (LHIN) had the lowest proportion of women reporting that they had undergone a clinical breast exam by an HCP or ever had a mammogram.
- There were small variations across LHINs in the numbers of women who reported that they had ever undergone Pap testing, a mammogram and/or a clinical breast exam by an HCP.
- There were large variations across LHINs in the numbers of women who reported that they had ever performed breast self-examination (Note: Data were not available for breast self-examination in women living in the Toronto Central LHIN).

Exhibit 5.4

Overall and age- and sex-specific proportion of the population aged 12 years and older reporting influenza vaccination and blood pressure checks, in Ontario, 2000/01

	Proportion of the population (%)								
Age group (years) and sex	Ever had flu vaccination	Had flu vaccination in previous two years	Ever had blood pressure taken	Had blood pressure taken in previous two years					
Women									
12–19	38	29	75	65					
20–39	37	30	97	91					
40–64	49	43	99	94					
65–74	80	73	99	96					
75 and older	84	74	99	98					
All ages	48	41	95	90					
Men									
12–19	45	32	74	61					
20–39	35	23	94	78					
40–64	43	35	98	89					
65–74	79	67	99	95					
75 and older	85	69	99	96					
All ages	45	34	93	82					
All Ontario	47	38	94	86					

©Institute for Clinical Evaluative Sciences

V Findings

• In 2000/01, fewer than half of Ontarians aged 12 years and older reported that they had ever been vaccinated against influenza.

• Older Ontarians were more likely than those under age 65 to report that they had been vaccinated against influenza. About 80% of those aged 65 years and older said they had received at least one "flu shot".

• More women than men (41% vs. 34%) said they had received a flu shot within the previous two years.

• Almost all Ontarians (94%) surveyed said their blood pressure had been measured at least once in their lifetime; 86% reported that their blood pressure had been measured within the previous two years.



5

Exhibit 5.5

Age- and sex-specific distribution of self-reported physical activity and smoking behaviours for those aged 12 years and older, in Ontario, 2000/01

	Proportion of the population (%)							
	Physical activity index (%)					Type of smoker (%)		
Age group (years) and sex	Active	Moderate	Inactive	Not stated		Never smoked	Daily smoker	
Women								
12–19	33	20	39	8		67	11	
20–39	19	23	54	4		42	21	
40–64	16	23	58	3		37	20	
65–74	16	22	58	5		47	11	
75 and older	7	13	72	8		54	7	
All ages	19	22	55	5		45	18	
Men								
12–19	45	20	20	15		67	12	
20–39	24	22	47	8		35	28	
40–64	19	22	52	8		25	25	
65–74	22	24	44	10		19	13	
75 and older	15	16	53	16		22	9	
All ages	24	21	45	9		33	23	
All Ontario	21	22	50	7		39	20	

©Institute for Clinical Evaluative Sciences

- Overall in 2000/01, men were more likely to report being physically active than women. Self-reported rates of inactivity increased with age in both men and women.
- Nearly 40% of Ontarians aged 12 years and older said that they had never smoked.
- More men than women reported being a daily smoker.



- Ontarians aged 65 years and older were more likely to report having a higher body mass index (BMI) than those in younger age groups.
- In all age groups, the proportion of self-reported overweight and obese men exceeded the proportion of self-reported overweight and obese women.
- For men and women combined, fewer than half of Ontarians reported that they were of "normal" weight, 33% said they were "overweight", and 16% identified themselves as "obese" (data not shown).

5

Exhibit 5.7

Proportion of adults aged 65 years and older who reported receiving influenza vaccination within the previous two years, by Local Health Integration Network, and for the Province of Ontario, 2000/01

	Proportion of	adults (%)		Proportion of adults (%)		
Local Health	Aged 65-7	74 years	Age 75 years and older			
Integration Network	Women	Men		Women	Men	
1. Erie St. Clair	78	67		74	73	
2. South West	75	67		84	70	
3. Waterloo Wellington	77	74		81	75	
4. Hamilton Niagara Haldimand Brant	78	58		72	66	
5. Central West	65	60		60	56	
6. Mississauga Halton	83	73		77	70	
7. Toronto Central	73	76		74	76	
8. Central	62	76		72	65	
9. Central East	69	56		72	69	
10. South East	73	76		82	77	
11. Champlain	68	70		73	67	
12. North Simcoe Muskoka	72	58		76	80	
13. North East	74	71		70	63	
14. North West	86	71		73	72	
All Ontario	73	67		74	69	

©Institute for Clinical Evaluative Sciences

Findings

• In 2000/01, more women than men aged 65 years and older reported that they had been vaccinated against influenza within the previous two years.

• There was variation among Local Health Integration Networks (LHINs) regarding the percentage of seniors reporting influenza vaccination in the previous two years. The lowest rate was 56% in men aged 65–74 years in the Central East LHIN; the highest rate was 86% in women aged 65–74 years in the North West LHIN.

Discussion

The data presented in this chapter indicate variability in the self-reports of preventive health behaviour in the Province of Ontario. Although there is evidence of area-to-area variation within the Province, the overall indicators for primary prevention are suboptimal in general. Levels of regular physical activity sufficient to reduce the risk for disease are low, obesity rates are high, vaccination rates could be improved, and smoking remains a significant health risk.

Self-reported measures of secondary prevention are close to targets set by the Ontario Ministry of Health and Long-Term Care,⁴ however, there is still some room for improvement. For example, Papanicolaou (Pap) testing rates can be improved. The increased level of risk associated with low levels of physical activity and high body mass index (BMI) foreshadow significant future chronic disease problems in the population. A province-wide, multi-sectoral effort is required to enhance prevention and health promotion.

Our analysis of data from Statistics Canada's 2000/01 Canadian Community Health Survey demonstrates what other research has shown: people who report having a regular physician have higher rates of preventive interventions.^{5,6} These findings illustrate the important role of primary care providers in preventive health care and health promotion. Efforts must be made to ensure access to primary care services in order to enhance uptake of prevention opportunities.

The data also indicate a relationship between having a regular physician and a higher likelihood of receiving possibly questionable preventive measures, for example, prostatespecific antigen (PSA) testing and mammography before the age of 50 years to screen for breast cancer. Contrary to recommendations of the Canadian Task Force on Preventive Health Care, breast self-examination is still widely practiced. These findings show that physician and patient behaviours are not necessarily in line with guideline recommendations.

Implications for primary care practice

The research literature indicates a number of potentially effective means of enhancing the primary care system and policy response to increase health promotion and disease prevention. In the clinical domain, increases in uptake of vaccinations, screening mammograms and Pap tests have been shown to occur in practices where reminder systems are in place. 7-11

Current primary care reform initiatives in Ontario have established targets for prevention which are tied to provider remuneration. These initiatives also promise to provide and support new or enhanced information technology (IT) systems. Therefore, it seems natural for the Ministry of Health and Long-Term Care to include IT-based reminder systems for preventive care and to encourage ongoing evaluation of coverage rates of preventive care and disease outcomes.

As well, there is evidence of behaviour change among patients when primary care providers, such as physicians, provide specific advice regarding smoking cessation, diet and exercise.¹²⁻¹⁶ Therefore, health care providers should be encouraged to include discussions on risk factor modification as part of routine clinical care.

Implications for primary care policy

Effective solutions require us to consider the broader determinants of health. There is a need to integrate public health promotion, healthy public policy* and primary care.

Advice to patients from their care providers can be complemented by a variety of other strategies—for example, using social marketing techniques to communicate health messages, and engaging in advocacy to support healthy public policy. This would include lobbying for enhanced health education and physical activity in schools, and rules to limit the availability of "junk food" in school cafeterias and vending machines.

Data needs

This analysis is by no means comprehensive with respect to prevention. As noted in the introduction, the realm of preventive modalities is large and increasing.

We did not address important preventive activities such as colorectal cancer screening and childhood vaccination rates because both are the subject of current initiatives involving researchers from the Institute for Clinical Evaluative Sciences (ICES) and will be reported on at a later date.

^{*} As defined by the World Health Organization, healthy public policy is characterized by an explicit concern for health and equity in all areas of policy and by an accountability for health impact. The main aim of healthy public policy is to create a supportive environment which will enable people to lead healthy lives. Such a policy makes healthy choices possible or easier for citizens.


How the research was done

Data sources

The analysis in this chapter is based on data from the 2000/01 Canadian Community Health Survey (CCHS), Cycle 1.1. Statistics Canada conducted the CCHS to provide regular and timely cross-sectional estimates of health determinants, health status and health system utilization for 133 health regions across Canada. Data were collected in a series of two-year cycles; the first cycle, CCHS Cycle 1.1, began in September 2000 and spanned 14 months.

How the analysis was done

Cross-tabulations based on data from the CCHS were used to estimate proportions of Ontarians who said they had received preventive health services. The data were weighted to represent the demographic makeup of the Ontario population in 2000/01. The percentage of preventive cancer screenings in women was calculated by Local Health Integration Network (LHIN) and age standardized to the 1991 Canadian population.

Descriptive analysis was conducted by age, gender and region. Descriptive statistics included the frequency and percentages of people among the different groups. We examined selfreported data from the CCHS regarding: use of the Pap test (in women aged 18 years and older); use of mammography (in women aged 35 years and older); influenza vaccination (for Ontarians aged 12 years and older); use of the prostate-specific antigen test (for men aged 40 years and older); clinical breast exam (in women aged 35 years and older); and breast selfexamination (in women aged 35 years and older). Information from the CCHS regarding health behaviours such as physical activity and smoking were also examined by age and gender.

All estimates were rounded to the nearest integer for presentation in exhibits. As a result, proportional distributions may not add up to 100%.

Limitations

The results presented in this chapter should be interpreted with caution for several reasons as follows:

- The survey relies on self-reported and voluntary participation of randomly selected participants, and as such, the results were not independently verified. Respondents who said they had received fewer preventive services may not have remembered receiving any services at all. Some survey topics, such as "Did the respondent go for regular physical checkups?" were not applicable in Ontario. As a result, we were unable to obtain a wholly robust picture of primary care preventive behaviours.
- The Toronto Central LHIN had 100% "not available" for breast self-exam, meaning that data were not collected on this question in the survey. Also, the Central, Central East and Central West LHINs had greater than 50% "not available" for breast self-exam. Thus, the overall rate for breast self-exam in Ontario may be an underestimate.
- The CCHS does not determine the purpose for any screening tests, nor does it specify whether "regular physicians" were family physicians or specialists. This analysis assumes that "regular physician" is equivalent in meaning to "primary care physician".

References

- 1. Chambers L, Patterson C. Preventive health care. *Lancet* 1995; 345(8965): 1611–5.
- 2. Shah CP. Public Health and Preventive Medicine in Canada. Fifth Edition. Elsevier Canada; 2003. 1–595.
- Langley JM, Faughnan M, Canadian Task Force on Preventive Health Care. Preventive Health Care, 2003 Update: Prevention of Influenza in the General Population: Systematic Review and Recommendations. London (ON): Canadian Task Force on Preventive Health Care; March 2005.
- Mandatory Health Programs and Services Guidelines. Ministry of Health/Public Health Branch. December 1997. Queen's Printer for Ontario, 1997. ISM 0-7778-6994-2 REV 2.2M/12/97 Cat.# 2206557
- 5. Finkelstein MM. Preventive screening. What factors influence testing? *Canadian Family Physician* 2002; 48:1494–501.
- McIsaac WJ, Fuller-Thomson E, Talbot Y. Does having regular care by a family physician improve preventive care? *Canadian Family Physician* 2001; 47:70–6.
- 7. Shea S, DuMouchel W, Bahamonde L. A meta-analysis of 16 randomized controlled trials to evaluate computer-based clinical reminder systems for preventive care in the ambulatory setting. *Journal of the American Medical Informatics Association* 1996; 3(6):399–409.
- Jacobson VJ, Szilagyi P. Patient reminder and patient recall systems to improve immunization rates. *Cochrane Database of Systematic Reviews* 2005; 20(3):CD003941.

- 9. Hulscher ME, Wensing M, van Der Weijden T, Grol R. Interventions to implement prevention in primary care. *Cochrane Database of Systematic Reviews* 2001; (1):CD000362.
- Stone EG, Morton SC, Hulscher ME, Maglione MA, Roth EA, Grimshaw JM, et al. Interventions that increase use of adult immunization and cancer screening services: a meta-analysis. *Annals of Internal Medicine* 2002; 136(9):641–51.
- 11. Toth-Pal E, Nilsson GH, Furhoff AK. Clinical effect of computer generated physician reminders in health screening in primary health care—a controlled clinical trial of preventive services among the elderly. *International Journal of Medical Information* 2004; 73(9–10):695–703.
- 12. Lancaster T, Stead L. Physician advice for smoking cessation. Cochrane Database of Systematic Reviews 2004; (4):CD000165.
- 13. Lancaster T, Stead LF. Individual behavioural counseling for smoking cessation. *Cochrane Database of Systematic Reviews* 2005; (2):CD001292.
- 14. Silagy C, Lancaster T, Stead L, Mant D, Fowler G. Nicotine replacement therapy for smoking cessation. *Cochrane Database of Systematic Reviews* 2004; (3):CD000146.
- Karmisholt K, Gyntelberg F, Gotzche PC. Physical activity for primary prevention of disease. Systematic reviews of randomised clinical trials. *Danish Medical Bulletin* 2005; 52(2):86–9.
- Eakin EG, Glasgow RE, Riley KM. Review of primary care-based physical activity intervention studies: effectiveness and implications for practice and future research. *Journal of Family Practice* 2000; 49(2):158–68.

INSIDE

Executive Summary Introduction List of Exhibits Exhibits and Findings Discussion Appendix 6.A How the research was done

References



Primary Care for Respiratory Diseases

Ross E.G. Upshur, MA, MD, MSc, CCFP, FRCPC, Li Wang, MD, MSc, Jin Luo, MD, MSc, Sarah Maaten, MSc, and Alan Leong, BSc (Hons.)



Executive Summary

Issue

Respiratory diseases such as pneumonia, asthma and chronic obstructive pulmonary disease (COPD) are among the leading causes of death in the population and among the most frequent reasons for hospitalizations. In fact, respiratory diseases were responsible for 10% of all deaths in Canada in 1999 and were responsible for 9.3% and 10.9% of all hospitalizations for females and males, respectively. Examining the state of health service delivery in Ontario for these diseases will help to determine which areas are in need of more targeted health service provision.

Study

This chapter presents a detailed description of the epidemiology of respiratory diseases—COPD, asthma, pneumonia and respiratory infectious diseases—in Ontario, from 1992/93 to 2002/03. The specific objectives are to provide estimates of the impact of respiratory diseases on ambulatory care, and to determine the age- and sex-specific rates of health service utilization. The geographic variability in health service provision by Local Health Integration Network (LHIN), and the relative extent to which primary care and specialty care are provided to the patient population, are described.

Key Findings

- Respiratory ambulatory care visits showed clear seasonal variation. Peaks in incidence occurred annually from the winter to early spring, corresponding to influenza and respiratory syncytial virus (RSV) circulations.
- Rates of health service utilization were high throughout the life course, especially in the youngest and oldest age groups.
- For both young and old, there was geographic variation by LHIN in the proportion of those who consulted a general practitioner/family physician (GP/FP), a specialist, or both.
- Very few patients with respiratory disease visited the emergency department only (less than one percent). Most people with a respiratory disease visited a GP/FP.

Implications

- Respiratory diseases remain among the most common reasons for consulting the primary care system.
- Visit rates to primary care providers declined in the study period and emergency departments played a larger role in the management of respiratory diseases.
- Respiratory diseases have clear seasonal and predictable patterns that can be rationally anticipated, and for which health system responses can be appropriately planned.
- An effective response to the challenges posed by respiratory diseases and their risk factors requires the full commitment of government and the health care system.
- Further health services research is needed, reflecting the significant role that the primary care system will continue to play in the prevention and treatment of respiratory diseases.

Introduction

Respiratory diseases are variably preventable and curable, with the major causes related to respiratory viruses, tobacco consumption, and adverse environmental and occupational conditions. Collectively, these diseases impose a substantial burden on the health care system. They are also responsible for direct and indirect financial burdens due to workforce and school absenteeism.

In Canada, respiratory diseases are among the leading causes of death in the population, responsible for 10% of all deaths nationwide in 1999*. They are also among the most frequent reasons for hospitalization, accounting for 10.9% of all male hospitalizations and 9.3% of all hospitalizations for females.¹ Pneumonia and influenza, chronic obstructive pulmonary disease (COPD) and asthma account for the largest proportion of these hospitalizations. Hospitalization rates are highest among the most vulnerable segments of the population—the elderly, the very young and those with significant chronic health problems.

Respiratory diseases play an even more significant role in ambulatory care settings. Recent data for Ontario indicate that respiratory disorders are the most common reason for office visits to general practitioner/family physicians, with upper respiratory tract infections accounting for 70% of the visit volume. Similarly, other respiratory diseases are among the major causes of ambulatory care visits, including asthma (nine percent), pneumonia (four percent), and COPD (three percent).²

Given the significant impact of respiratory diseases on the population, it is important for primary care providers to have a more detailed understanding of the impact of respiratory disease on their practices. Health planners and policy makers also require a more detailed picture of these diseases. As some respiratory diseases can be prevented (e.g., through immunization, prevention of tobacco consumption and reduction of emissions from pollutant sources) and others treated (e.g., antibiotic provision for pneumonia, medical therapy for asthma and COPD, and access to pulmonary rehabilitation programs), examining the state of health service delivery in Ontario for these diseases will help to determine which areas are in need of more targeted service provision.



This chapter presents detailed data on the descriptive epidemiology of respiratory diseases in Ontario from 1992/93 to 2002/03. The specific objectives are to provide estimates of the impact of respiratory diseases on ambulatory care, and to determine the age- and sex-specific rates of health service utilization. We will also describe the geographic variability in health service provision by Local Health Integration Network, and assess the relative extent to which primary care and specialty care is provided to this patient population.

^{*} This estimate rises to 19% of male deaths and 15% of female deaths, if lung cancer is included.

Chapter 6—List of Exhibits

Exhibit 6.1 Overall number (age- and gender-aggregated) of respiratory ambulatory care visits to general practitioner/family physicians, by month and year, in Ontario, 1992–2002

Exhibit 6.2 Overall number and age- and sex-specific rates of ambulatory care visits to all physicians, for asthma and chronic obstructive pulmonary disease (COPD), per 1,000 population aged 20 years and older, in Ontario, 1992/93, 1998/99 and 2002/03

Exhibit 6.3 Overall number and age- and sex-specific rates of ambulatory care visits to all physicians, for pneumonia and respiratory infectious disease, per 1,000 population, in Ontario, 1992/93, 1998/99 and 2002/03

Exhibit 6.4 Proportion of adults aged 20 years and older with asthma, chronic obstructive pulmonary disease (COPD), pneumonia and respiratory infectious disease who consulted various physician specialty types, and the range of proportions across Local Health Integration Networks (LHINs), in Ontario, 1992/93, 1998/99 and 2002/03

Exhibit 6.5 Proportion of adults aged 20 years and older with asthma, chronic obstructive pulmonary disease (COPD), pneumonia and respiratory infectious disease who consulted various physician specialty types, and the range of proportions across Local Health Integration Networks (LHINs), in Ontario, 1992/93, 1998/99 and 2002/03

Exhibit 6.6 Proportion of youth aged 19 years and younger with pneumonia and respiratory infectious disease who consulted various physician specialty types, and the range of proportions across Local Health Integration Networks (LHINs), in Ontario, 1992/93, 1998/99 and 2002/03

Exhibit 6.7 Usual Provider Continuity (UPC) Index and proportion of adults aged 20 years and older with asthma and chronic obstructive pulmonary disease (COPD) who consulted general practitioner/family physicians or specialists, by provider type, in Ontario, 2002/03

Exhibit 6.8 Age- and sex-specific Usual Provider Continuity (UPC) Index for adults aged 20 years and older with asthma and chronic obstructive pulmonary disease (COPD) who consulted general practitioner/family physicians, in Ontario, 1992/93, 1998/99 and 2002/03



6

Exhibits and Findings



• Visit volumes declined in the last few years of observation.

Exhibit 6.2

Overall number and age- and sex-specific rates of ambulatory care visits to all physicians*, for asthma and chronic obstructive pulmonary disease (COPD), per 1,000 population aged 20 years and older, in Ontario, 1992/93, 1998/99 and 2002/03

			Asthma			COPD		
Rates per 1	,000 population	1992/93	1998/99	2002/03	1992/93	1998/99	2002/03	
Age group	20–39	29	32	30	4	3	3	
(years)	40–64	33	36	34	16	14	12	
	65–74	45	47	43	58	53	48	
	75 and older	44	49	44	86	84	78	
	All ages	33	36	34	18	17	16	
Sex	Women	38	43	40	16	16	15	
	Men	26	29	27	20	18	17	
Number of	persons	289,786	336,369	325,645	156,804	157,581	153,682	
Ratio of number of women to number of men		1.52	1.56	1.55	0.80	0.93	0.90	

* Includes general practitioner/family physicians and specialist physicians.

©Institute for Clinical Evaluative Sciences

V Findings

Asthma

- Ambulatory visit rates for asthma were higher in older age groups throughout the study period. The highest visit rates occurred in 1998/99, among adults aged 75 years and older.
- More than 1.5 times more women than men made ambulatory care visits for asthma.

COPD

- In 1992/93, 156,804 adults aged 20 years and older visited a physician for chronic obstructive pulmonary disease (COPD). In 2002/03 the number of persons dropped to 153,682.
- In 1992/93, 18 out of every 1,000 Ontarians aged 20 years and older made at least one visit to a physician for COPD, but in 1998/99 and 2002/03, this number fell to 17 and 16 out of every 1,000 Ontarians aged 20 years and older, respectively.
- Physician visit rates for COPD increased with age and were consistently higher among males than females over time.

6



Overall number and age- and sex-specific rates of ambulatory care visits to all physicians*, for pneumonia and respiratory infectious disease, per 1,000 population, in Ontario, 1992/93, 1998/99 and 2002/03

			Pneumonia		Respir	atory infectious	disease	
Rates per 1	,000 population	1992/93	1998/99	2002/03	1992/93	1998/99	2002/03	
Age group	0–1	19	26	32	410	437	447	
(years)	2–5	29	38	42	548	505	492	
	6–11	16	19	18	391	340	299	
	12–15	8	10	10	273	264	232	
	16–19	7	8	8	248	250	215	
	20–39	8	9	8	238	211	184	
	40–64	14	15	14	234	216	185	
	65–74	29	34	31	250	230	219	
	75 and older	69	78	72	268	257	235	
	All ages	16	19	18	277	253	224	
Sex	Women	16	19	18	306	280	247	
	Men	15	18	17	249	226	200	
Number of	persons	193,130	237,266	229,132	3,450,221	3,247,630	2,924,176	

* Includes general practitioners/family physicians and specialist physicians.

©Institute for Clinical Evaluative Sciences

Findings

Pneumonia

- Visit rates for pneumonia increased over the study period, from 1992/93 to 2002/03. By 2002/03, over 229,000 people had ambulatory care visits for pneumonia.
- Visit rates were high among two- to five-year-olds and decreased with age up to and including the 16 to 19 year old age group. Starting at 20 years of age, visit rates for pneumonia doubled with increasing age, peaking among those aged 75 years and older.

Respiratory Infections

- Visit rates for respiratory infections declined over the study period.
- In 1992/93, 277 out of every 1,000 Ontarians of all ages made at least one visit to a physician for respiratory infections. Visit rates were highest in those aged two to five years.
- High visit rates in children under five years of age can be attributed to the co-circulation of respiratory syncytial virus (RSV) and influenza, where RSV has been found to be the driving force in childhood respiratory infections.³

Exhibit 6.4

Proportion of adults aged 20 years and older with asthma, chronic obstructive pulmonary disease (COPD), pneumonia and respiratory infectious disease who consulted various physician specialty types, and the range of proportions across Local Health Integration Networks (LHINs), in Ontario, 1992/93, 1998/99 and 2002/03

			Proportion of adults who consulted various physician specialty types (%)											
Disease	Fiscal year	GP	GP/FP Respirologist		Inte	rnist	Geriat	trician	Emergency medicine					
		Ontario	LHIN range*	Ontario	LHIN range*	Ontario	LHIN range*	Ontario	LHIN range*	Ontario	LHIN range*			
Asthma	1992/93	98	95–99	8	2–12	25	12–29	<.5	<.5–1	33	22–54			
	1998/99	98	94–99	8	3–14	24	11–29	1	<.5–1	33	23–48			
	2002/03	98	96–99	8	3–16	23	12–30	1	<.5–2	34	28–51			
COPD	1992/93	96	92–98	11	3–19	34	21–41	1	<.5–2	37	25–53			
	1998/99	97	92–99	13	4–21	35	20–42	2	<.5–5	42	30–56			
	2002/03	97	95–99	15	5–24	35	20–44	2	<.5–7	46	39–57			
Pneumonia	1992/93	97	92–98	7	2–11	30	21–39	1	<.5–2	46	33–66			
	1998/99	97	94–99	8	2–13	31	19–40	2	<.5–5	50	41–65			
	2002/03	97	95–98	9	3–16	34	18–42	3	<.5–8	55	46–72			
Respiratory	1992/93	99	97–100	1	<.5–2	13	9–16	<.5	<.5-<.5	26	16–50			
infectious	1998/99	99	97–99	2	1–3	14	9–17	<.5	<.5–1	26	16–45			
disease	2002/03	99	97–99	2	1–4	15	10–18	1	<.5–1	27	20–51			

*LHIN range represents the lowest and highest values among all LHINs.

GP/FP = General practitioner/family physician

©Institute for Clinical Evaluative Sciences

V Findings

- Nearly all patients with asthma, chronic obstructive pulmonary disease (COPD), pneumonia and respiratory infectious disease visited a general practitioner/family physician (GP/FP) for these conditions.
- Compared to patients with asthma, COPD or respiratory infections, patients with pneumonia were more likely to visit the emergency department (ED). Rates of ED visits increased over the study period for all respiratory diseases.
- Patients with COPD were more likely to visit respirologists and internists than patients with respiratory infections.
- The variation across Local Health Integration Networks was relatively small for GP/FP visits; however, there was significant geographic variation for specialist physician visits.

6

Exhibit 6.5

Proportion of adults aged 20 years and older with asthma, chronic obstructive pulmonary disease (COPD), pneumonia and respiratory infectious disease who consulted various physician specialty types, and the range of proportions across Local Health Integration Networks (LHINs), in Ontario, 1992/93, 1998/99 and 2002/03

		Proportion of adults who consulted various physician specialty types alone or in combination (%)									
Disease	Fiscal year	GP. or	GP/FP only		t only**	GP/F a spec	P and cialist**	Emerç medicir	jency ne only		
		Ontario	LHIN range*	Ontario	LHIN range*	Ontario	LHIN range*	Ontario	LHIN range*		
Asthma	1992/93	38	32–50	2	1–5	60	48–66	<.5	<.5–1		
	1998/99	39	34–50	2	<.5–5	59	48–65	<.5	<.5–1		
	2002/03	40	35–53	1	<.5–3	58	45–63	<.5	<.5–1		
COPD	1992/93	28	23–39	3	1–7	68	61–74	<.5	<.5-<.5		
	1998/99	27	22–38	3	1–7	70	61–76	<.5	<.5-<.5		
	2002/03	27	20–39	2	1–4	71	59–78	<.5	<.5-<.5		
Pneumonia	1992/93	34	25–47	3	1–7	63	49–71	<.5	<.5–1		
	1998/99	33	26–46	2	1–5	64	52–71	<.5	<.5–1		
	2002/03	31	25–46	2	1–3	66	51–72	1	<.5–2		
	1992/93	47	42–55	1	<.5–2	52	42–56	<.5	<.5–2		
Respiratory	1998/99	48	43–55	1	<.5–2	51	43–56	<.5	<.5–1		
disease	2002/03	47	43–55	1	<.5–1	52	43–56	<.5	<.5–2		

* LHIN range represents the lowest and highest values among all LHINs.

** Inpatient specialist visits were not included.

GP/FP = General practitioner/family physician

©Institute for Clinical Evaluative Sciences

Findings

- Compared with the other diseases examined, a higher proportion of adults with respiratory infections consulted a general practitioner/family physician (GP/FP) only.
- Patients with chronic obstructive pulmonary disease (COPD) were more likely to consult both specialists and GP/FPs, compared to patients with other respiratory diseases.
- From 1992/93 to 2002/03 the proportion of adults with respiratory disease that only consulted a specialist decreased for asthma, COPD and pneumonia.
- For all diseases, adults were most likely to consult both a GP/FP and a specialist, and were very unlikely to visit the emergency department only (less than .5% of adult visits).
- The proportion of adults who consulted either a GP/FP only, a specialist only, or both, varied across Local Health Integration Networks.

Exhibit 6.6

Proportion of youth aged 19 years and younger with pneumonia and respiratory infectious disease who consulted various physician specialty types, and the range of proportions across Local Health Integration Networks (LHINs), in Ontario, 1992/93, 1998/99 and 2002/03

		Proportio	Proportion of youth who consulted various physician specialty types alone or in combination (%)											
Disease	Fiscal year	GP. or	/FP Ny	Specialist only**		GP/FP and a specialist**		Emergency medicine only						
		Ontario	LHIN range*	Ontario	LHIN range*	Ontario	LHIN range*	Ontario	LHIN range*					
Pneumonia	1992/93	44	29–59	8	<.5–17	48	39–54	<.5	<.5–1					
	1998/99	42	24–60	10	<.5–26	47	39–53	<.5	<.5–1					
	2002/03	42	24–59	11	1–28	46	34–51	1	<.5–3					
	1992/93	55	44–69	6	1–13	38	28–44	<.5	<.5–3					
Respiratory	1998/99	55	44–70	6	<.5–14	38	29–42	1	<.5–2					
disease	2002/03	55	44–70	7	<.5–16	37	29–42	1	<.5–4					

* LHIN range represents the lowest and highest values among all LHINs.

** Inpatient specialist visits were not included.

GP/FP = General practitioner/family physician

©Institute for Clinical Evaluative Sciences

Findings

- Ontario youth with respiratory infections were more likely to only consult a general practitioner/family physician (GP/FP), whereas those with pneumonia were more likely to consult both a GP/FP and a specialist.
- The proportion of youth aged 19 years and younger with pneumonia or respiratory infections that only consulted a specialist increased from 1992/93 to 2002/03, while the proportion of adults with those diseases did not (Exhibit 6.5).
- For both diseases, very few patients visited the emergency department exclusively (one percent or less).
- There was significant geographic variation across Local Health Integration Networks with respect to the proportion of youth patients who only consulted a GP/FP, only consulted a specialist and consulted both a GP/FP and a specialist.

6



Usual Provider Continuity (UPC) Index* and proportion of adults aged 20 years and older with asthma and chronic obstructive pulmonary disease (COPD) who consulted general practitioner/family physicians or specialists**, by provider type, in Ontario, 2002/03



- * UPC Index is an established measure of physician continuity of care. Low continuity of care is defined as UPC \leq 0.75.
- ** Inpatient specialist visits were not included.

GP/FP = General practitioner/family physician

©Institute for Clinical Evaluative Sciences

🔻 Findings

- Adults with asthma or chronic obstructive pulmonary disease (COPD) were more likely to consult a general practitioner/ family physician (GP/FP) than those without these conditions.
- The proportion of adults who consulted a GP/FP for either asthma or COPD was similar, regardless of whether a specialist had also been consulted.
- The Usual Provider Continuity (UPC) Index showed minimal changes from 1992/93 to 2002/03 (data not shown).
- In 2002/03, continuity of care (interpreted from UPC Index) was low for patients who consulted a GP/FP for their asthma but did not consult a specialist as well.

Exhibit 6.8

Age- and sex-specific Usual Provider Continuity (UPC) Index* for adults aged 20 years and older with asthma and chronic obstructive pulmonary disease (COPD) who consulted general practitioner/ family physician, in Ontario, 1992/93, 1998/99 and 2002/03

					UPC Index			
			Asthma			COPD		
Sex/Age grou	ıp (years)	1992/93	1998/99	2002/03	1992/93	1998/99	2002/03	
Women	20–39	0.70	0.68	0.66	0.73	0.71	0.70	
	40–64	0.78	0.78	0.77	0.81	0.80	0.80	
	65–74	0.83	0.82	0.82	0.83	0.83	0.82	
	75 and older	0.82	0.81	0.81	0.82	0.81	0.81	
Men	20–39	0.69	0.67	0.66	0.74	0.72	0.71	
	40–64	0.79	0.78	0.77	0.82	0.81	0.81	
	65–74	0.84	0.83	0.83	0.85	0.84	0.84	
	75 and older	0.83	0.82	0.82	0.83	0.82	0.82	

* UPC Index is an established measure of physician continuity of care. Low continuity of care is defined as UPC \leq 0.75.

©Institute for Clinical Evaluative Sciences

Findings

- Both males and females aged 20–39 years with asthma or chronic obstructive pulmonary disease had the lowest continuity of care (defined as Usual Provider Continuity Index ≤ 0.75) in each of the three years examined.
- From 1992/93 to 2002/03, continuity of care indices decreased slightly.
- Continuity of care improved with age and there were no significant differences between males and females.

Discussion

The results of this chapter confirm the important role that respiratory diseases play in primary care. Visit rates to general practitioner/family physicians (GP/FPs) declined over the study period from 1992/93 to 2002/03 and emergency departments played a larger role in the management of respiratory diseases. This has clear policy implications.

Respiratory diseases have seasonal and predictable patterns related primarily to viral pathogens that can be rationally anticipated and for which health system responses can be appropriately planned. Rates of utilization are high throughout the life course but are specifically high in the youngest and oldest age groups.⁴ Relying on emergency services for the provision of front line health care will likely have a deleterious effect in terms of system crowding. Enhancing services in primary care, particularly during outbreaks of viral illness, would likely reduce this strain.

Implications for practice

GP/FPs play roles in the preventive, curative and treatment domains of respiratory disease management. Influenza vaccination will have an impact upon the reduction of morbidity from annual influenza outbreaks.⁵ As primary care services are pivotal in the provision and promotion of influenza vaccine, enhanced efforts to ensure high vaccine coverage are needed. Other respiratory viruses (such as respiratory syncyctial virus, for which there is no current vaccine), play significant roles in seasonal morbidity. Explaining the limitations of influenza vaccines may be a significant component of vaccine acceptance. Primary care also has an important function in ongoing surveillance efforts and in educating patients.

Recent clinical practice guidelines and research syntheses have emphasized the importance of medical management for both asthma and chronic obstructive pulmonary disease (COPD).6-11 Optimizing medical care may contribute to reductions in hospitalizations and health services utilization, and improve quality of life. Surprisingly the data presented here indicate a reduction in visits to physicians due to COPD. It is important that this finding be interpreted with caution. The coding for COPD has not been validated, and thus physician office visits for COPD may be underestimated. The literature supports an underdiagnosis of COPD in primary care.¹² This finding, if valid, in tandem with evidence of increasing care being sought in the emergency department, likely indicates a care gap that requires attention.⁸ It is anticipated that as the population ages, the burden of illness due to COPD in primary care will increase, particularly as the number of aging female smokers increases. The biggest long-term impact on COPD would be enhanced efforts at smoking cessation and smoking prevention. As

demonstrated in chapter 5 of this Atlas, a significant proportion of the Ontario population continues to smoke tobacco. Primary care clearly has a role to play in addressing this issue, along with other partners in many sectors of Canadian society.^{13–15}

Asthma is a common health care problem across the life course. Research indicates inconsistent use of clinical practice guidelines and that diagnosis rates, appropriate use of medication, self-management plans and patient education are suboptimal.¹⁰ A recent Alberta study indicated that a gap exists among primary care physicians in the provision of asthma care (e.g., education, written action plans and lung function testing).¹⁶ Primary care can contribute to improving outcomes in asthma care.¹⁷

Implications for policy

Respiratory diseases are clearly linked to ambient air quality, both indoor and outdoor.¹⁸ Support for initiatives to reduce the impact of tobacco and improve the quality of outdoor air could have a positive influnce on the respiratory health of Ontarians. In this regard, primary care providers could play an important role in advocation for positive policy changes in this area.

Future research and data needs

As respiratory disorders play such a large role in primary care, more detailed health services research is clearly needed. Analysis linking respiratory disease occurrence among those immunized and not immunized for influenza and pneumoccocal pneumonia is warranted. Further spatial analysis of respiratory disease occurrence may help identify vulnerable communities.

Validation of coding practices for respiratory disease and accurate individual-level immunization data is required in order to evaluate the impact of vaccination on health outcomes.

In conclusion, respiratory diseases remain among the most common reason for consulting the primary health care system. The primary health care system will continue to contribute to the prevention and treatment of respiratory diseases. The conclusions of this chapter echo those of the 2001 Health Canada report on respiratory disease in Canada, as follows:

An effective response to the challenges posed by respiratory diseases and their risk factors requires the full commitment of government and the health care system. The first step is to recognize that respiratory diseases are major health problems in Canada. The second step involves a collaborative approach by government, voluntary organizations, health care professionals and institutions toward the prevention and effective management of respiratory diseases. And finally, a fully effective comprehensive approach would include other sectors that influence indoor and outdoor air quality.¹



How the research was done

Data sources

Study groups were extracted from the Ontario Health Insurance Plan (OHIP) database consisting of people who had a diagnosis code for one of four respiratory diseases: chronic obstructive pulmonary disease (COPD); asthma; pneumonia; or a respiratory infectious disease. For each disease group, all ambulatory visits to physicians in Ontario were extracted. Emergency department (ED) visits and long-term care (LTC) visits were included, while inpatient visits were excluded. Rates of visits to physicians were calculated for both adults and youths, by age group and sex, for 1992/93, 1998/99 and 2002/03. The following codes were used to identify people who had a respiratory disease:

Table 6.1	International Classification of Diseases, Ninth Revision (ICD-9) codes used for identification of respiratory diseases
COPD	491 (Chronic bronchitis) 492 (Emphysema) 496 (Chronic airway obstruction not elsewhere classified)
Asthma	493
Pneumonia	486
Respiratory Infectious Disease	487 (Influenza) 460 (Acute upper respiratory tract infections) 466 (Acute bronchitis)

Individual geographic information is available from the Institute for Clinical Evaluative Sciences (ICES) databases that were used to define the best known postal code for each person on July 1st of each year (available from 1991 to 2004). Postal codes were then converted to Dissemination Areas (DA) by the Statistics Canada Postal Code Conversion File (PCCF), which was aggregated to the Location Health Integration Network (LHIN) level.

How the analysis was done

The proportion of patients for each diagnostic group with at least one visit to a specialist was determined. Visits to a respiratory specialist were defined as visits to a respirologist, an internist, or a geriatrician/pediatrician where a submitted claim had the diagnostic code for one of the four respiratory disease groups. The ICES Physician Database (IPDB) was used to identify physician specialty. In the IPDB, *mainspecialty* is based on physician self-reported specialty, which is gathered periodically. For each of the 14 LHINs in Ontario, the proportion of patients from each diagnostic group that visited either general practitioner/family physicians (GP/FPs), respirologists, internists, geriatricians, pediatricians or emergency medicine specialists was determined.

For the continuity of care measure the Usual Provider Continuity (UPC) Index using two years of OHIP data was calculated according to the following formula:

UPC = n_i / N where N = total # of visits and n_i = number of visits to usual provider in a defined time period.

Visits were restricted to those made to a GP/FP for primary care in the office, home or LTC facility. ED and inpatient visits were excluded from the calculation. Visits to a specialist were attributed to the GP/FP who referred the patient and were also included in the calculation.

The UPC Index was only calculated for individuals who had at least three visits in the past two years. The physician who provided the greatest proportion of care was specified as the usual provider. To arrive at the UPC Index the number of visits to the usual provider was divided by the total number of visits. A score of one represents perfect continuity of care.

With few exceptions, all estimates were rounded to the nearest integer. As a result, proportional distributions may not add up to 100%.

Limitations

Administrative data was used in this chapter. However, such data was not originally collected for the purposes of conducting health research; therefore, caution should be used when interpreting results.

The diagnostic codes provided in physician claims have not been validated and may be unreliable.

Patients were included in the data analysis if they had made at least one visit to any type of physician for which the diagnostic code corresponded to that disease. As a result, this may have included patients with only uncertain diagnoses. During the initial patient investigation, physicians may have submitted a claim with a diagnosis that was subsequently ruled out by test results or further examination.

Physicians were allowed to only enter one diagnosis per patient visit. This means that if a patient had more than one reason for

6

visiting, the secondary diagnosis was excluded. In addition, it was likely that one of the diseases was viewed as a secondary rather than primary diagnosis. Consequently, the results in this chapter may have underestimated or overestimated the impact of respiratory diseases an ambulatory care in Ontario.

OHIP includes only fee-for-service claims, so physicians and patients enrolled in alternative payment plans, such as Community Health Centres and Health Service Organizations, are excluded. Omission of individuals covered by alternate payment plans likely leads to underestimation of ambulatory care for respiratory diseases in Ontario.

The continuity of care index was based on office or ambulatory visits made to GP/FPs, excluding emergency department visits, which would have increased the continuity of care estimates.

References

- 1. Canadian Institute for Health Information, Canadian Lung Association, Health Canada, Statistics Canada. Respiratory Disease in Canada. Ottawa: Health Canada; 2001.
- Chan BTB, Schultz SE. Supply and utilization of general practitioner and family physician services in Ontario. ICES Investigative Report. Toronto: Institute for Clinical Evaluative Sciences; 2005.
- 3. Upshur RE, Moineddin R, Crighton EJ, Mamdani M. Interactions of viral pathogens on hospital admissions for pneumonia, croup and chronic obstructive pulmonary diseases: results of a multivariate time-series analysis. *Epidemiology and Infection* 2006; 1–5.
- Upshur RE, Moineddin R, Crighton E, Kiefer L, Mamdani M. Simplicity within complexity: seasonality and predictability of hospital admissions in the province of Ontario 1988–2001, a population-based analysis. BMC Health Services Research 2005; 5(1):13.
- Langley JM, Faughnan M, Canadian Task Force on Preventive Health Care. Preventive Health Care, 2003 Update: Prevention of Influenza in the General Population: Systematic Review and Recommendations. London (ON): Canadian Task Force on Preventive Health Care; 2005.
- Sin DD, McAlister FA, Man SF, Anthonisen NR. Contemporary management of chronic obstructive pulmonary disease: scientific review. *Journal of the American Medical Association* 2003 Nov 5; 290(17):2301–12.
- Croxton TL, Weinmann GG, Senior RM, Wise RA, Crapo JD, Buist AS. Clinical research in chronic obstructive pulmonary disease: needs and opportunities. *American Journal of Respiratory and Critical Care Medicine* 2003 Apr 15; 167(8):1142–9.
- Choi PP, Day A, Etchells E. Gaps in the care of patients admitted to hospital with an exacerbation of chronic obstructive pulmonary disease. *Canadian Medical Association Journal* 2004; 170(9):1409–13.
- Chapman KR, Bourbeau J, Rance L. The burden of COPD in Canada: results from the Confronting COPD survey. *Respiratory Medicine* 2003; 97(Suppl C):S23–31.
- Lemiere C, Bai T, Balter M, Bayliff C, Becker A, Boulet LP, et al. Adult Asthma Consensus Guidelines Update 2003. *Canadian Respiratory Journal* 2004; 11(Suppl A):9A–18A.
- Jin R, Choi BC, Chan BT, McRae L, Li F, Cicutto L, et al. Physician asthma management practices in Canada. *Canadian Respiratory Journal* 2000; 7(6):456–65.
- van Weel C. Underdiagnosis of asthma and COPD: is the general practitioner to blame? *Monaldi Archives for Chest Disease* 2002; 57(1): 65–8.
- 13. Lancaster T, Stead L. Physician advice for smoking cessation. *Cochrane Database of Systematic Reviews* 2004; (4):CD000165.
- Lancaster T, Stead LF. Individual behavioural counselling for smoking cessation. Cochrane Database of Systematic Reviews 2005; (2):CD001292.
- 15. Silagy C, Lancaster T, Stead L, Mant D, Fowler G. Nicotine replacement therapy for smoking cessation. *Cochrane Database of Systematic Reviews* 2004; (3):CD000146.
- Tsuyuki RT, Sin DD, Sharpe HM, Cowie RL, Nilsson C, Man SF, et al. Management of asthma among community-based primary care physicians. *Journal of Asthma* 2005; 42(3):163–7.

- To T, Cicutto L, Wajja A, McLimont S, Shahsavar A, Ghulmiyyah M. Evaluation of a Community-Based Primary Care Asthma Pilot Project. Proceedings of the American Thoracic Society, Volume 3; 2006 May 19–24; San Diego, USA. New York: American Thoracic Society; 2006. p.A528.
- Abelsohn A, Stieb D, Sanborn MD, Weir E. Identifying and managing adverse environmental health effects: 2. Outdoor air pollution. *Canadian Medical Association Journal* 2002; 166(9):1161–7.

INSIDE

Executive Summary Introduction List of Exhibits Exhibits and Findings Discussion Appendix 7.A How the research was done

References



Physician Care of Patients with Congestive Heart Failure

Karen Tu, MD, MSc, CCFP, FCFP, Yanyan Gong, MSc, and Sarah Maaten, MSc



Executive Summary

Issue

Patients who are admitted to hospital for congestive heart failure (CHF) can be treated by general practitioner/ family physicians (GP/FPs) or by specialists. The type of physician caring for CHF patients may be dependent on the availability of specialists, or on local hospital structure and policies. Use of CHF medications and patient outcomes may also vary according to physician speciality type. GP/FPs may be less familiar with treatment guidelines and recommendations compared to specialists; however, they may have increased familiarity with patients and can offer greater continuity of care.

Study

Patients in Ontario with new onset CHF hospital admissions were identified according to the Canadian Institute for Health Information Discharge Abstract Database from fiscal years 1997/98 to 2001/02. For this group of patients variations were described in:

- The type of physician designated as the most responsible physician;
- The rate of receiving a specialist consultation in those patients who had a GP/FP as their most responsible physician; and,
- The rate of hospital readmission and mortality by the physician type designated as the most responsible physician.

For patients aged 65 years and older, data from the Ministry of Health and Long-Term Care Ontario Drug Benefit Program was used to describe:

• The rates of dispensing relevant CHF medications according to the physician type of the most responsible physician.

Regional variations across Local Health Integration Networks (LHINs) are also reported.

Key Findings

- There were large variations between LHINs in the physician type caring for CHF patients.
- Among patients for whom a GP/FP was the most responsible provider of care, there were variations between LHINs in rates of specialist consultations.
- Rates of dispensing for most CHF medications were lower in patients cared for by a GP/FP, even after adjustments were made for age, sex and comorbidities.
- Mortality rates for patients cared for by a GP/FP were higher than for patients cared for by specialists.
 Patients cared for by a GP/FP with a specialist consultation had lower hospital readmission rates than patients cared for by a GP/FP without a specialist consultation.

Implications

- Future efforts should focus on improving the education of GP/FPs in evidence-based CHF management according to current guidelines and recommendations. This intervention may help to narrow the gap between specialist and non-specialist care for heart failure patients.
- The use of innovative strategies to enhance GP/FP consultations with specialists, particularly in under-serviced areas, is needed.
- The increased mortality rate in CHF patients receiving care from GP/FPs needs further investigation.

Introduction

Congestive heart failure (CHF) is a condition where the heart muscle is weakened and unable to pump with enough strength to maintain blood circulation to the rest of the body. This condition is most often caused by coronary artery disease or hypertension, and is seen more frequently with increasing age. In Canada, 85% of patients hospitalized with CHF are aged 65 years and over.¹ CHF is associated with significant morbidity, mortality and increased health care costs.^{2–4}

Patients admitted to hospital for CHF can be treated by general practitioner/family physicians (GP/FPs); by specialists such as cardiologists or internists; or, by GP/FPs with a specialist consultation. In Canada, half of the patients hospitalized for CHF are primarily treated by primary care physicians.⁵ Guidelines exist for the optimal management of CHF, including recommended use of medications for maximizing patient outcomes.⁶ Research has shown that heart failure medication prescription rates vary by province⁷ and although heart failure medication prescribing in Ontario is improving, it may still be less than ideal.⁸ Outcomes for heart failure patients can vary by age, sex, type of physician caring for hospitalized patients⁹ and health region.¹

The purpose of this chapter is to examine regional variations in the type of physician treating Ontario patients hospitalized for CHF, and the impact that type of physician has on prescribing rates over time for relevant heart failure medications, hospital readmissions and mortality.



Chapter 7—List of Exhibits

Exhibit 7.1 Number and proportion of patients newly hospitalized for congestive heart failure (CHF), by age and Local Health Integration Network, in Ontario, 1997/98 to 2001/02

Exhibit 7.2 Distribution of physician type most responsible for the care of newly hospitalized congestive heart failure (CHF) patients, in Ontario, 1997/98 to 2001/02

Exhibit 7.3 Distribution of physician type most responsible for the care of newly hospitalized congestive heart failure (CHF) patients, by Local Health Integration Network, and for the Province of Ontario, 1997/98 to 2001/02

Exhibit 7.4 Proportion of newly hospitalized congestive heart failure (CHF) patients with a general practitioner/family physician as the most responsible physician, who received a specialist consultation, by Local Health Integration Network, in Ontario, 1997/98 to 2001/02

Exhibit 7.5 Age-, sex- and comorbidity-adjusted proportion of newly hospitalized congestive heart failure (CHF) patients dispensed CHF medications, by most responsible physician type, in Ontario, 1997/98 to 2001/02

Exhibit 7.6 Age-, sex- and comorbidity-adjusted readmission rates per 100 hospital admissions for patients with congestive heart failure (CHF) aged 20 years and older, by most responsible physician type, in Ontario, 1997/98 to 2001/02

Exhibit 7.7 Age-, sex- and comorbidity-adjusted mortality rates per 100 hospital admissions for patients with congestive heart failure (CHF) aged 20 years and older, by most responsible physician type, in Ontario, 1997/98 to 2001/02

Exhibits and Findings

Exhibit 7.1	Number and proportion of and Local Health Integration	patients newly hospitalized for con n Network, in Ontario, 1997/98 to 2	gestive heart failure (CHF), by age 001/02
		Number	Proportion of patients with CHF (%)
Total		42,367	100
Age (years)			
65 and older*	,	31,268	74
Under 65		11,099	26
Local Health In	tegration Network		
1. Erie St. 0	Clair	3,165	8
2. South W	est	3,701	9
3. Waterloo	Wellington	2,089	5
4. Hamiltor	Niagara Haldimand Brant	5,906	14
5. Central \	West	1,415	3
6. Mississa	uga Halton	2,322	6
7. Toronto	Central	3,520	8
8. Central		3,945	9
9. Central E	East	4,567	11
10. South Ea	ast	2,178	5
11. Champla	ain	3,712	9
12. North Si	mcoe Muskoka	1,628	4
13. North Ea	st	3,130	7
14. North We	est	1,089	3

* For patients in this age category, prescription information is available through the Ministry of Health and Long-Term Care Ontario Drug Benefit Program database.

©Institute for Clinical Evaluative Sciences

V Findings

- The majority of people with congestive heart failure (CHF) were aged 65 years and older.
- There was considerable variation in the distribution of CHF patients across Local Health Integration Networks (LHINs). The greatest proportion of the Ontario population with CHF lived in the Hamilton Niagara (14%) and Central East (11%) LHINs.



Findings

- Most patients with congestive heart failure had a general practitioner/family physician (GP/FP) as their most responsible physician (39%).
- Of patients with a GP/FP as their most responsible physician, just under half also received a consult from a specialist.



GP/FP = General practitioner/family physician

©Institute for Clinical Evaluative Sciences

Findings

- The type of physician most responsible for the care of patients newly diagnosed with congestive heart failure varied by Local Health Integration Network (LHIN).
- The highest proportion of patients cared for by general practitioner/family physicians (GP/FPs) was found in the northern LHINs—North Simcoe Muskoka (77%), North West (74%) and North East (69%).
- Some central LHINs—Toronto Central (2%), Central (7%) and Central West (19%)—had the lowest proportion of patients being cared for primarily by a GP/FP.



Proportion of newly hospitalized congestive heart failure (CHF) patients with a general practitioner/family physician as the most responsible physician, who received a specialist consultation, by Local Health Integration Network, in Ontario, 1997/98 to 2001/02



[©]Institute for Clinical Evaluative Sciences

V Findings

- Patients newly hospitalized for congestive heart failure (CHF) with a general practitioner/family physician (GP/FP) as their most responsible physician had the lowest specialist consultation rates in the Central (30%), North East (30%) and South West (34%) Local Health Integration Networks (LHINs).
- Although patients cared for by a GP/FP in the Central LHIN had the lowest percentage of specialist consultations, only 7% of patients with CHF in the Central LHIN were primarily cared for by GP/FPs (see Exhibit 7.3).
- Patients newly hospitalized for CHF with a GP/FP as their most responsible physician had the highest specialist consultation rates in the Mississauga Halton (82%), followed by the Hamilton Niagara Haldimand Brant (61%) and Erie St. Clair (59%) LHINs.

Exhibit 7.5

Age-, sex- and comorbidity-adjusted proportion of newly hospitalized congestive heart failure (CHF) patients dispensed CHF medications, by most responsible physician type, in Ontario, 1997/98 to 2001/02

			Proportion of patients with CHF (%)						
Type of CHF medication	Type of physician	Number of patients	One post-o	e month discharge	Three post-c	e months lischarge	On post-o	e year discharge	
			Crude	Adjusted	Crude	Adjusted	Crude	Adjusted	
Angiotensin-	GP/FP with specialist consult	5,737	62	63**	71	71**	76	76**	
converting enzyme	GP/FP without specialist consult	6,858	55	55*	67	67*	72	73*	
(ACE) inhibitors	Internist	11,058	62	62**	71	71**	76	76**	
	Cardiologist	4,640	61	61	71	70	76	75	
	Other specialist	2,975	56	57*	65	66**	70	71*	
	Overall	31,268	60	-	70	-	75	-	
Beta-adrenergic	GP/FP with specialist consult	5,737	16	17*	22	23*	27	28*	
blocking agents	GP/FP without specialist consult	6,858	12	12*	18	19*	23	25*	
(beta-blockers)	Internist	11,058	20	20**	27	26*	33	33**	
	Cardiologist	4,640	28	25**	35	32**	43	39**	
	Other specialist	2,975	16	16*	22	23*	28	29*	
	Overall	31,268	18	-	25	-	31	-	
Digoxin	GP/FP with specialist consult	5,737	39	39**	47	47**	52	53**	
	GP/FP without specialist consult	6,858	29	29*	39	38*	44	44*	
	Internist	11,058	35	35	43	43	49	49	
	Cardiologist	4,640	39	39**	47	47**	52	52**	
	Other specialist	2,975	34	34	40	41*	46	46*	
	Overall	31,268	35	-	43	-	49	-	
Spironolactone	GP/FP with specialist consult	5,737	10	10**	13	13**	17	17**	
	GP/FP without specialist consult	6,858	8	8*	10	10*	14	14*	
	Internist	11,058	9	9	11	11	15	15	
	Cardiologist	4,640	11	11**	13	13**	18	18**	
	Other specialist	2,975	8	8*	10	10*	13	14*	
	Overall	31,268	9	-	11	-	16	-	
Angiotensin II	GP/FP with specialist consult	5,737	3	3	5	5	8	8	
receptor	GP/FP without specialist consult	6,858	3	3*	4	4*	6	7*	
DIOCKERS (ARBS)	Internist	11,058	4	4	6	6**	9	9**	
	Cardiologist	4,640	5	5**	7	7**	11	11**	
	Other specialist	2,975	3	3*	4	4*	7	7*	
	Overall	31,268	4	-	6	-	9	-	
Loop diuretics	GP/FP with specialist consult	5,737	77	77	86	86	90	90	
	GP/FP without specialist consult	6,858	75	75*	85	85*	88	88*	
	Internist	11,058	79	79**	87	87**	90	90**	
	Cardiologist	4,640	78	79**	87	87**	91	91**	
	Other specialist	2,975	75	75*	82	83*	86	86*	
	Overall	31,268	77	-	86	-	89	-	

* Statistically significantly lower than overall

Statistically significantly higher than overall

GP/FP = General practitioner/family physician

©Institute for Clinical Evaluative Sciences

Findings

- Rates of dispensing for all congestive heart failure (CHF)-relevant medications increased with time up to one year from the date of hospital discharge.
- Rates for all of the CHF medications at all time points were slightly, but significantly, lower than average for patients with a general practitioner/family physician (GP/FP), without a specialist consultation, as their most responsible physician.
- Rates for all of the CHF medications, except for angiotensin-converting enzyme (ACE) inhibitors, were higher than average for all of the patients with cardiologists as their most responsible physician at all time points.
- Rates for dispensing for ACE inhibitors, digoxin and spironolactone were higher than average in patients with a GP/FP, plus a specialist consult, as their most responsible physician.

Exhibit 7.6 Age-, sex- and comorbidity-adjusted readmission rates per 100 hospital admissions for patients with congestive heart failure (CHF) aged 20 years and older, by most responsible physician type, in Ontario, 1997/98 to 2001/02

		Readmission rates per 100 hospital admissions (%)										
Type of physician	Number of patients	30-day readmission		90-day readmission		One-year readmission						
		Crude	Adjusted	Crude	Adjusted	Crude	Adjusted					
GP/FP with specialist consult	6,927	7	6*	13	11*	22	20*					
GP/FP without specialist consult	7,948	9	8	14	13	23	21*					
Internist	13,742	8	7*	13	11*	22	20*					
Cardiologist	6,300	9	8	13	12	23	22					
Other specialist	3,680	8	7*	13	11*	21	18*					
Overall	38,597	8	-	13	-	22	-					

* Statistically significantly lower than overall rate ** Statistically significantly higher than overall rate

©Institute for Clinical Evaluative Sciences

GP/FP = General practitioner/family physician

Findings

- Patients who had a general practitioner/family physician (GP/FP) as their most responsible physician had lower readmission rates compared to the overall readmission rate for all patients.
- Patients with a GP/FP as their most responsible physician and who had a specialist consultation had statistically significantly lower readmission rates at 30 days, 90 days and one year post-discharge, compared to the overall readmission rate for all patients.

Exhibit 7.7Age-, sex- and comorbidity-adjusted mortality rates per 100 hospital admissions for patients with
congestive heart failure (CHF) aged 20 years and older, by most responsible physician type, in Ontario,
1997/98 to 2001/02

		Mortality rates per 100 hospital admissions (%)										
Type of physician	Number of patients	In-h	ospital	al One month post-discharge		One post-di	year ischarge					
		Crude	Adjusted	Crude	Adjusted	Crude	Adjusted					
GP/FP with specialist consult	7,740	11	10**	12	12	34	33**					
GP/FP without specialist consult	8,891	11	10**	14	13**	35	33**					
Internist	15,012	8	9	11	11	29	29*					
Cardiologist	6,585	4	5*	6	7*	22	25*					
Other specialist	4,139	11	10**	13	12**	35	32**					
Overall	42,367	9	-	11	-	30	-					

* Statistically significantly lower than overall rate

** Statistically significantly higher than overall rate

GP/FP = General practitioner/family physician

©Institute for Clinical Evaluative Sciences

Findings

- Patients who had a general practitioner/family physician (GP/FP) as their most responsible physician, with or without a specialist consultation, generally had significantly higher mortality rates at all time points compared to the overall rate.
- Patients who had an internist or cardiologist as their most responsible physician had significantly lower rates of oneyear mortality compared to the overall mortality rate.

Discussion

There was considerable geographic variation, by Local Health Integration Network (LHIN), in the most responsible physician type caring for newly hospitalized congestive heart failure (CHF) patients. For patients cared for by general practitioner/ family physicians (GP/FPs), specialist consultation rates also differed quite dramatically by LHIN. In some urban centres (e.g., Central and Toronto Central LHINs), patients hospitalized for CHF were mostly cared for by specialists, whereas in parts of Northern Ontario (e.g., North Simcoe Muskoka, North West and North East LHINs), patients hospitalized for CHF were mostly cared for by GP/FPs. This pattern may reflect the density of specialists available in the respective LHINs.

Rates of specialist consultation did not follow the same pattern for patients who had a GP/FP as the most responsible physician. For instance, patients with a GP/FP as their most responsible physician in the Mississauga Halton LHIN had by far the most specialist consultations but had just below the average rate of patients with a GP/FP as the most responsible physician. Relatively high rates of patients with a GP/FP as the most responsible physician and low rates of specialist consultations were seen in North West, North East and South West LHINs. In these areas patients with CHF were more likely to be solely managed by primary care physicians.

Relative prescribing rates for different CHF medications were similar to those reported in other studies that looked at heart failure pharmacotherapy at 30 days post-discharge.^{7,8} As well, the decreased prescribing of medications relevant to CHF by GP/FPs versus specialists was reported in previous research.^{9,10} The most marked difference in medication prescribing was found in the use of beta-adrenergic blocking agents (beta-blockers) in patients cared for by a GP/FP without a specialist consultation, and in patients cared for by cardiologists. Patients who were cared for by a GP/FP and received a specialist consult had higher rates of beta-blocker use than those that did not receive a specialist consult.

Implications for primary care practice

It was initially hypothesized that patients who had their hospital care provided primarily by their GP/FP would have better continuity of care, and that in turn would lead to increased use of CHF medications. The results did show that the proportion of patients who were prescribed CHFrelevant medications increased over time, for all types of physicians. However, the most responsible physician type for the in-hospital stay did not affect rates of dispensing at any time point, because relative dispensing rates did not change for most prescriptions even after adjusting for patient age, gender and comorbidities. It appears that patients who were cared for by a GP/FP without a specialist consultation had lower CHF-relevant medication dispensing rates compared to patients of specialists and patients that had a GP/FP with a specialist consultation. This suggests that the involvement of specialists in the care of these patients increased the dispensing of heart failure medications. Efforts to enhance the use of effective medications by GP/FPs should be supported through knowledge translation efforts.

The data showed that mortality rates for patients cared for by a GP/FP were higher than for patients who were cared for by specialists. Patients who were cared for by a GP/FP had lower readmission rates if they also had a specialist consultation than if they did not. These findings have been reported elsewhere⁹; however, the reasons behind them are not clear and warrant further study.

Implications for policy

Since the supply of specialists is limited, future efforts should focus on improving education of GP/FPs in the management of CHF, to narrow the gap between specialist and non-specialist care for heart failure patients. The use of innovative strategies to enhance consultations, particularly in under-serviced areas, is needed. R



Appendix 7.A

How the research was done

Data sources and analyses

Patients were identified as having congestive heart failure (CHF) from the Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD) for fiscal years 1997/98, through 2001/02 in Ontario. The CIHI-DAD contains information on the most responsible diagnosis and up to 15 secondary diagnoses for all hospitalizations in Canada. The quality of coding in CIHI-DAD for CHF⁹ has been assessed and validated and found to be reliable^{9,11}, whereas the validity of identification of CHF patients in ambulatory data is unknown.

Groups of patients were identified as having CHF by first identifying those with International Classification of Disease, Ninth Revision (ICD-9) codes 428.x (428.0–428.9) as their most responsible diagnosis for hospitalization. Patients were then excluded if:

- their age was less than 20 years or older than 105 years;
- they had invalid health card numbers or invalid addresses;
- they were transfers from another hospital; or,
- their CHF was an in-hospital complication.

Patients were also excluded if they had a hospital admission in the previous three years with CHF as the most responsible diagnosis, or secondary diagnosis, so as to confine the group studied to new onset CHF. This allowed for a balanced and reasonable comparison of treatment rates and outcomes.

The CIHI-DAD identifies up to eight physicians who provided care for the patient during the hospital stay. One physician is identified as the most responsible physician, defined as "the attending physician most responsible for the care of the patient and/or the longest length of stay." In addition, the physicians who served as consultants are also documented in the CIHI-DAD. The quality of coding for medical specialty of the discharging physician using CIHI data for Ontario has been validated and found to be fairly accurate.⁹ A consultant is defined as "a physician who is requested to provide advice and/or treatment regarding the patient's condition."

For the purpose of the analyses and for each Local Health Integration Network (LHIN), the most responsible physicians for patients newly hospitalized for CHF were divided into the following categories: general practitioners/family physicians (GP/FPs) (code 01/07), general internists (code 10), cardiologists (code 12), and other specialists. Other specialists tended to be subspecialists of internal medicine. For patients whose most responsible physician was a GP/FP, the percentage of patients also receiving a consult by a specialist (general internist and/or cardiologist) was calculated.

Dispensing rates of CHF medications for patients were obtained from the Ministry of Health and Long-Term Care Ontario Drug Benefit (ODB) Program database. The ODB contains almost all information about drug prescriptions for patients aged 65 years and older in Ontario. Rates of dispensing of angiotensin-converting enzyme (ACE) inhibitors, beta-adrenergic blocking agents (beta-blockers), digoxin, spironolactone, angiotensin II receptor blockers (ARBs) and loop diuretics dispensed at 30 days, 90 days and one year post-discharge date were calculated for each type of most responsible physician.

Readmission and mortality rates were calculated separately for all adult patients and for all types of most responsible physician. Patients that died in-hospital, or were discharged to chronic care facilities were not included in this analysis.

Rates for readmission, mortality and dispensing were all adjusted for age, sex and Deyo-Charlson comorbidity indices.¹² In addition, chi-squared testing was performed to assess for statistically significant differences in dispensing rates and outcomes between the different types of most responsible physician.

Limitations

Although adjustments were made for age, gender and Deyo-Charlson comorbidity indices, there may have been other differences in the patients cared for by specialists compared to GP/FPs that could not be accounted for. Results of echocardiograms and assessment of left ventricular function were not available. Different patterns of follow-up, whereby patients may have had follow-up by specialists or follow-up by GP/FPs only after discharge, were not assessed. Differences in the type and number of follow-up visits, and who was responsible for monitoring the post-hospital care and medication management may have had an impact on the results. As well, it was not possible to assess for differences in resource utilization between specialist and non-specialist care. Nevertheless, this study is a first look at the impact of a "shared care" model whereby the GP/FP and specialist are both involved in the care of newly hospitalized CHF patients.

References

- Lee DS, Johansen H, Gong Y, Hall RE, Tu JV, Cox JL, et al. Regional outcomes of heart failure in Canada. *Canadian Journal of Cardiology* 2004; 20(6):599–607.
- Croft JB, Giles WH, Pollard RA, Keenan NL, Casper ML, Anda RF. Heart failure survival among older adults in the United States: a poor prognosis for an emerging epidemic in the Medicare population. *Archives of Internal Medicine* 1999; 159(5):505–10.
- Johansen H, Strauss B, Arnold JM, Moe G, Liu P. On the rise: The current and projected future burden of congestive heart failure hospitalization in Canada. *Canadian Journal of Cardiology* 2003; 19(4):430–5.
- Tu JV, Zhang H. Congestive Heart Failure Outcomes in Ontario. In: Naylor CD, Slaughter P, editors. Cardiovascular health and services in Ontario: ICES Atlas. Toronto: Institute for Clinical Evaluative Sciences; 1999. p.111–22.
- Tu K, Gong Y, Austin PC, Jaakkimainen L, Tu JV, Canadian Cardiovascular Outcomes Research Team. An overview of the types of physicians treating acute cardiac conditions in Canada. *Canadian Journal of Cardiology* 2004; 20(3):282–91.
- Liu P, Arnold JM, Belenkie I, Demers C, Dorian P, Gianetti N, et al. The 2002/03 Canadian Cardiovascular Society consensus guideline update for the diagnosis and management of heart failure. *Canadian Journal of Cardiology* 2003; 19(4):347–56.
- Cox JL, Ramer SA, Lee DS, Humphries K, Pilote L, Svenson L, et al. Pharmacological treatment of congestive heart failure in Canada: a description of care in five provinces. *Canadian Journal of Cardiology* 2005; 21(4):337–43.
- Lee DS, Mamdani MM, Austin PC, Gong Y, Liu PP, Rouleau JL, et al. Trends in heart failure outcomes and pharmacotherapy: 1992 to 2000. American Journal of Medicine 2004; 116(9):581–9.
- Jong P, Gong Y, Liu PP, Austin PC, Lee DS, Tu JV. Care and outcomes of patients newly hospitalized for heart failure in the community treated by cardiologists compared with other specialists. *Circulation* 2003; 108(2):184–91.
- Edep ME, Shah NB, Tateo IM, Massie BM. Differences between primary care physicians and cardiologists in management of congestive heart failure: relation to practice guidelines. *Journal of the American College* of Cardiology 1997; 30(2):518–26.
- Lee DS, Donovan L, Austin PC, Gong Y, Liu PP, Rouleau JL, et al. Comparison of coding of heart failure and comorbidities in administrative and clinical data for use in outcomes research. *Medical Care* 2005; 43(2):182–8.
- Deyo RA, Cherkin DC, Ciol MA. Adapting a clinical comorbidity index for use with ICD-9-CM administrative databases. *Journal of Clinical Epidemiology* 1992; 45(6):613–19.

INSIDE

Executive Summary Introduction List of Exhibits Exhibits and Findings Discussion Appendix 8.A How the research was done

References



Primary Care in Disadvantaged Populations

Richard H. Glazier, MD, MPH, CCFP, FCFP, Joshua Tepper, MD, MPH, CCFP, Mohammad M. Agha, PhD, and Rahim Moineddin, PhD



Executive Summary

Issue

Despite the current policy focus on expanding access to primary care, there has been little analysis or discussion about populations that have difficulty accessing care. Without this information, efforts to establish new programs, payment mechanisms, and interdisciplinary teams may not effectively target these populations. People who are most likely to experience these barriers to accessing health care or who may have worse health status include those who have low socioeconomic status (SES), report unmet health needs, live in rural areas, or are recent immigrants or members of visible minorities. These disadvantaged groups form the specific focus of this chapter.

Study

For the Ontario population aged 20 years and older, data from Statistics Canada's 2000/01 Canadian Community Health Survey—Cycle 1.1 was linked with Ontario Health Insurance Plan physician claims to identify disadvantaged populations in Ontario. For each disadvantaged population, the following are described: self-reported health status, disability, depression and chronic conditions; use of age- and sex-specific preventive health care services; patterns of primary, specialist and emergency department care; and, the relationship between health needs and use of health services.

Key Findings

- People with low SES and those with unmet health needs had the worst health status. There were large disparities in preventive care, with low SES groups, immigrants and members of visible minorities having the fewest services.
- Despite wide variations in health needs and preventive health care, the number of primary care and specialist visits were similar across all groups, as was continuity of primary care.
- A higher proportion of people with low SES and those with unmet health needs made emergency department (ED) visits that were of slightly higher acuity than among more advantaged groups.
- People living in rural areas had similar health status, preventive care and use of health services except for more ED visits—than in urban areas. ED visits by rural residents were of lower acuity than among urban dwellers.

Implications

- There are large gaps between health needs and use of services by disadvantaged groups in Ontario.
- Disadvantaged populations need to be identified at local and system levels through mechanisms that include electronic medical records, geographic information systems and a substantial enhancement in the quality of routinely collected ambulatory data used for decision-making.
- The determination of access must also consider appropriateness of care for a given population.
- Further research is needed to identify the health needs and reasons for use and under-use of services by disadvantaged groups, and to evaluate clinical and policy interventions designed to improve their access to, and use of, needed health services.

Introduction

The focus of this chapter is on the relationship between disadvantage, health status and use of primary health care and related services in Ontario. Disadvantage can be conceptualized in many ways but for the purposes of this chapter it includes socioeconomic status (SES), unmet health needs, rural residence, immigration and ethnicity. The Ontario portion of a nationally-representative survey is used to identify these aspects of disadvantage. Patterns of health care use are examined for each group.

Each aspect of disadvantage carries with it a potential for adverse health outcomes and each may be associated with barriers to accessing appropriate and timely health care. Low SES has long been associated with adverse health including mortality. In 1996, Canada's lowest income urban populations had mortality rates which were 60% higher than the highest income groups, corresponding with six lost years of life for men and less than two lost years for women.¹ Income-related excess mortality, when considered a cause of potential years of life lost, was second only to neoplasms in urban Canada.¹ Low SES is also associated with barriers to health care, despite a universal health care system designed to address health needs.^{2–4} There is evidence that individuals with a regular source of health care have greater access to primary care and better continuity of care, which results in better access to specialist care services.^{3,5}

Lower SES groups tend to have increased time to diagnosis, in particular for occupational asthma, and higher rates of hospitalization.^{4,6,7} Although lower SES groups are more likely to be hospitalized, they also tend to undergo fewer surgeries (e.g., coronary artery bypass) as a result of less access to specialty care.^{4,8} An exception is pediatric surgery for otitis media, where higher rates of myringotomies and tonsillectomies were found in children of lower socioeconomic background.⁹ These findings are not attributed to a lack of resources available to people of lower SES, but rather to preferential access of resources, particularly to specialist care, by people of higher SES.^{2,3} Consequently, the current patterns in Canadian health care system utilization show additional benefits for those of higher SES, despite universal coverage.

Relatively little is known about health status and access to care among people who report needing health care but do not receive it. This group, with perceived unmet health needs, is likely to have greater morbidity than the general population and is likely to have experienced a variety of problems accessing timely and appropriate care.

Compared with urban dwellers, residents of rural areas face longer travel times to health services and are likely to have less choice of primary care provider within a reasonable travel time.¹⁰ It is also the case that many small or remote



communities face a shortage of primary care physicians, there is high provider turnover in many of these settings, and very few specialists are located in rural areas. Nearby health services are not always the dominant factor, however, in access to care for rural residents. For example, closure of small hospitals in Saskatchewan did not result in an adverse health impact.¹¹ An Alberta study found that rural family practice patients were much more likely than those in urban areas to feel that they could contact their family doctors during evenings and weekends.¹² Lack of resources in rural areas, however, are likely reflected in the findings that rural residents are less likely to die out of hospital,¹³ receive an angiogram after acute myocardial infarction,¹⁴ or have a Papanicolaou (Pap) test.¹⁵ In addition, rural populations are more likely to have higher rates of smoking and trauma.^{16,17} Rural areas in Ontario are also home to a large proportion of the province's Aboriginal populations, which are known to have significantly higher levels of physical and mental illness.^{18,19}

Recent immigrants to Canada are extremely heterogeneous in their countries of origin, SES, employment prospects in Canada, and circumstances of migration such as moving to seek better economic opportunities, reunite with family members or flee war or persecution. Taken as a whole, new immigrants enjoy better health than other Canadians, a situation known as the 'healthy immigrant effect'.²⁰ This effect has been explained by factors related to self-selection by healthy individuals seeking to migrate or by Canada's immigration policies that preferentially choose immigrants with higher educational attainment and screen out those with severe health conditions. Recent immigrants face challenges in accessing care, however, reflected in a pattern of gradual adoption of regular sources of care over time²¹ and in lower rates of preventive health care.^{22,23}

Chapter 8—List of Exhibits

Exhibit 8.1 Age- and sex-adjusted proportion of the population with self-reported poor or fair general health, disability, depression, and two or more chronic conditions, by aspect of disadvantage, in Ontario, 2000/01

Exhibit 8.2 Ratio of low to high income for self-reported poor or fair general health, disability, depression, and two or more chronic conditions, by age and sex, in Ontario, 2000/01

Exhibit 8.3 Age- and sex-adjusted distribution of preventive health care services scores, by aspect of disadvantage, in Ontario, 2000/01

Exhibit 8.4 Ratio of the percent of the population reporting poor or fair health, by lower to higher income and Local Health Integration Network, in Ontario, 2000/01

Exhibit 8.5 Age- and sex-adjusted percent of the population with primary care visits, primary care continuity of care and specialist visits, by aspect of disadvantage, in Ontario, 2000/01

Exhibit 8.6 Age- and sex-adjusted percent of the population with emergency department visits, and percent with more urgent emergency department triage level, by aspect of disadvantage, in Ontario, 2000/01

Exhibit 8.7 Ratio of the percent of the population with emergency department visits, by lower to higher income and Local Health Integration Network, in Ontario, 2000/01

Exhibit 8.8 Self-reported poor or fair general health and use of health services, by aspect of disadvantage, in Ontario, 2000/01
8

Exhibits and Findings

Exhibit 8.1

Age- and sex-adjusted proportion of the population with self-reported poor or fair general health, disability, depression, and two or more chronic conditions, by aspect of disadvantage, in Ontario, 2000/01

Aspect of disadvantage		Poor fair hea	or alth	Disabi	lity	Depres	sion	Two or chronic co	more nditions
		% of the population	Ratio*	% of the population	Ratio*	% of the population	Ratio*	% of the population	Ratio*
Low education	Yes	16	1.78	16	1.32	11	0.88	41	1.05
	No	9		12		13		39	
Low income	Yes	26	2.36	24	1.88	17	1.48	47	1.20
	No	11		13		11		39	
Unemployed	Yes	27	3.86	27	3.55	18	1.61	50	1.37
	No	7		8		11		37	
Food insecurity	Yes	26	2.60	27	2.28	22	2.14	53	1.39
	No	10		12		10		38	
Not own house	Yes	18	1.64	17	1.33	13	1.21	39	0.94
	No	11		13		11		41	
Unmet health care needs	Yes	25	2.27	26	2.19	23	2.33	56	1.08
	No	11		12		10		51	
Rural residence	Yes	11	0.92	14	1.16	10	0.84	51	0.93
	No	12		12		12		55	
Immigrated after 1991	Yes	14	0.93	13	0.80	11	1.06	30	0.78
	No	15		16		10		38	
Visible minority	Yes	12	1.00	13	0.96	8	0.68	33	0.81
	No	12		14		12		41	

* Ratios compare the proportion in the disadvantaged group to the proportion in the more advantaged group ('yes' to 'no' for each aspect of disadvantage).

©Institute for Clinical Evaluative Sciences

- Low socioeconomic status (low income, low education, unemployment, food insecurity and not owning a house) was associated with considerably worse health than among more advantaged groups.
- People who reported that they needed health care but did not receive it (i.e., report unmet health care needs) also had considerably worse health, with more than double the rate of poor or fair health, disability and depression.
- While there was a slight excess of disability among rural residents, they reported lower levels of poor or fair health, depression and chronic conditions.
- The overall health of immigrants and members of visible minorities appears to have been better than in the general population, a finding consistent with the "healthy immigrant effect".²⁰





* Ratios compare the prevalence in the less advantaged group to the prevalence in the more advantaged group.

©Institute for Clinical Evaluative Sciences

🔻 Findings

- Income disparities in self-reported poor or fair health, disability, depression and chronic conditions were consistently found in all age and sex groups. The largest disparities were found for poor or fair health and disability.
- Disparities for males were slightly greater than for females, especially among young adults aged 20 to 44 years.
- Both male and female adults aged 65 years and older reported relatively smaller disparities than their younger counterparts.

8



Age- and sex-adjusted distribution of preventive health care services scores*, by aspect of disadvantage, in Ontario, 2000/01

			Age group (years) and sex										
				Mal	е					Fema	le		
Aspect of disadvantage		20–4	19	50–6	69	70 and	over	20-4	49	50–69 an	d over	70 and (over
		Score (%)	Ratio**	Score (%)	Ratio**	Score (%)	Ratio**	Score (%)	Ratio**	Score (%)	Ratio**	Score (%)	Ratio**
Low education	Yes	66	0.88	69	0.83	35	0.62	65	0.88	41	0.77	42	0.71
	No	75		83		57		74		54		59	
Low income	Yes	61	0.83	66	0.84	26 ‡	0.57‡	61	0.83	33	0.67	35	0.69
	No	74		78		46		73		48		51	
Unemployed	Yes	66	0.91	71	0.88	54	1.02	65	0.86	43	0.80	55	0.95
	No	73		80		53		75		53		58	
Food insecurity	Yes	66	0.90	63	0.81	28 [‡]	0.61 [‡]	64	0.89	27	0.56	29 [‡]	0.60 [‡]
	No	73		78		45		73		49		49	
Not own house	Yes	65	0.87	64	0.80	34	0.73	64	0.87	35	0.71	41	0.81
	No	75		79		46		74		49		50	
Unmet health	Yes	69	0.96	74	0.96	37	0.83	73	1.03	42	0.88	47	0.98
care needs	No	73		77		44		71		47		48	
Rural location	Yes	68	0.93	73	0.95	40	0.88	71	0.99	43	0.91	47	0.98
	No	73		77		45		71		48		48	
Immigrated	Yes	69	0.96	78	0.93	¥	¥	53	0.79	21 ‡	0.42 [‡]	¥	¥
atter 1991	No	72		84		¥		67		50		¥	
Visible minority	Yes	71	0.97	85	1.13	27 ‡	0.59 [‡]	59	0.79	44	0.92	26 [‡]	0.52 [‡]
	No	73		76		45		75		47		49	

* Scores indicate the percent of the population accessing all indicated preventive services for the relevant age-sex group as follows:

20–49 years	BP check and dental visit
50–69 years	BP check and dental visit
70 years and over	BP check, dental visit and influenza immunization
20–49 years	BP check, dental visit and Pap test
ED ED VOOR	RP check dental visit breast examination mammagram and Pan test
50-69 years	BF check, dental visit, breast examination, maininogram and Fap test

** Ratio compares the proportion in the disadvantaged group to the proportion in the more advantaged group ('yes' to 'no' for each aspect of disavantage).

- [‡] Coefficient of variation is between 16.5% and 33.3%. This is an estimate with a marginal sample size that should be interpreted with caution.
- [¥] Coefficient of variation exceeds 33.3% so results cannot be reported due to small sample size and instability of the estimate.

BP = Blood pressure; **Pap** = Papanicolaou

©Institute for Clinical Evaluative Sciences

V Findings

Male

Female

- Patterns of preventive care and socioeconomic disadvantage (low income, low education, unemployment, food insecurity, and not owning a house) were similar for males and females. People with lower socioeconomic status, both males and females and all age groups, reported less preventive health care than those in higher socioeconomic groups.
- Those who reported unmet health needs and those who did not had approximately the same level of preventive care.
- Rural residents had slightly lower levels of preventive care compared with their urban counterparts.
- Immigrants to Canada after 1991 and visible minorities, especially males aged 70 years and older and females aged 50 years and older, had low rates of preventive health care.

Exhibit 8.4 Ratio* of the percent of the population reporting poor or fair health, by lower to higher income and Local Health Integration Network, in Ontario, 2000/01



* Ratios compare the proportion of the disadvantaged group (low income) who report poor or fair health to the proportion of the more advantaged group (high income) who report poor or fair health.

©Institute for Clinical Evaluative Sciences

- While approximately 12% of respondents rated their health as poor or fair, this varied across Local Health Integration Networks (LHINs).
- Across Ontario, low income respondents were 2.4 times more likely to have rated their health as fair or poor than those with high incomes. This rate varied from 1.6 to 3.2 across LHINs.
- The greatest disparities were found in the Toronto Central, North Simcoe Muskoka and South West LHINs—all with a greater than three-fold difference in poor or fair health by income.



Ratio* of the percent of the population reporting poor or fair health, by lower to higher income and Local Health Integration Network, in Ontario, 2000/01



©Institute for Clinical Evaluative Sciences

Exhibit 8.5

Age- and sex-adjusted percent of the population with primary care visits, primary care continuity of care and specialist visits, by aspect of disadvantage, in Ontario, 2000/01

			Visits t	o GP/FP		Primary continuity	care of care	v	isits to	specialists	
Aspect of disadvantage		≥ One v	isit	≥ Five v	isits			≥ One v	isit	≥ Five	visits
		% of the population	Ratio*	% of the population	Ratio*	UPC Index**	Ratio*	% of the population	Ratio*	% of the population	Ratio*
Low education	Yes	96	1.00	67	1.05	0.73	1.03	88	0.99	51	1.02
	No	96		64		0.71		89		51	
Low income	Yes	97	1.01	71	1.09	0.71	0.99	88	0.99	53	1.05
	No	96		65		0.72		89		51	
Unemployed	Yes	97	1.02	78	1.26	0.74	1.04	93	1.06	65	1.40
	No	96		62		0.71		88		46	
Food insecurity	Yes	97	1.02	70	1.07	0.71	0.99	87	0.98	50	0.98
	No	96		65		0.72		89		51	
Not own house	Yes	97	1.01	68	1.05	0.73	1.04	86	0.96	49	0.93
	No	96		65		0.70		90		52	
Unmet health care needs	Yes	98	1.02	74	1.14	0.67	0.92	92	1.04	58	1.15
	No	96		65		0.73		88		50	
Rural residence	Yes	95	0.99	64	0.96	0.72	1.00	89	1.00	50	0.98
	No	96		66		0.72		89		51	
Immigrated after 1991	Yes	97	1.01	65	0.92	0.74	1.00	81	0.88	39	0.68
	No	97		71		0.74		92		58	
Visible minority	Yes	97	1.01	67	1.03	0.74	1.04	87	0.97	43	0.81
	No	96		66		0.71		89		53	

* Ratios compare the proportion in the disadvantaged group to the proportion in the more advantaged group ('yes' to 'no' for each aspect of disavantage).

** Usual Provider Continuity (UPC) Index is defined as the proportion of GP/FP visits to the GP/FP who was seen most often in the previous two years, where perfect continuity is 1.0.

GP/FP = General practitioner/family physician

©Institute for Clinical Evaluative Sciences

- There was very little variation by disadvantage in visits to general practitioner/family physicians (GP/FPs) and specialists.
- At higher levels of utilization, with five or more visits, those who were unemployed made somewhat more GP/FP and specialist visits, while immigrants and visible minorities made slightly fewer specialist visits.
- Continuity of care (Usual Provider Continuity Index) was slightly lower among those reporting unmet health needs, but otherwise varied little by aspect of disadvantage.

Exhibit 8.6

Age- and sex-adjusted percent of the population with emergency department visits, and percent with more urgent emergency department triage level*, by aspect of disadvantage, in Ontario, 2000/01

			Emergeno	cy department	
Aspect of disadvantage		≥ One vi	sit	More urgen	t triage
		% of the population	Ratio**	% of the population	Ratio**
Low education	Yes	32	1.23	38	1.08
	No	26		35	
Low income	Yes	37	1.32	37	1.00
	No	28		37	
Unemployed	Yes	31	1.14	37	1.13
	No	27		33	
Food insecurity	Yes	38	1.34	40	1.10
	No	28		36	
Not own house	Yes	32	1.14	39	1.08
	No	28		36	
Unmet health care needs	Yes	38	1.36	39	1.07
	No	28		36	
Rural residence	Yes	34	1.22	27	0.70
	No	28		39	
Immigrated after 1991	Yes	18	0.70	42	0.95
	No	26		45	
Visible minority	Yes	22	0.70	43	1.20
	No	31		36	

* Includes resuscitation, emergent and urgent levels of triage.

** Ratios compare the proportion in the disadvantaged group to the proportion in the more advantaged group ('yes' to 'no' for each aspect of disavantage).

©Institute for Clinical Evaluative Sciences

🔻 Findings

- Use of emergency departments (EDs) was higher among those with low socioeconomic status (low income, low education, unemployment, food insecurity and not owning a house) and those with unmet health needs, but even lower among immigrants and visible minorities.
- People living in rural areas made more use of EDs but had lower triage scores, reflecting a lower acuity of illness.

Exhibit 8.7 R

Ratio* of the percent of the population with emergency department visits, by lower to higher income and Local Health Integration Network, in Ontario, 2000/01



* Ratios compare the proportion of the disadvantaged group (low income) with emergency department visits to the proportion of the more advantaged group (high income) with emergency department visits.

©Institute for Clinical Evaluative Sciences

- Across Ontario, 29% of respondents made at least one emergency department (ED) visit, varying across Local Health Integration Networks (LHINs) from 20% (Champlain LHIN) to 44% (North West LHIN). The North Simcoe Muskoka, North East and North West LHINs all had rates over 40%.
- A higher proportion of people with low incomes made ED visits than those with higher incomes in all LHINs except for Mississauga Oakville.
- The largest income disparities were found in the Champlain, Toronto Central, North Simcoe Muskoka and Waterloo Wellington LHINs.



Ratio* of the percent of the population with emergency department visits, by lower to higher income and Local Health Integration Network, in Ontario, 2000/01





- There was a stark contrast between high levels of poor or fair health by many disadvantaged groups and a fairly uniform use of services across all groups. While variation in health services was quite small, it tended to vary in the direction of worse health, especially for emergency department (ED) visits.
- The average or elevated triage scores seen among disadvantaged groups indicates that increased ED use was attributable to visits with at least the same acuity as among more advantaged groups.

Discussion

These findings relate to large numbers of Ontarians and not just to small, unusual groups. Each disadvantaged group addressed in this chapter represents more than one million residents in the Province. The findings of these analyses are relevant to both primary care practice and primary care policy in Ontario.

Implications for primary care practice

The much worse health of lower socioeconomic groups is well known to the primary care providers who look after them, but may not be well recognized by society at large. Providers are also aware of the difficulties they encounter in providing preventive care and chronic disease management to lower socioeconomic groups. Some of these challenges include low health literacy, transportation difficulties, problems getting time off work for child care responsibilities or appointments, and the high costs of drugs, devices and medical supplies for these who lack coverage for these services. While immigrants and visible minorities appear to enjoy good health, these groups are extremely heterogeneous. Subgroups such as refugees, single parent families, those who do not speak English and those with low educational attainment may experience worse health and have additional barriers to care. Language and cultural barriers and lack of information about available services are the most probable explanations for low levels of preventive care in these groups. Although socioeconomic and immigrant factors originate "upstream" from delivery of health care, there are several measures that providers can take to improve the situation. These measures include flexibility in appointment scheduling for disadvantaged people, providing extended hours, making written health information available in languages relevant to their practices, accessing translation services when possible, and advocating for individual patients and specific groups. The challenges and increased time requirements of working with disadvantaged groups should be recognized in financial compensation for health providers. Health professional education should also play a role in encouraging and equipping trainees to work with these groups.

Implications for primary care policy

The effectiveness of interventions that can be delivered by individual or group providers to disadvantaged populations is very limited. As many underlying issues are societal and structural in nature, they need to be addressed at the policy level. Financial barriers to needed health services may be contributing to the large disparities in the health of disadvantaged groups seen in this chapter. On the positive side, it may be enhanced access to these services for seniors, along with income supports, that have limited the health disparities seen among those aged 65 years and older. Immigrants are denied health coverage in Ontario during their first three months of residence. This policy is likely responsible for delays in seeking health care with potential consequences including more advanced disease at presentation, forgone preventive care and delayed acquisition of knowledge and skills for navigating the health care system to access needed care. A substantial cut in welfare rates in 1995 followed by only a very small recent increase has left Ontario Works* recipients so financially constrained that they often cannot meet basic needs such as food.²⁴ This lack of income support is likely to impact fundamental determinants of health and is relevant to the health of a large number of children growing up in welfare-dependent families. Severely constrained household income may also serve as a barrier to accessing transportation, child care, and adequate time, all of which are needed to attend appointments with health professionals.

Another fundamental policy issue raised by these findings is that of enabling providers and decision-makers at the system level to identify disadvantaged populations. Interventions to reduce health inequalities most often require multi-faceted and multidisciplinary approaches that include community involvement, face-to-face interaction, behaviour change strategies, and prompts and reminders.²⁵ Such interventions, whether for chronic disease management or preventive health care, are intensive and expensive and for that reason need to be targeted to disadvantaged groups. Identifying these groups is the first step towards understanding and addressing their needs. As electronic medical records become more common, standardized measures of disadvantage across the Province (such as years of education, occupation, income support, English language skills and year of arrival in Canada) are required if these groups are to be recognized and their needs addressed. This information is likely to be valuable for providers to assist them in individualizing care. It is also needed by decision-makers so that system integration, waiting list initiatives, emerging reimbursement models, education models and new and existing programs can identify and address the aspects of disadvantage that result in worse health and barriers to accessing appropriate primary and secondary care.

^{*} The Ontario Works Program provides income and employment assistance to those in temporary financial need.

Further research and evaluation questions

This chapter has laid the foundation for an understanding of the health needs and health care utilization of disadvantaged groups in Ontario. The breadth of the topic and the descriptive nature of this chapter mean that further work is needed to gain a more in-depth understanding of these issues, and of the clinical and policy interventions that have the potential to address them. Future directions for research include:

- Analyzing the independent contributions of different aspects of social disadvantage to health and health care utilization;
- Understanding barriers to preventive care among disadvantaged groups, and designing and evaluating effective interventions and programs;
- Examining use of health services by disadvantaged groups in relation to their health needs and the reasons for use and non-use of health services;
- Understanding the reasons for geographic variation in disparities across the Province of Ontario with a particular focus on the northern part of the Province and rural areas;
- In-depth examination of the health and health needs of heterogeneous groups of immigrants to Ontario; and,
- Further analyzing policy options "upstream" that affect the social determinants of health, and "downstream" at the heath care delivery interface that affect access to appropriate health care by disadvantaged groups.

Data needs

There is a growing realization in Ontario that improving the effectiveness and efficiency of health care requires a substantial investment in high quality and timely data for decision-making. In primary care, data needs include improved quality of encounter data as well as the collection of information about social advantage. Primary care encounter data for physicians are currently fragmented by program (e.g., Ontario Health Insurance Plan [OHIP] claims, Community Health Centres [CHCs], Health Service Organizations). Preventive care is not fully represented in OHIP due to lack of data integration with special programs such as the Ontario Breast Screening Program, lack of codes for Papanicolaou (Pap) testing done during complete physical examinations, influenza vaccinations given by public health, employers and other groups, and lack of vaccine-specific codes other than influenza. For these reasons, the rates of preventive health care presented in this chapter were based on self-report rather than fee-for-service physician claims. In the case of OHIP, which covers more than 90% of physician primary care, claims are linked to denominators in Ontario's Registered Persons Database which has no mechanism for systematic updating of addresses for many health cards. Disadvantaged groups such as recent immigrants and those with low income have high mobility rates and are therefore most subject to being misclassified by area of residence. Addresses are important for calculating rates, understanding who is and is not using services, and assessing the effectiveness of interventions to improve access to care. With addresses, geographic information systems can be used to locate clusters of disadvantaged populations, some of whom can be reached through their providers and some of whom require community outreach activities.²² Data initiatives to improve primary care for disadvantaged groups therefore include:

- Collection of indicators of disadvantage;
- Harmonization of encounter, diagnostic and procedure data across payment plans; and,
- Routine updating of addresses.

Also needed is information about the role and impact of other providers in delivering primary health care. In Ontario, CHCs are multi-disciplinary models of primary care that have been traditionally placed to help disadvantaged populations. New primary care reform initiatives, such as Family Health Teams, increasingly focus on the role of multiple providers (such as nurse practitioners) in primary care. Data on physicians are abundant in comparison to what is known about other providers.



Appendix 8.A

How the research was done

Data sources and analyses

Statistics Canada's Canadian Community Health Survey (CCHS)—Cycle 1.1, conducted in 2000/01, was designed to provide timely cross-sectional estimates of health determinants, health status and health system utilization at a sub-provincial level (health region or combination of health regions). The target population of the CCHS included household residents in all provinces and territories, with the principal exclusion of populations in First Nations reserves, Canadian Forces Bases, and some remote areas. The CCHS employed a multistage stratified cluster design. The Ontario portion of the CCHS consisted of 37,681 respondents in 37 health regions.

More detailed information about the CCHS can be found at: http://www.statcan.ca/english/concepts/health/cchsinfo.htm. http://www.chass.utoronto.ca/datalib/codebooks/cstdli/cchs.htm

CCHS respondents were asked to provide their Ontario health card numbers and to consent to linkage with their health care utilization data. In Ontario, 87.2% of respondents provided their health card numbers and consented to the linkage and were successfully linked to Ontario's Registered Persons Database (RPDB). Once linked with the RPDB, health card numbers were used to link respondents with claims to the Ontario Health Insurance Plan (OHIP) for 1999–2001 and to records of emergency department visits submitted to the Canadian Institute for Health Information (CIHI) for 2000–2001 as part of the National Ambulatory Care Reporting System (NACRS). All health card numbers were scrambled and all names and other identifying information were removed prior to data analysis.

All crude percents and all ratios were age- and sex-adjusted with the direct method using ten-year age intervals and the 2001 Ontario population.

All analyses were performed with the weight WTSAM provided by Statistics Canada to reflect sampling variation from region to region. Unweighted counts of less than 30 were not reported. Statistics Canada recommends that estimates with a coefficient of variation of >33.3% should not be reported and those with a coefficient of variation of 16.5%–33.3% should be reported as a marginal estimate to be interpreted accordingly. These guidelines were followed in the preparation of this chapter. All coefficients of variations were calculated by means of bootstrap methods with 200 replications using bootstrap weights provided by Statistics Canada.

Table 8.1Definition of aspects of disadvantage from the Canadian Community Health Survey (CCHS)							
Aspect of disadvantage	% of Ontario respondents	Definition	CCHS variable				
Low education	47.4	Highest education of respondent is secondary school graduation	EDUADR04				
Low income	8.3	Lowest and lower middle income quintiles based on total household income and the number of people living in the household	INCADIA5				
Unemployed	19.3	Not worked at a job or business any time in the past 12 months	GENA_08				
Food insecurity	13.2	Some food insecurity in the past 12 months	FINAF1				
Not own house	27.4	Dwelling not owned by a member of the household	DHHA_OWN				
Reported barriers to care	12.2	Self-perceived unmet health care needs in the past 12 months	HCUA_06				
Rural residence	14.7	Not living in a continuously built-up area having a population concentration of 1,000 or more and a population density of 400/km ² or more based on the previous census	GEOADUR2				
Immigrated after 199	1 7.8	Length of time since you first came to Canada (0-9 years)	SDCADRES				
Visible minority	17.5	Racial origin visible minority (other response = white)	SDCADRAC				

Limitations

Although based on a representative national sample, the analyses presented in this chapter are subject to response bias as response to the Ontario portion of the CCHS was 82% and the proportion of respondents who were finally linked to health care utilization data was 87%. While the factors related to non-response cannot be readily described as they are not released by Statistics Canada, these effects are likely to be non-random. For example, although efforts at translation into multiple languages were made, it is likely that those not speaking an official language would have been underrepresented.

Measures of health and use of preventive services were based on the self-report of respondents to the CCHS. The validity of these measures across socioeconomic groups and those who do not speak English has not been completely established. A small proportion of surveys were completed by one household member as a proxy response on behalf of another member. Such proxy reporting is known to under-estimate the presence of chronic conditions and may have caused some alteration in measures of health and preventive health care used in this chapter. A number of the variables used in this chapter, especially those measuring socioeconomic status, are interrelated and to some extent colinear. It is beyond the scope of this chapter to try to isolate the independent effect of each factor or to construct a socioeconomic index and for that reason the reader should interpret associations with individual socioeconomic factors with caution. The reader should also be aware that it is not possible to ascribe causation to an association in crosssectional analyses such as these. For example, unemployment is strongly associated with disability but is it not possible to tell whether unemployment caused disability, disability caused unemployment or a third factor such as low income caused both.

The definition of rural in both research and policy work varies widely. The definition here largely relates to population base. Other definitions have included presence of different health, social and education services or distance from large urban centres. A different definition may have identified a different set of communities with different findings. The definition of rural was applied Province-wide. Previous literature would suggest that Northern Ontario (small and rural communities as well as larger communities) may be a uniquely disadvantaged group. This is supported by some of the analyses in this report based on Local Health Integration Networks, that showed higher levels of need in Northern Ontario than other parts of the Province.

Table 8.2 Definition of measures of health from the Canadian Community Health Survey (CCHS)							
Measure of hea	alth	% of Ontario respondents	Definition	CCHS variable			
Poor or fair hea	lth	12.1	General health rated as poor or fair (other responses – good, very good, excellent)	GENA_01			
Disability		13.4	Need for help with at least one task of instrumental activities of daily living such as preparing meals, shopping for groceries or other necessities, doing everyday housework, doing heavy household chores, and personal care	RACAF6			
Depression		9.3	Probability of depression in the past 12 months on CIDI-SF = 90%	DPSADPP = 1			
≥ 2 chronic con	ditions	38.8	Respondent has at least two chronic conditions	CCCAGTOT			

Table 8.3 Definition of preventive health care measures from the Canadian Community Health Survey (CCHS)

Preventive health care measure	% of Ontario respondents	Definition	CCHS variable
Blood pressure	91.1	Blood pressure was taken in the past two years	BPCA_012
Flu shot	70.2	Had a flu shot less than one year ago	FLUA_162
Breast examination	82.5	Breasts examined for lumps by a doctor or other health professional in the past two years	BRXA_112
Mammogram	72.2	Had a mammogram within the past two years	MAMA_32
Papanicolaou (Pap) test	79.7	Had a Pap test in the past three years	PAPA_022
Dental visit	85.8	Went to a dentist in the past three years	DENA_132

Table 8.4 Definition of use of health care services

Measure	Definition
Visits to general practitioners/family physicians (GP/FPs)	"A" or "K" prefix codes with specialty code = 00 (non-specialist)
Continuity of care (Usual Provider Continuity Index)	Number of visits within the previous two years to the usual GP/FP provider of care as a proportion of all GP/FPs provider visits
Visits to specialists	"A" or "K" prefix coded with specialty code ≠ 00 (specialist)
Visits to emergency departments	Number of visits in NACRS
Triage level 1–5	Canadian Triage and Acuity Scale (CTAS) Level 1 = Resuscitation Level 2 = Emergent Level 3 = Urgent Level 4 = Less urgent Level 5 = Non-urgent

References

- Wilkins R, Berthelot JM, Ng E. Trends in mortality by neighbourhood income in urban Canada from 1971 to 1996. *Health Reports* 2002; 13(suppl):1–27.
- 2. Chan BT, Austin PC. Patient, physician, and community factors affecting referrals to specialists in Ontario, Canada: a population-based, multi-level modelling approach. *Medical Care* 2003; 41(4):500–11.
- Dunlop S, Coyte PC, McIsaac W. Socioeconomic status and the utilization of physicians' services: results from the Canadian National Population Health Survey. Social Science and Medicine 2000; 51(1): 123–33.
- Roos NP, Mustard CA. Variation in health and health care use by socioeconomic status in Winnipeg, Canada: does the system work well? Yes and no. *Milbank Quarterly* 1997; 75(1):89–111.
- Menec VH, Roos NP, Black C, Bogdanovic B. Characteristics of patients with a regular source of care. *Canadian Journal of Public Health* 2001; 92(4):299–303.
- Poonai N, van Diepen S, Bharatha A, Manduch M, Deklaj T, Tarlo SM. Barriers to diagnosis of occupational asthma in Ontario. *Canadian Journal of Public Health* 2005; 96(3):230–3.
- Roos LL, Walld R, Uhanova J, Bond R. Physician visits, hospitalizations, and socioeconomic status: ambulatory care sensitive conditions in a Canadian setting. *Health Services Research* 2005; 40(4):1167–85.
- Alter DA, Naylor CD, Austin P, Tu JV. Effects of socioeconomic status on access to invasive cardiac procedures and on mortality after acute myocardial infarction. *New England Journal of Medicine* 1999; 341(18): 1359–67.
- 9. Croxford R, Friedberg J, Coyte PC. Socioeconomic status and surgery in children: myringotomies and tonsillectomies in Ontario, Canada, 1996–2000. Acta Paediatrica 2004; 93(9):1245–50.
- Tepper JD, Schultz SE, Rothwell DM, Chan BTB. Physician Services in Rural and Northern Ontario. ICES Investigative Report. Toronto: Institute for Clinical Evaluative Sciences; 2006.
- Liu L, Hader J, Brossart B, White R, Lewis S. Impact of rural hospital closures in Saskatchewan, Canada. *Social Science and Medicine* 2001; 52(12):1793–804.
- 12. Szafran O, Bell NR. Use of walk-in clinics by rural and urban patients. *Canadian Family Physician* 2000; 46:114–9.
- Burge F, Lawson B, Johnston G. Where a cancer patient dies: the effect of rural residency. *Journal of Rural Health* 2005; 21(3):233–8.
- Alter DA, Naylor CD, Austin PC, Chan BT, Tu JV. Geography and service supply do not explain socioeconomic gradients in angiography use after acute myocardial infarction. *Canadian Medical Association Journal* 2003; 168(3):261–4.
- Johnston GM, Boyd CJ, MacIsaac MA. Community-based cultural predictors of Pap smear screening in Nova Scotia. *Canadian Journal* of Public Health 2004; 95(2):95–8.
- McMillen R, Breen J, Cosby AG. Rural-urban differences in the social climate surrounding environmental tobacco smoke: a report from the 2002 Social Climate Survey of Tobacco Control. *Journal* of Rural Health 2004; 20(1):7–16.

- Zwerling C, Peek-Asa C, Whitten PS, Choi SW, Sprince NL, Jones MP. Fatal motor vehicle crashes in rural and urban areas: decomposing rates into contributing factors. *Injury Prevention* 2005; 11(1):24–8.
- Martens PJ, Sanderson D, Jebamani LS. Mortality comparisons of First Nations to all other Manitobans: a provincial population-based look at health inequalities by region and gender. *Canadian Journal of Public Health* 2005; 96(Suppl 1):S33–8.
- Beals J, Novins DK, Whitesell NR, Spicer P, Mitchell CM, Manson SM. Prevalence of mental disorders and utilization of mental health services in two American Indian reservation populations: mental health disparities in a national context. *American Journal of Psychiatry* 2005; 162(9):1723–32.
- 20. McDonald JT, Kennedy S. Insights into the 'healthy immigrant effect': health status and health service use of immigrants to Canada. *Social Science and Medicine* 2004; 59(8):1613–27.
- 21. Leduc N, Proulx M. Patterns of health services utilization by recent immigrants. *Journal of Immigrant Health* 2004; 6(1):15–27.
- Glazier RH, Creatore MI, Gozdyra P, Matheson F, Steele L, Boyle E, et al. Geographic methods for understanding and responding to disparities in mammography use in Toronto, Canada. *Journal of General Internal Medicine* 2004; 19(9):952–61.
- Hislop TG, Teh C, Lai A, Ralston JD, Shu J, Taylor VM. Pap screening and knowledge of risk factors for cervical cancer in Chinese women in British Columbia, Canada. *Ethnicity and Health* 2004; 9(3):267–281.
- 24. Vozoris N, Davis B, Tarasuk V. The affordability of a nutritious diet for households on welfare in Toronto. *Canadian Journal of Public Health* 2002; 93(1):36–40.
- Arblaster L, Lambert M, Entwistle V, Forster M, Fullerton D, Sheldon T, et al. A systematic review of the effectiveness of health service interventions aimed at reducing inequalities in health. *Journal of Health Services Research and Policy* 1996; 1(2):93–103.

INSIDE

Executive Summary Introduction List of Exhibits Exhibits and Findings Discussion Appendix 9.A + How the research was done

References



Primary Mental Health Care

Anne E. Rhodes, MSC, PhD, Jennifer Bethell, MSC, and Susan E. Schultz, MA, MSC



Executive Summary

Issue

The care of those with mental illness has yet to be fully integrated into the existing primary health care system in Ontario.

Study

This chapter provides a picture of the ambulatory mental health care received by Ontarians prior to the widespread implementation of primary care reforms. Contacts with mental health professionals for mental health reasons in 2001/02 are described using both self-reported data from Statistics Canada's Canadian Community Health Survey—Mental Health and Well-being, Cycle 1.2 (CCHS 1.2), and administrative data from the Ontario Health Insurance Plan (OHIP) database of physician billings. For the purposes of this chapter, ambulatory mental health care provider types included physicians, social workers, counsellors, psychotherapists, nurses, psychologists and other professionals. Depression is highlighted as it is a common, costly, and disabling illness, which is readily treated in the primary care setting.

Key Findings

- Among those who sought mental health care, including those surveyed with depression, the most commonly contacted provider was a general practitioner or family physician (GP/FP).
- Half of those surveyed with depression did not report a mental health contact.
- Approximately one-half of those who contacted a GP/FP for mental health reasons also contacted other provider types.
- As the number of provider types contacted increased, so did the total number of contacts.
- Of those who reported a mental health contact with a GP/FP, more than two-thirds had two or more such contacts with the same GP/FP, and the majority was satisfied with this care.
- There were discrepancies between self-reported contacts and mental health contacts recorded in administrative data, particularly among the elderly.
- When using administrative data to identify ambulatory mental health contacts with physicians, more people were identified by choosing a broader versus a more conservative OHIP definition of these contacts. However, the number of contacts per person was similar regardless of the definition used.

Implications

- Given that most Ontarians access primary care, any changes to the primary health care system have the potential to change the access and quality of mental health care for persons with mental illness, such as depression.
- Future research is needed in a number of areas in order to better understand how individual characteristics, as well as financing and delivery of primary care, affect mental health outcomes.
- An ongoing method is needed to monitor how changes to existing systems may affect mental health costs and outcomes within and across Local Health Integration Networks.

Introduction

The purpose of this chapter is to provide a description of the ambulatory mental health care received by Ontarians prior to the widespread implementation of primary care reforms. This is of particular concern since it has recently been reported that care of those with mental illness, including addictions, has yet to be fully integrated into the existing system, in the wake of the most recent round of hospital closures and restructuring.^{1,2} A goal of mental health reform is to create a system that includes regional networks of care where people living with mental illness can access a continuum of community-based services and supports when and where they need it. Ontario's mental health system is diverse and fragmented, yet variations in supports and services are not well measured throughout the Province.³

Using both self-report and administrative data, this chapter describes those Ontarians aged 15 years and older who sought ambulatory mental health care in 2001/02 and the providers from whom they obtained this care. For the purposes of this chapter, providers of ambulatory mental health care include physicians, social workers, counsellors, psychotherapists, nurses, psychologists and other professionals. Those who received inpatient mental health care were excluded from the analyses. In addition to looking at overall mental health care, the care of those with major depression was examined separately. Major depression is of particular interest as an illness that is highly treatable in primary care settings.^{4–7} The two main data sources for this chapter are Statistics Canada's 2001/02 Canadian Community Health Survey—Mental Health and Well-being, Cycle 1.2 (CCHS 1.2)⁸ and the Ontario Health Insurance Plan (OHIP) database of physician billings.



Chapter 9—List of Exhibits

I. Self-reported ambulatory mental health contacts with health professionals

Exhibit 9.1 Proportion of the total population and the population surveyed with major depression aged 15 years and older, who self-reported ambulatory mental health contact, by age, sex and Local Health Integration Network, in Ontario, 2001/02

Exhibit 9.2 Distribution of provider types contacted by the total population and the population surveyed with major depression aged 15 years and older, who self-reported ambulatory mental health contact, in Ontario, 2001/02

Exhibit 9.3 Proportion of the total population and the population surveyed with major depression aged 15 years and older, who self-reported ambulatory mental health contact, by type of provider(s) contacted, in Ontario, 2001/02

Exhibit 9.4 Number of ambulatory mental health contacts by those aged 15 years and older who self-reported ambulatory mental health contact, by type of provider(s) contacted, in Ontario, 2001/02

Exhibit 9.5 Number of ambulatory mental health contacts, by those surveyed with major depression aged 15 years and older who self-reported ambulatory mental health contact, by type of provider(s) contacted, in Ontario, 2001/02

Exhibit 9.6 Proportion of the total population and the population surveyed with major depression aged 15 years and older who were satisfied with self-reported treatment and services received from a general practitioner/family physician (GP/FP) for ambulatory mental health care, in Ontario, 2001/02

II. Recorded ambulatory mental health contacts with physicians

Exhibit 9.7 Proportion of the total population aged 15 years and older who had ambulatory mental health contact with physicians, using self-reported and administrative data, by age, sex and Local Health Integration Network, in Ontario, 2001/02

Exhibit 9.8 Number of recorded ambulatory mental health contacts with physicians among the population aged 15 years and older, by physician specialty type, in Ontario, 2001/02

Exhibit 9.9 Distribution of physician specialty types contacted by those aged 15 years and older with recorded ambulatory mental health contacts, by age and sex, in Ontario, 2001/02

Exhibit 9.10 Distribution of physician specialty types contacted by those aged 15 years and older with recorded ambulatory mental health contacts, by Local Health Integration Network, and for the Province of Ontario, 2001/02

Exhibits and Findings

I. Self-reported ambulatory mental health contacts with health professionals

Exhibit 9.1 Proportion of the total population and the population surveyed with major depression aged 15 years and older, who self-reported ambulatory mental health contact[†], by age, sex and Local Health Integration Network, in Ontario, 2001/02

	Ontarians repo mental he	orting ambulatory alth contact	Ontarians surveyed with major depression			
	Number of people [¥]	Proportion of the total population (%)	Number of people [¥]	Proportion of the total population (%)	Proportion reporting ambulatory mental health contact (%)	
Total	691,616	7	428,827	5	47	
Sex						
Men	220,703	5	154,368	3	38	
Women	470,913	10	274,460	6	52	
Age group (years)						
15–19	52,379	6	43,121	5	**	
20–39	272,386	8	179,693	5	47	
40–64	319,966	8	182,820	5	51	
65 and over	46,886	3	23,193	2	**	
Local Health Integration Network						
1. Erie St. Clair	26,666	5*	27,009	5*	**	
2. South West	47,252	7	20,513	3*	**	
3. Waterloo Wellington	41,938	8	24,458	4*	52	
4. Hamilton Niagara Haldimand Brant	89,270	8	52,240	5	58	
5. Central West	**	**	**	**	**	
6. Mississauga	78,350	10*	**	**	**	
7. Toronto Central	78,152	9	36,590	4*	**	
8. Central	65,978	6*	**	**	**	
9. Central East	68,559	6	45,289	4	44*	
10. South East	15,095	4*	**	**	**	
11. Champlain	92,998	10	47,904	5	46	
12. North Simcoe Muskoka	21,914	6	**	**	**	
13. North East	35,922	8	24,405	6	60	
14. North West	14,212	8*	**	**	**	

[†] Ambulatory mental health care provider types include physicians, social workers, counsellors, psychotherapists, nurses, psychologists and other professionals.

Interpret with caution due to high sampling variability.

** Not reportable due to small cell size.

[¥] Weighted to represent the 2001 Ontario population.

©Institute for Clinical Evaluative Sciences

- Overall, seven percent of Ontarians reported ambulatory mental health contacts in the previous 12 months. A greater proportion of women than men reported contact with health professionals for mental health care. Adults between the ages of 20 and 64 years reported contact with health professionals for mental health care more often than younger or older Ontarians.
- Five percent of Ontarians were surveyed as having major depression in the previous 12 months, although less than half of these people reported contact with health professionals for mental health care during that time.



- Of the 47% of those with major depression who reported such contact, about half reported contact with only one provider type.
- The higher proportion of contact and lower tendency to see only one provider type among those surveyed with depression, compared to the total population of Ontarians, is not unexpected given that depression is an indicator of a need for mental health services.



- [†] Ambulatory mental health care provider types include physicians, social workers, counsellors, psychotherapists, nurses, psychologists and other professionals.
- * Interpret with caution due to high sampling variability.
- ** Not reportable due to small cell size.

GP/FP = General practitioner/family physician

©Institute for Clinical Evaluative Sciences

- The type of provider contacted most often by those who self-reported an ambulatory mental health contact were general practitioner/family physicians, both by all Ontarians (68%) and among those with major depression (73%).
- When contacts with all types of physicians were combined, 80% of Ontarians reported ambulatory mental health contacts and this proportion was slightly higher (89%) among those with major depression (data not shown).

Exhibit 9.4 Number of ambulatory mental health contacts by those aged 15 years and older who self-reported ambulatory mental health contact[†], by type of provider(s) contacted, in Ontario, 2001/02

Provider type(s) contacted	Ontarians repor mental hea	ting ambulatory Ilth contact	Number health c	of mental contacts
	Number of people [¥]	Proportion (%)	Mean	Median
GP/FP				
GP/FP only	242,943	35	4	2
GP/FP + psychiatrist only	54,784	8	**	**
GP/FP + social worker, counsellor, psychotherapist only	52,756	8	13	8
GP/FP + one other only§	46,018	7*	12*	6*
GP/FP + two or more other provider types§	70,328	10	44*	20*
No GP/FP				
Psychiatrist only	60,552	9	11*	4*
Social worker, counsellor, psychotherapist only	77,376	11	11*	4*
One other only§	55,278	8	**	**
Two or more provider types	31,582	5*	28*	12*
Total	691,617	100	14	5

[†] Ambulatory mental health care provider types include physicians, social workers, counsellors, psychotherapists, nurses, psychologists and other professionals.

- * Interpret with caution due to high sampling variability.
- ** Not reportable due to high sampling variability.
- [¥] Weighted to represent the 2001 Ontario population.
- § Other type of physician, nurse, psychologist, or other professional.

GP/FP = General practitioner/family physician

©Institute for Clinical Evaluative Sciences

- Among Ontarians who reported an ambulatory mental health contact, 35% reported contact with a general practitioner/ family physician (GP/FP) only. A similar proportion (33%) contacted a GP/FP as well as one or more other provider type(s).
- The provider types contacted most often in combination with GP/FPs were psychiatrists and social workers/counsellors/ psychotherapists.
- Seventy percent of those who reported contact with a GP/FP had two or more contacts with the GP/FP they accessed most often (data not shown).
- The number of mental health contacts varied according to both the type and number of providers contacted.
- For those who had contact with both a GP/FP and one or more other provider type(s), the overall number of mental health contacts reported was greater than for those who contacted a GP/FP alone.
- When only one type of health professional was contacted for mental health reasons, the mean number of contacts with non-GP/FP health professionals (psychiatrists, social workers, counsellors, psychotherapists or other professionals) was greater than with GP/FPs.

Exhibit 9.5

Number of ambulatory mental health contacts⁺, by those surveyed with major depression aged 15 years and older who self-reported ambulatory mental health contact, by type of provider(s) contacted, in Ontario, 2001/02

Provider type(s) contacted	Ontarians surv depression repo mental hea	eyed with major orting ambulatory alth contact	Number of mental health contacts		
	Number of people [¥]	Proportion %	Mean	Median	
GP/FP					
GP/FP only	61,152	31	6	4	
GP/FP + psychiatrist only	24,525	12*	**	**	
GP/FP + one other only§	26,860	13*	19*	13*	
GP/FP + two or more other provider types $\$$	33,690	17*	42*	18*	
No GP/FP	54,025	27	17*	6*	
Total	200,251	100	20	10	

[†] Ambulatory mental health care provider types include physicians, social workers, counsellors, psychotherapists, nurses, psychologists and other professionals.

- * Interpret with caution due to high sampling variability.
- ** Not reportable due to small cell size.
- [¥] Weighted to represent the 2001 Ontario population.
- § Other type of physician, social worker, counsellor, psychotherapist, nurse, psychologist, or other professional.

GP/FP = General practitioner/family physician

©Institute for Clinical Evaluative Sciences

- Among those surveyed with depression who reported an ambulatory mental health contact, 31% reported contact with a general practitioner/family physician (GP/FP) only. Forty-two percent contacted a GP/FP as well as one or more other provider type(s).
- The provider type contacted most often in combination with GP/FPs was psychiatrists.
- Seventy-one percent of those who reported contact with a GP/FP had two or more contacts with the GP/FP they accessed most often (data not shown).
- Like all Ontarians (Exhibit 9.4), among those surveyed with depression, the number of ambulatory mental health contacts varied according to both the type and number of providers contacted; however, the mean and median numbers of contacts were greater for those surveyed with depression.





* Psychiatrist, other type of physician, social worker, counsellor, psychotherapist, nurse, psychologist, or other professional.

** Interpret with caution due to high sampling variability.

©Institute for Clinical Evaluative Sciences

- Overall, among Ontarians who reported an ambulatory mental health contact with general practitioner/family physicians (GP/FPs), a high proportion expressed satisfaction with the treatments and services they received from the GP/FP they contacted most often.
- This was true for those who reported contact with only GP/FPs as well as those who reported contact with GP/FPs and one or more other provider type(s).
- This pattern was also true among those surveyed with depression.

II Recorded ambulatory mental health contacts with physicians

Exhibit 9.7 Proportion of the total population aged 15 years and older who had ambulatory mental health contact with physicians, using self-reported and administrative data, by age, sex and Local Health Integration Network, in Ontario, 2001/02

	Ontarians reporting ambulatory mental health contact with a physician		Mental health contact recorded in Ontario Health Insurance Plan (OHIP)			
			OHIP definition 1 [†]		OHIP definition 2 [†]	
	Number of people [¥]	Proportion of the total population (%)	Number of people	Proportion of the total population (%)	Number of people	Proportion of the total population (%)
Total	555,583	6	825,233	8	1,838,550	17
Sex						
Men	178,735	4	296,899	6	710,821	14
Women	376,848	8	528,334	10	1,127,729	21
Age group (years)						
15–19	29,198	3*	37,794	4	81,730	9
20–39	213,882	6	292,416	7	638,329	16
40–64	270,788	7	385,184	9	814,705	20
65 and over	41,716	3	109,838	7	303,784	20
Local Health Integration Network						
1. Erie St. Clair	23,462	4*	28,418	5	95,418	18
2. South West	33,972	5	59,750	8	130,645	18
3. Waterloo Wellington	28,851	5	38,202	7	81,716	16
4. Hamilton Niagara Haldimand Brant	73,557	7	85,518	8	200,151	18
5. Central West	**	**	38,110	7	99,420	18
6. Mississauga Halton	67,830	9*	63,543	8	139,062	17
7. Toronto Central	65,432	7	106,694	10	209,614	20
8. Central	48,264	4*	103,022	8	222,313	18
9. Central East	56,604	5	87,814	7	211,710	18
10. South East	11,866	3*	33,396	9	71,345	19
11. Champlain	73,035	8	105,875	11	195,727	20
12. North Simcoe Muskoka	19,192	5*	30,543	10	64,816	21
13. North East	30,316	7	31,654	7	84,347	18
14. North West	10,845	6*	10,924	5	28,441	14

[¥] Weighted to represent the 2001 Ontario population.

* Interpret with caution due to high sampling variability.

** Not reportable due to small cell size.

[†] See Appendix 9.A for a description of the two OHIP definitions used to define mental health contacts.

©Institute for Clinical Evaluative Sciences

- Two different Ontario Health Insurance Plan (OHIP) definitions were used to define recorded ambulatory mental health contacts (see Appendix 9.A). The proportion of Ontarians who self-reported making an ambulatory mental health contact to a physician tended to be similar to the proportion for recorded mental health contacts, when OHIP definition 1 was used. The only exception was among the elderly, suggesting that elderly respondents may often not recall or identify a mental health contact.
- When OHIP definition 2 was used, the proportion of the population with a recorded ambulatory mental health contact was much higher than for self-reported contacts across all categories of age, sex and Local Health Integration Networks.

Exhibit 9.8

Number of recorded ambulatory mental health contacts with physicians among the population aged 15 years and older, by physician specialty type, in Ontario, 2001/02

	Ontario Health Insurance Plan (OHIP) definition 1*					
Physician specialty contacted	Number of	Proportion	Number of mental health contacts			
	people	(%)	Mean	Median		
One provider type						
GP/FP only	550,836	67	3	1		
Psychiatrist only	169,593	21	8	4		
Other specialty only	25,049	3	3	1		
Two provider types						
GP/FP + psychiatrist	68,200	8	11	7		
GP/FP + other specialty	6,076	1	8	4		
No GP/FP	3,153	<1	12	7		
Three or more provider types	2,326	<1	19	12		
Total	825,233	100	4	2		
	Ontario Health Insurance Plan (OHIP) definition 2*					
Physician specialty contacted	Number of	Proportion	Number of mental health contacts			
	people	(%)	Mean	Median		
One provider type						
GP/FP only	1,458,637	79	2	1		
Psychiatrist only	96,971	5	9	4		
Other energialty and	05.000	F	0	4		

Psychiatrist only	96,971	5	9	4
Other specialty only	85,222	5	2	1
Two provider types				
GP/FP + psychiatrist	126,512	7	11	8
GP/FP + other specialty	51,419	3	6	4
No GP/FP	6,915	<1	9	5
Three or more provider types	12,874	1	16	11
Total	1,838,550	100	4	2

* See Appendix 9.A for a description of the two OHIP definitions used to define mental health contacts.

GP/FP = General practitioner/family physician

©Institute for Clinical Evaluative Sciences

- Two different Ontario Health Insurance Plan (OHIP) definitions were used to define recorded ambulatory mental health contacts (see Appendix 9.A). More people are identified using OHIP definition 2.
- Using either OHIP definition, the majority of Ontarians identified had an ambulatory mental health contact with one physician specialty type, typically a general practitioner/family physician (GP/FP), and the number of contacts increased as the number of provider types contacted increased.
- There was little variation in the number of ambulatory mental health contacts per person made to the various combinations of physician specialty provider groups. Therefore, although *OHIP definition 2* captures more people, the per capita use is similar with both definitions.



* These contacts were identified using Ontario Health Insurance Plan (OHIP) definition 2. See Appendix 9.A for a description of the two OHIP definitions used to define mental health contacts.

** Other physician specialty only; psychiatrist + other physician specialty; or, GP/FP + psychiatrist + other physician specialty.

GP/FP = General practitioner/family physician

©Institute for Clinical Evaluative Sciences

- General practitioner/family physicians (GP/FPs) were recorded as the physician specialty contacted most often for an ambulatory mental health contact by Ontarians, and this pattern did not vary considerably by age or sex.
- The elderly were recorded as making contact proportionally less often with "psychiatrist only" and "GP/FP + psychiatrist" than other age groups.
- In comparison to other age groups, those aged 15–19 years and 65 years and older were recorded as having a greater proportion of contact with "all other combinations" of physician specialty groups. The elderly also had more contact with "GP/FP + other specialty" group.
- In the elderly, these patterns may reflect a greater contact with a range of physician specialists due to concurrent physical illness, and in youths, may reflect a greater contact with physicians who are paediatricians.

Exhibit 9.10

Distribution of physician specialty types contacted* by those aged 15 years and older with recorded ambulatory mental health contacts, by Local Health Integration Network, and for the Province of Ontario, 2001/02



* These contacts were identified using Ontario Health Insurance Plan (OHIP) definition 2. See Appendix 9.A for a description of the two OHIP definitions used to define mental health contacts.

** Other physician specialty only; psychiatrist + other physician specialty; or, GP/FP + psychiatrist + other physician specialty.

GP/FP = General practitioner/family physician

©Institute for Clinical Evaluative Sciences

- The proportion of ambulatory mental health contacts recorded by physician specialty varied between Local Health Integration Networks (LHINs) with the most obvious difference occurring between the northern LHINs and the Toronto Central LHIN. Contact with "general practitioner/family physicians (GP/FPs) only" were recorded at a higher proportion in the northern LHINs compared to the Toronto Central LHIN; whereas, contact with "psychiatrists only" and "GP/FPs + psychiatrists" was more common in the Toronto Central LHIN.
- These findings may be explained by a higher proportion of psychiatrists relative to GP/FPs in the Toronto Central LHIN compared to the northern LHINs and/or variations in the underlying populations of these regions.

Discussion

These results confirm that when Ontarians had an ambulatory mental health contact, a physician was most often the provider type contacted. Furthermore, both self-reported and administrative data indicate that the type of physician contacted was, more often than not, a general practitioner/ family physician (GP/FP). This was the case for the population as a whole and also for those who were surveyed as having had major depression in the previous 12 months. People were equally likely to report contact(s) with GP/FPs alone or in combination with other providers-most often a psychiatrist, social worker, counsellor or psychotherapist. As expected, those surveyed with depression tended to have service patterns indicative of greater need as compared to Ontarians as a whole. Nevertheless, as in other jurisdictions, only about half of those surveyed as having major depression in the previous 12 months had contacted providers for mental health reasons during that same time frame.⁹

The source of the survey data used in this chapter was Statistics Canada's Canadian Community Health Survey-Mental Health and Well-being, Cycle 1.2 (CCHS 1.2), carried out in 2001/02. This survey gave Ontarians the opportunity to describe their perspectives on the health care they received. For those who did report mental health contacts, most reported being satisfied with this care and most had more than one contact with at least one provider. However, it would be premature to conclude that this translates into better health outcomes. For example, the benefits accrued to women, who are more likely to suffer from depression than men and tend to access care from GP/FPs more than men, are not yet clear.^{10,11} A limitation of the survey was that it was not large enough to precisely describe those who were not satisfied with their care, and to differentiate between those who had more consistent contacts with one or more provider(s) from those who had less consistent contacts. Similarly, it was not possible to describe the high users of health care services. Further research is needed in this area.

When more than one mental health care provider was involved, it was difficult to identify whether one played a more consistent role than another. This was particularly true for those surveyed with depression and may be a function of the 12-month time frame used. In future, studies with larger samples of patients with depression might ask those who report contact with more than one provider to identify whether one provider was more consistent over time, and if this provider would likely be their first mental health contact in the future.

Two different definitions were used to identify ambulatory mental health contacts recorded in the Ontario Health Information Plan (OHIP) database. A more conservative definition of a recorded mental health contact with a physician (OHIP definition 1*) more closely resembled self-reported mental health contacts, while a more encompassing definition of a recorded mental health contact with a physician (OHIP definition 2*) captured substantially more people. However, regardless of the OHIP definition used, GP/FPs were the provider type contacted most often and the volume of contacts recorded was quite similar. Previous studies reported that when OHIP definition 1 was employed, the bulk of the physician billing claims per contact were mental health procedure fee codes, suggesting that a mental health concern was the main reason for the visit.^{10–12} Using OHIP data for 2001/02 psychiatrists almost always applied a mental health diagnostic code and a mental health fee code, whereas physicians who were not psychiatrists tended to apply a mental health diagnostic code (often the code for anxiety). Perhaps the elderly and those additional persons identified by OHIP definition 2 may not recall or identify their contact(s) as often. In the elderly, this may be due to difficulties in recall coupled with competing mental and physical health needs addressed in one physician visit. In other age groups, it is possible that a physician contact was not recalled due to a lower level of mental health need and/or the nature of the care provided. From the perspective of the non-psychiatrist physician, clients may present with a host of physical health concerns even though the underlying problem is a mental health one, and yet the nature of the contact may not have merited coding a full mental health procedure. Accordingly, OHIP definition 1 would seem apt for identifying contacts where the bulk of the claims are related to mental health, whereas OHIP definition 2 is necessary in capturing the full range of mental health contacts and associated costs. For the purposes of measuring the number of ambulatory mental health contacts made per person to physicians, either definition would suffice.

Relevance to primary care practice

The difference in self-reported and recorded mental health contact patterns is not an issue so long as clients are receiving appropriate care and benefiting from this care. As in other jurisdictions, only about half of those identified as having major depression in the past 12 months had contacted providers for mental health reasons during that same time frame.⁹ It is further concerning that this gap did not disappear when self-reports of use were replaced by administrative health care utilization data.^{12,13} In fact, the gap may have widened even further if access to care had been measured in order to follow depression practice guidelines more closely.⁹

Yet, previous Canadian surveys have found that approximately 90% of those with underlying depression had contact with

^{*} See Appendix 9.A for OHIP definitions 1 and 2.

GP/FPs for *any* reason in the past 12 months.^{14,15} This raises concern about how well depression is detected and treated in Canadian primary care settings. Depression is sometimes treated "solo" by a GP/FP and this may be most appropriate when the depression is not severe in nature. Other specialty groups (e.g., psychiatrists, social workers, counsellors and psychologists) are frequently involved but it is unclear as to how these groups work individually with the client and together over time.

The major evidence-based treatments for depression consist of antidepressant medications and/or specific psychotherapies. The growth in the prescription rate of newer antidepressants¹⁶ is raising questions about appropriate prescribing practices and the relative benefits and harms for individuals and for the population as a whole. A growth in demand for these medications in a system that is already struggling¹ could affect the quality of care if there has been no change or a reduction in the supply of mental health care providers. Evidence-based psychotherapies may not be offered or requested if trained providers are not available. While many depression cases may indeed be mild¹⁷, cross-sectional data do not resolve how many people responded to treatment in the past or may do so in future.

Implications for primary care policy

This study was conducted during a time frame in which the majority of physicians were reimbursed through the fee-forservice provincial health care plan. Given that most persons with depression are accessing primary care physicians for one reason or another, changes in the delivery of primary care will likely have an impact on access to quality mental health care for Ontarians. While not directly tied to outcomes it is noteworthy that, within a universally insured fee-for-service environment, when clients reported ambulatory mental health contact(s) with GP/FPs they tended to see a particular GP/FP and were satisfied with this care.

A number of primary care reforms are now being initiated throughout the Province. It is not known how shifts in care will alter access, quality of care and health outcomes for persons with depression. While fee-for-service payment systems are thought to limit the amount of time a provider spends with a client, capitation payment systems could decrease any contact. Capitation may encourage primary care providers to select healthier patients or "cream skim" unless payers are successful in adjusting budgetary allocations for more complex and ill respondents.¹⁸

There is a growing interest in applying components of chronic disease management models in primary care and adopting shared or collaborative care models with respect to the detection and treatment of depression in Canada. These models have been shown to benefit those with depression in other countries.¹⁹ It remains to be seen how portable and effective these models will be within Local Health Integration Networks (LHINs).

Data needs

A limitation of the self-report data was that despite the fact that over 12,000 Ontarians were interviewed in the CCHS 1.2, a number of questions could not be addressed due to the small numbers of persons in subsamples. A major strength of OHIP data is the large number of people included—virtually all residents of Ontario.

Self-reported questions may be sensitive to persons who contacted more than one physician in a particular specialty. These questions would seem less appropriate for the purpose of describing the actual number of providers seen and the number of contacts made to each—necessary information for determining costs or for health human resources and/or training needs. OHIP data would seem to be better suited for this latter purpose; however, only physician providers are captured in this data source. As noted in the first section of this chapter, a considerable proportion of Ontarians who reported ambulatory mental health care contacted nonphysician providers, either alone or concurrently with physicians.

Discrepancies between the two data sources may also be due to the ecological nature of the comparisons. While those sampled in the survey were likely captured in the OHIP data, the converse is not true. Persons included in the OHIP data source, but not in the survey sample, may have differed in their use of physicians for mental health contacts. In future, comparisons between the linked and unlinked samples should be made.

Nevertheless, neither data source, on its own or linked, is well suited to examining the quality of care provided over time against a full range of health outcomes. Many macro- and micro-level factors determine quality of care. For example, continuity of care refers to the care of an individual that is delivered over time.²⁰ In addition to having some consistent contact with the same provider, continuity of care has a relational component.^{20,21} Relational continuity is thought to be most important when conditions are more serious and emotional in nature.²² To build continuity of care, a primary care provider has to be accessible²² and full insurance coverage allows a relationship to be sustained over time.²³ Health outcomes and the associated costs need be understood in terms of these contexts to determine whether and/or when interventions would be desirable.

The most credible evidence will come from well-designed prospective studies of clinical groups with comprehensive,

well-validated measures of diagnoses, illness severity and the nature and duration of treatment and support services. If the quality of care is poor with little impact on health outcomes, then the need to examine alternative interventions is hastened. While the costs of conducting a rigorous study may seem prohibitive, doing nothing or implementing reforms without solid evidence may be more costly.

Areas for future research

Further research is needed in the following areas:

- To explore the reasons why individuals choose to seek help for mental health-related problems from certain specific provider types versus others;
- To investigate possible reasons why individuals with depression do not seek help from a health professional;
- To discover whether not having a regular provider of mental health care indicates a lack of primary care in general, and whether this is an access issue or relates to other factors;
- To determine whether dissatisfaction with care and the lack of a consistent mental health care provider affects health outcomes;
- To compare linked survey and OHIP samples with unlinked ones to identify how those not included in survey samples may differ in the patterns of ambulatory mental health contacts;
- To examine (and compare) how well existing primary care delivery systems perform in the detection and management of key mental health problems in primary care settings;
- To identify where components of chronic disease models and collaborative care models can be incorporated into existing systems, and to measure the mental health costs and benefits of such interventions; and,
- To develop primary care monitoring systems that examine how changes in the financing and delivery of care affect mental health outcomes.

Conclusions and next steps

Primary mental health care in Ontario is in a state of flux. A number of areas for future research are identified. To be accountable to Ontarians, an ongoing method is needed to monitor the delivery and financing of primary care and how changes to existing systems may affect mental health costs and outcomes within and across the LHINs. The promotion of mental health and the prevention, detection and treatment of mental illness should receive priority given the substantial burden of mental illness to individuals and society as a whole.²⁴ For those who access primary care, many of these aims can be addressed in those settings.



Appendix 9.A

How the research was done

Data sources and analyses

Self-reported use of mental health services

The use of mental health services by Ontario residents was studied using data from Statistics Canada's 2001/02 Canadian Community Health Survey—Mental Health and Well-being, Cycle 1.2 (CCHS 1.2). In this cross-sectional survey, a representative sample of household residents 15 years of age or older were personally interviewed in 2002. Excluded from the survey were individuals living in health care institutions, on First Nations reserves, on government-owned land or in remote regions. Full-time members of the Armed Forces were sampled separately, and were not included in these analyses. The overall response rate for Ontario was 73.4% thus providing a sample size of 12,376. A more thorough description of the CCHS 1.2 is provided elsewhere.⁸ As less than one percent of Ontarians reported an inpatient mental health stay, these individuals were also excluded from analyses.

In the CCHS 1.2, respondents were asked a series of questions about contact(s) with specific types of providers for "help with emotions, mental problems or use of alcohol or drugs." The provider types specified were: psychiatrist, general practitioner/ family physician (GP/FP), other physician, psychologist, social worker/counsellor, psychotherapist, nurse or other type of professional. For each provider type seen, the respondent was asked to think of the provider(s) he or she talked to *most often* during the past 12 months when asked about the number of contacts made. A contact could be face-to-face or over the phone.

The respondents were interviewed between May and December 2002 and were asked to recall the previous 12-month period in their responses.

As there is no "gold standard" method for measuring the use of mental health services, it is not known how well persons with depression report their use. Nevertheless, in previous studies they tend to report their use "better" than those who are not depressed.^{12,13} Depending on the question being addressed, this differential recall can introduce bias. The potential for this bias is reduced when comparisons are limited to those who had depression in the past 12 months. However, it is also possible that there was confusion about the actual type of provider seen. For instance, a person may have seen a psychologist (with a doctorate) but reported this contact as occurring with a GP/FP, psychiatrist or other physician.

Due to the complex sampling design of the CCHS 1.2, all estimates were weighted to represent the 2001 Ontario population. In addition, all estimates were rounded to the nearest integer. As such, proportional distributions may not add up to 100%.

The use of ambulatory mental health services in administrative health care records

All persons captured in the Ontario Health Insurance Plan (OHIP) database, who were 15 years of age or older between April 1, 2001 and March 31, 2002, were initially selected for analysis. It was expected that this group would cover the same time period as the 12-month recall time frame of respondents in CCHS 1.2.

To focus on persons whose care was only ambulatory in nature, as in the self-report data source, 47,408 persons with longterm care claims, and 44,797 persons with an inpatient mental health hospital stay (Canadian Institute for Health Information discharge abstract database most responsible diagnosis ICD-9 290–319 or patients whose most responsible physician was a psychiatrist) were excluded.

Physicians who submitted OHIP billing claims during this time frame were assigned to a specialty group (GP/FP, psychiatrist or other physician) using information contained in the Corporate Provider Database held at the Institute for Clinical Evaluative Sciences.

Mental health contacts made to family physicians or general practitioners, psychiatrists and other physician specialties in the fiscal year 2001/2002 were examined. Mental health claims per person were aggregated into mental health contacts according to claims made to the same physician on the same day. A claim made by a psychiatrist was automatically deemed a mental health claim. Two definitions of mental health contacts with physicians who were not psychiatrists were examined as follows:

OHIP definition 1 was the most conservative and based on OHIP claim fee codes that contained a mental health procedure.^{11–13}

OHIP definition 2 included persons with contacts identified in the first definition, but also included contacts by persons where an OHIP claim contained a mental health diagnostic code. As long as there was a mental health diagnostic code, any fee code could be included in this definition, including counselling or hypnotherapy fee codes.²⁵

Definition of major depressive disorder

Major depression is defined as: at least one episode of two weeks or more with persistent depressed mood and loss of interest or pleasure in normal activities, accompanied by problems such as decreased energy, changes in sleep and appetite, impaired concentration, and feelings of guilt, hopelessness, or suicidal thoughts.

The presence of a major depressive disorder in the past 12 months was measured in the CCHS 1.2 based on the World Mental Health—Composite International Diagnostic Interview (WMH-CIDI), which determines the presence of mental disorders according to the definitions of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV), an international classification system.^{26–28}

While diagnostic information is collected in OHIP, it was not used due to concerns about its reliability. In the CCHS 1.2 sample, the prevalence of depression was 32.3% among those who reported making an ambulatory mental health contact with a physician. The prevalence of depression according to OHIP diagnostic codes 269 and 311 was lower—17% using OHIP definition 1 and 12% using OHIP definition 2.

References

- Sinclair D, Rochon M, Leatt P. Riding the third rail. The Story of Ontario's Health Services Restructuring Commission, 1996–2000. Toronto: Institute for Research on Public Policy; 2005.
- Kirby M, Keon W. Out of the Shadows at Last. Transforming mental health, mental illness and addiction services in Canada. Standing Senate Committee on Social Affairs, Science and Technology. Ottawa; 2006.
- Birney P, Chair, Wilson M, Vice-chair. The time is now: themes and recommendations for mental health reform in Ontario. Final report of the provincial forum of mental health implementation task force chairs. 1–65. 2002. Toronto; 2002.
- Canada Psychiatric Association (CPA) & Canadian Network for Mood and Anxiety Treatments (CANMAT). Clinical Guidelines for the Treatment of Depressive Disorders. 2001.
- American Psychiatric Association. Practice Guideline for the Treatment of Patients with Major Depressive Disorder. 2nd Edition. Arlington, VA; 2000.
- Royal Australian and New Zealand College of Psychiatrists, Clinical Practice Guidelines Team for Depression. Australian and New Zealand clinical practice guidelines for treatment of depression. 2004.
- 7. National Institute for Clinical Excellence (NICE). Depression: Management of depression in primary and secondary care. 2004.
- Gravel R, Béland Y. The Canadian Community Health Survey: Mental Health and Well-Being. *Canadian Journal of Psychiatry* 2005; 50(10): 573–579.
- Kessler RC, Berglund P, Demler O, Jin R, Koretz D, Merinkangas K et al. The epidemiology of major depressive disorder. Results from the National Comorbidity Survey Replication (NCS-R). *Journal of the American Medical Association*. 2003; 289(23):3095–3105.
- Rhodes A. Women's Need and Use of Mental Health Services. In: Romans S, Seeman M, editors. Women's Mental Health A Life-Cycle Approach. Baltimore: Lippincott, Williams and Wilkins; 2005. p. 367–375.
- Rhodes A, Jaakkimainen R, Bondy S, Fung K. Depression and mental health visits to physicians—a prospective records-based study. Social Science and Medicine 2006; 62:828–834.
- Rhodes A, Fung K. Self-reported use of mental health services versus administrative records: care to recall? *International Journal of Methods in Psychiatric Research* 2004; 13(3):165–175.
- Rhodes A, Lin E, Mustard C. Self-reported use of mental health services versus administrative records: should we care? *International Journal of Methods in Psychiatric Research* 2002; 11(3):125–133.
- Wang J, Langille D, Patten S. Mental health services received by depressed persons who visited general practitioners and family doctors. *Psychiatric Services* 2003; 54(6):878–883.
- Starkes J, Poulin C, Kisely S. Unmet need for the treatment of depression in Atlantic Canada. *Canadian Journal of Psychiatry* 2005; 50(10):580–590.
- Hemels M, Koren G, Einarson T. Increased use of antidepressants in Canada: 1981–2000. *The Annals of Pharmacotherapy* 2002; 36: 1375–1379.

- Kessler RC, Chiu W, Demler O, Walters E. Prevalence, severity and comorbidity of 12-month DSM-IV disorders in the national comorbidity survey replication. Archives of General Psychiatry 2005; 62:617–627.
- Deber R. Rationales for Primary Health Care Reform: Why Are We Doing This? An economic perspective. Implementing Primary Care Reform. Barriers and Facilitators. Montreal: McGill-Queen's University Press; 2004. p. 25–38.
- 19. Kates N, Mach M. Summary of a proposal for the synthesis of literature and environmental scan to integrate mental health services into primary care health care settings in which chronic disease management is a key component. Ontario; 2006.
- Haggerty J, Reid R, Freeman G, Starfield B, Adair C, McKendry R. Continuity of care: a multidisciplinary review. *British Medical Journal* 2003; 327(7425):1219.
- Adair C, McDougall G, Beckie A, Joyce A, Mitton C, Wild C et al. History and measurement of continuity of care in mental health services and evidence of its role in outcomes. *Psychiatric Services* 2003; 54(10):1351–1356.
- 22. Gill J. The structure of primary care: Framing a big picture. *Family Medicine* 2004; 36(1):65–68.
- Parchman M, Burge S. The patient-physician relationship, primary care attributes, and preventive services. *Family Medicine* 2003; 36(1):22–27.
- Ustun TB, Ayuso-Mateos J, Chatterji S, Mathers C, Murray C. Global burden of depressive disorders in the year 2000. *British Journal of Psychiatry* 2004; 184:386–392.
- Steele L, Glazier R, Lin E, Evans M. Using administrative data to measure ambulatory mental health service provision in primary care. *Medical Care* 2004; 42(10):960–965.
- Kessler R, Wittchen H-U, Abelson J, McGonagle K, Schwarz N, Kendler K et al. Methodological studies of the Composite International Diagnostic Interview (CIDI) in the US National Comorbidity Survey (NCS). International Journal of Methods in Psychiatric Research 2001; 7(1):33–55.
- Wittchen HU. Reliability and validity studies of the WHO— Composite International Diagnostic Interview (CIDI): a critical review. *Journal of Psychiatric Research* 1994; 28(1):57–84.
- Patten S, Li Wang J, Williams J, Currie S, Beck C, Maxwell C et al. Descriptive epidemiology of major depression in Canada. *Canadian Journal of Psychiatry* 2006; 51(2):84–90.
INSIDE

Executive Summary Introduction List of Exhibits Exhibits and Findings Discussion Appendix 10.A How the research was done

References



Physician Care of Cancer Patients

Lisa Del Giudice, MD, MSc, CCFP, Susan J. Bondy, PhD, Zhongliang Chen, MD, MSc, and Sarah Maaten, MSc



Executive Summary

Issue

It is estimated that, in 2005, over 56,000 people in Ontario were diagnosed with, and over 25,000 died from cancer. From screening or the onset of symptoms to post-treatment and palliative care, general practitioners and family physicians (GP/FPs) have long played a vital role in the care of cancer patients—a role which often receives less attention than specialty care. The purpose of this chapter is to describe the role of GP/FPs in the outpatient care of Ontario patients with breast, prostate, lung and colorectal cancer.

Study

The Ontario Cancer Registry and the Ministry of Health and Long-Term Care Ontario Health Insurance Plan database were used to describe health care contact rates and proportion of visits by physician specialty for each of the four most common cancers (lung, colorectal, breast and prostate) before, during and after diagnosis and treatment, as well as at the end of life. Regional variation in health care contact rates, according to place of residence, was also studied.

Key Findings

- The contact rate with GP/FPs among breast, prostate and colorectal cancer patients increased compared to baseline (pre-diagnosis), during the peri-diagnostic, active treatment, post-treatment (follow-up) and palliative periods.
- During the peri-diagnostic, post-treatment (follow-up) and palliative periods, patients with lung, colorectal, breast and prostate cancer had higher contact rates with their GP/FPs than with any oncology specialist or other physician.
- There is some regional variation in the follow-up and palliative care of cancer patients in Ontario by GP/FPs and by oncology specialists according to place of residence.
- GP/FPs play a significant role in the diagnosis of cancer patients, an important supportive role during the active treatment of cancer, and a key role in their follow-up and palliative care.

Implications

- GP/FPs have played an important role in the care of cancer patients in Ontario. They provide a solid foundation for patients through all phases of care and disease progression.
- Having contact with patients throughout the disease process, they provide a consistent and comprehensive resource for cancer patients.
- GP/FPs may play an important role in providing emotional support and helping to guide cancer-related decision-making in relation to overall quality of life and the management of other chronic and acute conditions.

Introduction

In 2005, an estimated 56,200 Ontarians were diagnosed with cancer and 25,600 died of cancer.¹ As shown in Table 10.1, the most common incident and fatal cancers in men were lung, colorectal and prostate, and were lung, colorectal and breast in women. Collectively, these cancers accounted for more than half of cancers in both sexes. The incidence of these cancers has increased over the past 10 years and is expected to continue to rise.

Table 10.1	Estimated incidence and most common cancers in	mortality of the Ontario in 2005
Type of Cancer	Incidence (number of new diagnoses)	Mortality (number of deaths)
Lung	7,500	6,500
Colorectal	7,500	3,050
Breast	8,200	2,000
Prostate	8,300	1,000

Adapted from: Canadian Cancer Society/National Cancer Institute of Canada. Canadian Cancer Statistics 2005, Toronto (Canada).¹

In 2001, it was estimated that the prevalence of cancer in the Canadian population was approximately 2.5%.¹ Therefore, in a practice of 2,000 people, an average family physician may have approximately 50 patients with a history of cancer. In the 2004 National Physician Survey, Ontario family physicians reported that cancer care/oncology and palliative care made up 23.6% and 33.8%, respectively, of their professional activity.² In Canada, over 90% of palliative care is delivered to patients with a primary diagnosis of cancer.³

General practitioners and family physicians (GP/FPs) are generally viewed as best able to provide continuous, comprehensive primary medical care and to coordinate care when other health care providers are involved. However, with respect to cancer care their role has traditionally been undervalued by themselves and by others.^{4–9}



It has been well recognized that cancer utilizes a high degree of health care resources^{10,11} even long after cancer treatment is over.¹² However, to date little has been formally documented about the degree of the GP/FPs' involvement in the care of cancer patients in Ontario. The goal of this chapter is to describe, through quantitative means, the extent of primary care that cancer patients in Ontario, specifically breast, prostate, lung and colorectal cancer patients, receive during the various stages of diagnosis and treatment of cancer.

Using the Ontario Cancer Registry and Ministry of Health and Long-Term Care Ontario Health Insurance Plan, outpatient physician contact rates were determined for groups of all incident cases of breast, prostate, colorectal and lung cancer patients diagnosed between April 1, 1993 and March 31, 2002*. Palliative care received by this group of patients who died before March 31, 2005 is also described. In addition, the role of GP/FPs in relation to place of residence was explored.

^{*} Visits for chemotherapy and radiation which did not involve a physician visit were not included in the data.

Chapter 10—List of Exhibits

Exhibit 10.1 Patients diagnosed with lung, colorectal, breast and prostate cancer between April 1, 1993 and March 31, 2002 inclusive, and deaths in these patients prior to March 31, 2005, by age, sex and Local Health Integration Network, in Ontario

Exhibit 10.2 Number of physician visits per person per year in patients diagnosed with lung, colorectal, breast and prostate cancer, between April 1, 1993 and March 31, 2002 inclusive, by diagnostic and treatment periods and physician specialty type, in Ontario

Exhibit 10.3 Proportion of physician visits in the post-treatment period in patients diagnosed with all cancers combined, between April 1, 1993 and March 31, 2002, by physician type and Local Health Integration Network, in Ontario

Exhibit 10.4 Proportion of physician visits in the palliative period in patients diagnosed with all cancers combined, between April 1, 1993 and March 31, 2002 and who died before March 31, 2005, by physician type and Local Health Integration Network, in Ontario

Exhibits and Findings

Exhibit 10.1

Patients diagnosed with lung, colorectal, breast and prostate cancer between April 1, 1993 and March 31, 2002 inclusive, and deaths in these patients prior to March 31, 2005, by age, sex and Local Health Integration Network, in Ontario

	Lung c	ancer	Colorecta	al cancer	Breast o	ancer*	Prostate	cancer
	Incidence	Mortality	Incidence	Mortality	Incidence	Mortality	Incidence	Mortality
Total number	57,080	50,934	53,615	30,632	57,166	16,890	56,248	19,699
				Proportion	of nationts	(%)		
Sex						(70)	_	
Men	59	61	53	54	0	0	100	100
Women	41	39	47	46	100	100	0	0
Age group (years)								
Under 40	1	1	2	1	6	3	< 0.5	0
40–64	33	29	30	20	50	30	26	6
65–74	36	36	32	27	23	20	42	24
75–84	22	27	26	33	15	26	23	45
85 and older	5	6	8	19	5	20	5	24
Missing age	4	1	2	1	2	1	4	1
Local Health Integration Network								
1. Erie St. Clair	6	7	6	6	6	6	6	7
2. South West	8	8	9	10	8	9	9	10
3. Waterloo Wellington	4	4	5	5	5	5	5	5
4. Hamilton Niagara								
Haldimand Brant	12	13	12	13	12	13	12	13
5. Central West	3	3	3	3	4	4	4	3
6. Mississauga Halton	5	5	6	6	7	6	6	5
7. Toronto Central	9	10	9	10	9	10	8	9
8. Central	8	8	10	9	11	9	10	9
9. Central East	11	12	11	11	11	11	12	11
10. South East	6	6	5	5	5	5	4	5
11. Champlain	10	10	9	10	10	10	9	9
12. North Simcoe Muskoka	4	4	4	4	4	4	4	4
13. North East	7	7	7	7	5	5	6	7
14. North West	2	3	2	2	2	2	2	3
Missing	5	1	3	1	3	1	5	< 0.5

* Male breast cancer cases were excluded.

©Institute for Clinical Evaluative Sciences

- More males than females developed (59% vs. 41%) and died from (61% vs. 39%) lung cancer.
- There was regional variation in incidence and mortality for all cancers across Local Health Integration Networks.
- Most patients with lung, colorectal and prostate cancer were aged 65 years and older. In contrast, the majority of breast cancer patients were younger than 65 years of age.

Primary Care in Ontario

Exhibit 10.2 Number of physician visits per person per year in patients diagnosed with lung, colorectal, breast and prostate cancer, between April 1, 1993 and March 31, 2002 inclusive, by diagnostic and treatment periods and physician specialty type, in Ontario

		Number of p	ohysician visits	per person per	year
	Pre-diagnosis = one year before peri-diagnosis period	Peri-diagnosis* = three months before diagnosis date	Active treatment = one year starting from diagnosis date	Post-treatment* = two years following active treatment	Palliative period* = three months before death**
Lung Cancer					
GP/FP	8	17	15	12	26
Oncology					
Surgery (general, thoracic and cardiothoracic)	< 0.5	3	4	2	3
Respirology (including internal medicine)	1	6	5	2	7
Medical oncology	< 0.5	1	7	2	6
Radiation oncology	0	< 0.5	4	1	3
Other physician	3	8	8	4	11
Colorectal Cancer					
GP/FP	8	14	11	10	26
Oncology					
General surgery	< 0.5	5	6	2	4
Gastroenterology (including internal medicine)	1	4	4	1	5
Medical oncology	< 0.5	< 0.5	9	2	6
Radiation oncology	0	< 0.5	1	< 0.5	1
Other physician	3	7	8	4	12
Breast Cancer					
GP/FP	7	14	10	8	27
Oncology	•			Ŭ	
General surgery	< 0.5	6	5	1	2
Medical oncology	0	< 0.5	5	2	7
Badiation oncology	0	< 0.5	4	- 1	2
Other physician	3	7	7	4	13
Brostate Cancer					
GP/FP	7	13	10	Q	27
Oncology	1	10	10	0	21
Urology	1	7	6	2	3
Medical oncology	< 0.5	< 0.5	< 0.5	< 0.5	2
Badiation oncology	0	0	3	1	2
Other physician	3	6	6	5	17
	0	Ū	Ŭ		

* Rate has been annualized for comparisons across time periods.

** Palliative care may overlap with active treatment or post-treatment periods. Deaths up to and including March 31, 2005 were included.

GP/FP = General practitioner/family physician

©Institute for Clinical Evaluative Sciences

- During the peri-diagnostic, post-treatment and palliative care periods visit rates to a general practitioner/family physician (GP/FP) were higher than to oncologists or other physicians for all four cancers.
- Although not larger than the visit rate to all oncologists combined, visit rates to GP/FPs were also very high during the active treatment period.
- Compared to the baseline pre-diagnosis rates, the annualized rate of contact with GP/FPs among cancer patients range from 75% to over 200% higher during the peri-diagnostic period, 38%–88% higher during the active treatment period, 15%–50% higher during the post-treatment (follow-up) period, and at least three times higher during the final three months of palliative care.

10



* Two-year time period starting one year after date of diagnosis.

** Lung, colorectal, breast and prostate cancer.

GP/FP = General practitioner/family physician

©Institute for Clinical Evaluative Sciences

- There was some variation across Local Health Integration Networks (LHINs) in the follow-up care of cancer patients (lung, colorectal, breast and prostate cancers combined) by general practitioner/family physicians (GP/FPs) and by oncologists.
- The proportion of care for cancer patients by GP/FPs ranged from 47% in the Hamilton Niagara Haldimand Brant LHIN to 59% in the South East LHIN.
- The highest proportion of visits to oncologists were in North West, Central West and Hamilton Niagara Haldimand Brant LHINs.
- Similar patterns were observed for each cancer individually (data not shown).



Proportion of physician visits in the palliative period* in patients diagnosed with all cancers** combined, between April 1, 1993 and March 31, 2002 and who died before March 31, 2005, by physician type and Local Health Integration Network, in Ontario



- * Final three months of life ending with date of death.
- ** Lung, colorectal, breast and prostate cancer.

GP/FP = General practitioner/family physician

©Institute for Clinical Evaluative Sciences

- There was some variation across Local Health Integration Networks (LHINs) in the palliative care of cancer patients by general practitioners/family physicians (GP/FPs) and by oncology specialists across Ontario, when lung, colorectal, breast and prostate cancers were combined. The proportion of care for palliative cancer patients by GP/FP ranged from 39% to 62% in the Central West and South East LHINs, respectively.
- The highest proportion of visits to oncologists were in the Central West, Mississauga Halton and Hamilton Niagara Haldimand Brant LHINs.
- Similar patterns were observed for each cancer individually (data not shown).

Relevance to primary care practice

This analysis of Ministry of Health and Long-Term Care Ontario Health Insurance Plan (MOHLTC-OHIP) data from 1993 to 2005 demonstrates the high burden of care created by cancer. It also highlights the continuous involvement of general practitioner/family physicians (GP/FPs) in the care of cancer patients in Ontario as patients transition through the diagnostic, therapeutic, follow-up and palliative phases of their illness. During each of these periods, compared to prediagnosis, cancer patients had increased contact rates with their primary care providers. Except during active treatment, cancer patients saw their GP/FPs more frequently than any other physician. A notable increase in physician visits, especially in the final three months of life, was also observed. Some differences in health care provision for cancer patients were seen across Local Health Integration Networks (LHINs).

GP/FPs have key roles to play in each phase of the cancer treatment cycle. It is also clear that they play an important part in the coordination of care. It is therefore essential that GP/FPs are aware of best practices in each phase and are able to access appropriate diagnostic technology and specialist oncology services, as well as have the requisite skills to provide palliative care.

With the exception of breast cancer, the majority of Ontario cancer patients are over the age of 65 years. Furthermore, as the population ages, the number of cancer patients, and the need to treat patients with multiple comorbid conditions, will increase. In cancer patients, treatment of the cancer itself can overshadow non-cancer medical issues. This could make these patients vulnerable because their diagnosis may shift attention away from important non-cancer problems and make them less likely to visit their GP/FP. Cancer patients who see both a GP/FP and an oncologist fare better as far as receiving recommended preventive care for non-cancer disorders, as well as cancer-related procedures such as surveillance colonoscopies.¹³

The defining features of primary care—continuity, coordination, and comprehensiveness—are well suited to the care of a chronic illness such as cancer. The growing body of health services research demonstrates the vital role that GP/FPs play in the care of cancer patients. In order to meet the needs associated with escalating cancer morbidity and mortality rates, increased support for GP/FPs is needed so they can thoroughly fulfill this role.

Relevance to primary care policy

The GP/FP remains an important cornerstone in the care of cancer patients. Caring for people with cancer presents unique challenges to GP/FPs due to substantial demands on physicians' time, knowledge and psychosocial resources.

With rapidly advancing changes in oncology and as GP/FPs assume increasing responsibility for cancer care, they must be supported through these challenges: by remunerating their activities appropriately; by providing funding to develop programs in knowledge translation of cancer care through medical school curriculum changes and continuing medical education; and, by providing consistent, updated diagnostic and treatment decision aids and guidelines.

Since early diagnosis is fundamental to improving outcomes, a stronger push to decrease wait times in order to ensure that patients receive timely life-saving treatment is crucial. This may in part be achieved by ensuring GP/FPs have improved, efficient access to investigative resources and specialists.

The role of GP/FPs in cancer care will likely continue to grow as clinical colleagues, the public and policy makers have increasing expectations from GP/FPs to: detect cancers earlier through screening and recognition of symptoms; provide supportive care during increasingly more aggressive treatments; manage co-morbid conditions; provide followup care to patients in remission; and, provide end of life care to palliative patients.

This issue becomes more significant for Ontario residents who do not have a family physician. With GP/FPs playing such an important role throughout cancer management from diagnosis to palliative care, the health of "orphaned" cancer patients (i.e., those without a GP/FP) may suffer. Policy makers need to ensure that there will be sufficient numbers of GP/FPs to provide this care.

Data needs

The data presented are limited to physicians reimbursed by OHIP. With well-validated shadow billings from physicians reimbursed under alternate funding payment plans, variation in contact rates according to the mechanism of reimbursement could be compared. Furthermore, these shadow billings could be incorporated with OHIP billings to strengthen the generalizability of the data presented. By ensuring that diagnostic codes are also well validated, endeavours could be untaken which might provide further insight into the details of care delivered by GP/FPs.

Future research

The data that has been presented demonstrates the profound role of GP/FPs in the care of cancer patients in Ontario and provides a strong foundation to explore further details regarding this care. These data could be further strengthened by adjusting for other illnesses and types of treatment received (e.g., surgery, chemotherapy, radiation).

Other literature has identified significant challenges faced by GP/FPs in carrying out a role in the provision of cancer care. Future research should focus on determining the average number of cancer patients in a typical family practice, and on quantifying the degree to which GP/FPs are adequately resourced and rewarded for their roles. Also the extent and distribution of barriers and challenges should be studied in greater depth than is possible through administrative data.

Using the diagnostic codes associated with each OHIP billing, the specific problems faced by cancer patients managed by GP/FPs could be examined. This information would provide insight into the extent of care that GP/FPs may provide with respect to cancer-related issues, psychosocial support, and management of comorbid illness.

Given increased public concerns regarding wait times for cancer care service, the period of time from the onset of presentation with symptoms to the primary care provider to first contact with an oncology physician, and also to the date of diagnosis, should be measured.

Geographic differences in cancer rates between LHINs should also be examined by determining rates of specific cancers across LHINs. This may help in determining appropriate resource allocation to LHINs with higher cancer rates.

The association between regular GP/FP involvement with cancer patients and emergency department visits as well as inpatient hospital admissions should also be examined. Furthermore, a detailed look at billing codes for office, home and inpatient visits would provide valuable information to determine where palliative care is delivered.



Appendix 10.A

How the research was done

Identification of cancer cohorts

The Ontario Cancer Registry (OCR) was used to identify lung, colorectal, breast and prostate cancer groups in Ontario. The OCR is responsible for gathering, processing and storing all newly diagnosed cases of cancer and is managed by Cancer Care Ontario (CCO). Included in the OCR database are all Ontario residents who have been diagnosed with cancer or have died from cancer. Although it is not required legally to report cancer incidents, the Cancer Act Ontario provides a legal mandate for CCO to compile and record the data. The OCR collects data from four major sources including: hospital discharge summaries with a diagnosis of cancer; pathology reports that identify cancer; records of patients from regional cancer centres or Princess Margaret Hospital; and/or death certificates that identify cancer as the underlying cause of death. Records are verified and the data are summarized into case records including several variables such as incident site, age at diagnosis and residence at diagnosis. The Ontario Cancer Incidence Database is updated annually, although there is a two-year lag period before the data becomes available for analysis.

All incident cancers diagnosed between April 1, 1993 and March 31, 2002, inclusive (using the variable dxdate from the OCR database) were selected. The International Classification of Diseases, Ninth Revision (ICD-9) reportable sites (listed in

Table 10.A1	ICD-9 diagnosis codes used to define lung, colorectal, breast and prostate cancer
Type of Cance	r ICD-9 code
Lung	162 (trachea, bronchus, lung)
	163 (pleura)
Colorectal	153 (colon)
	154 (rectum, rectosigmoid junction, and anus)
Breast	174 (female breast)
Prostate	185

Table 10.A1) were used to identify each cancer group (dxcode variable in the OCR database).

One record per person by first diagnosis was used. Cases were excluded if they had any previously registered cancer diagnosis, the diagnosis date was out of range, they lived out of province and/or they had an invalid encrypted health card number (IKN) in the OCR.

Within these groups, all patients who died before March 31, 2005, were identified using the Registered Persons Database (RPDB). It is recognized that this encompasses all-cause mortality and not just cancer deaths alone.

Descriptive statistics for each cancer group including proportions within each age category, gender (where applicable) and residence within a Local Health Integration Network (LHIN) were generated. All estimates were rounded to the nearest integer for presentation in exhibits. As a result, proportional distributions may not add up to 100%.

Time frame definitions

The **Index Event** is the date of diagnosis (the variable **dxdate** in the OCR database, which is the date of first diagnosis of the primary site of cancer) and the date of death (as per RPDB).

For each incident cancer patient, surrounding time frame definitions, cancer diagnosis and treatment are illustrated in Figure 10.1 (page 172).



• Palliative: three-month time period starting three months preceding the date of death.

The palliative period may overlap with active treatment and/or post-treatment periods. If a patient died partway through the active treatment or post-treatment period their rate of visits were totaled over the number of days alive in the period.

Data source and definitions of outcome variable

The RPDB was used to link each case during each time period with OHIP claims. An attempt was made to quantify the density of outpatient physician contacts among cancer patients. Therefore, all inpatient claims as well as laboratory, diagnostic radiology, anatomical pathology, microbiology, clinical biochemistry and nuclear medicine claims were excluded.

A **contact** involved one claim per day per physician. Contact with GP/FPs, oncology-related physicians and other physicians were determined as follows:

- 1) **Primary care contacts:** using OHIP fee codes, only general practitioners and family physicians were considered GP/FPs. Office, long-term care and home visits were identified.
- 2) Oncology contacts: using OHIP fee codes, oncology physicians were identified using the Institute for Clinical Evaluative Sciences (ICES) Physician Database (IPDB). Any fee code, per patient per day was considered a contact. Since chemotherapy and radiation therapy are generally covered under the global budget of the cancer centre, these visits are not captured under the oncology rates unless they involved contact with the oncologist. Oncology physicians that were included varied depending upon the specific cancer group as outlined below:

Breast cancer:	Medical oncology or haematology; Radiation oncology; General surgery
Prostate cancer:	Urology; Radiation oncology; Medical oncology or haematology
Colorectal cancer:	Medical oncology or haematology; Radiation oncology; General surgery; Gastroenterology; Internal medicine*
Lung cancer:	Medical oncology or haematology;

Radiation oncology; General surgery; thoracic surgery; Cardiothoracic surgery; Respirology; Internal medicine* Other Physician Contacts: using OHIP fee codes, one per patient per day.

For each of pre-, peri-diagnostic, active treatment, posttreatment and palliative windows, the "density" of health care contacts involving primary care, oncology and other physicians for cancer patients were generated. In order to facilitate comparisons across time periods, all rates were reported as contacts per year.

Geographic variation

Geographic variation of physician visits by specialty across Ontario was examined by exploring the proportion of visits with each type of physician across LHINs. Individual geographic information is available from ICES databases which were used to define the best known postal code for each person on July 1st of each year (available from 1991 to 2004) and thus to one of the LHINs using the Postal Code Conversion File from Statistics Canada.

Limitations

Individuals without a valid health card number were not included in the analyses because they could not be linked in the RPDB. It is assumed that the proportion of patients for whom this applied would not affect the generalizability of the results.

Physicians who are not reimbursed by OHIP were not included in this analysis. For example, some GP/FP visits that occur within Health Service Organizations, Family Health Teams or Community Care Health Centres could not be captured. Similarly, oncology physicians who are reimbursed through Alternative Payment Plans could not be included. Therefore, the contact rates are likely underestimated.

There are approximately 100 GP/oncologists in Ontario. Including these physicians should not affect the GP/FP visit rates, since prior to January 2003, most received a salary.

^{*} Internal medicine was included in colorectal and lung cancer groups in order to capture those internists who practice gastroenterology and respirology, respectively.

References

- Canadian Cancer Society/National Cancer Institute of Canada. Canadian Cancer Statistics 2005, Toronto (Canada): Canadian Cancer Society/National Cancer Institute of Canada; 2005. ISSN 0835-2976. Accessed June 5, 2006 at http://www.cancer.ca/vgn/images/portal/ cit_86751114/48/28/401594768cw_2005stats_en.pdf
- The College of Family Physicians of Canada, Canadian Medical Association, The Royal College of Physicians and Surgeons of Canada. National Physician Survey (NPS): Workforce, satisfaction and demographic statistics concerning current and future physicians in Canada. Accessed June 5, 2006 at http://www.cfpc.ca/nps/English/ home.asp
- 3. Gaudette LA, Shi F, Lipskie T, Allard P, Fainsinger RL, Maxwell D, Harlos M. Developing palliative care surveillance in Canada: results of a pilot study. *Journal of Palliative Care* 2002; 18(4):262–9.
- 4. Wood ML. Communication between cancer specialists and family doctors. *Canadian Family Physician* 1993; 39:49–57.
- McWhinney IR, Hoddinott SN, Bass MJ, Gay K, Shearer R. Role of the family physician in the care of cancer patients. *Canadian Family Physician* 1990; 36:2183–6.
- Dworkind M, Shvartzman P, Adler PS, Franco ED. Urban family physicians and the care of cancer patients. *Canadian Family Physician* 1994; 40:47–50.
- 7. Sangster JF, Gerace TM, Hoddinott SN. Family physicians' perspective of patient care at the London Regional Cancer Clinic. *Canadian Family Physician* 1987; 33:71–4.
- Gilbert R, Willan AR, Richardson S, Sellick S. Survey of family physicians: what is their role in cancer patient care? *The Canadian Journal of Oncology* 1994; 4(3):285–90.
- Wood ML, McWilliam CL. Cancer in remission: Challenge in collaboration for family physicians and oncologists. *Canadian Family Physician* 1996; 42:899–910.
- Stafford RS, Cyr PL. The impact of cancer on the physical function of the elderly and their utilization of health care. *Cancer* 1997; 80(10):1973–80.
- 11. Ko C, Chaudry S. The need for a multidisciplinary approach to cancer care. *The Journal of Surgical Research* 2002; 105(1):53–7.
- Nord C, Mykletun A, Thorsen L, Bjoro T, Fossa SD. Self-reported health and use of health care services in long-term cancer survivors. *International Journal of Cancer* 2005; 114(2):307–16.
- Earle CC, Neville BA. Under use of necessary care among cancer survivors. Cancer 2004; 101(8):1712–9.

INSIDE

Executive Summary Introduction List of Exhibits Exhibits and Findings Discussion Appendix 11.A How the research was done

References



Chapter

Characteristics of Primary Care Practice

Susan E. Schultz, MA, MSc, Joshua Tepper MD, MPH, CCFP, Astrid Guttmann, MDCM, MSc, FRCPC, and Liisa Jaakkimainen, MD, MSc, CCFP



Executive Summary

Issue

Previous studies have examined primary care in terms of the supply and utilization of general practitioners and family physicians (GP/FPs), physician turnover and training. To date, there have been few studies examining either the supply of specialists providing primary care, or the practice settings in which Ontario GP/FPs work.

Study

This chapter describes four aspects of primary care practice in Ontario:

- I. Changes in the supply of physicians providing primary care between 1993/94 and 2003/04, including GP/FPs, primary care paediatricians and obstetrician/gynecologists;
- II. Identification of various GP/FP practice venues;
- III. Characteristics of various practice venues, including physician workload and services provided; and,
- IV. Characteristics of patient populations in various practice venues.

Key Findings

- Ontario's primary care physician supply, as measured by physician to population ratios, was stable or declined slightly between 1993/94 and 2003/04.
- In 2003/04, approximately 30% of Ontario GP/FPs were purely in solo practice, with no formal group affiliations.
- Group affiliations of physicians varied by age and geographic location, but not by sex.
- Most primary care in Ontario still occurs in the context of solo practice.
- Physicians who work in walk-in or after hours clinics see a younger patient population than those in group or solo practice.
- Physicians who work in group or solo practice clinics were less likely to see patients with asthma and more likely to see patients with congestive heart failure or diabetes than those in walk-in or after hours clinics.
- Ontarians who relied on walk-in or after hours clinics for the majority of their primary care were less likely to have had either an annual exam or a flu shot in 2003/04.

Implications

- Both the supply of GP/FPs in Ontario and the aging of the GP/FP workforce remain areas of concern.
- Primary care reform in Ontario is currently focused on encouraging GP/FPs to organize into interdisciplinary groups. However, the majority of primary care still takes place in the context of solo practice and a small but not insignificant proportion of physicians and patients still provide or access primary care through other practice settings such as walk-in clinics.
- Further research is needed to explore physician and patient primary care model preferences, and to determine whether other practice models also need to be integrated into future primary care system strategies.

Introduction

The major focus of primary care reform in Ontario is the introduction of new practice structures (e.g., Family Health Groups, Family Health Networks and Family Health Teams [FHTs]) and the expansion of existing types of group practices (e.g., Community Health Centres [CHC]). Some of these models, such as FHTs and CHCs, are interprofessional groups where physicians not only work together, but also work with other primary care providers such as nurses and nurse practitioners. The purpose of these changes is to encourage comprehensive care, continuity of care and increased access, including "24/7" care. It should be noted that the end of the study period covered in this chapter is March 31, 2004. Thus, any transitions towards the new primary care models that occurred after that date would not be reflected in this study.

Most information describing general practitioner/family physician (GP/FP) practice structures in Ontario is based on survey information. For example, the 2004 National Physician Survey reported that 33% of Ontario GP/FPs practiced at least some of the time in a solo practice, 54% practiced in a group practice and 5% in a practice network.¹ In 2006, the College of Physicians and Surgeons of Ontario reported that 33% of physicians (both GP/FPs and specialists) said that they worked in a solo practice, while 56% worked in a clinical group setting.² They defined the clinical group setting as including not only shared space and staff, but also shared patient records.

One question that has not been well-addressed is whether physicians practicing in different settings—"venues", as they are called in this chapter—differ in the populations that they serve and the services that they provide. The current chapter explores this question across practice venues in Ontario.

Six venues were identified: solo practice, group practice, walk-in/after hours clinics, emergency departments, special programs (such as recruitment programs for northern physicians) and all others (which include hospital and mixed specialty groups). More information about how these venues were defined can be found in Appendix 11.A.



The chapter is divided into four sections describing some of the characteristics of primary care practice in Ontario. The first section looks at the supply of physicians providing primary care in Ontario. Because obstetrics and paediatrics are important components of primary care that are provided by some specialist physicians, this section includes information about the supply of primary care paediatricians (see Appendix 11.A for a description of how primary care paediatricians were defined) and obstetrician/gynecologists (who both provide prenatal care and attend deliveries).

The second section identifies the various practice venues of GP/FPs in Ontario using information about physicians' group affiliations from the Ontario Health Insurance Plan (OHIP) Corporate Provider Database. Then, using the OHIP database of physician billings, each provider's "main" practice venue (the venue associated with the majority of their billings) is identified.

The third section examines differences in practice characteristics between six different venues, such as average age distribution of assigned patients (see below) and the prevalence of selected chronic conditions.

The final section looks at GP/FP practice venues from the perspective of the patient population. Everyone in Ontario who visited a GP/FP in 2003/04 and for whom there was a billing in OHIP was "assigned" to the physician or the group practice where they received the majority (>50%) of their care. This section then looks for differences in the socio-demographic characteristics (e.g., age, sex, socioeconomic status) of people assigned to physicians in the different venues. The final two exhibits examine whether there was a difference in the services that patients received.

Chapter 11—List of Exhibits

I. Primary care physician supply in Ontario

Exhibit 11.1 Active primary care physicians per 10,000 population, by physician specialty and Local Health Integration Network, and for the Province of Ontario, 1993/94, 1998/99 and 2003/04

Exhibit 11.2 Supply of active general practitioner/family physicians (GP/FPs), by physician age group and sex, in Ontario, 1993/94, 1998/99 and 2003/04

Exhibit 11.3 Supply of physicians providing primary care to children, by physician specialty, age group and sex, in Ontario, 1993/94, 1998/99 and 2003/04

Exhibit 11.4 Supply of active physicians providing prenatal and obstetrical care, by physician specialty, by age and sex, in Ontario, 1993/94, 1998/99 and 2003/04

II. Practice venues of general practitioner/family physicians (GP/FPs)

Exhibit 11.5 All practice venues of general practitioner/family physicians (GP/FPs) by physician age and sex, in Ontario, 2003/04

Exhibit 11.6 All practice venues of general practitioner/family physicians (GP/FPs), by Local Health Integration Network, and for the Province of Ontario, 2003/04

Exhibit 11.7 Main practice venues of general practitioner/ family physicians (GP/FPs), by physician age and sex, in Ontario, 2003/04

Exhibit 11.8 Main practice venues of general practitioner/ family physicians (GP/FPs), by Local Health Integration Network, and for the Province of Ontario, 2003/04

III. Characteristics of general practitioner/family physician (GP/FP) practice venues

Exhibit 11.9 Average age distribution of all patients seen by general practitioner/family physicians (GP/FPs), by practice venue, in Ontario, 2003/04

Exhibit 11.10 Average proportion of assigned general practitioner/family physician (GP/FP) practice population with selected chronic conditions, by practice venue, in Ontario, 2003/04

Exhibit 11.11 Average proportion of general practitioner/ family physician (GP/FP) main practice venue visits in selected categories, by practice venue, in Ontario, 2003/04

Exhibit 11.12 Physician workload, as measured by the average number of days worked per year and patient visits per day, by general practitioner/family physician (GP/FP) main practice venue, in Ontario, 2003/04

IV. Patient characteristics of assigned practice venue

Exhibit 11.13 Overall patient assignment to general practitioner/family physicians (GP/FPs) by practice venue, in Ontario, 2003/04

Exhibit 11.14 General practitioner/family physician (GP/FP) practice venue to which patients were assigned, by patient age and sex, in Ontario, 2003/04

Exhibit 11.15 General practitioner/family physician (GP/FP) practice venue to which patients were assigned, by Local Health Integration Network, and for the Province of Ontario, 2003/04

Exhibit 11.16 General practitioner/family physician (GP/FP) practice venue to which patients were assigned, by patient neighbourhood income quintile, in Ontario, 2003/04

Exhibit 11.17 Proportion of the patient population that had an annual health exam, by age group and practice venue of assigned general practitioner/family physician (GP/FP) practice, in Ontario, 2003/04

Exhibit 11.18 Proportion of the population with at least one general practitioner/family physician (GP/FP) visit and that had a flu shot, by age group and practice venue where the majority of GP/FP care was received, in Ontario, 2003/04



Exhibits and Findings

I. Primary care physician supply in Ontario

Exhibit 11.1 Active primary care physicians per 10,000 population, by physician specialty and Local Health Integration Network, and for the Province of Ontario, 1993/94, 1998/99 and 2003/04								
Local Health Integration Network	Year	GP/FPs per 10,000 population	Primary care paediatricians per 10,000 children aged 0–17 years	OBGYNs per 10,000 women aged 15–44 years				
1. Erie St. Clair	1993/94	6.4	1.1	1.8				
	1998/99	5.7	1.3	1.7				
	2003/04	5.8	1.2	2.0				
2. South West	1993/94	8.8	1.0	1.6				
	1998/99	8.2	0.9	1.6				
	2003/04	7 9	1.1	1.7				
3. Waterloo Wellington	1993/94	7.7	1.0	1.7				
	1998/99	7.4	0.8	1.5				
	2003/04	7.5	0.9	1.8				
4. Hamilton Niagara Haldimand Brant	1993/94 1998/99 2003/04	8.2 7.4 7.4	1.6 1.4 1.5	1.9 1.8 1.8				
5. Central West	1993/94	6.4	0.8	1.2				
	1998/99	6.4	0.8	1.2				
	2003/04	5.7	1.2	1.2				
6. Mississauga Halton	1993/94	7.4	1.4	1.5				
	1998/99	7.6	1.6	1.3				
	2003/04	7.2	1.5	1.4				
7. Toronto Central	1993/94	14.9	3.9	4.1				
	1998/99	14.5	4.0	3.3				
	2003/04	14.0	4.3	2.9				
8. Central	1993/94	9.0	2.5	1.9				
	1998/99	9.1	2.6	1.9				
	2003/04	7.8	2.3	1.7				
9. Central East	1993/94	7.0	1.4	1.4				
	1998/99	7.2	1.4	1.5				
	2003/04	6.8	1.5	1.7				
10. South East	1993/94	9.6	1.7	1.5				
	1998/99	9.6	1.5	1.1				
	2003/04	10.0	1.0	0.9				
11. Champlain	1993/94	9.6	2.5	2.2				
	1998/99	10.2	2.4	2.2				
	2003/04	10.2	2.3	2.3				
12. North Simcoe Muskoka	1993/94	9.0	0.1	1.5				
	1998/99	8.9	0.2	1.0				
	2003/04	8.7	0.5	1.5				
13. North East	1993/94	7.8	0.6	1.7				
	1998/99	8.3	0.8	1.7				
	2003/04	9.0	1.0	1.5				
14. North West	1993/94	7.4	0.6	0.7				
	1998/99	8.3	0.8	1.1				
	2003/04	10.6	0.9	1.0				
All Ontario	1993/94	8.7	1.7	1.9				
	1998/99	8.7	1.7	1.8				
	2003/04	8.4	1.7	1.8				

GP/FP = General practitioner/family physician

OBGYN = Obstetrician/gynecologist

©Institute for Clinical Evaluative Sciences

Exhibit 11.1 Active primary care physicians per 10,000 population, by physician specialty and Local Health Integration Network, and for the Province of Ontario, 1993/94, 1998/99 and 2003/04 (Cont'd)

- The Toronto Central Local Health Integration Network (LHIN) had the highest number of general practitioner/family physicians (GP/FPs) per 10,000 population; primary care paediatricians per 10,000 children; and, obstetrician/gynecologists (OBGYNs) per 10,000 women.
- In 2003/04, the Toronto Central, North West, Champlain and South East LHINs all had 10 or more GP/FPs per 10,000 population.
- The Central West and Erie St. Clair LHINs had the fewest GP/FPs per 10,000 population.
- In 2003/04, in addition to the Toronto Central LHIN, the Champlain and Central LHINs had more than two primary care paediatricians per 10,000 children.
- The numbers of OBGYNs per 10,000 women were relatively stable during the study period from 1993/94 to 2003/04. There were two exceptions, the South East and Toronto Central LHINs, where the ratios declined by 40% and 30%, respectively.
- From 1993/94 to 2003/04 there was a sharp increase in the supply of GP/FPs in the North West LHIN and a modest increase in the North East LHIN.

Exhibit 11.2

Supply of active general practitioner/family physicians (GP/FPs), by physician age group and sex, in Ontario, 1993/94, 1998/99 and 2003/04

		Number of GP/FPs (head count)								
	1993	3/94	199	8/99	200)3/04				
	Number	Proportion (%)	Number	Proportion (%)	Number	Proportion (%)				
Sex										
Male	6,731	72	6,747	69	6,725	65				
Female	2,610	28	3,094	31	3,562	35				
Total	9,341	100	9,841	100	10,287	100				
Age group (years)										
Under 40	3,814	41	3,310	34	2,837	28				
40–54	3,553	38	4,339	44	4,711	46				
55–64	1,138	12	1,338	14	1,926	19				
65 and older	836	9	854	9	813	8				
Total	9,341	100	9,841	100	10,287	100				

		Number of GP/FPs (FTEs*)								
	1993	3/94	199	8/99	2003/04					
	Number	Proportion (%)	Number	Proportion (%)	Number	Proportion (%)				
Sex										
Male	6,863	77	7,038	74	6,828	71				
Female	2,061	23	2,509	26	2,772	29				
Total	8,924	100	9,547	100	9,600	100				
Age group (years)										
Under 40	3,546	40	3,079	32	2,436	25				
40–54	3,784	42	4,577	48	4,632	48				
55–64	1,079	12	1,323	14	1,915	20				
65 and older	515	6	568	6	617	6				
Total	8,924	100	9,547	100	9,600	100				

* See Appendix 11.A for a description of the calculation of full-time equivalents (FTEs).

©Institute for Clinical Evaluative Sciences

- The number of general practitioner/family physicians (GP/FPs) in active practice in Ontario rose by approximately 10% between 1993/94 and 2003/04.
- During the same period, the number of GP/FP full-time equivalents (FTEs) rose by only about 7.5%. (See Appendix 11.A for a description of the calculation of FTEs.)
- The proportion of the GP/FP workforce made up of female physicians increased over the study period.
- Over the study period, the average age of the GP/FP population increased, as shown by the decreasing proportion of GP/FPs under 40 years of age.

Exhibit 11.3

Supply of physicians providing primary care to children, by physician specialty, age group and sex, in Ontario, 1993/94, 1998/99 and 2003/04

		Number of primary care paediatricians							
	1993	/94	1998/99		2003/	'04			
	Head count	FTE*	Head count	FTE*	Head count	FTE*			
Sex									
Male	246	301	265	319	254	291			
Female	122	117	143	139	152	137			
Total	368	418	408	458	406	428			
Age group (years)									
Under 40	99	105	103	104	88	77			
40–54	163	207	177	219	174	203			
55–64	68	76	86	102	90	100			
65 and older	38	29	42	33	54	48			
Total	368	418	408	458	406	428			
Average number of children even									
for primary care during the year	54	6	510	D	747	7			
Overall average number of children seen during the year	2,00	2	2,119	9	2,11	5			

		Number of GP/FPs providing primary care to children							
	1993	3/94	1998	3/99	2003	3/04			
	Head count	FTE*	Head count	FTE*	Head count	FTE*			
Sex									
Male	6,050	6,440	6,020	6,517	6,088	6,343			
Female	2,278	1,883	2,669	2,254	3,049	2,474			
Total	8,328	8,323	8,689	8,771	9,137	8,817			
Age group (years)									
Under 40	3,542	3,391	3,022	2,877	2,612	2,284			
40–54	3,234	3,546	3,930	4,256	4,225	4,275			
55–64	972	964	1,130	1,173	1,672	1,735			
65 and older	580	422	607	465	628	523			
Total	8,328	8,323	8,689	8,771	9,137	8,817			
Average number of children seen during the year	52	20	50)7	46	2			

* See Appendix 11.A for a description of the calculation of full-time equivalents (FTEs).

©Institute for Clinical Evaluative Sciences

- Although the number of paediatricians providing preventive primary care to children increased during the study period from 1993/94 to 2003/04, this group represented a smaller proportion of all paediatricians in 2003/04 compared to 1993/94 (48% and 55%, respectively—data not shown).
- The number of general practitioner/family physicians (GP/FPs) providing care to children rose during the study period, but the proportion of all GP/FPs providing primary care to children remained the same (89%—data not shown).
- The average number of children seen by paediatricians for primary care increased by over 35%, although the overall average number of children seen remained similar, meaning that paediatricians are providing primary care to an increasing proportion of their patients.
- Between 1993/94 and 2003/04, the average annual number of children seen by GP/FPs declined.

Exhibit 11.4

Supply of active physicians providing prenatal and obstetrical care, by physician specialty, by age and sex, in Ontario, 1993/94, 1998/99 and 2003/04

	Numb	er of OBG	YNs providing	Average number of deliveries/physician						
	1993/	/94	1998/	1998/99		2003/04		All OBGYNs doing deliveries		
	Head count	FTE*	Head count	FTE*	Head count	FTE*	1993/94	1998/99	2003/04	
Sex										
Male	376	409	329	360	295	331	208	210	227	
Female	109	109	134	133	188	181	211	193	205	
Total	485	518	463	494	483	512	209	205	219	
Age group (years)										
Under 40	143	159	127	134	128	123	241	217	213	
40–54	185	210	196	227	243	280	230	233	249	
55–64	116	119	105	109	79	82	195	189	176	
65 and older	41	30	35	25	33	27	72	92	139	
Total	485	518	463	494	483	512	209	205	219	

	Num	ber of GP/F	Ps providing	Average number of deliveries/physician						
	1993	/94	1998/99		2003/04		All GP/FPs doing deliveries			
	Head count	FTE*	Head count	FTE*	Head count	FTE*	1993/94	1998/99	2003/04	
Sex										
Male	1,910	2,254	1,345	1,591	925	1,036	15	16	17	
Female	684	647	622	580	530	468	22	22	21	
Total	2,594	2,901	1,967	2,172	1,455	1,503	17	17	18	
Age group (years)										
Under 40	1,195	1,277	724	745	442	395	17	17	17	
40–54	1,082	1,285	970	1,124	767	827	17	18	19	
55–64	232	253	212	241	211	244	19	15	15	
65 and older	85	86	61	62	35	38	11	19	34	
Total	2,594	2,901	1,967	2,172	1,455	1,503	17	17	18	

* See Appendix 11.A for a description of the calculation of full-time equivalents (FTEs).

GP/FP = General practitioner/family physician

OBGYN = Obstetrician/gynecologist

©Institute for Clinical Evaluative Sciences

- The number of obstetrician/gynecologists (OBGYNs) providing both prenatal care and deliveries, as well as the average number of deliveries per OBGYN, declined in the mid-1990s and then rose after 1998/99.
- The number of general practitioner/family physicians (GP/FPs) providing both prenatal care and deliveries declined by 44% between 1993/94 and 2003/04, although the average number of deliveries (by those who did them) remained stable.
- Comparing the total number of GP/FPs providing prenatal care and deliveries to the total number of GP/FPs (see Exhibit 11.2), in 1993/94, 28% of GP/FPs performed at least one delivery during the year. In 2003/04, only 14% of GP/FPs performed at least one delivery during the year.

II. Practice venues of general practitioner/family physicians (GP/FPs)



* Physicians may belong to more than one venue group at a time, thus the totals will not sum to 100%. See Appendix 11.A for venue definitions.

©Institute for Clinical Evaluative Sciences

- In 2003/04, the proportion of general practitioner/family physicians (GP/FPs) practicing in multiple venues was highest among physicians under 40 years of age and decreased with age.
- The type and number of venues where a physician practiced was strongly related to age, and less so to sex. For example:
 - The proportion who did not belong to a group and were only in solo practice was less than 20% for physicians under 40 years of age, but was more than three times higher in the oldest age group;
 - > Conversely, the proportion in group practice declined with age; and,
 - Emergency department (ED) participation declined with age, and male physicians were more likely to work in the ED than female physicians in all age groups.





- In 2003/04, the North West LHIN had the highest proportion of GP/FPs in group practice (87%), emergency department (67%), special program including locums (28%), or other practice venues (33%).
- The Mississauga Halton LHIN had the highest proportion of GP/FPs practicing in a walk-in/after hours clinic (43%).



* See Appendix 11.A for venue definitions, and for how physicians' main practice venue was determined.

©Institute for Clinical Evaluative Sciences

- In 2003/04, solo practice was the main practice venue for the majority of general practitioner/family physicians (GP/FPs). This proportion increased with GP/FP age and there was little difference between male and female GP/FPs.
- The proportion of GP/FPs whose main practice venue was a group practice varied slightly with age.
- As GP/FP age increased, the proportion whose main practice venue was the emergency department (ED), walk-in/after hours clinic, special program or other practice setting decreased.
- In almost all age groups, male GP/FPs were twice as likely as female GP/FPs to have an ED as their main practice venue in 2003/04.



See Appendix 11.A for venue definitions, and for

information on how physicians' main practice venue was determined.

©Institute for Clinical Evaluative Sciences

- In Ontario as a whole, approximately 70% of general practitioner/family physicians (GP/FPs) were still mainly in solo practice in 2003/04.
- There was marked variation by Local Health Integration Network (LHIN) in the main practice venues of GP/FPs.
- The North West LHIN had the lowest proportion of GP/FPs whose main practice venue was a solo practice and the highest proportion of GP/FPs whose main practice venue was a group practice, emergency department or special program.
- Special programs, which include incentive programs for rural and northern physicians, involved a significant proportion of physicians in the North West and North East LHINs.
- The Toronto Central LHIN had the highest proportion of GP/FPs whose main practice venue was "other", which includes hospital-based and other mixed specialty groups.

III. Characteristics of general practitioner/family physician (GP/FP) practice venues







- * Patients were "assigned" to physicians using the majority rule—their assigned physician was the GP/FP or group practice from whom they received more than 50% of their primary care.
- ** See Appendix 11.A for venue definitions.

©Institute for Clinical Evaluative Sciences

- The proportions of assigned patients with asthma, congestive heart failure (CHF) or diabetes mellitus (DM) was similar between solo and group practices.
- General practitioner/family physicians (GP/FPs) in solo or group practice had a much higher proportion of their assigned patient populations with CHF or DM than physicians whose main practice venue was a walk-in/after hours clinic.
- However, GP/FPs whose main practice venue was a walk-in/after hours clinic had a higher proportion of their patients with asthma.



Type of service

* See Appendix 11.A for venue definitions.

©Institute for Clinical Evaluative Sciences

🔻 Findings

- General practitioner/family physicians (GP/FPs) who were mainly in solo practice provided substantially more primary mental health and psychotherapy services (as a proportion of the total patient visits in their main venue) compared to GP/FPs whose main practice venue was either a group practice or a walk-in/after hours clinic.
- The amount of educational counselling provided by GP/FPs, as a proportion of their total main venue billings, was similar regardless of main practice venue.
- The proportion of services provided in the GP/FPs main venue that were specialized services was highest for those with a main venue of solo practice, followed by group practice and then by walk-in/after hours clinics.



- General practitioners and family physicians (GP/FPs) in group practice worked the greatest number of days per year on average.
- Physicians in walk-in/after hours clinics worked approximately 30% fewer days per year, on average, than those in group or solo practice, but they saw the most patients per day.

IV. Patient characteristics of assigned practice venue



- * Patients were "assigned" to physicians using the majority rule—their assigned physician was the GP/FP or group practice from whom they received more than 50% of their primary care.
- ** See Appendix 11.A for venue definitions.

©Institute for Clinical Evaluative Sciences

- In 2003/04, just over half of Ontarians (53%) received the majority of their primary care from a general practitioner/ family physician (GP/FP) in solo practice; 17% received their care from GP/FPs in group practice.
- Approximately 22% received their primary care from multiple GP/FPs and could not be assigned to a single practice.
- In Ontario, 3% of people saw an emergency department GP/FP and 4% saw a walk-in/after hours clinic GP/FP, for the majority of their primary care.



* See Appendix 11.A for venue definitions.

** Patients were "assigned" to physicians or practices using the majority rule—their assigned physician was the GP/FP or a group practice from whom they received more than 50% of their primary care.

©Institute for Clinical Evaluative Sciences

- For both men and women and across all age groups, most people saw a solo practice general practitioner/family physician (GP/FP) in 2003/04 for the majority of their primary care.
- There were no gender differences in the proportion of people who received the majority of their primary care from GP/FPs in group practice. Patients 40 years and over were slightly more likely to be assigned to a group practice than those under 40 years of age.
- Over 20% of men and women, aged one to thirty-nine years, saw multiple physicians and could not be assigned to a single physician or practice.
- Ontarians between the ages of one and thirty-nine years were also the most likely to access the majority of their care from walk-in/after hours clinics or emergency departments.

Exhibit 11.15 General practitioner/family physician (GP/FP) practice venue* to which patients were assigned**, by Local Health Integration Network, and for the Province of Ontario, 2003/04



^{*} See Appendix 11.A for other venue definitions.

** Patients were "assigned" to physicians or practices using the majority rule—their assigned physician was the GP/FP from whom they received more than 50% of their primary care.

©Institute for Clinical Evaluative Sciences

- One in five Ontarians who saw a general practitioner/family physician (GP/FP) in 2003/04 visited multiple physicians and could not be assigned to an individual physician or practice.
- Individuals in the North West Local Health Integration Network (LHIN) were the most likely to be assigned to a group practice. Those in the Erie St. Clair LHIN were the least likely.
- The North West and North East LHINs had the highest proportion of patients receiving the majority of their GP/FP care from the emergency department.



- * See Appendix 11.A for venue definitions.
- ** Patients were "assigned" to physicians or practices using the majority rule—their assigned physician was the GP/FP from whom they received more than 50% of their primary care.
- *** See Appendix 11.A for a description of neighbourhood income quintile calculation.

©Institute for Clinical Evaluative Sciences

- There was not a strong relationship between patient neighbourhood income quintile and the practice venue of the general practitioner/family physician (GP/FP) or practice from which patients received the majority of their care (to whom they were "assigned").
- As neighbourhood income increased, there was a slight decrease in the proportion of patients assigned to solo practice GP/FPs, and to those patients assigned to GP/FPs who worked in the emergency department.
- There was a very slight increase in the proportion of patients assigned to walk-in clinics or who could not be assigned to a single GP/FP or practice as neighbouhood income increased.





* See Appendix 11.A for venue definitions.

** Patients were "assigned" to physicians or practices using the majority rule—their assigned physician was the GP/FP from whom they received more than 50% of their primary care.

©Institute for Clinical Evaluative Sciences

- The proportion of patients who received annual health exams in 2003/04 was similar among those assigned to general practitioner/family physicians in either solo or group practices.
- The proportion of patients assigned to walk-in/after hours clinics who received annual health exams was lower compared to those assigned to solo or group practices, for all ages except those over 80 years old. In the 80 years and older age group, the walk-in/after hours clinic proportion was slightly higher than for the other two venues.


* See Appendix 11.A for venue definitions.

©Institute for Clinical Evaluative Sciences

V Findings

- Individuals under the age of 80 years old were more likely to have received a flu shot in 2003/04 if their assigned physician's practice venue was solo or group, compared with a walk-in/after hours clinic.
- Adults aged 65 years and older assigned to physicians in group practice were slightly more likely than those assigned to solo practice physicians to have received a flu shot in 2003/04.
- Less than two-thirds of Ontarians aged 65 years and over who visited a GP/FP in 2003/04 received a flu shot.

Discussion Supply of primary care physicians in Ontario

Between 1993/94 and 2003/04, absolute numbers of primary care physicians, including general practitioners and family physicians (GP/FPs), obstetrician/gynecologists (OBGYNs) providing both prenatal and delivery care, and primary care paediatricians, increased. However, in the case of GP/FPs and OBGYNs this increase did not keep pace with the growth of the population and resulted in an overall decline in supply as measured by the number of physicians per population.

Although the supply of primary care physicians in Ontario as a whole was either stable or declined over the study period, there was considerable geographic variation. For example, in areas where there have been concerted government policy initiatives to recruit and retain physicians, such as Northern Ontario, there were noticeable increases in GP/FP supply. Other areas saw significant declines (e.g., the number of OBGYNs per 10,000 women aged 15–44 in Toronto). As other recent studies have shown, physician to population ratios are dynamic and are influenced both by factors that affect the number of physicians such as turnover³ and by population trends such as the migration of young families.

The results shown in Exhibits 11.2–11.4 also seem to suggest a slow shift of certain services away from GP/FPs and towards specialist primary care providers-for example, the continuing decline in the number of GP/FPs who do obstetrics, and the smaller but also steady shift in paediatric primary care towards paediatricians. The number of GP/FPs providing both prenatal care and deliveries dropped by 40% during the study period, although the average number of deliveries per year by GP/FPs who do them remained constant. In the case of primary care for children, the number of GP/FPs with children in their practice increased, but the average number of children seen declined. In both cases, there was a corresponding increase in services provided by OBGYNs and paediatricians, respectively. Services provided by midwives also increased but these data were not available for the current chapter. All of this may be a result of the aging of the population and the growing demand for GP/FP services by older adults with complex chronic conditions (highlighted in chapter 4 of this Atlas).

Practice venues of general practitioners and family physicians (GP/FPs)

One of the interesting findings in this chapter is the fact that it was not uncommon for GP/FPs to be affiliated with a variety of groups and to work in a number of different venues. The overall number of practice settings in which GP/FPs worked varied significantly with physician age, with younger physicians working in more settings than older ones. This may, in part, be a reflection of the life-course of a family physician's practice—when physicians are first starting out they may spend some time working in a variety of venues before settling down and building their own practice. For example, it has been said that working in the emergency department (ED), with its often hectic pace, is a "young physician's game". These data provide some support for that view.

The results may also be evidence of a group effect with a general shift in the practice of primary care medicine from individual solo practice to a more collaborative approach. Such a change has been encouraged by the introduction of new initiatives that promote group practice and interdisciplinary care⁴—initiatives that may be more accessible to physicians at the beginning of their careers rather than those nearing retirement.

There was also geographic variation in the practice settings in which GP/FPs worked. For example, in the northern Local Health Integration Networks (LHINs), a substantial proportion of GP/FPs were part of special recruitment or retention programs. The fact that this proportion was so high is evidence of both the success and the importance of these programs in ensuring an adequate supply of primary care physicians in the North. Other areas, such as LHINs in the central part of the Province, had a greater proportion of physicians affiliated with walk-in and after hours clinics. These types of clinics need a large potential catchment population because their patient populations are not stable. Their catchment population also needs to be relatively young because the role of these clinics is to provide service for acute, non-emergency conditions such as respiratory illnesses and minor trauma, which are more common among children and young adults.

With respect to where physicians provided the majority of their primary care, the findings show that in spite of all the different group practice affiliations physicians have, solo practice still dominated. In 2003/04, almost two-thirds of all GP/FPs still provided more than half of their care outside of any group arrangement and the proporation in solo practice increased with physician age.

An ongoing and quite contentious issue regarding the provision of primary care is the role of walk-in and after hours clinics. A study conducted in Ontario in 1997 compared walk-in clinics with EDs and "regular" family practices across a variety of measures.^{5–7, 11} The published results of that study generated controversy^{8–11} that was centred around two issues: first, the role of such clinics in the provision of primary care and second, the quality of care provided. Focus groups of physicians revealed that physicians who work in walk-in clinics believe that they are filling a

necessary gap in service provision while also lessening pressure on EDs.¹¹ Physicians who work in the other two venues, on the other hand, felt that walk-in clinic physicians were primarily concerned with maximizing their income by seeing patients with simple ailments who can be treated quickly and easily. The focus group of ED physicians also mentioned the duplication created when walk-in clinic physicians referred patients to the ED. The current study provides some information on the role of walk-in/after hours clinics but does not address the question of quality of care.

In this study, physicians whose main practice venues were solo practice, group practice and walk-in/after hours clinics were compared on a number of measures. There was little difference between solo and group practice physicians, but there were some noticeable differences between these two and walk-in clinic physicians. Physicians who worked mainly in walk-in/after hours clinics worked fewer days per year but saw slightly more patients per day. Their patients were younger, on average, and were more likely to have conditions such as asthma rather than chronic conditions like diabetes mellitus (DM) or congestive heart failure (CHF). In fact this suggests that walk-in/after hours clinics may be fulfilling the role described above-that of a non-ED alternative where people can seek help for acute conditions outside of office hours. People with asthma are prone to experiencing acute and sub-acute exacerbations that may be managed outside of an ED setting and these clinics may provide timely access to care. Long-term chronic conditions such as CHF and DM, however, are more amenable to scheduled visits during regular office hours.

Interestingly, approximately 4% of all Ontarians who saw a physician during 2003/04, and 5–6% of those one to thirty-nine years of age, got the majority of their care from walk-in clinics. Another 5% or so of those one to thirty-nine years of age relied on the ED for their care. Individuals who received the majority of their GP/FP care through walk-in/after hours clinics were less likely to have had an annual health exam or flu shot from any provider. This is somewhat worrisome, as it may indicate a lack of regular care and a lack of continuity of care.

Regarding the services provided in the three venue noted above, a higher proportion of GP/FPs in solo practice provided primary mental health care and psychotherapy than those in either group or walk-in/after hours clinic practices. One reason for this is that the solo practice category includes a number of GP/FP-psychotherapists. These are GP/FPs who have focused their practice almost entirely on mental health care. This tendency to focus practice on one specific area is a growing trend among GP/FPs. In fact, the 2004 National Physician Survey (NPS) estimated that only 31.2% of GP/FPs practices have more than 40% of their time dedicated to providing family medicine care.¹ Physicians with such focused interests are rarely part of a group practice. In addition, group practice physicians may work alongside a social worker or psychologist who would also provide these services to the patients in the group.

Whereas chapter 4 examined, in general terms, whether Ontario adults received their physician care from GP/FPs or specialists, the current chapter looked at the type of physician practice venues where Ontarians received the majority of their GP/FP care. As one might expect, the highest proportion of Ontarians in any age group received the majority of their care from physicians in solo practice. Most of the variance in where people received the majority of their care was in the proportion who could not be assigned to an individual physician or practice. This group often visits a number of physicians so a single "assigned" provider cannot be determined. The proportion of the population in this group varied by age and across LHINs. Reassuringly, there was little relationship between socioeconomic status (SES) as measured by neighbourhood income quintile and assigned physician practice venue. Individuals in the lowest SES group were slightly more likely to see a physician in solo practice or in the ED, but the differences were very small.

Implications for primary care practice

In 2003/04, solo practice was still the main venue for GP/FP care in Ontario. However, the impact of primary care reform can be seen in the inverse relationship between the proportion of GP/FPs in group practice and physician age group. It is easier for younger physicians, just beginning their careers, to adopt one of the new primary care models than for solo physicians with long-established practices to do so.

When looking at physician workload, as measured by either the number of days worked per year or the average number of patient visits per day, there does not seem to be a big difference between solo and group practice. This suggests that moving from solo to group practices should not have a large impact on access. However, because many of the new Family Health Groups did not start up until part-way through the study year, the data used in this study are insufficient to fully examine the impact of this new model. This will need to be examined in a future study.

Implications for primary care policy

This study reiterated the finding that the supply of GP/FPs in Ontario has not kept pace with growth in the population.¹² However, it should be noted that the numbers shown here do not reflect new initiatives in this area, such as the opening of the Northern Ontario School of Medicine and other efforts to train more physicians—the impact of which will be felt over the next several years.

For primary care practice venues, current policy in Ontario is focused mainly on encouraging the formation of group and interdisciplinary primary care practices, called Family Health Teams.¹³ However, there may continue to be a role for other practice models and venues as well, including solo practice, EDs and walk-in clinics. Primary care policy should strive for a system that integrates various models. It is also important to remember that uncomplicated obstetrics and the primary care provided by paediatricians to children are also important and expanding components of a comprehensive primary care system.

It is current policy to discourage the formation of walk-in/ after hours clinics—by restricting the availability of new billing numbers—in an effort to maximize the number of physicians available for comprehensive primary care. It may be time to rethink this policy, given the continued proliferation of these clinics. This study was only able to discern differences in practice population and practice patterns for "official" clinics. If all such clinics could be identified in the administrative data, it would allow for better understanding of their ongoing role of primary care provision with the system.

Limitations

There are a number of limitations to this study, most of which are related to the ongoing challenge of identifying and discriminating practice types. For ease of analysis and interpretation, the many GP/FP practice types have been grouped into six "venues". It should be remembered, however, that all these venues are quite heterogeneous. For example, not all group practices function the same way. Many physicians in designated group practices share overhead costs and may even share charts, but do not meet to discuss patients and do not really share patient care.¹⁴ The 2004 National Physician Survey (NPS) found that 66.6% of GP/FPs shared office space, and 56.9% shared patient records.¹ However, interactions with respect to patient care were not well described in the NPS and could not be determined with certainty from the administrative data available.

The Ontario Ministry of Health and Long-Term Care (MOHLTC) began issuing group billing numbers for walk-in and after hours clinics in 1984, as a way to encourage physicians to provide urgent care outside regular office hours and reduce pressure on EDs. However, in the past decade or so, fewer walk-in clinic billing numbers have been issued because the current primary care reform strategy encourages patients to see their own physician after hours. Thus, many of the newer walk-in clinics in operation across the Province cannot be identified as such in the administrative data. The walk-in/ after hours clinics group in this study comprises only those that are recognized accordingly by the Ontario Health Insurance Plan (OHIP).

"Main venue" is based on physicians' OHIP billings, either actual or shadow billings. If physicians work in multiple settings, for example salaried in some and billing fee-for service in others, the database might only contain the billings from their fee-for-service venue and so this would be identified as their "main practice venue". This is a problem primarily for physicians working in Community Health Centres (CHCs), Health Service Organizations (HSOs), as well as other venues. Because this is a very small proportion of the total GP/FP pool (less than one percent of all GP/FPs), it will not affect any overall estimates. However, Hamilton, Kitchener-Waterloo and Sault Ste. Marie contain large HSOs so results from the LHINs where these cities are located should be interpreted with caution.

Areas for further research

- Time and space did not permit analysis of the trend among family physicians towards subspecialization. An increasing number of GP/FPs are limiting their practices to areas such as psychotherapy, sports medicine, weight management, etc. Future research should examine this trend and its impact on physician supply.
- Further work is needed to assess the quality of primary care provided and the populations cared for by GP/FPs working in different practice settings. This should include GP/FPs participating in alternative funding programs such as HSOs and CHCs. Previous work in Ontario found that fee-forservice physicians performed a lower proportion of preventive care manoeuvers with high levels of evidence and a higher proportion of manoeuvers with little evidence than capitated/salaried physicians and that the same was true for physicians in group practice compared with those in solo practice.⁵ In comparing the quality of care for common acute conditions, quality scores were higher in walk-in clinics and EDs than in family practices (group practices).¹⁵
- More work is also needed to determine the factors influencing physician and patient preferences to either provide or access primary care through walk-in clinics and EDs.



Appendix 11.A

How the research was done

Data sources

Information about individual physician specialties, age, sex and practice location was obtained from the Institute for Clinical Evaluative Sciences (ICES) Physician Database (IPDB), which is constructed using physician information from several sources. Additional IPDB variables relating to practice characteristics are derived from analysis of physicians' OHIP billings. The first is the Ontario Health Insurance Plan (OHIP) Corporate Provider Database (CPDB) which maintains information about all health care providers eligible to bill OHIP. The second source is the Ontario Physician Human Resources Data Centre (OPHRDC), which has a mandate to monitor the supply of physicians in the Province. OPHRDC surveys physicians on a two-year cycle, confirming practice specialty, practice location and other basic information.

Physician practice affiliation information also comes from the CPDB, which maintains a running log of registered groups that are eligible to receive payments from OHIP and the physicians who are affiliated with each group. Each group is then classified into one of three larger categories: group type, group classification and group sub-classification. For the purposes of this study, further aggregation was done to arrive at the six practice "venues" used here: solo practice, group practice, walk-in or after hours clinics, emergency departments (EDs), special programs and other.

Methods

In this chapter, physicians and patients were "assigned" to a "main venue" for primary care. This was done using general practitioner/family physician (GP/FP) OHIP billings. Every time a physician provides a service to a patient, he or she submits a "billing" or "claim" to OHIP. This billing includes the patient's health card number, the physician's billing number and the billing number of the group, where applicable. All of these numbers are scrambled so that individuals cannot be identified. Assignment is done by linking physicians, groups and patients. One exception to this is Family Health Groups (FHGs). Group billing numbers are not included in billings made by physicians who are part of FHGs. However, because patients can be formally rostered to FHGs, it was assumed that any encounter between a patient and the physician to whom he or she was rostered took place in the context of the FHG with which the physician was affiliated.

Assigning physicians to a "main practice venue"

When a physician performs a service as part of a group practice, the OHIP billing for that service includes both the billing number of the physician and the billing number of the group. Using these billing numbers, as well as information describing the different types of groups and the venue definitions outlined below, patient visits were allocated to one of the six venues. The venue to which more than 50% of a physician's patient visits were allocated was identified as their "main practice venue". There were 240 physicians for whom a main practice venue could not be assigned using the majority rule (more than 50%)—for these, the plurality rule (the venue that had the greatest percentage of patient visits) was used instead.

Assigning patients to physicians

Using the OHIP physician billings database, each visit made by an individual to a GP/FP during the year was allocated to either an individual physician (if there was no group number in the OHIP billing) or a group practice (if a group number was present). The patient was "assigned" to the physician or practice to which they made more than 50% of their visits. Approximately 22% of patients could not be assigned.

Calculation of physician full-time equivalent (FTE)

The full-time equivalent (FTE) measure adjusts the head count upwards or downwards depending on whether or not the GP/FP appears to have a heavier or lighter workload than his or her peers.

First, the total price-adjusted billing is calculated for each physician. ICES maintains a master price file, updated yearly, which has a standard price for each fee code in the OHIP schedule of benefits. In most instances, the standard price equals the total services billed for that service divided by the total number of services. (Manual adjustments are made to some of these prices, however, if a fee code represents a renumbering, splitting or bundling of a previous fee code or set of fee codes.) Then, for each service billed or shadow billed, the price-adjusted billings for that service, equal to the number of services billed (usually one) times the standard price, was calculated. Then, for each physician, the sum of all price-adjusted billings was determined.

The advantage of using price-adjusted billings is that they allow for estimating the overall output of physician services by a physician, independent of price changes from year to year. Furthermore, they allow for comparing the output of physician services between physicians who are fee-for-service and those who are shadow billing.

A modified version of the formula developed by Health Canada and used by the Canadian Institute for Health Information was used to estimate FTEs. This modified formula is described as follows:

- 1 if price adjusted billings are between the 40th and 60th percentile
- **1+log (B/B₆₀)** if price-adjusted billings (B) are above the 60th percentile for the physician's specialty (B₆₀)

Definitions

Congestive Heart Failure (CHF)

An algorithm developed at ICES was used to identify people in Ontario newly diagnosed (incident cases) with CHF in fiscal year 2002/03. In this algorithm, an individual is identified as having CHF if they had either one hospitalization record in the Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD) with a diagnosis of CHF or one OHIP physician visit billing which was followed within two years by another OHIP billing or a CIHI record. CIHI data are available from 1988 and OHIP data from 1991. A case is considered incident if it is the first occurrence in the available data that fits the above criteria. Incident cases are counted from 1994, prevalent cases from 1992. After being identified as incident, a case is considered prevalent in that year and all subsequent years in which the individual had at least one contact with the health care system.

Venue definitions

The venues defined in this chapter were based on affiliations that physicians had with groups that had been assigned billing numbers for payment purposes, by the Ontario Ministry of Health and Long-Term Care. Physician groups were initially categorized into one of 11 venues, which were then further aggregated to six. Physician groups that were not formalized, and that had not been assigned a group billing number, could not be identified in the administrative databases available for this study.

Solo practice

Physicians were defined as "solo practice only" if they had no active group affiliations during the study period. When identifying a physician's main practice venue, OHIP billings with no group number were assumed to be solo practice billings. An exception to this was Family Health Network and Family Health Group billings, where the group practice type of a physician-patient encounter was to be inferred using a separate database of physician-patient rosters.

Group practice

Physicians work in many different types of groups. The group practices defined as such in this study were: those designated as private medical groups; clinic groups and salaried physician groups funded through alternative payment plans; primary care network groups; and, health service organizations (HSOs) and community health centres (CHCs). Hospital groups and groups that are defined as mixed specialty groups were excluded from this definition.

Emergency department groups

This included groups identified as "emergency services", or "sessional fees". The latter are fees paid to on-call physicians in hospital emergency departments in rural and remote parts of the Province.

Walk-in and after hours clinics

Walk-in and after hours clinics were identified as such in the data. However, this category is not comprehensive since few, if any, new walk-in clinic billing numbers have been available in recent years. One reason for this may be because primary care reform efforts are focused on ensuring that patients can obtain care during evenings and weekends from the physician or practice to which they are rostered. Newer walk-in clinics may be identified as regular group practices, or are not identified as formal groups at all, with the physicians billing as if they were in solo practice.

Special program

"Special program" refers to physician recruitment and retention programs such as the Northern Group Funding Program (NGFP), Community Sponsored Contracts (CSC), Underserviced Areas Program (UAP) and locum program for rural and northern physicians.

Other

This category included all other types of groups that GP/FPs are affiliated with, which are not mentioned above. Most of these are associated with hospitals, diagnostic facilities or laboratories. Others are mixed-specialty groups.

Table 11.1 Venue definitions used to categorize physician groups

The venues defined in this Atlas were based on affiliations that physicians had with groups that were recognized and assigned billing numbers by the Ministry of Health and Long-Term Care (MOHLTC) for payment purposes. There are many types of group arrangements, which are described using one or more of the following variables: "group type", "org class" and "sub class". For the purposes of this study, inferences about the nature of each physician group were made based on the combination of descriptors assigned to it. The table below outlines these combinations. Groups may be assigned one, two or all three descriptors. The venue 'solo practice' is not described below because it is, by definition, not a group.

	Descriptor variable (code-description)						
Venue grouping	Org_class	Group type	Sub-Class				
Group practice		R00-General practice P97-Private group, exception to current policy					
	PMG — Private medical group	P00-General practitioners (GPs) P40-Chronic care—private P46-Private practice GP/specialty P97-Private group, exception to current policy					
	 Alternative payment plan (APP) — APP Group 	Z99-APP Misc	217-Clinic with practitioners 218-Globally funded group practice				
	PCN-Primary care network	P00-GPs	FHN—Family health network FHG—Family health group				
	PCN-Primary care network	P00-GPs	SMO-SEAMO				
	PCN-Primary care network	C01-Primary care agency	PCG-Primary care group				
	 PMG—Private medical group 	P98-HSO Health Service Organization P99-CHC—Community Health Centre					
Emergency		R12-Emergency services					
department	APP-APP Group	Z99-APP Misc	216-Sessionals				
Walk-in/ after hours clinics	 PMG—Private medical group 	P90-Student/University health services P95-Walk-in clinics P96-After hours clinic					
Special program		P49-Locum program for rural physician P50-UAP-Outreach P52-APP CSC P53-APP GFGP/NGFP P54-APP MSC					
Other	 AGR—Academic Health Science Group APP—APP Group 	A00-APP Group					
	• APP—APP Group	A01-Anesthesia APP A18-Neurology A19-Psychiatry A20-Obstetrics/Gynecology APP A26-Paediatrics A40-Palliative care Z34-Radiation Onc APP A81-Intensive/Critical Care D73-Pulmonary function R26-Paediatrics R34-Rad Onc R01-Anaesthesia					

Table 11.1	Venues definitions used to categorize physician groups (Cont'd)								
	Descriptor variable (code-description)								
Venue grouping	Org_class	Group type	Sub-Class						
Other (Cont'd)	 IHF—Independent health facility 		200-Diagnostic						
	LAB-Laboratory	P44-Licenced laboratory medicine							
	PDF-Private diagnostic facility								
		Z01-Abortion							
	PMG—Private medical group	P20-OB/GYN P23-Ophthalmologists P42-Specialists (mixed) P60-Cardiology							
	• HAM—Hospital Associate Medical Group	H04 H09 H13 H19 H21 H23 H50 H66 H80							
	HDG-Hospital Departmental Group								
	• HAM—Hospital Associate Medical Group	R01-Anaesthesia R02-Dermatology R04-Neurosurg R06-Ortho surg R08-Plastic surg R09-Cardio/thoracic surg R13-Internal med R19-Psychiatry R20-Ob/Gyn R21-Perinatal R23-Ophthalmology R31-Physical med/rehab R33-Radiology R34-Rad onc R40-Chronic care - hosp R60-Cardiology R80-Mixed spec group R81-Intensive/critical care R96-Palliative care R97-Hospital group							
	• IHF-Independent health facilities		201 – Ambulatory						
		Q01 Q02							

Physician visit

For the purposes of this analysis, a visit was defined as one physician billing per person per physician per location per day.

Primary care paediatrician

General paediatricians were identified using the "mainspecialty" variable in the IPDB. In order to keep the OPHRDC up-to-date, practice specialty, practice address and active practice status are confirmed through telephone contact to all physicians in Ontario at least once every two years. The mainspecialty variable is the physician's self-reported practice specialty. This group will not include other subspecialists in other fields whose practice has a paediatric focus, such as paediatric respirologists, paediatric endocrinologists, etc. In such cases the physician's mainspecialty would be listed as respirology or endocrinology.

A paediatrician was deemed to be providing primary care if he or she had at least 10 billings during the year for the following services:

Annual health exams—fee codes K267, K269, K017

Annual health exams—fee codes A007 or A003 with diagnosis code 916 (well-baby care) or 917 (annual health exam, child after second birthday) (fee codes usually billed by GP/FPs)

Immunization—OHIP fee codes G538, G539, G590, G591

Because this definition focuses on primary preventive care rather than acute care, there may be some underestimation of the absolute number of children receiving primary care from a paediatrician, but this is unavoidable due to overlap in fee codes for other primary and consulting office visits.

GP/FP providing primary care to children

To be consistent with the primary care paediatrician definition outlined above, a threshold of 10 visits by children was set for a GP/FP to be classified as providing primary care to children.

Neighbourhood income quintiles

Neighbourhood income is calculated by Statistics Canada and is updated every five years when new census data become available. For 1996, income estimates were available by enumeration area (EA). In 2001, EAs were replaced by dissemination areas (DA). Ontario neighbourhoods are then classified into one of five approximately equal-sized groups (quintiles), ranked from poorest to wealthiest, where Q1 is the poorest and Q5 is the wealthiest. These income quintiles are used as a proxy for overall socioeconomic status, which has been shown to be related to population health status and levels of health care utilization. Individual geographic information is available from ICES databases that were used to define the best known postal code for each person on July 1st of each year (available from 1991 to 2004). Postal codes were then used to assign people to EAs and DAs (using the Postal Code Conversion File from Statistics Canada), and thus to one of the income quintiles.

Service definitions

Primary mental health care, psychotherapy:

• OHIP Fee codes—K005, K007, K019, K020, K012, K024, K025, K010, K004, K006, K011, K623, K624, K629

Counselling:

• Fee codes—K013, K033, K040, K041, K014, K015

Specialized services:

- Family-related interviews—fee codes K002,K003,K008,K121
- HIV primary care—K022,K037
- Palliative care support—K023
- Genetic assessment—K016
- Sexually transmitted diseases (STDs) management—K028
- Diabetes mellitus (DM) management—K030
- Hepatitis C—K026,K027
- Neurocognitive assessment—K032

Home care supervision

• Fee codes—K070, K071, K072

Papanicolaou smear

• Fee codes—G365, G394, E430, L643

Influenza immunization

• Fee codes—G590, G591

References

- National Physician Survey, 2004. College of Family Physicians of Canada (CFPC), Canadian Medical Association (CMA), Royal College of Physicians and Surgeons of Canada (RCPSC). Accessed June 15, 2006 at http://www.cfpc.ca/nps/
- 2005 Survey of Ontario's Physicians: Access Challenges Ahead. College of Physicians and Surgeons of Ontario. Accessed June 15, 2006 at http://www.cpso.on.ca/Whats_New/2005%20Physician%20Survey% 20Report.pdf
- Tepper JD, Schultz SE, Rothwell DM, Chan BTB. Physician Services in Rural and Northern Ontario. ICES Investigative Report. Toronto: Institute for Clinical Evaluative Sciences; 2006.
- Graham W. Primary Care Reform: a strategy for stability. January 1998. Accessed August 22, 2006 at http://www.oma.org/phealth/pcare/ pcaresum.htm
- Hutchison B, Woodward CA, Norman GR, Abelson J, Brown JA. Provision of preventive care to unannounced standardized patients. *Canadian Medical Association Journal* 1998; 158(2):185–193.
- Barnsley J, Williams AP, Kaczorowski J, Vayda E, Vingilis E, Campbell A, Atkin K. Who provides walk-in services? Survey of primary care practices in Ontario. *Canadian Family Physician* 2002; 48:519–526.
- Williams AP, Barnsley J, Vayda E, Kaczorowski J, Ostbye T, Wenghofer E. Comparing the characteristics and attitudes of physicians in different primary care settings: The Ontario Walk-in Clinic Study. *Family practice* 2002; 19(6):647–657.
- 8. Brown RH. What is the role of walk-in clinics? (letter) *Canadian Family Physician* 2002; 48:875–876.
- 9. Behroozi D. What is the role of walk-in clinics? (letter). *Canadian Family Physician* 2002; 48:875.
- 10. McElroy R. Reflections on walk-in clinics. *Canadian Family Physician* 2002; 48:1043.
- Brown JB, Bouck LMS, Ostbye T, Barnsley JM, Mathews M and Ogilvie G. Walk-in clinics in Ontario: an atmosphere of tension. *Canadian Family Physician* 2002; 48:531–536.
- Chan BTB and Schultz SE. Supply and Utilization of General Practitioner and Family Physician Services in Ontario. ICES Investigative Report. Toronto: Institute for Clinical Evaluative Sciences; 2005.
- Family Health Teams. Ministry of Health and Long-Term Care. Accessed August 3, 2006 at http://www.health.gov.on.ca/transformation/ fht/fht_mn.html
- Williams AP, Woodward CA, Ferrier B, Cohen M. Cohort, gender and practice organization: examining the bounds of collaborative medicine among newly established female and male family physicians in Ontario. *Health Services Management Research* 1997; 10(2):121–131.
- Hutchison B, Ostbye T, Barnsley J, Stewart M, Mathews M, Campbell MK, et al. Patient satisfaction and quality of care in walk-in clinics, family practices and emergency departments: the Ontario Walk-In Clinic Study. *Canadian Medical Association Journal* 2003; 168(8):977–983.

INSIDE

Executive Summary Introduction Background List of Exhibits Exhibits and Findings Discussion Appendix 12.A How the research was done

References



Chapter

Indicators of Primary Care Based on Administrative Data

Liisa Jaakkimainen, MD, MSc, CCFP, Julia E. Klein-Geltink, MHSc, Astrid Guttmann, MDCM, MSc, FRCPC, Jan Barnsley, BSc, MES, PhD, Brandon M. Zagorski, MS, Alexander Kopp, BA, Refik Saskin, MSc, Alan Leong, BSc (Hons.), and Li Wang, MD, MSc



Executive Summary

Issue

There is a growing emphasis on the need to evaluate how primary care services are delivered and received by the population. In Canada, indicators of primary care have been developed that target relevant structures, processes and outcomes of care. However, there are several different perspectives that need to be considered—those of policy makers, health care practitioners and patients—when examining the primary care system. This complexity makes the measurement of indicators of primary care effectiveness more challenging, since different methods of assessment are needed to address these various perspectives (e.g., provider and patient interviews and surveys, data abstraction from paper charts or electronic patient records, and administrative data). The purpose of this chapter was to determine the feasibility of measuring some indicators of primary care medicine that are based on Ontario administrative data.

Study

Indicators of primary care in Ontario were measured, choosing those which were previously chart-based assessments and could be measured using administrative data. Chosen indicators included: **chronic disease management** indicators of diabetes mellitus (DM), congestive heart failure (CHF) and asthma care; **preventive care** indicators of cervical and colorectal cancer screening and childhood vaccinations; and, an **acute disease management** indicator of acute low back pain care. The **continuity of care** provided by general practitioner/family physicians (GP/FPs) was also examined. These indicators were determined at a population level by patient age, sex, socioeconomic status (SES) and Local Health Integration Network (LHIN).

Key Findings

- Based on Ontario Health Insurance Plan (OHIP) billings, just under 60% of women between 20 and 39 years of age received at least one Papanicolaou (Pap) test over a three-year time period from April 1, 2000 to March 31, 2003.
- Only a small proportion of the population was screened for colorectal cancer during the study period. The most commonly used method for colorectal cancer screening was fecal occult blood testing (12%), followed by colonoscopy (5%). Older adults underwent colorectal cancer screening more frequently than younger adults, and within each age group, women were slightly more likely than men to undergo a colorectal investigation.
- Just over 70% of all children had OHIP billings for at least five vaccinations by two years of age (representing the minimum number needed to be up-to-date with the funded routine vaccination schedule). The proportion of children who had no vaccinations decreased with age, but still four percent of all children had no billings for vaccinations by two years of age.
- The proportion of people with DM who underwent an eye examination increased with age from just under 60% among 30 to 39 year olds, to just over 75% among those aged 65 years and older.
- In those over the age of 65 years who were newly diagnosed with DM, approximately 75% were prescribed metformin as their first oral hypoglycemic agent. In addition, 80% were given an antihypertensive agent, just over 60% received an angiotensin-converting enzyme (ACE) inhibitor, and almost 50% received a lipidlowering agent. Thirty-six percent received all three.

Key Findings (Cont'd)

- Compared to older patients, younger patients who were newly diagnosed with CHF were more likely to receive an echocardiogram within one year of their diagnosis. In all age groups, men were more likely to receive an echocardiogram than women. The proportion of newly diagnosed CHF patients prescribed an ACE inhibitor was higher among those aged 65 to 74 years compared with those over 75 years of age, and males were more likely to be prescribed an ACE inhibitor than women across all age groups.
- The proportion of young people newly diagnosed with asthma who received a spirometry test within one year of diagnosis was between 24 and 27 percent; and seven to 10 percent of these patients visited an emergency department within one year of diagnosis for an asthma-related condition.
- Among both men and women, the highest proportion of X-ray use for acute low back pain (LBP) was seen among those aged 65 to 74 years. Men were slightly more likely than women to receive an X-ray within six weeks of a visit to a GP/FP for acute LBP. Among both men and women and across all age groups, the use of magnetic resonance imaging scans, computerized tomography and electromyography within three months of a GP/FP visit for acute LBP was very low.
- The proportion of adults having high continuity of care was just under 40%. Approximately 14% saw a GP/FP but had a small number of visits and 16% did not visit a GP/FP at all. Continuity of care with a GP/FP increased with age, peaking at 65 to 74 years of age. There were no gender differences in continuity of care.
- There were few differences in various care practices, such as prescribing rates and test ordering rates, across LHINs and SES groups. However, among preventive practices such as cancer screening and immunizations, there was considerable geographic and socioeconomic variation. Continuity of care also tended to vary across LHINs but not across SES groups.

Implications

- There is a need to evaluate how primary care services are delivered and received by the population so that improvements can be focused in the appropriate areas. While some indicators of primary care based on administrative data may be used in combination with other methods of describing care, they should only be used to assess primary care performance at the population level.
- Further work combining administrative data with indicators of care based on clinical encounters may help to determine the feasibility of developing methods to monitor individual and group primary care practices, and to provide meaningful feedback to clinicians.

Introduction

Along with reforming primary care delivery in Ontario, there is a growing emphasis on the need to evaluate how primary care services are delivered and received by the population. Indicators of primary care practice need to be specifically defined and measured such that when put together, they describe care in a comprehensive and meaningful way. Historically, primary care effectiveness was crudely assessed using hospital-based measures of ambulatory-sensitive conditions.¹ However, various indicators of structures, processes and outcomes have now been developed and used in countries with strong primary care systems (e.g., the United Kingdom and New Zealand), or in countries where good primary care is available (e.g., the United States).^{2–5} The methods used to measure these indicators include provider and patient interviews and surveys, data abstraction from paper charts or electronic patient records, and administrative data.^{6,7}

Indicators of primary care have been previously developed in Canada.^{8,9} However, their measurement, at either a population or a practice level, is still in its infancy. These indicators tend to be based on a combination of metaanalyses or consensus-based guidelines among primary care practitioners as to what is deemed to be appropriate care. While policy makers may want to examine indicators of access to care, system-wide efficiency and patient satisfaction, providers of primary care tend to focus on professional standards, clinical processes and outcome indicators. The overall purpose of using indicators of primary care is to measure and improve care from a variety of perspectives. Therefore, for their users, they need to be deemed acceptable, reliable, sensitive to change and have some predictive value to quality of care.⁶



Measurement of primary care indicators using administrative data has been demonstrated in other Canadian provinces.^{10,11} Though informative, differences in the types of administrative data available from one jurisdiction to the next mean that these efforts are not directly transferable to Ontario. The overall goal of this chapter was to conduct a preliminary descriptive analysis of some Ontario-based indicators of primary care medicine, using administrative data. Most indicators were analysed during fiscal years 2001/02 to 2002/03, prior to the introduction of new primary health care initiatives in Ontario. The selected indicators were previously chart-based assessments of primary care practice and could be measured using administrative data. Chosen indicators included: chronic disease management indicators of diabetes mellitus, congestive heart failure and asthma care; preventive care indicators of cervical cancer screening, colorectal cancer screening and childhood vaccinations; and, an acute disease management indicator of acute low back pain care. The continuity of care provided by individual general practitioner/family physicians in Ontario was also examined. These indicators were determined at a population level by patient age, sex, socioeconomic status and Local Health Integration Network.

Background–All Indicators

Preventive Care

Cervical Cancer Screening

While the incidence of cervical cancer is relatively low among Ontario women, it is the second leading type of cancer (after breast cancer) among those 20–49 years of age.¹² The survival rate for cervical cancer is significantly associated with the stage of disease at diagnosis. There is a seven percent five-year survival rate for advanced disease versus an 80% fiveyear survival rate for women with early localized cancer, thus it is important to detect early stage disease when treatment is likely to succeed.¹³ Currently, the Papanicolaou (Pap) test is used to screen women in Ontario for cervical cancer.¹⁴

Pap testing rates in Ontario and across Canada have been reported using various methodologies. In chapter 5 of this Atlas, 85% of women in Ontario reported receiving a Pap test at some point in their lifetime,¹⁵ and this proportion varied across Local Health Integration Networks (LHINs). Using the Cytobase Ontario Pap test registry involving several community-based laboratories across Ontario, Cancer Care Ontario (CCO) recently reported that over 80% of women 20–69 years of age received a Pap test between 2001 and 2003.¹⁶

Therefore, as an **indicator of preventive care (cervical cancer screening)**, we estimated the proportion of women between the ages of 20 and 69 years who were eligible for screening and who had at least one Ontario Health Insurance Plan (OHIP) billing for a Pap test between April 1, 2000 and March 31, 2003.

Colorectal Cancer Screening

Colorectal cancer is among the top four causes of cancer in Ontario, and is the most common cause of cancer death among non-smokers.¹⁷ Since early detection is associated with a 90% cure rate, the Ontario Cancer Society, along with several practice guidelines, has tried to promote colorectal cancer screening.¹⁷ There are several options for screening including colonoscopy, fecal occult blood testing (FOBT), sigmoidoscopy and barium enema.¹⁸ Yet the guidelines are unclear as to which method is preferred. In addition, limited access to colonoscopy and sigmoidoscopy may impede the implementation of widespread screening.¹⁹

More recently in Ontario, FOBT has been recommended as the preferred screening test for those who are at average risk for colorectal cancer.²⁰ Studies show that deaths from colorectal cancer would be reduced by 15%–33% if screen-eligible adults 50–74 years of age had an annual FOBT.²¹ Access to FOBT is

not limited by specialist availability and it can be easily performed by general practitioner/family physicians (GP/FPs). A goal of CCO is to have 90% of the population screened by an organized colorectal cancer screening program by 2020.¹⁷

Therefore, as an **indicator of preventive care (colorectal cancer screening)**, we estimated the proportion of screeneligible adults between 50 and 69 years of age who received at least one colorectal cancer screening investigation (FOBT, colonoscopy, sigmoidoscopy or barium enema) between April 1, 2002 and March 31, 2004.

Childhood Immunization

Childhood immunization is one of the most cost-effective preventive measures in medicine. Over 95% of childhood immunizations in Ontario are provided by physicians, and the up-to-date immunization status of children is an important measure of the effectiveness of the primary health care system.²² In Ontario, although primary care visit rates are high in children under two years of age, only about 70% are up-todate for immunizations. A number of important primary care practice characteristics have been shown to be associated with up-to-date immunization coverage.²³ For example, immunization is more up-to-date in those practices with both higher volumes of children and patient/provider continuity of care. Studies from the United States (US) suggest that a number of important office-based practices can improve the delivery of immunization at a practice level. These include tracking and recall systems and other information technology, which can serve to remind families and providers of a child's need for immunization even at visits scheduled for other reasons.24,25

In Ontario, the physician billing data for immunizations is not specific to the type of vaccine given, so a complete picture of this important quality measure could not be presented. Therefore, as an **indicator of preventive care (childhood immunization)**, physician billings of non-influenza immunizations for children between seven weeks and two years of age were determined and these billings were compared by patient LHIN and socioeconomic status. A child was considered to be up-to-date with the recommended vaccinations if they had received five OHIP billings for vaccinations by two years of age.



Chronic Disease Management

Diabetes Care

Diabetes mellitus (DM) is a serious and growing health problem. Studies from Canada and the US have reported the prevalence of DM to be between three and eight percent, although as many as one third of cases remain undiagnosed.^{26,27} In Ontario, about six percent of the adult population has DM with the rates being as high as 20% in those 65 years of age and older.²⁸ Because of the aging population and growing rates of obesity, the number of individuals with DM is expected to rise significantly over time.²⁹

Diabetes is a leading cause of cardiovascular disease, end-stage renal failure, amputation and blindness.^{26–29} Disability caused by complications can have a major impact on the quality of life of persons affected by DM. Fortunately, there is now evidence that complications of DM can be delayed or prevented by specific interventions aimed at improving glucose, lipid and blood pressure levels. The Canadian Diabetes Association (CDA) and other organizations have published clinical practice guidelines outlining the optimal therapeutic approach for the management of DM.³⁰ Common across guidelines is the recommendation that all patients with DM should have an annual eye examination.^{13,30}

A consensus panel of Canadian researchers and health care providers have developed and validated a set of quality indicators for DM.³¹ In addition to retinopathy assessment, indicators of care include prescribing oral hypoglycemic agents (metformin is recommended as first-line therapy), lipidlowering agents, angiotensin-converting enzyme (ACE) inhibitors, and antihypertensive agents. They also set some benchmark targets for DM care. One example is the recommendation that 80% of people with DM should have a retinal assessment every one to two years if no retinopathy is present at diagnosis, or yearly if retinopathy is present at diagnosis.

As indicators of chronic disease (DM) management, we determined the proportion of people with DM as of April 1, 2002 who: underwent a routine eye examination during the two-year period from April 1, 2002 to March 31, 2004; received metformin as their first oral hypoglycemic medication within one year of diagnosis; and, were given at least one prescription for an antihypertensive agent, a lipid-lowering agent, an ACE inhibitor or all three, over a one-year period.

Congestive Heart Failure Care

Congestive heart failure (CHF) is a common disease that usually affects the elderly.³² In Canada, nearly 150 out of every 100,000 people were hospitalized for CHF in 2002.³³ CHF has a significant impact on the health of the population, including patients' activities of daily living and quality of life. As such, many recommendations have been put forth that are aimed at reducing CHF morbidity and mortality, both among people living with CHF and those who are at highrisk of developing it.³⁴

Current Canadian guidelines recommend that a transthoracic echocardiogram be performed on all patients suspected of having heart failure. It is also recommended that all asymptomatic patients with a left ventricular ejection fraction of less than 35% should receive an ACE inhibitor.³⁴ Thus, as **indicators of chronic disease (CHF) management**, we determined the proportion of people newly diagnosed with CHF from April 1, 2002 to March 31, 2003 who received an echocardiogram within one year of diagnosis and who received at least one prescription for an ACE inhibitor.

Asthma Care

Asthma is growing in prevalence and the rate of physician consultation for asthma is also increasing.^{13,35} The prevalence of asthma is higher in children, and it tends to be underdiagnosed in the elderly because it is difficult to differentiate asthma from chronic obstructive pulmonary disease. While asthma is an uncommon cause of death, it places a huge burden on society due to frequent hospital admissions, as well as reductions in work and school productivity.

Various patient factors are associated with the use of emergency departments (ED) by individuals with asthma.^{36–38} For example, patient attitudes and self-efficacy, rather than knowledge, were most strongly correlated with the number of ED visits among adults with asthma, as was compliance with treatment regimens.³⁸ There is substantial literature providing recommendations for asthma management. The current Canadian consensus guidelines encourage either spirometry or peak flow testing as a first step in establishing a diagnosis of asthma and recommend repeating these measurements at regular intervals.³⁹

Thus, as **indicators of chronic disease (asthma) management**, we determined the proportion of people between 11 and 40 years of age, who were newly diagnosed with asthma between April 1, 2002 and March 31, 2004, and who visited an ED at least once for an asthma-related complication within one year of their diagnosis. We also determined the proportion of these asthma patients who received a spirometry test within one year of diagnosis.

Acute Disease Management

Acute Low Back Pain Management

Acute low back pain (LBP) is a common complaint among people living in developed countries and it is most prevalent among people between the ages of 35 and 55 years.⁴⁰ Yet, only about 25% of patients visit a health care provider (mostly GP/FPs) for LBP.

In the absence of "red flags" obtained from a detailed clinical history that could suggest recent trauma, fracture, infections, tumours, or other severe conditions such as cauda equine syndrome, current Ontario guidelines suggest that a diagnostic intervention is not indicated in patients with LBP until the patient has been symptomatic for at least four to six weeks.^{13,41,42} If "red flags" are found, then X-rays or referral to a specialist may be indicated. If X-rays are negative, then computerized tomography (CT), magnetic resonance imaging (MRI) or electromyography (EMG) may be helpful. Ordering X-rays of the spine prematurely may actually adversely affect patient outcome and unnecessarily increase the workload for the GP/FP.¹³

As indicators of acute disease (LBP) management, we determined the proportion of Ontario adults over 20 years of age who visited a GP/FP for LBP between April 1, 2002 and March 31, 2003 and received a lumbar X-ray within six weeks of their visit, as well as those who received CT, MRI or EMG within three months of their visit.

Continuity of Care

Continuity of care is a term widely used in health care, often with different and inconsistent meanings. There are two core concepts required in defining continuity of care. First, continuity of care is an experience of care by an individual with his/her provider(s). And second, continuity of care continues over time.⁴³

Continuity of care is generally felt to represent a positive aspect of primary care. Many studies have demonstrated that high provider and/or group continuity of care is associated with both positive patient and provider satisfaction.^{44,45} High continuity of care has also shown other benefits including fewer ED visits, some avoidable hospitalizations and improved prescribing by physicians.^{46–48}

Therefore, as an **indicator of continuity of care** we assessed relational continuity of care received by patients with a GP/FP in Ontario, between April 1, 2001 and March 31, 2003. We used the Usual Provider Continuity (UPC) Index as a measure of continuity of care.⁴⁹ We calculated a UPC Index for each person over the age of 20 years who visited their GP/FP (the one seen most often) at least three times over a two-year period.

Chapter 12—List of Exhibits

I. Individual Indicators

Preventive Care

Exhibit 12.1 Cervical Cancer Screening

Proportion of women aged 20 to 69 years who had cervical cancer screening, by age, in Ontario, 2000/01 to 2002/03

Exhibit 12.2 Colorectal Cancer Screening

Proportion of the population aged 50 to 69 years who had a colorectal cancer screening procedure, by type of procedure, in Ontario, 2002/03 to 2003/04

Exhibit 12.3 Colorectal Cancer Screening

Proportion of the population aged 50 to 69 years who had a colorectal cancer screening procedure, by age and sex, in Ontario, 2002/03 to 2003/04

Exhibit 12.4 Childhood Immunization

Proportion of children born during 2002/03, by number of immunization billings and age in months, in Ontario

Chronic Disease Management

Exhibit 12.5 Diabetes Care

Proportion of the population aged 30 years and older with diabetes mellitus (DM) as of April 1, 2002, who received an eye examination within two years, by age and sex, in Ontario, 2002/03 to 2003/04

Exhibit 12.6 Diabetes Care

Proportion of the population aged 65 years and older newly diagnosed with diabetes mellitus (DM) as of April 1, 2002, who were prescribed metformin as their first hypoglycemic agent within one year of diagnosis, by age and sex, in Ontario, 2002/03

Exhibit 12.7 Diabetes Care

Proportion of the population aged 65 years and older diagnosed with diabetes mellitus (DM) as of April 1, 2002, who were prescribed an antihypertensive agent, a lipidlowering agent, an angiotensin-converting enzyme (ACE) inhibitor or all three, by age and sex, in Ontario, 2002/03

Exhibit 12.8 Congestive Heart Failure Care

Proportion of the population aged 20 years and older newly diagnosed with congestive heart failure (CHF), who received an echocardiogram within one year of diagnosis, by age and sex, in Ontario, 2002/03

Exhibit 12.9 Congestive Heart Failure Care

Proportion of the population aged 65 years and older newly diagnosed with congestive heart failure (CHF), who received an angiotensin-converting enzyme (ACE) inhibitor within one year of diagnosis, by age and sex, in Ontario, 2002/03

Exhibit 12.10 Asthma Care

Proportion of the population aged 11 to 40 years newly diagnosed with asthma, who had a spirometry test within one year of diagnosis, by age and sex, in Ontario, 2002/03

Exhibit 12.11 Asthma Care

Proportion of the population aged 11 to 40 years newly diagnosed with asthma, who had an emergency department (ED) visit within one year of diagnosis, by age and sex, in Ontario, 2002/03

Acute Disease Management

Exhibit 12.12 Acute Low Back Pain Management

Proportion of the population visiting a general practitioner/ family physician (GP/FP) for acute low back pain, who received an X-ray within six weeks of their visit, by age and sex, in Ontario, 2002/03

Exhibit 12.13 Acute Low Back Pain Management

Proportion of the population visiting a general practitioner/ family physician (GP/FP) for acute low back pain, who had magnetic resonance imaging (MRI), computerized tomography (CT) or electromyography (EMG) within three months of their visit, by age and sex, in Ontario, 2002/03

Continuity of Care

Exhibit 12.14 Continuity of Care

Level of continuity of care with a general practitioner/family physician (GP/FP) for adults aged 20 years and older, in Ontario, 2001/02 to 2002/03

Exhibit 12.15 Continuity of Care

Mean Usual Provider Continuity (UPC) Index for general practitioner/family physician (GP/FP) care for adults aged 20 years and older, by age and sex, in Ontario, 2001/02 to 2002/03

II. All Indicators by Local Health Integration Network

Exhibit 12.16 All Indicators

Proportion of the population who underwent the health care practices captured by each of the indicators of primary care, by Local Health Integration Network, and for the Province of Ontario

III. All Indicators by Neighbourhood Income Quintile

Exhibit 12.17 All Indicators

Proportion of the population who underwent the health care practices captured by each of the indicators of primary care, by neighbourhood income quintile, and for the Province of Ontario



Exhibits and Findings

I. Individual Indicators—Preventive Care



• This proportion fell with increasing age to 43% in women between 60 and 69 years of age.



Exhibit 12.2 Colorectal Cancer Screening

Proportion of the population aged 50 to 69 years who had a colorectal cancer screening procedure*, by type of procedure, in Ontario, 2002/03 to 2003/04



* Includes fecal occult blood testing (FOBT), colonoscopy, flexible sigmoidoscopy, rigid sigmoidoscopy, single contrast barium enema (SBE) and double contrast barium enema (DBE).

©Institute for Clinical Evaluative Sciences

Findings

• From 2002/03 to 2003/04, 17% of Ontarians between 50 and 69 years of age underwent colorectal cancer screening (fecal occult blood testing [FOBT], sigmoidoscopy, colonoscopy or barium enema).

• The most frequent type of screening procedure was FOBT (12%), followed by colonoscopy (5%).



 Includes fecal occult blood testing (FOBT), colonoscopy, flexible sigmoidoscopy, rigid sigmoidoscopy, single contrast barium enema (SBE) and double contrast barium enema (DBE).
 ©Institute for Clinical Evaluative Sciences

- Slightly more older adults (aged 60 to 69 years) underwent colorectal cancer screening investigations than younger adults (aged 50 to 59 years).
- In both age groups, a higher proportion of women than men underwent colorectal cancer screening investigations during the two-year time period from 2002/03 to 2003/04.



- Although the proportion of children born during 2002/03 who had no vaccination billings decreased with age, four percent of all children still had no billings for vaccinations by two years of age.
- Just over 70% of all children had at least five vaccinations—the minimum number recommended in order to be considered up-to-date with funded routine vaccinations—by two years of age.

I. Individual Indicators—Chronic Disease Management





- The proportion of Ontarians with diabetes mellitus (DM) who underwent a recommended eye examination over a twoyear time period increased with age, from just under 60% among 30- to 39- year-olds to over 75% among those aged 65 years and older.
- Among those aged 74 years and younger, women were slightly more likely than men to undergo an eye examination.



- Approximately 75% of those aged 65 years and older, who were newly diagnosed with diabetes mellitus (DM), were prescribed metformin as their first oral hypoglycemic agent within one year of diagnosis.
- Compared to other age groups, a slightly higher proportion of those patients who were 65 to 74 years of age were prescribed metformin as their first oral hypoglycemic agent.
- There were no gender differences in metformin prescribing.



Diabetes Care—Proportion of the population aged 65 years and older diagnosed with diabetes mellitus (DM) as of April 1, 2002, who were prescribed an antihypertensive agent, a lipid-lowering agent, an angiotensin-converting enzyme (ACE) inhibitor or all three, by age and sex, in Ontario, 2002/03



©Institute for Clinical Evaluative Sciences

🔻 Findings

- About 80% of people with diabetes mellitus (DM) over the age of 65 years received a prescription for an antihypertensive agent, just over 60% received an angiotensin-converting enzyme (ACE) inhibitor, nearly 50% received a lipid-lowering agent and just over 35% received all three medications.
- For both men and women with DM, those aged 65 to 74 years were more likely to receive a prescription for an ACE inhibitor, lipid-lowering agent or the combination of all three medications. Conversely, antihypertensive agents were prescribed more often to those 75 years of age and older.



Exhibit 12.8 Congestive Heart Failure Care

Proportion of the population aged 20 years and older newly diagnosed with congestive heart failure (CHF), who received an echocardiogram within one year of diagnosis, by age and sex, in Ontario, 2002/03



- Younger patients (aged 20 to 39 years) who were newly diagnosed with congestive heart failure (CHF) were more likely to receive an echocardiogram within one year of their diagnosis (54%) than patients in any other age group.
- In all age groups, men newly diagnosed with CHF were more likely to receive an echocardiogram within one year of their diagnosis than women.



- The proportion of newly diagnosed congestive heart failure (CHF) patients who were prescribed an angiotensin-converting enzyme (ACE) inhibitor was higher among those aged 65 to 74 years (77%) compared with those over 75 years of age (70%).
- Males newly diagnosed with CHF were more likely to be prescribed an ACE inhibitor than women.

Asthma Care



Exhibit 12.10

Proportion of the population aged 11 to 40 years newly diagnosed with asthma, who had a spirometry test within one year of diagnosis, by age and sex, in Ontario, 2002/03



Findings

• The proportion of the population newly diagnosed with asthma between April 1, 2002 and March 31, 2003 who received a spirometry test within one year of diagnosis was between 24 and 27 percent. There were no gender or age differences among those who received spirometry testing.



• Between seven and 10 percent of the population aged 11 to 40 who were newly diagnosed with asthma between April 1, 2002 and March 31, 2003 visited an emergency department (ED) within one year of diagnosis. There were no gender or age differences in ED visit rates.

those 65 to 74 years of age.

I. Individual Indicators—Acute Disease Management



• Men were slightly more likely than women to receive an X-ray within six weeks of a visit to a general practitioner/ family physician for acute LBP.

Exhibit 12.13

Acute Low Back Pain Management

Proportion of the population visiting a general practitioner/family physician (GP/FP) for acute low back pain, who had magnetic resonance imaging (MRI), computerized tomography (CT) or electromyography (EMG) within three months of their visit, by age and sex, in Ontario, 2002/03



- computerized tomography (CT) and electromyography (EMG) for acute low back pain (LBP), within three months of a visit to a general practitioner/family physician (GP/FP), was low.
- Compared to other age groups, men and women between 40 and 64 years of age had a slightly higher proportion of MRI, CT or EMG use within three months of a visit to a GP/FP for acute LBP.





• Fourteen percent of adults aged 20 years and older saw their GP/FP less than three times in a two-year period, and 16% did not visit a GP/FP at all.



🔻 Findings

- The Usual Provider Continuity (UPC) Index was used as a measure of continuity of care. As adults grew older, their UPC Index increased, peaking in those 65 to 74 years of age. There were no gender differences in the UPC Index.
- The UPC Index was high (mean of 0.8) for adults in Ontario with more than three visits to a general practitioner/ family physician.

II. All Indicators by Local Health Integration Network

Exhibit 12.16 All Indica Proportio indicators	hibit 12.16 All Indicators Proportion of the population who underwent the health care practices captured by each of the indicators of primary care, by Local Health Integration Network, and for the Province of Ontario								
	Local Health Integration Networks								
	1. Erie St. Clair	2. South West	3. Waterloo Wellington	4. Hamilton Niagara Haldimand Brant	5. Cent West	ral 6. Mississa Halton	uga 7. Toronto Central	8. Central	
Indicators	Proportion of the population (%)								
1. Cervical cancer screening*	53	58	63	59	59	61	57	61	
2. Colorectal cancer screening [‡]	18	16	17	14	17	18	16	21	
3. Childhood immunizations 0 billings 5 or more billings	5 65	4 69	4 68	3 66	3 71	3 77	4 75	3 81	
 4. Diabetes care Eye examinations Metformin[§] prescription Antihypertensive agent 	74 79	75 79	76 69	76 76	69 66	72 76	68 71	72 67	
prescription ACE inhibitor prescription Lipid-lowering agent	61 80	62 82	62 80	66 82	64 80	64 80	62 79	62 79	
All 3 medications	47 35	44 33	43 32	49 38	49 37	52 39	38	37	
			Lo	cal Health Inte	gration	Networks (Cor	nt'd)		
	9. Central East	10. South East	11. Champla	Musko	simcoe ka	13. North East	14. North West	All Ontario	
Indicators (Cont'd)	Proportion of the population (%)								
1. Cervical cancer screening*	60	62	64	61		50	56	59	
2. Colorectal cancer screening [‡]	19	13	20	17		17	15	17	
3. Childhood immunizations 0 billings 5 or more billings	2 73	7 57	3 74	3 65		12 49	11 47	4 71	
4. Diabetes Care Eye examinations Metformin [§] prescription Antihypertensive agent	73 74	72 76	76 81	75 77		78 74	77 85	73 75	
prescription ACE inhibitor prescription Lipid-lowering agent prescription	65 81 50	63 83 45	62 80 46	65 81 46		63 82 45	63 80 38	63 81 48	
All 3 medications	39		34	35		33	29	36	

* Papanicolaou (Pap) test

 [‡] Includes fecal occult blood testing (FOBT), colonoscopy, flexible sigmoidoscopy, rigid sigmoidoscopy, single contrast barium enema (SBE) and double contrast barium enema (DBE).

§ Oral hypoglycemic agent

ACE = Angiotensin-converting enzyme

©Institute for Clinical Evaluative Sciences

Exhibit 12.16 All Indicators

Proportion of the population who underwent the health care practices captured by each of the indicators of primary care, by Local Health Integration Network, and for the Province of Ontario (Cont'd)

V Findings

Cervical Cancer Screening

• There was some variation across Local Health Integration Networks (LHINs) in the proportion of eligible women receiving at least one Papanicolau (Pap) test, ranging from 50% in the North East LHIN to 64% in the Champlain LHIN.

Colorectal Cancer Screening

• There was LHIN variation in the proportion of adults receiving a colorectal cancer screening investigation, with the Central LHIN having the highest proportion (21%).

Childhood Immunization

• The North East and North West LHINs had the lowest proportion of children with at least five immunization billings and the highest proportion without any immunization billings at two years of age.

Diabetes Care

- There was some LHIN variation in the proportion of people with diabetes mellitus (DM) who received an eye examination, ranging from 68% in the Toronto Central LHIN to 78% in the North East LHIN.
- There were LHIN variations in prescribing metformin as the first oral hypoglycemic agent for people newly diagnosed with DM, ranging from 66% to 85% in the Central West and North West LHINs, respectively.
- There was little LHIN variation in adults over 65 years of age diagnosed with DM with respect to receiving an antihypertensive agent, and very slight variation in the proportion receiving an angiotensin-converting enzyme (ACE) inhibitor. The proportion who received a lipid-lowering agent as well as those who received all three medications (antihypertensive agent, ACE inhibitor and lipid-lowering agent) did vary by LHIN.

II. All Indicators by Local Health Integration Network (Cont'd)

Exhibit 12.16 Al Pr ind	ll Indicat roportior dicators	ors n of the population who underwent the health care practices captured by each of the of primary care, by Local Health Integration Network, and for the Province of Ontario (Cont'd)								
		Local Health Integration Networks								
		1. Erie St. Clair	2. South West	3. Waterloo Wellington	I. Hamilton Niagara Haldimand Brant	5. Centr West	al 6. Mississa Halton	uga 7. Toronto Central	8. Central	
Indicators		Proportion of the population (%)								
5. Congestive heart failure care Echocardiogram ACE inhibitor prescription		33 73	29 69	42 73	37 76	45 76	39 72	38 70	41 71	
6. Asthma care Spirometry testing Emergency department visits		28 9	23 13	28 13	33 11	22 7	26 6	27 7	23 6	
7. Acute low back pain management X-ray investigation MRI/CT/EMG investigation		12 2	10 2	9 2	11 3	9 2	9 2	9 2	9 2	
8. Continuity of care (UPC Index) High UPC Low UPC		41 30	44 26	35 30	44 26	39 37	37 35	36 30	38 34	
		Local Health Integration Networks (Cont'd)								
		9. Central East	10. South East	11. Champlai	n 12. North S Muskol	Simcoe [·] ka	13. North East	14. North West	All Ontario	
Indicators (Cont'd)		Proportion of the population (%)								
5. Congestive heart failt Echocardiogram ACE inhibitor prescrip	ure care ption	46 74	40 70	32 68	39 72		40 74	28 73	38 72	
6. Asthma care Spirometry testing Emergency departme	ent visits	21 8	26 13	33 8	26 11		22 17	29 16	26 9	
7. Acute low back pain management X-ray investigation MRI/CT/EMG investi	igation	9 2	9 2	9 3	9 2		9 3	10 2	9 2	
8. Continuity of care (UP High UPC Low UPC	'C Index)	41 33	44 26	34 33	40 35		38 29	31 31	39 31	

ACE = Angiotensin-converting enzyme

MRI/CT/EMG = Magnetic resonance imaging, computerized tomography or electromyography

UPC = Usual Provider Continuity

Exhibit 12.16 All Indicators

Proportion of the population who underwent the health care practices captured by each of the indicators of primary care, by Local Health Integration Network, and for the Province of Ontario (Cont'd)

Findings

Congestive Heart Failure Care

- There was variation across Local Health Integration Networks (LHINs) in the proportion of the newly diagnosed congestive heart failure patients receiving an echocardiogram. The lowest proportions were seen in the South West and North West LHINs and the highest proportions were experienced in the Central West and Central East LHINs.
- There was some LHIN variation in prescription of an ACE inhibitor—lowest in the South West and Champlain LHINs, and highest in the Hamilton Niagara Haldimand Brant and Central West LHINs.

Asthma Care

- There was LHIN variation in the proportion of people between 11 and 40 years of age who were newly diagnosed with asthma and who received a spirometry test within one year of diagnosis.
- The proportion of these patients who visited an emergency department within one year of asthma diagnosis varied across LHINs, ranging from six percent in the Mississauga Halton and Central LHINs to 17 percent in the North East LHIN.

Acute Low Back Pain Management

- The proportion of X-ray use within six weeks of a visit to a general practitioner/family physician (GP/FP) for acute low back pain (LBP) was low but did vary slightly across all LHINs. X-ray use was highest in the Erie St. Clair and Hamilton Niagara Haldimand Brant LHINs.
- There was some LHIN variation in the proportion of those receiving magnetic resonance imaging, computerized tomography and electromyography within three months of visit to a GP/FP for acute LBP, but the proportion was low.

Continuity of Care

• There was LHIN variation in the proportion of adults having high GP/FP continuity of care, with the highest proportions in the Hamilton Niagara Haldimand Brant, South West and South East LHINs, and the lowest in the North West LHIN.

III. All Indicators by Neighbourhood Income Quintile

Exhibit 12.17 All Indicators Proportion of the population who underwent the health care practices captured by each of the indicators of primary care, by neighbourhood income quintile[†], and for the Province of Ontario Neighbourhood income quintile 1 (Lowest) 5 (Highest) **Overall** Proportion of the population (%) Indicators 1.Cervical cancer screening* 2.Colorectal cancer screening[‡] 3. Childhood immunizations 0 billings 5 or more billings 4. Diabetes care Eye examinations Metformin§ prescription Antihypertensive agent prescription ACE inhibitor prescription Lipid-lowering agent prescription All 3 medications 5. Congestive heart failure care Echocardiogram ACE inhibitor prescription 6.Asthma care Spirometry testing Emergency department visits 7. Acute low back pain management X-ray investigation MRI/CT/EMG investigation 8. Continuity of care (UPC Index) High UPC Low UPC

† See Appendix 12.A for a description of neighbourhood income quintile calculation

* Papanicolaou (Pap) test

Includes fecal occult blood testing (FOBT), colonoscopy, flexible sigmoidoscopy, rigid sigmoidoscopy, single contrast barium enema (SBE) and double contrast barium enema (DBE).

©Institute for Clinical Evaluative Sciences

§ Oral hypoglycemic agent

ACE = Angiotensin-converting enzyme

MRI/CT/EMG = Magnetic resonance imaging, computerized tomography or electromyography UPC = Usual Provider Continuity

Findings

Cervical Cancer Screening

• The proportion of women who received at least one Papanicolaou (Pap) test was approximately 10% higher in those with the highest socioeconomic status (SES), as reflected by neighbourhood income quintile, compared with the lowest SES.

Colorectal Cancer Screening

• Adults with the highest SES were seven percent more likely to undergo a colorectal cancer screening investigation than those with the lowest SES.

Childhood Immunization

- The proportion of children born in 2002/03, who had at least five vaccinations in 24 months, increased with increasing SES.
- There was a slightly higher proportion of children in the two lowest SES groups who had no immunization billings at 24 months of age.
Exhibit 12.17 All Indicators

Proportion of the population who underwent the health care practices captured by each of the indicators of primary care, by neighbourhood income quintile[†], and for the Province of Ontario (Cont'd)

Findings (Cont'd)

Diabetes Care

- The proportion of people with diabetes mellitus (DM) who underwent eye examination increased slightly as SES increased.
- The proportion of adults over 65 years of age newly diagnosed with DM and who were prescribed metformin as their first oral hypoglycemic agent was similar across SES groups.
- For adults over 65 years of age diagnosed with DM, those with the lowest SES were slightly more likely to be prescribed an angiotensin-converting enzyme (ACE) inhibitor and an antihypertensive agent.

Congestive Heart Failure Care

- The proportion of the newly diagnosed congestive heart failure (CHF) patients who received an echocardiogram was slightly higher among people with the highest SES.
- Overall, there were no differences by SES among the proportion of CHF patients who were prescribed an ACE inhibitor.

Asthma Care

- The proportion of newly diagnosed asthmatics who received a spirometry test within one year of diagnosis varied by SES, from 22 percent in the lowest income quintile to 28% in the highest.
- There was little variation by SES in the proportion of newly diagnosed asthmatics who visited an emergency department within one year of diagnosis.

Low Back Pain Management

- The proportion of X-ray use within six weeks of a visit to a general practitioner/family physician (GP/FP) for acute low back pain (LBP) was slightly higher among people in the lower SES groups.
- Within three months of a visit to a GP/FP for acute LBP, the use of magnetic resonance imaging, computerized tomography and electromyography was low across all SES groups.

Continuity of Care

• There was no SES variation in the proportion of adults having high continuity of care with a GP/FP.

Discussion Preventive Care

Cervical Cancer Screening

Papanicolaou (Pap) testing is a recognized screening measure for cervical cancer, which is commonly used as an indicator of primary care performance in developed countries. In Ontario, many women visit general practitioner/family physicians (GP/FPs), providing them with an opportunity to have a Pap test. In addition, primary care is responsible for a number of activities related to cervical cancer screening including the process of care (e.g., performing the Pap test and dealing with Pap test results), evaluation of care (e.g., assessing reasons for Pap test non-attendance and auditing inadequate Pap test rates), as well as more general activities such as providing information about and/or reducing anxiety related to Pap testing.¹³

In this chapter, the proportion of screen-eligible women in Ontario who had at least one Ontario Health Insurance Plan (OHIP) billing for a Pap test over the three-year period from 2000/01 to 2002/03 was just under 60%. In Manitoba, the proportion of eligible women screened over a three-year period ranged from 60% in those seen by a physician in a non-urban area to 71% in those seen by a physician in urban settings (Winnipeg and Brandon).¹¹ The 2003 Canadian Community Health Survey (CCHS) published self-reported estimates of Pap test rates indicating a coverage of around 80%, with some provinces (Manitoba, Alberta and Nova Scotia) having higher rates than others (British Columbia and Ontario).¹⁶

There may be several reasons why the proportion of the population having an OHIP billing for a Pap test is not higher in Ontario. First, OHIP fee codes were used to capture Pap testing and although this includes both physician procedure codes and laboratory pathology fee codes, the proportion of tests identified using pathology fee codes was low. The reason for this difference is that Pap tests performed in a hospital system are not billed in the same way as Pap tests received in community-based laboratories. Therefore, the number of women having a Pap test OHIP billing in Ontario may be underestimated. Second, Pap tests performed as part of a periodic health examination may not be billed separately, additionally contributing to an underestimate of the proportion of women receiving a Pap test.

The testing rates reported here might be lower than those from self-reported data (CCHS) in Manitoba, Alberta and Nova Scotia because of some sample and recall bias. For example, women may recall receiving a Pap test, but they may not remember exactly when they received it.

Further work should be done to examine whether administrative data can accurately estimate the proportion of women undergoing cervical screening in Ontario. This would include validation of different methods used to capture Pap testing, determination of which women are under- or over-screened and the subpopulations in Ontario that may experience barriers to receiving a Pap test.

Colorectal Cancer Screening

The rates of colorectal cancer screening in Ontario reported in this chapter were low (17% in adults between 50 and 69 years of age). This finding is comparable to other studies both in Ontario and other parts of Canada.^{17,19,50} There are several possible reasons for this low rate, which include both provider and patient factors. Common barriers encountered by providers include conflicting and sometimes confusing advice on which colorectal screening test is appropriate, limited access to colonoscopy and sigmoidoscopy, patient resistance and lack of time to engage in discussion about preventive screening.⁵¹ There is also low awareness about the benefits of screening, as well as low motivation on the part of patients, both of which underscore the need for patient education.⁵²

The promotion of fecal occult blood testing (FOBT) may result in an increase in colorectal cancer screening rates since it can be performed in a physician's office and may be viewed as a less invasive test by some patients. Therefore, for the individuals who have shown a willingness to undergo colorectal cancer screening and who are seen in primary care, FOBT may provide a relatively simple opportunity to increase screening rates.

In a study done in the United States (US) among an insured population, the proportion of those seen in primary care who were eligible and who underwent screening was low (approximately 50%). This low rate was thought to be due to both individual factors as well as provider practices. It was suggested that primary care providers need to capitalize on each and every opportunity to offer screening to a patient. Office-based prompts (during illness visits in addition to well visits) and patient follow-up should be encouraged in order to increase annual FOBT rates.⁵³

There are limitations in the use of administrative data to capture colorectal cancer screening rates. First, it is not possible to ascertain whether a procedure was performed for screening or diagnostic reasons. Second, services including colonoscopy and sigmoidoscopy provided outside the OHIP fee-for-service (FFS) system are not adequately captured with the current administrative data. This affects three Ontario counties (Frontenac County, Kenora, Rainy River), which were therefore excluded from analysis:

• Physicians in Frontenac County, which includes the city of Kingston, operate outside the FFS system and do not shadowbill, thus no data are available from this area. As well, rates for surrounding counties may be somewhat underestimated if residents received service in Frontenac County. • Physicians in the Kenora and Rainy River Districts began providing endoscopy in 1999 under an alternative funding arrangement.

As well, there may be some under-reporting of FOBT rates since OHIP data only include tests conducted in communitybased laboratories and do not reflect FOBTs performed in hospitals. Finally, physician billings for FOBTs may also include single samples obtained by digital rectal examination during an office visit, which do not meet the current recommendation of taking three separate samples.

Childhood Immunization

A significant number of two-year-olds in Ontario have not had a sufficient number of immunizations to be considered up-to-date according to Ontario vaccination schedules. These results are similar to previous data reported by researchers at the Institute for Clinical Evaluative Sciences.23 If not universally funded, the uptake of vaccinations tends to be low, as evidenced by the lower proportion of vaccinated children in lower income neighbourhoods. When one considers that there were additional vaccines recommended at the time of this study that were not yet universally funded, it becomes even more worrisome that a significant proportion of two-year-olds were not vaccinated according to the funding schedule. Low overall coverage rates have been borne out by other sources of data in other parts of Canada.54 It is difficult to interpret the regional variation in vaccination billing that we observed. Although physicians provide the vast majority of immunizations in Ontario, it is likely that in the northern LHINs many children receive their immunizations from nurses, nurse practitioners or providers in public health units who do not submit billings for these services.

A true assessment of whether children have appropriate immunization coverage requires analysis of the different vaccines as well as the recommended timing of vaccination. For example, the measles vaccine is not as effective in children under one year of age, so children receiving it too early may not have optimal protection. Public health data with vaccinespecific information are collected from parents by individual public health units but are only available for schoolaged children and do not include information about the physicians who provided the vaccines.

It is unfortunate that better data do not exist to track this important preventive health service, which is widely accepted as the best measure of primary care quality for children. A system such as the Manitoba Immunization Monitoring System would be an ideal model for Ontario.⁵⁵ This system uses both physician billings as well as data from public health, which are specific for the type as well as the number in a series of vaccines given. It also serves as a reminder system for parents and physicians. Apart from billing systems, other information technologies exist for primary care practices to better track and thus improve immunization coverage. Ideally, these information systems would also be able to feed into a larger surveillance system across the Province.

Chronic Disease Management

Diabetes Care

Diabetic retinopathy is a common eye disease among persons diagnosed with diabetes mellitus (DM) and is a leading cause of blindness. A comprehensive dilated eye exam can detect early disease before the patient experiences any vision loss. The level of ophthalmological testing in Ontarians newly diagnosed with DM is comparable to, if not slightly better than, other Canadian jurisdictions. For example, in Manitoba the proportion of people with DM who saw either an optometrist or ophthalmologist in the same fiscal year as they were diagnosed, ranged from 37% to 48%.¹¹ A chart audit-based randomized controlled trial evaluating the effectiveness of an educational intervention in Southwestern Ontario found that retinopathy screening by ophthalmologists or optometrists was only performed in approximately 50% of patients with DM over a two-year period.⁵⁶

In this chapter, the prescribing of antihypertensive agents and angiotensin-converting enzyme (ACE) inhibitors was found to be higher than those previously reported in Ontario.^{56,57} While the proportion of people with DM receiving a prescription for a lipid-lowering agent or the combination of all three medications (ACE inhibitor, antihypertensive agent and lipid-lowering agent) was lower than those receiving an ACE inhibitor alone, these proportions are still higher than those reported in other studies.^{56,57} The proportion of people with DM who were prescribed metformin as their first hypoglycemic agent was also high. This may reflect physician adherence to guidelines that promote metformin as an appropriate first-line agent.

There are other indicators of DM care that have been used and described in the literature. These include process measures such as glucose monitoring, cholesterol testing, microalbuminuria testing, blood pressure assessment and foot examinations.^{11,13} Other outcome measures include: target glycosylated hemoglobin (hemoglobin A1c) levels, lipid profile, hospitalization and mortality rates for heart attacks, as well as rates of stoke, amputation and dialysis.^{58,59}

The current administrative data are limited with respect to receipt of laboratory services, since hospital-affiliated laboratories are not captured by OHIP physician billing data. Also, the results of laboratory investigations are not available with current administrative data. In addition, documentation of target blood pressure measures is only available through data abstraction from medical charts or electronic patient records.

Diabetes management typically falls within the scope of family medicine where many patients rely on their GP/FP to manage their care.⁵⁶ In Ontario, approximately three-quarters of persons with DM receive care from their GP/FP.²⁸ With the expansion of electronic patient records in primary care offices, there will be an opportunity to link administrative data collected by providers during clinical encounters. At that time, quality of care indicators for DM can be further refined.

Congestive Heart Failure Care

We found that less than half of newly diagnosed Ontarians with congestive heart failure (CHF) received an echocardiogram to assess their left ventricular function within one year of diagnosis. The current Canadian target benchmark level for echocardiogram use among CHF patients admitted to hospital is 75% (either prior to or during their admission).⁶¹ The CHF patients included in this chapter were not necessarily admitted to hospital. Since indicators and benchmark targets for all CHF patients are still not well established, the results from this study should be considered as a baseline measurement to be used in future evaluations. In addition, Ontario administrative data do not yet provide information on the stage of CHF, as determined by systems such as the New York Heart Association (NYHA) functional classification system.⁶² Further work, which includes examining indicators of CHF care by severity of CHF, would be helpful in determining realistic benchmarks.

The proportion of newly diagnosed CHF patients receiving an ACE inhibitor within one year of diagnosis was high (72%). In general, prescription rates for CHF in Canada have been shown to vary by province^{63,64} and by sex.⁶⁵ If there is documented evidence of impaired systolic function and no specific contraindication, then ACE inhibitors should be considered in all patients.¹³ These drugs have been shown to decrease relative mortality from CHF by up to 36% at one year, and by even more over the long-term.⁶⁷ Since administrative data do not provide information on systolic function, or other clinical data on patients with CHF, it is difficult to set benchmarks for the prescription of ACE inhibitors.

Asthma Care

While current Canadian consensus-based guidelines recommend spirometry testing in establishing a diagnosis of asthma, only 26 percent of newly diagnosed asthmatics in Ontario were tested. The reasons for this low rate are not clear, but may represent a lack of knowledge about the current recommendations or a belief that spirometry testing is not necessary in the clinical management of asthmatic patients. Further research into the barriers to and beliefs around spirometry testing for newly diagnosed asthmatics is needed. The proportion of emergency department visits for newly diagnosed asthmatics was in keeping with other rates published in the literature.³⁸

Other quality indicators of asthma care include the ratio of bronchodilators to inhaled steroids, and the percent of patients with documented action plans.⁶⁷ In Manitoba, the proportion of patients with an asthma diagnosis (identified as receiving one repeat prescription for a beta₂-agonist), who then filled a prescription for medications recommended for long-term control of asthma (e.g., inhaled corticosteroid or leukotriene modifiers), was determined.¹¹ The average rate of prescribing was reported to be 61% and the only regional difference was between Winnipeg and non-urban areas. The majority of physicians met the recommended prescribing target in 50% to 79% of their patients with asthma. The Ontario administrative data does not include prescription information for people under the age of 65 years, so an analysis of these prescription-based process indicators of care is not feasible.

Acute Disease Management

Acute Low Back Pain Management

Indicators for acute disease management in primary care are difficult to measure using existing administrative data. However, the data presented in this chapter suggest that Ontario GP/FPs are following current guidelines with respect to acute low back pain (LBP) management. For example, most people who visited a GP/FP in Ontario with acute LBP did not receive an X-ray within six weeks of their visit, nor did they receive magnetic resonance imaging, computerized tomography or electromyography within three months of their visit.

Continuity of Care

Overall, relational continuity of care with a GP/FP was high in Ontario. While 33% of patients had low continuity of care with a GP/FP, 40% had high continuity of care. These are similar to findings reported in other areas of Canada.⁶⁸ This high level of continuity of care may reflect the difficulty people have in accessing GP/FP care. For example, many GP/FPs are not accepting new patients, which may limit "doctor shopping" to some degree. On the other hand, those who had lower continuity of care may be accessing their care from walk-in clinics and so they may not necessarily see the same GP/FP over several visits.

As a measure of primary care performance, continuity of care based on administrative data is easily measured. The next step needed in describing continuity of primary care would be to determine how continuity of care differs for individuals who are part of a group practice. In addition, encounter data from non-physician primary care providers are needed. Nonphysician encounter data would allow further examination of care provided by interdisciplinary teams—particularly for specific conditions such as mental illness, diabetes and arthritis.

Relevance to Primary Care Practice and Policy

As electronic patient record systems are developed and adopted into clinical practice, consideration should be given to what information could be captured in order to assess clinical quality. It is also worth exploring the role of these systems in improving the quality of indicator data with, for example, electronic reminders. While newer primary care funding models in Ontario include bonus payments for some preventive care services (such as mammography and Pap tests) and the use of flow sheets to manage some chronic diseases (such as diabetes), clinical quality measurements should not be limited to these conditions. In order to foster the development of systems that are appropriate for quality assessment, further collaboration is needed between researchers and policy makers interested in quality assessment, providers of primary health care, and developers of electronic patient record systems.

Currently, a few indicators of primary care based on administrative data may be used to track performance at the population level. However, they should not be used in isolation from measures of primary care access, clinically obtained indicators or patient/provider surveys. The ability of administrative data alone to allow monitoring and feedback to individual and group primary care practices is limited. Further work that validates the administrative indicators against chart-abstracted data, as well as clinically relevant outcomes, is needed.

Data Needs

To improve the development of administrative-based indicators of primary care in Ontario, data from both community-based and hospital laboratories should be collected. These should include accurate data that not only record which laboratory and pathology tests were performed, but also the results of these tests. In addition, administrative data should include prescription data for all Ontarians including those people under 65 years of age.

Also, requirements should be put in place to encourage comprehensive shadow-billing records among those who submit them. For population-based indicators, a basis in administrative data is ideal. Recognizing that billing data will be used to measure quality, it may be worth the effort to have incentives for physicians and other health care providers so that these billings are accurate and complete.

To further the development of indicators based on administrative data, linkages with disease or other monitoring systems, such as the Cytobase Ontario Pap test registry, should be encouraged. This would allow further validation of existing indicators. It would also allow an examination of the relationship between certain indicators of care and other aspects of health care (e.g., physician services, hospitalization records and costs).

For certain indicators (e.g., childhood immunizations), improving the administrative data by including mandatory data fields, such as the diagnosis code associated with the antigen-specific vaccine, would greatly enhance the ability to track this important quality measure at both the practice and population level.

Quality indicators of primary care also need to be determined for non-physician primary care providers. Currently, little data are available on encounters or services provided by nurses, nurse practitioners, home care providers, rehabilitation providers or nutritionists. In addition, primary care indicators from alternative funding payment models should be developed, since the encounter data are currently incomplete.

Finally, linking administrative data with encounter data collected at the primary care practice level would strengthen the development of practical indicators of care.

Future Research

Future research should focus on:

- Validation of these and other administrative indicators with those based on primary care clinical encounter data or survey data;
- Development of more outcome indicators of health care;
- Use of the indicators that accurately reflect care for examining the different models of care in Ontario, such as FFS versus alternative funding models; and,
- Linkage of the administrative data-based indicators with survey data to examine other factors that may identify barriers or challenges faced by special needs populations.

Conclusions

There is a need to evaluate how primary care services are delivered and received by the population so that improvements can be focused in appropriate areas. Preliminary work in Ontario has begun to identify indicators of primary care practice that assess the structures, processes and outcomes of primary health care. The use of administrative data in creating some indicators of care is attractive since they are routinely collected and population-based. While some indicators of primary care based on administrative data may be used in combination with other methods of describing care, they should only be used to assess primary care performance at the population level. Further work combining administrative data with clinical encounter-based indicators of care may determine the feasibility of developing methods for monitoring and providing feedback to individual and group primary care practices.



Appendix 12.A

How the research was done

Administrative databases

The Institute for Clinical Evaluative Sciences (ICES) databases used in this chapter include: the Registered Person's Database (RPDB), the Ontario Health Insurance Plan (OHIP), the Ontario Drug Benefit Program (ODB), the ICES Physician Database (IPDB), and the Canadian Institute for Health Information Hospital Discharge Abstract Database (CIHI-DAD). The RPDB includes demographic information for all residents eligible for health care in Ontario. The OHIP claims database covers all reimbursement claims to the Ontario Ministry of Health and Long-Term Care, made by fee-for-service physicians, community-based laboratories and radiology facilities. The ODB database includes prescription information for all eligible recipients (those over the age of 65 years or people on social assistance). The IPDB contains information on physician demographics and specialty training. The CIHI-DAD includes hospital discharge abstracts that are mandatory submissions from Ontario hospitals to CIHI. Scrambled, anonymized health card numbers (IKN) were used to link patients across the various databases.

Socioeconomic Status (SES) and Local Health Integration Networks (LHINs):

Neighbourhood income is calculated by Statistics Canada and is updated every five years when new census data become available. For 1996, income estimates were available by enumeration area (EA). In 2001, EAs were replaced by dissemination areas (DA). Ontario neighbourhoods are now classified into one of five approximately equal-sized groups (quintiles), ranked from poorest (Q1) to wealthiest (Q5). These income quintiles are related to population health status and levels of health care utilization. Individual geographic information from ICES databases was used to define the best known postal code for each person on July 1st of each year (available from 1991 to 2004). Postal codes were then used to assign people to EAs and DAs (using the Postal Code Conversion File from Statistics Canada), and thus to one of the income quintiles.

An individual's postal code was also used to assign them to a Local Health Integration Network (LHIN) area in Ontario using a specialized program created at ICES.

Indicator measurement

Cervical cancer screening

All women aged 20 to 69 years of age, alive in Ontario on April 1, 2002, were included in the study. Each woman's OHIP billings were examined from April 1, 2000 to March 31, 2003 inclusive (three years) to identify those who underwent a Papanicolaou (Pap) test within that time frame. Women who were not eligible for OHIP at any point during 2002/03, who died prior to March 31, 2003, who had a previous diagnosis of cervical cancer or who had undergone a hysterectomy prior to or during the study period, were excluded.

Pap tests were captured using OHIP laboratory codes for the pathological interpretation of a Pap test and procedure codes for having a Pap test. During an annual health exam visit, a procedure code for a Pap test may not be billed.

Exclusion criteria

Table 12.1	Exclusion criter or billing code	ia and corresponding diagnostic s for cervical cancer screening
Exclusion criteria		Corresponding diagnostic or billing codes
Ontario Health Insurance Plan (OHIP) ineligible during 2002/03		N/A
Died before March 31, 2003		N/A
Previous diagnosis of cervical cancer (during the entire history of the Ontario Cancer Registry)		International Classification of Diseases Ninth Revision (ICD-9) Diagnostic codes: 180.0, 180.1, 180.8, 180.9
Women with hysterectomy (ever)		OHIP billing codes: S810, S757, S758, S759

Outcome definition

Screening status was determined using OHIP billing codes for Pap testing (G365a or G394a or E430—new codes that were possibly not in the schedule of benefits at the time of study), or laboratory billing code L812 among those without a Pap test billing code.

Colorectal cancer screening

All Ontarians between the ages of 50 and 69 years who were alive on April 1, 2002 were included in the study. OHIP billings were examined from April 1, 2002 to March 31, 2004 (two years) in order to identify those people who underwent at least one colorectal cancer screening investigation. People who died prior to March 31, 2004, who had a previous diagnosis of colorectal cancer and/or inflammatory bowel disease, or who underwent a colorectal cancer screening investigation within the five years prior to April 1, 2002 were excluded from the study.

The colorectal investigations examined in this study were: rigid or flexible sigmoidoscopy, single or double contrast barium enema, colonoscopy and fecal occult blood testing.

Exclusion criteria

Table 12.2	Exclusion criteria and corresponding diagnostic codes for colorectal cancer screening	
Exclusion criteria		Corresponding diagnostic or billing code
Died before March 31, 2004		N/A
Cases diagnosed with any colorectal cancer between April 1, 1997 and March 31, 2004 (using the Ontario Cancer Registry, linked by unique anonymous identifiers)		 ICD-9 codes: 153.0 to 153.4, 153.6 to 154.1 ICD-10 codes: C19, C20, C180, C182, C183, C184, C186, C187, C188, C189
Cases diagnosed with any severe inflammatory bowel disease between April 1, 1997 and March 31, 2004 (CIHI-DAD and Same Day Surgery database)		 ICD-9 codes: 556, 556.0 to 556.9 and 555, 555.0 to 555.9 ICD-10 codes: K500, K501, K508, K509, K510, K511, K512, K513, K514, K515
Cases who had undergone a colorectal investigation between April 1, 1997, and March 31, 2002 (according to the Ontario Health Insurance Plan database)		 Z535 or Z536 (rigid sigmoidoscopy) Z555 (without E740 or E741 or E747 or E705 on the same day) or Z580 (flexible sigmoidoscopy) X112 (single contrast barium enema) X113 (double contrast barium enema) Z555 plus one of E740 or E741 or E747 or E705 on the same day (colonoscopy)

Outcome definitions

Table
12.3Outcome definitions using OHIP billing codes to
capture colorectal cancer screening investigations

Colorectal Investigation—any person who had at least one of the following tests was considered to have had a colorectal cancer screening investigation:

- L181 or G004 (fecal occult blood testing)
- Z535 or Z536 (rigid sigmoidoscopy)
- Z555 (without E740 or E741 or E747 or E705 on the same day) or Z580 (flexible sigmoidoscopy)
- X112 (single contrast barium enema)
- X113 (double contrast barium enema)
- Z555 plus one of E740 or E741 or E747 or E705 on the same day (colonoscopy)

Child immunization

All babies identified in the CIHI-DAD as being born alive in an Ontario hospital between April 1, 2002 and March 31, 2003 were included. We excluded babies who died before their second birthday, babies who had no well-baby visits or fewer than four primary care visits in two years. Children with no or few primary care visits are likely to have resided in Ontario intermittently (although this can not be confirmed with our data) or sought care from a salaried provider (in certain settings such as Community Health Centres) for whom we do not have data. In past analyses using a similar algorithm, our data were shown to cover 95% of primary care providers and the ratio of children excluded was comparable to the proportion of providers on alternate payment plans.²³

We measured the number of immunizations received by children at various ages up to two years of age using OHIP physician billings for immunizations. Two years of age is a standard time to assess coverage for young children. We report vaccinations one month after the recommended vaccination schedule (i.e., at three months of age to assess vaccinations recommended for two months of age). Two different fee codes are used by physicians depending on whether the immunization is given in the context of a visit in which other care is provided (G538) or is the sole reason for the visit (G539). Unlike an influenza-specific billing code, these billings are not specific for any vaccine, thus it is impossible to tell which vaccines have been given, making it difficult to effect a true assessment of whether children are up-to-date and whether they are receiving immunizations in a timely fashion. As the routine set of immunizations start at age eight weeks, we only counted immunizations given after age seven weeks. We did not include influenza immunizations. The schedule for routine childhood immunizations which were universally funded at the time of this study included three doses (age two, four, six months) and one booster dose (at age 18 months) of diphtheria, pertussis, tetanus, polio, haemophilus influenzae type b (DPTPHib) and one dose of mumps measles rubella (MMR) (given after age 12 months). This would require five immunizations by the age of two years in order to be considered up-to-date, thus we assessed the proportion of children who had at least this number of immunizations over each time period, as a proxy for being up-to-date. Three additional vaccines (varicella, pneumococcus and meningigococcus) were recommended but not universally funded until 2005.

Exclusion criteria

Table 12.4	Exclusion criter diagnostic cod	ria and corresponding fee/ es for childhood immunization
Exclusion criteria		Corresponding diagnostic or fee code
Invalid health card number		N/A
Died before their second birthday (i.e., end of eligibility period)		N/A
Babies w well-bab first two	/ho had no y visits in years of life	 G538-9, G590-1, K017 or K267 OR Fee code A003 or A007 and diagnosis code 916 or 917
Babies with fewer than four primary care visits in the first two years of life		 An OHIP bill to a general practitioner/ family physician or paediatrician (specialty=00 or 26) Not a referral (refphys=null) With a fee code of any of the following: A001, A003, A004, A007, A261, A263, A264, A661, G538-9, G590-1, K002, K003, K005, K007, K008, K013, K014, K016, K017, K022, K033, K040, K267

Diabetes care

Using the Ontario Diabetes Database (ODD) held at ICES, all persons who had diabetes mellitus (DM) as of April 1, 2002 (prevalent cases) and who, between April 1, 2002 and March 31, 2004 (two years), developed DM (incident cases) were identified. Persons who were ineligible to receive OHIP benefits during fiscal year 2002 and those who died prior to March 31, 2004 were excluded from the analysis.

The OHIP billings for all prevalent cases of DM between 2002/03 and 2003/04 were used to identify those with any claim for an eye exam within a two-year time frame. The ODB claims database was searched to identify all incident cases of DM over the age of 65 years, those who also received a prescription for a hypoglycemic agent (or insulin) within one year of diagnosis, and those whose first hypoglycemic agent prescription was metformin. The ODB database was also used to identify all prevalent cases of DM over 65 years of age those who received at least one prescription for an antihypertensive, an angiotensinconverting enzyme (ACE) inhibitor, a lipid-lowering agent, as well as all three medications together (antihypertensive agent, ACE inhibitor and lipid-lowering agent). Relevant OHIP billing codes and ODB drug identification number lists are found in Table 12.5.

Outcome definitions

Table 12.5	Outcome definitions used to capture diabetes care	
Outcom of intere	e Definition with corresponding fee codes st	
Eye examinat	 Any claim for an eye exam within two years (March 31, 2004) as per OHIP fee code in: A111, A112—as long as treating physician specialty (spec)=00 or spec=23; A233, A234, A235, A236, A238, A239, A240—as long as spec=23; C233, C234, C235, C236, C238, C239—as long as spec=23; V401, V405, V406, as long as spec=56; V402, V407, as long as spec=56 and diagnosis code (ICD-9) 250 or 362; Or A114 as long as diagnosis code 250 or 362 and spec=00 or spec=23 	
Metformi	n All incident cases of diabetes as of April 1, 2002 identified in ODD with at least one claim for metformin any hypoglycemics, or insulin (DINs available upon request) in 2002/03	
Anti- hyperten ACE inhit Lipid-low agent	All prevalent diabetics as of April 1, 2002 identified in ODD with an at least one prescription for: 1) Antihypertensive (Drug Identification Numbers [DINs]) available upon request) 2) ACE inhibitor (DINs available upon request) 3) Lipid-lowering agent (DINs available upon request) 4) Antihypertensive and ACE inhibitor and lipid- lowering agent in 2002/03	

Congestive heart failure care

An algorithm developed at ICES was used to identify people in Ontario newly diagnosed (incident cases) with congestive heart failure (CHF) in fiscal year 2002/03. In this algorithm, an individual is identified as having CHF if they had either one hospitalization record in the CIHI-DAD with a diagnosis of CHF or one OHIP physician visit billing which was followed within two years by another OHIP billing or a CIHI record. CIHI data are available from 1988 and OHIP data from 1991. A case is considered incident if it is the first occurrence in the available data that fits the above criteria. Incident cases are counted from 1994, and prevalent cases from 1992. After being identified as incident, a case is considered prevalent in that year and all subsequent years in which the individual has at least one contact with the health care system.

The OHIP billings were examined for the period from April 1, 2002 to March 31, 2003 to identify whether each incident case of CHF had received an echocardiogram. For those incident cases over 65 years of age, the ODB database was examined over the same time period to identify those who were prescribed an ACE inhibitor.

Inclusion and exclusion criteria

Table 12.6	Inclusion and exclusion criteria and corresponding fee/diagnostic codes for congestive heart failure	
Inclusion criteria		Corresponding diagnostic or fee codes
Include those with a diagnosis of CHF since 1991 or prior (if prior, date of diagnosis defaulted to April 1, 1991)		• 428, I500, I501, I509
Must have had, over a period of two years, two OHIP claims or one hospitalization in order to be included		N/A
Exclusion criteria		Corresponding diagnostic or fee codes
Invalid he	ealth card number	N/A
Died before diagnosis of CHF		N/A
Died before April 1, 1991		• 428, I500, I501, I509
Born after diagnosis of CHF		• 428, I500, I501, I509
Not in RPDB		N/A
Out-of-province residents		N/A

Outcome definitions

Table 12.7	Outcome definitions used to capture congestive heart failure care	
Outcom	e of interest	Definition with corresponding fee codes
ACE inhil	bitor	DINS available upon request
Echocard one year	liogram use within of diagnosis	• G560, G561, G562, G566, G567, G568, G570, G571, G574, G575

Asthma care

The Ontario Asthma Surveillance Information System (OASIS) database was used to identify asthmatic patients up to the age of 40 years. The database uses OHIP visits and CIHI-DAD hospital admissions for asthma and is currently being validated in Ontario. People who were first diagnosed with asthma between April 1, 2002 and March 31, 2003 were included in the study. Ontarians below the age of 11 years were excluded .

Inclusion and exclusion criteria

In developing the OASIS database, all individuals up to 40 years of age with a diagnosis of asthma (ICD-9: 493.0–493.9 or ICD-10: J45) found in either the CIHI or OHIP databases were extracted for the period 1992/93 to 2002/03. Both CIHI and OHIP records were searched back for one year to differentiate existing asthma patients (prevalent) from new asthma patients (incident). Finally, OHIP and CIHI records were merged to create a dataset that included all asthma patients with at least one asthma hospital admission or at least two OHIP claims for asthma within a three-year period.

Outcome definitions

Table 12.8	Outcome definitions used to capture asthma care	
Outcom of intere	e est	Definition with corresponding fee codes
Emergen departme	cy ent visits	•J45 dx 1 (main diagnosis) or any of the following (R05, R060, R062, J96, I46) dx 1 and J45 in dx 2 or dx 3
Spiromet	ry tests	 Simple spirometry (J301 and J324), Flow volume loop (J304 and J327) or Bronchial provocation challenge (J333)

Spirometry testing was captured by OHIP billings for simple spirometry, flow volume loop and bronchial provocation challenge. The National Ambulatory Care Reporting System (NACRS) database was used to identify emergency department (ED) visits made by newly diagnosed asthmatics. ED visits for which a diagnosis of asthma or wheezing was recorded among the first three diagnoses listed were included.

Acute low back pain management

The OHIP database was used to identify all claims for acute low back pain (LBP) between April 1, 2002 and March 31, 2003. LBP cases were identified using OHIP claims for lumbar strain, lumbago, coccydynia and sciatica. We only included the first OHIP claim per person during fiscal year 2002/03, as well as only those claims made by GP/FPs. All OHIP and CIHI-DAD records in the five years prior to each person's LBP visit date were searched for other previous associated diagnoses and procedures. Persons with a prior diagnosis of LBP were excluded, as were persons with a diagnosis of neoplasm, disorders of the nervous system, arthritis, congenital anomalies, and fractures. Those with prior visits to neurosurgeons or orthopaedic surgeons were excluded, as well as those with prior magnetic resonance imaging (MRI), computerized tomography (CT), electromyography (EMG), spinal testing or spinal surgery for LBP. Persons under the age of 20 years as of the diagnosis date were also excluded.

Each eligible person with LBP was followed for six weeks after their OHIP LBP visit date to determine whether they had received a lumbar X-ray, and for three months to determine whether they had received a CT, MRI or EMG. Utilization of these non-invasive diagnostic tests for LBP was determined from submitted claims to OHIP. The professional component of all spinal X-ray, CT, MRI or EMG claims to OHIP was used to identify these claims. MRI claims include a base component plus optional repeat codes (i.e., a different plane or pulse sequence). For the purposes of capturing MRI utilization, only the base component was counted.

Exclusion criteria

Table 12.9	Exclusion criteria and corresponding fee/diagnostic codes for acute low back pain	
Exclusion criteria	Corresponding diagnostic or fee codes	
OHIP exclusions in five years prior	 Neoplasms dxcode 140–239 to index Nervous system dxcode: 320–330, 333–344, 348–349, 353–359 All arthritis dxcode: 714, 715, 716, 730 Congenital anomalies dxcode: 741–759 Fractures dxcode: 805, 806, 829 All fee codes for neurosurgery visits (See OHIP fee schedule July 1, 2000–A23) Neurosurgery visits spec='04' All fee codes for orthopaedic surgery visits (See OHIP fee schedule July 1, 2000–A23) Neurosurgery visits spec='06' X-ray of spine fee codes X025, X027, X028, X031, X032, X033, X034, X202, X203, X204, X205, X206, X207 CT fee code X415, X416, X128 Other tests on spine fee code X057, X058, X080, X081, X164, X173, J006, J011, J020, J030, J038, Z454, G368, G386 MRI fee code G455, G456, G457, G458, G459, G465, G466, G467, G469, Operations of the spine (See OHIP fee schedule July 1, 2000–N18–20, X5–7) 	
CIHI exclusions in five years prior to index (Any CIHI/ Same Day Surgery ICD-9 codes, specify inpatient and outpatient)	 324.1 Intraspinal abscess 334.8 Other spinocerebellar diseases 334.9 Unspecified spinocerebellar disease 335, 336 Diseases of the spinal cord 340 Multiple sclerosis 342, 344 Other diseases of central nervous system pertaining to spine 349 Reaction to spinal or lumbar puncture 349.81 Cerebrospinal fluid rhinorrhea 350–359 Disorders of peripheral nervous system 720–724 Dorsopathies 737 Curvature of spine 738.5 Other acquired deformity of back or spine 739.3 Lumbosacral region nonallopathic lesions 710–739 Diseases of the musculoskeletal system and connective tissue 740–742 Congenital anomalies 754.2 Congenital musculoskeletal deformities of spine 805 Fracture of vertebral column without spinal cord injury 806 Fracture of vertebral column with spinal cord injury 839 Other, multiple and ill-defined dislocations 847 Sprains, strains and other and unspecified parts of back 950 to 957 Injury to nerves and spinal cord 	

Outcome definitions

Table 12.10 Outco low I	Outcome definitions used to capture acute low back pain	
Outcome definition	Corresponding fee codes	
X-ray of spine fee codes	• X025, X202, X203, X027, X204, X028, X205, X206, X032, X033, X031, X034, X207	
CT of spine fee codes	• X415, X416, X128	
MRI of spine fee codes	 X490—Limited spine, one segment, multislice sequence X492—Limited spine, multislice, repeat X493—Intermediate spine, multislice sequence X495—Intermediate spine, repeat X496—Complex spine, multislice X498—Complex spine, repeat 	
EMG of spine fee codes	• G455, G456, G459, G466, G457, G469, G458, G465, G467	

Continuity of care

For each person over 20 years of age, we calculated the Usual Provider Continuity (UPC) Index using two years of OHIP data. OHIP office-based primary care visits to GP/FPs were extracted from April 1, 2001 to March 31, 2003. The OHIP office-based visits were then used in the following formula:

UPC = ni/N, where N = total # of visits and ni = number of visits to the usual provider seen over a two-year time frame.

Visits were restricted to those made to a GP/FP for primary care in the office, home or LTC facility. ED and inpatient visits were excluded from the calculation. Visits to a specialist are attributed to the GP/FP who referred the patient and are also included in the calculation.

The UPC index is calculated only for individuals who had at least three visits over a two-year time frame. The physician who provided the greatest proportion of care is specified as the usual provider. The number of visits to the usual provider is divided by the total number of visits to arrive at the UPC index. A score of one represents perfect continuity of care. Individuals were defined as having high continuity of GP/FP care if their UPC index was greater than 0.75.

References

- 1. Caminal J, Starfield B, Sanchez E, Casanova C, Morales M. The role of primary care in preventing ambulatory care sensitive conditions. *European Journal of Public Health* 2004; 14(3):246–251.
- Wilkinson EK, McColl A, Exworthy M, Roderick P, Smith H, Moore M, Gabbay J. Reactions to the use of evidence-based performance indicators in primary care: a qualitative study. *Quality in Health Care* 2000; 9(3):116–174.
- Crampton P, Perera R, Crengle S, Dowell A, Howden-Chapman P, Kearns R, et al. What makes a good performance indicator? Devising primary care performance indicators for New Zealand. New Zealand Medical Journal 2004; 17(1191):1–12.
- Engels Y, Dautzenberg M, Campbell S, Broge B, Boffin N, Marshall M, et al. Testing a European set of indicators for the evaluation of the management of primary care practices. *Family Practice* 2006; 23(1):137–147.
- Marshall MN, Roland MO, Campbell SM, Kirk A, Reeves D, Brook R, et al. Measuring general practice. A demonstration project to develop and test a set of primary care clinical quality indicators. London: The Nuffield Trust; 2003.
- Campbell SM, Braspenning J, Hutchinson A, Marshall M. Research methods used in developing and applying quality indicators in primary care. *Quality & Safety in Health Care* 2002; 11:358–364.
- Marshall M, Leatherman S, Mattke S and the members of the OECD Health Promotion, Prevention and Primary Care Panel. Selecting indicators for the quality of health promotion, prevention and primary care at the health systems level in OECD Countries, 2004. Accessed August 15, 2006 at http://www.oecd.org/dataoecd/27/52/ 33865865.pdf
- Arah OA, Westert GP. Correlates of health and healthcare performance: applying the Canadian health indicators framework at the provincialterritorial level. BMC Health Services Research 2005; 5:76.
- Barnsley J, Berta W, Cockerill R, MacPhail J, Vayda E. Identifying Performance Indicators for Primary Care Practices: A Consensus Process. *Canadian Family Physician* 2005; 700–701.
- Watson DE, Krueger H, Mooney D, Black C. Planning for renewal. Mapping primary health care in British Columbia. Vancover, British Columbia: Centre for Health Services and Policy Research, the University of British Columbia; 2004.
- Katz A, De Coster, C, Bogdanovic B, Soodeen RA, Chateau D. Using administrative data to develop indicators of quality in family practice. Winnipeg, Manitoba: Manitoba Centre for Health Policy; 2004.
- Cancer Care Ontario: Insight on Cancer. News and Information on Cervical Cancer. Toronto: Canadian Cancer Society (Ontario Division); 2005. Available at: http://www.cancercare.on.ca/documents/Insight OnCancer-cervical05.pdf
- Marshall MN, Campbell S, Hacker J, Roland MO, editors. Quality indicators for general practice: a practical guide for primary care health professionals and managers. London: Royal Society of Medicine Press; 2001.
- Ontario Cervical Screening Collaborative Group. New cervical screening guidelines issued to Ontario physicians. *Ontario Medical Review* 1996; December; 40–45.

- Upshur REG, Wang L, Maaten S, Leong A. Patterns of primary and secondary prevention. In: Jaakkimainen L, Upshur REG, Klein-Geltink JE, Leong A, Maaten S, Schultz SE et al., editors. Primary care in Ontario: ICES Atlas. Toronto: Institute for Clinical Evaluative Sciences; 2006.
- Cervical cancer screening (Pap test). Cancer Care Ontario. Cancer System Quality Index; 2006. Accessed August 15, 2006 at http://www.cancercare. on.ca/QualityIndex2006/access/cervicalScreening/index.html
- 17. Cancer Care Ontario. Accessed August 15, 2006 at http://www. cancercare.on.ca
- Canadian Task Force on Preventive Health Care. Colorectal cancer screening. Recommendation statement from the Canadian Task Force on Preventive Heath Care. Canadian Medical Association Journal 2001; 165(2):206–208.
- Vinden C, Schultz S, Rabeneck L. Use of large bowel procedures in Ontario: ICES Atlas. Toronto: Institute for Clinical Evaluative Sciences; 2004.
- Angus H, Greenberg A, Sullivan T (Editors). Improving the Management of Colorectal Cancer. Summary of the Cancer Quality Council of Ontario Signature Event on Colorectal Cancer, June 23, 2003. Cancer Quality Council of Ontario; Fall 2003.
- 21. Mandel JS. Screening of patients at average risk for colon cancer. Medical Clinics of North America 2005; 89(1):43–59.
- National Quality Measures Clearinghouse. Immunizations: percentage of two-year-olds who are up-to-date with their primary series of immunizations (DTaP, IPV, MMR, PCV7, VZV, Hib, Hep B). Accessed August 15, 2006 at http://www.qualitymeasures.ahrq.gov/summary/ summary.aspx?ss=1&doc_id=7440
- Guttmann A, Manuel D, Dick PT, To T, Lam K, Stukel TA. Volume matters: physician practice characteristics and immunization coverage in young children insured by a universal health plan. *Pediatrics* 2006; 117(3): 595–602.
- Szilagyi PG, Bordley C, Vann JC, Chelminski A, Kraus RM, Margolis PA et al. Effect of patient reminder/recall interventions on immunization rates: A review. *Journal of the American Medical Association* 2000; 284(14):1820–1827.
- Rodewald LE, Szilagyi PG, Humiston SG, Barth R, Kraus R, Raubertas RF. A randomized study of tracking with outreach and provider prompting to improve immunization coverage and primary care. *Pediatrics* 1999; 103(1):31–38.
- Hu J, Robbins G, Ugnat AM, Waters C. Trends in mortality from diabetes mellitus in Canada, 1986–2000. *Chronic Diseases in Canada* 2005 Winter; 26(1):25–29.
- 27. Roglic G, Unwin N, Bennett PH, Mathers C, Tuomilehto J, Nag S, et al. The burden of mortality attributable to diabetes: realistic estimates for the year 2000. *Diabetes Care* 2005; 28(9):2130–2135.
- Hux J, Booth G, Slaughter P, Laupacis A. Diabetes in Ontario: ICES Practice Atlas. Toronto: Institute for Clinical Evaluative Sciences; 2003.
- 29. Mo F, Pogany LM, Li FC, Morrison H. Prevalence of diabetes and cardiovascular comorbidity in the Canadian Community Health Survey 2002–2003. *Scientific World Journal* 2006; 6:96–105.
- Canadian Diabetes Association. Canadian Diabetes Association 2003 clinical practice guidelines for the prevention and management of diabetes in Canada. Accessed August 15, 2006 at http://www. diabetes.ca/cpg2003/default.aspx

- 31. Majumdar SR, Johnson JA, Bowker SL et al. A Canadian concensus for the standardized evaluation of quality improvement interventions in Type 2 diabetes. *Canadian Journal of Diabetes* 2005; 29:220–229.
- 32. Haydon E, Roerecke M, Giesbrecht M, Rehm J, Kobus-Matthews M. Chronic Disease in Ontario and Canada: Determinants, risk factors and preventive priorities. Summary of Full Report. March 2006. Prepared for the Ontario Chronic Disease Prevention Alliance and the Ontario Public Health Association.
- 33. Public Health Agency of Canada and Statistics Canada. Non-Communicable Diseases (NCD) Surveillance Infobase. Accessed June 23, 2006 at http://www.cvdinfobase.ca/surveillance/Mapdb/Infobase_e.htm
- Arnold JM, Liu P, Demers C, Dorian P, Giannetti N, Haddad H et al. Canadian Cardiovascular Society consensus conference recommendations on heart failure 2006: Diagnosis and management. Canadian Journal of Cardiology 2006; 22(1):23–45.
- Upshur REG, Wang L, Luo J, Maaten S, Leong A. Primary care for respiratory diseases. In: Jaakkimainen L, Upshur R, Klein-Geltink JE, Leong A, Maaten S, Schultz SE et al., editors. Primary care in Ontario: ICES Atlas. Toronto: Institute for Clinical Evaluative Sciences, 2006.
- Logheed MD, Garvey N, Chapman KR, Cicutto L, Dales R, Day AG, Hopman WM, Lam M, Sears MR, Szpiro K, To T, Paterson NA. Ontario Respiratory Outcomes Research Network. *Chest* 2006; 129(4):909–1017.
- Baibergenova A, Thabane L, Akhtar-Danesh N, Levine M, Gafni A, Leeb K. Sex differences in hospital admission from emergency departments in asthmatic adults: a population-based study. *Annals of Allergy, Asthma & Immunology* 2006; 96(5):666–672.
- Baibergenova A, Thabane L, Akhtar-Danesh N, Levine M, Gafni A, Moineddin R, Pulcins I. Effect of gender, age, and severity of asthma attack on patterns of emergency department visits due to asthma by month and day of the week. *European Journal of Epidemiology* 2005; 20(11):947–956.
- Lemiere C, Bai T, Balter M, Bayliff C, Becker A, Boulet LP et al. Adult asthma consensus guidelines update 2003. *Canadian Respiratory Journal* 2004; 11 (Suppl A):9A–18A.
- Iron K, Jaakkimainen L, Rothwell DM, Ping L, Laupacis A. Investigation of acute lower back pain in Ontario: Are guidelines being followed? ICES Investigative Report. Toronto: Institute for Clinical Evaluative Sciences; 2004.
- 41. Agency for Healthcare Research and Quality. Accessed Aug 10, 2006 at http://www.ahrq.gov/
- 42. Guidelines Advisory Committee website. Accessed June 28, 2006 at http://gacguidelines.ca
- 43. Haggerty J, Reid R, McGrail K, McKendry R. Here, there and all over the place: defining and measuring continuity of health care. Centre for Health Services and Policy Research. June 2001.
- Sans-Corrales M, Pujol-Ribera E, Gene-Badia J, Pasarin-Rua MI, Iglesias-Perez B, Casajuana-Brunet J. Family medicine attributes related to satisfaction, health and costs. *Family Practice* 2006; 23(3):308–316.
- O'Malley AS. Current evidence of the impact of continuity of care. Current Opinion in Pediatrics 2004; 16(6):697–699.
- 46. Gill JM, Mainous AG 3rd. The role of provider continuity in preventing hospitalizations. *Archives of Family Medicine* 1998; 7(4):52–57.

- Cree M, Bell NR, Johnson D, Carriere KC. Increased continuity of care associated with decreased hospital care and emergency department visit for patients with asthma. *Disease Management* 2006; 9(1):63–71.
- Jaakkimainen L, Crighton E, Grunraj N. Continuity of Care between Family Physicians and Pharmacies. Abstract AA2. Presented at the North American Primary Research Group. Quebec City, Quebec. October 17, 2005.
- Jee SH, Cabana MD. Indices for continuity of care: A systematic review of the literature. *Medical Care Research and Review* 2006; 63(2):158–188.
- 50. McGregor SE, Bryant HE. Predictors of colorectal cancer screening: a comparison of men and women. *Canadian Journal of Gastroenterology* 2005; 19(6):343–349.
- McGregor SE, Hilsden RJ, Murray A, Bryant HE. Colorectal cancer screening: practices and opinions of primary care physicians. *Preventative Medicine* 2004; 39(2):279–285.
- Klabunde CN, Vernon SW, Nadel MR, Breen N, Seef LC, Brown ML. Barriers to colorectal cancer screening: a comparison of reports from primary care physicians and average-risk adults. *Medical Care* 2005; 43: 939–944.
- Lafata JE, Williams LK, Ben-Menachem T, et al. Colorectal carcinoma screening procedure use among primary care patients. *Cancer* 2005; 104(7):1356–1361.
- McWha L, MacArthur A, Badiani T, Schouten H, Tam T, King A. Measuring up: results from the National Immunization Coverage Survey, 2002. *Canada Communicable Disease Report* 2004; 30(5):37–50.
- 55. Manitoba Health. Manitoba Immunization Monitoring System (MIMS) Annual Report 2003. Accessed August 1, 2006 at http://www.gov. mb.ca/health/publichealth/cdc/surveillance/mims03.pdf
- 56. Harris SB, Stewart M, Brown JB et al. Type 2 diabetes in family practice: Room for improvement. *Canadian Family Physician* 2003; 49:778–785.
- McAlister FA, Campbell NR, Duong-Hua M, Chen Z, Tu K. Antihypertensive medication prescribing in 27,822 elderly Canadians with diabetes over the past decade. *Diabetes Care* 2006; 29(4):836–841.
- Edelman D, Olsen MK, Dudley TK, Harris AC, Oddone EZ. Quality of care for patients diagnosed with diabetes at screening. *Diabetes Care* 2003; 26(2):367–371.
- Oliver MJ, Lok CE, Shi J, Rothwell DM. Dialysis therapy for persons with diabetes. In: Hux J, Booth G, Slaughter P, Laupacis A, editors. Diabetes in Ontario: ICES Practice Atlas. Toronto: Institute for Clinical Evaluative Sciences; 2003.
- Campbell SM, Roland MO, Shekelle PG, Cantrill JA, Buetow SA, Cragg DK. Development of review criteria for assessing the quality of management of stable angina, adult asthma, and non-insulin dependent diabetes mellitus in general practice. *Quality in Health Care* 1999; 8(1):6–15.
- Lee DS, Tran C, Flintoft V, Grant FC, Liu PP, Tu JV; Canadian Cardiovascular Outcomes Research Team/Canadian Cardiovascular Society Heart Failure Quality Indicator Panel. CCORT/CCS quality indicators for congestive heart failure care. *Canadian Journal of Cardiology* 2002; 19:357–364.
- 62. Heart Failure Society of America. The Stages of Heart Failure—NYHA Classication. 2002. Accessed July 15, 2006 at http://www.abouthf.org/ questions_stages.htm

- 63. Tu K, Gong Y, Austin PC, Jaakkimainen L, Tu JV, for the Canadian Cardiovascular Outcomes Research Team. An overview of the types of physicians treating acute cardiac conditions in Canada. *Canadian Journal of Cardiology* 2004; 20(3):282–291.
- 64. Cox JL, Ramer SA, Lee DS, Humphries K, Pilote L, Svenson L, Tu JV; Canadian Cardiovascular Outcomes Research Team Investigators. Pharmacological treatment of congestive heart failure in Canada: a description of care in five provinces. *Canadian Journal of Cardiology* 2005; 21:337–343.
- 65. Di Cecco R, Patel U, Upshur RE. Is there a clinically significant gender bias in post-myocardial infarction pharmacological management in the older (>60) population of a primary care practice? *BMC Family Practice* 2002; 3:8.
- 66. Buch P, Pasmussen S, Abildstrom SZ, Kober L, Carlsen J, Torp-Pedersen C, on behalf of the TRACE investigators. The long-term impact of the angiotensin-converting enzyme inhibitor trandolapril on mortality and hospital admissions in patients with left ventricular dysfunction after a myocardial infarction: follow-up to 12 years. *European Heart Journal* 2005; 26:145–152.
- 67. Gribben B, Coster G, Pringle M et al. Quality of care indicators for population-based primary care in New Zealand. *New Zealand Medical Journal* 2002; 115:163–166.
- Reid R, Barer ML, McKendry R, McGrail KM, Prosser B, Green B, Evans RG, Goldner E, Hertzman C, Sheps SB. Patient-focused care over time: Issues related to measurement, prevalence, and strategies for improvement among patient populations. Canadian Health Services Research Foundation. July 2003.

2.1

R