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REVIEW ARTICLE OPEN ACCESS

An Updated Scoping Review of Disparities in Pediatric Atopic Dermatitis

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Received: 7 October 2024 | **Revised:** 14 January 2025 | **Accepted:** 16 February 2025

Keywords: atopic dermatitis | dermatology | health inequities | healthcare disparities | pediatrics

ABSTRACT

Background/Objectives: Health disparities are preventable differences in various aspects of health and encompass a wide range of inequitable outcomes experienced by marginalized patient populations. The objective of this systematic scoping review was to provide an updated summary of published research on disparities within pediatric atopic dermatitis (AD) in the United States.

Methods: We performed a systematic search of full studies and abstracts according to PRISMA guidelines. Searches were developed with and performed by a medical librarian on various electronic databases for studies published from January 2021 through May 2024. Two authors independently screened titles and abstracts, followed by full-text review.

Results: Fifty-three studies met our inclusion criteria, of which 49 examined disparities due to race/ethnicity, 18 due to socioeconomic factors (SES), 6 due to region/environment, 11 due to sex/gender, and 1 due to preferred language. Disparities discussed included AD prevalence, health outcomes, and access to health care.

Conclusion: With an increasing focus on health disparities research, particularly within the context of the COVID-19 pandemic, an update on disparities within pediatric AD is needed. Examining the results of these studies can help point us to interventions that aim to reduce disparities and allow us to identify current knowledge gaps in disparities within pediatric AD.

1 | Introduction

Health disparities are preventable differences in aspects of health experienced by marginalized patient populations [1]. These disparities can be seen across demographics, income levels, and regions. Addressing health disparities is essential to ensure equitable care for all patients.

Disparities in dermatology include lack of skin of color education, higher incidence and poorer prognosis of certain diseases in patients of color [2], and lower dermatologist density in rural communities [3]. Within pediatric dermatology, a scoping review published in 2021 reported that most disparities exist across racial/ethnic groups and socioeconomic factors (SES) [4]. Notably, atopic dermatitis (AD) is more severe for children from low-income households [5, 6] and for Black and Hispanic children [7–10] compared to children from high-income households and non-Hispanic White children, respectively, and children of color with AD have increased comorbidities compared to white children [11].

With the body of health disparities literature increasing, notably since the start of the COVID-19 pandemic [12–16], an update on recently published research on pediatric AD, which affects up to 20% of children in the United States [17], is needed. In this scoping review, we provide an update on recently published pediatric

AD disparities literature and identify knowledge gaps to guide future research.

2 | Methods

We conducted a systematic scoping review based on PRISMA guidelines (Figure 1). The protocol for this review is uploaded to Open Science Framework (https://doi.org/10.17605/OSF.IO/EWG8H). We developed a comprehensive search strategy with a librarian (K.M.) that incorporated keywords and database-specific controlled vocabulary related to AD, pediatrics, and health disparities. We performed the search on MEDLINE (PubMed), Embase (Elsevier), and Cochrane Database of Systematic Reviews and Central Register of Controlled Trials (Wiley). All searches were performed on May 9, 2024. We limited searches to publications since January 2021, given this is an update to a previous scoping review [4]. We did not apply limits to publication type. Results were exported to citation management software (EndNote) for deduplication, and unique records were uploaded into an online screening platform (Rayyan) for blinded independent screening by two reviewers (S.G. and P.L.), first through title and abstract screen followed by full-text review. Disagreements were resolved through discussion. Full database searches are available in Appendix.

Studies were included if they were written in English, included pediatric participants (<18 years) or the parents/guardians of pediatric patients within the United States, and highlighted one or more pediatric AD disparities. We excluded studies that were not written in English due to errors in language translation that would affect our analysis of the results. Studies that did not meet the above criteria or report new quantitative data, such as review articles, were excluded to avoid data duplication.

Two authors (S.G. and P.L.) jointly developed and tested a data collection spreadsheet used to extract the title, lead author(s), year published, study aims/purpose, design, sample, data source, and key disparities findings from included studies. After piloting the form with three articles, data charting was done independently (S.G.). Due to the wide variety of topics and study designs in our retrieved studies, we did not perform a meta-analysis.

3 | Results

Fifty-three studies met our inclusion criteria (Table S1). Forty-nine studies examined disparities by race/ethnicity, 18 by SES, six by region/environment, 11 by sex/gender, and one by preferred language. Key findings of this review and/or additions to the previous scoping review are summarized (Table 1). Data reported reflect 95% confidence intervals.

3.1 | Race/Ethnicity

Of the 49 studies that examined racial/ethnic disparities, 17 commented on AD prevalence, 12 on comorbidities, 11 on access to care, 6 on medical outcomes, and the remainder on other topics.

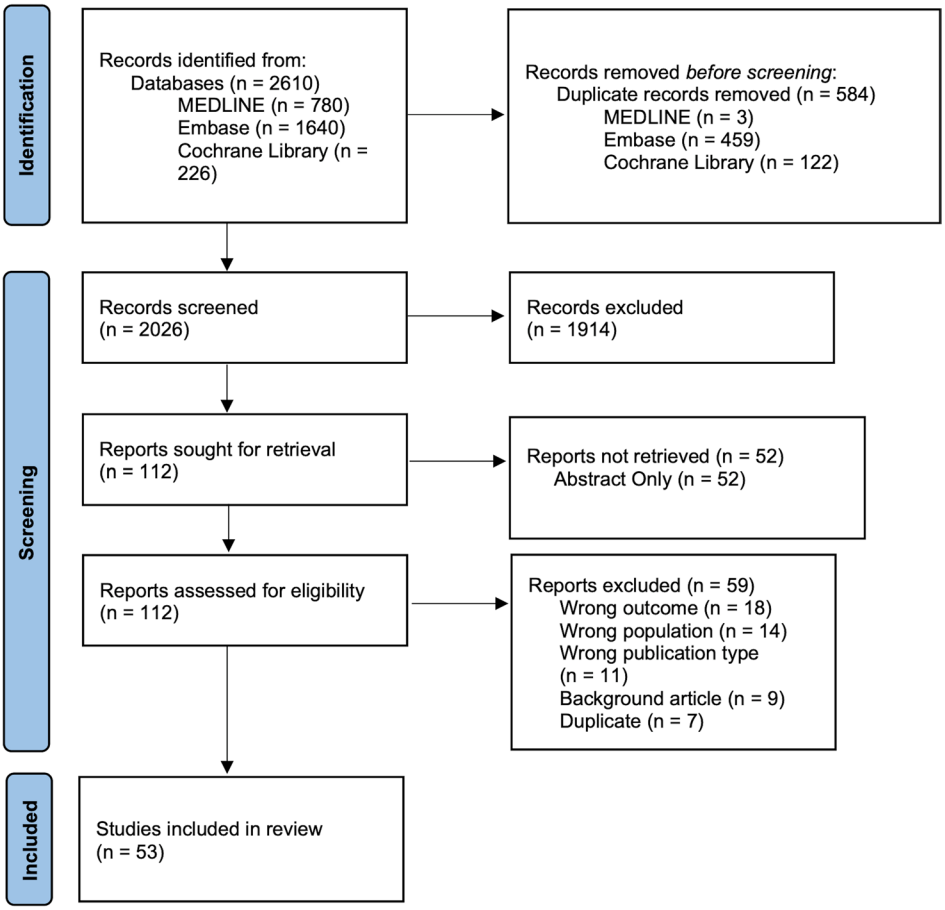

FIGURE 1 | PRISMA flow diagram of identification of studies included in this scoping review.

TABLE 1 | Key takeaways from this review and/or differences from previous scoping review [4].

Disparity category	Key takeaways and/or differences
Race/ethnicity	Compared to non-Hispanic white children, children of color, particularly Black children, have: • Highest AD prevalence and greater ↑ in AD prevalence • ↑ odds of comorbidities • ↑ odds of and greater ↑ in hospitalizations, ambulatory, and urgent care visits • ↑ odds of poor disease control and early/persistent AD • ↑ odds of harmful financial impact, food insecurity • ↑ sleep disturbance and less representation in clinical trials • ↑ rates of missed prescriptions • ↑ rates of transport-delayed care • Longer mean time to initial appointment and are less likely to: • Receive certain AD treatments • Be seen by a medical provider • Have undergone allergy testing
Socioeconomic factors (SES)	Compared to children with private insurance and/or higher income, children with public or no insurance and/or lower income have: • ↑ odds of delayed/unfilled prescriptions • ↑ transport-delayed care • ↑ odds of food insecurity • ↑ behavioral or functional issues, sleep disturbance, and fatigue • Longer mean time to initial appointment • Longer hospitalizations Additional findings: • Children with public insurance have ↑ AD prevalence compared to children with private insurance • Children with higher income, higher education level, and/or insurance have ↑ AD diagnosis and ↓ odds of AD comorbidities compared to children with lower income, lower education level, and/or no insurance
Region/living environment	• Pediatric AD prevalence is highest in the South and has had greatest ↑ in the Midwest • Northeast, Midwest, and South have ↑ pediatric AD diagnosis compared to the West • Living farther from a major road is associated with ↓ odds of pediatric AD • Majority of pediatric AD-related visits are from urban settings
Sex/gender	• Girls have ↑ AD prevalence compared to boys • Boys have ↑ risk of early/persistent AD, ↑ comorbidities, and ↑ odds of receiving systemic corticosteroids compared to girls

Compared to non-Hispanic White children, American Indian/Alaskan Native, Hispanic, and Asian children had approximately 1.2, 1.4, and 2.45 higher odds of AD, respectively [18, 19]. Across multiple studies, additional disparities between White children and children of color, particularly Black children, were observed. Children of color had approximately 2%–10% absolute higher AD prevalence [20–26], 1%–4% absolute increase in AD prevalence over time [27, 28], 4%–24% absolute increased association with AD [29–33], 5%–47% absolute increase and 0.4–2.8 higher odds of comorbidities [34–43], and 8%–24% absolute increase and 1.5–3.8 higher odds of hospitalizations, ambulatory, or urgent care visits [42, 44–46], with these studies falling in-between these ranges. Black children also had 1.24 (0.99, 1.55) higher odds of poor disease control [47] and 2.5–4.12 higher odds of early and persistent AD compared to White children [48]. Black children with AD had 3.86 (1.66, 8.98) increased odds of harmful financial impact [49], 1.32 (1.09, 1.60) higher odds of food insecurity [50], greater sleep disturbance ($B = 3.89$, $p < 0.01$) [51], and 10% less representation in clinical trials [52] compared to white children with AD. Black and/or Hispanic children were less likely to receive certain AD treatments [53] and be seen by a medical provider [35, 54, 55], more likely to lack allergy testing [35, 43], had higher rates of missed prescriptions [56], longer mean time to initial appointment and diagnosis of AD [26, 46, 57, 58], and higher rates of transport-delayed care compared with non-Hispanic white children [59].

In contrast, one prospective multi-center cohort study with 700 children reported no significant differences for AD odds between Black and White children [37], while another retrospective cohort study with 901 children found that White children had increased AD prevalence compared with Black children [58]. A cross-sectional study with 8014 children found that Black children with AD had slightly lower risks of developing atopic comorbidities than White children [60], and another cross-sectional study with 228,898 children reported

that White children with AD had higher associations with psychological comorbidities than children of color [61]. Black children were also less likely to have chronic school absenteeism [62] and behavioral or functional issues than White children [30]. Black and Asian/Pacific Islander children with AD had less association with fatigue (0.40 and 0.285, respectively) among all children with AD [63]. Other studies found no racial/ethnic disparities in terms of delayed care due to COVID-19 [64] or in terms of AD severity [65].

3.2 | Socioeconomic Factors

From the 18 studies that examined disparities due to SES, four commented on AD prevalence, two on comorbidities, five on access to care, two on medical outcomes, and six on other outcomes. Children with public insurance had approximately 6% higher AD prevalence compared to children with private insurance [26] while children from households with higher income, higher education level, and insurance had 0.68, 0.71, and 0.88 decreased odds, respectively, of psychological comorbidities among children with AD [61]. Children without insurance had 15.51 and 33.82 higher odds of delayed and unfilled prescriptions, respectively, compared to children with insurance [56], and children with Medicaid had an average of 17 additional days between the date of referral and the first appointment compared to children with private insurance [57]. Children with public or no insurance and/or lower income also experienced increased transport-delayed care [59], longer hospitalizations [42], increased behavioral or functional issues [30], increased odds of food insecurity [50], and increased sleep disturbance and fatigue scores compared to children with private insurance and/or higher income [63, 66]. Moreover, children from households with higher education level, higher income, and/or non-Medicaid insurance were less likely to experience treatment discontinuation [67] and had increased AD and food allergy diagnosis, most likely due to increased care access [22, 30, 39]. Insurance status was not found to predict infant AD severity or differences in quality of life [68]. Chronic school absenteeism was inversely associated with not having insurance among children with AD [62]. In contrast with the above findings, one prospective multi-center cohort study with 700 children did not find significant differences for AD rates among children with differing SES [37].

3.3 | Region/Living Environment

Six studies examined disparities due to region and/or living environment. Pediatric AD prevalence was highest in the South, as 2%–4% of children in the South had AD Medicaid claims [18], and it had the greatest increase in the Midwest from 7.6% in 1997 to 13.2% in 2018 [28]. Another cross-sectional study with 98,873 children showed that the Northeast, Midwest, and South had approximately 3%, 6%, and 9% absolute increased association, respectively, of AD diagnosis compared to the West [30]. Children who lived farther from a major road had 26.1% (13.4, 36.9) lower odds of AD [69], and 91.7% of AD-related visits were from children in urban settings, likely due to higher AD prevalence and increased access to care in urban areas [44].

3.4 | Sex/Gender

Eleven studies examined disparities due to sex/gender. Girls had approximately 2%–4% absolute higher AD prevalence than boys across two studies [23, 24], while boys had an increased risk of early and persistent AD and additional comorbidities compared with girls [39–41, 48, 58, 61]. Boys also had 1.23 (1.12, 1.35) higher odds of receiving systemic corticosteroids among children with AD [53]. No sex/gender disparities were found among children regarding delayed care due to COVID-19 [64].

3.5 | Other

One single-center cross-sectional study with 364 patients examined if there were disparities due to preferred language regarding AD-related electronic portal messages but did not find any [70]. This study also did not find disparities due to race/ethnicity, SES, sex/gender, and region/living environment.

4 | Discussion

Health disparities persist for pediatric patients with AD, and most studies included for full-text review examined racial/ethnic and SES disparities. We found that children of color, particularly Black and/or Hispanic children, and children with lower SES had increased AD prevalence, worse AD severity and outcomes, reduced access to care, increased comorbidities and hospitalizations, and were less likely to be seen by a medical professional compared with non-Hispanic White children and children with higher SES, respectively, with the previous scoping review reporting similar findings [4].

Interestingly, racial/ethnic and other disparities among adults, but not children, were found in terms of delayed care due to COVID-19 [64]. Furthermore, while children with lower SES had higher AD prevalence, children with higher SES had higher diagnosis rates of AD. These seemingly disparate results may be reconciled by considering that children with lower SES have reduced access to care and thus are less likely to receive a diagnosis [4], and barriers to care may also result in lower treatment rates and thus increased AD prevalence [53].

Reduced access to care for non-White and lower SES patients has previously been reported to contribute to worse dermatology health outcomes and thus increased hospitalizations [71]. The causes of health inequity and disparities in access to care are multifactorial, including systemic racism and classism, which have led to inequities in various aspects such as housing, education, income, transportation, and eroded trust in medicine in these communities (Figure 2) [71]. Moreover, skin of color images in pediatric dermatology textbooks are underrepresented; this makes it more difficult for health care providers to diagnose conditions and subsequently provide appropriate treatment, leading to worse outcomes for children of color [72]. Over 50% of children in the United States are children of color, with this number expected to increase [73, 74]; policies and efforts to reduce these disparities for an increasingly diverse pediatric population must focus on promoting equitable housing,

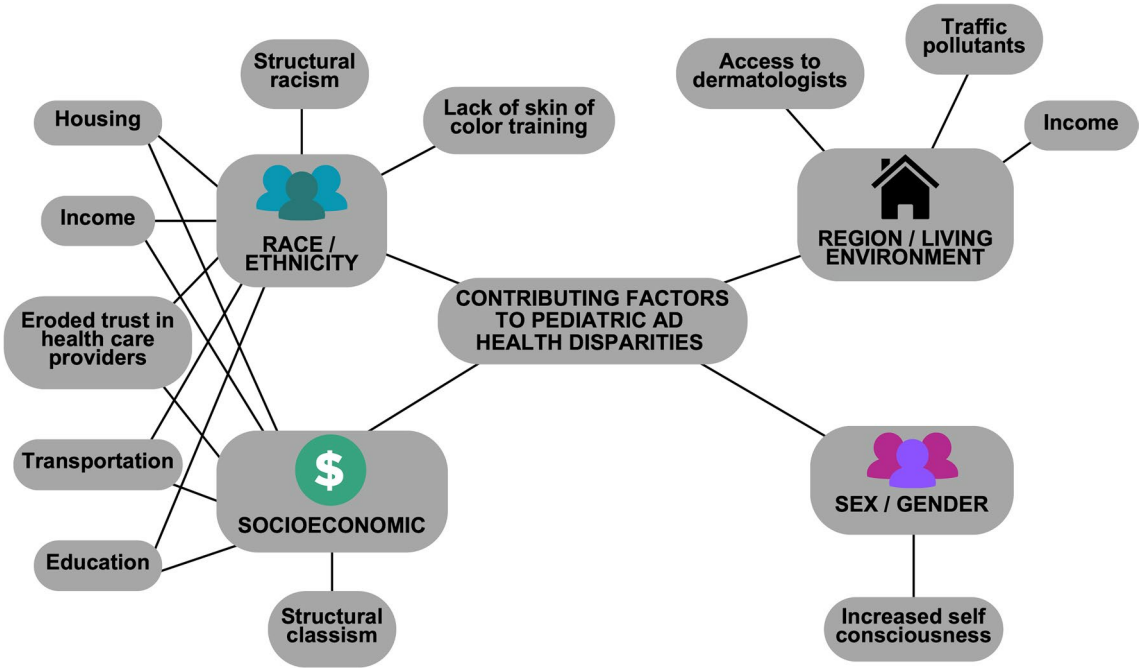

FIGURE 2 | Factors that contribute to racial/ethnic, SES, region/living environment, and sex/gender disparities in pediatric AD.

transportation, and education for children of color and children with lower SES while emphasizing cultural competence, humility, and skin of color training for dermatologists.

There are some overlaps and intersections between race/ethnicity and SES. Black children remain overrepresented in poverty [75], and a cross-sectional study with 59,658 children found that 25% of the disparity in AD prevalence between Black and non-Hispanic White children was explained by SES [21]. However, other studies found that SES does not fully explain racial/ethnic disparities among pediatric patients with AD [21, 26]. Therefore, disparities due to race/ethnicity and SES are not interchangeable; these disparities should be examined independently and in how they influence each other in future studies.

While the previous scoping review from 2021 focused on disparities due to race/ethnicity and SES [4], we also found several studies on disparities due to region/living environment and sex/gender. Findings of our included studies align with a recent systematic review and meta-analysis which found that urban residency is associated with increased AD risk, potentially due to increased exposure to traffic-related air pollutants (Figure 2) [76]. Thus, children in urban environments sought out more ambulatory care, likely due to increased AD risk and increased health care access. Children in the South had higher AD prevalence, possibly due to lower treatment rates; several Southern states had the highest rates of child poverty in 2022 [77], and a lack of pediatric dermatologists in rural areas of the United States has been reported [78], both contributing to barriers to care (Figure 2). Efforts to reduce geographic disparities should aim to provide affordable and accessible care, such as establishing more free health clinics and increasing the number of dermatologists in rural and Southern regions.

Within sex/gender disparities, girls may have had slightly higher AD prevalence due to increased female hormones such as estrogens, particularly after puberty, that promote a type 2 immunity [79, 80]. Alternatively, an international study found that girls were more likely to be self-conscious about AD, which could lead to increased seeking of care and thus increased diagnosis (Figure 2) [81]. Increased systemic corticosteroid use for boys correlates with boys having more persistent AD and increased comorbidities.

The one study that addressed disparities due to preferred language did not identify disparities in having AD-related electronic medical record messages. However, this should not discount the importance of examining primary language disparities; for instance, primary English-speaking patients had increased access to dermatology services at Medstar Health in Washington, DC, compared to non-English speakers [82]. More studies should examine disparities within pediatric dermatology due to preferred language.

Several studies disagreed with the above overall findings. A prospective multi-center cohort study with 700 children did not find significant differences for pediatric AD rates between racial and SES groups [37], and another retrospective cohort study with 901 children found that White children in their study had increased AD prevalence [58]. Other studies reported results suggesting that children of color were less likely to have worse AD-related outcomes and comorbidities than White children [30, 60–63]. Additionally, a cross-sectional study with 3132 children found that chronic school absenteeism was inversely associated with not having insurance among children with AD [62]. These disagreements may be due to differences in study demographics. For instance, the prospective multi-center cohort study analyzed AD prevalence among children with food allergies rather than the general pediatric population [37]. Children of color have been found to have reduced access to care, one factor that reduces AD diagnosis and treatment; comparing AD prevalence among children with a diagnosed food allergy and thus who have seen a health care provider decreases the disparity of reduced care access, which may be why this study did not find

significant differences. Additionally, the retrospective cohort study analyzed data from the National Inpatient Sample [58], whereas many other included studies did not restrict their sample to inpatients only. The authors suggest that White children may have increased access to inpatient care compared to children of color, and Black children may have been less likely to have been diagnosed with AD due to skin pigmentation, both possible explanations for this study's disagreement in results. Authors of two cross-sectional studies also note that scores indicating behavioral/functional issues may vary by cultural differences [30], and children of color may be less likely to report depressive symptoms than White children [61], which may explain their differing results.

Our findings on pediatric AD disparities in the United States generally parallel global health disparities. In the United Kingdom, Black children were found to have about six times the increased likelihood of severe AD compared to White children [83], and the one-year prevalence of AD may be as high as 16.5% among Canadian Indigenous children [84]. Internationally, AD guidelines and treatments such as dupilumab are less likely to be approved in regions with a larger population of children with more pigmented skin and/or lower income, such as South America and Africa compared to North America, Europe, Asia, and Australia [85]. Children in Ethiopia with higher maternal education were more likely to have AD compared to children with lower maternal education [86], and globally, children living in higher income countries were more likely to have AD [87], with higher education and income levels being associated with higher care access. Similar to our included studies, these global studies report that children of color and children with lower SES backgrounds have worse AD outcomes, while children with higher SES backgrounds have increased AD diagnoses, likely attributable to increased care access. Measures to reduce health disparities within and between different countries must focus on similar areas of improvement compared to the United States, with particular attention on increasing health care access, such as approval for more AD treatments, in lower income countries.

While we found studies that covered a broad array of disparities, knowledge gaps remain. We did not identify studies that examined disparities for pediatric patients who are part of the LGBTQ+ community, who are unhoused, or who have disabilities. Studies have found that dermatology residents receive inadequate clinical training to assess LGBTQ+ patients [88], that unhoused patients are less likely to receive competent dermatologic care [89], and that patients with disabilities have reduced health care access [90]. Future studies on pediatric AD must examine these disparities to promote health equity for all marginalized populations.

4.1 | Limitations

We were unable to perform statistical analysis due to the broad array of topics and study designs included. Additionally, this review aimed to highlight updated data on pediatric AD disparities in the context of COVID-19, but many cross-sectional studies analyzed patient data documented before the pandemic. Given the exacerbation of health disparities due to COVID-19, comparisons between data recorded during and after the pandemic would be useful.

5 | Conclusions

Previously identified health disparities among children with AD persist. As an update to a previous scoping review [4], we highlighted region/living environment and sex/gender disparities in addition to racial/ethnic and SES disparities. Children from racial/ethnic minority groups, lower-income families, who have public or no insurance, and live in Southern or rural regions have higher AD prevalence, increased comorbidities, and/or reduced access to care. The persistence of health disparities among an increasingly diverse pediatric population necessitates further health equity research. Analyzing health disparities is the first step to paving the way for future research and interventions that promote health equity for all marginalized patient populations.

Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

Data sharing is not applicable to this article as no new data were created or analyzed in this study.

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Supporting Information

Additional supporting information can be found online in the Supporting Information section.

Appendix

PubMed		
Line	**Search terms**	**Results**
#1	"Dermatitis, Atopic"[Mesh] OR "Eczema"[Mesh] OR "Diaper Rash"[Mesh] OR "atopic-dermatitis"[Title/Abstract] OR "atopic-eczema"[Title/Abstract] OR "infantile-eczema"[Title/Abstract] OR "diaper-dermatitis"[Title/Abstract]	48,483
#2	"Adolescent"[Mesh] OR "Child"[Mesh] OR "Infant"[Mesh] OR "Pediatrics"[Mesh] OR adolescent*[Title/Abstract] OR teen*[Title/Abstract] OR child[Title/Abstract] OR children[Title/Abstract] OR infant*[Title/Abstract] OR pediatric*[Title/Abstract] OR youth*[Title/Abstract] OR young*[Title/Abstract]	5,099,286
#3	"Ethnic and Racial Minorities"[Mesh] OR "Ethnicity"[Mesh] OR "Minority Groups"[Mesh] OR "Race Factors"[Mesh] OR "American Indian or Alaska Native"[Mesh] OR "Asian"[Mesh] OR "Black or African American"[Mesh] OR "Native Hawaiian or Other Pacific Islander"[Mesh] OR "Disabled Persons"[Mesh] OR "Developmental Disabilities"[Mesh] OR "Intellectual Disability"[Mesh] OR "Learning Disabilities"[Mesh] OR "Socioeconomic Disparities in Health"[Mesh] OR "Health Inequities"[Mesh] OR "Health Disparate Minority and Vulnerable Populations"[Mesh] OR "Social Determinants of Health"[Mesh] OR "Socioeconomic Factors"[Mesh] OR "Sociodemographic Factors"[Mesh] OR "Sociodemographic Factors"[Mesh] OR "Rural Population"[Mesh] OR "Suburban Population"[Mesh] OR "Urban Population"[Mesh] OR "Poverty"[Mesh] OR "Insurance Coverage"[MeSH Terms] OR "Medically Uninsured"[Mesh] OR "Medicaid"[Mesh] OR "Transportation"[Mesh] OR "Health Services Accessibility"[Mesh] OR "Quality of Life"[Mesh] OR ethnic*[Title/Abstract] OR ethnicity[Title/Abstract] OR Hispanic*[Title/Abstract] OR Latin*[Title/Abstract] OR minorit*[Title/Abstract] OR race*[Title/Abstract] OR racial[Title/Abstract] OR racism[Title/Abstract] OR American-Indian*[Title/Abstract] OR Native-American*[Title/Abstract] OR Indigenous[Title/Abstract] OR Alaska-Native*[Title/Abstract] OR Asian*[Title/Abstract] OR Black*[Title/Abstract] OR African-American*[Title/Abstract] OR Native-Hawaiian*[Title/Abstract] OR Pacific-Islander*[Title/Abstract] OR Middle-Eastern[Title/Abstract] OR Multiracial[Title/Abstract] OR Multi-racial[Title/Abstract] OR Mixed-race[Title/Abstract] OR Biracial[Title/Abstract] OR disabled[Title/Abstract] OR disabilit*[Title/Abstract] OR handicap*[Title/Abstract] OR impair*[Title/Abstract] OR disparit*[Title/Abstract] OR inequit*[Title/Abstract] OR inequality[Title/Abstract] OR unequal[Title/Abstract] OR social-determinant*[Title/Abstract] OR socioeconomic[Title/Abstract] OR SES[Title/Abstract] OR socio-demographic*[Title/Abstract] OR sociodemographic*[Title/Abstract] OR rural*[Title/Abstract] OR suburb*[Title/Abstract] OR urban*[Title/Abstract] OR poverty[Title/Abstract] OR impoverished[Title/Abstract] OR indigent*[Title/Abstract] OR low-income*[Title/Abstract] OR insurance[Title/Abstract] OR insured[Title/Abstract] OR uninsured[Title/Abstract] OR Medicaid[Title/Abstract] OR medical-assistance[Title/Abstract] OR under-resourced[Title/Abstract] OR underresourced[Title/Abstract] OR transportation[Title/Abstract] OR access-to-care[Title/Abstract] OR healthcare-access[Title/Abstract] OR quality-of-life[Title/Abstract] OR QOL[Title/Abstract]	3,720,589
#4	#1 AND #2 AND #3	3503
#5	(2021:2024[pdat])	780

Embase		
Line	**Search terms**	**Results**
#1	atopic dermatitis'/exp OR 'eczema'/exp OR 'diaper dermatitis'/exp OR 'atopic dermatitis':ab,ti OR 'atopic eczema':ab,ti OR 'infantile eczema':ab,ti OR 'diaper dermatitis':ab,ti	108,764
#2	adolescent'/exp OR 'child'/exp OR 'pediatrics'/exp OR adolescent*:ab,ti OR teen*:ab,ti OR child:ab,ti OR children:ab,ti OR infant*:ab,ti OR pediatric*:ab,ti OR youth*:ab,ti OR young*:ab,ti	6,018,771

Embase

Line	Search terms	Results
#3	ethnic group'/de OR 'ethnicity'/exp OR 'minority group'/exp OR 'race'/exp OR 'american indian'/exp OR 'asian'/exp OR 'african american'/exp OR 'oceanic ancestry group'/exp OR 'middle eastern/north african'/exp OR 'people of mixed ancestry'/exp OR 'disabled person'/exp OR 'disability'/exp OR 'developmental disorder'/exp OR 'intellectual impairment'/de OR 'learning disorder'/exp OR 'health disparity'/exp OR 'vulnerable population'/exp OR 'social determinants of health'/exp OR 'socioeconomic vulnerability'/exp OR 'rural population'/exp OR 'suburban population'/exp OR 'urban population'/exp OR 'poverty'/exp OR 'lowest income group'/exp OR 'insurance'/exp OR 'medically uninsured'/exp OR 'medicaid'/exp OR 'traffic and transport'/de OR 'health care access'/exp OR ethnic*:ab,ti OR ethnicity:ab,ti OR hispanic*:ab,ti OR latin*:ab,ti OR minorit*:ab,ti OR race*:ab,ti OR racial:ab,ti OR racism:ab,ti OR 'american indian*':ab,ti OR 'native american*':ab,ti OR indigenous:ab,ti OR 'alaska native*':ab,ti OR asian*:ab,ti OR black*:ab,ti OR 'african american*':ab,ti OR 'native hawaiian*':ab,ti OR 'pacific islander*':ab,ti OR 'middle eastern':ab,ti OR multiracial:ab,ti OR 'multi racial':ab,ti OR 'mixed race':ab,ti OR biracial:ab,ti OR disabled:ab,ti OR disabilit*:ab,ti OR handicap*:ab,ti OR impaired:ab,ti OR disparit*:ab,ti OR inequit*:ab,ti OR inequality:ab,ti OR unequal:ab,ti OR 'social determinant*':ab,ti OR socioeconomic:ab,ti OR ses:ab,ti OR 'socio demographic*':ab,ti OR sociodemographic*:ab,ti OR rural*:ab,ti OR suburb*:ab,ti OR urban*:ab,ti OR poverty:ab,ti OR impoverished:ab,ti OR indigent*:ab,ti OR 'low income*':ab,ti OR insurance:ab,ti OR insured:ab,ti OR uninsured:ab,ti OR medicaid:ab,ti OR 'medical assistance':ab,ti OR 'under resourced':ab,ti OR underresourced:ab,ti OR transportation:ab,ti OR 'access to care':ab,ti OR 'healthcare access':ab,ti OR qol:ab,ti	4,066,556
#4	#1 AND #2 AND #3	6059
#5	#1 AND #2 AND #3 AND [2021-2024]/py	1604

Cochrane

Line	Search terms	Results
#1	MeSH descriptor: [Dermatitis, Atopic] explode all trees	2712
#2	MeSH descriptor: [Eczema] explode all trees	1491
#3	#3 MeSH descriptor: [Diaper Rash] explode all trees	84
#4	atopic-dermatitis:ti,ab OR atopic-eczema:ti,ab OR infantile-eczema:ti,ab OR diaper-dermatitis:ti,ab	6288
#5	#1 OR #2 OR #3 OR #4	7097
#6	MeSH descriptor: [Adolescent] explode all trees	136,839
#7	MeSH descriptor: [Child] explode all trees	81,882
#8	MeSH descriptor: [Infant] explode all trees	46,083
#9	MeSH descriptor: [Pediatrics] explode all trees	1044
#10	adolescent*:ti,ab OR teen*:ti,ab OR child:ti,ab OR children:ti,ab OR infant*:ti,ab OR pediatric*:ti,ab OR youth*:ti,ab OR young*:ti,ab	261,841
#11	#6 OR #7 OR #8 OR #9 OR #10	368,754
#12	[mh "Ethnic and Racial Minorities"]	26
#13	[mh Ethnicity]	3436
#14	[mh "Minority Groups"]	609
#15	[mh "Race Factors"]	49
#16	[mh "American Indian or Alaska Native"]	471
#17	[mh Asian]	339
#18	[mh "Black or African American"]	3136
#19	[mh "Native Hawaiian or Other Pacific Islander"]	286
#20	[mh "Disabled Persons"]	1714

Cochrane

Line	Search terms	Results
#21	[mh "Developmental Disabilities"]	837
#22	[mh "Intellectual Disability"]	2031
#23	[mh "Learning Disabilities"]	795
#24	[mh "Socioeconomic Disparities in Health"]	2
#25	[mh "Health Inequities"]	586
#26	[mh "Health Disparate Minority and Vulnerable Populations"]	6902
#27	[mh "Social Determinants of Health"]	81
#28	[mh "Socioeconomic Factors"]	14,363
#29	[mh "Sociodemographic Factors"]	13
#30	[mh "Rural Population"]	2845
#31	[mh "Suburban Population"]	41
#32	[mh "Urban Population"]	1687
#33	[mh Poverty]	2442
#34	[mh "Insurance Coverage"]	156
#35	[mh "Medically Uninsured"]	102
#36	[mh Medicaid]	362
#37	[mh Transportation]	1045
#38	[mh "Health Services Accessibility"]	1684
#39	[mh "Quality of Life"]	43,875
#40	ethnic*:ti,ab OR ethnicity:ti,ab OR Hispanic*:ti,ab OR Latin*:ti,ab OR minorit*:ti,ab OR race*:ti,ab OR racial:ti,ab OR racism:ti,ab OR American-Indian*:ti,ab OR Native-American*:ti,ab OR Indigenous:ti,ab OR Alaska-Native*:ti,ab OR Asian*:ti,ab OR Black*:ti,ab OR African-American*:ti,ab OR Native-Hawaiian*:ti,ab OR Pacific-Islander*:ti,ab OR Middle-Eastern:ti,ab OR Multiracial:ti,ab OR Multi-racial:ti,ab OR Mixed-race:ti,ab OR Biracial:ti,ab OR disabled:ti,ab OR disabilit*:ti,ab OR handicap*:ti,ab OR impair*:ti,ab OR disparit*:ti,ab OR inequit*:ti,ab OR inequality:ti,ab OR unequal:ti,ab OR social-determinant*:ti,ab OR socioeconomic:ti,ab OR SES:ti,ab OR socio-demographic*:ti,ab OR sociodemographic*:ti,ab OR rural*:ti,ab OR suburb*:ti,ab OR urban*:ti,ab OR poverty:ti,ab OR impoverished:ti,ab OR indigent*:ti,ab OR low-income*:ti,ab OR insurance:ti,ab OR insured:ti,ab OR uninsured:ti,ab OR Medicaid:ti,ab OR medical-assistance:ti,ab OR under-resourced:ti,ab OR underresourced:ti,ab OR transportation:ti,ab OR access-to-care:ti,ab OR healthcare-access:ti,ab OR quality-of-life:ti,ab OR QOL:ti,ab	331,724
#41	#12 OR #13 OR #14 OR #15 OR #16 OR #17 OR #18 OR #19 OR #20 OR #21 OR #22 OR #23 OR #24 OR #25 OR #26 OR #27 OR #28 OR #29 OR #30 OR #31 OR #32 OR #33 OR #34 OR #35 OR #36 OR #37 OR #38 OR #39 OR #40	349,734
#42	#5 AND #11 AND #41	711
#43	#42 with Cochrane Library publication date Between Jan 2021 and Dec 2024	253
#44	#42 with Publication Year from 2021 to 2024, in Trials	224

Database	Coverage	Date searched	Total results	Duplicates removed	Unique results
PubMed (NIH/NLM)	1700 to present	5/9/2024	780	3	777
Embase (Elsevier)	1947 to present	5/9/2024	1604	459	1145
Cochrane library	1995 to present	5/9/2024	226	122	104
Total			2610	584	2026