

# Neighborhood Socioeconomic Deprivation and Childhood Adversity in Pediatric Autoimmune Skin Disease: A Preliminary Descriptive Analysis

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## Background

- Socioeconomic status (SES) is a key driver of health, with lower SES linked to greater social and environmental stressors<sup>1</sup>.
- Adverse Childhood Experiences (ACEs)—traumatic events in childhood—are associated with increased risk of autoimmune disease<sup>2</sup>.
- ACEs have also been linked to inflammatory skin diseases such as atopic dermatitis and psoriasis<sup>3,4</sup>.
- The Area Deprivation Index (ADI) ranks neighborhoods by socioeconomic disadvantage and can serve as a proxy for early-life adversity when individual ACE data are unavailable.
- This study uses ADI and county-level ACE data to describe neighborhood context in pediatric alopecia areata (AA) and vitiligo and to explore links between community disadvantage and childhood adversity.

## Objectives

- To describe** neighborhood-level socioeconomic status (SES), as measured by the Area Deprivation Index (ADI), among pediatric patients with alopecia areata (AA) or vitiligo seen at UCSF (2015–2025).
- To examine** whether county-level estimates of Adverse Childhood Experiences (ACEs) align with community-level socioeconomic disadvantage, establishing a foundation for more direct future studies of adversity and autoimmune skin disease.

## Design & Methods

- Design: Retrospective, descriptive chart review
- Population: Pediatric patients (<18 years) with AA or vitiligo seen at UCSF between January 1, 2015 and June 30, 2025
- Measures:
  - 1) Area Deprivation Index (ADI) – relative disadvantage of census block groups
    - State decile ADI (1–10) and national percentile ADI (1–100) ranks assigned from patient residential address
  - 2) County-level estimates of Adverse Childhood Experiences (ACEs), categorized into percentages of ACE = 0, ACE = 1, ACE = 2+
- Analysis:
  - Descriptive statistics (mean, median, interquartile range) of ADI ranks
  - OLS regression of mean ADI scores in each county and percentages of children with 0 ACEs, 1 ACE, and 2+ ACEs
  - Pearson correlation coefficients of mean ADI scores and ACE estimates

## Results

- Both patient cohorts lived in less deprived neighborhoods when compared to national averages, with median national ADI values in the lowest quartile of deprivation (AA: 8 [IQR 3–21]; Vitiligo: 8 [IQR 3–19]).
- Neighborhood SES patterns were similar across both conditions, with comparable county-level ADI distributions and overlapping geographic representation (Figure 1).
- Higher county-level ADI, reflecting greater neighborhood disadvantage, was associated with a greater percentage of children experiencing ≥2 ACEs (Table 1).
- Pearson correlations showed that higher ADI was linked to fewer children with 0 ACEs (AA:  $r = -0.72$ ; vitiligo:  $r = -0.67$ ) and more with ≥2 ACEs (AA:  $r = 0.75$ ; vitiligo:  $r = 0.67$ ).

Table 1: Weighted Associations (OLS) between ADI and County Level ACE 2+ Prevalence

AA		
ADI Rank (weighted)	$\beta$	p=
National	0.21	<0.001
State	1.05	<0.001
Vitiligo		
ADI Rank (weighted)	$\beta$	p=
National	0.21	<0.001
State	1.10	<0.001

Figure 1: Mean National ADI Ranks, by County

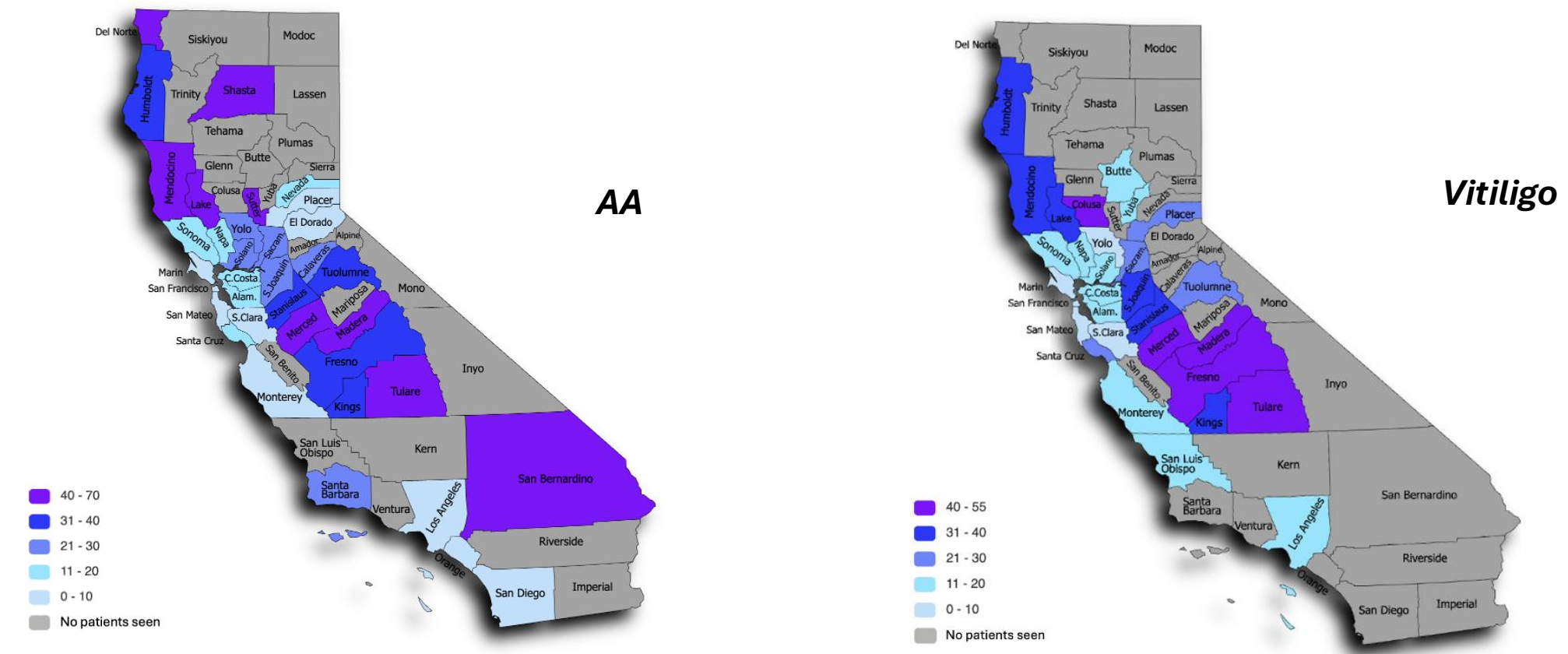
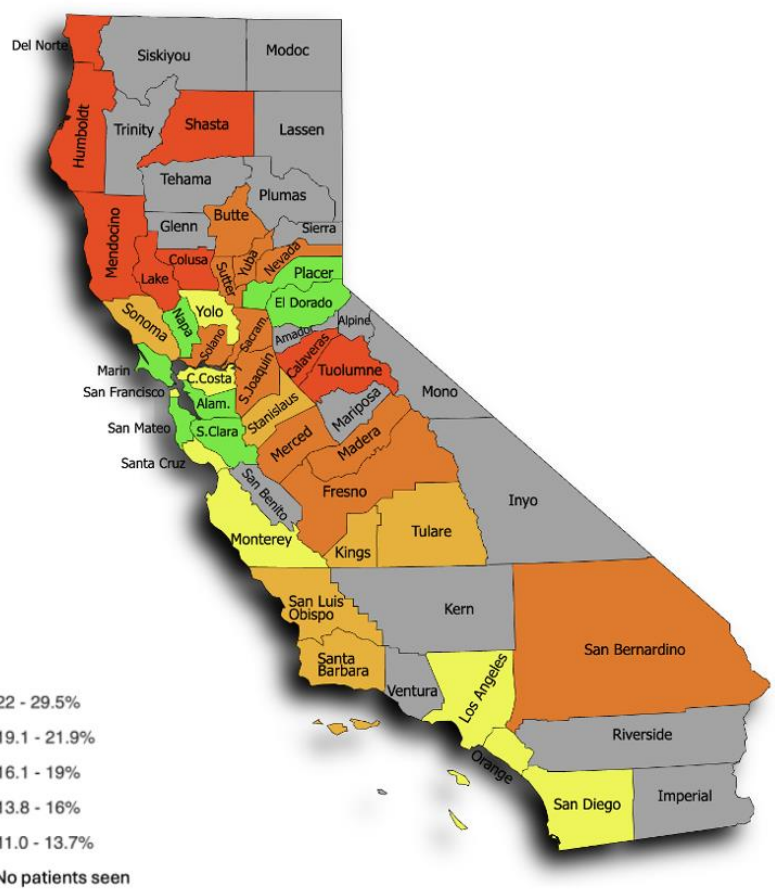


Figure 2: % of Children Experiencing 2+ ACEs, by County



## Discussion

- Most patients lived in less deprived neighborhoods, reflecting California regional demographics and access patterns to tertiary dermatologic care.
- Consistent associations of higher ADI rankings with higher ACE scores suggest that ADI may serve as a useful proxy for estimating community-level risk of adversity when individual ACE data are unavailable.
- Identified trends align with literature<sup>5</sup> – that greater socioeconomic disadvantage would parallel higher adversity exposure – and supports this patient sample as a reasonable reflection of broader population patterns.
- Results highlight the potential influence of neighborhood context on early-life stress exposure—factors that may shape immune health trajectories over time.
- Ongoing work will expand these analyses to include local control groups to draw more direct comparisons between adversity and skin disease.

## Conclusions

- This preliminary, descriptive study found that higher neighborhood deprivation (ADI) was consistently associated with greater reported childhood adversity (ACEs).
- Findings suggest that ADI may serve as a practical, population-level indicator of early-life adversity in the absence of individual-level ACE data.
- Future work will include control groups to more directly examine the relationship between childhood adversity and skin disease prevalence.

## Acknowledgements

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