

# Sociodemographic Indices in Head and Neck Cancer: A Scoping Review

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## Background

- Community deprivation is increasingly recognized as an important factor shaping health outcomes in head and neck cancer (HNC).<sup>1-4</sup>
- Neighborhood disadvantage can influence patient access to specialty care, continuity of treatment, ability to navigate complex cancer therapies, and long-term survivorship.<sup>5-6</sup>
- Geographic-based sociodemographic indices (SDI)** aggregate relevant SDOH measures into composite measures of area-level disadvantage and have **gained popularity in SDOH research** among many clinical subspecialties, including **otolaryngology**.<sup>7-8</sup>
- Despite growing SDI use in HNC research, there is no consensus on which indices should be used, what SDOH factors they capture, or how methodological differences may affect findings.**

## Objectives

The purpose of this scoping review is to **systematically examine the use of SDI in head and neck research**. We aim to describe the indices used, the factors they incorporate, the cancer sites and populations studied, the methodologies employed, and the limitations and gaps in the literature.

## Methods

- This scoping review was conducted using PRISMA-ScR guidelines.
- Studies were included if they met the following criteria:
  - Population of **patients with HNC**, including malignancies of the oropharynx, hypopharynx, larynx, nasopharynx, salivary glands, paranasal sinuses, thyroid, or parathyroid
  - Conducted in the **United States**
  - Geographically-based SDI**
  - Reported **original, peer-reviewed data**
  - Sample size of **at least 50 patients**
- Databases were searched from June 2024. The full search strategy is available in **Figure 1**.
- Data collection included: title, authors, year of publication, study design, study years, location, setting, sample size, demographics, tumor site, AJCC clinical staging, primary and secondary outcomes, SDI(s) utilized, SDI construct, source, and operationalization, primary and secondary outcome results, findings related to SDI, and study reported limitations
- A **descriptive synthesis** was conducted to compare SDI types, constructs, outcomes analyzed, and methodological approaches

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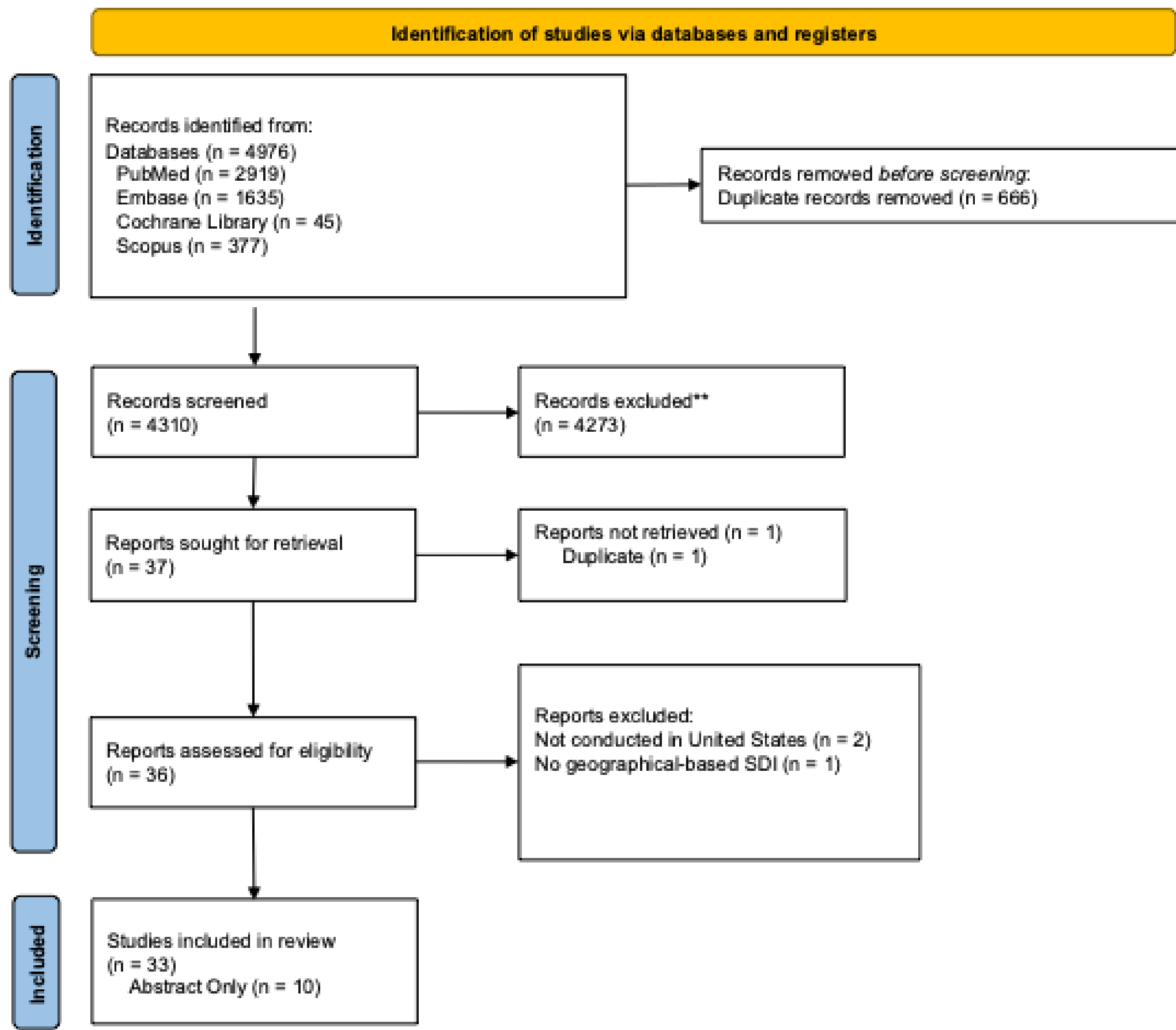


Figure 1. Scoping review search strategy

Study Characteristic		N (%)
Study Design	National Retrospective Database Study	17 (53.1)
	Retrospective Cohort	12 (37.5)
	Cross-sectional	3 (9.4)
	Study Years	
Study Years	2010-2015	2 (6.3)
	2016-2020	2 (6.3)
	2021-2022	7 (21.9)
	2023-2024	21 (65.6)
Study Location	National	17 (53.1)
	Midwest	7 (21.9)
	South	3 (9.4)
	Pacific	2 (6.3)
	Northeast	1 (3.1)
	Midwest, South	1 (3.1)
	West	1 (3.1)
Study Setting	Southwest	0 (0)
	National Database	17 (53.1)
Sample Size	Academic Medical Center	15 (46.9)
	0-500	5 (15.6)
	501-1000	8 (25)
	1000-10000	1 (3.1)
	10000-50000	8 (25)
	50000+	8 (25)
	Not Available	2 (6.3)

Study Characteristic (cont.)		N (%)
Demographics Reported	Age	22 (68.8)
	Gender	24 (75)
	Race	24 (75)
	Ethnicity	15 (46.9)
	Unavailable	8 (25)
Clinical Staging	AJCC	15 (46.9)
	SEER Summary Stage	1 (3.1)
	ICD Grade	1 (3.1)
Tumor Site	Unavailable	13 (40.6)
	Not Applicable	2 (6.3)
	Oral Cavity	9 (28.1)
	Oropharynx	10 (31.3)
	Nasopharynx	3 (9.4)
	Sinonasal	3 (9.4)
	Larynx	6 (18.8)
	Hypopharynx	3 (9.4)
	Salivary Glands	4 (12.5)
	Thyroid	3 (9.4)
	Vestibular Schwannoma	1 (3.1)
	Not available/applicable	10 (31.3)

Table 1. Study and sample characteristics

## Results

- See **Table 1** and **Table 2** for full results.
- 87.5% of included studies were published in 2020 or later
- The most frequently studied primary outcomes were **survival, surveillance period, and treatment choice**.
- The most used SDIs were **Area Deprivation Index (ADI)** and **Social Vulnerability Index (SVI)**
- 29 (90.6%) of the included studies, including 100% of SVI studies (n=10) and 75% of ADI studies (n=9), had a **significant association between worse primary outcomes and greater deprivation**
- Common limitations among the studies included inability to control for individual level socioeconomic factors, reliance on retrospective datasets, and lack of standardization in how indices were defined or applied

Study Characteristic		N (%)
Primary Outcome*	Survival	13 (40.6)
	Overall	12 (37.5)
	Cancer Specific Survival	4 (12.5)
	Surveillance Period	9 (28.1)
	Treatment Choice	9 (28.1)
	Tumor Characteristics at Presentation	7 (21.9)
	Incidence	4 (12.5)
	Delay in Treatment	3 (9.4)
	Patient Reported Outcomes	2 (6.3)
	Symptom Burden	2 (6.3)
SDI(s) Utilized	Quality of Life	1 (3.1)
	Mortality	2 (6.3)
	All Cause	1 (3.1)
	Disease Specific	2 (6.3)
	Care Fragmentation	2 (6.3)
	Vaccination Rates	1 (3.1)
	30-Day Readmission	1 (3.1)
	Postoperative Recovery	1 (3.1)
	Area Deprivation Index (ADI)*	12 (37.5)
	Social Vulnerability Index (SVI)**	10 (31.3)
SDI Operationalization	Yost index	3 (9.4)
	Digital Inequity Index (DII)	1 (3.1)
	Housing-based Index of Socioeconomic Status (HOUSES)	1 (3.1)
	Social Deprivation Index (SDI)	1 (3.1)
	U.S. State Tobacco Control Initial Outcomes Index (IOI)	1 (3.1)
	Area Deprivation Index (ADI) and Social Vulnerability Index (SVI)	1 (3.1)
	Other	2 (6.3)
	Continuous Scale	18 (56.3)
	Dichotomized	3 (9.4)
	Tertiles	3 (9.4)
	Continuous and Quartiles	3 (9.4)
	Quintiles	2 (6.3)
	Continuous and Deciles	2 (6.3)
	Quartiles	1 (3.1)

Table 2. Primary study outcomes and SDI utilization

**\*ADI** - created to identify how neighborhood-level socioeconomic conditions affect health and contribute to disparities; assesses variables of education, income, housing (home value, rent, housing unit composition), unemployment, poverty

**\*\*SVI** - created to inform emergency response planning for public officials; assesses variables of age, language, housing (crowding, group, mobile), disability status, unemployment, poverty, income, education, vehicle access

## Conclusions

- SDIs are increasingly used** to examine disparities HNC outcomes, yet they have **inconsistent application** across **study design, index selection and operationalization, and reporting practices**
- Majority of studies were **retrospective national database studies** that had **variable reporting** of key clinical elements with a focus on **survival and surveillance period**.
- Important **gaps** include **geographic representation, impact of staging, wider database applicability, and validation of indices** as accurate proxies for individual-level deprivation
- Limitations include the number of abstracts, inability to directly compare results across studies given variability outcome measures, and the qualitative nature of a descriptive synthesis

## Future Directions

**Standardization in methodology, prospective study designs, and direct comparison of indices** are needed to strengthen the rigor of this field and support the development of targeted interventions to **improve equity in HNC care**