



Canada's Drug and
Health Technology Agency

CADTH Health Technology Review

Emergency Department Overcrowding: Contributing Factors and Interventions

Evidence Preview

What Is the Issue?

Emergency departments (EDs) across Canada are under strain and experiencing overcrowding, a situation where the demand for health services in the ED exceeds the capacity of the ED, hospital, or community to deliver quality care in a reasonable amount of time.¹

Between April 2021 and March 2022, approximately 14 million patients visited EDs in Canada.² Recent evidence suggests that ED overcrowding is worsening in jurisdictions across Canada³ and there is an increasing trend of unexpected temporary ED closures or reductions of services across the country.^{4,5}

The causes and consequences of ED overcrowding are **complex, varied, and extend beyond the ED.**^{1,6,7}

Left unchecked, ED overcrowding:

- contributes to a **deteriorating standard of care** as staff become overworked and burned out⁶
- **puts patients' lives and health at risk** when treatment needs within the ED exceed the resources required to address them¹
- places additional strain on an already **overwhelmed health care system.**⁵

What Did CADTH Do?

- This Evidence Preview provides a summary of the factors contributing to ED overcrowding and the interventions that have been researched as possible methods to effectively alleviate ED overcrowding.
- The factors and interventions presented in this Evidence Preview are based on the **results** of an environmental scan and a summary of systematic review evidence of the published and grey literature from **Canadian and international sources**. Themes of contributing factors, the types of interventions, and the volume of the literature identified are summarized.
- The environmental scan identified and described literature framed around the lens of input-throughput-output factors contributing to ED overcrowding internationally and in Canada. Literature that described contextual factors that have an impact on ED overcrowding in Canada was also included.
- The summary of systematic review evidence summarized evidence from systematic reviews on the effectiveness of different interventions to alleviate ED overcrowding. This Evidence Preview provides a high-level overview of the effectiveness of the identified interventions and the conclusiveness of the evidence. Further details will be described in a final report available in September 2023.
- To enhance the quality and relevance of this work, CADTH engaged people with extensive personal and/or professional experience with ED care within the Canadian health system. The multistakeholder dialogue, consisting of a series of 3 group consultations, was led by CADTH's Engagement team in the summer of 2023 to understand and discuss interim findings from the environmental scan and the summary of systematic review evidence.
- Details about the methods used can be found in the [published protocol](#).⁸

Why Did We Do This?

Canadian jurisdictions have identified a need for objective, impartial, and trusted guidance about the causes and consequences of ED overcrowding, including which interventions are most effective for alleviating ED overcrowding in Canada.

This pan-Canadian issue calls for real solutions and CADTH is examining the evidence and expert-informed considerations about the causes and consequences of, and solutions to, ED overcrowding in health care systems across the country.

ED overcrowding is an international, complex, and multifactorial issue. This project set out to be as inclusive as possible when examining the factors contributing to, and interventions to alleviate, ED overcrowding. The findings presented here are based on the available literature. Some factors and interventions may not have been identified in the research, and some may be more relevant and applicable than others, depending on the context of the place where people live, work, and receive health care.

Multistakeholder Dialogue Sessions

What Did We Do?

Multistakeholder dialogue sessions were conducted in the summer of 2023 to discuss the factors contributing to ED overcrowding and potential interventions that have been studied, in addition to hearing perspectives about local context and implementation issues, and to identify and discuss important concerns. Participants included clinical, patient, and community members and we heard perspectives from people who identified as emergency physicians, pediatric emergency physicians, emergency nurses, pediatric researchers, pharmacists, patient and family advisors, directors, geriatric psychiatrists, and emergency medicine residents.

What Did We Hear?



Factors Contributing to ED Overcrowding

- Participants in the multistakeholder dialogue sessions told us that ED overcrowding is a symptom of a wider health care system dysfunction. They described a major driving force as hospitals operating at or over capacity and large proportions of patients who need alternate levels of care unable to be discharged because of a lack of long-term care spaces.
- We heard that an absence of health care resources available within communities can exacerbate the problem by filling EDs with low-acuity patients. Participants explained that this creates frustration among patients and families and can contribute to staff burnout and moral distress.



Interventions to Alleviate ED Overcrowding

- Participants suggested that to effect change, solutions are needed to address accountability and incorporate integration across health care systems. We heard that the specific health needs of patients and families should drive decision-making about solutions.
- Participants described that currently available technologies and data are not being used to their full potential.

“We will have minimal impact if we aren’t actually changing structures...and mindsets”

— Multistakeholder session participant

Factors Contributing to ED Overcrowding

Factors Contributing to ED Overcrowding

How Did We Categorize Our Findings?

We have defined **direct causal factors** as those that can be targeted by interventions to address ED overcrowding, and can be categorized into input, throughput, and output categories.^a



Input

Factors that influence the need for ED services (e.g., volume of visitors, complexity of patient needs).



Throughput

Factors that focus on inside the ED and hospital.



Output

Factors that focus on elements concerning next steps for the patient (i.e., the destination of the patient after discharge, such as a long-term care or home care).

^aInput, throughput, and output are defined based on the conceptual model developed by Asplin et al. (2003).⁹

We have defined **contextual factors** as those that exist outside of the input-throughput-output categories.



Micro Level

Factors that are applicable at the ED level.



Meso Level

Factors that are applicable at the hospital-wide and health system level.



Macro Level

Factors that are applicable at the broader socioeconomic, sociocultural, and institutional level.

What Did We Find?

We identified the following themes in the literature related to contributing causal and contextual factors to the experience of ED overcrowding. Descriptions of these factors are provided in the following pages.



Causal Factors

Input

- Limited primary care and community health services
- Frequent visits and low-acuity visits to the ED
- Growing patient volumes and complexity of needs
- Access via multiple avenues (e.g., self-referral, ambulance)

Throughput

- Barriers to optimal operational efficiency
- Staffing considerations
- Consultation, testing, and decision delays

Output

- Boarding and access block (i.e., inability to access inpatient beds)
- Strained hospital-wide resources
- Impediments to exiting the ED



Contextual Factors

Micro Level

- ED closures
- Crisis fatigue

Meso Level

- Limited postacute care and alternate level of care resources
- Elective surgeries
- Insufficient health resources
- Entrenched hospital culture
- Limited resources for mental health and substance use
- Community hospital closures
- Lack of inpatient workforce
- Limited care hours
- Lack of leadership alignment and priority

Macro Level

- Limited political will
- Population growth and shift
- Seasonal and temporal patterns

Contributing Factors to ED Overcrowding

Input

Input factors are those that influence the need for ED services. The factors identified in the literature can be categorized into the following themes: primary care and community health services, nonurgent visits to the ED, growing patient volumes and complexity of needs, and access via multiple avenues.

Primary Care and Community Health Services



Community and outpatient care service issues: Difficulty accessing health care services (e.g., diagnostic testing) outside of the ED.



Primary care issues: Difficulty finding a primary care provider and/or accessing their services in a timely manner.

Repeated Visits and Low-Acuity Visits to the ED



Low-acuity visits:^a Visits to the ED that could potentially be addressed in another setting (i.e., visits that would not be classified as urgent, emergent, or needing resuscitation when triaged in the ED).



People who access the ED frequently: Individuals who seek care in the ED repeatedly and recurrently (e.g., due to chronic conditions or lack of access to other health care services such as primary and outpatient care).

^aWe identified this factor in the literature; however, we acknowledge that there is also evidence that patients with low-acuity issues have minimal impact on overcrowding and that these patients may be using the ED because they do not have other care options.

Growing Patient Volume and Complexity of Needs



Complexity of needs: The increasingly severe or complicated care needs of people attending the ED.



More older patients: The increasing proportion of older adults visiting the ED.



Volume of visitors: The quantity of all patients, attendees, visits, and/or admissions to the ED.

Access Via Multiple Avenues



Ambulance arrival: Presentation to the ED via an ambulance, resulting in the presence of extra people in the ED (i.e., paramedics).



Referral by a health care provider: Presentation to the ED based on the direction of a provider, such as a specialist or primary care provider, for reasons unrelated to emergent status (e.g., access to diagnostic imaging).



Self-referral: Individuals may choose to go to the ED for any health concern, due to its ease of accessibility (e.g., no appointment is needed).

Throughput

Throughput factors are those that are focused within the ED. The factors identified in the literature can be categorized into the following themes: consultation, testing, and decision delays; staffing considerations; and operational inefficiencies.

Consultation, Testing, and Decision Delays



Consultations for ED patients: The availability and timeliness of consult services from other specialist health care providers in the hospital outside of the ED (e.g., neurology, gastroenterology).



Diagnostic testing and procedures: The time spent waiting to receive diagnostic testing and imaging (e.g., X-rays, blood work), as well as the time spent waiting for the results.



Disposition decision delays: The time spent waiting for patient disposition decisions.

Staffing Considerations



Staff skill mix: The characteristics and makeup of staff and their experience level (e.g., learners, junior staff, experienced staff).



Staff ratios: Low staff-to-patient ratios result from a shortage of numerous types of staff, including nurses, physicians, lab technicians, and so forth.

Barriers to Optimal Operational Efficiency



Patient processing: The administrative processes for admitting patients to the hospital.



Infrastructure: Considerations around items such as bed availability, bed placement, and number of consultation rooms.



Patient triaging: The process to assess and determine the severity of the presentation, which can be susceptible to inadvertent changes during periods of overcrowding.



Simultaneous duties of staff: Multiple ongoing commitments and distractions that health care providers must attend to at the same time (e.g., referral calls, electronic medical record documentation).

Output

Output factors are those that concern patient disposition (e.g., to inpatient or outpatient care). The factors identified in the literature can be categorized into the following themes: boarding and access block, strained hospital-wide resources, and impediments to exiting the ED.

Access Block and Boarding

Note: The terms *access block* and *boarding* may be used interchangeably; however, both were independently identified in the literature.



Access block: A situation where patients are unable to gain access to appropriate hospital resources (e.g., inpatient beds).



Boarding: The practice of holding patients in the ED after they have been admitted to the hospital because inpatient beds are not available.

Demand on Hospital Resources Outside the ED



Inpatient volume and bed availability: The number of admitted inpatients in the hospital and the proportion of beds occupied by those patients.



Gravity of inpatient care needs: The severity and complexity of the condition of those who are being treated in the hospital wards.



Staffing resources outside of the ED: The number and ratio of hospital staff.

Impediments to Exiting the ED



Transport delays and inefficient care transfer processes: Coordination and logistical issues in moving patients within the ED to outside the ED (e.g., to an inpatient service, long-term care, home).



Inpatient capping and/or blocking: A rationing strategy of reserving or holding inpatient beds for a specific type of patient (e.g., patients undergoing surgeries) that is typically implemented to cope with scarce resources.



Follow-up and alternate level of care resources: The availability and capacity of services to accept those leaving the ED and/or the hospital (e.g., long-term care facilities, rehabilitation, dedicated end-of-life care).

Contextual Factors

We have defined contextual factors related to ED overcrowding as those that exist outside of the input-throughput-output categories. While we did not identify contextual factors in the Canadian literature, ED overcrowding is an issue that spans many countries and while the factors may still apply to a Canadian setting, they may need to be tailored to this context. Additionally, many of these factors were echoed in the multistakeholder dialogue sessions that CADTH hosted, in which the participants lived and worked in Canada.

Micro Level

We have defined micro-level contextual factors as those that are applicable at the ED level.

- **ED closures:** Closures of EDs related to growing staffing shortages and difficult working conditions, which can then divert patients to other remaining EDs.
- **Crisis fatigue:** Prolonged exposure to stressful events within the ED that result in a burnout response among staff, which can affect performance and lead to turnover.

Meso Level

We have defined meso-level contextual factors as those that are applicable at the hospital-wide and health system-wide level.

- **Limited postacute care and alternate level of care resources:** The lack of care capacity outside of the acute hospital setting, including facilities and services such as primary care, hospice care, community services, nursing homes, home care, which increases demand on ED services as it may be the only care option.
- **Elective surgeries:** Nonemergency surgeries that can be scheduled in advance, which may contribute to boarding in the ED.
- **Limited health resources:** When resources in the health system, including funding, staffing, hospital capacity, and inpatient capacity, do not keep up with demand, resulting in delayed or reduced care for patients and poor working conditions for staff.
- **Entrenched hospital culture:** The ingrained values, beliefs, attitudes, and behaviours that exist within the hospital that can act as barriers to enacting change and shifting approaches.
- **Limited resources for mental health and substance use:** Decreasing services related to mental health and addiction conditions both within the hospital and outside of the community, including a decrease in available beds.

- **Community hospital closures:** The closure of local hospitals, particularly in areas with smaller populations, which can then divert more patients to remaining hospitals.
- **Limited inpatient workforce:** Loss of staff, including nurses, physicians, laboratory technicians, and others across inpatient services that can result in a diminished number of patient beds.
- **Limited care hours:** Primary care, community services, and some non-ED hospital services operate primarily during business hours, with limited after-hours care (e.g., fewer staff, reduced services), which makes the ED one of the only options outside of business hours.
- **Misalignment of leadership and priorities:** Disagreement among hospital administration over the importance of, and order in which, hospital-wide issues (including ED overcrowding) need to be addressed, which leads to difficulty implementing change.

Macro Level

We have defined macro-level contextual factors as those that are applicable at the broader socioeconomic, sociocultural, and institutional level.

- **Political will:** Uncertainty over how to effectively address issues at a political level, which leads to difficulty implementing change.
- **Population growth and shift:** The increase in population size over time, which can lead to more older adults with chronic and complex needs, a higher volume of visits, and so forth.
- **Seasonal and temporal patterns:** The spike in ED visits related to time of year, season (e.g., flu season), weekends, and/or holidays.

Interventions to Alleviate ED Overcrowding

How Did We Categorize Our Findings?

This Evidence Preview categorizes^a interventions we found in the literature as:

Emergency department	Input	Interventions related to how people make contact with the ED
	Throughput	Interventions within the ED
	Output	Interventions related to leaving the ED
Outside the emergency department	Hospital-wide collaboration with ED	Collaboration in the provision of physical resources, staff, or leadership across the hospital to support the ED
	Post-ED discharge case management	Helping people manage their health after they leave the ED
	Policy reform	Policies for performance metrics (e.g., time-based targets), payment models, and staff mix
	Multicomponent	Two or more interventions from the previous categories combined

^aThe definitions of input, throughput, and output were adapted from the conceptual model developed by Asplin et al. (2003).⁹ Although some of our other categories may be traditionally considered “Input” according to this model, we have separated the more upstream categories to highlight the various interventions that can take place outside the ED.

In this Evidence Preview, we present evidence for ED wait times, boarding, and occupancy, outcomes that have been reported to be most strongly associated with ED revisits¹⁰ and other outcomes based on conclusive evidence. Evidence for other outcomes can be found in the **full report** of the environmental scan and the summary of systematic review evidence on interventions.

Evidence was described as being **conclusive** when there was moderate (some uncertainty) or high certainty, and **inconclusive** when the evidence was very uncertain.

The effectiveness of interventions were categorized as:



Favourable: Evidence of the effectiveness of an intervention versus a comparator.



Neutral: Evidence that an intervention is equally effective versus a comparator.



Mixed: Evidence of mixed results for the effectiveness of an intervention versus a comparator.



Unfavourable: Evidence of ineffectiveness of an intervention versus a comparator, or the authors advised against the intervention, or it is not recommended.

What Did We Find?

- We identified 64 systematic reviews that described interventions across the 10 different categories.
- Most of the studies assessed throughput interventions inside the ED.
- Few studies assessed input or output interventions.
- Some studies assessed interventions outside of the ED.
- Most studies assessed outcomes on ED visits or revisits, total ED length of stay, ED-related wait times, and the number of patients who left the ED prematurely.
- Few studies assessed boarding or access block outcomes and ED occupancy.
- None of the studies reported the number or proportion of patients in the ED waiting room.
- Most of the systematic reviews did not specify the settings (e.g., location of the ED) studied in the primary studies, with very little evidence reported for rural and remote populations.
- Most of the systematic reviews did not specify the age of the populations; however, there is some evidence reported for:
 - different age groups (e.g., clinical pathways for pediatric patients, advance triage protocols for adults, active paramedic service for older adults)
 - populations experiencing mental health challenges (e.g., short stay crisis units)
 - populations that visit the ED frequently (e.g., care coordination strategies).
- Most of the evidence is from outside of Canada.
- Most of the evidence is of low methodological quality; hence, is inconclusive.

Within the ED, there is conclusive evidence that favours:

- paramedic practitioner programs for older adults (input) and short stay crisis units for mental health (throughput) for ED wait time outcomes
- strategic nursing roles (throughput) and time-based target interventions (policy reform) for ED occupancy
- several other throughput interventions, including advanced triage protocols, patient streaming, team triage, and others, for ED length of stay.

Outside the ED, there is conclusive evidence that favours:

- discharge and coordination of services by ED nurses for ED return visits.

There was conclusive evidence of several interventions, both within and outside the ED, that were shown to be equally effective when compared with usual care or no intervention. Some examples include:

- remote triage (e.g., virtually) (input) and patient case management outside the hospital (access interventions) for ED visits
- medical scribes (throughput) for ED length of stay
- paramedic decision-making (input), pharmacists in the ED (throughput), and community-based care transition strategies (multicomponent) for ED return visits.


There was no conclusive evidence of ineffectiveness for any interventions compared to usual care or no intervention.

Some interventions were favourable on 1 outcome and not favourable on another outcome. For example, time-based targets were favourable for ED occupancy outcomes but not for boarding outcomes.

What Is the Evidence for ED Overcrowding Interventions in Alleviating ED Boarding Outcomes?

Favourable

Throughput:

- Short stay crisis units for mental health  versus usual care
- LEAN (i.e., leadership, eliminate waste, act now, never ending) versus usual care
- External specialist units versus usual care
- Earlier inpatient consultation (e.g., text message reminder) versus usual care
- Radio frequency identification–based patient tracking in the ED versus usual care

Hospital support:

- Hospital leadership support versus usual care

Multicomponent:

- Active bed management and hospital leadership support versus usual care

Neutral


Throughput:

- Strategic nursing roles versus usual care

Unfavourable

Policy reform:

- Time-based targets versus no intervention
- Increased ED bed numbers versus usual care

Note: An  symbol indicates that there is moderate (some uncertainty) or high certainty of the evidence. All other outcomes are considered to have inconclusive or very uncertain evidence. An  indicates that at least 1 primary study took place in Canada.

What Is the Evidence for ED Overcrowding Interventions in Alleviating ED Occupancy Outcomes?



Throughput:

- Strategic nursing roles versus usual care

Policy reform:

- Time-based targets versus no intervention

Note: An  symbol indicates that there is moderate (some uncertainty) or high certainty of the evidence. All other outcomes are considered to have inconclusive or very uncertain evidence. An  indicates that at least 1 primary study took place in Canada.

What is The Evidence for ED Overcrowding Interventions in Reducing Wait Time Outcomes?



Input:

- Active paramedic services versus inactive paramedic service ✓

Throughput:

- Short stay crisis units for mental health versus usual care ✓
- General practitioner or cooperative of general practitioners in the ED versus usual care
- Nurse practitioner in the ED versus usual care 🍁
- Physician-led or -supported triage, senior doctor at triage 🍁, primary health care provider triage interventions, or ED team triage 🍁 versus usual care
- LEAN supported by digital technologies or LEAN versus usual care
- Interventions to improve consultations in the ED or earlier physician assessment versus usual care
- Dedicated registrar versus no intervention
- Bedside registration versus usual care
- Strategic nursing roles or expanded clinical nursing roles versus usual care
- Split-flow or fast-track streaming versus usual care
- Additional personnel in the ED for mental health versus usual care
- External specialist unit for mental health versus usual care
- Access centre for mental health versus usual care
- Physical therapies in the ED versus usual care
- Changes in diagnostic testing (e.g., point of care testing, dedicated laboratory) versus usual care
- Acute medical assessment unit versus usual care

Output:

- Active bed management versus usual care

Hospital support:

- Hospital leadership program versus usual care

Policy reform:

- Nationally mandated time-based targets or time-based targets versus usual care 🍁

**Neutral****Throughput:**

- Medical scribes in the ED versus no intervention
- Strategic nursing roles versus usual care
- Nurse-implemented Manchester Triage System in the ED versus usual care
- Nurse-initiated X-rays versus X-rays initiated by other health care providers
- Psychiatric fast-track service versus usual care
- Nurse practitioners in the ED versus emergency medicine registrars
- Mental health liaison nurse versus usual care
- Earlier inpatient consultation (e.g., text message reminder) versus usual care

**Mixed****Throughput:**

- Advantaged practice nurse versus usual care
- Nurse-initiated protocols versus usual care

Note: An 🍁 symbol indicates that there is moderate (some uncertainty) or high certainty of the evidence. All other outcomes are considered to have inconclusive or very uncertain evidence. An 🍁 indicates that at least 1 primary study took place in Canada.

What Is the Evidence for ED Overcrowding Interventions for Other Outcomes With Conclusive Evidence?



Input:

- Paramedic practitioner service (ED visits, patient satisfaction) versus inactive paramedic service
- Home care visits (ED visits) versus usual care
- Telemedicine (ED visits) versus usual care
- Community-based hospital (ED visits) versus going to ED
- Primary care-based model (ED visits) versus going to ED

Throughput:

- Advanced triage protocols (ED length of stay, patient satisfaction) versus conventional triage or Canadian Emergency Department Triage and Acuity Scale 🍁
- ED-based case models of care (ED visits) versus usual care
- Physicians in triage (ED length of stay) versus usual care 🍁
- Team triage (ED length of stay) versus usual care
- Short stay crisis unit for mental health (ED length of stay, patient safety) versus usual care
- Split-flow or fast-track patient streaming (ED length of stay) versus usual care

Output:

- Discharge services and coordination of services by nurses in the ED (ED return visits) versus usual care

Postdischarge case management:

- Hospital discharge telephone follow-up with home visit or clinic visit (ED visits) versus usual care 🍁
- Care coordination strategies (ED visits) versus usual care 🍁

Policy reform:

- Time-based targets (ED length of stay for patients who are discharged or left prematurely) versus no intervention

**Neutral****Input:**

- Paramedic decision-making (ED return visits) versus transport to ED
- Distanced (remote) triage (ED visits) versus usual care
- Patient case management, outside hospital (ED visits) versus usual care
- Free-standing primary care clinic (ED visits) versus usual care 🍁
- Asthma clinical pathway in general practices (ED visits) versus usual care
- Direct mailing interventions (ED visits) versus no intervention

Throughput:

- Short stay crisis unit for mental health (left the ED prematurely) versus usual care
- ED-based case management (ED psychiatric visits) versus usual care
- Medical scribes in the ED (ED length of stay) versus no intervention
- Pharmacists in the ED (ED return visits) versus usual care
- Additional nursing roles (patient satisfaction) versus usual care
- Nurse-initiated X-rays in the ED (return ED visits) versus physician-initiated X-rays
- Rapid influenza testing (ED length of stay) versus usual care

Output:

- ED discharge interventions (ED return visits) versus usual care

Postdischarge case management:

- Hospital postdischarge telephone follow-up (ED visits) versus usual care 🍁
- Postdischarge home-based patient-centred intervention (ED visits) versus usual care

Multicomponent:

- ED-community multicomponent care transition strategies (ED return visits) versus usual care 🍁

Note: An 🍁 symbol indicates that there is moderate (some uncertainty) or high certainty of the evidence. All other outcomes are considered to have inconclusive or very uncertain evidence. An 🍁 indicates that at least 1 primary study took place in Canada.

What Did We Learn?

Based on the learnings from the environmental scan on factors, summary of systematic review evidence on interventions, and multistakeholder dialogue sessions, a key takeaway from this project is that **ED overcrowding is a complex, multifaceted issue**. It is not an issue confined only to the ED but one that is influenced by the broader hospital and health system as a whole. Population changes, staffing shortages and burnout across specialties, and entrenched hospital cultures may be a few of the driving forces behind this phenomenon. To address ED overcrowding, stakeholders suggested we look beyond the ED and the health system for solutions, and not solely on implementing interventions at the ED level.

Our **multistakeholder dialogue** identified other factors and interventions that were not found in the literature and could be considered in addition to our findings when making decisions about ED overcrowding, including:

- individual and organizational cultures that affect how people use the ED, what their expectations are, and how they communicate with each other
- multifaceted solutions and system redesigns that target root causes and address accountability; collaboration between governments, health care providers, and the public; and context-specific needs (e.g., rural or urban); and that adopt technology to leverage data and increase integration.

The following are **equity considerations** related to ED overcrowding and interpretations of our findings:

- We used the PROGRESS-Plus framework to guide data extraction; however, few studies reported on these characteristics at all, or consistently, or summarized findings with an equity lens.
 - For the environmental scan, out of 27 articles, only 3 reported on populations experiencing mental health challenges or by the income status of countries
 - For the a summary of systematic review evidence on interventions, out of 64 systematic reviews, less than one-third reported on sex, disability status, populations experiencing mental health concerns, socioeconomic status, populations experiencing houselessness, populations speaking languages other than English, race (e.g., Indigenous or Black communities and other people of colour), or ethnicity. No systematic reviews reported information about gender identity, religion, newcomer status, or 2SLGBTQ+ communities.
- The overall lack of equity-related discussion in the literature can result in a failure to understand how various equity-deserving populations are differentially affected when it comes to factors and interventions related to ED overcrowding. This

absence of information does not mean that these issues do not exist, but rather that they were not comprehensively reported and/or captured.

- Future work, both from CADTH and in the primary literature, should strive to dedicate the time and effort needed to meaningfully integrate and address equity considerations.

We are aware that factors and interventions are conceptually related. However, the international literature did not make clear links between **interventions and the factors they were targeting**. In general, interventions can often be designed to target specific underlying factors that affect an issue. Because ED overcrowding is a complex issue where there may be several variables at play – from health needs to health service use to health care management – the factors themselves may be interrelated and the interventions may affect more than 1 factor at once. The full report will take a closer look at some factors and interventions we discovered in our work that we believe address the factors, even though the evidence did not clearly explain the link between them.

To help inform decision-making, there is a need for:

- **high-quality evidence that** assesses ED wait times, boarding, and occupancy outcomes that is generalizable to the Canadian context, including rural and remote settings
- more evidence that assesses solutions that **extend outside the ED**
- clearer reporting on the specific populations and settings being studied to help interpret and **contextualize** the findings.

Our findings are **limited** in the following ways:

- We included only articles written in English.
- The environmental scan took a broad, descriptive approach, which limited the ability to analyze and interpret the findings. If reporting of factors was unclear or not explicit, some relevant articles may have been excluded.
- We identified few articles written within the Canadian context so not all findings will be applicable to a Canadian setting. Variation across and within Canadian jurisdictions further adds to uncertainty around generalizability.
- We relied on the systematic review authors' descriptions of how interventions alleviated ED overcrowding.
- Due to the rapid nature of our work, the interventions findings may have overlap because of primary study evidence being reported in multiple systematic reviews.
- The interventions findings may not include novel or emerging solutions that are not yet captured in systematic reviews.

What Else Is CADTH Doing?

The full report of the environmental scan and the summary of systematic review evidence on interventions will be published in October 2023 and will document additional summaries, including an assessment of the effectiveness of the identified interventions, the methodological quality of the research, and a discussion that integrates the findings from both components, including reflections on considerations of equity. The full report will also summarize clinical, patient, and community partner engagement activities conducted as part of this project.

This Evidence Preview is part of a [series of publications](#) that CADTH will produce on the topic of ED overcrowding in Canada as an update to our 2006 publications.¹¹⁻¹⁴ Separate publications not described in this report will be published in September of 2023 to address:

- the impact ED overcrowding has on quality of care and patient safety (i.e., the risks of overcrowding), and on health professional learner experiences and staff well-being
- how ED overcrowding in Canada has changed since the last series of reports
- the identification of new and emerging interventions to alleviate ED overcrowding (those not captured in the the summary of systematic review evidence)
- a summary of CADTH's multistakeholder dialogue sessions.

CADTH's [Health Technology Expert Review Panel](#) (HTERP) will use the CADTH deliverables as inputs into deliberations that will result in the development of guidance and responses to addressing the decision problem of **what evidence-informed solutions should be considered to inform decision- and policy-making to effectively alleviate overcrowding of adult and pediatric ED services in urban, rural, and remote health care settings in Canada?**

For more information on CADTH's work on this topic, please visit [Emergency Department Overcrowding in Canada: An Update | CADTH](#).

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September 2023