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 associated with greater social and environmental stressors. Adverse Childhood Experiences (ACEs)—traumatic events occurring in childhood—are linked to increased risk of autoimmune disease and have been associated with inflammatory skin conditions such as atopic dermatitis and psoriasis, though they remain largely unexplored in alopecia areata (AA) and vitiligo. The Area Deprivation Index (ADI), a neighborhood-level measure of socioeconomic disadvantage, can serve as a proxy measure for early-life adversity. This study uses ADI and county-level ACE estimates to characterize neighborhood context in pediatric AA and vitiligo and to explore how community disadvantage aligns with patterns of childhood adversity.

Methods:
We performed a retrospective descriptive analysis of pediatric AA (n=956) and vitiligo (n=839) patients seen at UCSF from 2015–2025. SES was assessed using national (1–100) and state (1–10) ADI rankings from patient residential addresses. County-level ACE estimates were linked to represented counties (AA: 36; vitiligo: 30). Weighted/unweighted linear regressions and Pearson correlation coefficients evaluated associations between mean county ADI and percentages of children with 0, 1, or ≥2 ACEs.

Results & Implications:
Higher county-level ADI was consistently associated with greater prevalence of childhood adversity (ACE ≥2) across both diseases in national and state models (all $p<0.001$). Pearson correlation analyses showed that higher county-level ADI was strongly negatively correlated with the percentage of children with 0 ACEs (AA: $r = –0.72$; vitiligo: $r = –0.67$) and positively correlated with the percentage with ≥2 ACEs (AA: $r = 0.75$; vitiligo: $r = 0.67$), reinforcing the link between greater neighborhood deprivation and higher adversity burden. These findings suggest ADI may serve as a practical proxy for adversity in pediatric populations. Next steps include incorporating local matched controls, assessing whether ADI–ACE patterns relate to disease severity, and expanding analyses through multicenter collaboration to strengthen generalizability.