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Prenatal Substance Exposure and Multilevel Predictors of Child Protection System Reporting

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Abstract

Objective: To describe child protection system (CPS) reports after delivery and examine associations between individual- and hospital-level predictors and CPS reporting in a cohort of infants with prenatal substance exposure.

Study design: This state-level, retrospective cohort study used administrative data to analyze births to Black, White, and US-born Hispanic mothers with documented prenatal substance exposure. We used a random intercept mixed-model with individual- and hospital-level predictors to capture any association between birth hospital and CPS reporting. Interaction terms allowed for different effects dependent on characteristics of the delivering parent and the dominant demographics of the hospital setting.

Results: Among 260 525 births during 2018 in California, 2.6% had documented substance exposure, with observed racial differences in substance use and type. Nearly 4% of births to Black mothers had documented cannabis exposure compared with roughly 1% among White and Hispanic mothers. The delivery hospital explained 24% of variance in CPS reporting. Hierarchical models revealed race and insurance-type differences in the likelihood a CPS report followed a substance exposed birth. Namely, publicly-insured births in hospitals where majority births were

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Julia Reddy: Writing – original draft, Methodology, Investigation, Funding acquisition, Formal analysis, Conceptualization. **Carolyn T. Halpern:** Writing – review & editing, Supervision. **Davida M. Schiff:** Writing – review & editing. **Hendree Jones:** Writing – review & editing. **Anna Austin:** Writing – review & editing. **Laura Faherty:** Writing – review & editing. **Rebecca Rebbe:** Writing – review & editing. **Anissa Vines:** Writing – review & editing. **Emily Putnam-Hornstein:** Writing – review & editing, Supervision, Conceptualization.

covered by private insurance had nearly twice the probability of being reported compared with those with private insurance.

Conclusions: We found variation in CPS reporting of births with diagnosed substance exposure at the hospital level, and interactions between hospital- and individual-level characteristics in their association with the likelihood of CPS reporting. Associations offer insight into potential areas of bias and inconsistency in policy implementation that might be diminished through improved decision-making tools and provider training.

Prenatal drug or alcohol exposure is a factor in approximately a quarter of infant maltreatment reports and has increased significantly over time.^{1,2} Federal U.S. law requires states to notify child protection systems (CPS) of substance-exposed births, though these notifications are not required to be communicated to CPS as reports of alleged child maltreatment.³ This is an important distinction because notifications of infants with prenatal substance exposure (IPSE), unlike maltreatment allegations, do not need to be identifiable at the family level and do not result in CPS intervention in the absence of maltreatment risk.⁴ There is wide variation in jurisdictional policies regarding mandatory reporting for IPSE, with roughly half of states mandating that all IPSE be universally reported as child maltreatment and others allowing for provider discretion in whether a maltreatment report is indicated.^{5,6} Increasingly, jurisdictions are considering discretionary reporting policies,⁷ in which providers may selectively involve CPS after delivery in cases of identified harm or significant risk of harm, rather than solely because prenatal substance exposure was identified.⁸

Discretionary policies have the potential to improve patient–provider trust, increase service referrals, and limit the scope of CPS intervention.^{9,10} However, variability in hospital policy and provider decision-making affects policy implementation.^{11,12} Maternal race and ethnicity and substance type have been shown to be associated with the likelihood that prenatal substance use will be identified, documented, and reported to CPS.^{13–16} One study found that 15% of a sample of children’s health care providers considered the mother’s socioeconomic status when deciding whether to file a CPS report following prenatal substance exposure.¹⁷ Better understandings of the prevalence of IPSE-related CPS reporting in a discretionary policy setting, and associations between reporting and hospital or patient demographics, are needed to craft equitable and effective reporting practices.^{18,19} The objective of the current study is to: (1) describe CPS reports after delivery for a population of diagnosed IPSE, and (2) examine associations between individual- and hospital-level predictors and hospital CPS reporting in a discretionary reporting policy context.

Methods

Study Design, Settings, and Sample

This retrospective cohort study relied on probabilistic linkages of administrative records—vital statistical birth records, maternal hospital delivery discharge records, and CPS records—to capture all live births in California hospitals between January 1 and December 31, 2018, the most recent year available to the study team.²⁰ Match rates were comparable with

prior studies using these data sources.¹⁸ Analysis was restricted to the three racial categories, according to self-identified race input by the delivering parent on the birth record, that constituted 85% of prenatal substance use diagnoses: White, non-Hispanic; Black, non-Hispanic; and US-born Hispanic. The frequency distribution for all racial categories is presented in Table I; available at www.jpeds.com.

Births were selected for analysis if they had a diagnostic record of prenatal substance exposure. Such exposure was measured by documentation in the maternal discharge record of one or more International Classification of Diseases 10th revision, Clinical Modification (ICD-10-CM) codes related to drug or alcohol use disorder, or a birth or pregnancy complicated by drug or alcohol use. Included ICD-10-CM codes were based on prior research¹⁸ and are listed in Table II; available at www.jpeds.com. These restrictions resulted in an analysis file of 6756 observations. This project fell under approvals through state and university institutional review boards [blinded].

Dependent Variable

The dependent variable was whether a report of alleged child maltreatment was filed within 14 days of the infant's birth ("hospital CPS report") and was coded dichotomously as 1 if any report was received by CPS, regardless of whether the agency decided to investigate. Otherwise, the outcome was coded as 0. This variable was defined as a conservative estimate of hospital reporting. As only about 1% of births in our sample were very preterm (<28 weeks' gestation) and 2.5% were very low birth weight (<1500 g) (birth characteristics associated with extended hospital stays),²¹ a 14-day reporting window is likely to capture the majority of hospital reports for prenatal substance exposure.^{22,23}

Individual Predictors

Predictors of hospital CPS reporting included maternal self-identified race, ethnicity, and country of birth as input by the delivering parent on the birth certificate (primary race listed as Black or White, with any race over-ridden by primary ethnicity listed as US-born Hispanic) and birth payment insurance type (public; private). California retroactively enrolls any uninsured birth dyad in the state's public health insurance program.

We also adjusted for the following covariates, which have been shown to be associated with CPS reporting and were decided a priori: maternal parity (zero or one prior births; two or more prior births); initiation of prenatal care (first trimester; late or missing); establishment of paternity (yes; no); low birth weight (less than or greater than 2500 g); and whether cannabis was the only specific substance coded in diagnostic records (yes; no).^{24–26} Paternity establishment was based on whether a father was named in the birth record.

Hospital Predictors

Infant births were clustered in hospitals. Hospital-level predictor variables included the proportion of 2018 deliveries to White mothers (more or less than 50%) and how many 2018 hospital deliveries were covered by public health insurance (more or less than 50%). These

variables were dichotomized to examine the effect of minority status. Examinations of more gradated classification of hospital covariates led to models that failed to converge.

Additional hospital-level variables were assessed for inclusion. These included deliveries per year (<1,000; 1000-2,000; 2000-3,000; or > 3000); designation as a teaching hospital; hospital management type (nonprofit; investor; or public); and hospital affiliation (with a parent corporation vs independent). Each of these level-2 variables was individually added to the fully adjusted model. None were significantly associated with the outcome, nor did they meaningfully change the coefficients of the other parameters. All but one decreased the goodness of fit of the model (signified by an increased Bayesian information criterion); all were omitted from the final model, although results of this modeling exercise are included in Table III; available at www.jpeds.com.

Statistical Analysis

Because our outcome of interest, CPS reporting, was partly the product of provider behavior, we focused on models that estimated the effect of observable birth and maternal demographic characteristics on the (unobserved) provider's assessment of risk and choice to report. We also considered that each birth occurred in a California hospital and that each provider worked in that institutional setting. Prior research suggested that hospitals have unique regulatory and training environments.^{11,27} As such, we used multilevel modeling (level 1 = person, level 2 = hospital) fit using mixed models to allow reporting thresholds to vary by hospital.

For our cohort of diagnosed IPSE, frequency distributions and chi-square tests were used to examine differences between those with and without a hospital CPS report. We also used chi-square tests to assess the relationship between race and ethnicity and diagnosed substance types.

We used a random intercept mixed-model to capture any association between birth hospital and CPS reporting. Specifically, we employed a mixed-effects equation allowing random intercepts (α) that vary by hospital (j), with slope coefficients (β) that modified the independent variable levels for each individual (i) at a constant rate. This assumed that provider behavior varied in response to individual demographic characteristics relatively consistently across hospital sites.

$$\hat{y}_{ji} = \alpha_j + \beta_1 x_{1ij} + \dots + \beta_n x_{nij} + e_{ij}$$

We specified interaction terms to allow for different effects dependent on characteristics of the delivering parent and the dominant demographics of the hospital setting. This is because, in a hospital that primarily served White patient populations, the association among Black maternal race and providers' reporting decisions might be different than in a hospital that served fewer White patients. Multilevel models offer opportunities to examine intersectionality in health inequality research.²⁸ All analyses were conducted in Stata version 18.²⁹

Results

Descriptive results are presented in Table IV. Of the 260 525 live births within 232 hospitals that met study criteria, 2.6% (n = 6756) had a diagnosis of prenatal substance use. Roughly half of IPSE (n = 3070; 45.4%) were reported to CPS within 14 days of delivery. Diagnosed births that were reported to CPS were more likely to have had prenatal care initiated late or not at all, to be low birth weight, to have missing paternity, and to be the third or greater order birth. Diagnosed IPSE births to Black mothers had lower rates of CPS reports (37.3%) than those to Hispanic mothers (47.0%) and White mothers (47.6%). However, differences by race and ethnicity were eliminated when stratified by substance type. Among those with only cannabis diagnoses, 25.0% of Black mothers, 24.2% of Hispanic mothers, and 29.6% of White mothers were reported to CPS in the first 2 weeks. Among women with diagnoses related to substances other than cannabis, 59.9% of Black mothers, 63.7% of Hispanic mothers, and 59.7% of White mothers were reported in the first 14 days.

Prevalence distribution of substance-specific diagnostic codes by race and ethnicity is presented in Table V: 5.2% of births to Black mothers had a relevant diagnosis, compared with 2.1% of those born to Hispanic mothers and 2.3% born to White mothers. Among those with diagnoses, 54.6% had a code related to cannabis, 29.7% to amphetamines and other stimulants, 12.6% to opioids, and 6.8% to alcohol use. In addition to substance-specific codes, almost all (96.5%) had an ICD-10-CM code related to pregnancy or delivery complicated by alcohol or drug use. Nearly half (45.6%) of IPSE births had a code related to cannabis, but no other specific substance. Births to Black mothers were more likely to have no substance other than cannabis (64.7%) compared with Hispanic (42.2%) and White (40.2%) mothers.

An unconditional random-intercept model yielded an interclass coefficient of .24, signifying that 24% of variance in CPS reporting was between-hospitals. Individual- and hospital-level covariates were added to estimate a conditional random intercept model with interaction terms. The fully adjusted model identified an association between CPS reporting and public health insurance (relative risk: 1.95; 95% CI: 1.65, 2.30) and between CPS reporting and delivering in a hospital serving majority publicly insured maternal patients (relative risk: 1.77; 95% CI: 1.41, 2.21) (see Table VI).

Predicted probabilities show the differential association between hospital-level patient demographics and CPS reporting for individual racial and economic categories (Figure 1). For White mothers, the predicted probability of reporting in a minority-White hospital (0.49; 95% CI: 0.46, 0.53) trended higher than in a majority-White hospital (0.43; 95% CI: 0.39, 0.48). The same was true for Hispanic mothers (0.45; 95% CI: 0.43, 0.48 vs 0.36; 95% CI: 0.30, 0.42). Yet this pattern is not observed among Black mothers, whose likelihood of reporting was not significantly different in a minority-White hospital than in a hospital with greater than 50% of births occurring to White patients.

For those with private insurance, delivering in a minority-public health insurance hospital had a lower predicted probability of reporting (0.24; 95% CI: 0.20, 0.28) relative to a majority-public hospital (0.42; 95% CI: 0.36, 0.48). For those with public insurance,

however, the predicted probability of reporting was not statistically significantly different in a majority-public vs a minority-public hospital. Within minority-public hospitals, births covered by public health insurance were nearly twice as likely to be reported than births covered by private insurance (0.46; 95% CI: 0.42, 0.51 vs 0.24; 95% CI: 0.20, 0.28).

Discussion

In this cohort of Black, White, and US-born Hispanic births with evidence of substance exposure in the maternal record, racial differences existed in both substance use and substance type, with more births to Black mothers having documented cannabis exposure. Among diagnosed IPSE, we found that the delivering hospital explained 24% of variance in CPS reporting. In a fully adjusted hierarchical model, findings revealed race and insurance-type differences in the likelihood of a CPS report. Births to White and Hispanic mothers were less likely to be reported in White-dominated hospital settings compared with less White hospitals, while this was not true for births to Black mothers. Publicly insured births in hospitals where more than half the births were covered by private insurance had nearly twice the probability of being reported compared with those with private health insurance.

In line with earlier research that used California hospital discharge records of Black, White, and Hispanic mothers from 2006, we found that less than 3% of the birth cohort was IPSE, as documented in diagnostic coding.¹⁸ This is substantially lower than self-reported prenatal substance use prevalence, which was 13% in 2018.³⁰ Our finding that Black mothers were disproportionately likely to be diagnosed with cannabis use is also consistent with the prior analysis, though cannabis prevalence among all those with a substance use diagnosis in our 2018 cohort (74.3%) was higher than that found in 2006 (46.6%). Although differential rates of cannabis use by race and ethnicity is consistent with California-based analyses that relied on universal toxicology results³¹ or banked biospecimens from a prenatal screening program,³² prevalence of prenatal cannabis use diagnoses is far lower than positive toxicology tests. It is worth noting that the biological samples used in those studies were taken in the first and second trimesters of pregnancy, while the diagnoses used in this analysis were in the hospital discharge record at the time of a live birth event.

Similar to the 2006 California-based study, nearly half of the sample was reported to CPS (in 2006, 53.4% were reported in the first 28 days; in 2018, 45.4% were reported in the first 14 days).¹⁸ The current study extends that work by incorporating hospital-level data to examine associations with CPS reporting, which may contribute to variations in reporting prevalence. In line with an analysis from Washington, we found that clustering the data by birth hospital explained 24% of variance in the likelihood of CPS reporting and that hospitals with a majority of publicly insured births were more likely to report IPSE to CPS than hospitals with a minority of publicly insured births.¹⁹ The inclusion of interactions between individual- and hospital-level characteristics allowed us to demonstrate differential associations between maternal race and ethnicity and economic position and CPS reporting dependent on the predominant patient demographics of the birthing hospital.

The Child Abuse Prevention and Treatment Act requires states to quantify substance-exposed births, yet many states lack mechanisms to accomplish this outside of CPS

reporting.¹⁰ Prevalence estimates of IPSE involved in CPS reveal the burden of parental substance use in those reported for maltreatment but do not offer insights about a broader population of hospital-identified IPSE who may not be reported.^{2,33} Hospital diagnostic codes may be a valuable way to estimate the prevalence of IPSE in policy environments where universal CPS reporting is not required. However, in this analysis, as in previous similar studies, diagnostic codes demonstrated low sensitivity as a measure of prenatal use, though likely high specificity.^{34,35}

To maximize the utility of diagnostic codes, institutions must address inconsistencies in verbal screening, toxicology testing, and diagnostic documentation.^{36,37} For diagnoses to serve as a measurement tool for IPSE prevalence, there must be no institutional pressure to file maltreatment reports on all identified IPSE.^{11,38} Mechanisms for public health surveillance, such as those that allow for notification of substance-exposed births outside of maltreatment reporting, would improve quantification of prenatal substance use in a way that is not punitive or stigmatizing for a family.^{39,40} The low prevalence of IPSE in a large and diverse birth cohort found in this study contributes to an understanding of the magnitude of bias at play in the screening and identification of IPSE across institutions and providers and is a useful starting point from which to focus improved medical coding or other documentative mechanisms.

Efforts at the federal level, including proposed amendments to the Child Abuse Prevention and Treatment Act, indicate an intended shift away from universal reporting and toward situating responses to IPSE in a public health framework.^{7,10,41} Instrumental to this movement is a reassessment of the role of CPS and an improved ability of hospital teams to make decisions about maltreatment risk, including refinement of reporting policies and provider behaviors that engage CPS only when necessary to prevent child harm.^{42,43}

For decades, evidence has shown that bias is at play in CPS reporting, even in settings with universal screening or identification.^{44–46} Our findings of reporting variance by birth hospital cluster and differential associations dependent on hospital-level patient demographics confirm this. Efforts to combat biased reporting should be informed by perspectives and input from providers, clinicians, and affected families.^{11,47,48} Institutions should emphasize clinical education that acknowledges the role of provider bias⁴⁹ while pursuing comprehensive and systemic solutions to structural racism.⁵⁰ Individualized and team-based approaches that have an evidence-based tolerance for risk show the most promise to reduce discrimination and disproportionality in CPS reporting.⁵¹ In cases where CPS reporting can be avoided, warm referrals to effective family support services are essential components to a comprehensive public health response to prenatal substance exposure.⁵² Financial assistance to families, in particular, may protect against future CPS intervention.^{53,54}

This study develops upon existing examinations of discretionary reporting by updating prevalence statistics and including interaction terms between individual and hospital-level characteristics that reveal bias in reporting. Despite its usefulness, this analysis was affected by several limitations. First, we used diagnostic codes to identify a sample of IPSE, which allowed an examination of discretionary reporting. However, the sensitivity of this inclusion

criterion was low, meaning we omitted an unknown number of substance-exposed births from this analysis.³⁴

We should note that this study does not include data on prenatal substance use screening or testing. Research has consistently shown disparities in toxicology testing during pregnancy and at delivery.^{37,55–58} There is likely wide variation in how California birth hospitals identify IPSE: some with universal screening policies, others with risk-based screening protocols, and others without any standardized procedures in place. For this reason, our sample of births identified by the hospital as IPSE may be considered a high surveillance or high acuity subset of all substance exposed births.⁵⁹ The current analytic sample of diagnosed IPSE provides an opportunity to examine variance in reporting conditional on diagnostic identification.

Secondly, we were unable to link infant discharge records, meaning that we misclassified some number of identified substance-exposed birth dyads. In the similar California analysis from 2006, while 10% of substance-exposed dyads had this status documented only in the infant record, only 1.6% of the birth cohort had any indication of substance exposure.¹⁸ Changes in documentation in addition to growing incidence may have contributed to these discrepancies.

Third, our analysis had the possibility of omitted variable bias. We lacked data on other potentially important individual-level factors, including substance use extent and chronicity, patient presentation, treatment engagement, and parental readiness. We also lacked data on hospital- and provider-level characteristics, including screening and testing protocols, hospital teaming approaches, the presence of perinatal social workers, etc. However, our use of hospital as a clustering variable helped to capture unobserved differences at the institutional level.

Lastly, the dichotomization of the hospital-level variables we assessed, although allowing model convergence, resulted in information loss. A follow-up analysis that incorporates clinical documentation and qualitative inquiry would allow for a richer examination of CPS reporting decisions. These limitations mean that caution should guide the extrapolation of these findings to other samples. Even still, the variance we identified provides a useful quantitative indicator of the differential experiences birthing people may have dependent on their institution of care.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Declaration of Competing Interest

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Data Statement

Data sharing statement available at www.jpeds.com.

Glossary

CPS	Child protection system
ICD-10-CM	International Classification of Diseases 10th revision, Clinical Modification
IPSE	Infants with prenatal substance exposure

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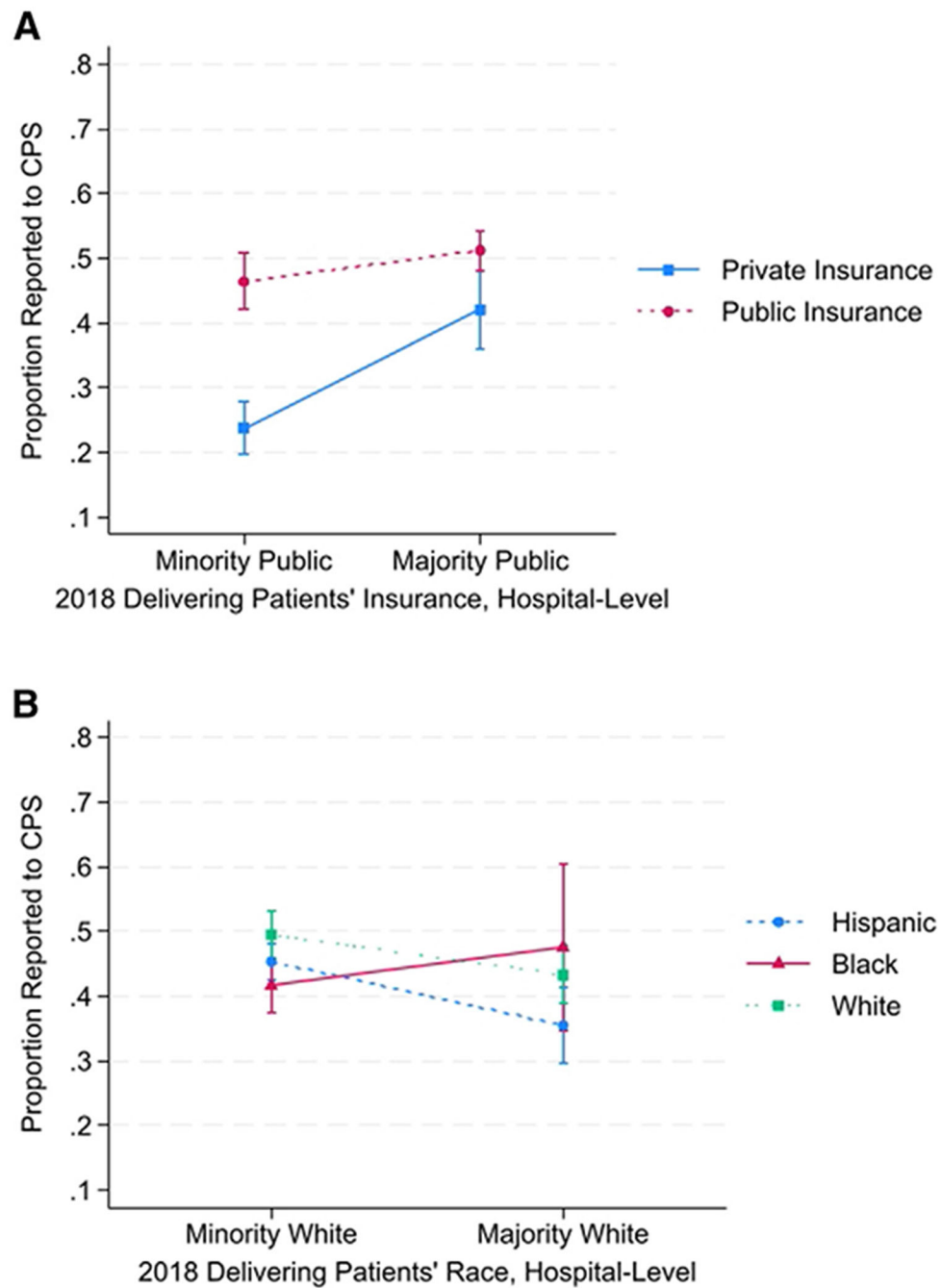


Figure 1.

Predicted probabilities of a hospital CPS report following documented IPSE derived from adjusted multilevel model showing interaction between individual- and hospital-level variables. Adjusted for individual level parameters maternal parity, prenatal care receipt, establishment of paternity, low birth weight, and whether cannabis was the only specific substance included in diagnostic record.

Panel **A**: individual insurance type and hospital-level proportion of public insurance among 2018 birth hospital admissions; Panel **B**: individual maternal race and ethnicity and proportion of hospital-level White maternal race.

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Table IV.

Distribution of Covariates

Covariate	PSE ICD code (n = 6756; 2.6% of 260 525 matched births)		Early neonatal CPS report (n = 3070; 45.44% of those with ICD code)		Row %
	N	%	N	%	
Birth payment*					
Public	5043	75.07	2638	86.75	52.31
Private	1675	24.93	403	13.25	24.06
Maternal race and ethnicity*					
Non-Hispanic Black	1262	18.68	471	15.34	37.32
U.S. born Hispanic	2620	38.78	1232	40.13	47.02
Non-Hispanic White	2874	42.54	1367	44.53	47.56
Cannabis as only specific substance in ICD code*	3078	45.46	814	26.51	26.45
Paternity*					
Missing	1909	28.26	1196	38.96	62.65
Established	4847	71.74	1874	61.04	38.66
Prenatal care*					
1st trimester	3977	58.87	1308	42.61	32.89
2nd, 3rd trimester or missing	2779	41.13	1762	57.39	63.40
Birth weight*					
Less than 2500g	983	14.55	590	19.22	60.02
More than 2500g	5773	85.45	2480	80.78	42.96
Parity*					
0 or 1 prior births	4110	61.02	1556	50.95	37.86
2 or more prior births	2625	38.98	1498	49.05	57.07

Missing values excluded from percent calculation. Listed covariates were missing data in less than 1% of birth records. Births with early neonatal CPS reporting are a subset of those with diagnostic (ICD) documentation of prenatal substance exposure (PSE). Chi-square test used to assess the distribution of births with ICD codes compared with the full cohort of 2015 births, and then births with CPS reporting compared to all those with ICD documentation of prenatal substance use.

* Indicates that chi-square test *P* values < 0.001 for CPS outcomes.

Table V.

Substance Exposure Diagnosis by Race and Ethnicity

Substance documented at birth	All births (n = 260 525)			Black (n = 22 688)			U.S. born Hispanic (n = 122 661)			White (n = 115 176)			Chi-square
	n	%of births	%of ICD	n	%of births	%of ICD	n	%of births	%of ICD	n	%of births	%of ICD	
Any substance-related code ***	6756	2.6%		1,262	5.6%		2,620	2.1%		2,874	2.5%		861.5 ***
Cannabis, * ****	3688	1.4%	54.6%	938	4.1%	74.3%	1,342	1.1%	51.2%	1,408	1.2%	49.0%	1300 ***
Opioids, * * ****	848	0.3%	12.6%	70	0.3%	5.5%	242	0.2%	9.2%	536	0.5%	18.6%	119.0 ***
Stimulant, * ****	2007	0.8%	29.7%	258	1.1%	20.4%	933	0.8%	35.6%	816	0.7%	28.4%	47.0 ***
Alcohol, **	459	0.2%	6.8%	51	0.2%	4.0%	177	0.1%	6.8%	231	0.2%	8.0%	11.28 ***
Other substance/Not specified, ****	1059	0.4%	15.7%	136	0.6%	10.8%	442	0.4%	16.9%	481	0.4%	16.7%	18.4 ***
Cannabis and no other substance ****	3078	1.2%	45.6%	816	3.6%	64.7%	1,106	0.9%	42.2%	1,156	1.0%	40.2%	1200 ***

P values are denoted

* <0.01

** <0.001

*** <0.0001.

* Births with > 1 type of substance documented are counted more than once. Chi-square tests compare distribution of substance type across race and ethnicity categorizations.

Table VI.
Relative Risks of Child Protection System Reporting From Adjusted Multilevel Model

Restricted sample to US-born Hispanic, Non-Hispanic Black, and Non-Hispanic White (n = 277 285) Who had ICD code (n = 6756)		
	RR	(95% CI)
Individual birth-level exposures		
Non-Hispanic Black vs U.S.-born Hispanic	0.92	(0.83, 1.01)
Non-Hispanic White vs U.S.-born Hispanic	1.09 [*]	(1.02, 1.17)
Public birth payment method	1.95 [†]	(1.65, 2.30)
Hospital-level exposures		
>50% of births with public health insurance	1.77 [†]	(1.41, 2.21)
>50% of births to Non-Hispanic White mothers	0.78 [‡]	(0.66, 0.94)
Interaction terms		
Public x Hospital with over 50% of births having public health insurance	0.63 [†]	(0.50, 0.77)
Non-Hispanic Black x Hospital with over 50% of births being to White non-Hispanic mothers	1.46 [‡]	(1.13, 1.88)
Non-Hispanic White x Hospital with over 50% of births being to White non-Hispanic mothers	1.12	(0.92, 1.35)
Fixed effects		
Intercept (SE)	0.21 [†]	(0.18, 0.25)
Error variance (SE)		
Level-2 intercept	0.04	(0.02, 0.07)
Model fit		
BIC	10 037.26	
2 log likelihood	9905.12	

ICC = 0.24; RR, relative risk.

Adjusted for individual level parameters maternal parity, prenatal care receipt, establishment of paternity, low birth weight, and whether cannabis was the only specific substance included in diagnostic record.

^{*} $P < .05$.

[‡] $P < .01$.

[†] $P < .001$.