

At A Glance

June 2010

Monthly highlights of ICES research findings for stakeholders

Lack of primary care physicians putting Ontario's children at risk

Guttman A, Shipman S, Lam K, Goodman D, Stukel T. Primary care physician supply and children's health care use, access, and outcomes: findings from Canada. *Pediatrics*. 2010; 125(6):1119–26.

Issue	What is the relationship between the supply of primary care physicians (PCPs) and children's health care use, access and outcomes?
Study	Conducted a population-based, cross-sectional study of all Ontario children aged 0 to 17 years from April 2003 to March 2005. The county-level supply of full-time equivalent (FTE) PCPs was calculated, and the relationship between PCP supply and recommended primary care visits, emergency department (ED) use, and ambulatory care-sensitive condition admissions was modelled. Population-based surveys were used to describe PCP access.
Key Findings	<ul style="list-style-type: none">• The supply of PCPs varied widely across Ontario's 49 counties, ranging from 1,720 to 4,720 children per FTE physician.• Approximately 8% of Ontario children lived in areas with very low numbers of PCPs (more than 3,000 children per FTE physician).• Compared with the highest-supply counties, those with the lowest PCP supply had a significantly higher proportion of children with no PCP (32.8% vs. 6.3%) and newborns without early follow-up care (58.2% vs. 14.5%).• Rates of overall ED use per 1,000 children increased from 179.8 in counties with the highest supply of PCPs to 440.3 in counties with the lowest supply. This trend was predominantly due to low-acuity visits.
Implications	Under universal insurance, there are still important differences in primary and ED care use and preventable hospital admissions related to physician supply. Physician distribution is a critical issue to address in policies to improve access to primary care.

Risk-factor control edges out new therapies as source of CHD mortality decline

Wijeyesundera H, Machado M, Farahati F, Wang X, van der Velde G, Tu J, Lee D, Goodman S, Petrella R, O'Flaherty M, Krahn M, Capewell S. Association of temporal trends in risk factors and treatment uptake with coronary heart disease mortality, 1994–2005. *JAMA*. 2010; 303(18):1841–7.

Issue	Death from coronary heart disease (CHD) has declined substantially in Canada since 1994. How much of this decline is associated with progress in the control of cardiovascular risk factors and how much with advances in evidence-based medical treatments?
Study	Evaluated the Ontario population aged 25 to 84 between 1994 and 2005 using a mathematical model that integrated data on population size, CHD mortality, trends in six risk factors for CHD (smoking, diabetes, systolic blood pressure, cholesterol level, inactivity and obesity) and uptake of changes in 42 medical and surgical therapies for eight CHD subgroups (acute myocardial infarction (AMI), acute coronary syndromes, secondary prevention post-AMI, chronic coronary artery disease, heart failure in the hospital vs. in the community, and primary prevention for hyperlipidemia or hypertension).
Key Findings	<ul style="list-style-type: none">• Between 1994 and 2005, the age-adjusted CHD mortality rate in Ontario decreased by 35%, dropping from 191 deaths per 100,000 to 125—or an estimated 7,585 fewer CHD deaths in 2005.• Nearly half of the decline (48%) was attributed to improvements in cardiovascular risk factors, particularly cholesterol level (23% of the total) and blood pressure (20%).• Another 43% of the decline was the result of advances in medical treatment (mainly medications), in patients with chronic, stable coronary artery disease (17% of the total), heart failure in the community (10%) and AMI (8%).• Reductions in smoking (6% of the total) and physical inactivity (11%) combined to prevent or delay an additional 1,035 deaths in 2005.• Offsetting these improvements, diabetes accounted for a 6% increase in cardiac deaths over the study period, while obesity accounted for a 2% increase.
Implications	These results provide better insight for policy makers on where to concentrate future efforts in continuing to lower heart disease deaths.

Diabetes cases in Canada to increase by almost two million between 2007 and 2017

Manuel D, Rosella L, Tuna M, Bennett C. *How Many Canadians will be Diagnosed with Diabetes Between 2007 and 2017? Assessing Population Risk*. ICES Investigative Report. Toronto: Institute for Clinical Evaluative Sciences; 2010.

Issue	Based on current levels of obesity and other risk factors, what is Canadians' future risk of developing diabetes?
Study	Devised the Diabetes Population Risk Tool (DPoRT) to estimate diabetes risk at 10 years for 101,807 respondents who anonymously reported their height, weight and other relevant risk factors in the 2007 Canadian Community Health Survey. New cases of diabetes were also estimated by province, socio-economic status, weight and age group.
Key Findings	Between 2007 and 2017, 1.9 million Canadians (or about nine out of every 100 residents) are predicted to develop diabetes. In 2007, the 10-year risk of diabetes was lowest in Quebec, British Columbia and Canada's urban regions. Individuals who are obese have the highest individual diabetes risk, but those who are overweight bear the greatest population risk. In total, 712,000 cases are predicted to develop in people who are defined as overweight (having a Body Mass Index [BMI] of 25–30) compared to 247,000 cases in people who are defined as very obese (BMI>35).
Implications	These findings show how population baseline risk can be used to predict how many people will newly develop diabetes, determine who to target for prevention, and estimate the potential benefit of different prevention strategies.

Adverse outcomes from joint replacement surgery not linked to provider volumes

Paterson M, Williams J, Kreder H, Mahomed N, Gunraj N, Wang X, Laupacis A. *Provider volumes and early outcomes of primary total joint replacement in Ontario*. *Can J Surg*. 2010; 53(3):175–83.

Issue	Are adverse outcomes from total joint replacement related to hospital and surgeon procedure volumes?
Study	Identified Ontarians aged 20 and older who underwent a unilateral elective total hip replacement (THR) or total knee replacement (TKR) between April 2000 and March 2004, and followed them for one year. Associations between (1) procedure volume and acute length of hospital stay (ALOS), and (2) procedure volume and rate of surgical complications, were assessed for four outcomes: surgical complications during the index admission; death within 90 days; readmission for amputation, fusion or excision within one year; and revision arthroplasty within one year.
Key Findings	The study included 45,507 patients—20,290 THRs and 27,217 TKRs. Patient age, sex and comorbidity were significant predictors of complications and mortality. There were no associations between hospital/surgeon volume and mortality. Surgeons with the lowest-quartile THR volumes had about 30% higher complication rates than surgeons in the higher-volume quartiles; no such relation was observed for TKR. Surgeons with the lowest-quartile volumes had roughly 30% and 40% higher revision rates for THR than surgeons in the second- and highest-volume quartiles, respectively, but did not differ statistically from surgeons in the third-volume quartile. Higher-volume surgeons had relatively shorter ALOS after both THR and TKR; no such associations were present with hospital volume.
Implications	Evidence for a relationship between provider volume and outcome was limited and inconsistent.

Heart failure patients discharged from ED at higher risk of early death than hospitalized patients

Lee D, Schull M, Alter D, Austin P, Laupacis A, Chong A, Tu J, Stukel T. *Early deaths in patients with heart failure discharged from the emergency department: a population-based analysis*. *Circ Heart Fail*. 2010; 3(2):228–35.

Issue	Approximately one-third of patients with heart failure (HF) visiting the emergency department (ED) are discharged without hospital admission. What outcomes do these patients experience?
Study	Examined the acute care and early outcomes of patients aged 20 and older who visited an ED in Ontario from April 2004 and March 2007 with a primary diagnosis of HF. Clinical and demographic characteristics were compared between discharged and admitted patients.
Key Findings	Of 50,816 patients visiting an ED for HF, 31.7% were discharged without hospital admission. Death occurred in 1.3% within seven days and in 4.0% within 30 days after discharge from the ED. Patients were more likely to be hospitalized if they were older, arrived by ambulance, had a higher ED triage acuity score, or received resuscitation in the ED. In those with comparable predicted risks of death, 90-day mortality rates were significantly higher among discharged than admitted patients (11.9% vs. 9.5%).
Implications	Patients with HF discharged from the ED have substantial risks of death which may exceed that of hospitalized patients in some cases. Further clinical evidence is needed to guide risk stratification in the ED and to assist in decision-making regarding the safety of direct discharge of patients with HF from the ED.