Prenatal Substance Exposure and Reporting of Child Maltreatment by Race and Ethnicity

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abstract

BACKGROUND: Substance exposure is thought to contribute to reports of suspected maltreatment made to child protective services (CPS) at or shortly after birth. There are limited data, however, on whether clinicians are more likely to report black and Hispanic substance-exposed infants compared with white infants.

METHODS: We examined racial differences in diagnosed substance exposure and subsequent maltreatment reports by using linked birth, hospital discharge, and CPS records. Diagnostic codes were used to document substance exposure; CPS records provided information on maltreatment reports. Prevalence of infant exposure was calculated by race or ethnicity, substance type, and sociodemographic covariates. We estimated racial differences in maltreatment reporting among substance-exposed infants using multivariable models.

RESULTS: In a 2006 population-based California birth cohort of 474 071 black, Hispanic, and white infants, substance exposure diagnoses were identified for 1.6% of infants (n = 7428). Exposure varied significantly across racial groups (P < .001), with the highest prevalence observed among black infants (4.1%) and the lowest among Hispanic infants (1.0%). Among white and Hispanic infants, the most frequently observed substances were amphetamine and cannabis; for black infants, cannabis was the most common, followed by cocaine. After adjusting for sociodemographic and pregnancy factors, we found that substance-exposed black and Hispanic infants were reported at significantly lower or statistically comparable rates to substance-exposed white infants.

CONCLUSIONS: Although we were unable to address potential racial and ethnic disparities in screening for substances at birth, we found no evidence that racial disparities in infant CPS reports arise from variable responses to prenatal substance exposure.

WHAT'S KNOWN ON THIS SUBJECT: In the United States, black infants are reported to child protective services at significantly higher rates than other infants. Little is known, however, about the role of prenatal substance exposure on decisions to report based on race/ethnicity and substance type.

WHAT THIS STUDY ADDS: Black and Hispanic newborns with prenatal substance exposure were no more likely than white infants to be reported for maltreatment. Findings held across substance types and suggest that racial/ethnic reporting disparities are minimized in the presence of prenatal substance exposure.

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ARTICLE

In the United States, black infants have a rate of substantiated maltreatment twice that of white and Hispanic infants (40 per 1000 vs 18 per 1000, respectively),[1,2] and in some states racial and ethnic disparities are even greater.[3] Factors that may contribute to racial differences in the rates of child protective services (CPS) reports include uneven levels of poverty and other risk factors for maltreatment,[4,5] variability in surveillance,[6,7] and inconsistencies in decisions to report possible maltreatment.[8,9] Prenatal substance exposure is also thought to be an important contributor to the involvement of CPS at or shortly after birth[10,11] and a source of racial disparities.[12] Reliable data establishing in utero substance exposure is limited, however, which makes it challenging to document the relationship between prenatal exposure and CPS reporting.[13,14]

The Child Abuse Prevention and Treatment Act[15] requires all states have policies and procedures to notify CPS when an infant is born with prenatal substance exposure. As of 2012, substance exposure had been incorporated into the definition of child abuse and neglect in at least a dozen states.[16] In California, however, there are no laws mandating that prenatal substance exposure be reported to CPS.[17] Specifically, the law requires a report of a substance-exposed infant only when "other factors are present that indicate risk to a child" and makes explicit that "a positive toxicology screen at the time of delivery of an infant is not in and of itself a sufficient basis for reporting child abuse or neglect."[10] It is unknown whether race or ethnicity biases medical decisions to report prenatal substance exposure to CPS.

This study examined the association between prenatal substance use and neonatal reporting of exposed infants to CPS. We used linked administrative records from California to determine the diagnosis of prenatal exposure and assess whether the discretion afforded to clinicians results in racial and ethnic disparities in the reporting of substance-exposed infants to CPS. We hypothesized that among substance-exposed newborns, black and Hispanic infants would be no more likely than white infants to be reported to CPS, after controlling for other risk factors.

METHODS

Data

This analysis is based on a linked file of records originating from 3 administrative data sources from California: maternal and infant hospital discharge records managed by the Office of Statewide Health Planning and Development, child protection records from the Department of Social Services, and vital birth records falling under the authority of the Department of Public Health. Prenatal substance exposure was determined from codes in hospital records. Reporting to CPS was obtained from the state's child protection records. Birth records provided sociodemographic and pregnancy covariates.

Birth and hospital discharge records reflected information concerning statewide births from calendar year 2006; CPS records used in the present analysis spanned the 28-day period after birth. Hospital discharge records were probabilistically linked to birth records as part of an ongoing state surveillance project.[18] A total of 98% of hospital discharge records were successfully linked to a birth record. Excluded from these linkages were births that occurred in military hospitals, at home, or in small birthing centers, which are not reported to the state. Accounting for these exclusions, data used in this study reflect ~95% of all live births in California in 2006.

In a separate set of probabilistic linkages, CPS records for children born in 2006 and reported as alleged victims of maltreatment during infancy were linked to birth records. A total of 92% of infants reported for maltreatment were successfully matched to a birth record. Unmatched CPS records included infants born outside California and infants for whom the accuracy or completeness of the data prevented a successful record match. The final data set was constructed with state-generated numbers assigned to each birth record to integrate information across the 2 linked files. This study received human subjects approvals from both state and university institutional review boards.

Variables

Dependent Variable

The dependent variable was defined as a report of maltreatment made to CPS during the 28-day neonatal window starting at birth. The neonatal period was chosen to incorporate longer average hospital stays of substance-exposed infants reported in previous studies.[19–21] We included all reports, regardless of whether the report was screened in for investigation or substantiated as abuse or neglect. The inclusion of all reports was based on our interest in factors contributing to clinical decisions to report an infant with documented substance exposure, rather than the CPS response.

Independent Variables

We examined the likelihood of a neonatal report to CPS based on 2 variables: maternal race or ethnicity (as coded in the birth record) and diagnoses of substance exposure (as coded in the hospital discharge records). We restricted the analysis to the 3 largest racial and ethnic groups in California (black, Hispanic, white). Diagnoses of in utero substance exposure were based on International Classification of

Diseases, Ninth Revision, Clinical Modification codes from hospital discharge records.[22] Substance exposure was based on diagnostic codes for maternal alcohol and nondependent and dependent substance abuse disorders; drug withdrawal syndrome; narcotic, hallucinogenic, or cocaine exposure via placenta or breast milk; and suspected damage to fetus from substances (alcohol, narcotics, hallucinogenic agents, or cocaine). Additionally, we included obstetrical diagnostic categories for unspecified drug dependence and suspected damage to the fetus from unspecified drugs. All codes and the number of births in each category are presented in Supplemental Table 5. Overall, 61.5% of births with substance diagnoses were from codes in the maternal record only, 10.0% from codes in the infant record only, and 28.5% from codes in both records.

Covariates

To isolate the relationship between maternal race or ethnicity, medically diagnosed substance exposure, and the likelihood an infant was reported to CPS, we examined and adjusted for several sociodemographic and pregnancy covariates recorded at birth. Covariates were derived from birth records and included maternal age (≤19 years, 20–24 years, 25–29 years, ≥30 years), insurance type (private, public), the trimester prenatal care was initiated (first, second, third, no care/missing), paternity establishment (established, missing), birth order (first birth, non-first birth), and infant birth weight (≥2500 g, <2500 g). California provides retroactive enrollment in the state's public health insurance program if there is no insurance coverage at birth. Paternity establishment was based on whether a father was named in the birth record.

Analysis

Analyses were carried out with R version 3.2.2 (The R Project for Statistical Computing, Vienna, Austria).[23] Covariate distributions were examined between children born with and without diagnosed substance exposure for the overall cohort and within race and ethnicity. We used χ^2 tests to assess the significance of differences between groups. We then restricted our examination to births in which substance exposure was diagnosed and used χ^2 tests to assess the relationship between race or ethnicity and specific substance exposure types. To examine racial differences in CPS reporting among newborns exposed to substances, we estimated the relative risk (RR) and corresponding 95% confidence intervals (CIs) using the δ method. We specified 3 generalized linear models with a Poisson distribution, log link, and robust SE adjustments.[24,25]

We first estimated the RR of reporting to CPS when substance exposure had been diagnosed at birth (Model 1). We then examined the individual and combined effects of substance exposure and race or ethnicity (Model 2). Finally, we estimated the adjusted RR of a CPS report after adjusting for covariates and a co-occurring second substance (Model 3). For each model, we estimated the likelihood of a substance-exposed infant being reported to CPS by examining any diagnosed substance (Model 3A) and then stratifying by individual substance types (Models B–G). This allowed us to examine the RR of being reported to CPS among infants in the same substance categories and when ≥2 substances were diagnosed.

RESULTS

Diagnosed Substance Exposure

As shown in Table 1, 7428 births (1.6%) with diagnosed prenatal substance exposure. Diagnosed substance exposure was highest among black (4.1%), followed by white (2.1%) and Hispanic (1.0%) infants. Substance-exposed infants were more likely to be born to younger mothers and covered by public insurance. Among infants with diagnosed exposure, paternity was more likely to be not established (40.6% vs 9.5%), and prenatal care was more likely to have started after the first trimester or not at all (44.6% vs 14.5%). Substance exposure was also more common among mothers with previous births and infants born at low birth weight.

Diagnosed Substance Exposure by Race and Ethnicity

Table 2 shows births by substance exposure and race or ethnicity. Among white and Hispanic infants, maternal age tended to be younger in the substance-exposed group relative to those without exposure; the opposite trend was observed for black births. However, all other covariates were unidirectional in relation to substance exposure. Findings also indicated that black infants had a greater concentration of socioeconomic and health vulnerabilities, regardless of substance exposure. Yet differences across race and ethnicity were notably lower among substance-exposed infants. For example, although the share of births covered by public insurance varied substantially by race and ethnicity among infants without substance exposure (white = 22.1%, black = 53.8%, Hispanic = 67.1%), there were minimal differences in the substance-exposed subpopulation (white = 70.4%, black = 72.4%, Hispanic = 76.1%).

Diagnosed Substance Exposure by Substance Type and Race or Ethnicity

As shown in Table 3, among births in which substance exposure was diagnosed, we identified significant variations between racial and ethnic groups for all substance types with the exception of alcohol

TABLE 1 Sociodemographic and Pregnancy Characteristics of Births in California in 2006 by Diagnosed Prenatal Substance Exposure

	Birth Cohort ($N = 474\,071$)					χ^2 Test
	All Births	No Substance ($n = 466\,643$; 98.4%)		Substance ($n = 7428$; 1.6%)		
	N	n	%	n	%	
Race or ethnicity						
Black	30 885	29 616	6.3	1269	17.1	$P < .001$
Hispanic	290 947	287 948	61.7	2999	40.4	
White	152 239	149 079	31.9	3160	42.5	
Age at childbirth						
$\leq$19 y	50 123	49 278	10.6	854	11.5	$P < .001$
20–24 y	116 326	114 061	24.4	2265	30.5	
25–29 y	126 344	124 255	26.6	2089	28.1	
30+ y	181 254	179 037	38.4	2217	29.9	
Insurance type						
Private	226 153	224 175	48.1	1978	27.0	$P < .001$
Public	247 034	241 673	51.9	5361	73.0	
Paternity						
Established	426 705	422 291	90.5	4414	59.4	$P < .001$
Missing	47 366	44 352	9.5	3014	40.6	
Prenatal care						
1st tri	403 072	398 597	85.5	4115	55.4	$P < .001$
2nd tri	54 000	52 236	11.2	1764	23.7	
3rd tri	10 421	9881	2.1	540	7.3	
No care /missing	6578	5569	1.2	1009	13.6	
Parity						
First birth	179 543	177 228	38.0	2315	31.2	$P < .001$
Non–first birth	294 528	289 415	62.0	5113	68.8	
Infant birth wt						
Normal ($\geq$2500 g)	442 514	436 338	93.5	6176	83.1	$P < .001$
Low (<2500 g)	31 557	30 305	6.5	1252	16.9	

Tri, trimester.

($P = .409$). Amphetamine was the most commonly diagnosed substance among white and Hispanic mothers (41.6% and 51.3%, respectively), followed by cannabis (35.2% and 21.9%, respectively). Black mothers of substance-exposed infants were most likely to have diagnoses for cannabis (46.6%), followed by cocaine (30.5%).

Figure 1 shows the prevalence of co-occurring substances for the 3 most prevalent substance types, which also varied by race and ethnicity. When amphetamine exposure was diagnosed, co-occurring cannabis exposure was present for 29.7% of black births, 20.7% white births, and 13.3% of Hispanic births. Co-occurring cocaine exposure was also twice as common among black infants with diagnosed amphetamine exposure as among white or Hispanic infants. Diagnosed cannabis exposure showed a different pattern, with black infants

having the lowest percentage of co-occurring amphetamine exposure (9.1%), whereas Hispanic infants had the highest (31.2%), followed by white infants (24.6%). When cocaine exposure was diagnosed, black infants had the lowest and white infants had the highest percentage of co-occurrence across other substances.

Likelihood of Neonatal Reports to CPS

Although the overall percentage of substance-exposed infants with a neonatal report to CPS was 53.4%, reporting ranged from only 36.1% of infants with diagnosed alcohol exposure to 72.1% of infants with cocaine exposure (Table 4). Among all infants neonatally reported to CPS, we found that 40.6% had been diagnosed with substance exposure at birth (not reported in the table). Model 1A shows that infants with diagnosed substance exposure

were significantly more likely to be reported to CPS than infants not exposed (RR 42.96; 95% confidence interval [CI], 41.55–44.41), a finding that emerged across all substance types (Models 1B–1G). The lowest RR was observed for alcohol versus no alcohol (RR 17.85; 95% CI, 15.98–19.94), whereas the highest RR was for amphetamine versus no amphetamine (RR 41.59; 95% CI, 40.24–42.98). Statistically significant racial and ethnic differences in CPS reporting emerged among infants with any diagnosed substance exposure (Model 2A) and for several specific substance types (Models 2B–2G). Overall, both black and Hispanic infants with diagnosed substance exposure were slightly but significantly more likely than white infants to be reported to CPS (black RR 1.15; 95% CI, 1.08–1.21; Hispanic RR 1.13; 95% CI, 1.08–1.18).

In Model 3, diagnosed substance exposure (with and without a

TABLE 2 Sociodemographic and Pregnancy Characteristics of Births in California in 2006 by Race or Ethnicity and Diagnosed Prenatal Substance Exposure

	Black (N = 30 885)					Hispanic (N = 290 947)					White (N = 152 239)				
	No Substance (95.9%)		Substance (4.1%)		χ^2 Test	No Substance (99.0%)		Substance (1.0%)		χ^2 Test	No Substance (97.9%)		Substance (2.1%)		χ^2 Test
	n	%	n	%		n	%	n	%		n	%	n	%	
Age at childbirth					P = .002					P < .001					P < .001
≤19 y	4301	14.5	145	11.4		71 943	25.0	905	30.2		6945	4.7	277	8.8	
20–24 y	8466	28.6	334	26.4		77 487	26.9	828	27.6		25 521	17.1	989	31.3	
25–29 y	7480	25.3	331	26.1		67 751	23.5	707	23.6		38 984	26.1	876	27.7	
30+ y	9369	31.6	457	36.1		70 748	24.6	558	18.6		77 629	52.1	1018	32.2	
Insurance type					P < .001					P < .001					P < .001
Private	13 652	46.2	346	27.6		94 512	32.9	710	23.9		116 011	77.9	922	29.6	
Public	15 869	53.8	908	72.4		192 962	67.1	2257	76.1		32 842	22.1	2196	70.4	
Paternity					P < .001					P < .001					P < .001
Established	22 075	74.5	632	49.8		259 615	90.2	1730	57.7		140 601	94.3	2052	64.9	
Missing	7541	25.5	637	50.2		28 333	9.8	1269	42.3		8478	5.7	1108	35.1	
Prenatal care					P < .001					P < .001					P < .001
1st tri	24 247	81.9	739	58.2		240 515	83.5	1577	52.6		134 195	90.0	1799	56.9	
2nd trimester	4094	13.8	281	22.1		36 854	12.8	730	24.3		11 288	7.6	753	23.8	
3rd tri	761	2.6	81	6.4		7026	2.4	222	7.4		2094	1.4	237	7.5	
No care/ missing	514	1.7	168	13.2		3553	1.2	470	15.7		1502	1.0	371	11.7	
Parity					P < .001					P < .001					P < .001
First birth	12 018	40.6	327	25.8		100 305	34.8	839	28.0		64 905	43.5	1149	36.4	
Non–first birth	17 598	59.4	942	74.2		187 643	65.2	2160	72.0		84 174	56.5	2011	63.6	
Infant birth wt					P < .001					P < .001					P < .001
Normal (≥2500 g)	26 223	88.5	952	75.0		270 301	93.9	2504	83.5		139 814	93.8	2720	86.1	
Low (<2500 g)	3393	11.5	317	25.0		17 647	6.1	495	16.5		9265	6.2	440	13.9	

Tri, trimester.

TABLE 3 Substance Type Among Prenatally Exposed Black, Hispanic, and White Births in California in 2006

Substance Documented at Birth[a]	All Births		Black		Hispanic		White		χ² Test
	n	%	n	%	n	%	n	%	
Amphetamine	2754	37.1	182	14.3	1539	51.3	1316	41.6	P < .001
Cannabis	2359	31.8	591	46.6	656	21.9	1112	35.2	P < .001
Opioids	1143	15.4	145	11.4	545	18.2	564	17.8	P < .001
Cocaine	881	11.9	387	30.5	292	9.7	202	6.4	P < .001
Alcohol	513	6.9	104	8.2	239	8.0	228	7.2	P = .409
Neonatal drug withdrawal syndrome	480	6.5	46	3.6	190	6.3	290	9.2	P < .001

[a] Births with >1 type of substance use documented are counted more than once.
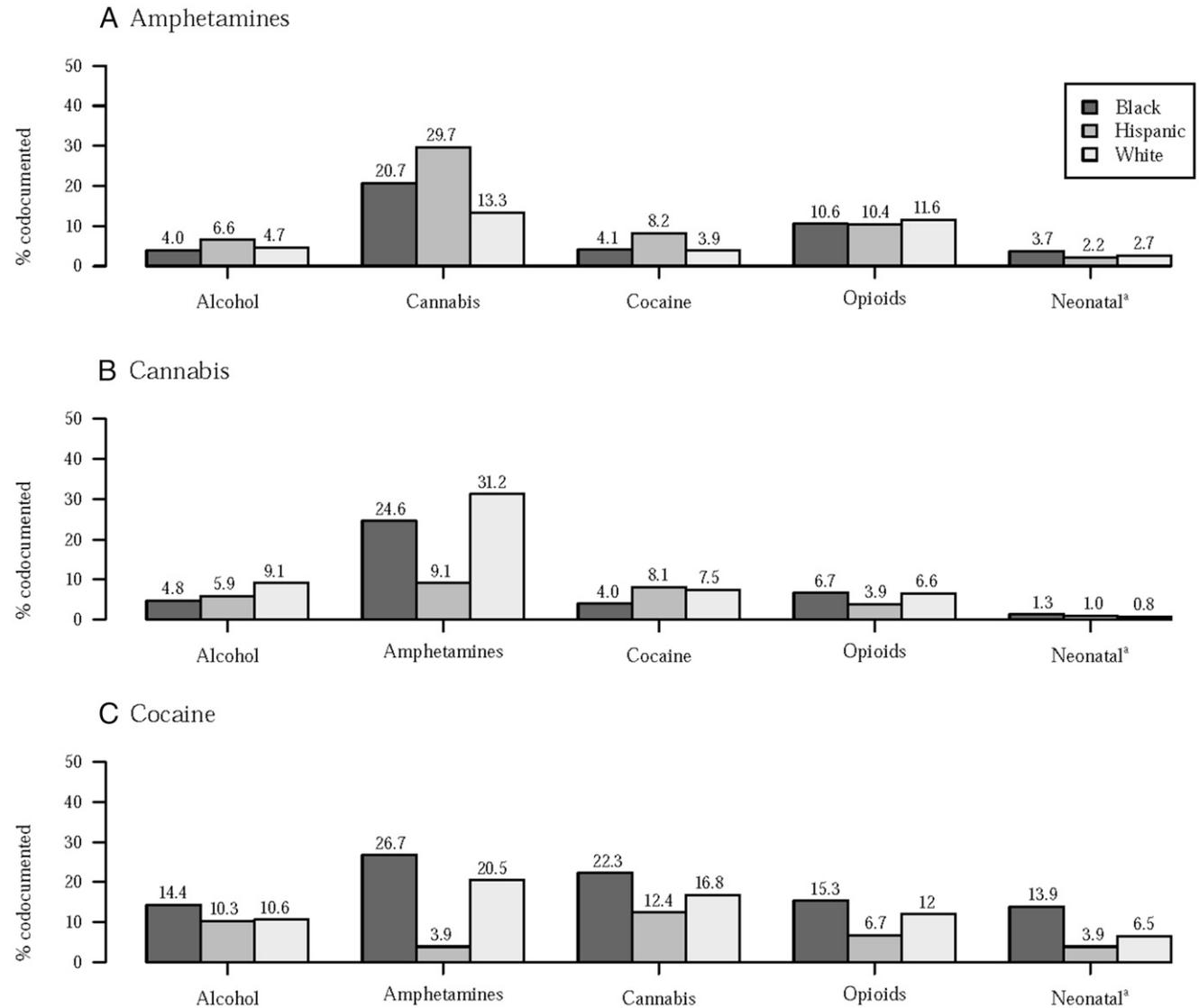

FIGURE 1
Codocumented substances for the 3 most prevalent substance types: amphetamines, cannabis, and cocaine. Results are stratified by race and ethnicity.
[a]Neonatal, neonatal drug withdrawal syndrome.

codocumented substance) remained a significant predictor of a report to CPS after adjustment for covariates and across individual substance types (Models 3B–3G). Among infants with diagnosed exposure (either a single substance or codocumented substances), previously observed differences by race and ethnicity were no longer statistically significant after adjustment for covariates. Across specific substance types, black and Hispanic newborns with in utero exposure had a statistically lower or equivalent likelihood of being reported to CPS compared with white newborns with the same substance exposure.

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TABLE 4 Race or Ethnicity and Diagnosed Prenatal Substance Exposure as Predictors of a Neonatal Report to CPS Among Black, Hispanic, and White Infants in California in 2006

	A. Any Substance (53.4% reported)		B. Amphetamine (68.1% reported)		C. Cannabis (41.1% reported)		D. Opioids (62.4% reported)		E. Cocaine (72.1% reported)		F. Alcohol (36.1% reported)		G. Neonatal Withdrawal (56.7% reported)	
	RR	95% CI	RR	95% CI	RR	95% CI	RR	95% CI	RR	95% CI	RR	95% CI	RR	95% CI
Model 1														
Substance	42.96	41.55–44.41	41.59	40.24–42.98	22.00	20.87–23.19	32.78	31.26–34.38	37.31	35.64–39.06	17.85	15.98–19.94	28.31	26.20–30.58
Model 2														
Substance	35.77	33.84–37.81	35.85	33.98–37.83	19.44	17.97–21.03	27.38	25.38–29.54	27.69	24.83–30.87	14.42	11.99–17.35	22.55	20.08–25.32
Race, substance														
Black[a]	1.15	1.08–1.21	1.16	1.05–1.27	1.03	0.91–1.14	1.02	0.87–1.17	1.34	1.19–1.48	1.54	1.21–1.87	1.22	0.94–1.50
Hispanic[a]	1.13	1.08–1.18	1.05	0.99–1.10	0.99	0.88–1.10	1.10	1.01–1.20	0.94	0.81–1.08	0.93	0.70–1.16	1.21	1.04–1.38
Model 3														
Substance	10.85	10.03–11.74	6.62	5.97–7.27	5.57	4.83–6.32	4.93	3.99–5.87	4.96	3.61–6.3	3.56	2.04–5.09	3.79	2.62–4.96
Codocumented substance	12.48	11.36–13.60	6.88	6.15–7.61	4.88	4.24–5.52	5.33	4.62–6.03	4.14	3.20–5.08	3.53	2.60–4.45	4.17	3.38–4.96
Race, one substance														
Black[a]	0.96	0.86–1.06	0.94	0.70–1.19	0.77	0.61–0.93	0.88	0.53–1.24	0.78	0.54–1.02	0.68	0.02–1.35	1.22	0.26–2.18
Hispanic[a]	0.93	0.85–1.01	0.95	0.84–1.06	0.81	0.63–1.00	0.78	0.58–0.98	0.88	0.57–1.19	0.47	0.19–0.76	1.25	0.70–1.79
Race, codocumented substance														
Black[a]	0.91	0.78–1.05	0.94	0.72–1.17	0.77	0.59–0.95	1.02	0.73–1.30	0.81	0.58–1.04	0.92	0.56–1.27	0.80	0.43–1.17
Hispanic[a]	0.90	0.80–1.00	0.95	0.82–1.08	0.85	0.68–1.02	0.88	0.72–1.04	0.83	0.58–1.08	0.80	0.50–1.10	0.84	0.60–1.08

Model 1 presents the ratio of the maltreatment reporting risk for newborns with diagnosed prenatal substance exposure relative to infants without exposure. For example, in Model 1D, findings indicate that newborns with diagnosed in utero exposure to opioids were reported at 32.8 times the rate of those without exposure to opioids (95% CI, 31.26–34.38).

Model 2 presents the individual and combined effects of prenatal substance exposure and race or ethnicity. For example, in Model 2E, findings indicate that newborns with diagnosed cocaine exposure were reported at 27.7 times the rate of those without cocaine exposure (95% CI, 24.83–30.87), and black children with diagnosed cocaine exposure were reported at 1.3 times the rate of white children with diagnosed cocaine exposure (95% CI, 1.19–1.48).

Model 3 presents the individual and combined effects of prenatal substance exposure and race or ethnicity, after adjustment for other covariates and with findings stratified by whether there was a codocumented substance. For example, in Model 3A, findings indicate that newborns with any diagnosed prenatal exposure for a single substance type were reported at 10.9 times the rate of those without exposure, after adjustment for other covariates (95% CI, 10.03–11.74). For infants with ≥2 substance types diagnosed, they were reported at 12.5 times the rate of those without exposure, after adjustment for other covariates (95% CI, 11.36–13.60). Meanwhile, black children with diagnosed prenatal exposure for a single substance type were 4% less likely to be reported than white children with a single substance type (RR 0.96), a difference that was not statistically significant (95% CI, 0.86–1.06), and again after adjustment for other covariates.

[a] Compared with white infants.

DISCUSSION

We linked records from 3 administrative sources to develop a population-level analysis of diagnosed substance exposure at birth and the corresponding likelihood of reporting to CPS by race or ethnicity. After matching the hospital discharge and birth records of infants with prenatal substance exposure to child protection records, we tested whether black, Hispanic, and white infants were differentially reported to CPS after the same substance was diagnosed and after adjustment for covariates. Although our data did not allow us to test variable patterns of prenatal substance screening or substance use self-disclosure by race or ethnicity, key findings emerged for infants with diagnosed substance exposure.

First, diagnosed substance exposure significantly increased an infant's risk of being reported to CPS during the neonatal period. Even after adjustment for other factors, infants with diagnosed substance exposure had a risk of being reported to CPS 10 times that of infants without any exposure. Despite the relative difference in reporting rates for substance-exposed versus nonexposed infants, however, only half of all infants with a substance exposure diagnosis were reported to CPS (53.4%). For infants who were not reported, it is unknown what supports or service referrals were made. From the perspective of the CPS system, 40.6% of all infants reported during the neonatal period had diagnosed substance exposure, underscoring just how many child protection–involved newborns probably need health and developmental supports to offset in utero adversities. Although none of these findings are necessarily unexpected, few studies have examined the contribution of substance exposure to maltreatment reporting.

Second, we found notable differences in the nature of diagnosed substances by race and ethnicity, a relevant

factor given that the likelihood of a report being made to CPS varied substantially by substance type. Our finding that amphetamine exposure was the most commonly diagnosed substance among Hispanic and white infants but much less frequently observed for black infants aligns with broader population differences in amphetamine use.[26–28] We also found that the distribution of substances documented for California infants born in 2006 had shifted significantly from earlier birth cohorts,[29] including lower rates of prenatal cocaine use, a finding consistent with more recently published studies on substance use during pregnancy.[30–32]

Third, as hypothesized, we found no evidence that black or Hispanic infants with diagnosed prenatal substance exposure were more likely to be reported to CPS than white infants after adjustment for other covariates. Among newborns with diagnosed exposure, black and Hispanic infants had a statistically lower or equivalent risk of being reported to CPS for maltreatment compared with white infants. Although we did not find evidence that clinicians were more likely to report substance-exposed black or Hispanic infants to CPS, our findings do not address whether there is bias in screening for substances.[33] Our findings simply suggest that once substances have been diagnosed, race or ethnicity does not seem to drive the decision to report maltreatment.

Results from our analysis do not align with those in the frequently cited study by Chasnoff et al,[9] who found that substance-exposed black infants were more likely to be reported to CPS than white infants. It should be noted, however, that this earlier analysis was based on a data set of aggregated prenatal substance screening results (stratified by race and ethnicity) and a separate data set of contemporaneous maltreatment reports with positive toxicology (also stratified by race and ethnicity).

Our study benefits from access to linked individual-level records, which significantly strengthen the conclusions that can be drawn.

Few population-based epidemiologic studies have explored licit and illicit prenatal substance exposure. Fewer still have connected in utero exposure to clinicians' decisions to report to CPS. Hospital discharge records linked to vital birth records provide an incomplete yet still valuable means of monitoring population-level patterns of documented substance exposure. Cross-sector linkages to administrative CPS records provide valuable information about reporting decisions that may vary by race or ethnicity and substance type. Despite the strength of hospital discharge data as a source of standardized and population-level diagnostic information for studying various health outcomes, including child maltreatment[34,35] and substance exposure,[29,36] findings must be interpreted cautiously.

There are at least 3 limitations to the current study. The first is imperfect measurement of substance exposure. Our results should be viewed as very conservative estimates of the true rates of in utero exposure, both overall and by race or ethnicity.[37–39] Our data reflect only the subset of infants with diagnoses made at birth; it is unknown whether substance exposure diagnoses made prenatally are recorded in birth discharge records. Second, we have no data on variations in clinician and hospital substance screening practices. Previous research has shown that clinical decisions to screen for substances are correlated with socioeconomic status and race or ethnicity.[40–43] In our data we were unable to determine the full universe of births that were screened. In an attempt to address factors that might have influenced screening and therefore diagnosis rates, we explored and modeled

hospital-level variables, such as the rate of publicly insured births. None of the hospital-level variables changed our findings, however. The third limitation is that the study used 2006 data from California, and it is unknown how generalizable these results are for other birth cohorts and for other regions of the country. Still, to the best of our knowledge no other study has used linked records to examine diagnosed exposure and maltreatment reporting.

CONCLUSIONS

Prenatal substance exposure poses serious health risks for infants because of both the direct in utero impact on the developing fetus and the potential that ongoing parental substance abuse may place a newborn at risk for harm.[44] Identifying exposed infants at birth allows medical providers to connect families to services that may offset health adversities and risks posed by ongoing substance abuse. In states such as California, there is no mandate for reporting substance-exposed infants to CPS. Therefore, medical providers may choose to make a formal maltreatment report to CPS or instead refer a family to community services. Factors that contribute to clinical decisions to report to CPS when substance exposure has been diagnosed are not well understood, and previous research has indicated racially biased responses.[9] Results from the present analysis indicate that in cases where substance exposure was diagnosed, clinicians were no more likely to report minority infants to CPS than white infants.

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ABBREVIATIONS

CI: confidence interval
CPS: child protective services
RR: relative risk

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