State Spending on Public Benefit Programs and Child Maltreatment

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abstract

BACKGROUND: To determine the association between states' total spending on benefit programs and child maltreatment outcomes.

METHODS: This was an ecological study of all US states during federal fiscal years 2010–2017. The primary predictor was states' total annual spending on local, state, and federal benefit programs per person living ≤100% federal poverty limit, which was the sum of (1) cash, housing, and in-kind assistance, (2) housing infrastructure, (3) child care assistance, (4) refundable Earned Income Tax Credit, and (5) Medical Assistance Programs. The main outcomes were rates of maltreatment reporting, substantiations, foster care placements, and fatalities after adjustment for relevant confounders. Generalized estimating equations adjusted for federal spending and estimated adjusted incidence rate ratios (IRRs) and 95% confidence intervals (CIs).

RESULTS: States' total spending was inversely associated with all maltreatment outcomes. For each additional $1000 states spent on benefit programs per person living in poverty, there was an associated −4.3% (adjusted IRR: 0.9573 [95% CI: 0.9486 to 0.9661]) difference in reporting, −4.0% (adjusted IRR: 0.903 [95% CI: 0.9534 to 0.9672]) difference in substantiations, −2.1% (adjusted IRR: 0.9795 [95% CI: 0.9759 to 0.9832]) difference in foster care placements, and −7.7% (adjusted IRR: 0.9229 [95% CI: 0.9128 to 0.9330]) difference in fatalities. In 2017, extrapolating $1000 of additional spending for each person living in poverty ($46.5 billion nationally, or 13.3% increase) might have resulted in 181 850 fewer reports, 28 575 fewer substantiations, 4168 fewer foster care placements, and 130 fewer fatalities.

CONCLUSIONS: State spending on benefit programs was associated with reductions in child maltreatment, which might offset some benefit program costs.

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WHAT'S KNOWN ON THIS SUBJECT: Poverty is believed to contribute substantially to child maltreatment, with individual benefit programs being linked to reductions in maltreatment. An assessment of the relationship between states' cumulative spending on benefit programs and maltreatment may inform policy decision-making.

WHAT THIS STUDY ADDS: States' spending on benefit programs was associated with decreases in child maltreatment reporting, substantiations, foster care placements, and fatalities. The economic burdens associated with potentially prevented maltreatment may partially offset some benefit program costs.

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Child maltreatment is a prevalent and costly public health problem. In the US in 2018, ~3.5 million children received an investigation for suspected maltreatment, 678 000 children were substantiated as victims, 207 000 children received foster care services, and 1770 children died as a result of maltreatment.[1] The lifetime economic burdens associated with only 1 year of maltreatment have been estimated at $2.96 trillion.[2,3] Despite these burdens, few individual-level prevention modalities have proven effective.[4–6]

Strengthening families' economic well-being through a public health model has been considered an essential and effective strategy toward preventing child maltreatment.[7–9] Modest improvements in families' economic well-being, either through increases in income, fewer material hardships, or decreases in out-of-pocket expenses, have frequently been shown to decrease rates of child welfare involvement[10–12] and substantiated maltreatment.[12–14] Individual benefit programs that have been linked to reductions in maltreatment have been the refundable Earned Income Tax Credit (EITC),[15–17] Medicaid expansion,[18] Temporary Assistance for Needy Families (TANF),[10,14,19] and other welfare benefits and policies.[11–13,20] However, previous investigations of individual programs may not capture the full scope of states' investments in providing economic supports for poor and near-poor families, potentially underestimating the relationship between benefit programs and reductions in maltreatment.

States' spending on public benefit programs, more so than federal, may be of particular relevance for the prevention of maltreatment (as well as other economic-sensitive outcomes). Whereas federal expenditures are principally, but not exclusively, distributed based on calculations of need, levels of state spending are more often dependent on policy, allowing for greater interstate variability in state spending compared with federal. State spending also represents a significant sum, even when compared with federal spending. Finally, changing state policies may be more readily achievable than federal.

A better understanding of the association between states' cumulative spending on benefit programs and rates of child maltreatment would provide evidence regarding benefit programs as a population-level prevention modality, provide a key input into cost-effectiveness estimates for states' investments, and inform policy decision-making. In this study, our primary objective was to determine the state-level associations between states' spending on public benefit programs with rates of child maltreatment known to the child protection system: reporting, substantiations, foster care placements, and fatalities.

METHODS

This was an ecological study of all US states and the District of Columbia during federal fiscal years 2010–2017 (ie, October 1, 2009, through September 30, 2017), excluding Oregon in 2010 and 2011 because of missing maltreatment reporting data. The unit of analysis was state-year observations. The Office of Research Integrity at Children's Mercy Kansas City deemed our study as involving deidentified data and exempt from institutional board review.

Outcome Variable

Our primary outcomes were risk-adjusted rates of maltreatment known to the child protection system: reporting (ie, referrals to child protective services screened-in for investigation), substantiations (ie, reports in which children were deemed victims of maltreatment), foster care placements, and maltreatment-related fatalities among children aged <18 years. For maltreatment reports, we examined reporting overall and individually for physical abuse, neglect, and sexual abuse. Data for maltreatment reporting, substantiations, and foster care were sourced from the National Child Abuse and Neglect Data System Child Files.[21] Counts of fatalities were sourced from the annual *Child Maltreatment* reports (Department of Health and Human Services, Administration for Children and Families).[22] Population estimates for children were obtained from the American Community Survey (US Census).

Confounding Variables for Adjustment of Maltreatment Outcomes

We adjusted states' maltreatment rates for confounding variables selected a priori: childhood poverty, states' Medicaid expansion status, US Census Division, unemployment rate, teenager birth rate, and the percentages of adults with illicit drug use disorder, adults with alcohol use disorder, adults with a serious mental illness, single mother households, adult educational attainment, and foreign-born population. Historically, some racial and ethnic minorities of children have been disproportionately involved with the child protection system. Therefore, we felt it prudent to also adjust for race and ethnicity demographics. These data were obtained from the American Community Survey (US Census Bureau) and the National Survey on Drug Use and Health (Substance Abuse and Mental Health Services Administration).[23]

Predictor Variable

Our primary predictor was states' total spending on benefit programs per person living below the federal poverty limit (FPL) and was the sum of spending on (1) cash, housing, and in-kind assistance; (2) low-income housing infrastructure development; (3) child care assistance; (4) refundable EITC; and (5) Medical Assistance Programs (MAPs), inclusive of Medicaid and Children's Health Insurance Program. A full description of these categories of spending and their program sources are detailed in Supplemental Table 4. We aimed to capture state and local government spending on benefit programs that had the capacity to reduce poverty or material hardship, with an emphasis on programs with the largest absolute expenditures and expenditures that varied on a per beneficiary basis from state to state. We also captured total federal spending on the aforementioned benefit programs within each state-year (along with the Supplemental Nutrition Assistance Program)[24] to be used as a confounding variable for the association between state spending and maltreatment outcomes.

Expenditures were collected from 6 sources that contributed to the aforementioned 5 types of spending (Supplemental Table 4). The US Census Bureau's Annual Survey of State and Local Government Finances provided data for state and local spending, outside of federal programs.[25] Data for federal programs were obtained directly from program sources and included the Child Care and Development Fund (CCDF),[26] TANF,[27] SNAP,[28] and MAPs.[29] Data for refundable EITC were collected/calculated from the Internal Revenue Service and collected directly from some states' Departments of Revenue (California, Washington, DC, Minnesota, Wisconsin).[30]

Statistical Analysis

Medians and interquartile ranges (IQRs) described the state-year observations. Generalized estimating equations (GEEs) with repeated measures of years risk-adjusted each states' maltreatment counts using the aforementioned confounding variables. GEE models with repeated measures of years were again used to determine the associations between states' total spending on benefit programs and risk-adjusted maltreatment rates, with and without adjustment for total federal spending, providing incidence rate ratios (IRRs) with 95% confidence intervals (CIs) for increments of $1000 per person living in poverty. We constructed similar models for each category of spending, adjusting for federal spending within the same category. Negative binomial distributions were used in all GEE models given overdispersion of maltreatment counts.

We then extrapolated our federally adjusted IRRs to the 2017 data to estimate hypothetical reductions in maltreatment that might have been associated with states spending an additional $1000 on benefit programs per person in poverty (maltreatment counts in 2017 × (1 − IRR)). (Maltreatment counts from 2017 for these estimates were 4 258 772 occurrences of children being reported, 719 765 occurrences of children substantiated as victims, 203 298 foster care placements, and 1682 fatalities.) Cost-effectiveness ratios were then calculated as the absolute cost for all states to increase spending by $1000 per poor person divided by the counts of potentially prevented maltreatment outcomes. P values $<$ .05 were considered significant. Descriptive statistics were performed by using SPSS Version 24 (IBM SPSS Statistics, IBM Corporation) and all modeling was performed by using SAS 9.4 (SAS Institute, Inc. Cary, NC).

RESULTS

There were 406 state-year observations across the 8 study years (Table 1). In aggregate, there were 31 198 322 reports for suspected maltreatment, 5 322 401 substantiated reports, 1 526 189 foster care placements, and 12 558 maltreatment-related fatalities. In total, a median of $353.8 billion (IQR: $316.3–$374.2) was spent by states on benefit programs annually: $189.9 billion ($156.5–$203.7) on MAPs; $105.6 billion ($97.4–$110.5) on cash, housing, and in-kind assistance; $51.5 billion ($49.9–$53.6) on housing infrastructure; $4.9 billion ($4.7–$6.9) on child care assistance; and $2.9 billion ($2.7–$3.2) on refundable EITC. In total, a median of $7285 ($6585–$8368) per person living in poverty was spent by the states on benefit programs annually. Individual states' average annual spending per person living in poverty and spending by category are depicted in Fig 1.

Before adjusting for federal spending, states' total spending on benefit programs was indirectly associated with maltreatment reporting (neglect only), foster care placements, and fatalities (Table 2). Figure 2 depicts individual states' total annual spending in relation to their risk-adjusted rates of maltreatment outcomes.

After adjusting for federal spending, states' total spending on benefit programs was indirectly associated with all maltreatment outcomes (Table 2). Independent of population risk and federal spending, each additional $1000 spent by states on benefit programs per person living

TABLE 1 Characteristics of State-Year Observations From 2010 Through 2017 Federal Fiscal Years

Variable	State-Year Observations (n = 406)[a]
States' annual spending per person ≤100% FPL, $	
All categories of spending	6858 (4729–11089)
Cash, housing, and in-kind assistance	2438 (1343–3466)
Housing infrastructure	957 (645–1562)
Child care assistance	80 (45–162)
Refundable EITC[b]	0 (0–120)
MAPs	3369 (2396–5451)
Federal annual spending per person ≤100% FPL, $	
All categories of spending	9161 (7676–12048)
Cash, housing, and in-kind assistance	1556 (1360–1826)
Housing infrastructure	Not applicable
Child care assistance	141 (109–198)
Refundable EITC	1154 (1041–1301)
MAPs	6149 (4936–8931)
Race and ethnicity, %	
Black or African American	7.3 (2.9–15.1)
Hispanic	8.4 (4.3–12.3)
Non-Hispanic White	72.3 (58.4–82.2)
American Indian or Alaskan native	0.5 (0.3–1.1)
Asian American	2.4 (1.4–4.0)
Native Hawaiian or other Pacific Islander	0.05 (0.03–0.1)
Other	2.2 (1.1–4.0)
Children living ≤100% FPL, %	19.4 (15.4–24.0)
Adults with illicit drug use disorder in past year, %	2.6 (2.4–2.9)
Adults with alcohol use disorder, %	6.9 (6.1–7.6)
Adults with serious mental illness, %	4.3 (3.9–4.7)
Unemployment, %	7.1 (5.5–8.9)
Single mother households, %	6.7 (6.1–7.4)
Less than high school education, %	11.1 (9.2–14.1)
Foreign born, %	7.0 (4.4–13.5)
Teenager birth rate, per 1000 women 15–19 y	18.0 (13.0–14.1)
All maltreatment reporting per 1000 children	50.2 (37.9–67.6)
Neglect	31.1 (20.0–45.8)
Physical abuse	10.5 (7.8–14.3)
Sexual abuse	3.2 (1.9–5.0)
Other maltreatment	11.0 (1.6–19.6)
Substantiations per 1000 children	8.9 (5.3–13.1)
Foster care placements per 1000 children	2.8 (2.0–4.0)
Maltreatment-related fatalities per 100 000 children	1.9 (1.2–2.7)

Data are presented as median (IQR). FFY, federal fiscal year.
[a]All 50 States and the District of Columbia included for all 8 study years, excluding Oregon in 2010 and 2011 because of missing maltreatment report data.
[b]Median spending was $0 because of the majority of states not having their own refundable EITC.

in poverty was associated with −4.3% (95% CI: −3.4% to −5.1%) difference in all maltreatment reporting (including significant differences for neglect, physical abuse, and sexual abuse), −4.0% (95% CI: −3.3% to −4.7%) difference in substantiated reports, −2.1% (95% CI: −1.7%, to −2.4%) difference in foster care placements, and −7.7% (95% CI: −6.7% −8.7%) difference in fatalities.

Extrapolating these associations for the 2017 federal fiscal year suggested that an additional $1000 of state spending on the benefit programs included in this study per person living in poverty, a 13.3% increase for that year, would have cost $46.5 billion nationally, and might have been associated with 181 850 fewer reports for suspected maltreatment, 28 575 fewer children substantiated as victims of maltreatment, 4168 fewer children placed into foster care, and 130 fewer maltreatment-related fatalities. Cost-effectiveness ratios were $1.6 million per potentially prevented substantiation and $358 million per potentially prevented fatality.

After adjusting for federal spending within the same category, only spending on cash, housing, and in-kind assistance, child care assistance, and MAPs were associated with less maltreatment reporting and substantiations (Table 3). Housing infrastructure and refundable EITC were not associated with reporting but were directly associated with substantiations. All categories of spending were indirectly associated with fewer foster care placements and fatalities.

DISCUSSION

In this study of all 50 states and the District of Columbia during federal fiscal years 2010–2017, we found that states' spending on local, state, and federal public benefit programs, independent of federal spending, was associated with less child maltreatment reporting, substantiations, foster care placements, and fatalities. States' spending on MAPs, child care assistance, and cash, housing, and in-kind assistance were the categories of spending most consistently associated with differences in Child Protective Service measures of maltreatment. These findings appear to support state investments in benefit programs as a population-level modality for the prevention of child maltreatment. Our measured associations suggest that a 13.3% increase in state spending on benefit programs might hypothetically be related to ∼181 000 fewer reports for suspected maltreatment, 28 500 fewer children being substantiated as victims of maltreatment, 4100 fewer children requiring foster care, and 130 fewer maltreatment-related fatalities.

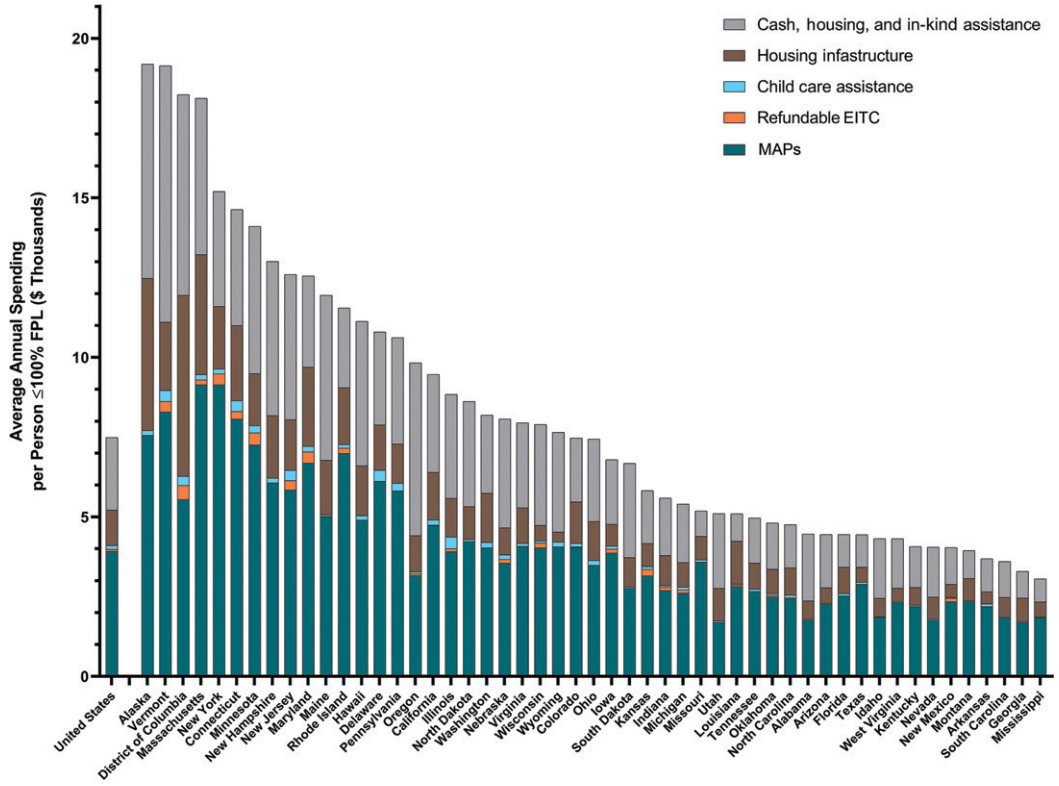

FIGURE 1
States' total annualized spending on public benefit programs from 2010 through 2017 federal fiscal years.

Previous investigations have consistently supported an association between more generous benefit programs and less maltreatment, particularly for neglect.[11–13,15,17,19,20,31] Our results broadly align with these previous findings. We found that an additional investment of $1000 per person living in poverty was associated with 4.3% less reporting, 4.0% fewer substantiated reports, 2.1% fewer foster care placements, and 7.7% fewer maltreatment-related fatalities. Using quasi-experimental designs among TANF recipients, Cancian et al found that an additional $100 of income per year was associated with a 2-percentage point reduction in investigated reports of maltreatment and Beimers et al found that for each $100 of income per month there was an associated 2-percentage point reduction in substantiated maltreatment.[10,14] Previous estimates are not available for maltreatment-related fatalities, but McLaughlin et al found that an additional $1000 per capita in federal transfers to states to fund benefit programs was associated with an ∼7.7% reduction in overall infant mortality.[32] Further study is needed to quantitate benefit program effects at the individual

TABLE 2 Associations Between States Spending an Additional $1000 per Person Living in Poverty Annually and Adjusted Maltreatment Outcomes

	State Spending Only	State Spending Adjusted for Federal Spending
All maltreatment reporting	0.9925 (0.9858 to 0.9994)*	0.9573 (0.9486 to 0.9661)**
Neglect	0.9918 (0.9883 to 0.9953)**	0.9675 (0.9615 to 0.9735)**
Physical abuse	0.9975 (0.9904 to 1.0046)	0.9518 (0.9439 to 0.9598)**
Sexual abuse	1.0026 (0.9996 to 1.0056)	0.9758 (0.9710 to 0.9806)**
Substantiations	1.0047 (0.9996 to 1.0098)	0.9603 (0.9534 to 0.9672)**
Foster care placements	0.9874 (0.9831 to 0.9917)**	0.9795 (0.9759 to 0.9832)**
Fatalities	0.9540 (0.9445 to 0.9636)**	0.9229 (0.9128 to 0.9330)**

Data are presented as IRR (95% CI). All associations modeled using GEEs with repeated measures of year, with and without adjustment for total federal spending per person living in poverty within the same state.
*$P < .05$.
**$P \leq .001$.

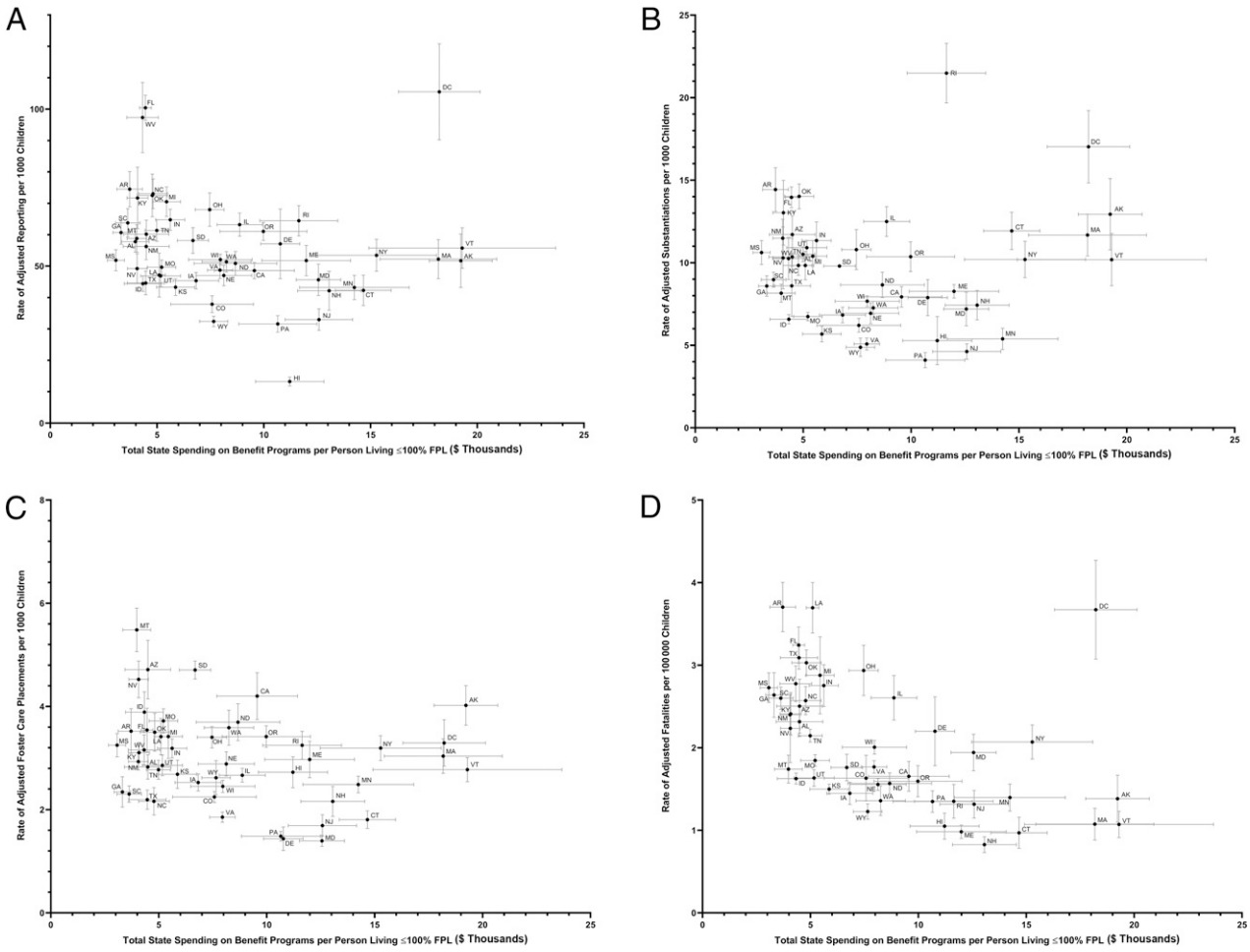

FIGURE 2

States' total annual spending on benefit programs in relation to their adjusted rates of maltreatment reporting (A), substantiated reports (B), foster care placement (C), and maltreatment-related fatalities (D) from 2010 through 2017 federal fiscal years. Means and 95% CIs.

level and to examine how benefit program eligibility and receipt may moderate the effectiveness of other individual-level prevention modalities, such as home visiting.

Our cross-sectional study suggests that $1.6 million and $358 million in spending on benefit programs were associated with 1 fewer substantiated maltreatment victim and 1 fewer maltreatment-related fatality, respectfully. These cost-benefit ratios do not appear advantageous until one considers the substantial lifetime economic burdens associated with child maltreatment, estimated at $830 928 per nonfatal victim and $16.6 million per fatal victim (inclusive of short- and long-term health care costs, criminal justice costs, child welfare costs, special education costs, monetized quality-adjusted life years, and value per statistical life).[3] Using these previous estimates, we suggest that an additional annual investment of $46.5 billion from states in benefit programs might be associated with $25.8 billion fewer costs related to substantiated maltreatment and fatalities or up to $153.2 billion fewer maltreatment-related costs if also considering all children investigated for maltreatment. This latter estimate is based on the application of costs for nonfatal victims to children investigated but not substantiated as victims, an assumption previously made by others,[2,3] given that unsubstantiated and substantiated children have similar long-term outcomes.[33–35] It should be stressed, however, that the majority of potentially avoided economic burdens related to reductions in maltreatment would not be realized within the same fiscal year as spending. Conservatively assuming only $51 000 of near-term health, child welfare, and criminal justice costs associated with nonfatal maltreatment,[3] states' additional $46.5 billion investment in benefit programs might only return $1.5

TABLE 3 Associations Between States Spending an Additional $1000 per Person Living in Poverty Annually on Individual Categories of Benefit Programs and Adjusted Maltreatment Outcomes

	% Increase in Spending From the Median	Reporting	Substantiations	Foster Care Placements	Fatalities
Cash, housing, and in-kind assistance	41.1	0.9751 (0.9557 to 0.9949)*	0.947 (0.9581 to 0.9915)**	0.9821 (0.9729 to 0.9915)***	0.8569 (0.8324 to 0.8822)***
Housing infrastructure[a]	204.5	1.0199 (0.9920 to 1.0485)	1.0734 (1.0481 to 1.0994)***	0.9833 (0.9670 to 0.9999)*	0.8202 (0.7969 to 0.8442)***
Child care assistance	1350.0	0.6054 (0.4851 to 0.7553)***	0.6464 (0.5010 to 0.8340)***	0.3662 (0.3211 to 0.4176)***	0.4961 (0.3419 to 0.7199)***
Refundable EITCs	Undefined[b]	1.0974 (0.9911 to 1.2151)	1.3614 (1.2428 to 1.4914)***	0.4718 (0.4012 to 0.5549)***	0.5411 (0.4838 to 0.6051)***
MAPs	29.7	0.9170 (0.9008 to 0.9334)***	0.9329 (0.9231 to 0.9428)***	0.9438 (0.9335 to 0.9543)***	0.8954 (0.8705 to 0.9210)***

Data are presented as IRR (95% CI). All associations modeled using GEEs with repeated measures of year and adjusted for federal spending per person living in poverty within the same category within the same state.

[a] Estimates for housing infrastructure for state spending only, because no federal housing spending was included.

[b] The percentage increase for an additional $1000 of state spending on EITC was undefined because of the median value for states' spending being $0.

*$P < .05$.

**$P \leq .01$.

***$P \leq .001$.

billion to $9.3 billion in near-term reductions in maltreatment-related economic burdens (substantiations and reports, respectively). Although benefit program costs were high, potential reductions in economic burdens related to prevented maltreatment may partially offset some program costs. It should be stressed however, that reductions in maltreatment need not fully offset programs costs and that prevention of maltreatment would be just one of many secondary positive outcomes of public benefit programs.

It is important to highlight how our estimates should be interpreted and the potential for ecological fallacy. Although we standardized states' spending relative to the size of their impoverished populations, precise beneficiaries of spending or changes in spending varied by program, year, and state. For instance, TANF largely benefits families in deep poverty, whereas MAP eligibility criteria are often inclusive of individuals above the FPL. Likewise, some benefits are contingent on earned income and/or employment (eg EITC, CCDF), criteria selecting for populations with already higher incomes. Children and families at the greatest risk for maltreatment, therefore, may not always be the largest beneficiaries of states' investments in benefit programs. Also, maltreatment can and does occur outside of the context of poverty, and supplementary benefits and income may prevent maltreatment with varying effectiveness across the spectrum of income. For these reasons, our estimates apply broadly to state budgets and maltreatment at the population-level and cannot be translated to the individual level.

MAPs under the Affordable Care Act have been estimated to reduce poverty to a similar degree as all other mean-tested benefits programs and tax credit programs combined.[36] Medicaid expansion has also been reported to reduce economic burdens and psychological distress among low-income parents, specifically.[37] It follows then, that states' spending on MAPs would be associated with reductions in maltreatment, as we found in our analysis. Our results are qualitatively similar to Brown et al who found that neglect reporting was ~10% lower in states that chose to expand Medicaid, the only other study to test this association.[18] Children investigated for maltreatment impose substantial economic burdens on the Medicaid system directly, accounting for ~9% of all expenditures among children.[38] Therefore, in addition to the other benefits that MAPs provide to recipients, health care systems, and states' economies,[39] further expansion of states' Medicaid and Children's Health Insurance Programs might also have the potential associated benefits of reducing maltreatment and lowering future program costs.

Our results suggest that states' decisions to financially invest in quality child care for low-income families may be related to lower population rates of maltreatment. The potential for child care subsidies to reduce child maltreatment has previously been demonstrated, specifically for measures of neighborhood-level availability and paid family leave policies.[40–42] Child care assistance, in addition to reducing low-income families' out-of-pocket expenses, may also increase maternal employment and income,[43,44] potentiating direct program effects. Recently, however, only 1 in 7 eligible children received CCDF benefits, the largest federal-state

program subsidizing child care among low-income families.[45] Despite these unmet needs, levels of funding are currently low, only accounting for ~1% of states' annual spending on benefit programs in this study. The potential for child care assistance for low-income families to contribute to the prevention of child maltreatment appears to be an opportune area for policy discussion and future study.

EITC benefits have previously been associated with reductions in self-reported child welfare involvement,[17] reports for neglect (but not abuse),[46] and foster care entry.[15,16] Klevens et al[31] reported a marginally significant effect for EITC reducing abusive head trauma. Our results align with these previous findings, suggesting that states' spending on their own EITC programs may be related to lower rates of foster care placement and maltreatment-related fatalities, but not reporting or substantiations.

This study had limitations. States' generosity in spending on benefit programs may have correlated systematically with their inclusivity in identifying maltreatment, a relationship that would have favored this study not finding significant associations. In this study, we exclusively examine child maltreatment captured by the child protection system. We may have under- or overestimated the association between spending and maltreatment given that not all of child maltreatment is reported to Child Protective Services.[47,48] Although the Annual Survey of State and Local Government Finances database captured all state and local government spending, it was not feasible to include all applicable federal benefit programs, with the most notable omission being Supplemental Security Income. State refundable Child Tax Credit and Child and Dependent Care Tax Credit were given consideration but ultimately not included given that the expenditures were nominal compared with other categories of spending, and data could not be located for some state-year observations.

CONCLUSIONS

Our study appears to support an association between state fiscal investments in public benefit programs and population-level reductions in child maltreatment. Future cost-benefit analyses of benefit programs need to account for potential reductions in maltreatment as their associated economic burdens might offset some program costs, minimally in the near-term, but substantially longer-term. Future investigations should also explore if benefit programs, as they are currently structured, either increase or decrease racial and ethnic disparities in maltreatment, and health equity more broadly.

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ABBREVIATIONS

CCDF: Child Care and Development Fund
CI: confidence interval
EITC: Earned Income Tax Credit
FPL: federal poverty limit
GEE: Generalized estimating equation
IQR: interquartile range
IRR: incidence rate ratio
MAP: Medical Assistance Program
TANF: Temporary Assistance for Needy Families

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