

SAGES 2026 Disparities in access to and outcomes of minimally invasive surgery: A scoping review

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Objective of the study

- Minimally invasive surgery (MIS) is associated with improved clinical outcomes compared to open surgery for various procedures.
- Despite growing adoption of minimally invasive surgery (MIS), disparities in access to MIS persist.
- We answered the following research questions:
 - 1) What patient populations experience inequities in access to MIS?
 - 2) What outcomes of MIS are linked to disparities across sociodemographic measures?

Methods and procedures

- We searched PubMed and Scopus for English-language peer-reviewed literature from January 1, 2020, to October 28, 2024, investigating access to and outcomes of MIS in equity-seeking populations—groups historically or systemically denied equal access to healthcare, employment, education, and other opportunities.
- Inclusion criteria: patients ≥18 years in the United States
- MIS defined as soft tissue procedures performed using laparoscopy, video-assisted thoracoscopic surgery (VATS), and/or robotic-assisted surgery (RAS).
- Title/abstracts and full texts were independently screened by two reviewers using Laser AI, with conflicts resolved by consensus. Study characteristics (design, disparity measures, and outcome measures) and both clinical and non-clinical outcomes were extracted from included articles using Microsoft Excel.
- The disparity domains examined in each study were then categorized by surgical specialty. Their distribution across specialties was summarized and visualized in a bubble plot to highlight patterns and trends across studies. This protocol is registered on OSF Registries.

Protocol



Results

Figure 1. PRISMA Flow Diagram for Scoping Review

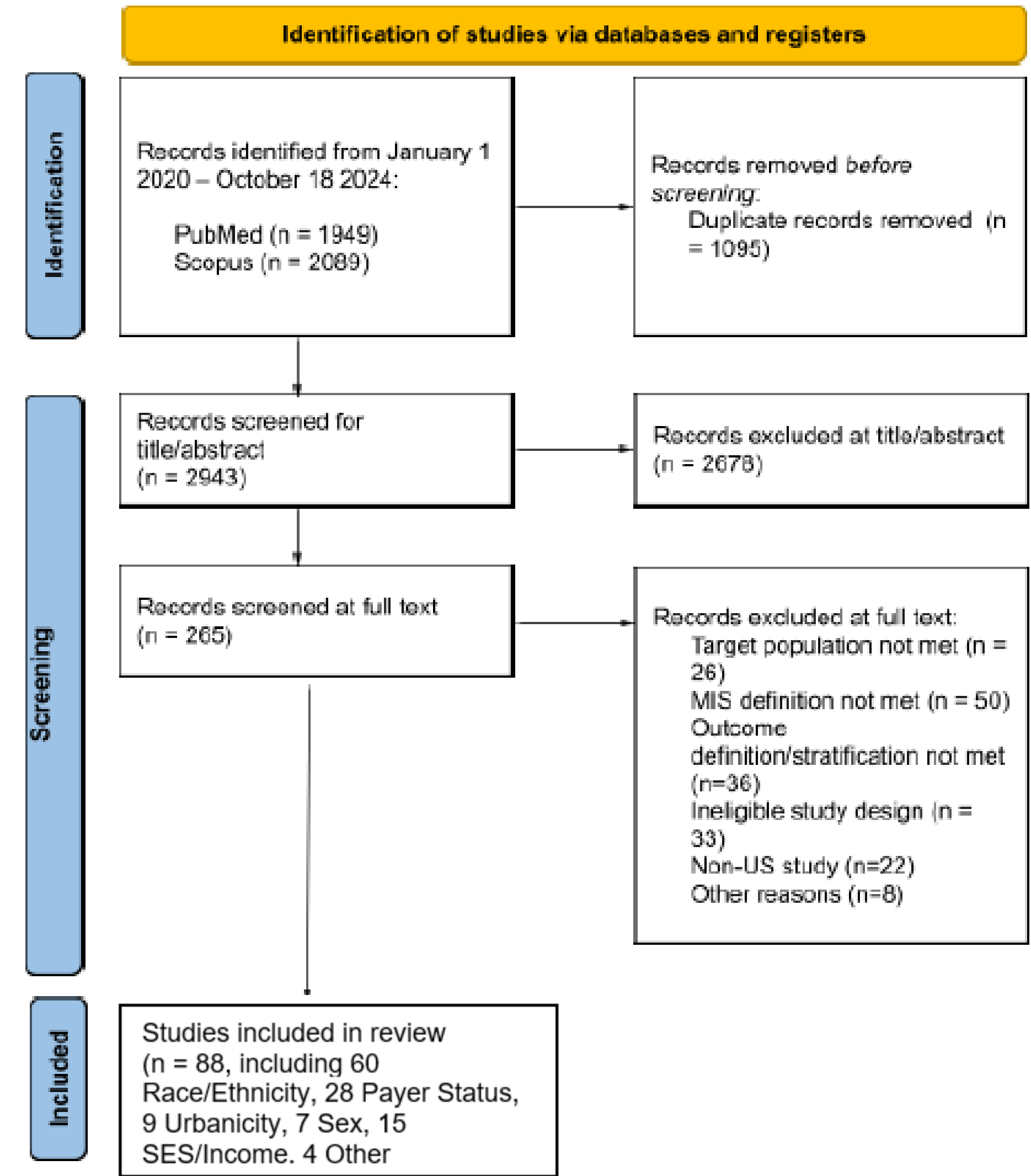
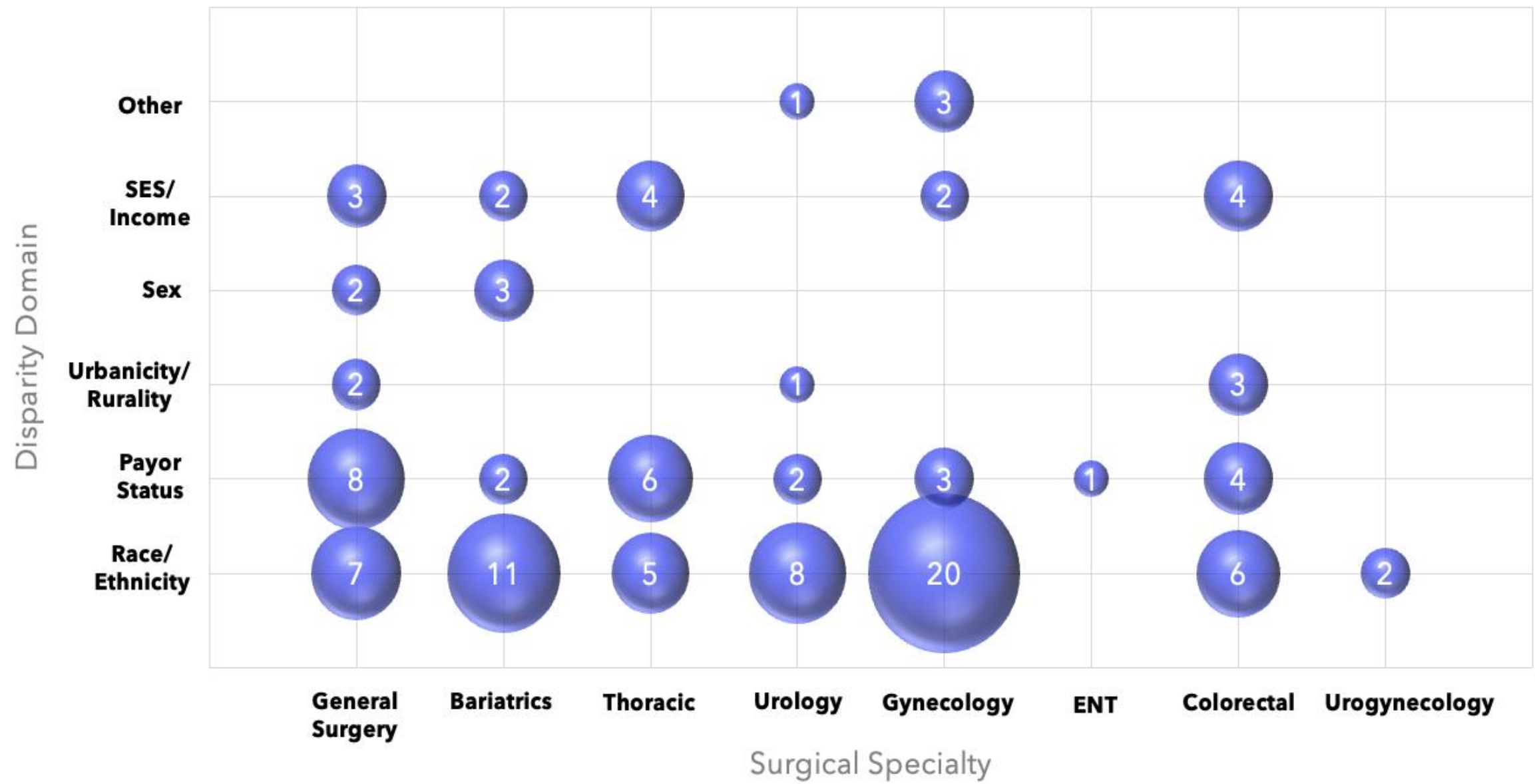


Figure 2. Distribution of Disparity Domains Across Surgical Subspecialty



Results

- After title/abstract screening for 2,943 references, 265 met eligibility criteria for full text screening, and 88 were included in the review.
- The included studies comprised of 11,647,821 patients, with a median of 22,349 patients per study.
- Lower odds of MIS was reported among patients who were: Black, Hispanic or Native American, uninsured or on Medicaid, from lower socioeconomic status (SES), and those living in rural locations.
- Surgical specialties represented included general surgery (n=41), cardiothoracic (n=11), gynecology (n=24), urology (n=9), ENT (n=1), and surgical oncology (n=2).
- Disparity domains investigated across studies, in descending order, included Race/Ethnicity, Payor status, SES/Income, Urbanicity/Rurality, Sex, and Other (e.g., language) (Figure 1).

Conclusions based on the results

- While a growing body of literature on disparities in MIS exists, it remains concentrated in a few specialties narrowly focused on single domains of disparity.
- Further research is needed to standardize disparity-domain definitions, investigate intersectionality, and link MIS access differences to risk-adjusted clinical and patient-reported outcomes across specialties.
- Finally, incorporating global perspectives will be essential for a more comprehensive understanding of MIS disparities.

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