Association Between Recent Medicaid Expansions and Child Maltreatment Reporting and Outcomes

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Key Points (100/100 words)

Question. What was the association of recent Medicaid expansion in Maine on the volume and quality of child maltreatment reporting, and how did associations differ across children's characteristics?

Findings. In this cohort study of 25,307,932 maltreatment reports across 38 states, Medicaid expansion in Maine led to increased overall reporting, particularly from medical professionals, resulting in increased separations at lower substantiation rates. Associations were stronger among Black and female children.

Meaning. Our results suggest recent Medicaid expansions are associated with increased maltreatment reporting and intervention at lower specificity, resulting in a greater rate of unsubstantiated separations of children from their caregivers.

Abstract (349/350 words)

Importance. Public health insurance programs like Medicaid increase interactions with medical professionals, particularly for low-income or at-risk children. Medical personnel are mandatory reporters of suspected child maltreatment, but mandatory reporting laws result in many false positive reports which inflict unnecessary trauma on children and caregivers. Recent Medicaid expansions may affect the quantity and quality of maltreatment reports, impacting children and caregivers.

Objective. To evaluate the association of Medicaid expansions on child maltreatment reporting, investigations, and interventions, and how effects vary across subgroups of age, sex, and race/ethnicity.

Design, Setting, and Participants. This cohort study of 25,307,932 child maltreatment reports across 38 states used National Data Archive on Child Abuse and Neglect (NDACANS) data from 2008 to 2021. The effects of Medicaid expansion in Maine were estimated using synthetic differences-in-differences.

Exposure. Maine's Medicaid expansion under the Patient Protection and Affordable Care Act on January 10, 2019.

Main Outcomes and Measures. Number of first-time child maltreatment reports per 1,000 children; number of maltreatment reports per 1,000 children from medical professionals; incidence of child separations from caregivers; percent of separations ultimately unsubstantiated.

Results. Medicaid expansion is associated with an increase of 1.97 reports per 1,000 children (95% CI, 1.95 to 1.98; $p < .001$) and an additional 0.28 reports from medical practitioners per 1,000 children (95% CI, 0.27 to 0.29; $p < 0.001$). This led to 0.15 more separations per 1,000 children (95% CI, 0.15 to 0.15; $p < .001$) and an increase in the rate of unsubstantiated separations of 8.73 percentage points (95% CI, 7.37 to 10.10; $p < .001$). Subgroup analysis reveals that Black, female, and children under 5 years of age were most likely to be separated from caregivers or incur an unsubstantiated intervention.

Conclusions and Relevance. In this cohort study, Maine's Medicaid expansion led to increased reports of maltreatment, including from medical professionals; this led to increased rates of separations and reduced quality of maltreatment detection. Effects were concentrated among Black and female children. Findings suggest that increasing access to healthcare should be accompanied by safeguards ensuring reporting quality and minimizing false positive reports among medical mandatory reporters.

Introduction

Child protective services (CPS) investigates over one-third of all US children for possible child maltreatment, including neglect and physical, sexual, or emotional abuse.[1] The incidence of investigations has increased 29% since 2007, impacting 7.5 million children annually.[2] Exposure to maltreatment is higher for low-income children[3,4] and a risk factor for physical and mental health concerns later in life.[5,6] States spend $33 billion annually on maltreatment prevention, detection, and intervention.[7] In particular, all US states and the District of Columbia have legal mandates requiring medical personnel to report maltreatment suspicions to local or state authorities.[8]

Mandatory reporting laws have been shown to result in many false positive reports,[2,9] inflicting unnecessary trauma on children, creating inequitable social burdens for households, and wasting resources.[10,11] Even among medical professionals, suspected maltreatment is frequently unsubstantiated; for example, the American Academy of Pediatrics checklists for maltreatment[12] result in false positive rates as high as 92%.[13,14] False reports are not harmless; unsubstantiated CPS investigations and separations occur frequently and have severe social impacts on children, caregivers, and medical personnel.[15] They may even erode trust in the healthcare system, leading children and their caregivers to avoid future high-value healthcare;[16] for example, automatic filing of child maltreatment among substance-exposed newborns has recently been shown to prohibit caregivers from seeking treatment for opioid use disorders.[17] The costs of false positive reports and interventions have been overlooked in research and cost-benefit analyses of child maltreatment intervention strategies.

Policies that expand access to healthcare—such as state expansions of Medicaid under the Affordable Care Act (ACA)—provide financial protections typically associated with reductions in maltreatment.[3,18–20] In this setting, however, expanded access is accompanied by increased exposure to surveillance from mandatory reporters. Children affected by Medicaid expansions have greater coverage and service take-up rates following expansions,[21–24] including increased utilization of outpatient appointments, ED visits, and preventive care.[25–29] Given the low specificity of medical reporting, these interactions with medical personnel may increase rates of maltreatment reporting without improved detection. This is particularly possible for children from marginalized groups whose social factors (e.g., household income) are more likely to be mistaken by a physician for maltreatment and result in investigation or separation.[30–33] Understanding the unintended consequences of increased access to healthcare on lower-quality maltreatment reporting is vital as states continue to expand Medicaid while also attempting to promote the equitable well-being of children.

Our study aimed to assess the association between recent Medicaid expansion in Maine and child maltreatment reporting, including reports, substantiation rates, and separations of children from

caregivers. We assessed the effect of Medicaid expansion on reporting by medical professionals specifically, and measured effects on the quality of reporting, including the fraction of investigations and separations that were unsubstantiated by CPS. Finally, we highlighted equity concerns of medical surveillance by performing sub-group analyses for children across race, ethnicity, sex, and age.

Methods

Research Design and Study Sample

This study used individual child maltreatment reports from the National Data Archive on Child Abuse and Neglect (NDACANS) database from 2008 to 2021.[34] These data represent the population of all state-reported investigations and reports for suspected maltreatment for all 50 US states and the District of Columbia. State-level information on Medicaid expansion status and 1115 waiver status were sourced from the Kaiser Family Foundation.[35] We restricted the data to include only initial, nonfatal reports of child maltreatment for children 18 years of age or younger and performed analysis at the state-month level to account for state-level changes in policy. Our resulting analytical sample consisted of 25,307,932 individual reports in 8,138 state-month observations (eMethods).

This study was based on public and deidentified data and did not constitute human subjects research as defined by 45 CFR §46.102. This study follows the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) reporting guidelines.[36]

Study Variables

Outcome Measures

We aimed to measure how Medicaid expansion in Maine affected both the quantity of maltreatment reporting and the quality of downstream interventions. We therefore used four primary outcomes: total reports per 1,000 children; reports from medical personnel per 1,000 children; the rate of separations of children from their primary residence per 1,000 children; and the percentage of separations that were ultimately unsubstantiated by CPS.

Our final measure—the percentage of unsubstantiated separations—is an imperfect proxy for false positive maltreatment interventions by CPS. NDACANS data contains substantiation by CPS caseworkers, measuring the extent to which CPS considered a maltreatment report to have sufficient evidentiary backing. This typically requires little evidence, particularly compared to legal substantiation, where a court decides that there is sufficient evidence to support claims of abuse or neglect. As such, criteria influencing whether an investigation is substantiated vary across states, and a substantiated report does not necessarily indicate maltreatment in all cases. Using CPS substantiation as a proxy for

investigation quality may suffer from two biases. First, there may be maltreatment interventions (e.g., separations) that are not reflective of true maltreatment but are still labeled substantiated by CPS. Second, there may be separations undertaken due to true maltreatment which are ultimately labeled as unsubstantiated based on court decisions. As NDACANS data does not include information on reunifications following separations or whether a substantiated separation ultimately met the evidentiary standard for separation in a court, we are unable to provide a true measure of false positive reporting. However, given that evidentiary thresholds triggering separations in the US tend to be low relative to other countries,[37] our measure is likely an undercount of the true false positive reporting rates across states.

Secondary outcomes included the rate of all reports which were unsubstantiated and differences in rates across child sex, race, ethnicity, age, and the type of suspected maltreatment.

Exposure Measure

Our primary exposure is Maine's expansion of Medicaid on January 10, 2019.[35] Although the expansion was retroactive to July 2, 2018, we consider only the actual implementation date as retroactive coverage would not have changed actual child exposure to physicians before Medicaid enrollment.

We estimated treatment effects of expansion against three distinct comparison groups (eTable 1): all other states in the New England region since these states bear the closest demographic, cultural, and political resemblance to Maine; all US states that expanded Medicaid during 2014, the first year Medicaid expansions were available; and all states which had not expanded Medicaid as of December 31, 2021. For the first two groups, comparisons were conducted from 2014 onwards to avoid capturing effects from other states' own Medicaid expansions. Each comparison group matches Maine more closely on different measures (Table 1); hence, showing robustness in our analysis across all groups provides a consistent level of generalizability.

We focus only on Maine's expansion—rather than every state expanding Medicaid—given state variations in reporting[38] and the occurrence of several high-profile child maltreatment fatalities in late 2013 and early 2014 (see eMethods for more discussion).[39,40]

Statistical Analysis

We used a synthetic difference-in-differences (SDID) approach to estimate the average treatment effect of Maine's Medicaid expansion associated with child maltreatment.[41] SDID is a technique that infers treatment effects without requiring strong parallel trends assumptions.[42,43] SDID regressions used

weighted averages of algorithmically-selected control states and pretreatment periods to construct a counterfactual "synthetic" Maine, which matches observed pre-treatment trends (eMethods). Regression analysis across groups, adjusting for state and month-level variation, captures the association of Medicaid expansion with maltreatment reporting, investigations, and interventions. Inference was conducted using placebo tests (i.e., a test for significant treatment effects among unexposed units, where no such effects are expected). Subgroup analyses were performed across child race/ethnicity, age, sex, and the type of reported maltreatment, estimating the approximate percentage change within category following expansion (eMethods). Analyses were performed using Stata MP version 15 (StataCorp LLC).

Results

Our analysis sample consisted of 25,307,932 individual reports, or 8,138 state-month observations (38 states across 14 years). Measures of reporting and substantiation are similar across groups, although other New England states substantiate new reports at approximately twice the rate of other states and Maine has a significantly lower rate of unsubstantiated separations than comparison groups (Table 1). Additionally, although all states have a similar fraction of non-white reported children, Maine has more non-Black, non-Hispanic children reported for maltreatment compared to New England states (majority Hispanic) and other states (majority Black).

Comparisons across Maine and each control group were formalized using the SDID regression (Table 2, Figure 1). Medicaid expansion was associated with overall increases in maltreatment reporting: new reports per 1,000 children rose by 1.97 (95% CI, 1.95 to 1.98; $p < .001$), and reports from medical professionals rose by 0.28 per 1,000 children (95% CI, 0.27 to 0.29; $p < .001$). These correspond to 78.0% and 77.5% increases, respectively, over pre-expansion rates. New investigations led to increased separations of children from their homes (coefficient, 0.15 per 1,000 children; 95% CI, 0.15 to 0.15; $p < .001$) at a reduced quality: the rate of unsubstantiated separations increased by 8.73 percentage points (95% CI, 7.37 to 10.10; $p < .001$) and the overall rate of unsubstantiated reports (without conditioning on separation) increased by 4.88 percentage points (95% CI, 1.73 to 8.02; $p < .001$; not shown in Table). Estimated effects are comparable regardless of the chosen control group.

Figure 1 illustrates comparisons between Maine and its synthetic counterpart using all 2014 expansion states as a comparison group. There is little evidence that Maine and synthetic Maine have differing trends pre-expansion, providing suggestive support for the parallel trends assumption. The figure also provides important context for our results. In 2018, two high-profile fatalities from child maltreatment occurred in Maine (Marissa Kennedy and Kendall Chick).[44] These fatalities are associated with short-lived spikes in both reporting and separations, as seen in panels (a) and (c) in Figure 1.

Reporting of separations in Maine appears to be fundamentally different in 2017 compared to other years; our results are robust to omitting 2017 to alleviate concerns of data integrity (eTable 6).

Finally, we performed subgroup analysis assessing how Medicaid expansion in Maine may have differentially affected children (Figure 2). In each panel, we compare the effects of Medicaid expansion on the outcome variable of interest across groups, estimated with the SDID regression. We observe insignificant differences across overall reporting (panel A); however, non-White children are significantly more likely to be reported for maltreatment by medical practitioners (panel B) (Black-White difference = 0.16; $p < .001$), as are female children (female-male difference = 0.10; $p < .001$). These differences are mirrored in the rates of separation (panel C), (Black-White difference = 0.22; $p < .001$). There is also heterogeneity across the age distribution, with toddlers more likely to be reported for potential maltreatment (difference between ages 1-5 to age 0 = 0.31; $p < .001$), but infants more likely to be separated for maltreatment (difference between age 0 and ages 1-5 = 0.54; $p < .001$).

Robustness was assessed across control groups (Table 2), and with and without log-transforming outcome variables. Additionally, although SDID methods do not typically require covariate adjustment to ensure balance across observed and synthetic treatment groups,[42] we show our results are robust to including covariates used in previous studies (eTable 2) and to using traditional synthetic controls and difference-in-differences regressions as opposed to SDID methods (eTables 3 and 4). Finally, our results are also robust to excluding reports in the NDACANS data that do not indicate a high likelihood of risk for maltreatment (eTable 5). This addresses potential concerns that states occasionally screen reports for children that are at no risk of maltreatment, including for public service referrals.[45,46]

Discussion

In this cohort study, we examined the association between Medicaid expansion and child maltreatment practices in Maine. We highlight two important effects of Maine's expansion: first, more children were reported for potential maltreatment—particularly by medical professionals—suggesting that expanded access to healthcare is associated with increased surveillance and, ultimately, reporting for maltreatment by mandatory reporters. Second, we document that this increase affects the quality of downstream interventions, including a 146% ($p < .001$) increase in the rate at which children are separated from their homes and a 39.4% ($p < .001$) increase in the likelihood that separations will ultimately be unsubstantiated. Given the limitations of our quality measure discussed above, we are unable to observe all interventions which are ultimately deemed to be false positives (e.g., separations labeled as substantiated but ultimately rejected in court); hence, this proxy is likely an under-estimate of the true decline in investigation and intervention quality following Medicaid expansion. Our findings

also highlight that minoritized groups, such as Black children, are more likely to suffer unsubstantiated interventions.

We also found that the effects of Medicaid expansion are persistent over time, particularly compared to other observed changes in maltreatment reporting. Specifically, Figure 1 highlights that reporting and separation rates increased briefly following high-profile fatalities in Maine.[44] However, the observed effects following Medicaid expansion are both larger in magnitude and more sustained over time than these responses. In addition, our subgroup analysis is consistent with the notion that Medicaid expansion disrupted the type of evidence justifying maltreatment interventions (Figure 2). We observe that expansion is associated with increased reporting of physical abuse (coefficient: 31.3%; 95% CI 30.9% to 31.7%; $p < 0.001$) and increased separations for physical abuse (coefficient: 3.6%; 95% CI 2.8% to 4.4%; $p < 0.001$). This is reasonable considering that medical professionals are in unique positions to identify physical maltreatment and medical neglect;[47] however, we observe these separations (especially those that are for physical abuse *and* medical neglect) are more likely to be unsubstantiated (coefficient: 17.8%; 95% CI 7.3% to 28.4%; $p = 0.001$). Finally, we find that infants are more likely to be separated from their caregivers following an investigation post-expansion (difference between age 0 and ages 1-5 = 0.54; $p < .001$); this is in line with the notion that interventions for younger children require less evidence, an idea which has been argued in the literature.[48]

This research adds to evidence on the role of medical mandatory reporting and increased access to healthcare on maltreatment detection. This study also contributes to a broader discussion on the impacts of the ACA and Medicaid expansions on financial protections and access to healthcare.[49–51] Prior work has documented that public supports for households, including minimum wage laws and tax credits, may reduce maltreatment reporting.[3,20] Indeed, previous work has identified declines in aspects of maltreatment reporting following the 2014 wave of Medicaid expansions;[18,19] however, these findings evaluate only a single time point and are potentially contaminated by pre-treatment events, such as high-profile child fatalities in 2013. In contrast, our study evaluates more recent expansions while considering changes in overall reporting rates as well as the source and quality of reports and downstream interventions. Taken together, this research suggests that child maltreatment reporting is influenced by increased exposure of children to medical surveillance.

Our findings have important policy implications. First, Medicaid expansions increased access to healthcare—providing large health benefits to children and caregivers—with the unintended consequence of increasing a child's risk of unwarranted and harmful CPS interventions arising from increased surveillance. Reporting and investigation protocols—both among organizations such as hospitals and CPS itself—should take these consequences into account. Investigations and interventions

should be conducted with an eye to minimizing potential trauma for households, potentially by raising or harmonizing evidentiary standards for substantiation and separations. Second, policymakers and medical personnel should be aware of the low specificity of medical maltreatment reports[12–16] and take action to reduce false positive reporting. This may require clear guidance accompanying mandatory reporting laws to measure and improve reporting quality, or reducing or eliminating immunity for mandatory reporters when an intervention such as a separation is ultimately unsubstantiated.[52] Finally, our results add to a growing discussion casting doubt on the effectiveness of mandatory reporting laws themselves—particularly for medical practitioners—in detecting true maltreatment.[9,37,53,54] As the quantity of reports increase, corresponding investigation quality may decrease, effectively reducing the likelihood of detecting true maltreatment and negatively impacting households. Furthermore, mandatory reporting laws may inhibit physicians' abilities to treat patients, particularly in instances where investigations are triggered by low evidentiary thresholds.[37] Reforming or eliminating mandatory reporting laws could allow for expanded access to healthcare while mitigating these unintended consequences.

Limitations

This study had several limitations. First, our analytical method relies on satisfying the key identifying assumption of parallel trends among the treatment state and the synthetic control. While the synthetic difference-in-differences approach weakens the necessary parallel trends assumption, satisfying this assumption is ultimately untestable. We show that our results are robust to multiple alternative specifications and that similar findings result from alternative analytical approaches.

Another key limitation is our inability to correctly measure the true quality of child maltreatment investigations and interventions. The NDACANS data does not have a consistent measure for reunification of children with their caregivers, nor does it provide court decisions or other data on whether a report or intervention was unwarranted beyond its reported level of substantiation. Furthermore, states vary in their definition of "substantiation," and simply substantiating child maltreatment does not indicate that abuse is truly taking place.[38] We report strong evidence that expanding Medicaid in Maine led to an increased likelihood that separations and new reports are ultimately unsubstantiated; however, this is likely an undercount of the true decline in investigation quality given that there are potentially many reports and interventions which are reported as substantiated but whose evidence is ultimately rejected in court.

Conclusions

This cohort study examined the association between Medicaid expansion in Maine and child maltreatment reporting and found immediate increases in the overall rates of reporting and separations as well as the fraction of unsubstantiated interventions. Medicaid expansion is associated with increased rates of lower-quality maltreatment reports, especially for minoritized groups such as Black and female children. This study adds to the discussion of the role of medical surveillance and mandatory reporting in promoting equitable well-being for children. These findings suggest that the important financial and health protections of Medicaid expansion should be supplemented with policies that protect children and caregivers from imperfect surveillance by medical mandatory reporters.

Article Information

Author Contributions: Dr. Hoagland and Mr. Sabey had full access to all the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis.

Concept and design: All authors.

Acquisition, analysis, or interpretation of data: All authors.

Drafting of the manuscript: All authors.

Critical revision of the manuscript for important intellectual content: All authors.

Statistical analysis: All authors.

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Data Sharing Statement: National Child Abuse and Neglect Data System (NCAND) Child File used for the current study may be requested from the National Data Archive on Child Abuse and Neglect (NDACANS) at Cornell University where the data are stored: https://www.NDACANS.acf.hhs.gov/datasets/datasets-list-ncands-child-file.cfm (accessed on 1 April 2023)

References

1. Kim H, Wildeman C, Jonson-Reid M, Drake B. Lifetime Prevalence of Investigating Child Maltreatment Among US Children. *Am J Public Health*. 2017;107(2):274-280. doi:10.2105/AJPH.2016.303545

2. Prettyman A. *Child Maltreatment Referrals and Mandatory Reporting Laws*. Working Paper; 2021.

3. Bullinger LR, Boy A. Association of Expanded Child Tax Credit Payments With Child Abuse and Neglect Emergency Department Visits. *JAMA Network Open*. 2023;6(2):e2255639. doi:10.1001/jamanetworkopen.2022.55639

4. Kim H, Drake B. Child maltreatment risk as a function of poverty and race/ethnicity in the USA. *International Journal of Epidemiology*. 2018;47(3):780-787. doi:10.1093/ije/dyx280

5. Basu A, McLaughlin KA, Misra S, Koenen KC. Childhood Maltreatment and Health Impact: The Examples of Cardiovascular Disease and Type 2 Diabetes Mellitus in Adults. *Clinical Psychology: Science and Practice*. 2017;24(2):125-139. doi:10.1111/cpsp.12191

6. Jaffee SR. Child Maltreatment and Risk for Psychopathology in Childhood and Adulthood. *Annual Review of Clinical Psychology*. 2017;13(1):525-551. doi:10.1146/annurev-clinpsy-032816-045005

7. Stoltzfus E. *Child Welfare: Purposes, Federal Programs, and Funding*. Congressional Research Service; 2023.

8. Fishe JN, Moffat FL. Child Abuse and the Law. *Clinical Pediatric Emergency Medicine*. 2016;17(4):302-311. doi:10.1016/j.cpem.2016.09.003

9. McTavish JR, Kimber M, Devries K, et al. Mandated reporters' experiences with reporting child maltreatment: a meta-synthesis of qualitative studies. *BMJ Open*. 2017;7(10):e013942. doi:10.1136/bmjopen-2016-013942

10. Goudarzi S. Separating families may cause lifelong health damage. *Scientific American https://www scientificamerican com/article/separating-families-may-causelifelong-health-damage*. Published online 2018.

11. Howard K, Martin A, Berlin LJ, Brooks-Gunn J. Early mother–child separation, parenting, and child well-being in Early Head Start families. *Attachment & human development*. 2011;13(1):5-26.

12. Kellogg ND, Abuse C on C, Neglect. Evaluation of suspected child physical abuse. *Pediatrics*. 2007;119(6):1232-1241.

13. Sittig JS, Uiterwaal CSPM, Moons KGM, et al. Value of systematic detection of physical child abuse at emergency rooms: a cross-sectional diagnostic accuracy study. *BMJ Open*. 2016;6(3). Accessed May 3, 2023. https://bmjopen.bmj.com/content/6/3/e010788.short

14. Annapragada AV, Donaruma-Kwoh MM, Annapragada AV, Starosolski ZA. A natural language processing and deep learning approach to identify child abuse from pediatric electronic medical records. *PLOS ONE*. 2021;16(2):e0247404. doi:10.1371/journal.pone.0247404

15. Teeuw AH, Derkx BHF, Koster WA, van Rijn RR. Detection of child abuse and neglect at the emergency room. *Eur J Pediatr*. 2011;171(6):877-885. doi:10.1007/s00431-011-1551-1

16. Lonne B, Herrenkohl TI, Higgins DJ, Scott D. The Implications of Leveraging Administrative Data for Public Health Approaches to Protecting Children: Sleepwalking into Quicksand? *Int Journal on Child Malt*. 2022;5(4):501-517. doi:10.1007/s42448-022-00126-9

17. Work EC, Muftu S, MacMillan KDL, et al. Prescribed and Penalized: The Detrimental Impact of Mandated Reporting for Prenatal Utilization of Medication for Opioid Use Disorder. *Matern Child Health J*. Published online May 31, 2023. doi:10.1007/s10995-023-03672-x

18. McGinty EE, Nair R, Assini-Meytin LC, Stuart EA, Letourneau EJ. Impact of Medicaid Expansion on Reported Incidents of Child Neglect and Physical Abuse. *American Journal of Preventive Medicine*. 2022;62(1):e11-e20. doi:10.1016/j.amepre.2021.06.010

19. Brown ECB, Garrison MM, Bao H, Qu P, Jenny C, Rowhani-Rahbar A. Assessment of Rates of Child Maltreatment in States With Medicaid Expansion vs States Without Medicaid Expansion. *JAMA Network Open*. 2019;2(6):e195529. doi:doi:10.1001/jamanetworkopen.2019.5529

20. Antonisse L, Garfield R, Rudowitz R, Artiga S. The effects of Medicaid expansion under the ACA: updated findings from a literature review. *Published March*. Published online 2018.

21. Hamersma S, Kim M, Timpe B. The Effect of Parental Medicaid Expansions on Children's Health Insurance Coverage. *Contemporary Economic Policy*. 2019;37(2):297-311. doi:10.1111/coep.12392

22. Lipton BJ. Adult Medicaid benefit generosity and receipt of recommended health services among low-income children: The spillover effects of Medicaid adult dental coverage expansions. *Journal of Health Economics*. 2021;75:102404. doi:10.1016/j.jhealeco.2020.102404

23. Venkataramani M, Pollack CE, Roberts ET. Spillover Effects of Adult Medicaid Expansions on Children's Use of Preventive Services. *Pediatrics*. 2017;140(6):e20170953. doi:10.1542/peds.2017-0953

24. Kenney GM, Haley J, Pan C, Lynch V, Buettgens M. Children's coverage climb continues: Uninsurance and Medicaid/CHIP eligibility and participation under the ACA. *Princeton, NJ: Robert Wood Johnson Foundation*. Published online 2016.

25. Nikpay S, Freedman S, Levy H, Buchmueller T. Effect of the Affordable Care Act

Medicaid Expansion on Emergency Department Visits: Evidence From State-Level Emergency Department Databases. *Annals of Emergency Medicine*. 2017;70(2):215-225.e6. doi:10.1016/j.annemergmed.2017.03.023

26. Elani HW, Kawachi I, Sommers BD. Changes in emergency department dental visits after Medicaid expansion. *Health Services Research*. 2020;55(3):367-374. doi:10.1111/1475-6773.13261

27. Gordon SH, Sommers BD, Wilson IB, Trivedi AN. Effects Of Medicaid Expansion On Postpartum Coverage And Outpatient Utilization: The effects of Medicaid expansion on postpartum Medicaid enrollment and outpatient utilization. Comparing Colorado, which expanded Medicaid, and Utah, which did not. *Health Affairs*. 2020;39(1):77-84. doi:10.1377/hlthaff.2019.00547

28. Sommers BD, Blendon RJ, Orav EJ, Epstein AM. Changes in Utilization and Health Among Low-Income Adults After Medicaid Expansion or Expanded Private Insurance. *JAMA Internal Medicine*. 2016;176(10):1501-1509. doi:10.1001/jamainternmed.2016.4419

29. Hoopes MJ, Angier H, Gold R, et al. Utilization of Community Health Centers in Medicaid Expansion and Non-Expansion States, 2013–2014. *J Ambul Care Manage*. 2016;39(4):290-298. doi:10.1097/JAC.0000000000000123

30. Baron EJ, Doyle Jr. JJ, Emanuel N, Hull P, Ryan J. Racial discrimination in child protection. *NBER Working Paper*. Published online 2023.

31. Drake B, Jolley JM, Lanier P, Fluke J, Barth RP, Jonson-Reid M. Racial Bias in Child Protection? A Comparison of Competing Explanations Using National Data. *Pediatrics*. 2011;127(3):471-478. doi:10.1542/peds.2010-1710

32. Luken A, Nair R, Fix RL. On Racial Disparities in Child Abuse Reports: Exploratory Mapping the 2018 NCANDS. *Child Maltreat*. 2021;26(3):267-281. doi:10.1177/10775595211001926

33. Fong K. Getting Eyes in the Home: Child Protective Services Investigations and State Surveillance of Family Life. *Am Sociol Rev*. 2020;85(4):610-638. doi:10.1177/0003122420938460

34. Bronfenbrenner Center for Translational Research. National Data Archive on Child Abuse and Neglect. Published online 2023. Accessed March 1, 2023. https://www.ndacan.acf.hhs.gov/datasets/pdfs_user_guides/ncands-child-file-codebook.pdf

35. Kaiser Family Foundation. *Status of State Medicaid Expansion Decisions: Interactive Map.* Kaiser Family Foundation; 2023. Accessed April 1, 2023. https://www.kff.org/medicaid/issue-brief/status-of-state-medicaid-expansion-decisions-interactive-map/

36. Vandenbroucke JP, Elm E von, Altman DG, et al. Strengthening the Reporting of Observational Studies in Epidemiology (STROBE): explanation and elaboration. *Annals of internal medicine*. 2007;147(8):W-163.

37. Finkelhor D. Screening for adverse childhood experiences (ACEs): Cautions and suggestions. *Child Abuse & Neglect*. 2018;85:174-179. doi:10.1016/j.chiabu.2017.07.016

38. Children's Bureau. *National Child Abuse and Neglect Data System (NCANDS) Child File (FY2020): Codebook*. National Data Archive on Child Abuse and Neglect (NDACAN); 2022. doi:10.34681/QWAX-VB30

39. Report details pattern of abuse in toddler's death. Accessed May 5, 2023. https://www.capecodtimes.com/story/news/crime/2014/06/01/report-details-pattern-abuse-in/36129823007/

40. The Tragic Case of Omaree Varela | HuffPost Latest News. Accessed May 5, 2023. https://www.huffpost.com/entry/the-tragic-case-of-omaree_b_5534857

41. Auty SG, Cole MB, Wallace J. Association Between Medicaid Managed Care Coverage of Substance Use Services and Treatment Utilization. *JAMA Health Forum*. 2022;3(8):e222812. doi:10.1001/jamahealthforum.2022.2812

42. Arkhangelsky D, Athey S, Hirshberg DA, Imbens GW, Wager S. Synthetic Difference-in-Differences. *American Economic Review*. 2021;111(12):4088-4118. doi:10.1257/aer.20190159

43. Clarke D, Pailañir D, Carleton Athey S, Imbens GW. Synthetic Difference-in-Differences Estimation. *SSRN Journal*. Published online 2023. doi:10.2139/ssrn.4346540

44. Writer ER. Reports of child abuse in Maine spiked 26 percent in 2018, driven by 2 high-profile cases. Press Herald. Published July 30, 2019. Accessed May 18, 2023. https://www.pressherald.com/2019/07/30/child-abuse-reports-spike-26-percent-in-2018/

45. Department of Health and Human Services. *Statewide Data Indicators and National Standards for Child and Family Services Reviews*. Children's Bureau (CB), Administration for Children and Families (ACF), Administration on Children, Youth and Families (ACYF), Department of Health and Human Services (HHS).; 2014. doi:10.1037/e722922011-001

46. Horwitz SM, Hurlburt MS, Cohen SD, Zhang J, Landsverk J. Predictors of placement for children who initially remained in their homes after an investigation for abuse or neglect. *Child Abuse & Neglect*. 2011;35(3):188-198. doi:10.1016/j.chiabu.2010.12.002

47. Christian CW, COMMITTEE ON CHILD ABUSE AND NEGLECT. The Evaluation of Suspected Child Physical Abuse. *Pediatrics*. 2015;135(5):e20150356. doi:10.1542/peds.2015-0356

48. Gilbert R, Fluke J, O'Donnell M, et al. Child maltreatment: variation in trends and policies in six developed countries. *The Lancet*. 2012;379(9817):758-772. doi:10.1016/S0140-6736(11)61087-8

49. Linde S, Egede LE. Association Between State-Level Medicaid Expansion and Eviction

Rates. *JAMA Network Open*. 2023;6(1):e2249361. doi:10.1001/jamanetworkopen.2022.49361

50. Hoagland A, Shafer P. Out-of-pocket costs for preventive care persist almost a decade after the Affordable Care Act. *Preventive Medicine*. 2021;150:106690. doi:10.1016/j.ypmed.2021.106690

51. Shafer PR, Hoagland A, Hsu HE. Trends in pediatric wellness visits with out-of-pocket costs before and after the Affordable Care Act. *JAMA Network Open*. Published online 2021.

52. Feng JY, Chen YW, Fetzer S, Feng MC, Lin CL. Ethical and legal challenges of mandated child abuse reporters. *Children and Youth Services Review*. 2012;34(1):276-280. doi:10.1016/j.childyouth.2011.10.026

53. Rodriguez MA, McLoughlin E, Nah G, Campbell JC. Mandatory reporting of domestic violence injuries to the police: What do emergency department patients think? *Jama*. 2001;286(5):580-583.

54. Jordan CE, Pritchard AJ. Mandatory reporting of domestic violence: what do abuse survivors think and what variables influence those opinions? *Journal of interpersonal violence*. 2021;36(7-8):NP4170-NP4190.

Table 1: Summary Statistics

	Maine	New England States	All 2014 Expansion States	All Non-Expansion States
A. Outcome Measures				
Reports per 1,000 children	2.52	2.81	3.60	3.61
	(0.003)	(0.001)	(0.001)	(0.001)
Medical Reports per 1,000 children	0.36	0.43	0.32	0.32
	(0.0004)	(0.0002)	(.001)	(.001)
Separations per 1,000 children	0.10	0.14	0.15	0.11
	(0.0002)	(.001)	(0.0000)	(0.0000)
% of Investigations Unsubstantiated	82.3%	70.20%	84.99%	85.17%
	(0.01)	(0.02)	(0.002)	(0.002)
% of Separations Unsubstantiated	22.19%	31.00%	38.44%	42.78%
	(0.04)	(0.02)	(0.01)	(0.01)
B. Maltreatment Types				
Physical Abuse	22.63%	18.88%	23.80%	21.28%
	(0.15)	(0.05)	(0.01)	(0.01)
Sexual Abuse	7.98%	5.67%	6.13%	8.58%
	(0.09)	(0.03)	(0.01)	(0.01)
Neglect	76.22%	69.74%	63.98%	59.04%
	(0.15)	(0.05)	(0.01)	(0.01)
Other	7.88%	2.56%	6.08%	6.71%
	(0.10)	(0.03)	(0.06)	(0.07)
C. Children Characteristics				
Age	5.57	6.99	7.31	7.08
	(0.02)	(0.01)	(0.00)	(0.00)
Female	48.59%	47.44%	49.47%	49.79%
	(0.17)	(0.06)	(0.01)	(0.01)
White	60.62%	58.11%	56.19%	60.77%
	(0.17)	(0.06)	(0.01)	(0.01)
Black	3.57%	16.23%	24.45%	32.33%
	(0.06)	(0.04)	(0.01)	(0.01)
Hispanic	2.38%	22.22%	24.40%	18.96%
	(0.05)	(0.05)	(0.01)	(0.01)
Other non-Hispanic	36.66%	21.19%	11.05%	8.36%
	(0.17)	(0.05)	(0.01)	(0.01)
$N_{reports}$	82,557	714,211	11,266,735	13,199,715
N_{states}	1	5	26	11
Time Frame	2008-2019	2014-2021	2014-2021	2008-2021

Notes: Standard errors for population-level incidence rates assume a Poisson distribution. The sample is limited to all first-time reports of maltreatment and excludes maltreatment fatalities as identifying information is masked for these reports. Substantiation is reported at the maltreatment type level; any investigation with an unsubstantiated claim is labeled as unsubstantiated. Perpetrator characteristics are not sufficiently populated in NDACANS data for inclusion.

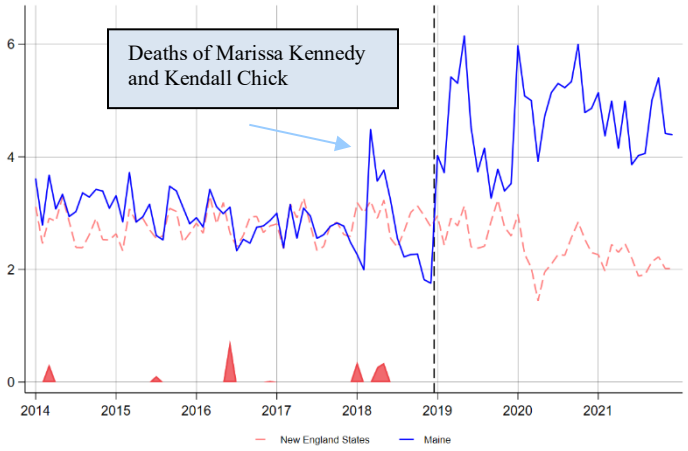
Table 2: Estimated Treatment Effects

	Comparison Groups		
Outcomes	New England States	All 2014 Expansion States	All Non-Expansion States
Reports per 1,000 children	1.965***	1.947**	1.735***
	(0.017)	(0.730)	(0.466)
Medical Reports per 1,000 children	0.279***	0.209**	0.227*
	(0.005)	(0.068)	(0.106)
Separations per 1,000 children	0.146***	0.056*	0.129**
	(0.005)	(0.024)	(0.049)
% of Separations that are Unsubstantiated	8.735***	10.948**	9.378
	(2.283)	(4.014)	(6.371)

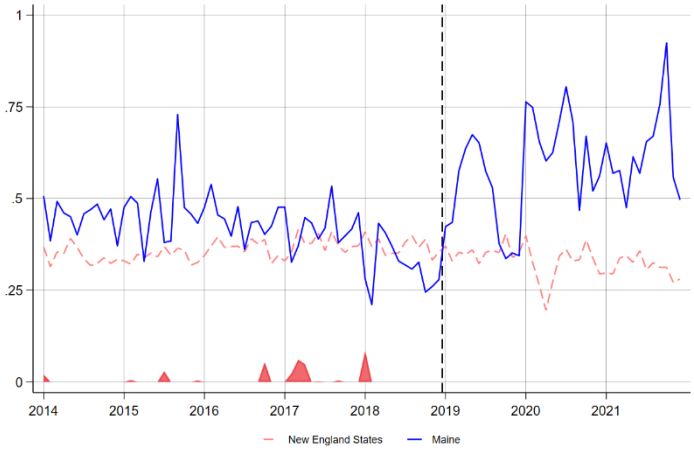
Notes: Table includes estimated treatment effects from synthetic difference-in-differences estimation. Estimation is performed using the sdid package in Stata. Standard errors are calculated based on 500 placebo iterations. * $p < 0.05$, * $p < 0.01$, *** $p < 0.001$.

Figure 1. Synthetic Difference-in-Differences Estimation (comparison: All 2014 Expansion States)

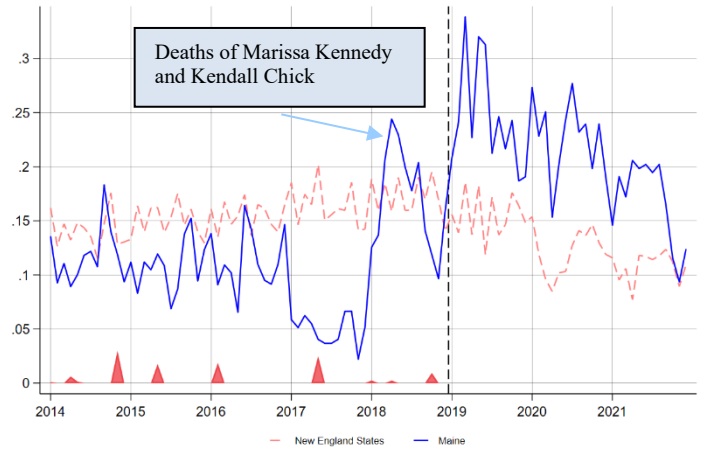
(a) Total new reports per 1,000 children



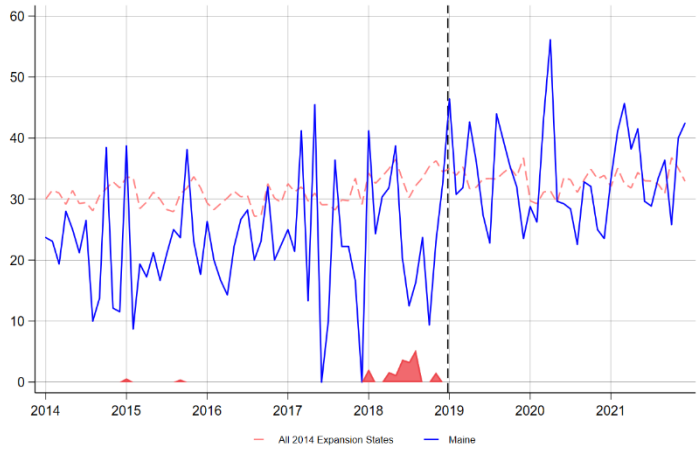
(b) New reports from physicians per 1,000 children



(c) Child separations per 1,000 children



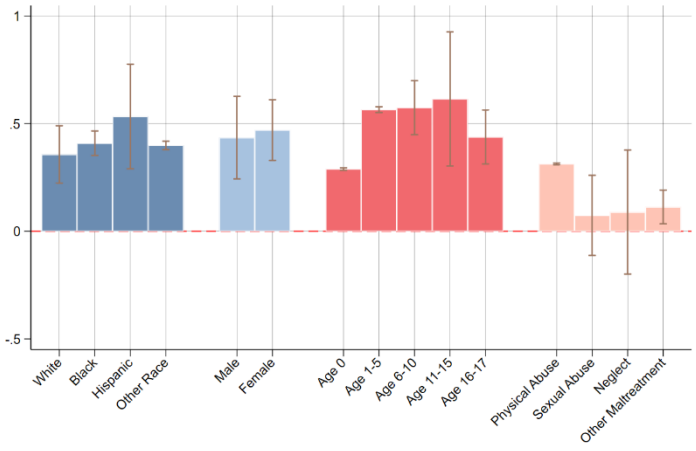
(d) % of separations ultimately unsubstantiated



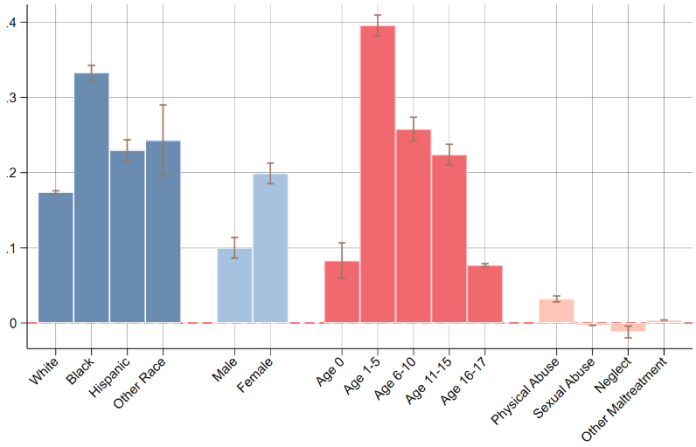
Notes: Figures illustrate trends in Maine (blue) and synthetic Maine (red, dashed) before and after Medicaid expansion in 2019. Weights used in SDID regressions are shown in red along the *x*-axis (additional discussion of methodology provided in the eSupplement). The dashed black line indicates the period of Medicaid expansion in Maine. The timing of two high-profile child fatalities from abuse is indicated in panels (a) and (c). Results are robust to omitting 2017 in regressions given the irregularities observable in panel (c) (eSupplement).

Figure 2. Subgroup Analysis

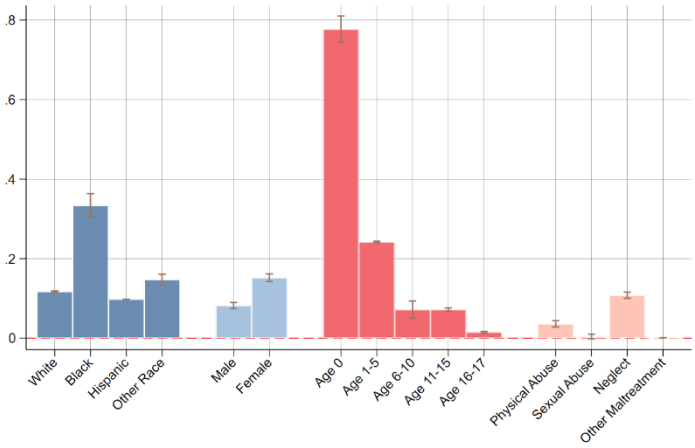
(b) Total new reports per 1,000 children



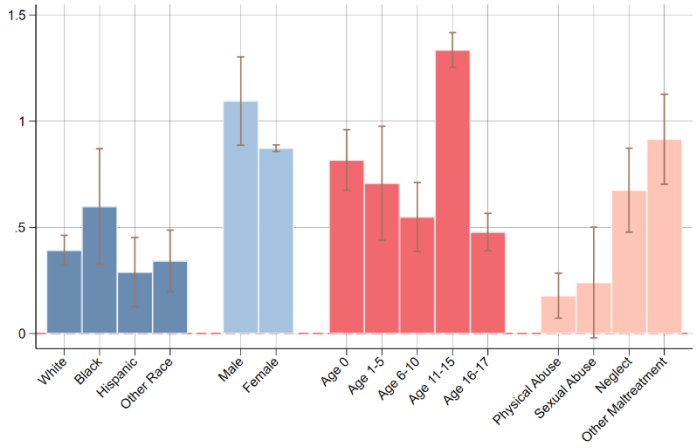
(b) New reports from physicians per 1,000 children



(c) Child separations per 1,000 children



(d) % of separations ultimately unsubstantiated



Notes: Figures estimate the average percentage change in reporting, separation, and substantiation rates using the synthetic difference-in-differences method with all other New England states as the comparison group. For each bar, outcomes are transformed so that coefficients represent approximate percentage changes following expansion. Coefficients and 95% confidence intervals are shown for each group-outcome pair.