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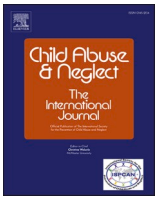

Historical redlining, neighborhood disadvantage, and reports of child maltreatment in a large urban county

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ABSTRACT

Background: Child protective services (CPS) reports are spatially concentrated in disadvantaged neighborhoods and Black children are more likely than White children to reside in these neighborhoods. Entrenched patterns of racial residential segregation reflect the lasting impact of historical redlining – a racist practice spearheaded by the federally sponsored Home Owners' Loan Corporation (HOLC) in the 1930s that assigned worst risk grades to minoritized neighborhoods. Research has established links between historically redlined areas and the present-day wellbeing of children and families; however, little is known about the relationship between historical redlining and CPS report rates in neighborhoods.

Objective: Using census tracts as a proxy for neighborhood, this study examines the relationship between historical redlining and the number of CPS reports within neighborhoods.

Participants, setting, and method: This study combines data on HOLC risk grades and sociodemographic data from the American Community Survey with the aggregate number of CPS reports per census tract in Los Angeles County, CA (n = 1137).

Results: We used Bayesian conditionally autoregressive models to examine the relationship between historical redlining score (A = 1, B = 2, C = 3, D = 4) and the number of CPS reports within neighborhoods. In the unadjusted model, each unit increase in redlining score is associated with a 21.6 % higher number of CPS reports (95 % CI; 1.140, 1.228). In adjusted models that included concentrated disadvantage, each unit increase in redlining score is associated with a 7.3 % higher number of CPS reports (95 % CI; 1.021, 1.136).

Conclusion: Housing policy reforms through a racial equity lens should be considered as a part of a national strategy to prevent child maltreatment.

1. Introduction

In the United States, contact with child protective services (CPS), the agency that investigates allegations of child abuse and neglect,

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varies by both race and place. While it is estimated that 37 % of children will be the subject of a CPS investigation by age 18, that number rises to 53 % for Black children (Kim et al., 2017). In addition, CPS cases are spatially concentrated in disadvantaged neighborhoods (Barboza-Salerno, 2020; Coulton et al., 2018; Klein, 2011; Klein & Merritt, 2014; Marco et al., 2020). Children living in high poverty neighborhoods are over three times as likely to have a substantiated CPS investigation during childhood compared to children living in low poverty neighborhoods (Fong, 2019). As a result of structural racism within the U.S. housing system, Black and Latinx children are more likely than their White counterparts to live in high poverty neighborhoods that are racially segregated and lacking in quality goods and services that promote social and economic wellbeing (Acevedo-Garcia et al., 2020) Children are in fact the most segregated demographic group resulting in little overlap between the neighborhood environments of White and Black children (Owens, 2017). These separate and unequal neighborhood environments expose Black children to a host of structural, social, and environmental risks that can undermine parental wellbeing while also granting advantages and opportunities to White families (Krivo et al., 2009) in a form of opportunity hoarding (Garces & Gordon da Cruz, 2017). Thus, neighborhood environments are a critical mechanism through which the resources necessary for family wellbeing are unequally distributed contributing to the disproportionate risk of contact with CPS for Black children (Maguire-Jack et al., 2021).

The segregation of Black children in low opportunity neighborhoods reflects the enduring legacy of slavery, Jim Crow laws, and state-sanctioned housing discrimination such as historical redlining. Historical redlining was a federally backed zoning practice in the 1930s that assigned worst risk scores to neighborhoods inhabited by Blacks, Latinx, and other minoritized groups limiting their access to home loans and segregating them into distressed communities. An emerging body literature has established links between historically redlined areas and the health and economic wellbeing of residents that currently reside in these areas (Lee et al., 2022). However, to date, associations between historical redlining and CPS report rates in neighborhoods has not been explored prompting the need for the current study.

1.1. The enduring legacy of historical redlining

Increasing attention has been directed to the explicit role federal, state, and local governments played in creating racially segregated neighborhoods and the continued impact of these actions on the wellbeing of racialized groups. Throughout most of the twentieth century, intentional government action defined where Black and White people should live by enforcing racist housing policies, including the practice of historical redlining spearheaded by the Home Owners' Loan Corporation (HOLC). In the 1930s, the federal government created the HOLC as a part of the New Deal during the Great Depression to reduce foreclosures and facilitate access to low interest home loans for Americans (Hillier, 2005). To assess lending risk and determine credit worthiness, the HOLC assigned grades to neighborhoods using racial composition as a main factor (Hillier, 2005). Neighborhoods were rated and color coded as A ("best" or green), B ("still desirable" or blue), C ("definitely declining" or yellow), and D ("hazardous" or red) (Nelson et al., 2023). Neighborhoods with large percentages of Black, Latinx, and other ethnic groups received worst grades and were outlined in red on maps (Nelson et al., 2023). Redlined areas were deemed hazardous investments leading to high rates of loan denials and widespread disinvestment in these communities (Woods, 2012).

The HOLC's actions succeeded in making homeownership the primary tool of wealth generation in the United States (Oliver & Shapiro, 2006) while also ensuring that the "The American Dream" of homeownership would be difficult to attain for minoritized groups. Redlining—the practice of denying borrowers access to credit based on the location of properties in minoritized or economically disadvantaged neighborhood—was widely adopted outside of the HOLC maps, and its influence permeated the housing market (Mitchell & Franco, 2018). For example, the Federal Housing Authority and Veteran's Administration refused to insure mortgages to Black people in designated "White" neighborhoods and would not insure mortgages for White people in neighborhoods where Black households were present (Eberhardt, 2019). State regulated insurance companies adopted this same policy (Rothstein, 2017). In addition, federally backed loans were awarded to private builders only if racial restrictions were included in their subdivision deeds (Rothstein, 2017). As a result, by the 1940s nearly 80 % of neighborhoods in cities such as Chicago and Los Angeles were off limit to Black families (Eberhardt, 2019).

The Fair Housing Act of 1968 outlawed government sponsored discriminatory housing practices however, the legacy of de jure segregation continues to reverberate through the U.S. housing system (Faber, 2020). Persistent patterns of racial residential segregation are maintained by present-day racial discrimination across the stages of the housing exchange process (Korver-Glenn, 2018) and exclusionary zoning practices that limit the creation of multifamily housing dwellings in high opportunity neighborhoods (An et al., 2019). Digitization of HOLC maps (Nelson et al., 2023) has made it possible to examine the impact of historical redlining and an emerging body of literature has established links between diminished health and economic wellbeing and residing in formerly redlined communities. Sixty-four percent of formerly redlined communities are majority-minority today and 74 % are low-to moderate income, with median family incomes at 80 % or less than the average area income (Mitchell & Franco, 2018). Analyses of cohorts born decades later that were raised in poorly rated areas found causal impacts on household income in adulthood, likelihood of living in a high poverty census tract, likelihood of incarceration, homeownership rates, and modern credit scores (Aaronson et al., 2021). In addition, living in formerly redlined areas has been linked to higher rates of gun violence (Mehranbod et al., 2022), exposures to air pollution (Lane et al., 2022), preterm births (Krieger et al., 2020), and chronic diseases (Nardone et al., 2020) as well as reduced access to neighborhood amenities such as green space (Nardone et al., 2021).

More than any other group, Black individuals and families continue to bear the burden of the legacy of redlining and racial residential segregation in the US (Williams et al., 2019). Blacks are more segregated than any other minoritized group in the United States (Intrator et al., 2016). Racial residential segregation has impacted Black people intergenerationally (Sharkey, 2013) and across the income spectrum (Reardon et al., 2015). Where one lives is a critical determinant of socioeconomic status, health, and wellbeing

because it determines access to resources (e.g., green space) (Casey et al., 2017); exposure to environmental hazards (e.g., crime, pollution) (Krivo et al., 2009; Woo et al., 2019); and the availability of economic opportunities such as a quality education (Condron et al., 2013). Since Black Americans experience greater exposure to neighborhood 'disamenities' (negative neighborhood characteristics) and reduced exposure to neighborhood amenities across the life span, racial residential segregation is a primary driver of racial disparities in income (Ananat, 2011), educational attainment (Quillian, 2014) health (Kramer & Hogue, 2009), wealth accumulation (Ray et al., 2021), and upward intergenerational mobility (Sharkey, 2013). Furthermore, the harsh environmental context created by disadvantaged neighborhoods destabilizes family units by increasing the risk of mental problems (Truong & Ma, 2006), intimate partner violence (Beyer et al., 2015), mass incarceration (Sampson & Loeffler, 2010) and eroding social support networks (Molnar et al., 2016) – all of which can contribute to racial disparities in CPS contact.

It is important to distinguish the experiences of racial residential segregation for Black and Latinx communities. Historically, Latinx families have experienced much lower levels of residential segregation compared to Black Americans (Massey, 1979; Massey & Denton, 1987). Their levels of segregation have risen over time due in part to increased immigration and increased population in metropolitan areas (Tienda & Fuentes, 2014). In addition, the impact of Latinx segregation has received far less attention in the literature. Despite these differences, evidence suggests that segregation negatively impacts the health and wellbeing of the Latinx population. Latinx segregation has been association with poorer self-rated health (Do et al., 2017) and diminished life opportunities including decreased likelihood of working in a professional occupation and completing college and greater disparities in income (la Roca et al., 2018). In addition, segregation has been associated with increased risk of homicide among Latinx adults and this relationship was mediated by concentrated disadvantage (Feldmeyer, 2010). Some studies have also observed a protective effect of segregation among Latinx communities including decreased mental distress among Latinx men (Nobles et al., 2017) and lower odds of smoking during pregnancy (Yang et al., 2014). Nevertheless, compared to their White counterparts, Latinx families continue to experience much lower quality neighborhood environments (Acevedo-Garcia et al., 2020) that increase the risk for negative outcomes.

1.2. Neighborhood disadvantage and child maltreatment

Historical redlining and modern-day discriminatory housing practices have disproportionately sorted families of color into disadvantaged neighborhoods resulting in unequal access to the resources and opportunities that support optimal parenting. Informed by social disorganization theory, prior research has linked aspects of neighborhood disadvantage to higher rates of child maltreatment within neighborhoods (Barboza-Salerno, 2020; Freisthler & Maguire-Jack, 2015; Klein & Merritt, 2014). Social disorganization theory posits that high rates of crime occur within neighborhoods because the presence of concentrated disadvantage, ethnic heterogeneity, and residential instability leads to a breakdown of informal social control (Sampson & Groves, 1989; Shaw & McKay, 1942). When applied to risk for child maltreatment, residents of 'socially disorganized' neighborhoods fail to develop the shared social norms and social cohesion that promote healthy parenting practices.

Social disorganization theory first emerged during a time when state-sanctioned housing discrimination was commonplace. It has been critiqued for reinforcing racial and ethnic stereotypes while failing to acknowledge that measures of racial composition, concentrated disadvantage, and residential instability reflect systemic inequities (Henson et al., 2023) created by housing policy decisions. For example, higher rates of residential instability have been associated with higher rates of child maltreatment in neighborhoods (Klein & Merritt, 2014). Rates of residential instability are higher among residents in low-income neighborhoods because of financial hardship and a lack of affordable housing options (Coulton et al., 2012). Moreover, residential instability is likely exacerbated by restrictive zoning laws that prevents the construction of multifamily housing structures as well as persistent disparities in homeownership rates. The application of social disorganization theory in neighborhood-level child maltreatment research primarily situates risk within the racialized identities of residents instead of focusing on the ways in which structures and institutions disproportionately exposes minoritized groups to environmental conditions that increase the risk for negative outcomes. Conversely, a structural risk perspective explicitly identifies the ways in which risk of child maltreatment is shaped by structural racism that unequally distributes the opportunities and resources that support wellbeing (Feely & Bosk, 2021). When viewing child maltreatment risk through this lens, the spatial concentration of CPS cases within poor, non-White neighborhoods is the result of structural racism and biases perpetuated through institutional harm like the housing system.

1.3. The current study

The purpose of this study is to explore the relationship between historical redlining and present-day CPS report rates in neighborhoods. To date, historical redlining has not been explored in neighborhood-level research on child maltreatment. We hypothesize that poorly rated neighborhoods will experience a higher number of CPS reports. By assessing the impact of redlining on neighborhood reports of child maltreatment, this study can begin to untangle how racist housing policies have created neighborhood environments where parents may not have enough resources to care for their children. Although our study will not be able to identify the mechanisms by which historical redlining may affect CPS reports, possible pathways include (1) the lack of generational wealth and resulting disparate rates of poverty among minoritized groups; (2) the widespread disinvestment in these neighborhoods that limits access to the resources that support optimal parenting; and (3) the toxic stress induced by harsh neighborhood environments that can undermine parental functioning.

2. Methods

2.1. Study population and design

This study utilized a cross-sectional, ecological approach to examine the relationships among neighborhood concentrated disadvantage, historical redlining, and reports of suspected child maltreatment. Census tract is used as a proxy for neighborhood. Our study location is Los Angeles County, CA. Los Angeles County is the most populous county in the United States with nearly 10 million residents (U.S. Census Bureau, 2021). It is also one of the most diverse counties in the U.S. Nearly 50 % of residents are Latinx (any race), 15 % are Asian, 9 % are African American/Black, and a third of residents are foreign-born. About 70 % of residents are White. Approximately 21 % of residents are children under the age of 18. Los Angeles is home to the third-most populous formerly redlined area in the country, currently encompassing 620,000 residents (Perry & Harshbarger, 2019).

Data on historical redlining were obtained from the Inter-University Consortium for Political and Social Research (ICPSR) (Meier & Mitchell, n.d.). To create the dataset, digitized HOLC maps from the 1930s were overlaid with census tracts using ArcGIS to determine the proportion of HOLC grades contained within the boundaries (Meier & Mitchell, n.d.). However, HOLC grades are not available for all present-day census tracts in Los Angeles County resulting in 1105 census tracts being excluded from the study. An additional 100 census tracts that had HOLC grades were excluded because they were not connected to the largest contiguous land mass of census tracts with available grades. Their spatial discontinuity from the other census tracts impedes a meaningful examination of spatial effects and their inclusion could bias results (Klein, 2011). Thus, the final analytic sample was 1137 census tracts. Appendix A compares the sociodemographic characteristics of the analytic sample, the noncontiguous census tracts, and the census tracts that did not have a HOLC grade.

2.2. Measures

2.2.1. Dependent variable

The number of CPS reports in 2015 aggregated at the census tract level was obtained from the California Child Welfare Indicators Project (CCWIP) (Webster et al., 2020). CCWIP is a collaboration between the University of California at Berkeley and the California Department of Social Services that provides child welfare administrative data to interested parties seeking information about California's child welfare system. It is important to note that the dependent variable includes all reports of suspected child maltreatment made to local CPS agencies in Los Angeles County which includes reports that were screened out (not investigated) or unsubstantiated following an investigation. Although the outcomes of the reports are unknown, this measure captures a broad range of potentially high-risk circumstances involving children.

2.2.2. Historical redlining

In order to derive a historical redlining score, HOLC maps for Los Angles from 1939 were overlaid with 2010 census tract boundary files using ArcGIS (Meier & Mitchell, n.d.; Nelson et al., 2023). The portion of HOLC grades within the boundaries of each census tract was determined. A numerical value was assigned to each HOLC grade, with higher scores indicating greater redlining of the census tract: "A" grade = 1, "B" grade = 2, "C" grade = 3, and "D" grade = 4. The historic redlining score for each census tract was calculated from the summed proportion of HOLC grades multiplied by a weighting factor based on the area within each census tract (Meier & Mitchell, n.d.). For example, a census tract graded half "A" (0.5*1) and half "B" (0.5*2) was assigned a historic redlining score of 1.5 (1.5 = 0.5*1 + 0.5*2) (Lynch et al., 2021). Historical redlining is measured as a continuous variable in our study to assess the degree of redlining within each census tract.

Five year (2011–2015) pooled estimates of the sociodemographic factors described below were obtained from the U.S. Census Bureau's American Community Survey (ACS) and included as covariates in this study.

2.2.3. Concentrated disadvantage

A concentrated disadvantage index was created using variables that are highly correlated to each other and linked to a greater number of CPS reports within neighborhoods (e.g. Klein, 2011). The variables for the concentrated disadvantage index include the percentage of families living below the federal poverty status in the last 12 months, the unemployment rate for the population 16 years and older, the percentage of female-headed households, and the percentage of families receiving public assistance (cash income or SNAP benefits). A principal components analysis of the correlation matrix of these variables using varimax factor rotations uncovered a single factor accounting for 68.1 % of the variance. The index was created by summing the equally weighted z-scores for each of the items and dividing by the total number of items. The Cronbach's alpha for the concentrated disadvantage index is 0.83 indicating good internal reliability. The index is measured on a continuous scale with higher numbers indicating greater levels of concentrated disadvantage within census tracts.

2.2.4. Race and ethnicity

We include measures of racial and ethnic composition to assess whether higher percentages of minoritized groups in a neighborhood were related to rates of CPS reports over and above concentrated disadvantage and historical redlining scores. This included the percentage of African American/Black residents, the percentage of Latinx (any race) residents, and the percentage of Asian residents.

Table 1
Descriptive statistics of census tract sociodemographic characteristics of sample ($n = 1137$).

Variable	*M*	*SD*	Min	Max
Child maltreatment reports (number)	54.00	47.55	0.00	289.00
Child maltreatment reports (rate)	51.73	31.65	0.00	185.19
Historical redlining score	3.00	0.81	1	4
Population density[a]	18,012	12,296	94	102,995
Percent African American/Black residents	9.41	13.93	0.00	86.30
Percent Latinx residents	49.87	30.45	1.13	100.00
Percent Asian residents	13.71	16.49	0.00	89.43
Residential instability[b]	14.35	7.12	1.70	64.00
Concentrated disadvantage index[c]	0.62	2.78	−4.38	16.92
Family poverty rate	18.74	13.15	0	100
Unemployment rate	10.70	4.30	0	39.7
Female-headed households	17.57	9.41	0	59.2
Public assistance utilization	13.13	10.32	0	66.4

[a] Total population per area (in square miles).
[b] Percentage of individuals who moved in the last 12 months.
[c] Index with the following variables: percentage of families living below the federal poverty status in the last 12 months, the unemployment rate for the population 16 years and older, the percentage of female-headed households, and the percentage of families receiving public assistance (cash income or SNAP benefits).

2.2.5. Residential instability

This variable was measured as the percentage of individuals who moved in the last 12 months. High residential instability within neighborhoods may indicate a higher number of renters. Residential instability tends to be higher in lower income neighborhoods (Coulton et al., 2012) and has been associated with a greater number of CPS reports in neighborhoods (Klein & Merritt, 2014).

2.2.6. Population density

This variable was created by dividing the total population of the census tract by the area of the census tract. Population density measures the degree of crowdedness within a neighborhood. High population densities may lead to doubling up (sharing housing with another family) which has been linked to increased odds of contact with CPS (Yang, 2015). In our analysis, we rescale population density/1000 to aid in model convergence.

2.3. Analytic approach

Descriptive analysis was conducted of all variables included in the analysis. Kendall's tau-b was used to assess bivariate relationships because CPS reports are not normally distributed. As this study uses census tracts as the unit of analysis, we use Bayesian conditionally autoregressive (CAR) models that adjust for spatial structure of the data (Law et al., 2006; Waller & Gotway, 2004) to analyze the effects of historical redlining scores on CPS reports, while controlling for covariates.

CAR models offer several advantages over traditional spatial regression models. First, CAR models allow us to model the data as a Poisson distribution which is appropriate for our data which are counts. Second, this technique addresses issues of spatial autocorrelation (i.e., adjacent census tracts being correlated) by modeling the spatial distribution as a random effect.

Lastly, to address instability in CPS reports due to small area estimation, the spatial parameter "borrows strength" from adjacent areas, smoothing those estimates across the area (Law et al., 2006).

We model CPS reports with an underlying Poisson distribution with an offset of child population logged (see Appendix B for more information). CAR models generally model unknown parameters as distributions (Lawson et al., 2003). When estimating those parameters, the model is informed by both the data and any prior information (called priors) about the relationship between the independent and dependent variables. However, given that the relationship between redlining and CPS reports is largely unknown, we use non-informative (or vague) priors to model those distributions meaning the resulting point estimates will be similar to those found in frequentist analyses. The resulting information from the models estimate the posterior distribution. In our results, we provide the point estimate and the 95 % credible interval to ease interpretation. For individual variables, 95 % credible intervals that contain the value of '1' indicate that the findings are not well-supported. Further, the interpretation of *p*-values differs in CAR models, such that the *p*-value indicates the probability that the null hypothesis is true. This contrasts with frequentist statistics where the interpretation of the p-value is the likelihood of observing similar or more extreme data if the null hypothesis is true. Markov chain Monte Carlo simulation estimates posterior values for all variables. Inference was based on 50,000 MCMC samples obtained by running the chain for 100,000 samples and discarding 50,000 as the burn-in period. We then exponentiate model derived estimates to provide the relative risk.

Table 2
Bayesian conditionally autoregressive (CAR) models assessing relationship of HOLC grade and redlining score on allegations of child abuse and neglect (n = 1137).

Variable name	Model 1		Model 2	
	Relative risk	95 % credible interval	Relative risk	95 % credible interval
Intercept	0.024	(0.020, 0.029)*	0.014	(0.011, 0.018)*
Historical redlining score	1.216	(1.140, 1.288)*	1.073	(1.021, 1.136)*
Population density[a] *1000			0.998	(0.995, 1.001)
Percent Black residents			1.017	(1.012, 1.021)*
Percent Asian residents			1.003	(0.999, 1.006)
Percent Latinx residents			1.013	(1.010, 1.016)*
Residential instability[b]			1.004	(1.000, 1.008)
Concentrated disadvantage index[c]			1.031	(1.015, 1.047)*
Correlated (spatial) heterogeneity	2.175	(2.082, 2.277)	1.981	(1.900, 2.069)*

Relative risk provides information on whether the area has higher or lower exposure to the outcome variable.
Credible interval provides a probability that the population value of the measure falls within this range. Thus, for credible intervals excluding 1, there is a 95 % probability the population value is within the interval provided.
* Credible interval excludes 1, indicating relationship is well supported.
[a] Total population per area (in square miles).
[b] Percentage of individuals who moved in the last 12 months.
[c] Index with the following variables: percentage of families living below the federal poverty status in the last 12 months, the unemployment rate for the population 16 years and older, the percentage of female-headed households, and the percentage of families receiving public assistance (cash income or SNAP benefits).

3. Results

3.1. Descriptive and bivariate analyses

The mean historical redlining score was 3.00 ($SD = 0.81$). The average concentrated disadvantage index was 0.62 with significant variability, as indicated by the high standard deviation ($SD = 2.78$) and wide range of scores (−4.38–16.92). Approximately 14 % ($SD = 7.12$) of residents in each census tract had moved in the last 12 months. Census tracts on average received 52 reports of suspected maltreatment per 1000 children. See Table 1 for additional sample characteristics.

Bivariate results are presented in Appendix C. CPS reports was positively correlated with historical redlining score ($\tau_b = 0.256$, $p < .001$), concentrated disadvantage ($\tau_b = 0.589$, $p < .001$), percentage of African American/Black residents ($\tau_b = 0.198$, $p < .001$), percentage of Latinx residents ($\tau_b = 0.553$, $p < .001$), and population density ($\tau_b = 0.236$, $p < .001$). CPS reports were negatively correlated with percentage of Asian residents ($\tau_b = -0.334$, $p < .001$) and residential instability.

3.2. Bayesian model results

Table 2 presents the CAR models. In our unadjusted model (Model 1), each unit increase in redlining score is associated with a 21.6 % higher number of CPS reports. The adjusted model (Model 2) shows that the effect redlining is diminished when controlling for sociodemographic characteristics such that each unit increase in redlining score is related to a 7.3 % higher number of CPS reports. Each unit increase in concentrated disadvantage is related to a 3.1 % higher number of CPS reports. Each unit increase in African American/Black residents is related to a 1.7 more CPS reports. Each unit increase in Latinx residents is related to 1.3 more CPS reports. Effects related to population density, percent of Asian residents, and residential instability were not well-supported in our models. The correlated spatial heterogeneity was related to CPS reports which confirms the presence of spatial structure in the data and the need for spatial analysis techniques instead of traditional OLS regression.

4. Discussion

This study is among the first to our knowledge that examines the relationship between historical redlining and neighborhood reports of suspected child maltreatment. Consistent with our hypothesis, historically redlined neighborhoods had a higher number of CPS reports. In addition, neighborhoods with greater levels of concentrated disadvantaged, a higher percentage of African American/Black residents, and a higher percentage of Latinx residents also had a higher number of CPS reports.

Our findings are consistent with other studies that have found links between historical redlining and the present-day wellbeing of residents, including increased risk of adverse birth outcomes (Nardone et al., 2020) and higher rates of gun violence (Benns et al., 2020).

In general, redlined neighborhoods continue to have higher concentrations of minoritized groups and are more economically disadvantaged than other neighborhoods in the city (Mitchell & Franco, 2018). Neighborhood concentrated disadvantage has consistently been linked to greater risk of child maltreatment (Barboza-Salerno, 2020; Coulton et al., 2018; Klein, 2011; Marco et al., 2020). The harsh living conditions of disadvantaged neighborhoods can create toxic levels of stress among residents which has been associated with punitive and neglectful parenting behaviors (Guterman et al., 2009). Neighborhood disadvantage has also been

associated with mental health problems (Park et al., 2021) and intimate partner violence (Beyer et al., 2015) both of which are known risk factors for child maltreatment (Austin et al., 2020). It is important to emphasize that our study utilizes administrative data as a proxy for risk of child maltreatment and does not measure actual parenting behaviors. Thus, it is likely that our findings reflect patterns of differential reporting within neighborhoods (Maguire-Jack et al., 2021). Spatial stigma refers to the ways in which residents of disadvantaged neighborhoods are stereotyped because of neighborhood conditions (e.g., poverty, crime) that were created by structural racism and economic inequality (Keene & Padilla, 2014). Spatial stigma can potentially influence how residents are perceived and how incidents involving suspected child maltreatment are evaluated contributing to higher rates of reports. Research examining the role of stigma as a possible pathway linking neighborhood disadvantage to increase risk of contact with CPS is warranted.

Relatedly, neighborhoods with higher percentage of Black residents and neighborhoods with a higher percentage of Latinx residents had more CPS reports. This finding is consistent with some prior studies that have found associations between a greater concentration of Black and Latinx residents and higher rates of substantiated cases of child maltreatment and foster care placements within neighborhoods (Freisthler, 2004; Freisthler et al., 2005; Freisthler et al., 2007). Moreover, one study found that rates of child maltreatment rose in neighborhoods as the extreme segregation of Black Americans increased over time (Coulton et al., 2018). As previously discussed, due to structural racism in the housing market, Black and Latinx children inhabit neighborhoods with much lower opportunity (Acevedo-Garcia et al., 2020) and higher concentrated poverty (Reardon et al., 2015) than their White counterparts exposing their families to social adversity that can impact parenting while also raising concerns about race, class, and placed-based bias that can inform perceptions of risk.

4.1. Housing policy through a racial equity framework

Addressing the legacy of racist housing policies should be an integral part of strategies to prevent child maltreatment and rectify racial disparities in CPS contact. Historical redlining and other forms of de jure segregation has led to a cascade of negative impacts across various systems (e.g., education, healthcare, economic) and will require policy investments in all these sectors to reverse the harm to communities of color (Egede et al., 2023). Housing policy reforms with an emphasis on strategic racial equity should be a part of this multisector approach. A strategic racial equity framework emphasizes the need for transformative policies and practices that aim to ensure the full participation of groups who have historically been excluded from meaningful engagement in institutions, society, and our democracy (Garces & Gordon da Cruz, 2017). This framework attends to the interrelated dynamics among power, race, and identity, actively names and addresses hidden drivers of inequity, and generates power among marginalized communities of color (Garces & Gordon da Cruz, 2017). Housing reform through a racial equity lens should include place-based strategies to revitalize distressed neighborhoods, increase access to high opportunity neighborhoods, and raise homeownership rates for minoritized groups.

Place-based neighborhood revitalization programs incentivize public and private investments in distressed neighborhoods with the goal of improving housing, infrastructure, economic activity, and amenities (Neumark & Simpson, 2015; Turner et al., 2014). While these programs may raise property values and reduce neighborhood poverty, they can lead to gentrification and the displacement of low-income populations (Ghaffari et al., 2018). Gentrification occurs as economic, environmental, and social investments are made in distressed communities therefore raising property values and prompting more affluent residents to move-in while displacing minoritized and low-income populations due to the rising costs (Bhavsar et al., 2020). Gentrification is associated with greater economic change in historically redlined areas but also greater economic inequality within cities (Mitchell & Franco, 2018) and reduced homeownership rates among Blacks (Robertson et al., 2023). Residents have not had an active role in guiding plans for their communities and as a result they often do not benefit from neighborhood improvements as costs rise in revitalized neighborhoods (Ghaffari et al., 2018). Placed-based strategies should seek to involve residents in decision making to shift power differentials in these communities. Efforts should also be made to identify and build on community strengths. For example, the Partnership for Equitable and Resilient Communities (PERC) is a collaborative partnership between community, philanthropic, and government entities that advances racial equity and justice by shifting decision-making power and resources to Black, Indigenous, and Latinx people living in low-wealth, under-resourced communities (PERC, 2023). The PERC engages impacted communities in the decision-making process to ensure resources target equitable solutions by creating comprehensive community plans, layering funding streams across programs, and creating new pathways between community and government (PERC, 2023). The PERC initially launched in four cities with plans to expand to additional cities.

In addition, inclusionary zoning should be widely adopted to increase access to high opportunity neighborhoods. Inclusionary zoning requires developers to make a certain percentage of new residential units affordable to households with lower incomes (Jacobus, 2019). One study found that cities with more inclusionary laws had lower levels of poverty and unemployment and less frequent mental and physical distress (Jones et al., 2022). Efforts should also be made to limit restrictive zoning practices that privilege the construction of single-family homes and prohibits the construction of multifamily dwellings in higher income neighborhoods (Manville et al., 2020). Restrictive zoning has racist and classist history that reinforces patterns of income and racial segregation within neighborhoods and contributes to a lack of affordable housing options for low- and moderately-income families (An et al., 2019). Thus, addressing the ways in which zoning maintains inequality is critical for socially just housing reform.

Lastly, housing policy should include strategies to increase homeownership rates among people of color. There are persistent racial disparities in rates of homeownership with little progress since the implementation of the Fair Housing Act of 1968. The homeownership rate is nearly 72 % for White households but about 43 % for Black households and 50 % for Latinx households (Snowden & Evangelou, 2022). Homeownership reduces residential instability that negatively impacts children's health and wellbeing (Clair, 2019) and helps families build wealth across generations (Rostad et al., 2019). A shared-equity homeownership (SEH) model is an

alternative to traditional homeownership in which the resale of a home is restricted to limit the amount of appreciation to preserve the long-term affordability of the home (Perkins et al., 2020). Oversight of these programs is typically provided by nonprofit organizations, or a public entity and the sale price is generally below market value with public or philanthropic funding making up the difference (Perkins et al., 2020). While there are still relatively few SEH programs due to lack of funding, evidence suggests that SEH models would give access to homeownership for millions of households for whom homeownership is currently out of reach due to financial barriers (Perkins et al., 2020). Despite the limitations placed on the amount of home equity accrued, residents still build assets through program participation (Jacobus & Davis, 2010) and are often able to access higher opportunity neighborhoods when exiting the program (Ramiller et al., 2022). Other important strategies include efforts to increase equitable access to credit and down payment assistance programs (McCargo et al., 2019). The housing policies described herein should be considered along with economic relief policies that help alleviate poverty and have shown promise in reducing CPS reports, such as expanding the Earned Income Tax Credit (Kovski et al., 2022) and increasing to the minimum wage (Raissian & Bullinger, 2017).

4.2. Limitations and future directions for research

We acknowledge several limitations of this study. First, our analyses are cross sectional and thus causation cannot be inferred from the findings. Second, the dependent variable in our study is all CPS reports received by CPS agencies in Los Angeles County. We are unable to identify cases that were screened out or unsubstantiated. Third, like other neighborhood-level research, this study utilizes summative statistics that masks individual and family level differences increasing the possibility of aggregation effects. In addition, it has been argued that self-selection into a neighborhood is indicative of an individual's choice to live in a certain neighborhood due to individual attributes rather than neighborhood factors which introduces the threat of selection bias in neighborhood level research (Coulton et al., 2007; Freisthler et al., 2006). However, housing choice is often limited by discrimination within the U.S. housing market (Korver-Glenn, 2018) that restricts neighborhood choice for minoritized groups. Lastly, any spatial interaction occurring within a spatial unit like a census tract may extend beyond its boundaries (Gao et al., 2017) and our analyses do not account for people traveling beyond neighborhood boundaries in their daily social interactions.

Despite these limitations, this study adds to our understanding of how the legacy of state-sanctioned housing discrimination continues to influence the present-day experiences of children and families. This study should be replicated using more recent CPS data across additional geographic locations to increase confidence in these findings. Since children from minoritized groups often experience vastly different neighborhood environments than their White counterparts, future neighborhood-level studies should disaggregate samples into same-race groups to assess how exposure to various social and economic conditions may impact the risk for child maltreatment differently across racial groups (Jones et al., 2023). In addition, future research should utilize different outcome measures such as substantiated cases of child maltreatment or entries to foster care. Future studies should also incorporate other housing variables such as measures of zoning practices to model the impact of inequitable housing policies on children and families. Lastly, future studies should explore alternative theoretical frameworks to inform our understanding of how neighborhood disadvantage contributes to elevated risk of contact with CPS.

CRediT authorship contribution statement

Tenesha Littleton: Writing – review & editing, Writing – original draft, Methodology, Formal analysis, Data curation, Conceptualization. **Bridget Freisthler:** Writing – review & editing, Writing – original draft, Methodology, Formal analysis, Data curation. **Reiko Boyd:** Writing – review & editing, Writing – original draft. **Angela M. Smith:** Writing – review & editing, Writing – original draft. **Gia Barboza-Salerno:** Writing – review & editing, Methodology.

Declaration of competing interest

None.

Data availability

The data that has been used is confidential.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.chiabu.2024.107011.

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