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Sepsis policy, guidelines, and standards in Canada: a jurisdictional scoping review

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Abstract

Introduction Sepsis, the body's life-threatening response to infection, is associated with significant morbidity and mortality. In 2017, the World Health Assembly passed a resolution urging member states to recognize sepsis as a public health priority. Our objective was to identify and describe sepsis policies, guidelines, and health professional training standards in Canada.

Methods We conducted a scoping review and an environmental scan, including systematic searches of published and grey literature. Policies, guidelines, or training standards related to identifying, managing, or reporting sepsis, published since 2010 and available in English/French, were included. We extracted data on the organization(s) involved in the development, information on the source, including the target patient population, measures of inclusive engagement, and whether the source considered at-risk, equity-denied, and/or Indigenous communities.

Results We identified 32 sources of evidence, including sepsis policies or guidelines for 38% (5/13) of provinces and territories, the inclusion of sepsis as a training competency in 16% (11/67) of the Royal College of Canada medical specialties/subspecialties competency standards, and two Canadian Hospital Accreditation Standards. Only 6% (2/32) of the sources considered the role of social determinants of health, and 13% (4/32) engaged individuals with lived sepsis experience or members of the public.

Conclusions We identified existing sepsis policies, guidelines, and standards that reveal significant gaps across provinces and territories, particularly the lack of attention to social determinants of health and the exclusion of individuals with lived experience. Coordinated national policy efforts are urgently needed to reduce the burden of sepsis in Canada.

Keywords National action plan, Early detection, Social determinants of health, Patient engagement, Disease screening

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Background

Sepsis, defined as acute life-threatening organ dysfunction caused by infection, is a significant public health challenge [1]. Approximately 50 million people are affected by sepsis each year, accounting for 20% of all deaths worldwide [2]. Although sepsis can affect anyone, nearly 85% of cases occur in areas with a lower sociodemographic index, a measure that considers income, education, and fertility rates, highlighting the disproportionate burden of sepsis among equity-denied communities [2]. For those who survive, sepsis can lead to significant physical and mental post-sepsis sequelae [3–5]. Unsurprisingly, the economic burden of sepsis on the Canadian healthcare system is significant. For example, in Ontario, the incremental annual costs due to sepsis are estimated at one billion dollars [6]. Sepsis survivors also have more than two-fold increased odds of falling into the top 1% of healthcare spending compared to those without sepsis [7]. Although this life-threatening condition is most often considered a hospital-based challenge, sepsis commonly begins in the community [8, 9]. Without considering public health and policy measures to address this complex health challenge [8], we risk limiting efforts to reduce the burden of sepsis. These measures should be focused on communities at disproportionate risk for sepsis, such as those at the extremes of age and equity-denied communities [10–12].

Recognizing sepsis as a global health challenge, in 2017, the World Health Assembly (WHA) passed Resolution WHA70.7, "Improving the prevention, diagnosis, and clinical management of sepsis [13]." The resolution calls on member states to implement standards and establish guidelines that facilitate prevention, early diagnosis, and appropriate management of sepsis. In line with this resolution, several member states, including, for example, Australia [14], Belgium [15], France [16], Ireland [17], New Zealand [18], and the United Kingdom [19], have taken measures to reduce the burden of sepsis through national action plans. Where implemented, these efforts—which include sepsis policies, guidelines, and clinical standards—have demonstrated increased detection of sepsis [20], reduced healthcare costs [21], and reduced sepsis-related mortality [20, 22–24]. Canada, however, lacks a coordinated, proactive approach to reducing the burden of sepsis [25].

The objective of this scoping review is to identify and describe existing sepsis policies, clinical practice guidelines, and health professional training standards in Canada, including whether they consider equity-denied communities to inform evidence-based policy recommendations as part of a Sepsis National Action Plan for Canada (SNAP-C).

Methods

Protocol and registration

We conducted the scoping review according to the stages outlined by Arksey and O'Malley [26] and reported in alignment with the criteria identified by the Preferred Reporting Items for Systematic Review and Meta-analyses Extension for Scoping Reviews (PRISMA-ScR) guidelines. The protocol for this review is published [27]. Individuals with lived experience as a sepsis patient and/or caregiver (LS, KR, KH) were engaged in the study protocol development and throughout the review.

Search strategy

We searched EMBASE, CINAHL, Medline, Turning Research Into Practice (TRIP), and Policy Commons from January 1, 2010, to July 22, 2024. We selected this range of dates to identify the current landscape for sepsis policies, guidelines, and health professional training standards. Search terms included key terms related to sepsis, the region (i.e., Canadian provinces and territories) and policies, guidelines and health professional training standards (Appendix 1). The search strategy was limited to sepsis broadly and did not include condition- or population-specific terms (e.g., neutropenia).

To identify potential sources of evidence not published in peer-reviewed journals, we searched a list of Canadian organizations responsible for regulating the training of healthcare professionals and organizations accountable for reporting health outcomes across Canada using the site search function on Google.com (Appendix 2). The use of the site search function on Google.com ensured that sites and sources in non-English languages were captured. We began by compiling the organizations which served as our initial sampling frame. We then shared this list with our diverse research team, which included healthcare professionals, individuals with lived sepsis experience, policy experts, and health professional education, to ensure it was comprehensive and reflected various important perspectives and locations where sepsis policies, guidelines, and training standards for health professionals might be found.

Within each website, sites were searched using "sepsis" and commonly used terms for sepsis (Appendix 1), and retrieved pages, links and documents were manually reviewed to identify relevant policies, guidelines and standards. Search results were screened by title and URL by one reviewer (FS, VC) to assess relevance and identify potentially eligible documents for full-text review. Full-text screening and data extraction were conducted in duplicate, consistent with the approach used for the electronic database search.

Eligibility criteria

We included sepsis policies, guidelines, and health professional training standards if they met the following criteria: (1) published or revised since 2010; (2) a provincial, national or international policy, guideline, or health professional training standard applicable in Canada and specific to the identification, management, and/or reporting of sepsis; (3) publicly available or easily accessible through a reasonable request (i.e., the process for requesting the document was straightforward and could be completed in an appropriate time frame); and (4) available in English or French. Local sources of evidence, such as hospital-specific policies, were not included. Commentaries on sepsis policies, policies that apply to areas outside of Canada, and policies superseded by more relevant policies were excluded.

Selection of sources of evidence

We uploaded our search results to Covidence (Veritas Health Innovation, Melbourne, Australia) and removed duplicates. Following pilot testing of our inclusion/exclusion criteria ($n = 10$), two reviewers (FS, VC) independently screened all articles, first by title and abstract and then by full text. Studies were included in the full-text review if both reviewers included them. We resolved disagreements with a third reviewer (KB) at all screening stages. No changes were made to the inclusion/exclusion criteria following pilot testing.

The sources of evidence identified by searching the websites of organizations responsible for training healthcare professionals and reporting health outcomes were screened by two reviewers (FS, VC) for eligibility. Disagreements were resolved by a third reviewer (KB). The sources were combined in Excel.

Data extraction

Prior to data extraction, we piloted our data abstraction form in a random sample of eligible sources of evidence ($n = 10$) [28]. Minor changes were made to clarify the fields and the information to extract. For sources of evidence that met our eligibility criteria, we extracted, independently and in duplicate: (1) bibliographic details (e.g. author, title, date of publication); (2) the names of the organization(s)/group(s) involved in the development and the authoritative or regulatory body; and (3) information on the policy, guideline or standard, including policy type, jurisdiction or setting in which the policy/guideline applies, target patient population, whether it includes reportable information either to a government organization and/or public reporting, date since last updated, and which sepsis definition was used, if specified. Where available, we also extracted measures of inclusive engagement (i.e., the inclusion of individuals with lived or living experience) and whether the policy, guideline, or health professional training standard considered at-risk, equity-denied, and/or Indigenous communities. See Appendix 3 for the complete data extraction form.

Critical appraisal of individual sources of evidence

Given the descriptive objectives of this review, we did not conduct critical appraisal of the included sources of evidence [29].

Synthesis of results

To guide the reporting of results, we grouped our sources of evidence, based on how they were reported, into the following categories: policies, guidelines, and standards (i.e., health professional training and accreditation standards). We collated and summarized key information in tables, including bibliographic details, summary information on each of the policies, guidelines, and standards, and the authoritative or regulatory bodies involved. Additional information on the current landscape of sepsis policies, guidelines, and standards in Canada was included in our narrative synthesis. Although we originally planned to use the framework method to guide our narrative synthesis [27, 30], following review of the included sources and the information they contained, we determined that applying an a priori framework was not appropriate. Specifically, sources varied substantially in purpose, level of prescriptiveness, and the extent to which sepsis-related content was explicitly addressed, which limited the consistent and meaningful application of a single analytic framework across all sources.

Results

We identified 1717 sources of evidence, of which we reviewed 155 in full text and included 32 in our final review (Fig. 1). These sources of evidence were published between 2010 and 2024; nine were guidelines, including the International Surviving Sepsis Campaign (SSC) Guidelines, three were provincial sepsis policies, 16 were health professional training standards, three were accreditation standards, and one was a reporting standard. Of the resources included, the majority were national (19/32; 60%) and provincial (10/32; 31%). Three resources (3/32; 9%) were international. At least one resource from each of the following provinces was identified and included: Alberta (1/10; 10%) [31], British Columbia (BC) (3/10; 30%) [32–34], Nova Scotia (1/10; 10%) [35], Saskatchewan (4/10; 40%) [36–39], and Prince Edward Island (P.E.I) (1/10;10%) [40]. No resources were identified from the three territories (Northwest Territories, Yukon, and Nunavut) or from Manitoba, Ontario, Quebec, Newfoundland and Labrador, or New Brunswick. A complete list of resources is presented in Fig. 2, and a summary of resource characteristics is provided in Table 1, with more details available in Appendix 4.

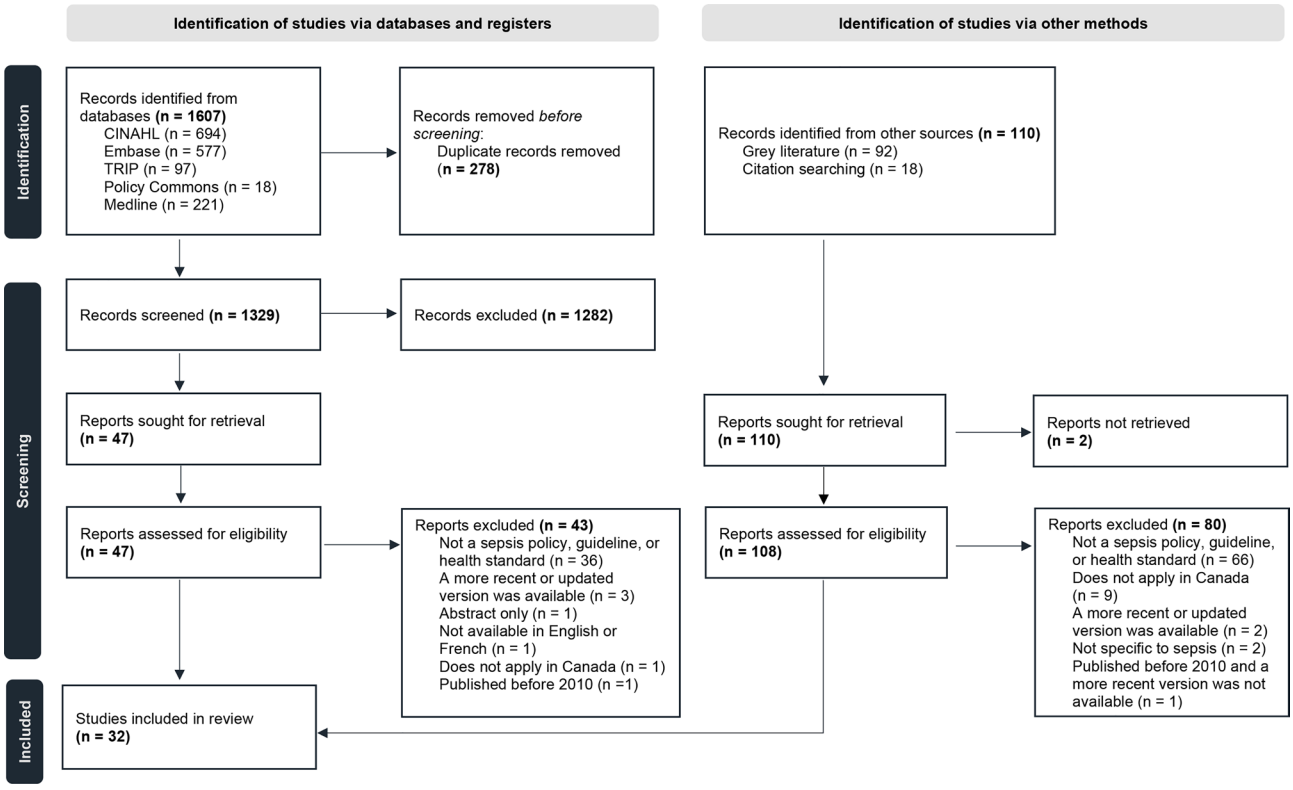

Fig. 1 PRIMSA flowchart of sources of evidence identification, review, and selection. From: Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. BMJ 2021;372:n71. https://doi.org/10.1136/bmj.n71. For more information, visit: http://www.prisma-statement.org/

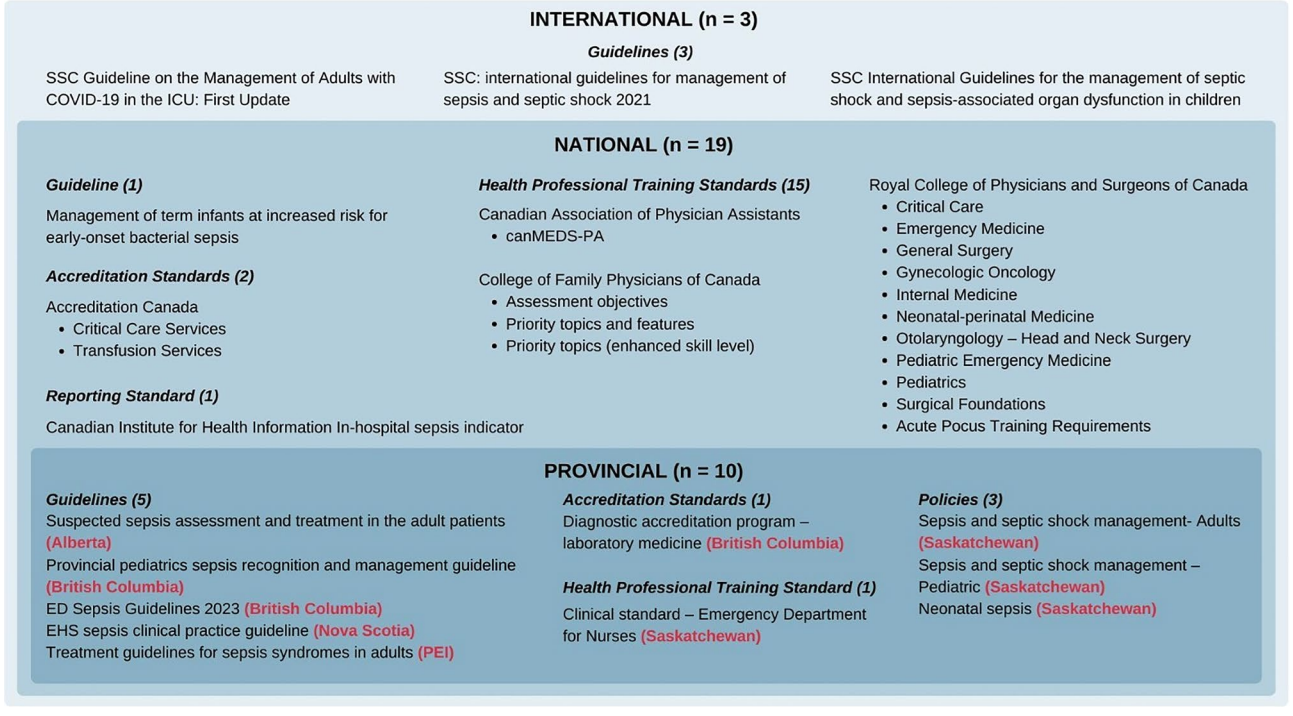

Fig. 2 International, national, and provincial sepsis policies, guidelines and standards

Table 1 Characteristics of sepsis guidelines, policies, and standards ($n = 32$)

Resource Title	Producer	Year	Audience
Guidelines (n = 9)			
EHS Sepsis Clinical Practice Guideline	NS Department of Health	2013	Pre-hospital/Emergency healthcare providers
Treatment Guidelines for Sepsis Syndromes in Adults	Health PEI	2014	Physicians, nurse practitioners, & pharmacists
Management of term infants at increased risk for early onset bacterial sepsis	Canadian Paediatric Society	2017	Pediatricians caring for neonates at risk of early-onset bacterial sepsis
SSC Guidelines for the Management of Septic Shock in Children	SCCM	2020	Clinicians caring for children with septic shock and other sepsis-associated organ dysfunction
Suspected Sepsis Assessment and Treatment in the Adult Patient	Alberta Health Services	2020	Healthcare professionals
SSC Guidelines on the Management of Adults with COVID-19 in the ICU: First Update	SCCM	2021	Healthcare professionals caring for adults with severe or critical COVID-19
SSC guidelines for management of sepsis and septic shock	SCCM	2021	Frontline clinicians, allied health professionals, and policymakers involved in the care of patients with sepsis/septic shock.
Provincial Pediatric Sepsis Recognition and Management Guideline	Child Health BC	2023	Healthcare providers involved in the care and management of children with sepsis/septic shock
ED Sepsis Guidelines 2023	Health Quality BC	2023	ED physicians
Policies (n = 3)			
Neonatal Sepsis	*SK Ministry of Health	2011	Nursing personnel
Sepsis and septic shock management - Pediatric Patients	**SK Ministry of Health	2016	ED - registered nurses / healthcare team
Sepsis and septic shock management - Adult	**SK Ministry of Health	2017	Acute care - Emergency Dept
Health Professional Training Standards (n = 16)[§]			
Priority topics and key features	CFPC	2010	Resident physicians in family medicine, program directors, and evaluators
CanMEDS-PA	Canadian Association of PAs	2015	PAs, supervising physicians, legislators, educators
Key Features of priority topics (enhanced skill level)	CFPC	2017	Resident physicians in family and EM, program directors, and evaluators
Otolaryngology – Head and Neck Surgery	RCPSC	2017	Physicians who wish to specialize in Otolaryngology and program directors
Emergency Medicine	RCPSC	2018	Physicians who wish to specialize in EM and program directors
Internal Medicine	RCPSC	2018	Physicians who wish to specialize in Internal Medicine and program directors
Surgical Foundations	RCPSC	2018	Resident physicians in a surgical residency and program directors
Critical Care Medicine Competencies	RCPSC	2019	Physicians who wish to subspecialize in Critical Care and program directors
Assessment objectives - Family Medicine	CFPC	2020	Resident physicians in family medicine, program directors, and evaluators
General Surgery	RCPSC	2020	Physicians who wish to specialize in General Surgery and program directors
Clinical Standard - ED - for Nurses	SK Ministry of Health	2021	Emergency Department Nurses
Neonatal-Perinatal Medicine	RCPSC	2021	Physicians who wish to subspecialize in Neonatal-Perinatal Medicine and program directors
Pediatrics	RCPSC	2021	Physicians who wish to specialize in Pediatrics and program directors
Gynecologic Oncology	RCPSC	2022	Physicians who wish to subspecialize in Gynecologic Oncology and program directors
Acute POCUS Training Requirements	RCPSC	2022	Physicians who work in an acute care setting and wish to become certified in acute care POCUS and educators
Pediatric Emergency Medicine	RCPSC	2023	Physicians who wish to subspecialize in Pediatric EM and program directors
Accreditation Standards (n = 3)			

Table 1 (continued)

Resource Title	Producer	Year	Audience
Diagnostic Accreditation Program - Laboratory Medicine	College of Physicians and Surgeons of BC	2023	Laboratory medicine physicians, managers, employees, and directors
Critical Care Services	Accreditation Canada[†]	2024	Not stated
Transfusion Services	Accreditation Canada†	2021	Not stated
Reporting Standards (n = 1)			
In-Hospital Sepsis Indicator	CIHI	2024	This indicator will "help hospitals improve patient safety and learn from their peers"

EHS Emergency Health Services; *NS* Nova Scotia; *PEI* Prince Edward Island; SSC Surviving Sepsis Campaign; SCCM Society of Critical Care Medicine; BC British Columbia; ED Emergency Department; SK Saskatchewan; PA Physician Assistant; EM Emergency Medicine; *CFPC* College of Family Physicians of Canada; *RCPSC* Royal College of Physicians and Surgeons of Canada; *POCUS* Point-of-Care-Ultrasound; *CIHI* Canadian Institute for Health Information

*Prairie North Regional Health Authority

** Kelsey Trail Health Region

[§]Royal College of Physicians and Surgeons of Canada documents can be accessed via the following link: https://www.royalcollege.ca/en/standards-and-accreditation/information-by-discipline

[†]These documents were not publicly accessible. We accessed them via an email request

Guidelines (*n* = 9)

Nine of our included sources were guidelines (9/32; 28%), including the SSC guidelines for adults [41] and children [42] and the guidelines on the management of adults with Coronavirus Disease 2019 (COVID-19) [43]. We identified one national guideline written by the Canadian Pediatric Society on managing infants at risk for early-onset bacterial sepsis [44]. Five provincial guidelines were included. Three guidelines focused on adults [31, 33, 40], one on pediatric patients [32], and one guideline, produced by the Nova Scotia Department of Health and Wellness [35], included both adult and pediatric populations. Most guidelines (7/9; 78%) were designed for healthcare professionals caring for patients with sepsis or risk of sepsis in any hospital setting, including in urgent care, emergency, and intensive care settings and two guidelines (2/9; 22%) were designed specifically for providers caring for patients in pre-hospital and emergency settings.

Except for the authors noting that they considered the availability and costs of corticosteroids, dexamethasone, and remdesivir, and the need for adaptations for low- and middle-income settings, the SSC guidelines do not specifically address equity-denied communities. The two guidelines from BC, produced by Health Quality BC [33] and Child Health BC [32], highlighted at-risk populations (e.g., older adults, immunocompromised patients and those with chronic illnesses) and, in the pediatric guidelines specifically, the importance of strength-based perspectives and applying a trauma-informed lens when caring for children and their families, an often-underserved population. The BC pediatric guidelines also note that providers must complete Indigenous Cultural Safety and Cultural Humility training, understand implicit biases and intersectionality, and understand the role of self-reflection with respect to their values, assumptions, and beliefs. The remaining guidelines (4/9; 44%) do not mention at-risk or equity-denied populations. The pediatric guidelines produced by Child Health BC and the adult and pediatric SSC guidelines included "patient partners/advisors" and "members of the public," respectively [32, 42]. None of the other guidelines noted the inclusion of people with lived sepsis experience as part of the guideline working groups (6/9; 67%).

Policies (*n* = 3)

Three of our included sources of evidence were sepsis policies (3/32; 9%). All three policies were produced by the Saskatchewan Health Authority and focused on sepsis detection and management in emergency and acute settings. The three policies focused on Adult [36], Pediatric [37] and Neonatal [38] sepsis management. No at-risk or equity-denied populations were considered in any of the policies. These policies do not describe the composition of the working groups, those involved in developing the policies, or whether individuals with lived sepsis experience were involved. We did not identify a Canadian national sepsis policy.

Health professional training standards (*n* = 16)

We identified 16 health professional training standards for physicians, physician assistants, and nurses that mentioned sepsis as a competency (16/32; 50%). Most health professional training standards were national (15/16; 94%), with only one clinical standard for nurses in the emergency department, developed by the Saskatchewan Ministry of Health, identified at the provincial level (1/16; 6%) [39]. We identified no training standards for midwives or paramedics that mentioned sepsis.

Most professional training standards that mention sepsis applied to Physician training (14/16; 88%) and were issued by the College of Family Physicians of Canada (3/14; 21%) [45–47] or the Royal College of Physicians and Surgeons of Canada (RCPSC) (11/14; 79%) [48]. In the assessment objectives for family physicians, guidelines for the early recognition and management of "septicemia," including management of antibiotics and awareness of local antibiotic resistance patterns, are provided. In the assessment objectives and priority topics for family physicians, patients at increased risk for sepsis (e.g., newborn babies) or with symptoms that may overlap with sepsis (e.g., patients with an altered level of consciousness) are also noted. The priority topics for the enhanced skill level specifically mention the risk of sepsis and strategies to manage it in neonates, infants, and children. The RCPSC lists 67 specialties and subspecialties on its website, of which only 11 (16%) included sepsis as a competency [48]. The Internal Medicine document only notes the investigation and management of "urosepsis." None of the competency documents that include sepsis management highlight the importance of social determinants of health on sepsis, or equity-denied communities, and only speak to applying "clinical and biomedical sciences" knowledge when developing a management plan for patients with sepsis. The inclusion of patients with lived experience in developing and/or reviewing the documents was not stated in any of the standards.

We identified two non-physician clinical standards that mentioned sepsis (2/16; 12%), one for Emergency Department (ED) nurses in Saskatchewan [39] and one for Physician Assistants (PA) [49], developed by the Canadian Association of Physician Assistants, referred to as CanMEDS-PA. Management of patients with sepsis in the ED and the recognition, diagnosis, management and/or treatment of "uncomplicated cases" of sepsis were included in the ED nurses' and PAs' standards, respectively. Although the CanMEDS-PA document mentions integrating knowledge and understanding of the patient's context, including, for example, socioeconomic status and living situation, neither the clinical standard for nurses nor PAs considers equity-denied communities at risk for sepsis. Of note, the nursing clinical standard only lists sepsis as part of the "Basic PLUS Orientation" standard, which applies only to those identified by the site manager.

The distribution of provincial sepsis guidelines, policies and health professional training standards across Canada are summarized in Fig. 3.

Accreditation standards (*n* = 3)

We identified three health accreditation standards (3/32; 9%) that mention sepsis, one authorized by the College of Physicians and Surgeons of BC for Laboratory Medicine specialists [34] and the other two by Accreditation Canada. Hospital Accreditation Standards provide operational benchmarks to ensure patients receive safe, high-quality care. The BC accreditation standards for Laboratory Medicine identify procedures to manage and investigate transfusion-transmitted bacterial sepsis, including ensuring guidelines for recognizing the signs and symptoms and procedures to take if it is suspected (i.e., transfusion is stopped). The two hospital Accreditation Canada standards that included guidelines for sepsis were for hospital Critical Care Services and Transfusion Services. Like the BC accreditation standards for Laboratory Medicine, the Transfusion Services standard highlights bacterial sepsis as a transfusion-related adverse event and provides guidance on what to do if bacterial sepsis is suspected. The Critical Care accreditation standard offers guidelines for sepsis prevention, early identification and treatment of sepsis, noting that patients who develop sepsis should receive "early interventions based on evidence-based guidelines." The Critical Care Services standard also recommends measures and targets to evaluate the management of sepsis in critical care units, listing "Percentage of clients with septic illness who had blood cultures taken before IV Antibiotics were initiated" as one metric to measure and evaluate. Both transfusion-transmitted sepsis and sepsis in the Transfusion Services and Critical Care Services Accreditation Canada standards were categorized as high-priority. None of these sources integrate social determinants of health as part of the standards.

Reporting (*n* = 1)

We identified one source of evidence focused on sepsis reporting (1/32; 3%), the Canadian Institute for Health Information (CIHI) "In-Hospital Sepsis" indicator [50]. The indicator covers all provinces and territories, includes separate models for children (under 18 years) and adults (over 18 years) and is reported annually. The indicator calculates the risk-adjusted rate of in-hospital (nosocomial) sepsis (per 1000 discharges) among patients admitted to an acute care institution with a stay of at least two days. The indicator does not report patients with community-acquired sepsis or stratify data by social determinants of health. Patients under one year of age are excluded as "they have different mechanisms and risk factors for developing sepsis, as well as different coding standards."

Across included sources, explicit consideration of at-risk, equity-denied, and Indigenous communities was limited and inconsistently addressed. Consideration of social determinants of health, including upstream factors contributing to inequities, was similarly limited. No sources of evidence provided comprehensive recommendations or examples of incorporating equity-related

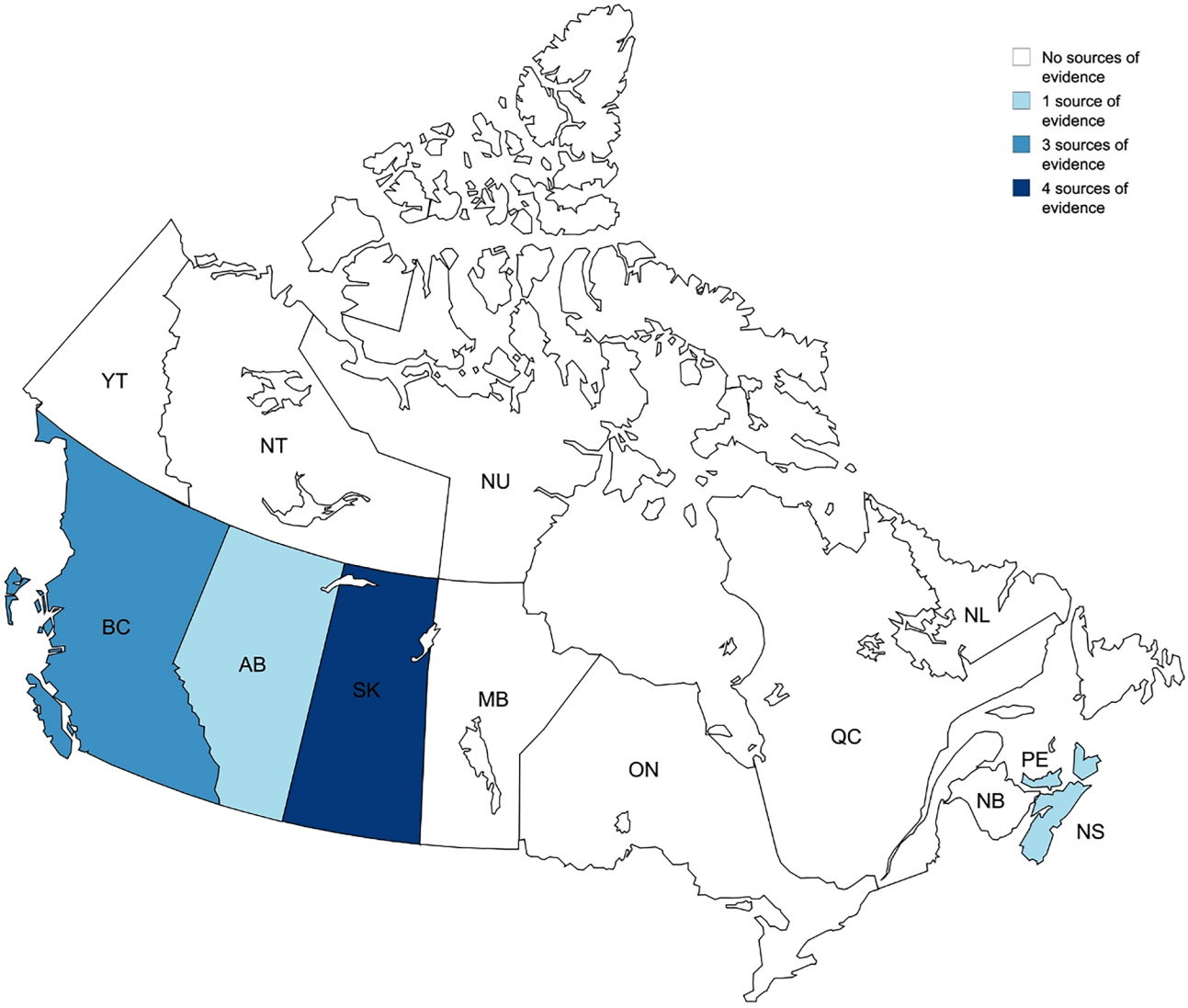

Fig. 3 Distribution of provincial sepsis policies, guidelines and standards across Canada

considerations or social determinants of health into sepsis policies, guidelines, or health professional training standards.

Discussion

We identified 32 sources of evidence, including nine sepsis guidelines, three sepsis policies, 16 health professional training standards that included sepsis, three accreditation standards and one sepsis reporting standard. Most of the sources of evidence included were national in scope, followed by provincial, and a small minority were international. Provincial sources of evidence were only identified in Alberta, British Columbia, Nova Scotia, Saskatchewan, and Prince Edward Island, representing a minority of Canadian provinces and territories and the total population. Of the identified health professional training standards, only two were identified for non-physician groups, and no standards that mentioned sepsis were identified for paramedics or midwives. Guidelines from Health Quality BC and Child Health BC highlighted communities at increased risk of sepsis, and guidelines from Child Health BC and the SSC included patient partners or members of the public. None of the other policies, guidelines, or standards included consideration of the role of social determinants of health, nor did they mention including people with lived sepsis experience as part of the development or review of the documents. The existing sepsis policies, guidelines, and health professional training standards represent a fragmented approach to addressing the burden of sepsis in Canada.

Canada does not have a National Sepsis Action Plan to reduce the burden of sepsis [25]. The absence of a coordinated national framework has resulted in inconsistent—and in some cases absent—efforts to prevent,

detect, and manage sepsis effectively. Although the WHA sepsis resolution and more recently the Global Sepsis Alliance (GSA) 2030 Sepsis Agenda [51] highlight the importance of defining and implementing standards and establishing guidelines to reduce the burden of sepsis, we have identified several gaps, including (1) the absence of a national sepsis policy or policy guidance for provinces and territories; (2) clear gaps in sepsis policies, guidelines, and health professional standards across more than half of Canadian provinces and territories; and (3) a lack of health professional standards and accreditation standards that include sepsis. In most sources of evidence, there are glaring gaps in understanding and integrating the interplay between social determinants of health and sepsis, despite a growing body of evidence demonstrating the link [2, 10–12] and engaging people with lived sepsis experience, providing an opportunity to consider more collaboration, including with equity-denied communities [52].

Australia, France, New Zealand, England, Switzerland, Ireland, and Belgium have developed or are in the process of developing and implementing Sepsis National Action Plans. Where established, jurisdictions have shown an increase in the detection and identification of sepsis [17, 53] and a reduction in sepsis-related mortality [53]. These international examples provide context for understanding Canada's current state relative to jurisdictions that have implemented coordinated approaches to sepsis prevention, recognition and management. Sepsis health policies are often developed in response to tragedies or system failures rather than as part of proactive efforts, reflecting a reactive pattern of health policy development [25]. In this context, the gaps identified in this review provide policy-relevant evidence base that can help inform more coordinated and proactive sepsis policy responses in Canada. Implementing a Sepsis National Action Plan in Canada, aligned with the strategic pillars of the 2030 Global Agenda for Sepsis – Political Leadership and Multilateral Cooperation, Health System Readiness, Whole-of-Society Response, Sepsis Research and Innovation, and Sepsis in Pandemics – could save lives and yield significant economic benefits [25, 51, 54].

While healthcare in Canada is publicly funded at the federal level and delivered by provincial and territorial governments, a national, or "pan-Canadian" approach to addressing the burden of sepsis is feasible. Several organizations with national oversight, including the Royal College of Physicians and Surgeons of Canada, Accreditation Canada, and the Public Health Agency of Canada, are well-positioned to support coordinated sepsis policy efforts across provincial and territorial jurisdictions. Recent efforts to develop Canada's national strategy on antimicrobial resistance illustrate how pan-Canadian coordination across multiple levels of government and institutions can be achieved [55].

Protocolized care that supports early identification and treatment is associated with better outcomes [23, 56]; however, implementing guidelines, such as those produced by SSC, is low [57–59]. In the Canadian context, policies and guidelines to support early detection and evidence-based management were available in fewer than half of the provinces and territories and were often limited to only adult or pediatric populations. Except for a policy in Saskatchewan, neonates at risk for sepsis were not considered in any sources of evidence and excluded from the only reporting standard. The lack of comprehensive policies risks delayed sepsis recognition, deviations from effective evidence-based practices, and preventable morbidity and mortality [23]. Evaluations of the first state-mandated regulations in New York, Rory's Regulations, which include a pediatric-specific mandate, demonstrate how protocolized care improves sepsis outcomes, including in children [60].

Protocolized care may be most effective among individuals "at the margins," among whom signs of sepsis are more likely to be missed [61]. This can extend to socially and structurally disadvantaged communities that are disproportionately impacted by sepsis [2, 11, 12]. However, as we demonstrated in this review, consideration of at-risk, equity-denied, and Indigenous communities was notably absent from sepsis policies, guidelines, and standards—a gap that likely extends beyond sepsis. This gap is especially important given the growing body of evidence highlighting the impact of social determinants of health on sepsis incidence and outcomes [62, 63]. Embedding equity considerations, including social determinants of health, into sepsis policies, guidelines and health professional training standards represents an important opportunity to support prevention, recognition and management of sepsis across diverse populations. Despite the availability of SSC guidelines—representing current evidence-based practices—and evidence showing improved sepsis outcomes in areas with protocolized care, Canada lacks robust policies and guidelines.

To effectively identify, treat, and manage individuals at risk for sepsis, sepsis needs to be included in health professional training and accreditation standards. We identified an alarming lack of learning objectives pertaining to sepsis among physician training standards in Canada. For example, over 80% of physician training standards did not mention sepsis, which is a highly prevalent syndrome, identified in 14.5% of all Ontario hospitalizations [6], and therefore of importance to all trainee physicians. Given that over 80% of sepsis cases originate in the community [8], a major concern is the lack of standards for community-facing clinicians, including Emergency Medicine Services (EMS) staff, who are often the first point

of contact with individuals at risk of developing sepsis or already experiencing it. This has important implications for early recognition and management in community settings, an increasingly recognized priority [64]. Because sepsis can arise in any care setting, all physician training standards should include sepsis prevention, identification and treatment. This process should begin with appropriate training and accountability metrics, which are essential for effectively implementing efforts to reduce the burden of sepsis, such as sepsis policies for early detection and treatment.

This study is limited to the Canadian context and identifies only sepsis policies, guidelines, and health professional training standards published or updated from 2010 onwards. Only provincial, national, and international sources that apply in Canada (e.g., international guidelines endorsed by the Canadian Critical Care Society) were included. Local sources of evidence, including, for example, hospital-specific policies, were not included because it would not have been feasible to search for and capture them accurately, as most local policies, guidelines, and standards are only available to those within the organization. Our search was limited to publicly available documents or documents noted on public websites and accessible through a reasonable request. This could have limited the sources of evidence included in our analysis. We made efforts to mitigate this effect through a multi-pronged search strategy, including a grey literature search and a study team with diverse experiences and areas of practice guiding the search and overall study. It is also possible that documents only disseminated in French may not have been identified in our search if they used different terminology for sepsis. However, we did not place any language restrictions during the search to identify French-language documents. To our knowledge, this review is the first comprehensive analysis of sepsis policies, guidelines and standards in Canada, highlighting key policy gaps and opportunities for future efforts.

Conclusion

We reviewed sepsis policies, guidelines, and standards in Canada, and we identified that there was no national sepsis policy. This has led to a fragmented approach to addressing sepsis in Canada, including a paucity of guidelines and policies across more than half of Canadian provinces and territories and limited inclusion of sepsis in health professional training and accreditation standards. These gaps highlight the need for a coordinated, comprehensive policy effort to develop a Sepsis National Action Plan for Canada to reduce sepsis-related morbidity, mortality and healthcare costs.

Abbreviations

WHA	World Health Assembly
SNAP-C	Sepsis National Action Plan for Canada
PRISMA-ScR	Preferred Reporting Items for Systematic Review and Meta-analyses Extension for Scoping Reviews
TRIP	Turning Research Into Practice
BC	British Columbia
P.E.I	Prince Edward Island
SSC	Surviving Sepsis Campaign
COVID-19	Coronavirus Disease 2019
RCPSC	Royal College of Physicians and Surgeons of Canada
ED	Emergency Department
PA	Physician Assistant
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Supplementary Information

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Supplementary Material 1

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Author contributions

FS, KB, and VC conceptualized and designed the study. FS and VC executed the literature search (with guidance from an experienced librarian), screening and data extraction. FS drafted the manuscript. All authors provided feedback throughout and reviewed the final draft of the manuscript.

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Data availability

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Declarations

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Not applicable.

Consent for publication

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Competing interests

The authors declare no competing interests.

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