Office of the Assistant Secretary for Planning and Evaluation, U.S. Department of Health and Human Services

Treatment for Opioid Use Disorder May Reduce Substantiated Cases of Child Abuse and Neglect

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HIGHLIGHTS

Buprenorphine treatment is an effective treatment for opioid use disorder (OUD). Child welfare systems often partner with treatment providers to increase access, yet little is known about the role of OUD in improving outcomes related to child maltreatment. This study finds that increased availability of buprenorphine treatment predicts reductions in certain types of child maltreatment caseloads in 25 states. Key findings include:

- Changes in buprenorphine patient capacity have no relationship with the number of children reported to child protective services.

- Increased treatment capacity predicts decreased rates of low risk maltreatment cases. These cases receive supportive services – known as alternative response – rather than intrusive investigations and involvement of child welfare systems. This is in line with expert recommendations that response is not appropriate for parental SUD.

- Increased treatment capacity predicts decreased rates of substantiated abuse or neglect, suggesting treatment is effective in reducing immediate risk to children.

- However, children with unsubstantiated maltreatment are still at risk if supportive services are not provided.

Introduction

Opioid use disorder (OUD) continues to be a major contributing factor for child welfare caseloads across the country. For example, one study finds that a 10 percent increase in opioid-related hospitalizations predicted a 1.3 percent increase in substantiated reports of child maltreatment (Ghertner et al. 2018). Child welfare stakeholders have increasingly called for expanding access to evidence-based treatment for OUD, including buprenorphine treatment. Buprenorphine is an FDA-approved medication that is a cost effective approach to reducing opioid misuse and opioid related mortality (Wen, Borders, and Cummings 2019).

Little is known about the effectiveness of buprenorphine treatment in reducing child maltreatment outcomes. To date a single, site-specific study identified that buprenorphine is associated with improved child permanency (Hall et al. 2016).

While improved OUD-related outcomes may have positive effects on child maltreatment, prior ASPE research has found child welfare systems are not always well-integrated with substance use treatment services (Radel et al. 2018b). In addition, counties with the highest foster care increases have some of the lowest buprenorphine treatment capacity (Ghertner 2020). Some child welfare agencies experience difficulty in finding local buprenorphine providers – indeed, according to another ASPE study, a large percentage of waivered providers do not opt to be publicly listed (Ghertner and Ali 2020).

Additionally, OUD may be associated with a number of other difficulties, not least of which is use of multiple substances (Radel et al. 2018a). Treating a caregiver's OUD does not mean that other contributing factors are ameliorated. Higher-risk maltreatment cases that involve OUD, which could entail physical or sexual abuse or a combination of a number of factors may be less likely to be effectively addressed by buprenorphine treatment alone.

This study uses statistical methods to identify how changes in a county's buprenorphine treatment capacity in a county predicts changes in child maltreatment cases, focusing on states that implement formal differential response systems (see the side box for a definition). Our sample includes all children – over 6 million – reported to child protective services agencies (CPS) in the 25 states that report alternative response (AR) cases to the Children's Bureau over the 2016-2018 time period. We look at how changes in buprenorphine treatment capacity – defined as the total patient limit of all providers with a buprenorphine waiver in a county – relate to the total number of screened-in children reported in a county, and the case determinations of those children. Details on data sources and methods can be found in the Appendix, along with detailed statistical output.

Differential Response

Differential response, also called alternative response, is a child welfare approach designed to support family stability with targeted services for children at lower risk of maltreatment, while also addressing children at higher risk with traditional child welfare interventions.

Agencies screen cases into two or more tracks. Higher risk cases are tracked to traditional response, which begins with an investigation and subsequent substantiation determination. Lower risk cases are sent to alternative response (AR), where a family assessment replaces the investigation. The assessment identifies needs and strengths, and is followed by voluntary supportive services.

Buprenorphine Waivers

Healthcare providers can receive a waiver from the Drug Enforcement Administration that permits them to prescribe buprenorphine to patients with OUD. Providers with waivers have a limit to the number of patients they can concurrently treat with this medication. Providers can be certified for limits of 30, 100, or 275 patients.

How Could Buprenorphine Treatment for OUD Impact Child Welfare Caseloads?

Increasing buprenorphine capacity could lead to changes in child welfare cases at several points in differential response systems, shown in figure 1. At the first point, a report of alleged abuse or neglect is received by child protective services. At the second point, caseworkers determine the severity of a report that has been screened-in, and may direct lower risk cases to AR and higher risk cases to investigation. At the third point, for cases going to investigation, a case may be substantiated or unsubstantiated. Substantiated cases present sufficient evidence of the immediate risk to children. Our data permit focusing on the second two decision points.

Buprenorphine treatment can affect caseloads at any point in this case flow. For example, access to treatment could reduce the number of reports by reducing the overall prevalence of maltreatment related to OUD. It could also increase the number of reports, if more children at risk are visible to healthcare providers, who are required to report suspected child maltreatment to their local child protective services agency.

Our analysis focuses on the second and third decision points. At the second decision point, we hypothesize that treatment should reduce the proportion of cases going to AR. If treatment mainly helps families with children at lower risk of maltreatment, we could see reductions in AR cases. In addition, experts have recommended that AR not be used for cases involving substance use, but rather such cases be investigated (Piper et al. 2019). Research finds that families are less likely to voluntarily engage in services designed to address complex conditions that underlie maltreatment, including substance use (Loman and Siegel 2012; Piper et al. 2019).

For investigations, at decision point 3, if caseworkers find that treatment is effective in helping parents manage their OUD, we may see a reduction in substantiations and an increase in investigations leading to no action by child welfare agencies.

Figure 1. Flow of Child Maltreatment Reports in Systems Implementing Differential Response
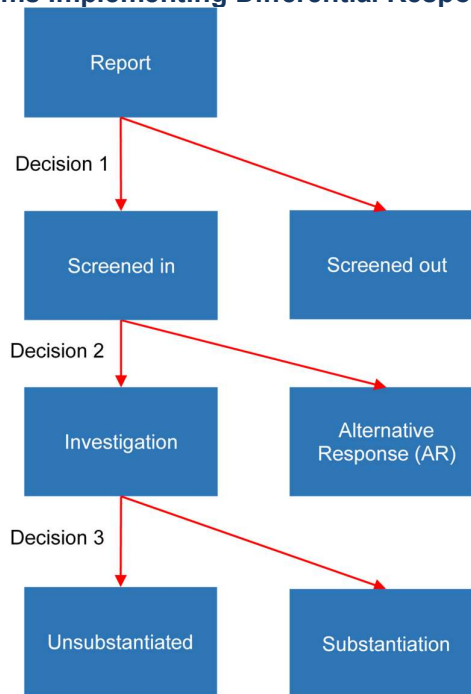
Our analysis focuses on differences for counties in metropolitan and non-metropolitan areas. The opioid crisis has impacted urban and rural areas differently, and the availability of buprenorphine treatment differs by urbanicity (Ghertner 2019). As a recent ASPE report has found (Clary, Ribar, and Weigensberg 2020), rural child welfare systems experience substance use differently, and treatment may have a different role in non-metropolitan relative to metropolitan areas.

Results

Increases in Treatment Capacity Have No Relationship with the Number of Children Screened In to Child Protective Services

Total treatment capacity in a county has no identifiable relationship to the total number of children reported to child welfare agencies. Our model estimates that an increase in capacity of one patient per 100 predicts a 0.01 percent increase in the number of children reported in a county, but the result is not statistically significant. While it is possible that buprenorphine treatment for OUD affects maltreatment reports, our approach does not detect such an effect.

Table 1. Percent Change in Children Reported for Maltreatment Predicted by an Increase in Buprenorphine Treatment Capacity by 1 patient per 100 Residents

	Estimate	95% Confidence Interval
All Counties	-0.01%	-1.69%, 1.67%
Metropolitan Counties	0.20%	-2.08%, 2.48%
Non-Metropolitan Counties	-0.19%	-1.90%, 1.51%

95% cluster-robust confidence intervals in parenthesis. See Appendix Table A1 for detailed output.
N: All counties=8,263; Metro: 3,191; Non-Metro: 5,072.

Increases in Treatment Capacity Predict Fewer Reports Going to Alternative Response, and More Reports Going to Investigation Response

When a county's total treatment capacity increases, the probability that a report will go to alternative response decreases by 1.7 percent, as shown in Figure 2. This means more cases are predicted to be investigated.

When breaking down cases by metropolitan status, we see minor differences, though none are statistically different. The probability that a case goes to AR declines by slightly more in metropolitan counties than in non-metropolitan counties (-1.6 percent vs -1.4 percent), but the difference is not statistically significant.

Increased Treatment Capacity Predicts Fewer Substantiated Investigations

Increases in a county's buprenorphine patient capacity predict a lower likelihood that an investigation leads to a substantiated report of maltreatment. As shown in Figure 3, an increase in capacity of one patient per 100 residents predicts a -0.9 percent decrease in the probability that a report will be substantiated following an investigation.

The role of buprenorphine treatment in reducing substantiation rates is not uniform across metropolitan areas. For cases investigated in metropolitan counties, a one patient per 100 increase in treatment capacity predicts a 1.7 percent drop in substantiation. In non-metropolitan areas, the relationship between treatment and substantiation was not statistically significant.

Discussion

This is the first study to find a significant relationship between buprenorphine treatment for OUD and substantiated investigations of child maltreatment. No other study has yet explored at a large scale this aspect of the intersection of OUD treatment with child welfare cases. Buprenorphine patient capacity has no relationship with the total number of children with screened-in reports to CPS. Among states implementing alternative response, increases in a county's treatment capacity predict decreased rates of alternative response, and increased investigations. Once a case is investigated, increases in treatment capacity predict lower substantiation rates.

Reductions in AR cases may be due to several factors. Child welfare agencies may recognize that AR may not effectively reduce maltreatment risk for cases involving parental or caregiver substance use. As a result, agencies may be more likely to investigate reports when parents are receiving buprenorphine

### Figure 2. Reduced Probability of a Case Going to Alternative Response

Increase in buprenorphine treatment capacity by 1 patient per 100 residents predicts reduced probability of a case sent to AR by:
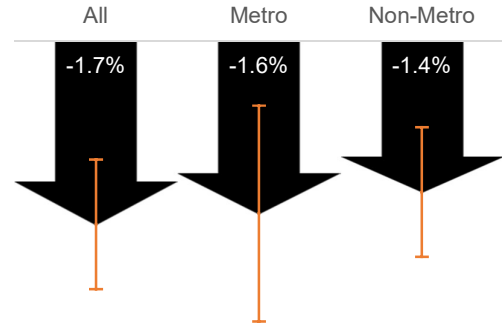
Orange lines are 95% cluster-robust confidence intervals. All estimates statistically significant at *p<0.01*. See Appendix Table A2 for detailed output. confidence intervals.
N: All counties=6,102,958; Metro: 4,588,023; Non-Metro: 1,207,208.

Figure 3. Reduced Probability of a Substantiated Investigation

Increase in buprenorphine treatment capacity by 1 patient per 100 residents predicts reduced probability of an investigation being substantiated by:
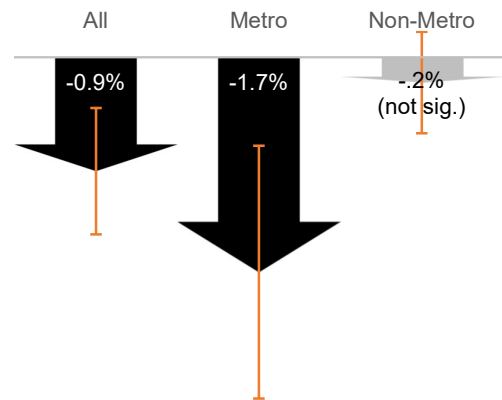
Orange lines are 95% cluster-robust confidence intervals. Black arrows are statistically significant at *p<0.01*. See Appendix Table A3 for detailed output. confidence intervals.
N: All counties=4,400,056; Metro: 3,310,322; Non-Metro: 830,520.

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treatment. Alternatively, these findings may reflect the changing mix of children being reported to CPS. Treatment may be effective in reducing risk for children whose parents have OUD, but otherwise have no other risk factors. As a result these children may be less likely to come in contact with child welfare systems. Finally, increases in treatment may give providers greater visibility over their patients' children. Because health care providers are mandatory reporters, this may lead to more children to come to the attention of CPS, and subsequently lead to more investigations.

Lower substantiation rates suggest that increased treatment availability predicts lower immediate risk to children. Although investigation rates rise with treatment capacity, this suggests that buprenorphine treatment can effectively mitigate the impact of OUD on child safety and well-being. Importantly, treatment capacity predicts larger reductions in substantiated investigations in metropolitan counties compared to non-metropolitan counties. Metro areas may have higher treatment capacity than non-metro areas to begin with, making it more likely that parents can access treatment. Non-metropolitan counties have lower availability of treatment, and may have fewer publicly-listed providers (Ghertner 2019). Individuals involved in child welfare systems in rural areas face unique barriers to accessing treatment (Radel et al. 2020). As treatment capacity increases in non-metropolitan counties, they may experience a greater benefit to child welfare.

However, children with unsubstantiated cases of maltreatment are likely still at risk, and may have just as much risk over the long run as children with substantiated cases. Research has found that children with unsubstantiated and substantiated maltreatment reports may not differ in terms of subsequent maltreatment cases (Kohl, Jonson-Reid, and Drake 2009), behavioral and developmental outcomes (Hussey et al. 2005), educational outcomes (Leiter, Myers, and Zingraff 1994), and substance use and risky sexual behavior (Kugler et al. 2019). Families with unsubstantiated cases are not likely to receive any supportive services from child welfare systems. Unless children are receiving services from treatment providers or other providers, they may continue to be at risk.

The study has several important limitations. First, our results are not causal and should not be interpreted to mean that increasing access to buprenorphine will necessarily lead to reduced AR and substantiations. Second, we do not have data on buprenorphine treatment among caregivers involved in child welfare systems. Nor do we have reliable data on whether opioid misuse was a contributing factor for children's involvement in child welfare systems.

More research is needed to evaluate the effectiveness of buprenorphine and other medications to treat OUD, including methadone and naltrexone. In particular, we need to understand which families with OUD can benefit most from treatment, and what additional supportive services should accompany treatment. We also need to better understand the relationship between treatment and longer-term child welfare outcomes, such as repeat maltreatment, foster care placement, and reunification.

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Appendix: Data, Methodology and Detailed Statistical Results

Data Sources and Measures

Data on child welfare caseloads come from administrative records from the Children's Bureau. Data on substantiated cases and alternative response cases come from the NCANDS. Data on buprenorphine patient capacity are drawn from administrative records from the Center for Substance Abuse Treatment at the U.S. Substance Abuse and Mental Health Services Administration (SAMHSA). This includes all providers with a DATA waiver to prescribe buprenorphine for OUD, including both those listed in SAMHSA's publicly-available Treatment Locator, as well as those not listed. Data were collected in July 2016 and June 2017. The number of waivered providers is fluid throughout the year, as they get initial waivers or change their patient limits. Patient capacity is measured as the sum of the patient limit for all waivered providers in a county, per 100 residents.

Counties are classified as metropolitan or non-metropolitan based on urban influence codes for 2013, created by the Economic Research Service at the US Department of Agriculture. Control variables in the analysis include the following demographic and socioeconomic factors at the county-level: population race/ethnicity, age, poverty, median income, unemployment, and labor force participation. Healthcare access measures include primary care physicians per capita from the American Medical Association Physician Masterfile, and the number of prescribers reported in state PDMPs. In addition, the models include percent of the population receiving Supplemental Security Income, the percent enrolled in Medicare, and the illicit drug overdose rate per 100,000 residents.

Descriptive statistics for all variables are found in table A1.

Study Sample

For analyses of county child welfare reports, the unit of analysis is the county-year, over the 2016 to 2018 period in 32 states that report alternative response cases to the federal government. For analysis of AR and substantiation outcomes for children, the unit of analysis is the unique children reported to CPS agencies, over the same time period in the same states. Children can be reported multiple times in the year and by multiple sources. We collapse multiple reports into a single record, preserving the unique characteristics of each report. For example, if a child is reported in one record by a health care provider, and in another record by a day care provider, our de-duplicated record would indicate the child has been reported by both sources. We drop records in county-years without data for the covariates.

The sample sizes are reported in tables A2-A4.

Statistical Methods

To estimate the relationship between total children reported and buprenorphine treatment capacity, we used population-weighted models with the county-year as the unit of analysis. This model includes county and year fixed effects and all county-level covariates described below, but does not include any child-level characteristics. Detailed output for models of reports can be found in table A2.

To estimate the relationship of treatment capacity and the outcome of reports, we shift our focus to child-level data using linear probability models. We run two models, corresponding to the two decision points in Figure 1 in the text. The first model looks at the decision of response type (AR vs investigation). The dependent variable is an indicator variable, taking on the value of 1 for children whose case goes to AR, and 0 if it is investigated. The second model looks at the decision to substantiate an investigation, and focuses exclusively on cases under investigation (removing cases going to AR). In this model, an outcome of 1 indicates the investigation is

substantiated, and a 0 that it is unsubstantiated. In addition to county and year effects and county-level covariates, these models include child-level characteristics.

Child characteristics include the report source (e.g. medical provider, social services provider, alleged victim), child race/ethnicity, child age, and whether any flags relate to substance use were on the record. These flags include alcohol or drug use by parents or the child, or the family being referred to substance use treatment services. County-level covariates include: total population; percent of population that is Black, White, Hispanic, under 18, and over 65; value of public assistance transfers in a county (SNAP, TANF, etc.); total Medicaid expenditures in a county; poverty and unemployment rates; retail opioid dispensing rates; drug overdose death rates; and per capita primary care physicians.

Detailed output for the models of AR and substantiation can be found in tables A3 and A4.

Table A1. Model Summary Statistics

Variable	Mean	SD
Alternative response case	0.28	-
Substantiated investigation	0.18	-
Bup patient capacity (per 100 residents)	0.87	-
Male	0.5	-
White	0.63	-
Black	0.29	-
Hispanic	0.17	-
Report Source: Social Services	0.12	-
Report Source: Medical	0.08	-
Report Source: Law Enforcement	0.17	-
Report Source: Mental Health	0.05	-
Report Source: Education	0.19	-
Report Source: Child Care	0.01	-
Report Source: Substitute Care	0	-
Report Source: Alleged Victim	0	-
Report Source: Parent	0.06	-
Report Source: Religious	0.07	-
Report Source: Friend/Neighbor	0.05	-
Report Source: Perpetrator	0	-
Substance use indicator	0.14	-
Age: Infant	0.08	-
Age: 1-3	0.18	-
Age: 4-7	0.25	-
Age: 8-11	0.23	-
Age: 12-14	0.14	-
Black population (%)	0.15	0.14
White population (%)	0.66	0.22
Hispanic population (%)	0.14	0.16
Welfare expenditures (1000s)	405.31	624.3
Opioid Rx rate	66.61	30.81

Variable	Mean	SD
Overdose death rate	21.33	10.93
Medicaid expenditures (1000s)	904.82	1617.49
Unemployment rate	4.45	1.19
Poverty rate	14.88	5.21
Primary care physicians per capita	70.85	31.01
Population age 0-17 (%)	0.23	0.03
Population age over 65 (%)	0.15	0.04

Note: Variables with no standard deviation are 1/0 indicator variables.

Table A2. Detailed Regression Model Results – Outcome Variable: Number of Screened-in Maltreatment Reports

	All Children	Metropolitan	Non-Metro
Buprenorphine Patient Capacity	-0.000 (0.009)	0.002 (0.012)	-0.002 (0.009)
Black population (%)	-3.554 (2.944)	-4.424 (3.203)	-7.128 (4.425)
White population (%)	-1.175 (2.592)	-1.612 (2.900)	-8.265** (3.171)
Hispanic population (%)	-4.854 (3.134)	-5.211 (3.354)	-9.554* (4.242)
Welfare expenditures (log)	0.338*** (0.077)	0.371*** (0.088)	0.044 (0.129)
Opioid rx rate (log)	0.025 (0.025)	0.052 (0.072)	0.018 (0.016)
Overdose death rate (log)	-0.005 (0.028)	-0.010 (0.029)	0.054 (0.049)
Medicaid expenditures (log)	-0.025 (0.060)	-0.024 (0.066)	-0.122 (0.068)
Unemployment rate	0.005 (0.009)	0.009 (0.012)	-0.001 (0.008)
Poverty rate	0.003 (0.003)	0.003 (0.004)	0.003 (0.003)
Primary care physicians per capita	-0.001 (0.001)	-0.004* (0.002)	0.002 (0.001)
Population age 0-17 (%)	3.070 (2.609)	2.003 (3.539)	4.512 (2.529)
Population age over 65 (%)	1.482 (1.961)	0.969 (2.831)	1.994 (1.916)
Constant	5.710* (2.804)	6.032 (3.081)	15.859*** (3.324)
Observations	8,263	3,191	5,072

Note: Cluster-robust standard errors in parenthesis. *** $p<0.001$, ** $p<0.01$, * $p<0.05$. County and year effects suppressed.

Table A3. Detailed Linear Probability Model Results – Outcome Variable: Alternative Response Case (versus Investigation)

	All Children	Metropolitan	Non-Metro
Buprenorphine Patient Capacity	-0.017*** (0.003)	-0.016** (0.005)	-0.014*** (0.003)
Male	0.010*** (0.001)	0.010*** (0.001)	0.011*** (0.001)
White	0.015* (0.007)	0.013 (0.008)	0.034*** (0.009)
Black	0.001 (0.009)	0.001 (0.010)	0.012 (0.007)
Hispanic	-0.014*** (0.002)	-0.013*** (0.003)	-0.014*** (0.002)
Report Source: Social Services	-0.077*** (0.007)	-0.078*** (0.010)	-0.073*** (0.005)
Report Source: Medical	-0.076*** (0.007)	-0.080*** (0.010)	-0.074*** (0.006)
Report Source: Law Enforcement	-0.077*** (0.007)	-0.078*** (0.009)	-0.073*** (0.005)
Report Source: Mental Health	-0.058*** (0.008)	-0.056*** (0.011)	-0.059*** (0.005)
Report Source: Education	-0.016* (0.007)	-0.020* (0.010)	-0.012* (0.005)
Report Source: Child Care	-0.098*** (0.008)	-0.102*** (0.011)	-0.084*** (0.008)
Report Source: Substitute Care	-0.141*** (0.013)	-0.140*** (0.017)	-0.142*** (0.011)
Report Source: Alleged Victim	-0.049*** (0.009)	-0.049*** (0.013)	-0.050*** (0.011)
Report Source: Parent	-0.018** (0.006)	-0.020* (0.009)	-0.010* (0.005)
Report Source: Religious	-0.014* (0.006)	-0.017* (0.008)	-0.008* (0.004)
Report Source: Friend/Neighbor	-0.013* (0.006)	-0.016* (0.008)	-0.004 (0.004)
Report Source: Perpetrator	-0.047*** (0.013)	-0.043** (0.014)	-0.076* (0.030)
Quarter=2	-0.006*** (0.001)	-0.006*** (0.001)	-0.006*** (0.002)
Quarter=3	-0.008*** (0.001)	-0.009*** (0.002)	-0.005* (0.002)
Quarter=4	0.001 (0.001)	0.001 (0.002)	0.002 (0.002)
Substance use indicator	-0.060*** (0.006)	-0.061*** (0.008)	-0.060*** (0.006)
Age: Infant	-0.024*** (0.007)	-0.026** (0.009)	0.000 (0.004)
Age: 1-3	-0.032*** (0.006)	-0.034*** (0.008)	-0.006 (0.003)
Age: 4-7	-0.009* (0.005)	-0.010 (0.006)	0.006* (0.003)
Age: 8-11	0.015*** (0.002)	0.016*** (0.003)	0.021*** (0.002)
Age: 12-14	0.011*** (0.002)	0.014*** (0.002)	0.014*** (0.002)
Black population (%)	-1.367 (2.889)	-2.116 (3.187)	-0.698 (3.135)
White population (%)	-3.086 (2.667)	-3.816 (2.977)	-1.105 (2.610)
Hispanic population (%)	-2.886 (3.029)	-4.334 (3.338)	2.170 (3.375)

	All Children	Metropolitan	Non-Metro
Welfare expenditures (log)	0.042 (0.060)	0.048 (0.077)	0.117 (0.082)
Opioid rx rate (log)	-0.003 (0.002)	-0.007 (0.004)	-0.003 (0.002)
Overdose death rate (log)	-0.018 (0.022)	-0.026 (0.025)	0.029 (0.023)
Medicaid expenditures (log)	0.025 (0.027)	0.018 (0.036)	0.077* (0.030)
Unemployment rate	-0.024*** (0.006)	-0.034** (0.011)	-0.024*** (0.004)
Poverty rate	-0.001 (0.002)	-0.002 (0.003)	-0.001 (0.001)
Primary care physicians per capita	-0.001 (0.001)	-0.000 (0.002)	-0.001 (0.001)
Population age 0-17 (%)	-2.105 (1.409)	-1.421 (2.228)	-4.373** (1.340)
Population age over 65 (%)	-2.138 (1.225)	-2.900 (2.102)	-4.069*** (1.112)
Constant	3.211 (2.841)	3.965 (3.250)	0.930 (2.999)
Observations	6,102,958	4,588,023	1,207,208

Note: Cluster-robust standard errors in parenthesis. *** $p<0.001$, ** $p<0.01$, * $p<0.05$. County and year effects suppressed.

Table A4. Detailed Linear Probability Model Results – Outcome Variable: Investigation Substantiation (versus Unsubstantiated)

	All Children	Metropolitan	Non-Metro
Buprenorphine Patient Capacity	-0.009** (0.003)	-0.017*** (0.005)	-0.002 (0.002)
Male	-0.011*** (0.001)	-0.011*** (0.001)	-0.009*** (0.001)
White	0.037*** (0.003)	0.039*** (0.004)	0.031*** (0.003)
Black	0.032*** (0.004)	0.036*** (0.005)	0.015*** (0.003)
Hispanic	0.020*** (0.003)	0.023*** (0.004)	0.011*** (0.002)
Report Source: Social Services	0.145*** (0.005)	0.139*** (0.006)	0.166*** (0.007)
Report Source: Medical	0.128*** (0.005)	0.128*** (0.006)	0.131*** (0.008)
Report Source: Law Enforcement	0.274*** (0.007)	0.275*** (0.009)	0.277*** (0.008)
Report Source: Mental Health	0.055*** (0.004)	0.056*** (0.005)	0.070*** (0.006)
Report Source: Education	0.056*** (0.005)	0.057*** (0.006)	0.067*** (0.006)
Report Source: Child Care	0.041*** (0.005)	0.043*** (0.006)	0.033** (0.010)
Report Source: Substitute Care	0.071*** (0.006)	0.071*** (0.007)	0.080*** (0.010)
Report Source: Alleged Victim	0.080*** (0.009)	0.066*** (0.011)	0.128*** (0.015)
Report Source: Parent	0.022*** (0.005)	0.019** (0.006)	0.039*** (0.007)
Report Source: Religious	0.061*** (0.004)	0.059*** (0.005)	0.077*** (0.007)
Report Source: Friend/Neighbor	0.004 (0.007)	-0.004 (0.009)	0.043*** (0.008)
Report Source: Perpetrator	0.200*** (0.031)	0.214*** (0.033)	0.106*** (0.025)
Quarter=2	-0.005*** (0.001)	-0.005*** (0.001)	-0.004* (0.002)
Quarter=3	-0.002 (0.001)	-0.001 (0.001)	-0.004 (0.002)
Quarter=4	-0.004*** (0.001)	-0.004** (0.001)	-0.006** (0.002)
Substance use indicator	0.240*** (0.008)	0.221*** (0.010)	0.294*** (0.008)
Age: Infant	0.127*** (0.005)	0.126*** (0.006)	0.107*** (0.004)
Age: 1-3	0.048*** (0.002)	0.049*** (0.003)	0.048*** (0.003)
Age: 4-7	0.030*** (0.002)	0.030*** (0.003)	0.032*** (0.003)
Age: 8-11	0.025*** (0.002)	0.025*** (0.002)	0.028*** (0.003)
Age: 12-14	0.021*** (0.001)	0.021*** (0.002)	0.022*** (0.002)
Black population (%)	-1.761 (1.760)	-2.687 (1.952)	0.272 (2.503)
White population (%)	0.102 (1.556)	-0.358 (1.700)	-0.206 (2.133)
Hispanic population (%)	0.289 (1.860)	0.404 (2.088)	0.137 (2.396)

	All Children	Metropolitan	Non-Metro
Welfare expenditures (log)	0.030 (0.039)	0.008 (0.049)	-0.002 (0.046)
Opioid rx rate (log)	-0.001 (0.001)	-0.001 (0.003)	-0.001 (0.001)
Overdose death rate (log)	-0.005 (0.013)	-0.006 (0.014)	-0.008 (0.019)
Medicaid expenditures (log)	0.053* (0.025)	0.065* (0.031)	-0.055* (0.025)
Unemployment rate	-0.000 (0.003)	0.007 (0.007)	-0.001 (0.003)
Poverty rate	-0.001 (0.001)	-0.002 (0.002)	0.001 (0.001)
Primary care physicians per capita	0.001 (0.001)	0.001 (0.001)	0.001 (0.000)
Population age 0-17 (%)	0.593 (0.996)	-0.258 (1.578)	1.428 (0.859)
Population age over 65 (%)	-0.447 (0.675)	-0.240 (1.160)	-0.629 (0.720)
Constant	-0.939 (1.778)	-0.281 (2.054)	0.576 (2.101)
Observations	4,400,056	3,31,0322	830,520

Note: Cluster-robust standard errors in parenthesis. *** $p<0.001$, ** $p<0.01$, * $p<0.05$. County and year effects suppressed.