

Assessment of the Health System Performance in Ontario Major Cities (Canada)

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Abstract

This study aims to provide evidence to support policymaking by assessing health system performance in the province of Ontario, Canada, and its major cities (Toronto, Mississauga, Oakville, and Brampton). It reports on the performance of health care organizations and local health systems over the years 2012-2018. The performance indicators analyzed are grouped into two categories: health status and quality of service (Ontario Ministry of Health). The analysis reports health care waiting times for the year 2018, focusing on the most frequently reported disease groups and procedures such as: pediatric, cancer, cardiac, orthopedic, eye, diagnostic imaging, and emergency room. It also looks at government spending on health, the benchmark for surgical procedures, the number of physicians, the health status of the population, and rates of hospitalization and hospital admissions. As recommendations, among policies to improve the health system, the government should pay attention to health spending, increasing the number of doctors rather than beds, and introducing the privately-owned hospitals that could coexist with the public ones.

Keywords: health system, performance, health status, health policies.

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1. Introduction

This study provides an assessment of the health system performance in the province of Ontario, Canada, and its major cities (Toronto, Mississauga, Oakville, and Brampton). It reports on the performance of health care organizations and local health systems over the years 2012-2018. The performance indicators analyzed are grouped into two categories: health status and quality of service (Ontario Ministry of Health). One of the concerns of health policies is the waiting time for health care. This study reports the status of wait times in major Ontario cities in 2018 for major surgical procedures: pediatric, cancer, orthopedic, cardiac and eye surgical procedures. Waiting times for emergency departments and diagnostic imaging are also reported. It also looks at government spending on health, the benchmark for surgical procedures, the number of doctors, the health status of the population, and rates of hospitalization and hospital admissions.

Internationally, in 2015, health spending in Canada was 10.4% of GDP, lower than the U.S. (16.9%), France (11.1%), Germany (11.2), Sweden (11%), the Netherlands (10.7%). The OECD average of health spending was 8.9% of GDP (Canadian Institute for Health Information). There have been concerns in the media (CBC news) about the health care crisis in Ontario and the need for reform. Some of the problems faced by patients include bed shortages, lengthy wait times, and communication breakdown. According to the *Globe and Mail* (January 2018), during the summer of 2017, half of Ontario's hospitals were operating at or above 100% capacity, with one facility reaching 140%. The accepted international standard for hospital capacity is 85%, while if this occupancy rate exceeds 85% there is a high risk of hospital-acquired infections.

The Canadian Institute for Health Information (CIHI) has initiated a three-year plan to work on reporting the performance of Canada's health care system. According to CIHI, many countries issue public reports on the performance of their health systems, while integrated health system performance reporting is required in Canada. This study fills the gap in public reporting of health system performance in Ontario's four major cities.

The performance of the health system is important to be monitored, as it offers policy-makers an opportunity to improve the health care, by improving the quality of decisions made by everyone involved in the health system. According to CIHI, the health system is defined as 'all activities whose primary purpose is to promote, restore, and maintain health', therefore including both health care services provided to individuals, as well as public health services and policies.

Nowadays, demands for health services are increasing, and the current challenge is to develop sustainable policies and provide quality services to achieve the best possible health status of citizens, within the current socio-economic constraints. Therefore, issues related to health system performance and sustainability in the future should occupy a considerable space in policy discussions, and it is a major concern for decision makers at all levels of government to consider that major step of defining the problem based on assessment and then set objectives and strategies to formulate efficient and effective public policies. Governments have a key role in promoting the health of citizens through the provision of

health care, so provincial governments across Canada should explore different models of primary health care reform and share them across jurisdictions.

2. Overview of health care services in the province of Ontario, Canada

According to Closing the Gap Healthcare, the largest interdisciplinary service provider in Ontario, legislation regarding Canada Health Act was adopted in 1984 and sets out conditions to be followed by each province to receive federal transfer payments. The Health Act deals with how the system is financed and not how the health services should be delivered. Each province of Canada independently determines the delivery of the health care system.

For the province of Ontario, 38.7% of tax dollars go to the Ministry of Health and Long-Term Care (MOHLTC). The MOHLTC's role is to create legislation to make Ontario's health care system work. The Ministry of Health takes the money and divides it into eight spending categories: the Ontario Health Insurance Program; Population and Public Health; Provincial Programs and Stewardship; Local Health Integration Networks (LHIN); Administration of the Ministry; Health Policy and Research; eHealth and Information Management; Information Systems. We will briefly present the background on the three largest expenditure segments of the MOHLTC in the period 2017–2018: Local Health and Integration Networks (50.88% operating expenses); Ontario Health Insurance Program (36.45% operating expenses), and Provincial Programs and Stewardship (7.43% operating expenses).

Local Health and Integration Networks (LHINs) represent the infrastructure of Ontario's healthcare system responsible for the local planning of health services. There are 14 total LHINs in Ontario, each aligned according to population distribution. The LHINs examine the specific needs of their community and develop programs to provide appropriate care. There are four sections of the LHIN: Long-Term Care Homes, Community Support Agencies, Hospitals, and Home and Community Care.

Part of the Ontario Health Insurance Program (OHIP) includes Ontario Health Insurance (physicians, practitioners), drug programs, and assistive devices. OHIP physicians/practitioners and clinics account for more than 14 billion dollars from the 19 billion dollars allocated to OHIP. OHIP clinics are funded directly through the Ministry of Health and include physiotherapy, x-ray, ultrasound, MRI, blood tests or other medical imaging clinics. These services can be free or for a minimal fee, just like when you see a primary care physician. These clinics bill directly to the Ministry of Health. Provincial Programs and Stewardship include Cancer Care Ontario, HIV/AIDS, Hepatitis C programs and emergency health services such as ambulances. Emergency transport services are free to Canadian citizens and are tax funded.

3. Literature review

According to the World Health Organization (WHO, 2008), studies on performance measurement of the health sector began as early as 250 years ago. Dr. Ernest Codman pioneered the idea of performance measurement as a tool for evaluating the quality of health care. Codman proposed a detailed system of patient records, including post-discharge follow-up, identification of the 'best' and 'worst' surgeons based on the actual results of their care, and patient access to the results of different treatments, including comparisons between hospitals (Loeb, 2004). The experiences, challenges, and prospects of performance measurement in the health system are detailed in the report WHO (2008).

Loeb (2004) investigated the current state of performance measurement in the health care sector: there is little agreement on the philosophy of measurement, what to measure, on how data should be analyzed or on how to report the data, with ultimate questions relating to the value of measurement. There are two different philosophies on performance measurement: one view seeks to collect data from an organization (e.g., hospital, nursing home), and creates questions on what might be measured using the available data; the second view asks first what needs to be measured, followed by determining if the data required can be derived from existent data sources.

Nuti, Seghieri and Vainieri (2013) analyzed the performance evaluation system (PES) in Tuscany, Italy, to evaluate actions and promote a 'managed' competition in the health system. Through factors such as the design and the implementation process of the PES (e.g., user-friendly reporting system, continuous updates, and refinement of work indicators), the Tuscan PES is seen as a success. According to Nuti, Seghieri and Vainieri (2013) there are five critical success factors: the visual reporting system, the link between PES and CEO's reward system, the public disclosure of data, the high level of involvement of employees and managers in the whole process and strong political commitment. According to this stream of literature, the work of Nuti, Seghieri and Vainieri (2013) contributes through the new experience of the Tuscan PES in addressing a further fruitful application of the constructivist approach in healthcare (Nuti, Seghieri and Vainieri, 2013).

Peltokorpi (2011) uses a case study method to analyze the strategic decisions and operational management practices on the operating room productivity. The multiple case study approach was implemented with the hypotheses tested in multi-hospital settings, including 26 operational units in 15 hospitals, with 24 units located in Finland, one in Germany, and one in the USA. The results show that operating room productivity depends on factors like low idle time per operation, low staff intensity, and high-speed surgery. Staff incentive systems were the strongest driver of high productivity. Peltokorpi (2011) concludes that attention should be paid to personnel management and staffing levels, while productivity could be increased in all units if more attention was paid to personnel.

Hoflund and Farquhar (2008) implement a case study of the National Quality Forum (NQF), created in an effort to improve the quality of healthcare in the USA. NQF is viewed through the lenses of democratic experimentalism, while considering the benefits and challenges of this approach to healthcare regulation. Their findings show mixed results

of using this experiential approach: cooperation between stakeholders, many divided by conflicting interests, in order to collectively explore alternative quality improvement strategies, with an immediate challenge to the power imbalance and free rider problems associated with participatory decision making, and to develop solutions in the most efficient and timely manner. Lastly, Hoflund and Farquhar (2008) mentioned the question of whether such an institution can generate the broad changes that the current health system requires.

Some studies use individual performance indicators (DeRosario, 1999; Goncharuk, 2017; Cerovic, Dukic and Brkic, 2017), questionnaires (Briš *et al.*, 2016), or a composite index (Tandon *et al.*, 2000) derived from the World Health Organization data to study the efficiency of the health system. Io Storto and Goncharuk (2017) provide a review of studies on measuring efficiency in the health sector using individual performance indicators, implementing econometric models, or using parametric or non-parametric techniques.

4. Method and results

This study provides an evaluation of the status of health system and addresses policy concerns on the health system, by offering information on health indicators (World Health Organization, Canadian Institute for Health Information) for Canadians, with a focus on four major cities in the province of Ontario, namely Toronto (the capital of the province), Mississauga, Oakville, and Brampton (located in proximity). Our aim was to take a sample out of the population of the 52 cities in Ontario and to focus on the major cities. These four cities chosen account for 31.608% of Ontario's population (City Population, 2021) and are the main destinations of immigrants who come to Canada each year. Recognizing their value, the Government of Canada plans to welcome 465,000 new permanent residents in 2023, 485,000 in 2024, and 500,000 in 2025 (Government of Canada, 2018).

Health status indicators (wellbeing, health status, deaths) report on the current state of health of Canadians and answer the question: 'How healthy are Canadians right now?'. Service quality measures assess whether Canadians are receiving adequate, timely, efficient, and acceptable health services. Health financing indicators investigate government spending on health.

Therefore, in this analysis we used data mainly provided by the Canadian Institute for Health Information (CIHI), Hospital Morbidity Database (HMDB) and Ontario Mental Health Reporting System (OMHRS), and through exploratory data analysis, applying reasoning and critical thinking, we aimed to report on the performance indicators grouped into two categories: health status and quality of service. The main questions addressed in this research were those concerning the state of health care in the province of Ontario, the government spending on health, and the overall performance of the health care system in the province of Ontario.

Regarding the state of health care, an international comparison shows that waiting times for a total hip replacement (Vilberg *et al.*, 2013; Siciliani, Moran and Borowitz, 2014) are the lowest in the Netherlands and Sweden (around 40 days), while in Ontario waiting times for orthopedic surgery ranges from 62 to 191 days (Ontario average is 118

days). For cataract surgery, the shortest wait times are in England (average wait time is 18 days), Sweden (40 days), the Netherlands (33 days), while in Ontario wait times for eye surgery, including cataracts, ranges from 54 to 166 days (the cities of Oakville, Mississauga and Toronto having a much longer wait time than the Ontario average of 94 days).

The patients are assigned a priority level from 1 to 4 by doctors and hospitals: priority 1 means emergency and those patients are seen immediately and are not included in waiting time data. For non-emergencies, priority 2 is the most urgent. Table 1 shows system performance wait times for major surgical procedures, diagnostic imaging, and the emergency department in 2018. For diagnostic imaging there is a one day wait for priority 2 patients, in Toronto and Oakville. Priority 3 patients wait 13 days in Toronto and 20 days in Mississauga. In the emergency department, the average wait time for all patients for first evaluation is 1.5 hours in Ontario, with the highest wait time in Oakville (1.8 hours) and 1.35 hours in Toronto. Non-hospital emergency patients wait an average of 3.9 hours in Ontario and 4.65 hours in Mississauga. Emergency room waiting times for all hospitalized patients ranged from 13.73 hours in Toronto to 18 hours in Mississauga.

Regarding the waiting times for orthopedic surgery, the health system in Oakville and Brampton stands out. These two cities have the longest waiting times for a first orthopedic surgery appointment: 110 days in Oakville and 121 days in Brampton. The waiting time from specialist decision to surgery is longest in Brampton (191 days), while Ontario wait time to surgery is 118 days.

The Canadian Institute for Health Information (CIHI 2017) sets target benchmarks for some surgical treatment procedures for all priority level patients, excluding emergencies, as follows: hip replacement (182 days); knee replacement (182 days); hip fracture repair (48 hours); cataract (112 days); bypass surgery (182 days); radiotherapy (28 days).

In the emergency department, the waiting time for all patients admitted in the hospital is 18 hours in Mississauga and 14 hours in Toronto. There is an average of 4 hours waiting time for high urgency patients not admitted in the hospital and treated in the emergency department.

According to CIHI (2017), total health spending in Canada was forecast at \$6,604 per Canadian in 2017, almost \$200 more per person than in 2016 (\$6,419). The health-to-GDP ratio was estimated at 11.5% in 2017. Most of the money spent on health care in 2017 went to hospitals (28.3%), drugs (16.4%), and physicians (15.4%). In Ontario, in 2017, health spending per capita was forecast at \$6,367, representing 10.78% of GDP (Figure 1). From 2016 to 2017, per capita health spending in Ontario increased by 2.7%, representing \$169 more per person than in 2016.

Internationally, in 2015, health spending in Canada was 10.4% of GDP, lower than the U.S. (16.9%), France (11.1%), Germany (11.2), Sweden (11%), the Netherlands (10.7%). The OECD average of health spending was 8.9% of GDP (Canadian Institute for Health Information). Hospital capacity is another indicator of how well the health system is functioning. Available data for 2016–2017 shows that the number of beds per thousand population in Ontario was 2.18.

Table 1: Waiting times for surgeries and procedures

Name of procedure		Waiting time (days)				
		Ontario	Toronto	Mississauga	Oakville	Brampton
Pediatric	time to first surgical appointment	72	69	49	80	92
	time from decision to pediatric surgery	62	65	89	44	82
Cancer	time to first surgical appointment	10	9	12	6	8
	time from decision to cancer surgery	16	17	18	21	17
Cardiac	time from decision to cardiac surgery	1	1	1	n/a	1
Ortopedic	time to first surgical appointment	78	59	74	110	121
	time from decision to ortopedic surgery	118	86	n/a	62	191
Eye including cataract	time to first eye surgical appointment	84	69	76	171	56
	time from decision to eye surgery	94	135	166	163	54
Diagnostic imaging	priority 2 patients	0	1	0	1	n/a
	priority 3 patients	13	13	20	n/a	n/a
	priority 4 patients	31	33	59	n/a	n/a

		Waiting time (hours)				
Emergency department	first assessment by a doctor for all patients	1.5	1.35	1.6	1.8	1.5
	low urgency patients not admitted in hospital	2.4	2.35	2.65	2.2	2.2
	high urgency patients not admitted in hospital	3.9	3.93	4.65	3.5	3.8
	all patients admitted in hospital	14.4	13.73	18	15	15.5

Source: Health Quality Ontario (www.hqontario.ca)

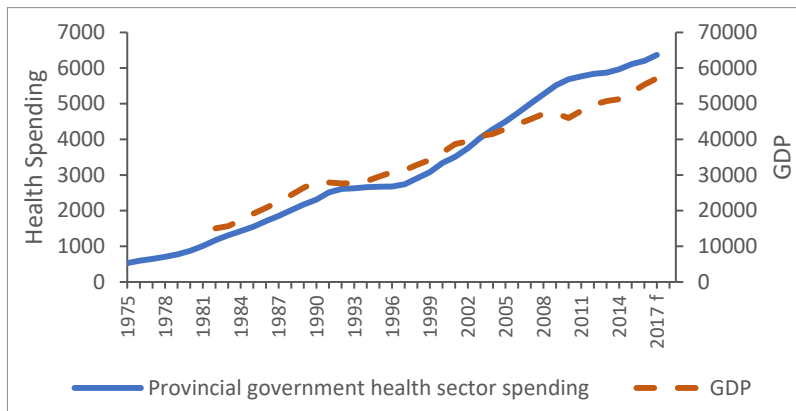


Figure 1: Provincial government health sector spending

Source: CIHI: Table B1.2 and Appendices A1, D1

According to an OECD study by Siciliani and Hurst (2003), most of the variation in hospital waiting times is explained by the availability of doctors rather than beds. A marginal increase of 0.1 physicians per 1,000 population is associated with a reduction in mean waiting times of 8.3 days and median waiting times of 7.6 days. Similarly, a \$100 increase

in total health expenditure per capita is associated with a reduction in mean waiting times of 6.6 days, and median waiting times of 6.1 days (Siciliani and Hurst, 2003). For Ontario, according to CIHI (2017), the total number of physicians per 100,000 population from 2015 to 2016 remained the same at 220. From 2014 to 2015, the total number of physicians per 100,000 population increased from 214 to 220.

There are news reports of Canadians leaving the country for Medicare (CTV News July 2017, Fraser Institute) due to long wait times in Canada. The Fraser Institute estimated that in Ontario in 2016, approximately 26,513 patients traveled abroad for treatment, indicating that Canadians are dissatisfied with the quality of health care at home. In 2015, 1.2% of Ontario patients received treatment outside of Canada for all medical specialties (Fraser Institute).

Regarding the health status of the population of Ontario for 2016, 60.8% of the total population reported their perceived health as ‘very good or excellent’, while 11.6% of the total population reported their perceived health as ‘fair or poor’. In 2017, 60.6% of the population reported their health as ‘very good or excellent’, while 11.3% of the total population reported their perceived health as ‘fair or poor’ (Statistics Canada). In 2010–2012, life expectancy at birth in Ontario for men was 79.8 years and 84 years for women. In terms of causes of death, in 2016 the premature mortality rate per 100,000 inhabitants was 284.7, while the mortality rate from preventable causes was 131.7. This represents an increase over 2015 of 2.7% for each of both categories.

Figure 2 shows Ontario hospitalization rates (e.g., the number of inpatient hospital discharges per 100,000 people) which increased from 2013 to 2016–2017 by 6%. In the years 2014–2015 and 2015–2016 they were approximately at the same level (around 7,400 per 100,000 inhabitants).

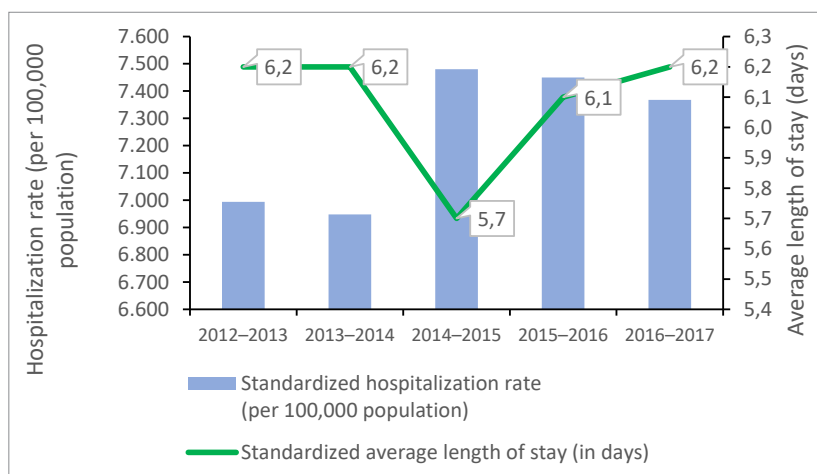


Figure 2: Standardized hospitalization rate and average length of stay

Source: CIHI

The hospitalization rate is not a complete indicator of the utilization rate of the health care system. This indicator seems to suggest a constant rate of hospital use but omits data on people admitted to hospital and still waiting for treatment and omits data on people on the waiting list for surgery but unable to be admitted to hospital and may decide to have the surgery outside of Canada. Figure 3 shows that hospital admissions in Ontario have increased over time since 2013. Furthermore, from 2016 to 2017, hospital admissions in Ontario increased by 13,000. Another indicator of the state of health care in Canada is the number of Canadians receiving health care outside the country. According to Fraser Institute (2017), Canadian patients travel abroad for medical treatment due to long wait times in the Canadian health care system. In 2016, Fraser Institute estimates show that the largest number of Canadian patients leaving the country for treatment was from Ontario (26,513 patients, representing 1.3% of all patients in Canada). There may be adverse medical consequences of waiting too long for health care, such as worsening of the health condition, disability, or death; other patients may have decided to avoid the delay and return to a normal life more quickly (Fraser Institute, 2017).

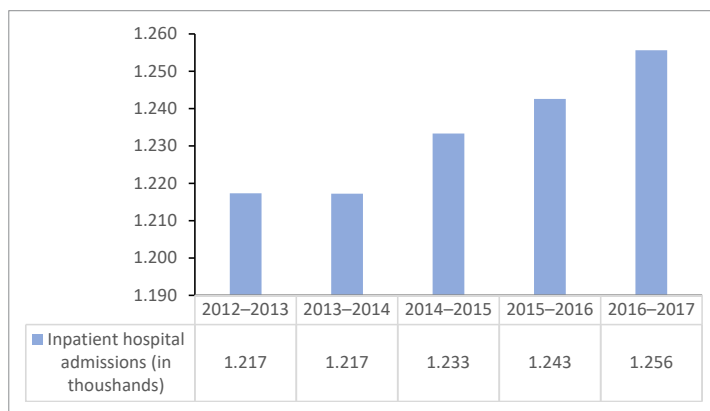


Figure 3: Inpatient hospital admissions

Source: CIHI

5. Conclusions

This paper examined the status of the health care system in the province of Ontario, Canada, and its four major cities (Toronto, Mississauga, Oakville, and Brampton), over the years 2012–2018. Some of the problems faced by patients include bed shortages, long waiting times, and communication breakdown. Thus, the effectiveness of the Canadian health care system was examined by looking at hospital wait times, government health spending, surgical procedures benchmark, hospitalization rates, and number of physicians, addressing public policy concerns about the health system that has become strained and main topic of debate in the Province of Ontario. The obvious concern of health policy is the organization and delivery of health care, so governments at all levels should focus

their efforts on these issues, while provincial governments should bear the responsibility of highlighting needs and responding accordingly. Only by knowing the health status of the population and the performance of the health system, decision-makers can make informed decisions when developing the course of action in the field of health policy.

The analysis reports waiting times for 2018, focusing on the most reported disease groups and procedures, such as pediatric, cancer, cardiac, orthopedic, eye, diagnostic imaging, and emergency room. Acknowledging the long waiting times for health interventions in Ontario, Canadian patients travel abroad to receive medical care. In 2016, Fraser Institute estimates show that the largest number of Canadian patients leaving the country for treatment was from Ontario (26,513 patients, representing 1.3% of all patients in Canada). With a steady number of physicians in Ontario (220 physicians per 100,000 population in 2015–2016), the data shows that the inpatient hospital admissions are increasing over time (1% increase from 2016 to 2017).

The findings provide points of comparison for future analyses and suggest the need to develop stronger policies that more effectively address public concerns. The results highlight the need to consider performance assessment and correct problem definition as major steps in the entire public policy-making process, by highlighting key health variables that are relevant to assess the performance of the health system in any jurisdiction. This study is applied to four specific cities in Ontario, which can be extrapolated to any other jurisdiction, to develop broad population health strategies that would improve the health status of the entire Canadian population.

The question that should be addressed is ‘What can be some policies for the health care system in Canada to reduce wait times?’. Siciliani, Moran and Borowitz (2014) note that the reductions in waiting times can be achieved through a sustained increase in health spending. An increase in total health spending per capita of \$100 is associated with a reduction of mean waiting times of 6.6 days and of median waiting times of 6.1 days (Siciliani and Hurst, 2003). Another proposal would be to increase the availability of doctors rather than beds (Siciliani and Hurst, 2003). As mentioned before, a marginal increase of 0.1 physicians per 1,000 population is associated with a reduction in mean waiting times of 8.3 days and median waiting times of 7.6 days. For Ontario, according to CIHI (2017), the total number of physicians per 100,000 population from 2015 to 2016 stayed the same at 220. Additionally, more strict health time use targets can be implemented for a broader range of medical procedures, along with initiatives targeting the supply side, such as the introduction of the privately-owned hospitals that could coexist with the public ones. These initiatives will contribute to additional hospital resources and the creation of better ambulatory surgery centers (Siciliani, Moran and Borowitz, 2014; Garcia-Goni *et al.*, 2012).

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