

STUDY PROTOCOL

Open Access



# Global perspectives in acute and emergency general surgery in low and middle-income countries: a WSES project protocol for scoping review on global surgery

Mahmoud Daa Hindawi<sup>1,2</sup> , Arda Isik<sup>3</sup> , Fausto Rosa<sup>4</sup> , Diego Visconti<sup>5</sup> , Taras Nechay<sup>6</sup> , Sharfuddin Chowdhury<sup>7,8</sup> , Abdourahmane Ndong<sup>9</sup> , Tushar S. Mishra<sup>10</sup> , Stefano Piero Bernardo Cioffi<sup>11</sup> , Francesco Piscioneri<sup>12</sup>  and Edward C.T.H. Tan<sup>13\*</sup> 

## Abstract

**Background** Around five billion people globally lack access to safe, timely, and affordable surgical facilities and care in low-income and middle-income countries (LMICs). Global initiatives have been launched, including efforts led by organizations. Also, regional efforts have shed light on the unique challenges faced by different areas within LMICs. Despite these efforts, many countries still face significant challenges, including inadequate infrastructure, limited availability of trained surgical personnel, lack of essential medical equipment, and insufficient financial resources allocated to healthcare and their related possible factors. Here is that we aim to identify the progress made in areas such as capacity building, training programs, infrastructure development, and policy reforms, as well as highlight the gaps that persist, providing a foundation for future research. Such a comprehensive scoping review will be crucial to enhance surgical care services and ultimately improve health outcomes in LMICs.

**Methods** A comprehensive literature search up to November 2024 will be conducted across six major databases. PubMed, Scopus, Ovid, Web of Science, Cochrane Central, CNKI (China National Knowledge Infrastructure) database. The methodology will follow the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) Checklist. The first version of this project will not include a quality appraisal.

### \*Correspondence:

Edward C.T.H. Tan

Edward.tan@radboudumc.nl

<sup>1</sup>Faculty of Medicine, Al-Azhar University, Cairo, Egypt

<sup>2</sup>Medical Research Group of Egypt, Negida Academy, Arlington, MA, USA

<sup>3</sup>Istanbul Medeniyet University, Istanbul, Turkey

<sup>4</sup>Emergency and Trauma Surgery, Fondazione Policlinico Universitario "A.

Gemelli" IRCCS, Università Cattolica del Sacro Cuore, Rome, Italy

<sup>5</sup>Chirurgia Generale d'Urgenza e PS - AOU Città della Salute e della Scienza, Turin, Italy

<sup>6</sup>Pirogov Russian National Research Medical University, Moscow, Russia

<sup>7</sup>Trauma Center, King Saud Medical City, Riyadh, Saudi Arabia

<sup>8</sup>School of Health Professions, University of Alabama at Birmingham, Birmingham, AL, USA

<sup>9</sup>Department of Surgery, Gaston Berger University, Saint-Louis, Senegal

<sup>10</sup>Department of Surgery, All India Institute of Medical Sciences, Bhubaneswar, India

<sup>11</sup>General Surgery - Trauma Team, ASST GOM Niguarda Milan, Milan, Italy

<sup>12</sup>Division of Surgery, Canberra Health Services, Canberra, ACT, Australia

<sup>13</sup>Department of Surgery, Radboud University Medical Center, Nijmegen, The Netherlands



© The Author(s) 2025. **Open Access** This article is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License, which permits any non-commercial use, sharing, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if you modified the licensed material. You do not have permission under this licence to share adapted material derived from this article or parts of it. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit <http://creativecommons.org/licenses/by-nc-nd/4.0/>.

## Background

Acute surgical care in low-income and middle-income countries (LMICs) has stagnated or deteriorated [1]. Globally, around five billion people lack access to safe, timely, and affordable surgical facilities and care [1, 2]. Recognizing the critical nature of this issue, global initiatives have been launched to address the deficiencies in surgical care within LMICs. Global initiatives have been launched, including efforts led by organizations such as the World Health Organization (WHO) and the World Federation of Societies of Anesthesiologists (WFSA), aiming to develop frameworks for capacity building and health education to address these critical gaps in LMICs [3–5].

Also, regional efforts have been conducted to highlight and investigate the issue by shedding light on the unique challenges faced by different areas within LMICs, such as limited resources, inadequate training programs, and insufficient policy support hinder progress [6, 7].

Despite these efforts, many countries still face significant challenges in scaling up their surgical systems to meet the growing burden of acute surgical conditions [7, 8]. Persistent challenges include inadequate infrastructure, limited availability of trained surgical personnel, lack of essential medical equipment, and insufficient financial resources allocated to healthcare [9–11]. Additionally, factors such as political instability, socioeconomic disparities, and logistical hurdles in rural and remote areas further exacerbate the difficulty in providing adequate surgical services.

The main objective for this proposed scoping review is to evaluate all literature related to acute surgical care and emergency surgery, in developing countries and resource-limited countries. By comprehensively mapping the current state of knowledge, the review aims to identify the progress made in areas such as capacity building, training programs, infrastructure development, and policy reforms. It will also highlight the gaps that persist, providing a foundation for future research. This scoping review is crucial for informing policymakers, healthcare practitioners, and international organizations as they develop targeted strategies to enhance surgical care services and ultimately improve health outcomes in LMICs.

## Methodology

### Scoping review

This protocol is designed to make a systematic map and evaluate the existing literature on acute surgical capacity and care in developing and resource-limited countries. The review will focus on key areas such as capacity building, including training programs for healthcare workers, infrastructure development, health education, and policy frameworks aimed at improving acute and emergency surgical care in LMICs.

### Scoping review framework

The methodology will follow the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) Checklist [12]. The review will adhere to the following five steps: (i) identifying the research question, (ii) identifying relevant studies, (iii) selecting eligible studies, (iv) collating and summarizing the results. This review does not include a quality appraisal, as its main goal is to map out all research activities in this field. This structured approach ensures a comprehensive and transparent review, allowing for the identification of research gaps and informing future studies.

### Research question

The central research question guiding this scoping review is:

What are the existing global strategies, gaps, and initiatives in capacity building, training programs, infrastructure development, health education, and policy frameworks aimed at improving acute and emergency surgical care in low- and middle-income countries?

### Eligibility criteria

The keywords for inclusion will be: Global Surgery, Acute Care Surgery, Emergency General Surgery, Capacity building, Training Programs Infrastructure development, and Health Education.

The keywords for exclusion will be: Non-surgical, Otolaryngology and Facial Plastic Surgery, ENT, Eye surgery, Case reports, Experimental studies, Personal views/letters to editors, and conference abstracts.

### Search strategy

A comprehensive literature search up to November 2024 will be conducted across six major databases to ensure a wide capture of relevant studies:

PubMed, Scopus, Ovid, Web of Science, Cochrane Central, CNKI (China National Knowledge Infrastructure) database.

### Search terms and MeSH headings

The search terms will be adapted for each database, considering their specific indexing systems. The core search terms include:

- **Population Terms:** “Low and middle income countries,” “Developing countries,” “Low resource setting,” “Resource-limited settings”.
- **Intervention Terms:** “Global Surgery,” “Acute Care Surgery,” “Emergency General Surgery,” “Surgical capacity,” “Capacity building,” “Training programs,” “Infrastructure development,” “Health education,” “Policy reforms”.

**Table 1** Shows the search strategy that will be used for each specific database up to November 26, 2024

Databases	Search Strategy for Each Database
PubMed Ovid (MEDLINE) Cochrane (CENTRAL) Web of Science	(Low and middle income countries OR Low and middle-income countries OR middle income countries OR Low resource setting OR limited-resource setting OR LMICs OR LMICS OR Poor OR Low-income OR Low income OR Middle income OR Middle-income) AND (Global Surgery OR Global OR Globally OR World) AND ((Acute Care OR Critical Care OR Emergency) AND General AND Surgery) AND (capacity building OR training programs OR infrastructure development OR health education OR infrastructure OR capacity)
Scopus	("Low and middle income countries" OR "Low and middle-income countries" OR "middle income countries" OR "Low resource setting" OR "limited-resource setting" OR "LMICs" OR "LMICS" OR "Poor" OR "Low-income" OR "Low income" OR "Middle income" OR "Middle-income") AND ("Global Surgery" OR "Global" OR "Globally" OR "World") AND ("Acute Care" OR "Critical Care" OR "Emergency") AND "General" AND "Surgery") AND ("capacity building" OR "training programs" OR "infrastructure development" OR "health education" OR "infrastructure" OR "capacity")
CNKI	(Low and middle-income countries OR middle income countries OR Low resource setting OR limited-resource setting) AND (Global Surgery OR surgical capacity) AND (Acute Care Surgery OR Emergency General Surgery) AND (capacity building OR training programs OR infrastructure development OR health education)

The specific search strategy for each database is presented in Table 1.

### Study selection process

- **Title and Abstract Screening:** The initial screening will be conducted using Rayyan, a web-based tool designed for systematic reviews [10]. Two independent reviewers will screen the titles and abstracts against the inclusion and exclusion criteria.
- **Full-Text Screening:** will be conducted using excel spreadsheets. Additionally, every step will be divided into four sections and each section will be parallelly assigned to two authors. Further, any conflicts thus arising will be addressed by a third one.

Regular meetings will be held to discuss any conflicts or uncertainties in the selection process. A third reviewer will adjudicate unresolved disagreements.

### PRISMA flow diagram

A PRISMA flow diagram will illustrate the study selection process, including the number of records identified, duplicates removed, records screened, full-text articles assessed for eligibility, and studies included in the final review.

### Addressing the structure of the review

The final report will be structured as follows: an introduction, methods, results presenting descriptions of included studies, thematic findings, and visual representations like charts and frameworks if found as the main goal is to highlight all topic gaps, discuss and interpret the findings, discussing implications for practice and policy, and identifying research gaps; and a conclusion summarizing key insights with recommendations for future research.

### Discussion and future review perspectives

The proposed scoping review aims to highlight global concerns about capacity building, training programs, infrastructure development, and policy and health education in acute care surgery and emergency general surgery in LMICs. This protocol is the basis for all versions of this project and the mentioned methodology review will be the first part of the WSES global surgery project that will overview and highlight the gaps for health professionals in acute care surgery in LMICs. The strength of this review is that it will comprehensively collect all published studies in six databases involving widely different regions. We expect that we will continue further versions of this project acquiring specific issues after categorizing it first in this first part. The limitation of this first version is it will not consider the quality of the included studies and further the studies' related data or details. We expect to do this in future versions.

### Acknowledgements

N/A.

### Author contributions

Mahmoud Diaa Hindawi prepared the protocol and Edward Tan reviewed it. All authors read and approved the protocol manuscript.

### Funding

Not applicable.

### Data availability

No datasets were generated or analysed during the current study.

### Declarations

#### Ethics approval

Not applicable.

#### Conflict of interest

The authors declare that there is no conflict of interest regarding the publication of this article.

#### Registration, ethics, and dissemination

We don't need ethics approval to conduct the review. We'll share our findings with the scientific community through peer-reviewed publications and academic presentations. We have registered the basic version for this project with Open Science Framework (<https://osf.io/8ehqf>).

Received: 28 November 2024 / Accepted: 6 January 2025

Published online: 10 January 2025

## References

1. Meara JG, et al. Global surgery 2030: evidence and solutions for achieving health, welfare, and economic development. *Int J Obstet Anesth*. Feb. 2016;25:75–8. <https://doi.org/10.1016/j.ijoa.2015.09.006>.
2. Shrimo MG, Bickler SW, Alkire BC, Mock C. Global burden of surgical disease: an estimation from the provider perspective. *Lancet Glob. Health*, vol. 3 Suppl 2, pp. S8–9, Apr. 2015. [https://doi.org/10.1016/S2214-109X\(14\)70384-5](https://doi.org/10.1016/S2214-109X(14)70384-5)
3. Naal H, Koussa ME, El Hamouch M, Hneiny L, Saleh S. A systematic review of global health capacity building initiatives in low-to middle-income countries in the Middle East and North Africa region. *Global Health*. Jul. 2020;16(1):56. <https://doi.org/10.1186/s12992-020-00585-0>.
4. Kucchal T, Pigeolet M, Rolle M, Johnson WD, Park KB. International organisations in global surgery: challenges and opportunities. *J. Public Health Emerg.*, vol. 4, pp. 35–35, Dec. 2020. <https://doi.org/10.21037/jphe-2020-gs-10>
5. Bickler SW, Spiegel D. Improving surgical care in low- and middle-income countries: a pivotal role for the World Health Organization. *World J. Surg.*, vol. 34, no. 3, pp. 386–390, Mar. 2010. <https://doi.org/10.1007/s00268-009-0273-2>
6. Binda C, Zivkovic I, Duffy D, Blair G, Baird R. Evaluation of Interventions Addressing Timely Access to Surgical Care in Low-Income and Low-Middle-Income Countries as Outlined by the LANCET Commission 2030 Global Surgery Goals: A Systematic Review. *World J. Surg.*, vol. 45, no. 8, pp. 2386–2397, Aug. 2021. <https://doi.org/10.1007/s00268-021-06152-x>
7. Bath M, Bashford T, Fitzgerald JE. What is 'global surgery'? Defining the multidisciplinary interface between surgery, anaesthesia and public health. *BMJ Glob Health*, vol. 4, no. 5, p. e001808, Oct. 2019. <https://doi.org/10.1136/bmjgh-2019-001808>
8. Isik A, Rasa K, Sartelli M. Surgical care in refugee populations: addressing the unmet needs and overcoming challenges. *Impact Surgery*, vol. 1, no. 5, pp. 165–167, Sep. 2024. <https://doi.org/10.62463/surgery.93>
9. Aderinto N, Olatunji G, Kokori E, Abdulrahmon MA, Akinmeji A, Fatoye JO. Expanding surgical access in Africa through improved health insurance schemes: a review. *Med (Baltim)*. Mar. 2024;103(11):e37488. <https://doi.org/10.1097/MD.00000000000037488>.
10. Bickler SN, et al. Global burden of surgical conditions. In: Debas HT, Donkor P, Gawande A, Jamison DT, Kruk ME, Mock CN, editors. *Essential surgery: disease control priorities, third edition (volume 1)*. Washington (DC): The International Bank for Reconstruction and Development / The World Bank; 2015.
11. Pedro KM, Alvi MA, Fehlings MG. Obstacles in 'Time to spine': challenges for the timely delivery of Acute Surgical Care for patients with traumatic and non-traumatic spinal cord Injury. *Healthcare*. Nov. 2024;12(22):2222. <https://doi.org/10.3390/healthcare12222222>.
12. Tricco AC, et al. PRISMA Extension for scoping reviews (PRISMA-ScR): checklist and explanation. *Ann Intern Med*. Oct. 2018;169:467–73. <https://doi.org/10.7326/M18-0850>.

## Publisher's note

Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.