

# Racial Health Disparities in Acute Ischemic Stroke: A Targeted Literature Review for Estimates to be used in Distributional Cost-Effectiveness Analysis

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## Background

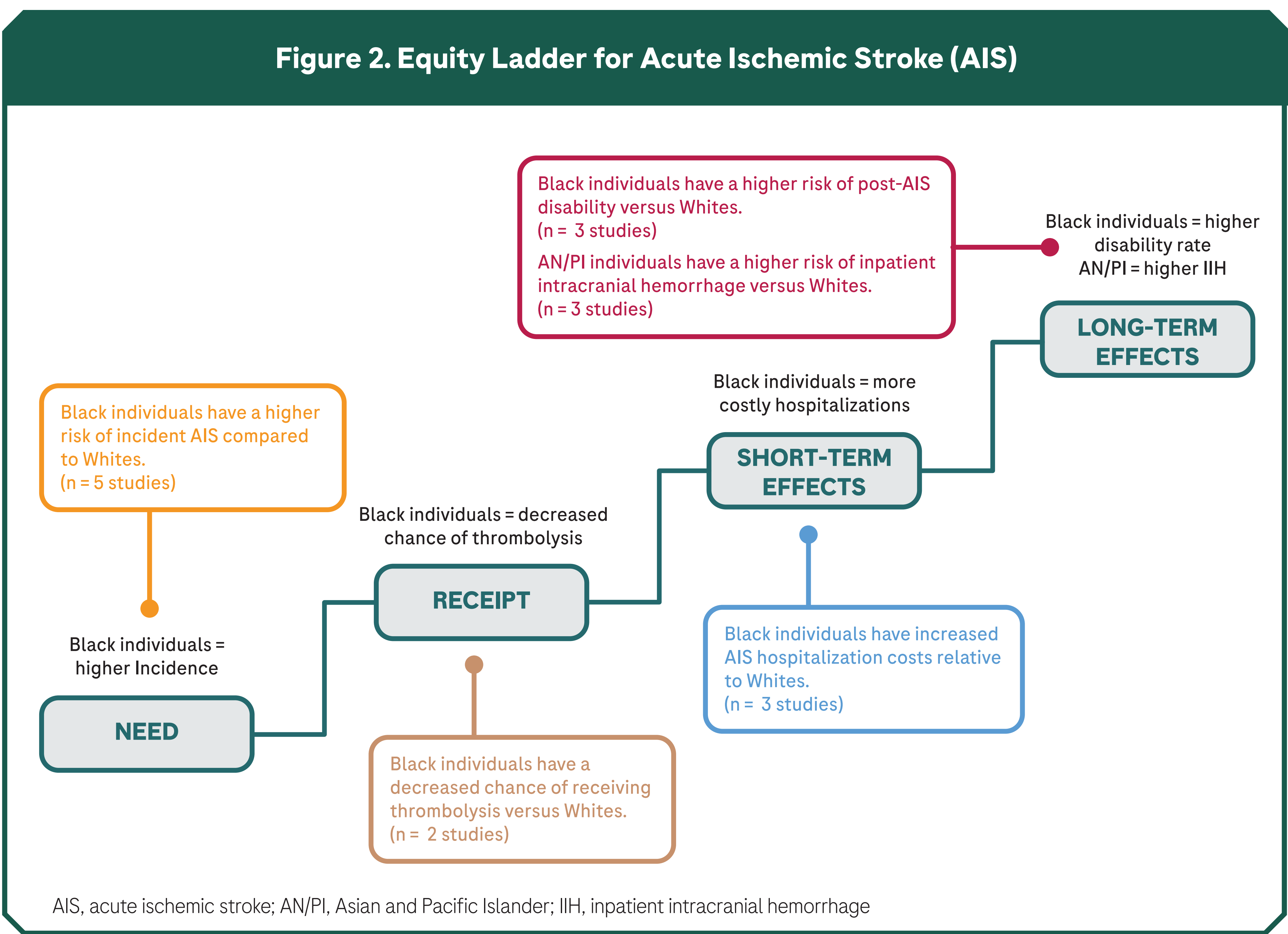
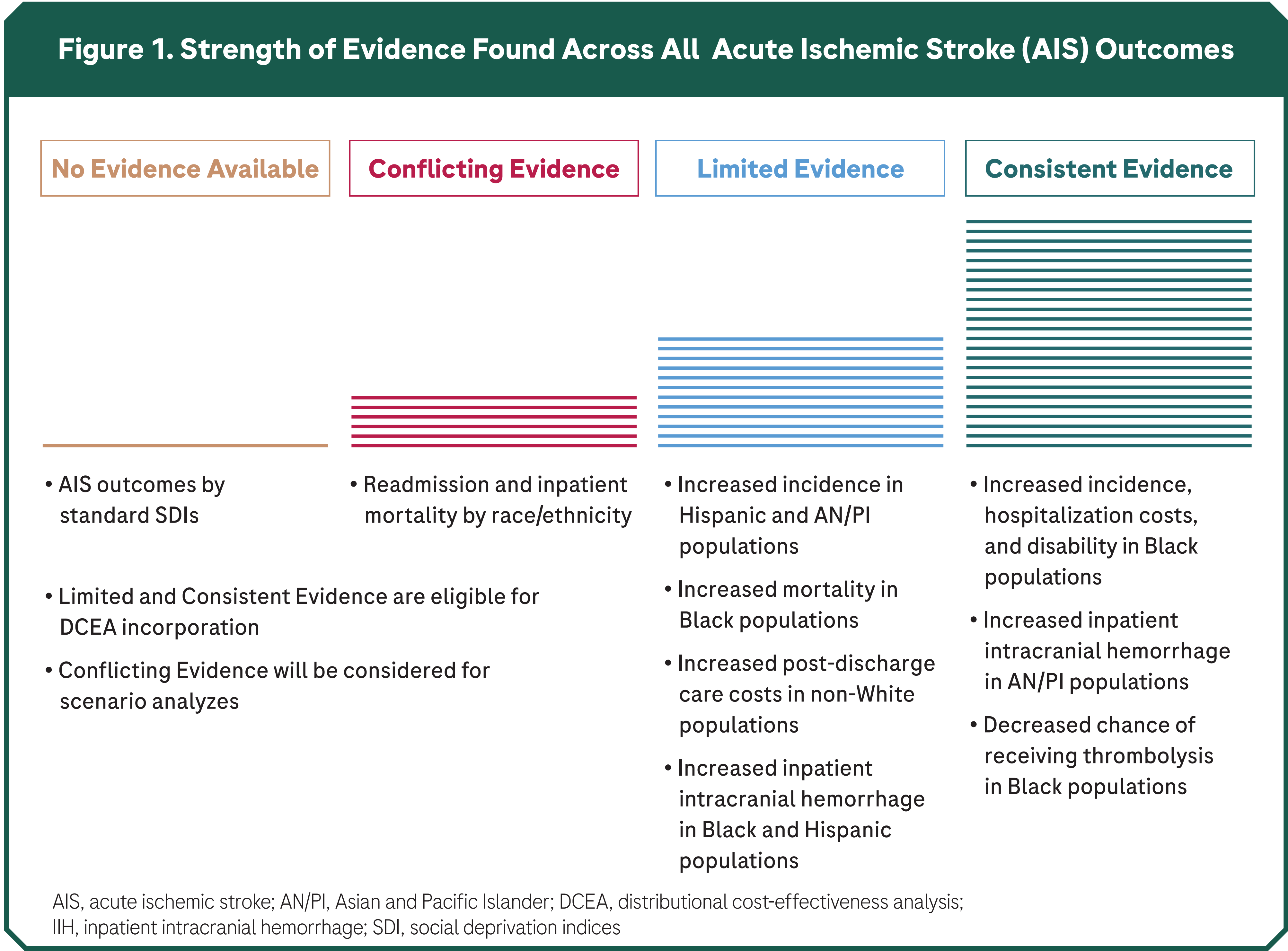
- Health disparities in acute ischemic stroke (AIS) are documented across the patient journey, from incidence to treatment access.<sup>1,2</sup>
  - Disparities are observed across race and ethnicity as well as geography, and are shaped by healthcare system factors as well as broader social determinants of health (e.g., socioeconomic status, education, etc.).
- Equity-informative cost-effectiveness analyses, such as distributional cost-effectiveness analysis (DCEA), can allow for clear quantification of disparities and can estimate the equity consequences of treatment and access decisions.
- With the use of modeling inputs that vary by equity-relevant subgroups in DCEA, we can:
  - Quantitatively consider the gains and opportunity cost losses from a decision across equity-relevant subgroups;
  - More clearly understand population subgroups that will benefit the most, or least, from a decision; and
  - Understand how different populations or health systems or geographic factors influence equity impacts.

## Objective

- The objective of this review is to summarize existing disparities across race and ethnicity as well as social determinants of health in AIS to highlight the level of evidence and existing trends for DCEA modeling.

## Methods

- In March 2022, We conducted a targeted search of MEDLINE and Google Scholar for literature investigating the impact of race/ethnicity and social deprivation indices (SDIs) on selected AIS outcomes relevant to economic modeling, including
  - Incidence
  - Inpatient mortality
  - Post-stroke disability
  - Readmission (within 90 days of AIS)
  - Inpatient intracranial hemorrhage
  - Mortality (at least 90 days post-stroke)
  - Hospitalization cost
  - Post-discharge care costs
  - Receipt of thrombolysis (i.e. tPA administration)
- The search terms included a combination of controlled vocabulary and keyword or free-text search terms.
- Studies were limited to those available in English, conducted on a US population, and published in the past 10 years.



## Results

- The search yielded 1349 results, with 53 articles selected for full-text review.
- We sorted the strength of evidence found qualitatively as consistent, limited, conflicting, and none available. (Figure 1)
  - Consistent evidence = identified evidence demonstrated consistent trends/effects across multiple sources
  - Limited evidence = identified evidence in a small number of studies or studies that were not nationally representative
  - Conflicting evidence = identified studies had inconsistent results in terms of the magnitude and trend of disparity, but more evidence suggests an existing disparity than not
- Consistent evidence across studies demonstrated that Black individuals have a higher risk of incident AIS, decreased chance of receiving thrombolysis, increased hospitalization costs, and higher risk of disability at 90 days post-stroke (OR 1.16, 95%CI, 1.06-1.26) relative to Whites, but only limited evidence was identified that suggested similar increased risks for Hispanic and Asian individuals.
- An equity ladder was generated to highlight that baseline life expectancy by SVI and race/ethnicity is varied across outcomes associated with need for care, receipt of care, and short / long-term effects of AIS.
- Additionally, other consistent evidence suggests increased risk of inpatient intracranial hemorrhage in Black, Hispanic, and particularly Asian individuals.
- Although some evidence was found that inpatient mortality, readmission, and hospitalization cost vary by median household income that can be leveraged in DCEA modeling, no studies investigating SDIs' impact on AIS outcomes were found.
- AIS Outcomes with Conflicting Evidence
  - Two more recent studies suggested increased 30 day readmission rates in Black individuals compared to Whites whereas 3 studies did not find this difference.
  - Studies of inpatient AIS mortality by race/ethnicity varied. Specifically, Black and Asian individuals showed lower mortality than Whites in 2 studies, no difference in 1 study, and increased mortality in 1 study for Asian individuals compared to Whites.
- Modeling Impact Case Study - Incidence
  - Using a source that studied ischemic stroke incidence in a US veteran population and comparing it to the general US population stroke incidence, we illustrated the impact racial disparities can have on important modeling inputs.<sup>1,3</sup>
  - For example, after adjusting for age and other factors, Black individuals in the US veteran population experienced 39 (95%CI, 13 - 66) and 533 (95%CI, 302 - 781) more strokes per 100,000 persons in individuals aged 60-79 and ≥80, respectively, compared to Whites.

SVI, Social Vulnerability Index.

## Conclusion

- Existing literature demonstrates important distributional differences across equity-relevant subgroups based on race and ethnicity that can be modeled in DCEA.
- However, more evidence is needed to determine if inpatient and overall mortality varies by race/ethnicity and to better understand how AIS outcomes are impacted by broader social determinants of health and geographic factors, such as social deprivation indices.

## References

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## Disclosures

**TM** is a postdoctoral fellow at Genentech, Inc. **SK** is an employee of Genentech and a shareholder in Roche. **MC** is an employee of Genentech and a shareholder in Roche.