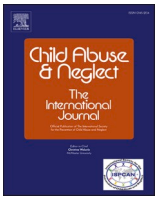
Child Abuse & Neglect 160 (2025) 107175

Contents lists available at ScienceDirect

Child Abuse & Neglect

journal homepage: www.elsevier.com/locate/chiabuneg



Prenatal cannabis exposure and the risk of subsequent maltreatment

Joseph P. Ryan [a,*], Lauren Oshman [b], Christopher J. Frank [b], Brian Perron [a], Bryan Victor [c], Vivek Sankaran [d]

[a] University of Michigan School of Social Work, United States of America
[b] University of Michigan, Department of Family Medicine, Institute for Healthcare Policy and Innovation, University of Michigan, Ann Arbor, United States of America
[c] Wayne State University School of Social Work, United States of America
[d] University of Michigan Law School, United States of America

ARTICLE INFO

Keywords:
Substance exposed infants
cannabis
Maltreatment
Racial bias

ABSTRACT

Background: Parental substance use can increase the risk of child maltreatment.
Objective: The purpose of this study was to assess racial bias in newborn drug testing and to investigate the association between prenatal tetrahydrocannabinol (THC) exposure and subsequent child maltreatment.
Participants and Setting.
This retrospective cohort study (n = 35,437) linked University of Michigan Hospital birth data and Michigan Department of Health and Human Services child maltreatment data relative to a 2018 policy change. Prior to 2018, prenatal THC exposure was routinely substantiated as physical abuse; after 2018 THC exposure was investigated but not automatically substantiated.
Methods: We defined prenatal THC exposure as a positive newborn meconium drug test for THC. The primary outcome was a substantiated Child Protective Services (CPS) report of maltreatment before and after the policy change. Demographic variables included parent age, race, ethnicity, zip code and insurance type. Covariates included prenatal urine drug test orders and results, and newborn drug test orders and results. Regression models estimated the rate of subsequent maltreatment and racial disparities associated with newborn testing.
Results: Regression analyses indicated that Black and multiracial newborns were significantly more likely to be tested for substance exposure at birth. Newborns with a test positive for THC only were not more likely to experience maltreatment after the policy change as compared with newborns that tested negative and newborns not tested.
Conclusions: The evidence strongly supports a policy to end routine CPS investigations for cannabis exposure and eliminate racially biased drug testing practices.

1. Introduction

Parental substance use disorders can contribute to parenting practices that increase the risk of child maltreatment and placement in

* Corresponding author.
E-mail addresses: joryan@umich.edu (J.P. Ryan), laoshman@med.umich.edu (L. Oshman), cfrank@med.umich.edu (C.J. Frank), beperron@umich.edu (B. Perron), bvictor@wayne.edu (B. Victor), vss@umich.edu (V. Sankaran).

https://doi.org/10.1016/j.chiabu.2024.107175
Received 26 August 2024; Received in revised form 19 November 2024; Accepted 27 November 2024
Available online 12 December 2024

foster care in part by creating an environment that is not responsive to the needs of children (Chassin et al., 2019; Children's Bureau, 2019; Jernbro et al., 2022; Lin et al., 2022) Substance use was second only to mental health as the most frequently identified risk factor for child maltreatment (Younas & Gutman, 2022). Estimates from the Adoption and Foster Care Analysis and Reporting System (AFCARS) indicate that the prevalence of parental substance use disorders as an identified condition of removal more than doubled between 2000 and 2019, and that 50 % of children under the age of one placed in foster care were removed for reasons related to parental substance use (Children's Bureau, 2019).

The amended Child Abuse Prevention and Treatment Act (CAPTA) requires states to have policies to identify substance-exposed infants (SEI). Specifically, CAPTA requires that health providers notify Children's Protective Services (CPS) of all infants identified as affected by substance abuse, withdrawal symptoms resulting from prenatal drug exposure, or a fetal alcohol spectrum disorder (ACF, 2023). While CAPTA does not require states to investigate every report of substance exposure at birth, thirty-seven states and the District of Columbia require clinicians to report prenatal drug use, and forty-three jurisdictions include prenatal substance exposure as part of their definition of maltreatment (Mathematica, 2023).

Prenatal and newborn drug testing is considered important as exposure to drugs and alcohol may compromise the developing fetus and may also indicate a problem with substance abuse that subsequently impacts one's ability to parent. While newborn drug testing is a commonly used approach to identify prenatal substance exposure, there are no guidelines that support the use of prenatal or newborn drug testing as an evidence-based practice to identify newborns at risk of maltreatment due to parental substance use disorder (Kurtz & Smid, 2022; Obstetricians & Gynecologists, 2017). In a 2007 national study, 89 % of participating hospitals indicated that "an assessment" determined whether a newborn should be tested for substance exposure, while 56 % indicated that "suspicion of drug use" triggered a test (Drescher, 2007; Drescher-Burke, 2005). Although it is not clear whether such practices or suspicions continue to influence testing decision, recent studies demonstrate racial and economic bias in prenatal and newborn testing leading to disproportionate reporting to CPS (Cohen et al., 2023; Ellsworth et al., 2010; Jarlenski et al., 2023; Kerker et al., 2006; Kunins et al., 2007; Obstetricians & Gynecologists, 2017; Perlman et al., 2022; Winchester et al., 2022).

Most evidence connecting parental substance use and risk for child maltreatment focuses on opioids, cocaine, alcohol, and methamphetamines (Prindle et al., 2018). There is little evidence supporting a link between prenatal cannabis exposure and risk for future child maltreatment (Panday et al., 2022; Perlman et al., 2022; Winchester et al., 2022). In a geographic analysis of >2300 census tracks in California, the density of cannabis dispensaries (a proxy measure for increased use) was not associated with child maltreatment referrals (Freisthler & Kranich, 2022). Although cannabis use remains illegal under federal law, it is legal for medical or recreational use in 41 states. Michigan legalized cannabis for medical use on November 4, 2008, and for recreational use in the state of Michigan on December 6, 2018. Given rising rates of cannabis use during pregnancy, clinicians and child protection systems are wrestling with how to address prenatal cannabis use under their current state laws (Volkow et al., 2019).

This study takes advantage of a natural experiment created by a policy change in 2018. In Michigan, state law mandates that clinicians place a CPS report if a newborn has known or suspected exposure to alcohol and/or a controlled substance as evidenced by a positive newborn drug test or physical withdrawal symptoms. However, a report is not required if this is the result of medical treatment, such as medication treatment for opioid use disorder or medical cannabis (MDHHS, 2023). Historically, such reports were investigated by CPS and routinely substantiated as physical abuse. In 2018, the Michigan Department of Health and Human Services changed the policy so that "*a complaint involving only substance use is insufficient for investigation or confirmation of child abuse or neglect. Parents may use legally or illegally obtained substances and prescribed medications to varying degrees and remain able to safely care for their children. Substance use and/or abuse by a parent/caregiver may be a risk factor for child maltreatment. When substance use by a parent/caregiver or another adult in the home is alleged, caseworkers must evaluate its impact on child safety*" (MDHHS, 2019). This change complies with federal CAPTA requirements but changed the standard practice of substantiating THC exposure as physical abuse.

The aim of the current study was to use linked hospital birth records and state child maltreatment records to determine whether newborns with prenatal cannabis exposure were at increased risk of child abuse or neglect. A secondary aim was to examine the potential for racial bias in newborn drug testing and to quantify the impact of THC only investigations on racial disproportionality in the child protection system. We hypothesized that newborns exposed only to THC are not at an increased risk of maltreatment.

2. Methods

Study setting and sample: This retrospective cohort study used data from the University of Michigan Health System and the Michigan Department Health and Human Services (MDHHS). The cohort sample includes all live births ($n = 35{,}437$) at the University of Michigan between June 7, 2014 and July 1, 2022. The study followed the Strengthening the Reporting of Observational Studies in Epidemiology reporting guideline (Von Elm et al., 2007). A data sharing agreement provided administrative records for all children associated with child protection investigations in Michigan between June 1, 2014, and January 31, 2023. The investigation data included demographic information (birthdates, race, gender, geographic region), allegations of maltreatment (report date, type of alleged maltreatment including sexual abuse, physical abuse, and neglect, and findings). A substantiated allegation of maltreatment is defined as CPS finding a "preponderance" of evidence that maltreatment occurred (MDHHS, 2023).

Study Measures: The outcome measures were newborn drug test completion and subsequent substantiated CPS reports of child maltreatment. Demographic data extracted from the electronic medical records included self-reported birthing parent age, ethnicity, and race (American Indian or Alaska Native, Asian, Black, Native Hawaiian or other Pacific Islander, Other, and White). As American Indian, Alaska Native, Native Hawaiian and Pacific Islander accounted for 0.3 % of the cohort, these individuals were combined with the "Other" racial category for all analyses. We categorized individuals self-identifying more than one race as multiracial. Additional variables included presence or absence of prenatal care within the health system, results of prenatal urine drug tests, birthing parent's

insurance (private, self-pay, Medicaid or Medicare), and order completion and results of newborn meconium drug tests.

We calculated the neighborhood disadvantage index (NDI) by connecting the birthing parent's census tract to data from the Neighborhood Data Archive (NaNDA). The NDI ranged from zero to one hundred, with a higher number representing greater disadvantage (Melendez et al., 2020; Schoneich et al., 2023) The NDI includes the proportion of households in a given census tract that are female-headed with children, on public assistance or receiving food stamps, with income below the federal poverty level, and the proportion of unemployed among those 16 years or older. The measure used in the current study excludes race, as we explore this field directly in the regression models. We recoded disadvantage into quartiles (low, low-moderate, moderate, and high) because it was not normally distributed.

There was no formal policy at the institution regarding newborn drug testing during the study period. Clinicians used their discretion on the need for drug testing for prenatal substance exposure. Newborn drug tests were performed via a meconium enzyme-linked immunosorbent assay test that screens for amphetamines, cannabinoids, cocaine and metabolites, opiates, and phencyclidine; a positive screen automatically reflexes to confirmatory liquid chromatography–tandem mass spectrometry testing of which we captured positive tests for the substances of interest (amphetamine, cocaine, methamphetamine, opioids, phencyclidine, and THC). We created three dummy variables to capture the test results: (1) did not screen/negative test, (2) positive for THC only and (3) positive for any other combination of substances. The prenatal urine drug tests (for birthing parents) resulted for amphetamines, barbiturates, benzodiazepines, buprenorphine, cocaine, THC, methadone, methamphetamine, opiates, and oxycodone and were aggregated into 3 categories for statistical analysis: (1) did not test; (2) test negative for amphetamines, buprenorphine, THC, cocaine, methamphetamines, methadone, opiates, and oxycodone; and (3) test positive for any other combination of above substances. Patients with active prescriptions for buprenorphine or methadone who had tests positive only for their prescribed medication were reported with the negative result group. We excluded barbiturates and benzodiazepines, which were typically medically prescribed in the included sample of patients.

We created a dummy variable to indicate whether the child was born before or after the MDHHS policy change and we created a time variable to capture the length of observed risk (i.e. days between birthdate and last date of observation). We observed children for an average of 4.5 years post birth.

Statistical Analysis: We report demographic variables using descriptive statistics for the entire sample, and then stratified by newborn drug test completion, positivity for THC only, and a substantiated CPS allegation. Recognizing the discretion of physicians to

Table 1
Descriptive Statistics for Overall Sample and Stratified by Newborn Drug Test Completion, Newborn Drug Test Positive of THC Only and Substantiated Allegation of Maltreatment.

	Overall (35,437)	*Newborn Drug Test Completed (1548)*	*Newborn drug test positive for THC only (714)*	*Substantiated Allegation for maltreatment (1372)*
	n (%)	n (%)	n (%)	n (%)
Child				
Male	18,318 (51.7)	838 (54.1)	378 (52.9)	742 (54.1)
Female	17,119 (48.3)	710 (45.9)	336 (47.1)	630 (45.9)
Birthing Parent				
Asian	2763 (7.8)	8 (0.5)	2 (0.3)	16 (1.2)
Black	4565 (12.9)	444 (28.7)	249 (34.9)	480 (35.0)
Multiracial	2138(6.0)	160 (10.3)	84 (11.8)	118 (8.6)
Other (race)*	1015 (2.9)	12 (0.8)	9 (1.0)	25 (1.7)
White	24,884 (70.2)	915 (59.1)	368 (51.5)	730 (53.2)
Birthing Parent age $<$ 21)	2027 (5.7)	245 (15.8)	126 (17.6)	219 (16.0)
Birthing Parent age $\geq$ 21	33,410 (94.3)	1303 (84.2)	588 (82.4)	1153 (84.0)
Hispanic	1855 (5.2)	59 (3.8)	25 (3.5)	60 (4.4)
Non-Hispanic	33,582 (94.8)	1489 (96.2)	689 (96.5)	1312 (95.6)
No prenatal care	1322 (3.7)	197 (12.7)	103 (14.4)	152 (11.1)
Prenatal care	34,115 (96.3)	1351 (87.3)	611 (85.6)	1220 (88.9)
Prenatal drug test	1558 (4.4)	794 (51.3)	305 (42.7)	324 (23.6)
No prenatal drug test	33,879 (95.6)	754 (48.7)	409 (57.3)	1048 (76.4)
Prenatal drug test negative	744 (2.1)	214 (13.8)	45 (6.3)	92 (6.7)
Prenatal drug test positive	814 (2.3)	580 (37.5)	260 (36.4)	232 (16.9)
Public insurance	6911 (19.5)	727 (47.0)	321 (45.0)	626 (45.6)
Private insurance	28,526 (80.5)	821 (53.0)	393 (55.0)	746 (54.4)
Disadvantage low	8176 (23.1)	123 (8.5)	52 (7.8)	118 (9.3)
Disadvantage low moderate	8184 (23.1)	230 (15.9)	96 (14.4)	183 (14.4)
Disadvantage moderate	8220 (23.2)	322 (22.3)	124 (18.6)	285 (22.4)
Disadvantage high	8221 (23.2)	769 (53.3)	395 (59.2)	687 (54.0)
System				
Pre 2018 policy change	17,558 (49.5)	796 (51.4)	299 (41.9)	999 (72.8)
Post 2018 policy change	17,879 (50.5)	752 (48.6)	415 (58.1)	373 (27.2)

* Other includes self-reported as Other, American Indian, Alaska Native, Native Hawaiian and Pacific Islander.

initiate drug testing, we used binomial logistic regression and descriptive statistics to investigate racial bias in prenatal and newborn drug testing. We used survival analysis to estimates the risk of maltreatment for THC exposed newborns both before and after the 2018 policy change. We estimated this risk for three groups of newborns: (1) THC only exposed, (2) other drug exposed, and (3) no known substance exposure. We developed Cox regression models to examine the influence of individual variables on rates of subsequent substantiated reports of maltreatment. This analytic technique is similar to logistic regression in that it enables one to calculate the odds of a particular event occurring. However, survival analysis considers the differential impact between groups on the timing of this event. In the current study, newborns entered and remained in the observation period (2014–2022) for different lengths of time. Thus, their exposure to the risk of a substantiated report of maltreatment varied. We calculated this risk period as the number of days between the birth and the final day of observation (January 31, 2023). The average time at risk of maltreatment for newborns prior to the policy change was 6.20 years and the average time at risk of maltreatment for newborns subsequent to the policy change was 4.46 years. The cox regression table displays the adjusted hazard rate (HR) and 95 % confidence intervals.

It is important to note that if the caseworkers adhered to the new policy, one would not expect to see substantiated reports of maltreatment for THC-exposed newborns immediately after birth. Yet in the current study, we observed the risk of maltreatment for several years post birth. This approach permitted us the opportunity to investigate whether a long-term risk of maltreatment is associated with THC exposure, rather than just an initial adherence to new policy. That is, does THC exposure at birth serve as a risk factor for abuse or neglect observed within the first several years of life?

3. Results

Of the 35,437 live births during the study period. 17,588 (49.5 %) occurred prior to and 17,879 (50.5 %) occurred after the 2018 policy change. Among birthing parents, 2763 (7.8 %) were Asian, 4565 (12.9 %) were Black, 2138 (6.0 %) were multiracial, 1015 (2.9 %) were recorded as other, and 24,884 (70.2 %) were White. Approximately 5 % (1855) of birthing parents self-reported ethnicity as Hispanic. At the time of birth, 2027 (5.7 %) of birthing parents were younger than age 21, 1322 (3.7 %) had no prenatal care within the health system, 6911 (19.5 %) had public insurance, and approximately half (16,441) were in the moderate or highly disadvantaged quartiles of NDI. Of the full birth cohort, 1548 (4.4 %) had a newborn drug test performed, 714 (2.0 %) of newborn drug tests were positive for only THC, and 1372 (3.8 %) had a substantiated allegation of maltreatment (Table 1).

The odds of newborn drug testing were associated with birthing parent race. Physicians were significantly more likely to test newborns of Black (OR, 1.26, 95 % CI, 1.07–1.49) and multiracial birthing parents (OR, 1.39, 95 % CI, 1.12–1.76) as compared with newborns of White birthing parents. Prenatal urine drug test completion, both negative (OR, 10.97, 95 % CI 9.04–13.31) and positive (OR, 77.56, 95 % CI 64.58–93.16), was associated with newborn drug testing. Other associations included birthing parent age < 21 (OR, 1.61, 95 % CI, 1.33–1.94), public insurance (OR, 2.11, 95 % CI, 1.83–2.40), and neighborhood disadvantage (Table 2).

Given the association with prenatal urine drug testing, we explored the patterns of prenatal and newborn drug tests by race. Black (8.7 %) and multiracial (7.2 %) birthing parents were more likely to experience a prenatal drug test as compared with White birthing parents (3.8 %), (Table 3). Black and multiracial newborns were also more likely to have a drug test at birth as compared with White newborns. Thus, there exists racial bias in both prenatal and newborn testing practices which results in a relatively large difference in the overall risk of testing (14.3 % Black, 10.9 % multiracial, 5.5 % White). This overall risk is displayed in the last row of Table 3 and

Table 2
Binomial Logistic Regression: Probability of Newborn Drug Test ($n = 35,437$).

Independent Variables	OR (95 % CI)	*P* value
Child		
Female	1 [Reference]	NA
Male	1.17 (1.03–1.33)	<0.05
Birthing Parent		
White	1 [Reference]	NA
Asian	0.14 (0.07–0.29)	<0.001
Black	1.26 (1.07–1.49)	<0.01
Multiracial	1.39 (1.12–1.76)	<0.01
Other	0.25 (0.13–0.48)	<0.001
Age >21	1 [Reference]	NA
Age equal or <21	1.61 (1.33–1.94)	<0.001
Non-Hispanic	1 [Reference]	NA
Hispanic	0.85 (0.62–1.19)	0.34
No Prenatal Care	1 [Reference]	NA
Prenatal Care	0.52 (0.42–0.65)	<0.001
Private Insurance	1 [Reference]	NA
Public Insurance	2.11 (1.83–2.40)	<0.001
No Prenatal Test	1 [Reference]	NA
Prenatal Test Negative	10.97 (9.04–13.31)	<0.001
Prenatal Test Positive	77.56 (64.58–93.16)	<001
Disadvantage Low	1 [Reference]	NA
Disadvantage Low Moderate	1.54 (1.21–1.97)	<0.001
Disadvantage Moderate	1.80 (1.42–2.28)	<0.001
Disadvantage High	3.48 (2.77–4.38)	<0.001

displays the relative risk of testing at either the prenatal or newborn decision point.

The coefficients associated with THC exposure and subsequent maltreatment before and after the policy change are displayed in Table 4. There are many similarities across the two models. Race, age of the birthing parent and economic status were associated with the risk of a substantiated complaint of maltreatment both pre and post policy change. With regard to substance exposure at birth, newborns exposed to drugs (other than THC only) were significantly more likely to experience a substantiated allegation of maltreatment (pre policy HR 8.62, post policy HR = 9.06). Regarding THC exposure, prior to the policy change in 2018, infants exposed to THC only were significantly more likely to be associated with a subsequent substantiated report of maltreatment (HR 15.30). This was expected as the general practice was to substantiate THC exposure as physical abuse. Post policy change, infants exposed to THC only were no more likely to experience a substantiated allegation of maltreatment compared with newborns with a negative test and newborns with no drug test performed (HR 1.20).

4. Discussion

To our knowledge, this is the first study to link individual hospital birth records including newborn drug tests and results with subsequent CPS investigations and records of substantiated maltreatment. The policy reform initiated by MDHHS in 2018 provided a unique opportunity to understand whether a change in practice compromised the short and long-term safety of children. The findings indicate that after MDHHS changed their investigation policy, a report associated with a newborn drug test positive for THC only did not increase the risk of experiencing a subsequent substantiated allegation of maltreatment over the average 4.5 years of monitoring in this cohort. If prenatal THC exposure conferred additional risk of harm, we would expect to observe higher rates of substantiated complaints identified for other forms of maltreatment by teachers, physicians, law enforcement or other mandated reporters.

These findings are timely as recreational and medical cannabis use in pregnancy is increasing and child protection systems seek to establish best practices that limit CPS contact while maintaining child safety. While CAPTA does not require reporting for substance exposed infant, there exists wide variation in how states respond to positive newborn tests. For example, any positive drug test for alcohol or drugs is automatically considered child abuse in Alabama, while withdrawal symptoms or fetal alcohol spectrum disorder are required for California's definition of substance exposure (Gateway, 2020). Findings from the current study provide compelling evidence that CPS involvement is unnecessary for newborns in which the only concern is a prenatal cannabis exposure as evidenced by a positive newborn test for THC.

Moreover, our findings confirm racial and economic bias in newborn drug testing as described in numerous prior studies. The vast majority of racial disproportionality in exposure to the CPS often starts at the point of reporting (Baron et al., 2022; Barth et al., 2020; Drake et al., 2021). These findings provide insight into the role of testing practices by clinicians that set this process in motion. Changes at the point of clinician decision-making in assessing substance exposed infants, ordering newborn drug testing, and reporting should be an area of intense focus if child protection systems are committed to reducing racial disproportionality not associated with disproportionate need. Moreover, health care systems may seek to clarify the purpose and intent of testing for THC altogether. How does this information help better support new parents or ensure the safety and well-being of newborns?

CPS investigations can be stressful and traumatic for families, particularly for Black families who already experience systematic racism and stress from the health care system (Schiff et al., 2022). A recent study of parental perceptions noted that parents felt mistreated, unfairly judged, stigmatized, shamed, intimidated and generally afraid of CPS (Merritt, 2020). CPS investigations should only commence when the evidence indicates a concern for the health and safety of the child. A drug test is not a parenting test, and a positive drug test for THC does not meet that threshold and is not required under the federal CAPTA statute. CPS investigations require significant resources and child protection systems have limited financial and human capital resources. Shifting limited resources away from unnecessary investigations to building evidence-based prevention-oriented and family support programming benefits everyone (Kuklinski et al., 2020).

This study has several limitations. We acknowledge that official reports of maltreatment underestimate the true scope of maltreatment and recognize that a healthy debate exists surrounding the use of unsubstantiated and substantiated allegations (Day et al., 2022; Fallon et al., 2010; Font et al., 2020). This study included patients from a single academic hospital system in southern Michigan and may not be generalizable to all other patient populations. While medical records did not capture medical cannabis prescription data, medical cannabis legalization predated our study cohort. Finally, there are likely THC exposed newborns that were not tested by physicians. Estimating the false positives within this group is not possible. Future collaborations with health care systems

Table 3
Prenatal and Newborn Drug Testing by Race and Ethnicity Stratified by Prenatal Drug Test Results (n = 35,437).

	Asian	Black	Hispanic	Multiracial	Other*	White
Prenatal Drug Test Status						
No Prenatal Urine Test	2746 (99.4 %)	4167 (91.3 %)	1792 (96.6 %)	1983 (92.8 %)	963 (97.2 %)	23,929 (96.2 %)
Prenatal Urine Test Negative for Illicit Substances	12 (0.4 %)	183 (4.0 %)	36 (1.9 %)	78 (3.6 %)	21 (2.1 %)	447 (1.8 %)
Prenatal Urine Test Positive for Illicit Substances	5 (0.2 %)	215 (4.7 %)	27 1.5 %)	77 (3.6 %)	7 (0.7 %)	508 (2.0 %)
Newborn Test by Prenatal Drug Test Status						
No Prenatal Urine Test	4 (0.1 %)	256 (6.1 %)	32 (1.8 %)	77 (3.9 %)	8 (0.8 %)	405 (3.5 %)
Prenatal Urine Test Negative for Illicit Substances	0 (0.0 %)	49 (26.8 %)	7 (19.4 %)	25 (32.1 %)	2 (9.5 %)	135 (30.2 %)
Prenatal Urine Test Positive for Illicit Substances	4 (0.0180 %)	139 (64.7 %)	20 (74.1 %)	58 (75.3 %)	2 (28.6 %)	375 (73.8 %)
Combined Prenatal or Newborn Drug Tested	21 (0.8 %)	654 (14.3 %)	95 (5.1 %)	232 (10.9 %)	36 (3.6 %)	1360 (5.5 %)

Table 4
Cox Regression: Rate of substantiated allegation of maltreatment before and after CPS policy change.

Independent Variables	Pre Policy Change (n = 17,558)	Post Policy Change (n = 17,879)
	HR (95 % CI)	HR (95 % CI)
Child		
Male	1.04 (0.91–1.17)	1.10 (0.90–1.35)
Positive for THC only	15.30 (12.87–18.19)**	1.20 (0.76–1.93)
Positive for other drug(s)	8.62 (6.95–10.68)**	9.06 (6.46–12.71)**
Birthing Parent		
Asian	0.25 (0.14–0.44)**	0.23 (0.09–0.62)**
Black	1.90 (1.62–2.20)**	2.01 (1.56–2.61)**
Multiracial	1.47 (1.15–1.86)**	1.52 (1.07–2.17)*
Other (race)	0.41 (0.23–0.74)**	1.15 (0.59–2.30)
Age equal or <21	1.41 (1.18–1.67)**	1.55 (1.15–2.10)**
Hispanic	1.10 (0.77–1.46)	0.65 (0.38–1.11)
Prenatal Care	0.91 (0.74–1.11)	0.62 (0.43–0.89)*
Public Insurance	1.90 (1.67–2.17)**	2.13 (1.72–2.65)**
Disadvantage Low Moderate	1.17 (0.93–1.46)	0.79 (0.052–1.19)
Disadvantage Moderate	1.35 (1.10–1.67)**	1.61 (1.15–2.26)**
Disadvantage High	2.00 (1.65–2.43)**	2.46 (1.79–3.37)**

*p < .05, **p < .01.

requiring universal testing at birth would address this particular limitation.

In conclusion, no individual person, family or institution benefits from racially biased testing or unnecessary CPS investigations. These practices have no impact on child safety, but they represent a clear racial disparity and unnecessarily contribute to racial disproportionality in child welfare. In fact, if mandated reporters did not report complaints for THC-only exposure to CPS, referrals would decrease by 5.5 % (249/4565 referred for THC only complaints) for Black children compared to only 1.5 % (368/24,884 for THC only complaints) for White children. The evidence strongly supports a change in policy to eliminate racially biased testing practices and CPS investigations and substantiations for cannabis exposure.

CRediT authorship contribution statement

Joseph P. Ryan: Writing – original draft, Supervision, Project administration, Methodology, Formal analysis, Conceptualization. **Lauren Oshman:** Writing – review & editing, Writing – original draft, Conceptualization. **Christopher J. Frank:** Writing – review & editing, Writing – original draft, Methodology, Conceptualization. **Brian Perron:** Writing – review & editing, Methodology, Conceptualization. **Bryan Victor:** Writing – review & editing, Writing – original draft, Methodology, Conceptualization. **Vivek Sankaran:** Writing – review & editing, Writing – original draft.

Data availability

The data that has been used is confidential.

References

ACF. (2023). Child Welfare Policy Manual. Retrieved March 1, 2023 from https://www.acf.hhs.gov/cwpm/public_html/programs/cb/laws_policies/laws/cwpm/.

Baron, E. J., Goldstein, E. G., & Ryan, J. (2022). The push for racial equity in child welfare: Can blind removals reduce disproportionality? *Available at SSRN, 3947210*.

Barth, R. P., Jonson-Reid, M., Greeson, J. K., Drake, B., Berrick, J. D., Garcia, A. R., … Gyourko, J. R. (2020). Outcomes following child welfare services: What are they and do they differ for black children? *Journal of Public Child Welfare, 14*(5), 477–499.

Chassin, L. B., Marc, H., Hussong, A., & M; Rothenberg, W Andrew; Sternberg, Ariel.. (2019). Parenting and substance use disorder. *Routledge*. https://doi.org/10.4324/9780429398995-16

Children''s Bureau, A., o. C., & Youth and Families, Administration For Children and Families, U.S. Department of Health And Human Services. (2019). *Adoption and Foster Care Analysis and Reporting System (AFCARS), foster care file 2017* [Dataset].

Cohen, S., Nielsen, T., Chou, J. H., Hoeppner, B., Koenigs, K. J., Bernstein, S. N., … Wilens, T. (2023). *Disparities in maternal-infant drug testing, social Work assessment, and custody at 5 hospitals* (Academic pediatrics).

Day, E., Tach, L., & Mihalec-Adkins, B. (2022). State child welfare policies and the measurement of child maltreatment in the United States. *Child Maltreatment, 27*(3), 411–422.

Drake, B., Jonson-Reid, M., Kim, H., Chiang, C.-J., & Davalishvili, D. (2021). Disproportionate need as a factor explaining racial disproportionality in the CW system. *Racial disproportionality and disparities in the child welfare system*, 159–176.

Drescher, K. (2007). Substance-exposed newborns: Hospital and child protection responses. *Children and Youth Services Review, 29*, 1503–1519. https://doi.org/10.1016/j.childyouth.2007.06.007

Drescher-Burke, K. (2005). *Identifying, reporting, and responding to substance exposed newborns*. National Abandoned Infants Assistance Resource Center Berkeley, CA: In An exploratory study of policies & practices.

Ellsworth, M. A., Stevens, T. P., & D'Angio, C. T. (2010). Infant race affects application of clinical guidelines when screening for drugs of abuse in newborns. *Pediatrics, 125*(6), e1379–e1385.

Fallon, B., Trocmé, N., Fluke, J., MacLaurin, B., Tonmyr, L., & Yuan, Y.-Y. (2010). Methodological challenges in measuring child maltreatment. *Child Abuse & Neglect, 34*(1), 70–79.

Font, S., Maguie-Jack, K., & Dillard, R. (2020). Allegations of child maltreatment. *Decision-Making and Judgment in Child Welfare and Protection: Theory, Research, and Practice, 173*.

Freisthler, B., & Kranich, C. (2022). Medical marijuana dispensaries and referrals for child maltreatment investigations. *Journal of Interpersonal Violence, 37*(1–2), 371–386. https://doi.org/10.1177/0886260520912596

Gateway, C. W. I. (2020). Plans of safe Care for Infants with Prenatal Substance Exposure and Their Families. https://www.childwelfare.gov/topics/systemwide/laws-policies/statutes/safecare/.

Jarlenski, M., Shroff, J., Terplan, M., Roberts, S. C., Brown-Podgorski, B., & Krans, E. E. (2023). *Association of Race with Urine Toxicology Testing among Pregnant Patients during Labor and Delivery*. JAMA Health Forum.

Jernbro, C., Tindberg, Y., & Janson, S. (2022). High risk of severe child abuse and poly-victimisation in families with parental substance misuse–results from a swedish school-based survey. *Child Abuse Review, 31*(3), Article e2741.

Kerker, B. D., Leventhal, J. M., Schlesinger, M., & Horwitz, S. M. (2006). Racial and ethnic disparities in medical history taking. *Ethnicity & Disease, 16*(1), 28–34.

Kuklinski, M. R., Oxford, M. L., Spieker, S. J., Lohr, M. J., & Fleming, C. B. (2020). Benefit-cost analysis of promoting first relationships®: Implications of victim benefits assumptions for return on investment. *Child Abuse & Neglect, 106*, Article 104515.

Kunins, H. V., Bellin, E., Chazotte, C., Du, E., & Arnsten, J. H. (2007). The effect of race on provider decisions to test for illicit drug use in the peripartum setting. *Journal of Women's Health, 16*(2), 245–255.

Kurtz, T., & Smid, M. C. (2022). Maternal drug testing should be performed only with explicit consent and a clear plan for interpretation and treatment. *Obstetrics & Gynecology, 4*, 163–166. https://doi.org/10.1097/AOG.0000000000004808

Lin, J., Lai, M. M. P., Wan, K. K. Y., Cheng, A. W. F., & Zee, B. C. Y. (2022). The developmental outcomes of children born to parental substance abusers supported by local counselling centres for psychotropic substance abusers in Hong Kong. *Journal of Pediatrics, Perinatology and Child Health, 6*, 145–154.

Mathematica. (2023). State Child Abuse & Neglect Policies Database. https://www.scanpoliciesdatabase.com/.

MDHHS. (2019). Notification of Policy Changes. Retrieved February 1, 2023 from https://www.michigan.gov/-/media/Project/Websites/mdhhs/Folder2/Folder97/Folder1/Folder197/Section_2222_PA_207_of_2018.pdf.

MDHHS. (2023). Children's Protective Services Policy Manuals. https://dhhs.michigan.gov/olmweb/ex/PS/Mobile/PSM/PSM%20Mobile.pdf.

Melendez, R., Clarke, P., Khan, A., Gomez-Lopez, I., Li, M., & Chenoweth, M. (2020). National Neighborhood Data Archive (NaNDA): socioeconomic status and demographic characteristics of census tracts, United States, 2008–2017. Retrieved February 2023 from https://nanda.isr.umich.edu/.

Merritt, D. H. (2020). How do families experience and interact with CPS? *The Annals of the American Academy of Political and Social Science, 692*(1), 203–226.

Obstetricians, A., C.o., & Gynecologists. (2017). Committee opinion no. 711: Opioid use and opioid use disorder in pregnancy. *Obstetrics and Gynecology, 130*(2), e81–e94.

Panday, J., Taneja, S., Popoola, A., Pack, R., Greyson, D., McDonald, S. D., … Vanstone, M. (2022). Clinician responses to cannabis use during pregnancy and lactation: A systematic review and integrative mixed-methods research synthesis. *Family Practice, 39*(3), 504–514.

Perlman, N. C., Cantonwine, D. E., & Smith, N. A. (2022). Racial differences in indications for obstetrical toxicology testing and relationship of indications to test results. *American Journal of Obstetrics & Gynecology MFM, 4*(1), Article 100453.

Prindle, J. J., Hammond, I., & Putnam-Hornstein, E. (2018). Prenatal substance exposure diagnosed at birth and infant involvement with child protective services. *Child Abuse & Neglect, 76*, 75–83.

Schiff, D. M., Work, E. C., Muftu, S., Partridge, S., MacMillan, K. D. L., Gray, J. R., … Jones, H. E. (2022). "You have to take this medication, but then you get punished for taking it:" lack of agency, choice, and fear of medications to treat opioid use disorder across the perinatal period. *Journal of Substance Abuse Treatment, 139*, Article 108765.

Schoneich, S., Plegue, M., Waidley, V., McCabe, K., Wu, J., Chandanabhumma, P. P., … Oshman, L. (2023). Incidence of newborn drug testing and variations by birthing parent race and ethnicity before and after recreational Cannabis legalization. *JAMA Network Open, 6*(3), 1–12. https://doi.org/10.1001/jamanetworkopen.2023.2058

Volkow, N. D., Han, B., Compton, W. M., & McCance-Katz, E. F. (2019). Self-reported medical and nonmedical Cannabis use among pregnant women in the United States. *JAMA, 322*(2), 167–169. https://doi.org/10.1001/jama.2019.7982

Von Elm, E., Altman, D. G., Egger, M., Pocock, S. J., Gøtzsche, P. C., & Vandenbroucke, J. P. (2007). The strengthening the reporting of observational studies in epidemiology (STROBE) statement: Guidelines for reporting observational studies. *The Lancet, 370*(9596), 1453–1457.

Winchester, M.-L., Shahiri, P., Boevers-Solverson, E., Hartmann, A., Ross, M., Fitzgerald, S., & Parrish, M. (2022). Racial and ethnic differences in urine drug screening on labor and delivery. *Maternal and Child Health Journal*, 1–7.

Younas, F., & Gutman, L. M. (2022). Parental risk and protective factors in child maltreatment: A systematic review of the evidence. *Trauma, Violence & Abuse, 24*(5), 3679–3714. https://doi.org/10.1177/15248380221134634