



## Examining Child Maltreatment Reports Using Linked County-Level Data

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## Introduction

This appendix presents an overview of the UA-SSW project, conducted as part of the CMI Data Linkages work. The site team wrote the appendix, although the Mathematica team worked with the site to ensure consistency in information, level of detail, and presentation across sites.

### Overview

This project focused on understanding how risk and protective factors relate to child maltreatment reports at the county level across the nation. In previous studies, researchers have assessed county-level racial disparities in child welfare involvement—for example, Maguire-Jack et al. (2015) and Putnam-Hornstein et al. (2013)—but additional research is needed to explain widely varying state- and county-level maltreatment rates.

This study builds on earlier work (Smith et al. 2018), expanding it to a national level, and incorporates counties with fewer than 1,000 child maltreatment reports, which could offer new insights about rural counties and reveal new regional or state patterns. The site team continues to work on developing valid ways to measure county-level risk of child maltreatment.

### Partnership history

No formal partnerships were needed to access the data used in the project. A university professor and graduate students from the University of Alabama’s School of Social Work formed the research team. Data were publicly accessible (for example, from the U. S. Census Bureau or U.S. Departments of Labor or Agriculture) or were available upon request from the National Data Archives on Child Abuse and Neglect (NDACAN). No formal partnership existed between the research team and NDACAN, although the professor had previously used data housed at NDACAN.

### Background

Previous research (Smith et al. 2017) focused on larger counties in the U.S. South, examining the association between (1) county-level child maltreatment risk and protective factors and (2) county-level child maltreatment reports and victimization rates. This project extended that work and addressed the previous study’s research questions nationally with all counties, which offers new insights about rural counties and reveals new regional or state patterns. The site team also worked to develop new ways to operationalize county-level child maltreatment risk.

New measures included factors shown to be associated with child maltreatment at the community level, including rates of child poverty, single parenthood, unemployment, food insecurity, access to health care, and other county-level characteristics. Finally, the project provided an opportunity to assess the characteristics of counties in which the risk factors for child maltreatment do not coincide with rates of child maltreatment reports. For example, some counties with high rates of child poverty and solo parenthood – two critical child maltreatment risk factors – have very low rates of child maltreatment reports and victimization. Likewise, some counties with comparatively low child maltreatment risk factors have high maltreatment and victimization rates. In addition, the site team recognized that the community causal mechanisms that influence parental behavior (that is, actual maltreatment) might differ from those that influence the reporting of maltreatment. The reports are likely affected by community

members' definitions, observations, and decisions to report, which may be distinct from maltreatment behaviors (Coulton et al. 2007).

## Research Questions

The site team posed four research questions.

1. How closely are county-level risk factors for child maltreatment associated with county-level rates of child maltreatment reports and victimization? Do counties having comparatively high risk factors for child maltreatment also have high maltreatment report rates?
2. What distinguishes counties with high risk factors for child maltreatment but low report rates, and vice versa? (Demographic characteristics? Protective factors, such as comparatively high rates of social association, primary health care providers, or mental health care providers)?
3. Throughout the U.S., how do child maltreatment risk factors and report rates in rural counties with majority populations of color compare with the risk factors and report rates in (a) nonrural counties with majority populations of color, (b) rural counties that are majority White, and (c) nonrural counties that are majority White?
4. In counties that have higher risk factors for child maltreatment but lower child maltreatment report rates than other counties in the same regions:
  - a. How do county-level report rates vary by report source? In counties with higher risk factors but lower report rates than in comparison counties, are the report rates lower among professionals, nonprofessionals, or both?
  - b. How do county-level report rates vary by the race of the child subject? That is, what is the county-level racial composition of child maltreatment report and victimization rates for all counties in the relevant regions, including rural counties?
  - c. How do county-level report rates vary by report type? That is, what is the county-level distribution of the most severe allegation type for all counties in relevant regions, including rural counties?

Owing to issues with data access, the team was unable to address Question 4.

## Data

### Sources

Most of the data used for this project are publicly available, such as data from the U.S. census (Table E.1). The county-level data on child maltreatment comes from the National Child Abuse and Neglect Data System (NCANDS), which is housed at NDACAN. Researchers may request data from NCANDS data at the child level and aggregate to the county level using county-level identifiers. However, the county-level identifiers are not available on child level data for counties with fewer than 1,000 reports (about 78 percent of U.S. counties). The site team requested a number of variables aggregated to the county level for all counties. The site team received number of reports, number of children in reports, number of substantiated reports, and number of child victims from 2021 through 2015 aggregated at the county level. NDACAN would not release even county-level aggregates of report source or maltreatment types for all counties. NDACAN declined our request because HHS policies prohibit sharing any data (even aggregated data) from counties with fewer than 1,000 reports.

**Table E.1. Data sources**

Data source	Description of records and sample
NCANDS	(1) number of reports; (2) number of substantiated reports; (3) number of children in the reports; and (4) number of child victims for all U.S. counties, including rural counties (2012 – 2015)
U.S. Census	Percentage rural: Percentage of the county defined as rural by the U.S. census
U.S. Census, Small Area Income and Poverty Estimates	Child poverty rate: County-level child poverty rate for 2012 through 2015
U.S. Census, American Community Survey	Single-Parent Household Rate: Percentage of children living in a household headed by a single parent, by county (2008 to 2012) and aggregate estimates (2011 to 2015)
U.S. Bureau of Labor Statistics	Unemployment Rate: Percentage of population ages 16 and older unemployed but seeking work, by county
U.S. Department of Agriculture survey distributed by Map the Meal Gap, a program of Feeding America	Food Insecurity Rate: Percentage of the population estimated to be food insecure based on responses to a survey distributed by the U.S. Department of Agriculture
Small Area Health Insurance Estimates	Adult Uninsured Rate: Percentage of adults under age 65 without health insurance
Centers for Disease Control and Prevention’s WONDER mortality data	Injury Death Rate: Number of deaths as a result of injury per 100,000 people
National Center for Health Statistics natality files	Low Birth Weight Rate: Percentage of births under 2,500 grams Teen Birth Rate: The birth rate for 1,000 women ages 15 to 19
County Business Patterns	Social Association Rate: Number of membership organizations per 10,000 people; membership organizations include labor, professional, recreational, religious, and civic organizations
Area Health Resources File from the American Medical Association and the Health Resources and Services Administration	Primary Care Physician Rate: Number of primary care physicians per 100,000 people
Centers for Medicare & Medicaid Services Provider Identification File	Mental Health Provider Rate: Number of mental health providers per 100,000 people
Behavioral Risk Factor Surveillance System	Adult Current Smokers Rate: Percentage of adult smokers Excessive Drinking Rate: Percentage of adults who report binge or heavy drinking
Child Welfare Information Gateway	State Universal Reporting Law: State has a universal child maltreatment reporting law

Source: Project documents.

A primary concern for this project was identifying counties for which the population is too small to reliably assess county-level child maltreatment report and victimization rates. A small number of U.S. counties have populations so low that a rate per 1,000 children is subject to vast fluctuation with a change of only one or two reports. In each of the four years, we excluded about 150 to 200 such counties nationwide. We also assessed report rates and victimization rates and excluded a small number of counties with outlier rates (i.e., report rates of greater than 150 per 1,000 or victimization rates greater than 70 per 1,000). The total number of counties excluded per year because of small populations or outlier

rates was 207 in 2012, 202 in 2013, 151 in 2014, and 167 in 2015. Nearly all of the counties excluded were the very small population counties. The project’s findings do not apply to counties with population less than 1,000.

Another data concern involved assessing the extent of missing data. Although most data sources have data for every county, a small number are missing data for some counties. These tend to be data elements (such as the primary physician rate or mental health provider rate) that are calculated per 100,000 people and cannot be reliably calculated for counties with very small populations. Such data elements were less helpful than others for understanding risks in rural counties.

We assessed the extent of missing data by conducting a descriptive analysis of all variables. Because variables with larger percentages of missing data (such as the primary physician rate) were not critical to our main research questions or analysis, the missing data were not a problem for the analysis. We were able to address our study aims and answer Research Questions 1 through 3 with data from all counties.

### Linking process

We linked data using the Federal Information Processing Standard (FIPS) code assigned to each U.S. county or county equivalent. We linked state-level data using a state code only (Table E.2).

Unlike some probabilistic linking processes, the FIPS code provided a high quality and accurate method for linking data. Any errors, such as a mis-specified FIPS code, were easily to identify by an error code or warning message in the linking process.

**Table E.2. Methods for linking data**

Data source	Variables used to link data	Linkage approach
NCANDS	FIPS code	Simple merge on key variable
Census and all other county-level variables	FIPS code	Simple merge on key variable
Census and all other state-level variables	State code	Simple merge on key variable

Source: Project documents.

### Analytic Methods

The site team used descriptive statistics and multilevel regression models to address all research questions. We used the multilevel models to account for the fact that counties are nested within states, and therefore there is dependence between counties in the same state. (Dependency means that counties in the same state are more alike one another than counties in other states.)

We conducted the regression models to assess associations of a range of independent variables with the county-level maltreatment report rate. For most of our analyses, the dependent variable was the county-level child maltreatment investigated report rate, or the number of investigated reports per 1,000 children in a county. In some analyses, the dependent variable was the county-level child victimization rate, or the number of child victims per 1,000 children in a county. Key independent variables at the county level included continuous measures of the child poverty rate; percentage rural; and percentages Black, White, and Latinx. State-level variables included the child welfare worker/child ratio and an indicator of Medicaid accessibility. The independent variable social association rate was defined as the number of membership organizations (such as religious, labor, and political organizations) per 10,000 county

residents. Because counties are nested in states, we conducted multilevel regression models with random intercepts.

## Findings

### Research Question 1

1. How closely are county-level risk factors for child maltreatment associated with county-level child rates of maltreatment report and victimization rates? Do counties having comparatively high risk factors for child maltreatment also have high maltreatment report rates?

To answer Question 1, we investigated the role of social association as a protective factor for child maltreatment at the county level. We examined whether social association was linked to child maltreatment reports and whether this relationship differed in rural versus nonrural counties. Additional work related to county-level risk and protective indices is ongoing.

At a bivariate level, there was a weak negative association between the maltreatment report rate and the social association rate ( $r = -.07$ ,  $p < .01$ ). In multilevel models accounting for child poverty, demographics, and Medicaid expansion status, the social association rate retained a negative association with child maltreatment reports. When we included county rurality status in the model, however, the association was suppressed, pointing to an interaction effect. Models run separately for rural and nonrural counties illustrated that the social association rate retained a strong negative association with child maltreatment reporting in rural counties but had a positive association in nonrural counties.

General patterns differed in rural and nonrural counties, suggesting that the role of social association could differ in different community contexts. In rural counties, as opportunities for social association went up, maltreatment report rates went down, suggesting a protective effect from membership organizations and perhaps reflecting enhanced bonds of social trust (Putnam 2000). But in nonrural counties, as opportunities for social association went up, so did maltreatment report rates. In more densely populated areas, opportunities for social association might promote more observation and formal support for struggling families (Klinenberg 2002), resulting in more maltreatment reports. Hence, social association could have different protective functions in different types of communities. (Additional findings for this research question are forthcoming.)

### Research Questions 2 and 3

2. What distinguishes counties with high risk factors for child maltreatment but low report rates, and vice versa? (Demographic characteristics? Protective factors, such as comparatively high rates of social association, primary health care providers, or mental health care providers)?
3. Throughout the U.S., how do risk factors and report rates for child maltreatment in rural counties with majority populations of color compare with the risk factors and report rates in (a) nonrural counties with majority populations of color, (b) rural counties that are majority White, (c) nonrural counties that are majority White?

Research Questions 2 and 3 address the relationship between county-level child maltreatment reports and demographic and other county-level characteristics. The county-level child maltreatment report rate ranged from less than 1/1,000 children to over 119/1,000 children. Of all counties, 9.6 percent have majority populations of color, and 58.8 percent are majority rural. In 2015, of county types based on

rurality and race/ethnicity, rural counties that were majority Black ( $n = 59$ ) had the highest mean rate of child poverty (43 percent in 2015) but the lowest mean child maltreatment report rate (26/1,000 in 2015).

Post-hoc analysis showed that the maltreatment report rate in rural, majority Black counties differed from the maltreatment report rate in rural, majority White counties at a statistically significant level. Rural majority Latinx counties ( $n = 23$ ) also had a higher mean rate of child poverty (31 percent in 2015) and lower rate of child maltreatment reports (32/1,000 in 2015) compared with rural, majority White counties (24 percent and 39/1,000 in 2015). The same patterns were evident in all four years, 2012 through 2015.

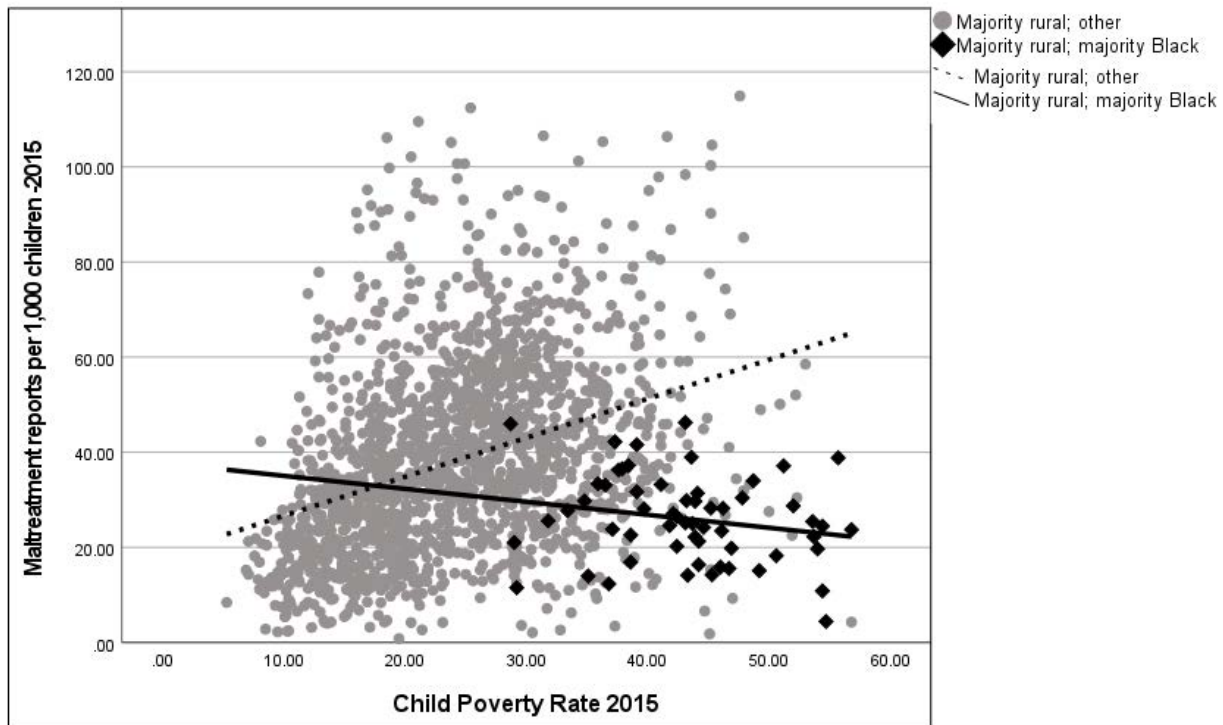
Consistent with previous research, in all rural counties, child maltreatment report rates were positively associated with child poverty. But this pattern did not apply to the small number of rural counties with majority populations of color, where child maltreatment report rates were negatively associated with child poverty. In multilevel models accounting for child poverty, majority rural counties and counties with majority populations of color generally had lower maltreatment report rates than other counties. An interaction term showed that maltreatment report rates were even lower in rural counties with majority populations of color.

We conducted a subsequent analysis to rule out the possibility that the results reflected (1) regional reporting differences rather than differences based on the racial/ethnic composition of rural counties and (2) an effect primarily driven by one racial/ethnic group rather than by populations of color generally. To test whether the results reflected lower report rates in states that also happened to have the most rural counties with majority populations of color, we repeated the analysis among southern states only, as southern states contain most rural counties with majority populations of color. Among six southern states (Alabama, Georgia, Louisiana, Mississippi, North Carolina, and South Carolina), maltreatment report rates were lower among rural counties with majority populations of color than among rural counties with majority White populations (27.9 vs. 38.5,  $t = -9.1$ ,  $p < .01$ ). Hence—although southern states contain most rural counties with majority populations of color, and maltreatment reporting tends to be lower in the South than in other U.S. regions—the lower report rates we found in U.S. rural counties with majority populations of color were not simply a result of lower report rates in the region.

We then tested whether a particular racial/ethnic group was driving the negative association between child maltreatment reports and child poverty in rural counties with majority populations of color. To do this, we conducted separate regression plots in rural counties to compare the race/ethnic-specific relationship between the child maltreatment report rate and child poverty. The negative relationship seen for all rural counties with majority populations of color was mainly driven by rural counties with majority Black populations, where the association between child poverty and maltreatment report rates was negative, albeit not statistically significant ( $r = -.21$ ,  $p = .12$ ) (Figure E.1). Among rural counties with majority Latinx populations, the relationship between the child maltreatment report rate and child poverty was positive and strong ( $r = .47$ ,  $p = .03$ ), as in rural counties with majority White populations. In counties with majority populations of color in which no single race/ethnic group constitutes a majority, child poverty was unrelated to the maltreatment report rate ( $r = .009$ ,  $p = .97$ ). The research team obtained similar findings from analyses conducted for years 2012 through 2015.



**Figure E.1. Association between child poverty and child maltreatment report rates in counties that are majority rural and majority Black vs. other counties, 2015**



Consistent with our previous findings focusing only on the U.S. South, the national data we analyzed revealed surprising patterns of child maltreatment reporting in rural counties with majority populations of color. We were fortunate to have access to data on child maltreatment reporting from all U.S. counties, including rural counties. To our knowledge, our work for the project was the first national child maltreatment study to disentangle county rurality from racial/ethnic composition by specifically investigating rural counties with majority populations of color.

We found that, compared with rural, majority White counties, rural counties with majority populations of color tended to have higher rates of child poverty but lower child maltreatment report rates. In addition, these counties did not have a positive relationship between child poverty and child maltreatment report rates, as seen in most counties and commonly found in previous studies. In the comparatively small number of rural counties with majority populations of color, as poverty rates went up, child maltreatment report rates went down. This negative relationship appeared to be primarily driven by low report rates in rural counties with majority Black populations.

As with most U.S. counties, in rural counties with majority Latinx populations, we found a strong positive association between child poverty and child maltreatment reporting. But child poverty rates were higher and child maltreatment reporting was lower in rural, majority Latinx counties compared with rural, majority White counties.

Our project adds to the literature on the complex and sometimes paradoxical relationships between child poverty, race/ethnicity, and child maltreatment at the community level. As with other recent U.S. studies (Wulczyn et al. 2013; Maguire-Jack et al. 2020), the project’s findings indicate that simple conclusions about the relationship between community poverty, racial/ethnic composition, and child maltreatment may not apply for some child welfare indicators, or in some areas where higher rates of child poverty do

not coincide with higher rates of child maltreatment or other child welfare involvement. The findings are also consistent with those of studies from other countries, which have shown surprisingly low levels of child welfare intervention in high-poverty, marginalized, or racial/ethnic minority communities (Bywaters et al. 2016; Sulimani-Aidan and Benbenishty 2013). Our findings make a case for avoiding assumptions about the level of child welfare involvement based on a community's demographic characteristics.

Besides revealing lower rates of child maltreatment reports in rural counties with majority populations of color, our project points to the distinction between child maltreatment investigated report rates and the incidence of child maltreatment. Although it is well-known that official maltreatment report rates do not reflect all child maltreatment, more research is needed on how child maltreatment comes to the attention of state authorities. Many studies have addressed racial/ethnic and urban/rural differences in trust in the police and crime reporting (for example, Burgason 2017; Desmond et al. 2016; Hamm et al. 2017; Kocheil 2019), but few researchers have investigated how racial/ethnic composition or other community characteristics relate to confidence in child welfare authorities or hotlines for reporting child maltreatment. Future research should help distinguish the community characteristics that increase or reduce risks for child maltreatment from the characteristics that increase or reduce the reporting and investigation of maltreatment.

## Next Steps

This project raised new questions about the child welfare response to communities of color. Black children are disproportionately represented in maltreatment reports and have greater exposure to maltreatment risk factors (Drake and Jonson-Reid 2011; Kim et al. 2017; Putnam-Hornstein et al. 2013; Wildeman et al. 2014). And many communities of color, including those with majority Black populations, have high levels of child welfare intervention (Fong 2019; Roberts 2008), prompting justified concern about invasive and authoritative overinvolvement of state agents. But what does it mean that this disproportionate level of intervention in communities of color is not evident in the smaller number of rural counties with majority populations of color, most notably in rural counties that are majority Black?

We hope these findings will not be interpreted as making a case for unnecessary intervention or more formal investigative oversight in high-poverty rural counties, but as raising questions about overlooked inequities and associated service gaps.

## Lessons Learned About Administrative Data-Linkage Practices Related to Examining the Incidence and Risk of Child Maltreatment

Our project differed from the other CMI Data Linkage projects in its use of county-level rather than case-level linkages. Perhaps an important lesson is that there is still much to learn from comparing child maltreatment responses at the county and state levels. We began the project after examining the state Kids Count data map and noticing surprising patterns, such as apparently low maltreatment report rates in counties with high levels of need. Although probabilistic data linkages at the child level are complex and exceed the resources and capacity of many child welfare researchers and administrators, much can be learned from fairly simple county-level data linkages that many could conduct. It takes time to track down county-level data from various public sources, but the linkages are straightforward. Child welfare administrative data linked to publicly available data can be used more extensively to illuminate and inform child welfare practice. Analyses involving comparisons between counties and states can inform and improve child welfare services and policy.

Many of the project’s accomplishments are described in the “Findings” section. We are excited about those contributions from this project. Most important, the analyses conducted for the project revealed a previously overlooked pattern in the formal child welfare response to rural counties with majority populations of color.

We encountered two primary challenges. First, NDACAN was not able to release even county-level aggregates of report source or maltreatment types for all counties. The request was declined due to policies set by HHS that prohibit sharing any data (even aggregated data) from counties with fewer than 1,000 reports. Therefore, we were able to replicate our findings over four years, however we were unable to confirm that the patterns identified from 2012 through 2015 continued. Furthermore, without county-level data on report sources, we could not address Research Question 4, which pertains to explaining the results identified in response to Question 3. One consideration stemming from this project is potentially having NDACAN allow for aggregated, county-level data on select variables from all U.S. counties available to more researchers.

The second challenge related to our organizational capacity. PI time was limited because of university administrative responsibilities, which increased as a result of the COVID-19 pandemic. The PI was therefore not able to devote time to data analysis during much of 2020, and work on Research Question 1 was delayed. The site team will conduct additional data analyses to answer Research Question 1 in summer 2021.

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