



Canada's Drug and
Health Technology Agency

CADTH Health Technology Review

Emergency Department Overcrowding: Utilization Analysis

Methods Document

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Context

Emergency department (ED) utilization data suggest that the number of ED visits in Canada are climbing closer to prepandemic levels.¹ According to data from the National Ambulatory Care Reporting System (NACRS), which is managed by the Canadian Institute for Health Information (CIHI), the number of reported ED visits in fiscal years 2019 to 2020, 2020 to 2021, and 2021 to 2022 was approximately 15.1 million, 11.7 million, and 14.0 million, respectively.¹ The demand for ED services has been high and described as “ED overcrowding.”² ED overcrowding is typically defined as a situation in which the demand for ED services exceeds the capacity to deliver those services.^{2,3}

In response to the current crisis in emergency care in Canada, CADTH has worked on a series of reports to help identify factors contributing to ED overcrowding, identify and describe interventions that can effectively alleviate ED overcrowding, and assess how ED overcrowding has changed over the years. To help inform these evidence reviews and the development of pan-Canadian guidance by the CADTH Health Technology Expert Review Panel (HTERP), CADTH has conducted an analysis of real-world data on demographic and utilization patterns of ED patients.

Objectives

The key objective of this utilization analysis is as follows:

- To extract, analyze, and summarize relevant real-world data on ED patient demographics and utilization patterns.

CADTH’s series of reports also includes the following:

- an Environmental Scan of the contributing factors to ED overcrowding and an overview of reviews to assess the effectiveness of interventions to alleviate ED overcrowding
- a qualitative review of the impact of ED overcrowding on those who engage with ED services
- a Horizon Scan on new and emerging interventions to alleviate ED overcrowding (those not captured in the intervention effectiveness review noted previously)
- a summary report of CADTH’s multistakeholder dialogue sessions.

Research Questions

1. How has ED utilization and overcrowding changed over time in Canada?
2. How have patient subgroups accessing care in EDs changed over time in Canada?
3. What are the common reasons for people accessing care in EDs and how has this changed over time in Canada?

Methods

An analysis of publicly available CIHI data was conducted to help determine potential CIHI data elements⁴ and years of data to request. Of the various databases maintained by CIHI, the primary focus of this analysis was the NACRS database. Multiple consultations with CIHI were conducted to help refine the specifications for the requested NACRS data. In addition to NACRS data, other sources of information are described subsequently.

National Ambulatory Care Reporting System

NACRS collects data from hospital-based and community-based ambulatory care, which includes day surgery, outpatient and community-based clinics, and EDs.¹ CIHI maintains the NACRS database and has data dating back to 2001.¹ During each fiscal year (April 1 to March 31 in the next year), participating facilities submit data to NACRS based on the NACRS Abstracting Manual,⁵ which contains instructions on collections and how to complete the NACRS abstract as well as detailed data element descriptions.

Data Coverage

Nine jurisdictions in Canada (i.e., Alberta, British Columbia, Manitoba, Nova Scotia, Ontario, Prince Edward Island, Quebec, Saskatchewan, and Yukon) reported data to the NACRS database in the fiscal year 2021 to 2022. The estimated coverage of the facilities varied by jurisdiction.⁶ New Brunswick, Newfoundland and Labrador, Northwest Territories, and Nunavut do not submit data to the NACRS database. Four of the 9 reporting jurisdictions have mandated ED visit reporting to NACRS: Ontario (2002 to 2003 onward), Alberta (2010 to 2011 onward), Yukon Territory (2015 to 2016 onward), and Quebec (2018 to 2019 onward). In fiscal year 2021 to 2022, it was estimated that all visits to EDs in these 4 jurisdictions were reported to NACRS.⁶ The coverage of ED visit data in the other 5 jurisdictions reporting ED visit data was estimated to range from 38.0% to 83.5% in 2021 to 2022 (estimated ED coverage by jurisdiction since 2010 to 2011 is provided in [Table 1](#)).⁶

Table 1: Estimated Coverage of Emergency Department Visit Data by Jurisdiction

Jurisdiction	Percentage of ED visits reported to NACRS by fiscal year (%)						
	2015 to 2016	2016 to 2017	2017 to 2018	2018 to 2019	2019 to 2020	2020 to 2021	2021 to 2022
Alberta	100	100	100	100	100	100	100
British Columbia	74.1	71.7	73.3	72.5	71.3	71.3	72.9
Manitoba	44.6	45.5	42	43.8	43.7	43.7	38
New Brunswick	0	0	0	0	0	0	0
Newfoundland and Labrador	0	0	0	0	0	0	0
Northwest Territories	0	0	0	0	0	0	0
Nova Scotia	50.4	55.3	52.3	47.6	48.6	48.6	46.2
Nunavut	0	0	0	0	0	0	0
Ontario	100	100	100	100	100	100	99.9

Jurisdiction	Percentage of ED visits reported to NACRS by fiscal year (%)						
	2015 to 2016	2016 to 2017	2017 to 2018	2018 to 2019	2019 to 2020	2020 to 2021	2021 to 2022
Prince Edward Island	25.8	25.6	25.9	25.8	25	25	67.8
Quebec	0	0	0	96.8	100	100	100
Saskatchewan	40.3	45.3	49.3	48.7	51.7	51.7	83.5
Yukon	100	100	100	100	100	100	100

ED = emergency department; NACRS = National Ambulatory Care Reporting System.

Notes: Fiscal year begins on April 1.

ED coverage estimated and published by the Canadian Institute for Health Information.¹

Quebec began reporting to the NACRS database in the fiscal year 2018 to 2019.

Multiple Data Submission Levels

Since 2010 to 2011, 3 data submission levels were made available to help reduce data collection burden, improve reporting timeliness, and promote coverage across jurisdictions.⁷ Facilities submitting full NACRS datasets are classified as Submission Level 3, whereas facilities submitting a subset of the full NACRS dataset are classified as Submission Levels 1 or 2. Specifically, Submission Level 1 includes approximately 30 mandatory data elements needed for ED wait time indicators (e.g., time of registration, time of triage, time of discharge and triage level). Submission Level 2 includes Level 1 data and the completion of at least 1 of the NACRS pick-lists (e.g., presenting complaint list). Submission Level 3 includes Level 2 data and the capturing of diagnoses using the International Statistical Classification of Diseases and Related Health Problems, 10th Revision, Canada (ICD-10-CA) and interventions using the Canadian Classification of Health Intervention (CCI). Mandatory data elements required for each submission level are provided in the NACRS Data Elements, 2023 to 2024 document.⁴ A detailed breakdown of the number of submitting facilities by submission level and jurisdiction in fiscal year 2021 to 2022 is provided in [Table 2](#).⁷

Table 2: Number of Submitting Facilities by NACRS Submission Level and Jurisdiction, Fiscal Year 2021 to 2022

Jurisdiction	Facilities submitting by NACRS submission level, n			Submitting ED facilities, n
	Level 1	Level 2	Level 3	
Alberta	0	0	109	109
British Columbia	0	30	0	30
Manitoba	7	0	0	7
New Brunswick	Did not submit	Did not submit	Did not submit	NA
Newfoundland and Labrador	Did not submit	Did not submit	Did not submit	NA
Northwest Territories	Did not submit	Did not submit	Did not submit	NA
Nova Scotia	4	0	4	8
Nunavut	Did not submit	Did not submit	Did not submit	NA
Ontario	1	0	178	179

Jurisdiction	Facilities submitting by NACRS submission level, n			Submitting ED facilities, n
	Level 1	Level 2	Level 3	
Prince Edward Island	0	0	2	2
Quebec	115	0	0	115
Saskatchewan	0	0	54	54
Yukon	0	0	3	3
Total	127	30	350	507

ED = emergency department; NA = not applicable; NACRS = National Ambulatory Care Reporting System.
 Source: Statistics provided by the Canadian Institute for Health Information.⁷

Data Elements and Emergency Department Indicators

CIHI released the summaries of NACRS data for the fiscal years 2016 to 2017 to 2021 to 2022.^{6,8} CIHI summarized the estimated coverage relative to all EDs in each jurisdiction, lengths of stay in the EDs, and numbers of ED visits.⁶ The length of stay in the EDs was from the time when patients were registered or triaged to the time when patients left the ED or had their visit disposition determined. The length of stay was reported in medians (50th percentile) and 90th percentiles by Canadian jurisdiction.⁶ The number of ED visits were reported by jurisdiction.⁶ Some of the statistics were provided for certain subgroups, such as different triage status, admission status after ED visits, and main problems.⁶ The lengths of stay in the EDs were further categorized by triage status and hospital peer groups (teaching or community hospitals).⁶ A detailed description of the NACRS data elements and indicators are provided in [Table 3](#).

Table 3: Detailed Description of NACRS Data Elements and Indicators

Indicator	Description	Data collection considerations
Number of ED visits	<ul style="list-style-type: none"> The number of ED visits is based on the date of registration or visit data element (i.e., date on which the patient is registered for emergency services) This number does not necessarily equal the number of individuals Scheduled ED visits are excluded from this number 	<ul style="list-style-type: none"> Records meeting inclusion and exclusion criteria as per CIHI's document titled Emergency Department Visits: Volumes and Median Lengths of Stay Metadata are included in this number (refer to p. 2)⁹ Date of registration or visit: Mandatory data element for all submission levels
Length of stay	<ul style="list-style-type: none"> 2013 to 2014 onward: LOS is calculated based on LOS_HOURS = [date and time patient left ED or disposition date and time, whichever is earlier] – [registration date and time or triage date and time, whichever is earlier] 2010 to 2011 to 2012 to 2013: LOS = [patient left ED date and time or disposition date and time, whichever is earlier] – [registration date and time or triage date and time, whichever is earlier] 	<ul style="list-style-type: none"> Additional details on LOS data collection methodology are provided by CIHI (refer to p. 5).⁹ Disposition date and time and registration date and time: Mandatory data element for all submission levels Patient left ED date and time and triage date and time: Conditional mandatory for all submission levels

Indicator	Description	Data collection considerations
Wait time to physician initial assessment	<ul style="list-style-type: none"> • Wait time to physician initial assessment = [date and time physician initial assessment] – [registration date and time or triage date and time, whichever is earlier] 	<ul style="list-style-type: none"> • Physician initial assessment date and time: Conditional mandatory for all submission levels • Registration date and time: Mandatory data element for all submission levels
Wait time to inpatient bed	<ul style="list-style-type: none"> • Wait time to inpatient bed = [date and time patient left ED for admission to an inpatient bed or operating room] – [disposition date and time (as determined by the main service provider)] 	<ul style="list-style-type: none"> • Inclusion and exclusion criteria are provided by CIHI¹⁰ • Patient left ED date and time and triage date and time: Conditional mandatory for all submission levels • Disposition date and time: Mandatory data element for all submission levels
Access to primary care	<ul style="list-style-type: none"> • This data element identifies whether or not a patient has access to primary health care • If a patient has access to primary health care, 1 of 2 options is submitted to NACRS: family physician or other (i.e., family health team, walk-in clinic, or in other settings) 	<ul style="list-style-type: none"> • Access to primary care: Mandatory data element for Submission Level 3
Arrival via ambulance	<ul style="list-style-type: none"> • This data element identifies whether a patient arrived via ambulance and the type of ambulance 	<ul style="list-style-type: none"> • Admit via ambulance: Mandatory data element for all submission levels
Ambulance offload time	<ul style="list-style-type: none"> • Ambulance offload time = [ambulance transfer of care process date and time] – [ambulance arrival date and time] • Ambulance transfer of care process date and time: date and time at which the ambulance personnel turn care of the patient over to ED or hospital staff • Ambulance arrival date and time: date and time at which the ambulance pulls into the hospital driveway and arrives at the hospital 	<ul style="list-style-type: none"> • Ambulance transfer of care process date and time and ambulance arrival date and time is only mandatory for Ontario • These data elements are optional for all other reporting jurisdictions regardless of their submission level

LOS = length of stay; NACRS = National Ambulatory Care Reporting System.

Urban and Rural Facility Setting

To analyze ED utilization based on the setting facilities are situated in, we requested NACRS data to be aggregated according to facility setting (i.e., urban or rural and remote) within each reporting jurisdiction. CIHI uses an established Canada Post tool, Postal Code Conversion File, to sort ED facilities by their postal codes.¹¹ Rural postal codes are identifiable by the presence of a zero in the second position, whereas urban postal codes are identifiable by a number from 1 to 9.

Exclusion Criteria

As per methodology used by CIHI, scheduled ED visits, duplicate records, and records with undifferentiated sex were excluded from the NACRS database. Calculations for length of stay, wait time to physician initial assessment, and wait time to inpatient bed (mean, 50th percentile, and 90th percentile) excluded patients who registered but left without being seen or triaged. Furthermore, mean, 50th percentile, and 90th

percentile calculations excluded patients with invalid or missing length of stay, wait time to physician initial assessment, wait time to inpatient bed, and ambulance offload time.

Data Analysis

The analysis of publicly available NACRS data included statistics from 9 jurisdictions since the fiscal year 2016 to 2017,⁶ except that Quebec began to report in the fiscal year 2018 to 2019.⁶ Furthermore, supplementary statistics from fiscal year 2003 to 2004 to 2021 to 2022 were available publicly.¹² The released NACRS statistics by jurisdiction included lengths of stay in the EDs and number of ED visits, which does not necessarily equal the number of individuals.⁶ To supplement publicly available NACRS data, a formal data request was submitted to CIHI for additional NACRS data. This data request included data elements and indicators such as access to primary care, ambulance offload time, wait time to physician initial assessment, wait time to inpatient bed, number of ED visits, and length of stay for fiscal years from 2010 to 2011 to 2022 to 2023. Furthermore, key indicators have been aggregated according to jurisdiction, Canadian Triage and Acuity Scale (CTAS) level, age, sex, and/or urban or rural setting. The release of NACRS data from Quebec was not granted as part of this data request.

At the onset of this utilization analysis, the intended goal was to assess for trends in the demographic, health system, and utilization data. However, due to various data quality considerations related to NACRS, caution should be used when analyzing trends over time and across jurisdictions. In addition to the variation in the number of facilities submitting to NACRS over time and multiple submission levels (i.e., 1, 2, and 3), various data elements have evolved over time (e.g., change in data element definition, new and retired data elements). An overview of data element evolution by fiscal year is provided in CIHI's Data Quality Documentation (refer to p. 15 to 22).⁷ For additional details of changes in data elements over time, please refer to the NACRS Abstracting Manual.⁵

International Health Policy Survey

The Commonwealth Fund implemented the International Health Policy Survey (IHPS) in 11 developed countries, including Canada.¹³ The IHPS surveyed physicians (in 2009, 2012, 2015, 2019, and 2022), people aged 65 years and older (in 2017 and 2021), and adults (those aged 18 years and older in 2007, 2008, 2010, 2011, 2013, 2016, and 2020) in separate series.¹⁴ More than 5,000 adults living in Canada were surveyed in the 2020 IHPS.¹⁵ The questions that IHPS asked older people or adults about their ED use in 2020 included:¹⁶

- Q26: "How many times have you used a hospital emergency department for your own medical care in the past 2 years?"
- Q27: "The last time you went to the hospital emergency department, how long did you wait before being treated?"
- Q31: "The last time you went to the hospital emergency department, was it for a condition that you thought could have been treated by the doctors or staff at the place where you usually get medical care if they had been available?"

Your Health System

CIHI also provided statistics on the health systems by province or territory in the Your Health System page.¹⁷ The indicators are categorized into access, person-centredness, safety, appropriateness and effectiveness, efficiency, health status, and social determinants.¹⁷ CIHI provided the latest statistics for provinces and territories.¹⁸ However, depending on data availability, the years when data were available ranged from 2011 to 2021, and Canadian jurisdictions lacked some data.¹⁸

Organisation for Economic Co-operation and Development

The Organisation for Economic Co-operation and Development (OECD) develops statistics on health system performance for countries around the world.¹⁹ Relevant data were extracted from the OECD database to help understand where Canada stands compared with select countries in the world. A detailed description of the OECD indicators are provided in [Table 4](#).¹⁹

Table 4: Detailed Description of OECD Indicators

Indicator	Description	Data collection considerations
Curative (acute) care beds	<ul style="list-style-type: none"> Hospital beds to “manage labour (obstetrics), cure illness or provide definitive treatment of injury, perform surgery, relieve symptoms of illness or injury (excluding palliative care), reduce severity of illness or injury, protect against exacerbation and/or complication of illness and/or injury which could threaten life or normal functions, perform diagnostic or therapeutic procedures”²⁰ including “beds for somatic curative (acute) care and psychiatric curative (acute) care”²⁰ 	<ul style="list-style-type: none"> Country-level data No breakdown by Canadian jurisdictions Data sources including Statistics Canada, Canadian Institute for Health Information, Éco-Santé Québec, and Ministère de la Santé et des Services sociaux du Québec²⁰
Acute care occupancy rate	<ul style="list-style-type: none"> “Occupancy rate = Total number of bed-days during the year / (Number of beds available * 365 days) * 100”²¹ 	<ul style="list-style-type: none"> Country-level data No breakdown by Canadian jurisdictions Data sources including Statistics Canada, Canadian Institute for Health Information, and Ministère de la Santé et des Services sociaux du Québec²¹
Total hospital beds	<ul style="list-style-type: none"> • Beds in all hospitals that included general hospitals, mental health hospitals, and other specialized hospitals²⁰ 	<ul style="list-style-type: none"> Country-level data No breakdown by Canadian jurisdictions • Data sources including Statistics Canada, Canadian Institute for Health Information, Éco-Santé Québec, and Ministère de la Santé et des Services sociaux du Québec²⁰
Total ICU beds (average)	<ul style="list-style-type: none"> • “An intensive care unit (ICU) is an organized system for the provision of care to critically ill patients that provides intensive and specialised medical and nursing care, an enhanced capacity for monitoring, and multiple modalities of physiologic organ support to 	<ul style="list-style-type: none"> Country-level data No breakdown by Canadian jurisdictions Data sources including Canadian MIS Database at the Canadian Institute for Health Information and Régie de l’assurance maladie du Québec²⁰

Indicator	Description	Data collection considerations
	sustain life during a period of acute organ system insufficiency ²⁰	
Hospital long-term care beds	<ul style="list-style-type: none"> “Hospital beds accommodating patients requiring long-term care”²⁰ 	<ul style="list-style-type: none"> Country-level data No breakdown by Canadian jurisdictions Data sources including Statistics Canada, Canadian Institute for Health Information, Éco-Santé Québec, and Ministère de la Santé et des Services sociaux du Québec²⁰
Residential long-term care beds	<ul style="list-style-type: none"> “Establishments primarily engaged in providing residential long-term care that combines nursing, supervisory or other types of care as required by the residents”²² 	<ul style="list-style-type: none"> Country-level data No breakdown by Canadian jurisdictions Data sources including Statistics Canada²²
Curative care average length of stay	<ul style="list-style-type: none"> “Average length of stay (ALOS) is calculated by dividing the number of bed-days by the number of discharges during the year”²¹ “Curative care comprises health care contacts during which the principal intent is to relieve symptoms of illness or injury, to reduce the severity of an illness or injury, or to protect against exacerbation and/or complication of an illness or injury that could threaten life or normal function”²¹ 	<ul style="list-style-type: none"> Country-level data No breakdown by Canadian jurisdictions Data sources including Statistics Canada, Canadian Institute for Health Information, and Ministère de la Santé et des Services sociaux du Québec²¹
Inpatient care length of stay	<ul style="list-style-type: none"> “An inpatient discharge is the release of a patient who was formally admitted into a hospital for treatment and/or care and who stayed for a minimum of one night”²¹ “Average length of stay (ALOS) is calculated by dividing the number of bed-days by the number of discharges during the year”²¹ 	<ul style="list-style-type: none"> Country-level data No breakdown by Canadian jurisdictions Canadian data not available²¹
Generalist medical practitioners	<ul style="list-style-type: none"> “Generalist medical practitioners do not limit their practice to certain disease categories or methods of treatment, and may assume responsibility for the provision of continuing and comprehensive medical care to individuals, families and communities including general practitioners, district medical doctors/therapists, family medical practitioners, primary health care physicians, medical doctors (general), medical officers (general), medical interns or residents specialising in general practice or without any area of specialisation yet”²⁰ 	<ul style="list-style-type: none"> Country-level data No breakdown by Canadian jurisdictions Data sources including Canadian Institute for Health Information and Canadian Post-MD Education Register²⁰

ALOS = average length of stay; ICU = intensive care unit; LOS = length of stay; OECD = Organisation for Economic Co-operation and Development.

Other Data Sources

The numbers of long-term care beds by provinces and territories were retrieved from a CIHI report published in 2021.²³ The numbers for long-term care beds were the numbers available around March 2021.²³

CIHI summarized the numbers of hospital beds and cribs staffed and in operation by hospital from the Canadian Management Information System Database (CMDB) for the fiscal year 2020 to 2021.²⁴ Hospital beds available for pediatrics, mental health and addictions, rehabilitation, long-term care, and other acute conditions were summed by province and territory. CIHI summarized the number of nurses by using data from CIHI's Health Workforce Database, which included information provided by provincial and territorial regulatory bodies.²⁵ The numbers of nurses in 4 categories were summed by jurisdiction: nurse practitioners, registered nurses, registered psychiatric nurses, and licensed practical nurses.²⁵ The number of nurses in each category was available annually from 2012 to 2021.²⁵ One of the measures of the nurse shortage in Canada was the number of overtime hours.¹⁰ Statistics Canada uses the Labour Force Survey to provide monthly summaries of overtime hours by occupation (National Occupational Classification).²⁶ We retrieved the numbers of weekly overtime hours for "health occupations" and "professional occupations in nursing."²⁶

Statistics Canada summarizes the annual gross domestic product (GDP)²⁷ and population sizes by province.²⁸ The overall population sizes in the fourth quarter of each year were extracted. The population sizes of people aged 65 years and older living in Canada were retrieved separately.²⁹

CIHI has summarized the numbers of physicians in Canada annually since 1971.³⁰ We extracted the numbers of 3 types of specialist ED physicians: emergency medicine specialists, emergency family medicine physicians, and pediatric emergency medicine specialists.

Data Categorization

The variables collected from various data sources were reported in the following categories: intake data analysis, process data analysis, output data analysis, and system-level data analysis. Intake data analysis included the data that were related to the number of ED visits. Process data analysis were for the variables related to ED assessment and interventions, such as overall length of stay and wait time for assessment. Output data analysis included the description of patient outcomes after ED visits. System-level data analysis aimed to present statistics about contextual factors that were related to ED overcrowding, such as the number of ED physicians and inpatient beds.

Data Analyses

This utilization analysis aimed to report descriptive statistics obtained from public websites or requested from CIHI. Continuous variables might be summarized in means, medians (50th percentile), and 90th percentiles depending on data availability. Because only 4 jurisdictions reported all ED visits to NACRS, all statistics were reported by jurisdiction and not generalizable to Canada. Although there were variations in data collection methods between jurisdictions and over time, statistics were plotted in time trends. No statistical tests were conducted.

Dashboard Tool

We created a dashboard tool using publicly available data from the previously mentioned sources. Additional data requested from CIHI were excluded from this dashboard tool, and related findings were summarized in the utilization analysis report. Due to the variations in estimated coverage and submitting facilities, the

data were merged at the jurisdiction level and managed with R-4.0.3³¹ and RStudio 1.4.1106.³² The summary statistics were plotted over time.³³ An online dashboard was created to show the time trends related to ED use and length of stay in EDs (<https://cadth.info/ed-overcrowding-dashboard>).³⁴ This online dashboard allowed users to select the data items and jurisdictions to show in the figures.

Limitations

We created this report using publicly available data from various sources. The data quality and reporting rates varied over time and by jurisdiction. NACRS was a major data source for ED visits and length of stay in EDs, but only 4 jurisdictions had mandatory reporting to NACRS.¹ We were not able to report national estimates of ED-related statistics based on NACRS data because of the differences in reporting standards by jurisdiction.¹ Due to the variations in data quality over time and by jurisdiction, the time trends and correlations between measures should be interpreted with caution.

The 2006 CADTH report on ED overcrowding recommended adopting comprehensive and consistent strategies to collect ED utilization data.³⁵ However, NACRS remained the major source of data for ED utilization and only 4 jurisdictions mandated the reporting to NACRS.⁴ Alberta, Ontario, Quebec, and Yukon mandated the reporting of ED utilization to NACRS in the fiscal year 2021 to 2022.⁶ For each data element, there were 3 levels of reporting that were related to the reporting rates of data elements.⁶ Many of the data elements that we aimed to analyze were not mandatory to report. For example, the reporting of arrival by ambulance and access to primary health care were optional⁶ and this affected the proportions of data availability relative to all ED visits reported to NACRS. Therefore, we decided to report the time trends of selected items in jurisdictions that mandated the reporting to NACRS.

Another limitation is the scope and length of the utilization analysis. We aimed to provide a summary of the patterns in ED utilization in Canadian jurisdictions and describe basic information for the other ED overcrowding reports. Some of the NACRS data items that we requested from CIHI required modelling or advanced knowledge in the contexts to interpret. For example, arrival via ambulance was related to the severity of patients' conditions and acuity was measured by CTAS. Overall, a small proportion of patients arrived via ambulance. Presenting ED utilization by arrival via ambulance might risk neglecting other major issues and providing overlapping information.

Since the release of the 2006 CADTH reports, significant knowledge gaps remain outstanding. In the analysis of the ED output, data on the number of ED beds and inpatient beds for ED admissions are lacking. We were unable to assess the factors associated with wait time to inpatient beds. Moreover, we did not request data directly from EDs and provincial or territorial administrators due to time and resource constraints. There were also changes to the questions in the IHPS.¹⁴ Although the Commonwealth Fund had conducted this survey more than a decade ago, CIHI released provincial and territorial results of this survey for 2016, 2017, 2020, and 2021.¹⁴ There were also multiple changes made to the questions in this survey and this made establishing time trends difficult.



The OECD database also had the variations in data collection methods and standards. The database houses data from more than 30 countries, and Canadian health measures data were collected from up to 4 agencies in Canada.¹⁹ There were various methodological notes related to the data housed by OECD. Readers are advised to check the data collection methods and sources in the OECD database.¹⁹

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