

INPLASY

Measuring Medication Safety Across The Health Care System: A Scoping Review

INPLASY202630028

doi: 10.37766/inplasy2026.3.0028

Received: 8 March 2026

Published: 8 March 2026

Pozzobon, L; Perfetto, K; Sheldrick, M; Duhn, L; Panagioti, M; Hibbert, P; Carson-Stevens, A; Sears, K.

Corresponding author:

Laura Pozzobon

laura.pozzobon@queensu.ca

Author Affiliation:

Queen's University.

ADMINISTRATIVE INFORMATION**Support** - NA.**Review Stage at time of this submission** - Formal screening of search results against eligibility criteria.**Conflicts of interest** - None declared.**INPLASY registration number:** INPLASY202630028**Amendments** - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 8 March 2026 and was last updated on 2 August 2026.**INTRODUCTION**

Review question / Objective To describe methods used to measure avoidable medication-related harm at various levels of the healthcare system (e.g., locally by health care facilities and services, nationally by governments, and globally), with a sub-focus on methods used to measure patient identified avoidable medication-related harm. For each method, we will map the classes of information captured to the 10 high level classes of the World Health Organization's (WHO) International Classification for Patient Safety (ICPS) (2009).

Background Avoidable medication-related harm continues to impact the outcomes of patients and healthcare systems globally (WHO, 2017). Previous researchers have demonstrated the global burden of medication related harm. However, there is great variation in the definitions and methods to capture and understand avoidable medication-related harms (Panagioti et al., 2024; WHO, 2017; 2021). To make coordinated, timely improvements to

medication safety, we must understand how medication-related harm is measured and reported at various levels of the healthcare system.

Rationale With this scoping review, we will contribute to global ambitions to address gaps on measuring medication safety. Further, this review is highly relevant as "Medication Without Harm" remains a global patient safety challenge (WHO, 2017). Additionally, the WHO (2021) Global Patient Safety Action Plan recognizes the need to learn from the experiences of patients and identify all potential sources of patient safety data across health care systems to develop a comprehensive understanding of safety, and strengthen synergies between data to support improvement.

METHODS

Strategy of data synthesis The proposed scoping review will be conducted in accordance with the JBI methodology for scoping reviews (JBI) manual for evidence synthesis, (2020). A preliminary literature search will be conducted in

MEDLINE, and a full search strategy developed and completed with a Health Sciences Librarian in MEDLINE, Embase, Epistemonikos, Health and Psychosocial Instruments (HaPI) and CINAHL. The reference list of all included sources of evidence will be screened for additional studies.

Eligibility criteria Epidemiological and observational studies, including longitudinal, prospective, and retrospective cohort studies, case-control studies, and analytical cross-sectional studies will be included. Descriptive observational study designs, including case series and descriptive cross-sectional studies for inclusion will also be included. However, individual case reports will be excluded. Mixed-method studies reporting on measures of avoidable medication-related harm (i.e., incidence, prevalence, and rate) will be included. The reference lists of studies that meet the inclusion criteria will also be reviewed. Qualitative studies, textual evidence, opinion papers, and grey literature will be excluded.

Studies published in any language since January 2010 meeting the inclusion criteria will be included. Specific inclusion and exclusion criteria have been developed in alignment with the Population Concept-Context framework.

Population: We will consider studies where avoidable medication-related harm is captured from patients, caregivers, family members, or health care workers, or organizations. No studies will be excluded based on population age, gender, or sex. Studies including non-human subjects will be excluded.

Concept: We will consider studies that measure avoidable medication-related harm. Medication-related harm is an outcome caused by medication if taken incorrectly, monitored insufficiently or as the result of an error, accident or communication problem by a health care/system worker or the patient themselves (WHO. 2019). Studies capturing other types of avoidable health care harms not related to medications will be excluded.

Context: This review will consider studies that measure avoidable medication-related harm during any stage of the medication-use process, at the national levels of governments/patient safety organizations, and primary, secondary, community and tertiary health care facilities and services. Studies capturing harm from clinical trials or that are specific to an unavoidable adverse drug reaction or disease or medication will be excluded.

Source of evidence screening and selection

Covidence will be used to manage references during the screening process. The data will be extracted from the included papers by two independent reviewers (LP and KP) by using the JBI SUMMARI System (JBI, Adelaide, Australia) (Munn et al., 2019). Extracted data will include: study setting (country and healthcare sector); participants and sample size; participant demographics; avoidable medication-related harm definition; method(s) to measure the harm; data source(s) for method(s); WHO (209) ICPS concept(s) measured; definition(s) of concept(s) measured; and stage(s) of medication-use process captured through measurement. The data extraction fields may evolve as the review progresses.

Language restriction No language restrictions.

Country(ies) involved Canada, United Kingdom, and Australia.

Keywords Medication Safety; Patient Safety; Medication Errors.

Contributions of each author

Author 1 - Laura Pozzobon.

Email: laura.pozzobon@queensu.ca

Author 2 - Kayley Perfetto.

Email: kayley.perfetto@queensu.ca

Author 3 - Melissa Sheldrick.

Email: melissa.sheldrick@ismpcanada.ca

Author 4 - Lenora Duhn.

Email: duhnl@queensu.ca

Author 5 - Maria Panagioti.

Email: maria.panagioti@manchester.ac.uk

Author 6 - Peter Hibbert.

Email: peter.hibbert@mq.edu.au

Author 7 - Andrew Carson-Stevens.

Email: carson-stevensap@cardiff.ac.uk

Author 8 - Kim Sears.

Email: searsk@queensu.ca

References

JBI. (n.d.). Resources. <https://jbi.global/scoping-review-network/resources>. JBI manual for evidence synthesis. (2020). (E. Aromataris & Z. Munn, Eds.).

Lash, T. L., & O'Rotham, K. J. (2021). Chapter 4: Measures of Occurrence. In Timothy L. Lash, Tyler J. VanderWeele, Sebastien Haneuse, & Kenneth J. Rothman (Eds.), *Modern epidemiology* (4th ed.). Philadelphia.

Munn, Z., Aromataris, E., Tufanaru, C., Stern, C., Porritt, K., Farrow, J., Lockwood, C., Stephenson,

M., Moola, S., Lizarondo, L., McArthur, A., Peters, M., Pearson, A., & Jordan, Z. (2019). The development of software to support multiple systematic review types: the Joanna Briggs Institute System for the unified management, assessment and review of Information (JBI SUMARI). *International Journal of Evidence-Based Healthcare*, 17(1), 36-43. <https://doi.org/https://doi.org/10.1097/XEB.0000000000000152>

Nabhan, M., Elraiyah, T., Brown, D. R., GDilling, J., LeBlanc, A., Montori, V. M., Morgenthaler, T., Naessens, J., Prokop, L., Roger, V., Swensen, S., Thompson, R. L., & Murad, H. (2012). What is preventable harm in healthcare? A systematic review of definitions. *BMC Health Services Research*, 12(128). <https://doi.org/http://www.biomedcentral.com/1472-6963/12/128>

National Coordinating Council for Medication Error Reporting and Prevention. (1998). NCC MERP taxonomy of medication errors. <http://www.nccmerp.org/sites/default/files/taxonomy2001-07-31.pdf>

Panagioti, M., Hodkinson, A., Planner, C., Dhinger, N., & Gupta, N. (2024). Global burden of preventable medication-related harm in health care. A systematic review. <https://iris.who.int/bitstream/handle/10665/376203/9789240088887-eng.pdf?sequence=1>

World Health Organization. (2009). Conceptual framework for the international classification for patient safety. Version 1.1. Final technical report. https://apps.who.int/iris/bitstream/handle/10665/70882/WHO_IER_PSP_2010.2_eng.pdf

World Health Organization. (2017). Medication without harm. WHO global patient safety challenge. <https://www.who.int/publications/i/item/WHO-HIS-SDS-2017.6>

World Health Organization. (2020). Patient safety incident reporting and learning systems. Technical report and guidance. <https://www.who.int/publications/i/item/9789240010338>

World Health Organization. (2021). Global patient safety action plan 2021-2030. Towards eliminating avoidable harm in health care. <https://www.who.int/teams/integrated-health-services/patient-safety/policy/global-patient-safety-action-plan>