

# The Rise of Database-Driven Research in Plastic and Reconstructive Surgery



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**INTRODUCTION**

In recent years, there has been a noticeable increase in the use of large national databases in plastic surgery research. This pattern may be associated with the transition of the United States Medical Licensing Examination (USMLE) Step 1 to pass/fail scoring, which has placed greater emphasis on research productivity during medical school.<sup>1,2</sup> The availability of easily accessible, high-powered, de-identified data may offer valuable research opportunities for medical students, particularly those without home plastic surgery programs.<sup>3</sup> However, this trend also warrants caution, as the growing volume of database-driven studies raises concerns about overall research quality and the potential for redundancy or overlap in the literature.<sup>4,5</sup>

**PURPOSE**

To identify and quantify trends in database-driven research within plastic surgery, evaluate medical student authorship patterns, and characterize the overall landscape of these studies.

**METHODS**

A systematic review was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 guidelines.<sup>6</sup> A comprehensive search of PubMed, Embase, and Web of Science was performed for studies published between 2020 and 2024. Eligible studies were those that utilized United States (US)-based national databases or insurance claims registries reporting surgical outcomes after plastic surgery. Studies were excluded if they were unrelated to plastic surgery or used non-US, state-level, single-institution, or non-healthcare-related databases. Title, abstract, and full-text screening were conducted independently by two reviewers, with discrepancies resolved by a third reviewer. Extracted data included first authorship and medical student status, institutional affiliation, journal of publication, plastic surgery subspecialty, and general study topic. Linear regression analysis was used to assess trends in publication volume over time.

**RESULTS**

**Overall Landscape**

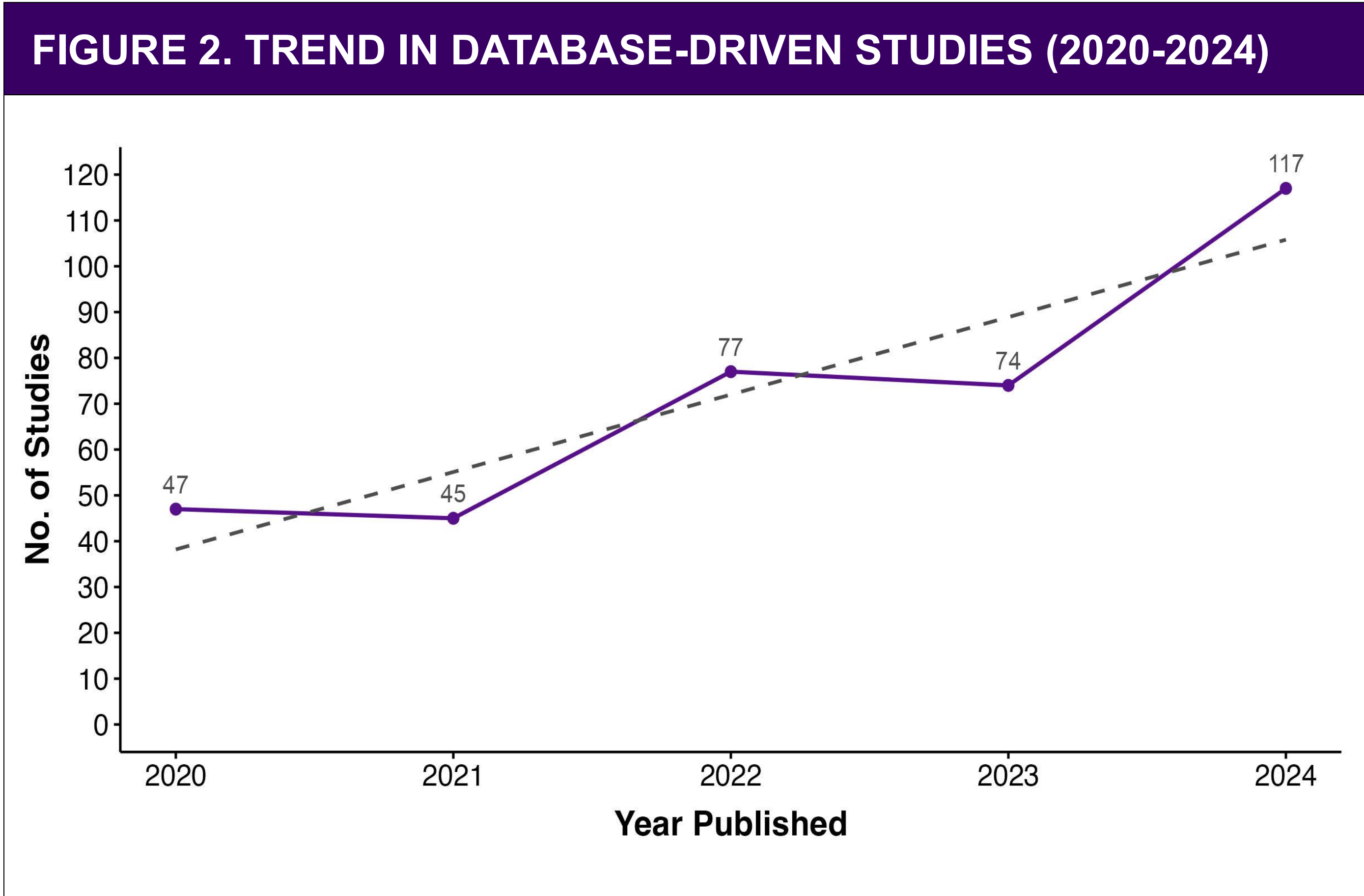
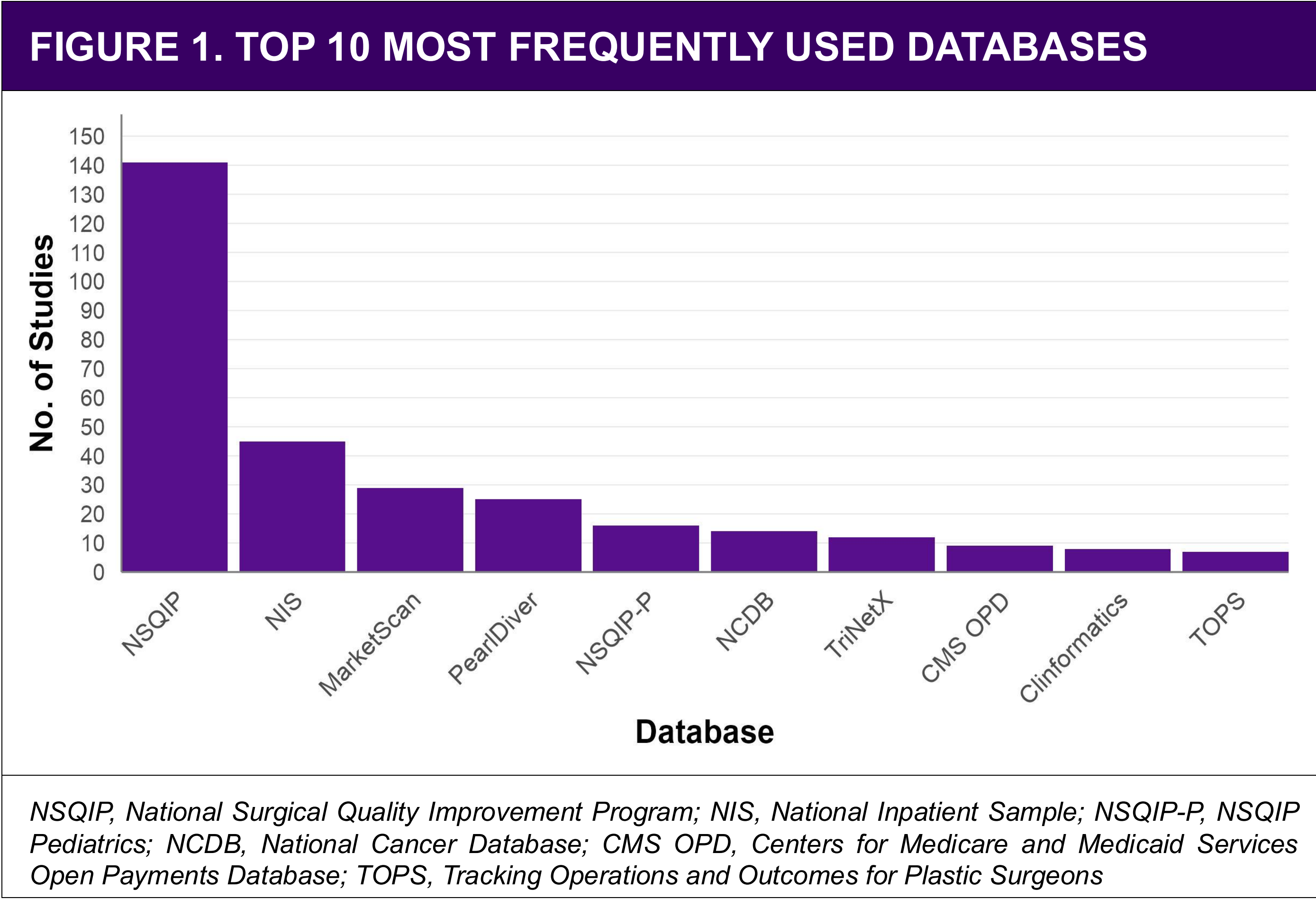
- 360 studies included
- 373 total database uses across 49 unique databases
  - Top 10 most frequently used databases shown in **Figure 1**.
    - NSQIP was the most common (n = 141, 37.8%)
    - Only six studies (1.61%) used the plastic surgery dedicated database, Tracking Operations and Outcomes for Plastic Surgeons (TOPS)
- The most common journal was *Annals of Plastic Surgery* (n = 44, 12.2%)
- Breast surgery was the most researched subspecialty (n = 134, 37.2%)

**Medical Student Involvement**

- First authors for 43.6% (n = 157) of studies
- Of these, 24.8% (n = 39) had no home integrated or independent plastic surgery program

**Trends Over Time from 2020 to 2024**

- Total database publications increased significantly ( $R^2 = 0.83$ ,  $p = 0.03$ ) seen in **Figure 2**
- Medical student first authorship increased significantly ( $R^2 = 0.96$ ,  $p = 0.004$ )
- Total publications by medical students without home programs increased significantly ( $R^2 = 0.76$ ,  $p = 0.05$ )



**CONCLUSIONS**

- Database-driven publications in plastic surgery have increased significantly from 2020 to 2024
- Medical student first authorship has risen in parallel with this trend
- There has been a significant increase in publications by medical students without home plastic surgery programs
- The American College of Surgeons (ACS) NSQIP database was the most frequently utilized
- The TOPS database, despite being plastic surgery-specific, was markedly underutilized
- These findings support the observed rise in database-driven research
- Further research should explore the underlying drivers of this trend and its implications for research quality and redundancy.

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