

## APSAC Research-to-Practice Brief

**Study Title:** Connecting Child Maltreatment Risk with Crime and Neighborhood Disadvantage Across Time and Place: A Bayesian Spatio-temporal Analysis

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### **Introduction:**

Previous research has found that neighborhood social disadvantage, including economic deprivation, residential mobility and crime, are structural factors associated with child maltreatment risk. The present study examined the relationship between child maltreatment and several structural determinants of the social environment from 2008 – 2016 across zip codes in Davidson County, Tennessee. The novelty of this study lies with its use of Bayesian space-time modeling – a statistical technique designed to uncover the spatial and temporal dimensions of phenomena – to child maltreatment risk. Bayesian space-time modeling can identify areas with stable high or low risk, or areas with increasing or decreasing risk, over time and be used to assess the effectiveness of prevention and intervention programs.

### **Research Questions/Hypotheses:**

The research question was whether there is an association between structural disadvantage including poverty, vacant housing, unemployment and crime, and child maltreatment risk controlling for the impact of space and time. The authors hypothesized that higher percentage of families living in poverty, higher unemployment, and higher percentage of vacant housing would be associated with higher overall rates of substantiated child maltreatment as well as maltreatment subtypes (i.e., child sexual abuse, child physical abuse, child neglect) over time. Rates of criminal offenses were also hypothesized to predict child maltreatment risk above and beyond indicators of neighborhood disadvantage. Finally, the authors hypothesized that a positive relationship between crimes rates and rates of substantiated child maltreatment, overall and by type, would exist controlling for neighborhood disadvantage.

### **Study Sample/Setting:**

Data on victims who were substantiated for child maltreatment between the ages of 0 – 18 from the years 2008 – 2016 were obtained from the State of Tennessee Department of

Children's Services and aggregated for each year across thirty-one zip codes in Davidson County. Primary outcomes included overall maltreatment<sup>1</sup>, child sexual abuse, child physical abuse and child neglect.

**Findings:**

The authors found that overall rates of substantiated child abuse and neglect in Davidson County, Tennessee, fell from 7.3 children per 1,000 in 2008 to 4.3 children per 1,000 in 2016. The spatial analysis revealed common patterns across child maltreatment types with areas of higher relative risk of substantiated child maltreatment located at the center and western parts of the county. The authors noted differences between child maltreatment types, however. Child physical and sexual abuse risk was found to be higher and more concentrated in the central area of the county, whereas child neglect risk was higher in the central and western areas of the county. Despite the overall decrease in maltreatment over time across the county, the number of zip codes deemed 'high risk' increased over the time period. Zip codes with higher percentages of families living in poverty were at higher risk for all maltreatment subtypes whereas vacant housing, unemployment and crime, were only associated with specific subtypes. More specifically, (1) zip codes with higher percentages of vacant housing were at higher risk for child sexual abuse and neglect but not for child physical abuse; (2) zip codes with higher unemployment rates were at increased risk for child neglect but not for child physical or sexual abuse; and (3) zip codes with higher crime rates were at greater risk for overall maltreatment, child sexual abuse and physical abuse.

**Recommendation:**

The study findings translate into several policy recommendations aimed at reducing and/or preventing substantiated child maltreatment risk. First, targeting high poverty areas with community-level prevention efforts could help to reduce overall risk for substantiated child maltreatment. Second, investing in programs that address vacant housing, such as vacant lot greening programs could be targeted to zip codes experiencing high and/or increasing relative risk for substantiated child sexual abuse or neglect. Third, programs addressing unemployment could be selectively implemented in zip codes experiencing high and/or increasing relative risk for substantiated child neglect. Finally, monitoring spatio-temporal patterns in annual crime report data can help identify zip codes at high and/or increasing relative risk for child sexual or physical abuse.

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<sup>1</sup> Overall child maltreatment included sexual abuse, physical abuse, psychological harm, abandonment, abuse-related deaths, drug-exposed child, drug-exposed infant, educational neglect, environmental neglect, lack of supervision, medical maltreatment, neglect-related death, and nutritional neglect.

**Bottom Line:**

The present study identified distinct patterns of associations among disadvantage indicators and risk for child physical abuse, sexual abuse, and neglect. Bayesian spatio-temporal models can help to identify areas where risk for substantiated maltreatment subtypes is increasing as well as potentially malleable environmental factors contributing to increasing risk. Interventions addressing community-level risk factors in areas with higher risk of child maltreatment may spillover to neighboring areas.

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**About the Research-to-Practice Brief Author**

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