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Maternal Mortality and Severe Maternal Morbidity Reports from Seven Countries: Protocol for a Qualitative Deductive Content Analysis to Inform Canadian Obstetric Survey System Reporting

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ADMINISTRATIVE INFORMATION

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Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 23 November 2026 and was last updated on 23 November 2026.

INTRODUCTION

Study aim This study aims to examine how maternal mortality and severe maternal morbidity reports from Belgium, Australia, Canada, Ireland, New Zealand, the United Kingdom, and the United States identify, analyze, interpret, and communicate factors contributing to adverse maternal outcomes, and how their recommendations address equity and provide actionable guidance for improving maternal health. The specific objectives are to:

1. Describe the scope and intended audiences of eligible reports.

2. Examine how clinical, operational, provider-related, patient-related, social, and structural contributing factors are identified, analyzed, interpreted, and communicated.

3. Examine the transparency and reproducibility of methods used to generate findings and recommendations.

4. Examine how equity and the lived knowledge of patients, families, and communities are incorporated into case review, interpretation, and recommendation development.

5. Analyze recommendation development, including specificity, actionability, prioritization, assignment to responsible actors, and links to implementation and monitoring.

6. Identify exemplary practices and opportunities to inform an evidence-informed, standardized reporting framework for the Canadian Obstetric Survey System (CanOSS).

Background Maternal mortality and severe maternal morbidity (SMM) are important indicators of health-system performance, maternity-care quality, and health equity. Maternal morbidity and

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mortality are not distributed evenly across the population. Indigenous, Black, racialized, immigrant and refugee, rural and remote, and other structurally marginalized populations may experience disproportionate risk.

The causes and circumstances of maternal morbidity and mortality vary across countries and health systems. Differences in maternal outcomes across high-income countries suggest that national wealth and access to skilled birth attendance alone do not ensure safe or equitable maternal care. Although epidemiologic surveillance quantifies incidence, distribution, causes, and trends, it cannot fully explain why an adverse outcome occurred, whether it was preventable, how contributing factors interacted, or what changes may prevent recurrence. Maternal mortality and morbidity review systems address this gap through detailed case review.

Several high-income countries have established confidential inquiry, maternal mortality review, and obstetric surveillance systems. The International Network of Obstetric Survey Systems (INOSS) supports multinational research on uncommon but serious pregnancy complications, while programs such as Mothers and Babies: Reducing Risk through Audits and Confidential Enquiries across the UK (MBRRACE-UK) combine population surveillance with confidential inquiries and recommendations for improving care.

The resulting reports produced by these systems can transform case-level findings into recommendations for clinicians, organizations, policymakers, patients, families, and communities. Their influence, however, depends on transparently describing their mandate, governance, case definitions, data sources, case-identification procedures, review methods, reviewer composition, approaches to determining preventability and contributing factors, and processes for developing recommendations. Reports also vary in their attention to equity, patient and family perspectives, implementation responsibility, and monitoring of previous recommendations.

The Canadian Obstetric Survey System (CanOSS) was established to complement epidemiologic surveillance by going "beyond the numbers" and examining the clinical, operational, provider-related, patient-related, social, and structural circumstances contributing to severe maternal morbidity and mortality. Guided by equity and evidence, and working across health systems and with patients, families, and communities, CanOSS seeks to understand why maternal morbidity and mortality are rising in Canada and why their burden disproportionately affects Indigenous and other structurally marginalized populations.

CanOSS seeks to contribute to a Learning Health System that integrates research, data analysis, lived experience, quality improvement, and clinical practice. Through rigorous case review, synthesis, reporting, and knowledge mobilization, CanOSS intends to generate actionable recommendations that can produce meaningful and sustained changes in policy and practice.

Rationale CanOSS will publish condition-specific reports arising from successive cycles, beginning with postpartum hemorrhage, followed by maternal sepsis. To support systematic, transparent, and reproducible report development, it is important to learn from the structures and methods used by established maternal review and obstetric surveillance systems internationally.

To the team's best knowledge, the literature does not report a similar study utilizing qualitative, deductive content analysis to examine and compare the methodological reporting approaches adopted by maternal morbidity and mortality reports published by Australia, Canada, Ireland, New Zealand, the United Kingdom, and the United States of America that may be relevant to CanOSS reporting, particularly regarding equity, patient and family engagement, recommendation development, implementation accountability, and impact monitoring. This review will therefore identify exemplary practices, methodological limitations, and opportunities for evolution.

This qualitative, deductive content analysis will examine published maternal mortality and SMM reports from these seven countries. It will explore the data sources used in each report, the analysis approaches, data synthesis methods, recommendation development, the reported writing process, how equity considerations were incorporated, and the reported implementation plans. The findings will inform the development of a standardized, transparent, equity-oriented, and reproducible reporting framework for CanOSS.

METHODS

Search strategy We searched the following sources:

Belgium

Belgian Obstetric Surveillance System (B.OSS)

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Australia

- Australian Institute of Health and Welfare (AIHW)

- Queensland Health

- New South Wales Health

- Western Australia Department of Health

New Zealand:

- Perinatal and Maternal Mortality Review Committee

- Maternal Morbidity Working Group

Canada

- Public Health Agency of Canada

- Government of Canada Publications

- Ontario Office of the Chief Coroner — Maternal and Perinatal Death Review Committee

- Ontario Government Publications

- Perinatal Services BC

- Society of Obstetricians and Gynaecologists of Canada (SOGC)

Ireland

- Maternal Death Enquiry Ireland

- National Perinatal Epidemiology Centre (NPEC)

- MBRRACE-UK — joint UK and Ireland confidential enquiries

United Kingdom

- MBRRACE-UK

- Healthcare Quality Improvement Partnership (HQIP)

United States

- Alaska Maternal and Child Death Review

- Arkansas Maternal Mortality Review Committee

- Idaho Maternal Mortality Review Committee

- Iowa Maternal Mortality Review Committee

- Kentucky Maternal Mortality Review Program

- Missouri Pregnancy-Associated Mortality Review Board

- Nevada Maternal Mortality Review Committee

- New Hampshire Maternal Mortality Review Committee

- New Mexico Maternal Mortality Review Committee

- North Carolina Maternal Mortality Review Committee

- North Dakota Maternal Mortality Review Committee

- Oklahoma Maternal Mortality Review Committee

- Oregon Maternal Mortality and Morbidity Review Committee

- Rhode Island Pregnancy and Postpartum Death Review Committee

- South Dakota Maternal Mortality Review Committee

- Utah Perinatal Mortality Review Program

- Vermont Maternal Mortality Review Panel

- Wisconsin Maternal Mortality Review Team

- Centers for Disease Control and Prevention (CDC)

- California Pregnancy-Associated Mortality Review

- California Pregnancy Mortality Surveillance System

- Maryland Maternal Health Innovation Program

- Michigan Maternal Mortality Surveillance Program

- Minnesota Maternal Mortality Review Committee

- Texas Maternal Mortality and Morbidity Review Committee

- Illinois Maternal Morbidity and Mortality Reports

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- Nebraska Maternal Mortality Review Committee

- Connecticut Maternal Mortality Review Committee

- New York Maternal Mortality Review Board

- New Jersey Maternal Mortality Review Committee

- Ohio Pregnancy-Associated Mortality Review

- Pennsylvania Maternal Mortality Review Committee

- Washington Maternal Mortality Review Panel

- Colorado Maternal Mortality Prevention Program

- Massachusetts Maternal Mortality and Morbidity Review

- Georgia Maternal Mortality Review Committee

- Tennessee Maternal Mortality Review

Eligibility criteria Inclusion criteria are defined using the population, concept, and context (PCC) framework.

Population: Reports will be included if they report on cases of maternal morbidity or mortality.
Concept: Eligible documents should present findings from a formal process for reviewing maternal deaths or severe maternal morbidity cases. This may include confidential inquiries, maternal mortality review committees, obstetric surveillance systems, clinical audits, confidential case reviews, or comparable national or subnational review mechanisms.
Context: Maternal mortality and morbidity reports from Belgium, Australia, Canada, Ireland, New Zealand, the United Kingdom, and the United States of America published on or after January 1, 2016, and up to October 31, 2026.

Exclusion criteria:
- Clinical guidelines, consensus statements, editorials, commentaries, conference abstracts, protocols, news articles, peer-reviewed journal articles, epidemiological studies, or advocacy materials.
- Reports that focus only on fetal, neonatal, or infant outcomes and do not report separable maternal findings.
- Reports that do not investigate the contextual circumstances or contributing factors surrounding maternal mortality or morbidity events, do not develop recommendations for improving maternal healthcare or preventing adverse maternal outcomes, or present statistical or descriptive findings only without examining underlying clinical, facility-level, provider-related, patient-related, social, or structural contributing factors.
- Reports published outside Belgium, Australia, Canada, Ireland, New Zealand, the United Kingdom, and the United States of America.

Data extraction Trained reviewers independently screened the reports for eligibility. All eligibility decisions and coding entries are reviewed by a second reviewer. Excluded reports are documented in an Excel log recording the report title, date of exclusion, and reason for exclusion.
Before initiating the coding process, SH and MK jointly conducted a calibration exercise using one report to establish consistency in coding and assess interrater agreement. Coding followed a deductive approach, with themes and codes informed from the WHO Maternal and Perinatal Death Surveillance and Response guidance and extended to address severe maternal morbidity, equity, patient and family involvement, and contextual considerations. The codebook will capture information related to reporting infrastructure, data sources, analysis approaches, synthesis of findings, recommendation development, report writing, equity considerations, and implementation and monitoring approaches.
For each code, reviewers will distinguish information that is described, mentioned without sufficient detail, explicitly absent, not reported, unclear, or not applicable. Relevant excerpts and page references will support coding decisions. A feature that is not reported will not be interpreted as evidence that it was not undertaken.

Outcome definitions The study will examine the following domains:
Reporting infrastructure: Steering committee, information collection, case selection for review, involved parties, and identification of monitoring approaches.
Data sources: Clinical records, community death notification, community verbal autopsy, vital statistics, administrative data, interviews, patient/family narratives, incident reviews, linkage methods, and triangulation.
Analysis approaches: Case review procedures, contributing-factor frameworks, qualitative/quantitative methods, multidisciplinary review, and analytical rigour.
Synthesis of findings: Integration of findings across cases, data sources, facilities, and populations,

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and identification of patterns and systemic factors.
Recommendation development: How findings informed recommendations, who developed them, identification of modifiable factors, evidence used and its reliability, prioritization, specificity, responsible actors, traceability to contributing factors, consensus processes, SMART criteria, and alternative frameworks.
Report writing process: Authorship, governance, drafting procedures, review and validation, stakeholder input, and dissemination.
Equity considerations: Disaggregated analyses, social and structural determinants, patient and community participation, cultural safety, equity-informed recommendations, confidentiality, anonymity, respect, and a no-blame approach.

Implementation and monitoring: Implementation responsibilities, timelines, resources, documented actions, uptake, monitoring indicators, and evidence of impact. Suggested future actions will be distinguished from formal implementation plans. Whether actions were implemented, monitored, or evaluated will be recorded separately.

Strategy of data synthesis / Statistical analysis
This study will use a qualitative, deductive content analysis approach. Proposed recommendations will be reviewed using SMART criteria.
Reports from the same reporting body or series will be compared across publication years. Editions with identical methodological and reporting approaches will be grouped as one analytical unit for those features, while retaining each report's publication details and documenting differences in findings or recommendations. Editions with major methodological or reporting differences will be analyzed separately. Grouping decisions and their rationale will be documented and reviewed by a second reviewer.
Tables will compare reporting systems and jurisdictions across the principal domains. Reviewers will identify common and divergent reporting practices, methodological strengths, recurrent omissions or weaknesses, innovative approaches, practices potentially transferable to Canada, and contextual factors that may limit transferability.
Equity analysis will examine acknowledgment of disparities, collection of equity-relevant information, stratified analysis, analysis of social and structural causes, involvement of affected populations, equity-specific recommendations, and assignment and monitoring of actions intended to reduce inequities.
Recommendations will be categorized by action level, stage of care, contributing factor targeted, specificity and measurability, responsible actor, implementation timeframe, equity orientation, and monitoring or accountability measures.
Exemplary practices will be identified when clearly described, methodologically credible, relevant to CanOSS, and supported by transparent links between findings, recommendations, and implementation mechanisms.

Countries involved Canada.

Other relevant information N/A.

Keywords Maternal mortality; severe maternal morbidity; qualitative deductive content analysis; reporting methods; equity; CanOSS.

Dissemination plans Findings will be disseminated through:

A peer-reviewed publication.

Presentations to CanOSS partners and participating institutions.

Conference presentations.

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