Racial and ethnic disparities: A population-based examination of risk factors for involvement with child protective services ☆

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ABSTRACT

Objective: Data from the United States indicate pronounced and persistent racial/ethnic differences in the rates at which children are referred and substantiated as victims of child abuse and neglect. In this study, we examined the extent to which aggregate racial differences are attributable to variations in the distribution of individual and family-level risk factors.

Methods: This study was based on the full population of children born in California in 2002. Birth records were linked to child protective service (CPS) records to identify all children referred for maltreatment by age 5. Generalized linear models were used to compute crude and adjusted racial/ethnic differences in children's risk of referral, substantiation, and entry to foster care.

Results: As expected, stark differences between Black and White children emerged in the rates of contact with CPS. Black children were more than twice as likely as White children to be referred for maltreatment, substantiated as victims, and enter foster care before age 5. Yet, there were also significant differences across racial/ethnic groups in the distribution of socioeconomic and health factors strongly correlated with child maltreatment and CPS involvement. After adjusting for these differences, low socioeconomic Black children had a lower risk of referral, substantiation, and entry to foster care than their socioeconomically similar White counterparts. Among Latinos, before adjusting for other factors, children of U.S.-born mothers were significantly more likely than White children to experience system contact, while children of foreign-born mothers were less likely to be involved with CPS. After adjusting for socioeconomic and health indicators, the relative risk of referral, substantiation, and foster care entry was significantly lower for Latino children (regardless of maternal nativity) compared to White children.

Conclusions: Race and ethnicity is a marker for a complex interaction of economic, social, political, and environmental factors that influence the health of individuals and communities. This analysis indicates that adjusting for child and family-level risk factors is necessary to distinguish race-specific effects (which may reflect system, worker, or resource biases) from socioeconomic and health indicators associated with maltreatment risk. Identifying the independent effects of these factors is critical to developing effective strategies for reducing racial disparities.

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Introduction

In the United States, information collected by child protective service (CPS) agencies suggests that child maltreatment is not randomly distributed throughout the population (U.S. Department of Health and Human Services, 2011). Rather, data indicate that children of different racial/ethnic groups are subjected to abuse and neglect at different rates. Black children are over represented among maltreatment victims, whereas Latino and White children are typically underrepresented (Shaw, Putnam-Hornstein, Magruder, & Needell, 2008; U.S. General Accounting Office, 2007).

Historically, it was widely held that observed disparities reflected the incomplete or biased nature of CPS data, which captures only those children officially reported for maltreatment. This position was based largely upon empirical support from a single data source – the National Incidence Studies (NIS) – a periodic, community-based effort to estimate the incidence of abuse and neglect using information gathered for both unreported and reported cases (Sedlak, 1991; Sedlak & Broadhurst, 1996). Until 2010, the authors of these studies reported there to be "*no* race differences in the incidence of maltreatment" (italics in original text) and concluded that racial and ethnic disparities arose from differential treatment across races (Sedlak & Broadhurst, 1996, p. 8). In other words, the conclusion was drawn that the overrepresentation of Black children in official CPS statistics arose from reporting, substantiation, and removal processes in which race, rather than risk, was the relevant factor. As a result, efforts to address racial disparities in the United States during the last two decades have been developed accordingly, with a focus on reducing worker and agency racial biases (Bartholet, 2009; Wulczyn, 2009). Yet, while CPS data are undoubtedly incomplete, racial disparities in the incidence of maltreatment mirroring those in official statistics were reported for the first time in the most recent NIS (Sedlak, McPherson, & Das, 2010; Sedlak, Mettenburg et al., 2010). Further, Drake and Jonson-Reid (2011), noting fallacies in the conclusions drawn from the earlier NIS findings, have compellingly argued that small samples led to the absence of statistically significant racial differences in earlier NIS studies.

Although recent research points to factors other than bias as important contributors to observed racial disparities (Drake, Jolley, Lanier, Fluke, Barth, & Jonson-Reid, 2011), an unanswered question is the extent to which racial differences in CPS involvement may be attributable to the distribution of individual and family-level risk factors associated with maltreatment. Indeed many of the most well-established correlates of child abuse and neglect – poverty, limited education, single-parent status, environmental stress (Berger, 2005; Berger, Paxson, & Waldfogel, 2009; Coulton, Korbin, Su, & Chow, 1995; Drake, Lee, & Jonson-Reid, 2009; Jonson-Reid, Drake, & Kohl, 2009; Parrish, Young, Perham-Hester, & Gessner, 2011) – are burdens disproportionately borne by families of color. Yet, conclusions of risk differences are complicated by the fact that Latino children in California, and in many other states, have rates of CPS contact comparable to those of Whites, despite a socioeconomic profile that aligns more closely with that of Black families (Needell et al., 2012; Putnam-Hornstein & Needell, 2011; Drake & Rank, 2009; U.S. General Accounting Office, 2007).

Race/ethnicity is widely viewed as a marker for a complex interaction of economic, social, political, and environmental factors that influence the health of individuals and communities. In this study, we used population-based data, consisting of the entire cohort of children born in California in 2002, to examine: (1) racial disparities in socioeconomic and health indicators predictive of children's involvement with CPS, and (2) racial disparities in the rates of children reported to CPS, as well as disparities in rates of substantiation and entry to foster care, both before and after adjusting for socioeconomic and health indicators. Our aim was twofold: first, we wanted to explore whether aggregate Black/White disparities are largely attributable to the distribution of risk and protective factors at birth; second, we sought to determine whether the epidemiologic or health paradox observed for Latinos in other domains of health is similarly observed in maltreatment risk among children in California, and whether there were variations among Latinos by maternal nativity.

Methods

Dataset

This analysis is based on a dataset constructed by linking CPS records to vital birth records. CPS records for all children born in 2002 and referred for maltreatment before the age of 5 were extracted from California's statewide administrative data system. These records fall under the authority of the California Department of Social Services and are hosted at the University of California at Berkeley under a longstanding interagency collaborative agreement. CPS records were probabilistically matched to the complete file of 2002 birth records obtained from the California Department of Public Health. The linkage methodology used to create this dataset has been described in prior publications (Putnam-Hornstein & Needell, 2011; Putnam-Hornstein, Webster, Needell, & Magruder, 2011). This project received both state and university IRB approvals, and the endorsement of the state's Vital Statistics Advisory Board.

Variables

In this analysis, we examined race/ethnicity as predictor of a child's: (1) referral for maltreatment, (2) substantiation as a victim of maltreatment, and (3) entry to an out-of-home foster care placement. We coded each child's race/ethnicity based on first identified maternal race and a Latino ethnicity indicator, as self-reported by the mother on the birth record. To explore possible variations by maternal nativity status for Latino children, we further stratified children based on maternal birth place, resulting in six levels of our independent variable: (1) Black; (2) White; (3) Latino with U.S.-born mother; (4)

Latino with foreign-born mother; (5) Asian/Pacific Islander; and (6) Native American/Alaskan Native. Although included in our analysis, for reporting simplicity we suppressed results for Asian/Pacific Islander and Native American/Alaskan Native groups and focused on results for Black, Latino, and White children.

In an attempt to isolate the relationship between race/ethnicity and CPS contact, we examined differences in the distribution of risk and protective factors for each racial/ethnic group in our descriptive tables and adjusted for these same covariates in our multivariable models. All covariates were derived from the birth record. Chosen covariates consisted of previously identified sociodemographic risk factors for contact with CPS, as well as those markers for pregnancy and child health which emerged as significant in prior linkages between birth records and CPS records (Murphey & Braner, 2000; Murphy, Jenkins, Newcombe, & Sibert, 1981; Needell & Barth, 1998; Parrish et al., 2011; Putnam-Hornstein & Needell, 2011; Spencer, Wallace, Sundrum, Bacchus, & Logan, 2006; Wu et al., 2004).

Covariates included: *sex* (male, female); *birth weight* (<2,500 g, ≥2,500 g); *commencement of prenatal care* (1st trimester, 2nd trimester, 3rd trimester, no care); *birth abnormality* (1 or more abnormalities, none); *maternal age* (<20 years, 20–24 years, 25–29 years, 30+ years); *maternal education* (<high school, high school degree, some college, college+); *paternity* (established at birth, missing); *birth order* (first-born, second-born, third-born or higher); and *health insurance* (public, private). Rates of missing values for these covariates were low, ranging from 0.04% (for child sex) to 2.21% (for maternal education). It should be noted that among women giving birth without any health insurance in California, infants are retroactively enrolled in the state's public health insurance program and therefore fall in the public insurance group. Paternity was coded based on whether or not a father was named on the birth record. The presence of a recorded abnormality at birth was gleaned from a list of over thirty abnormality codes related to the fetus or newborn, including congenital anomalies (e.g., anencephaly, cleft palate, or down syndrome), birth injuries, and medical interventions (e.g., assisted ventilation or admission to intensive care).

Analysis

Descriptive tabulations are presented in Table 1, capturing the distribution of all covariates for the full 2002 birth cohort as well as the subset of births covered by public health insurance, with stratifications by race/ethnicity and maternal nativity. Tables 2–4 document cohort variations in referral, substantiation, and foster care entry rates per 1,000 children born, along with crude risk ratios and corresponding 95% confidence intervals for all covariates. This allowed an examination of variations in the likelihood of CPS involvement based on a child's covariate level, and captured unadjusted risk ratios (or disparity ratios) commonly cited in the racial disproportionality and disparities literature (Shaw et al., 2008). These same rates per 1,000 births and crude risk ratios are also reported for those children whose births were covered by public insurance. The decision was made to focus our attention on those children eligible for public health insurance as a proxy for low socioeconomic status (SES) because public health insurance eligibility: (1) consistently translates into at least half to more than three quarters of children known to CPS across all racial/ethnic groups (see Fig. 1); and (2) reduces surveillance confounds given that all of these children were part of a public entitlement system at birth. Finally, we utilized generalized linear models to calculate the adjusted relative risk of a referral, substantiation, and entry to foster care before the age of 5 (McCullagh & Nelder, 1989; Zou, 2004). We specified a Poisson distribution and log link, using a robust standard error adjustment (sandwich estimator) in order to correct for estimated confidence intervals that would otherwise be too wide (UCLA Academic Technology Services: Statistical Consulting Group, n.d.). All statistical analyses were conducted using StataSE version 11 (StataCorp).

Results

Cohort Characteristics

As reflected in Table 1, there were a total of 531,035 children born in California in 2002 and included in this analysis; approximately 43% were eligible and covered by the state's public health insurance system (*n* = 226,904). In the overall birth cohort, 6% (*n* = 31,148) of children were Black, 51% (*n* = 263,838) were Latino, and 31% (*n* = 165,192) were White. Among Latino children, 64% were born to mothers born outside of the United States (*Latino with foreign-born mother*), whereas the remaining 36% had native-born mothers (*Latino with U.S.-born mother*). Although not reported in this analysis, Asian/Pacific Islander children comprised 12% of the cohort, whereas Native American/Alaskan Native children comprised less than half a percent. Only 1.2% of birth records were missing maternal race/ethnicity.

Full birth cohort. Notable variations were observed in the distribution of cohort characteristics by racial/ethnic group, as well as maternal nativity. For example, 11.7% of Black children in the cohort were low birth weight, compared with only 6.0% of White children and 6.4% and 5.4% of Latino children with U.S.-born and foreign-born mothers, respectively. Among Latino children with foreign-born mothers, health advantages manifested in the form of a low prevalence of birth abnormalities (4.6%) relative to other groups, despite a proportion of public health insurance utilization (a proxy for low SES) that was much higher (71.3%). The health advantages reflected in normal birth weights and low levels of birth abnormalities were attenuated but still present for Latino children of U.S.-born mothers.

Nearly one out of every five (19.7%) Black children had no paternity established, a dynamic true of only 5.2% of White children, 8.5% of Latino children of foreign-born mothers, and 13.1% of Latino children with U.S.-born mothers. Meanwhile,

Table 1
Characteristics of California's 2002 birth cohort by maternal race/ethnicity and nativity.

	Full birth cohort (N = 531,035)				Public health insurance (N = 226,904)			
	White (N = 165,192)	Black (N = 31,418)	Latino, U.S. born mother (N = 94,388)	Latino, foreign-born mother (N = 169,450)	White (N = 31,388)	Black (N = 15,210)	Latino, U.S. born mother (N = 43,395)	Latino, foreign-born mother (N = 120,572)
Sex								
Male	51.3%	51.1%	50.9%	50.9%	51.2%	51.1%	50.8%	50.7%
Female	48.7%	48.9%	49.1%	49.1%	48.8%	48.9%	49.2%	49.3%
Birth weight								
Low (<2,500 g)	6.0%	11.7%	6.4%	5.4%	6.7%	12.7%	6.5%	5.4%
Normal (≥2,500 g)	94.0%	88.3%	93.6%	94.6%	93.3%	87.3%	93.5%	94.6%
Prenatal care								
None	0.5%	0.9%	0.8%	0.4%	1.1%	1.0%	1.0%	0.3%
3rd trimester	1.4%	2.4%	2.4%	2.7%	4.0%	3.2%	3.3%	3.0%
2nd trimester	7.8%	13.6%	13.3%	12.5%	18.8%	17.4%	17.8%	13.4%
1st trimester	90.3%	83.1%	83.5%	84.4%	76.2%	78.3%	78.0%	83.3%
Birth abnormality								
1+ abnormality	7.3%	8.3%	5.9%	4.6%	8.5%	5.9%	4.5%	4.5%
None	92.7%	91.7%	94.1%	95.4%	91.5%	94.1%	95.5%	95.5%
Maternal age at birth								
<20 yrs	5.3%	13.6%	19.7%	9.8%	16.1%	17.9%	29.1%	12.2%
20–24 yrs	17.8%	29.3%	34.9%	25.2%	37.7%	35.6%	42.8%	28.8%
25–29 yrs	23.9%	23.9%	24.1%	29.1%	23.5%	23.3%	18.1%	28.7%
30+ yrs	52.9%	33.1%	21.4%	35.9%	22.7%	23.2%	10.1%	30.4%
Maternal education								
<12th grade	7.3%	16.3%	26.8%	61.3%	25.1%	25.4%	41.6%	70.3%
12th grade	26.2%	40.6%	41.1%	24.7%	46.2%	48.6%	42.5%	21.9%
Some college	25.4%	28.0%	22.2%	8.9%	22.1%	21.8%	14.2%	5.7%
College+	41.1%	15.1%	9.9%	5.2%	6.6%	4.2%	1.7%	2.1%
Paternity								
Missing	5.2%	19.7%	13.1%	8.5%	20.2%	37.9%	20.2%	10.4%
Established	94.8%	80.3%	86.9%	91.5%	79.8%	62.1%	79.8%	89.6%
Total children born to mother								
Three children	23.6%	35.1%	29.0%	38.4%	31.6%	39.9%	30.5%	38.1%
Two children	34.0%	28.3%	30.6%	30.2%	28.2%	25.4%	27.5%	29.4%
One child	42.4%	36.6%	40.4%	31.4%	40.2%	34.7%	42.0%	32.6%
Insurance coverage								
Public (Medi-Cal)	19.1%	48.6%	46.1%	71.3%	–	–	–	–
Private	80.9%	51.4%	53.9%	28.7%	–	–	–	–

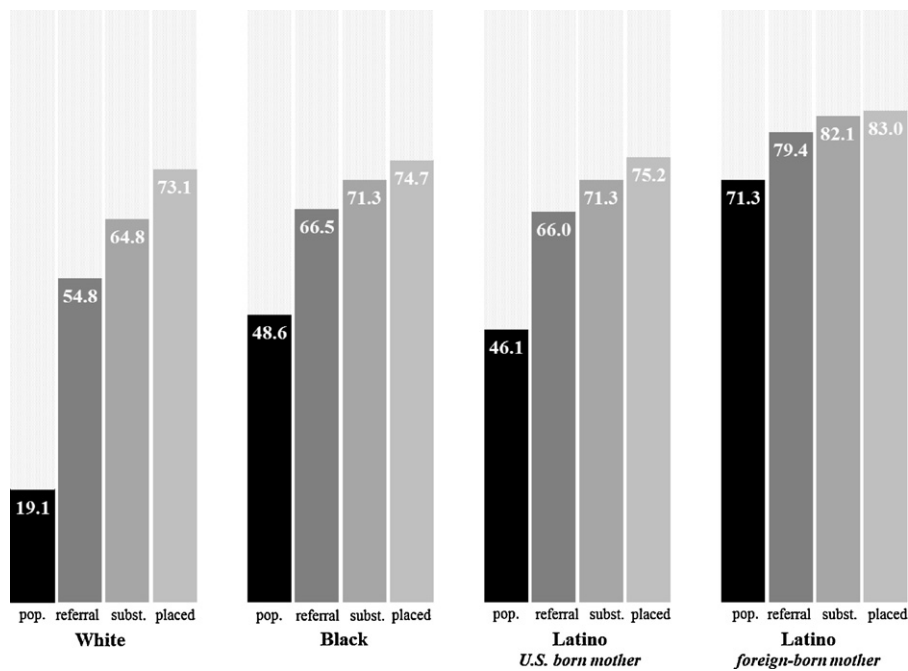*Notes*: 1,680 (0.3%) of birth records were missing birth payment method.

Fig. 1. Percentage of children covered by public health insurance at birth among those in the overall population of children born in 2002, referred for maltreatment, substantiated as victims, and entering foster care (by race, ethnicity, and maternal nativity). Notes. 1. Pop. = percentage of children born in California in 2002 who were covered by public health insurance at birth. 2. Referral = percentage of children referred for maltreatment before the age of 5 who were covered by public insurance at birth. 3. Subst. = percentage of children with a substantiated allegation of maltreatment before the age of 5 who were covered by public insurance at birth. 4. Placed = percentage of children placed in foster care before the age of 5 who were covered by public insurance at birth.

the prevalence of teen births was highest among U.S.-born Latino mothers (19.7%). Overall, what emerged from an examination of covariate distributions for the full birth cohort was a story of pronounced racial/ethnic heterogeneity in risk and protective correlates of child maltreatment.

Publicly insured births. Among the subset of children covered by public insurance at birth, a more consistent picture emerged – variations across racial/ethnic groups were notably attenuated. For example, in the overall birth cohort, the share of Black mothers with less than a high school degree was more than twice that of White mothers (16.3% vs. 7.3%), yet among those covered by public insurance, the proportions were equivalent (25.1% vs. 25.4%). Similarly, late or absent prenatal care (i.e., commencing after the first trimester) across racial/ethnic groups was fairly constant among publicly insured births, despite large disparities in the overall cohort.

Public Health Insurance Coverage

Given the tremendous variation in rates of public insurance coverage by race, ethnicity, and maternal nativity in the overall birth cohort (as reported in Table 1), Fig. 1 presents a closer examination of these dynamics. As reflected in this figure, among all children born in California in 2002, public insurance coverage at birth ranged from a low of 19.1% among White children to a high of 71.3% among Latino children with foreign-born mothers. Black children and Latino children of U.S.-born mothers had fairly comparable rates of public insurance coverage at 48.6% and 46.1%, respectively. Yet, a more consistent picture emerges for those children referred for maltreatment: among children reported to CPS, more than 50% of children were covered by public health insurance at birth, independent of race/ethnicity. The prevalence of public insurance eligibility was consistently high across groups when substantiations and entries to foster care were similarly examined. Given the large and fairly racially invariant share of children reported to CPS who were covered by public health insurance at birth, as well as the implications this coverage may have had for surveillance and contact with mandated reporters, we focused our modeling attention on these children, providing unadjusted estimates for the overall birth cohort as a point of reference to the method commonly used to report aggregate racial disparities.

Crude and Adjusted Risk of Referral, Substantiation, and Entry to Foster Care

Tables 2–4 display the crude rates (per 1,000), risk ratios (RR), and accompanying 95% confidence intervals (95% CI) of children who, before the age of 5: (1) were reported for maltreatment, (2) were substantiated as victims of maltreatment, and (3) entered an out-of-home foster care placement. These tables also present the corresponding unadjusted statistics for

Table 2
California's 2002 birth cohort: children referred for maltreatment before age 5.

	Referred for maltreatment							
	Full birth cohort (N = 74,182)			Public health insurance (N = 48,026)				
	Rates	Crude risk ratios		Rates	Crude risk ratios		Adjusted risk ratios	
	per 1,000	RR	(95% CI)	per 1,000	RR	(95% CI)	RR	(95% CI)
Race/ethnicity								
Black	300.0	2.24	(2.20, 2.29)	409.8	1.10	(1.07, 1.13)	0.95	(0.92, 0.97)
Latino, US-born mother	207.6	1.55	(1.53, 1.58)	297.0	0.80	(0.78, 0.81)	0.72	(0.70, 0.73)
Latino, foreign-born mother	107.2	0.80	(0.79, 0.82)	119.2	0.32	(0.31, 0.33)	0.30	(0.29, 0.31)
White	133.5	Ref	–	383.0	Ref	–	–	–
Sex								
Male	139.8	1.00	*ns*	211.5	1.00	*ns*	1.00	*ns*
Female	139.7	Ref	–	211.8	Ref	–	–	–
Birth weight								
Low (<2,500 g)	186.9	1.37	(1.33, 1.40)	284.6	1.38	(1.34, 1.42)	1.16	(1.12, 1.19)
Normal (2,500 g+)	136.5	Ref	–	206.6	Ref	–	–	–
Prenatal care								
None	488.5	3.92	(3.70, 4.13)	550.7	2.80	(2.67, 2.94)	1.48	(1.41, 1.56)
3rd trimester	253.9	2.04	(1.96, 2.11)	280.2	1.42	(1.37, 1.48)	1.15	(1.11, 1.19)
2nd trimester	222.8	1.79	(1.75, 1.82)	263.6	1.34	(1.31, 1.37)	1.10	(1.08, 1.12)
1st trimester	122.7	Ref	–	194.8	Ref	–	–	–
Birth abnormality								
1+ abnormality	172.7	1.26	(1.22, 1.29)	284.7	1.37	(1.33, 1.41)	1.09	(1.06, 1.12)
None	137.6	Ref	–	207.1	Ref	–	–	–
Maternal age at birth								
<20 yrs	256.6	2.75	(2.69, 2.81)	257.6	1.33	(1.30, 1.36)	1.59	(1.54, 1.63)
20–24 yrs	189.5	2.03	(1.99, 2.07)	219.7	1.13	(1.11, 1.16)	1.21	(1.18, 1.23)
25–29 yrs	125.6	1.35	(1.32, 1.37)	190.1	0.98	*ns*	1.03	(1.01, 1.05)
30+ yrs	93.2	Ref	–	193.5	Ref	–	–	–
Maternal education								
<12th grade	200.7	4.40	(4.28, 4.53)	205.5	1.97	(1.85, 2.10)	1.96	(1.85, 2.10)
12th grade	179.3	3.93	(3.82, 4.04)	235.2	2.26	(2.12, 2.41)	1.67	(1.58, 1.79)
Some college	114.3	2.51	(2.43, 2.59)	205.3	1.97	(1.84, 2.11)	1.46	(1.37, 1.57)
College+	33.7	Ref	–	104.1	Ref	–	–	–
Paternity								
Missing	343.6	2.77	(2.73, 2.81)	359.4	1.95	(1.92, 1.98)	1.48	(1.46, 1.51)
Established	124.0	Ref	–	184.2	Ref	–	–	–
Children born to mother								
Three children	207.4	1.96	(1.93, 1.99)	278.8	1.71	(1.67, 1.74)	2.22	(2.17, 2.27)
Two children	118.7	1.12	(1.10, 1.14)	190.8	1.17	(1.14, 1.19)	1.44	(1.41, 1.47)
One child	105.6	Ref	–	163.1	Ref	–	–	–

Notes. "Adjusted risk ratios" have been adjusted for race/ethnicity, sex, birth weight, prenatal care, birth abnormality, maternal age at birth, maternal education, paternity, and the number of children born.

children whose births were covered by public health insurance. Additionally, we included a fully adjusted model for children covered by public health insurance as our best attempt to identify the relative risk of CPS involvement for socioeconomically similar Black, Latino, and White children. Our adjusted model includes: race/ethnicity, sex, birth weight, prenatal care, birth abnormality, maternal age at birth, maternal education, paternity, and the number of children born.

Prevalence of CPS involvement. Approximately 14% (n = 74,182) of children in the birth cohort were reported to CPS; 37.5% (n = 27,805) of referred children were substantiated as victims at least once before the age of 5. In the overall birth cohort, 2.2% (n = 11,777) of children entered foster care before age 5, representing a placement prevalence of 15.9% of all reported children and 42.4% of all substantiated child victims. Among children covered by public health insurance at birth, 21.2% (n = 48,026) were referred for maltreatment and 40.5% (n = 19,342) of referred children were substantiated as victims. Nearly 4% (n = 8,672) of publicly insured children entered foster care before the age of 5 – reflecting 18.1% of referred children and 44.6% of substantiated victims.

Fig. 2 charts the cumulative percentage of children's CPS involvement by race, ethnicity, and maternal nativity. For each racial/ethnic grouping, we calculated the proportion of children in the overall birth cohort who were referred, substantiated, and entered foster care, as well as the comparable statistics for those who met the income threshold for public health insurance. Data for the overall birth cohort indicate systematic racial differences in SES. Notable are the diminished differences across racial/ethnic groups for children similarly covered by public health insurance. Risk differences are starkest between

Table 3
California's 2002 birth cohort: substantiated victims of maltreatment before age 5.

	Substantiated as a victim of maltreatment							
	Full birth cohort (N = 27,805)			Public health insurance (N = 19,432)				
	Rates	Crude risk ratios		Rates	Crude risk ratios		Adjusted risk ratios	
	per 1,000	RR	(95% CI)	per 1,000	RR	(95% CI)	RR	(95% CI)
Race/ethnicity								
Black	118.4	2.19	(2.11, 2.27)	172.7	0.97	*ns*	0.79	(0.76, 0.83)
Latino, US-born mother	84.0	1.55	(1.51, 1.60)	129.6	0.73	(0.71, 0.75)	0.65	(0.63, 0.67)
Latino, foreign-born mother	31.5	0.58	(0.56, 0.60)	36.3	0.20	(0.20, 0.21)	0.19	(0.18, 0.19)
White	54.3	Ref	–	183.6	Ref	–	–	–
Sex								
Male	57.5	1.00	*ns*	85.6	1.00	*ns*	1.00	*ns*
Female	57.3	Ref	–	85.7	Ref	–	–	–
Birth weight								
Low (<2,500 g)	95.3	1.74	(1.68, 1.80)	140.5	1.71	(1.64, 1.79)	1.33	(1.28, 1.40)
Normal (2,500 g+)	54.8	Ref	–	81.9	Ref	–	–	–
Prenatal care								
None	407.4	8.67	(8.24, 9.13)	410.1	5.53	(5.18, 5.91)	2.31	(2.15, 2.48)
3rd trimester	148.1	3.15	(3.00, 3.32)	145.0	1.95	(1.84, 2.07)	1.45	(1.37, 1.53)
2nd trimester	112.0	2.38	(2.32, 2.45)	121.3	1.64	(1.58, 1.69)	1.26	(1.22, 1.30)
1st trimester	45.5	Ref	–	72.5	Ref	–	–	–
Birth abnormality								
1+ abnormality	86.3	1.55	(1.50, 1.62)	138.3	1.68	(1.61, 1.76)	1.14	(1.09, 1.20)
None	55.5	Ref	–	82.4	Ref	–	–	–
Maternal age at birth								
<20 yrs	116.2	3.20	(3.09, 3.31)	100.4	1.23	(1.18, 1.28)	1.41	(1.34, 1.49)
20–24 yrs	82.7	2.27	(2.21, 2.34)	88.5	1.08	(1.05, 1.12)	1.13	(1.09, 1.17)
25–29 yrs	49.9	1.37	(1.33, 1.42)	76.5	0.94	(0.90, 0.97)	0.99	*ns*
30+ yrs	36.3	Ref	–	81.6	Ref	–	–	–
Maternal education								
<12th grade	92.5	6.28	(5.98, 6.59)	84.1	2.46	(2.19, 2.76)	2.69	(2.40, 3.02)
12th grade	76.1	5.16	(4.92, 5.42)	95.8	2.80	(2.49, 3.15)	2.06	(1.83, 2.31)
Some college	39.8	2.70	(2.56, 2.86)	76.7	2.24	(1.99, 2.53)	1.62	(1.44, 1.82)
College+	8.4	Ref	–	34.2	Ref	–	–	–
Paternity								
Missing	204.0	4.32	(4.21, 4.43)	177.0	2.57	(2.51, 2.65)	1.77	(1.72, 1.82)
Established	47.2	Ref	–	68.6	Ref	–	–	–
Children born to mother								
Three children	97.7	2.51	(2.44, 2.58)	122.4	2.04	(1.17, 1.26)	2.56	(2.46, 2.67)
Two children	44.7	1.15	(1.11, 1.19)	73.2	1.22	(1.97, 2.10)	1.52	(1.34, 1.49)
One child	38.6	Ref	–	59.8	Ref	–	–	–

Notes. "Adjusted risk ratios" have been adjusted for race/ethnicity, sex, birth weight, prenatal care, birth abnormality, maternal age at birth, maternal education, paternity, and the number of children born.

Black and White children. Thirty percent of all Black children born in California's 2002 birth cohort were referred for possible abuse or neglect by age 5, versus only 13.4% of White children. Yet, when only those children covered by public health insurance are considered, we find a fairly small cumulative risk difference in CPS referrals between Black (41.0%) and White (38.3%) children. Similarly, whereas nearly 12% of Black children born in California were substantiated as victims of abuse or neglect before age 5, this is true of only 5.4% of White children. Among recipients of public health insurance, however, the proportions were close to equivalent, with 17.3% and 18.4% of Black and White children substantiated, respectively.

Racial variations in risk and protective factors. As displayed in Table 2 through 4, there were statistically significant (*p* < .05) and substantive variations in the relative risk of CPS contact for all covariates, with the exception of child gender. Largely consistent gradations in crude risk ratios were observed both within each covariate (i.e., from one variable value level to the next), and with increasing penetration into the CPS system (i.e., from referral to substantiation to entry into foster care). For example, children in the full birth cohort with low birth weight were 1.37 times more likely to be referred for maltreatment than those weighing 2,500 g or more (Table 2). This risk differential increased with CPS involvement: low birth weight children were 1.74 times more likely to be substantiated (Table 3) and 2.18 times more likely to enter foster care (Table 4), relative to their normal weight peers.

Similarly, prenatal care that began during the first trimester of pregnancy was a protective factor associated with reduced risk of a child's report for maltreatment, substantiation, and entry to foster care. Children in the full birth cohort whose prenatal care began during the second trimester were 1.79 times as likely to be referred as those whose care commenced

Table 4
California's 2002 birth cohort: children entering foster care before age 5.

	Entered an out-of-home foster care placement							
	Full birth cohort (N = 11,777)			Public health insurance (N = 8,672)				
	Rates	Crude risk ratios		Rates	Crude risk ratios		Adjusted risk ratios	
	per 1,000	RR	(95% CI)	per 1,000	RR	(95% CI)	RR	(95% CI)
Race/ethnicity								
Black	62.4	2.57	(2.44, 2.71)	95.4	1.07	*ns*	0.81	(0.76, 0.86)
Latino, US-born mother	37.5	1.55	(1.48, 1.62)	61.0	0.68	(0.65, 0.72)	0.62	(0.59, 0.70)
Latino, foreign-born mother	8.6	0.35	(0.33, 0.37)	9.9	0.11	(0.10, 0.12)	0.10	(0.09, 0.11)
White	24.2	Ref	–	92.4	Ref	–	–	–
Sex								
Male	22.4	1.03	*ns*	38.7	1.02	*ns*	1.02	*ns*
Female	21.7	Ref	–	37.7	Ref	–	–	–
Birth weight								
Low (<2,500 g)	44.6	2.18	(2.06, 2.29)	77.2	2.17	(2.04, 2.31)	1.53	(1.43, 1.64)
Normal (2,500 g+)	20.5	Ref	–	35.5	Ref	–	–	–
Prenatal care								
None	232.2	14.66	(12.9, 16.6)	274.6	9.98	(8.54, 11.65)	2.88	(2.61, 3.19)
3rd trimester	69.8	4.19	(3.71, 4.72)	79.6	2.47	(2.15, 2.85)	1.74	(1.61, 1.89)
2nd trimester	48.4	2.91	(2.71, 3.12)	61.8	1.99	(1.83, 2.16)	1.46	(1.39, 1.54)
1st trimester	15.5	Ref	–	29.1	Ref	–	–	–
Birth abnormality								
1+ abnormality	39.9	1.91	(1.81, 2.02)	74.3	2.07	(1.94, 2.20)	1.18	(1.10, 1.27)
None	20.9	Ref	–	36.0	Ref	–	–	–
Maternal age at birth								
<20 yrs	41.1	2.80	(2.65, 2.95)	43.0	1.08	(1.01, 1.15)	1.14	(1.05, 1.23)
20–24 yrs	30.6	2.09	(1.99, 2.18)	38.2	0.96	*ns*	0.95	*ns*
25–29 yrs	19.0	1.30	(1.23, 1.36)	33.7	0.85	(0.77, 0.93)	0.89	(0.84, 0.94)
30+ yrs	14.7	Ref	–	39.7	Ref	–	–	–
Maternal education								
<12th grade	36.2	19.71	(17.23, 22.54)	37.2	2.91	(2.40, 3.52)	3.50	(2.90, 4.24)
12th grade	28.9	15.74	(13.75, 18.01)	43.7	3.42	(2.82, 4.14)	2.45	(2.04, 2.97)
Some college	12.9	7.03	(6.10, 8.10)	31.6	2.47	(2.02, 3.02)	1.71	(1.40, 2.08)
College+	1.2	Ref	–	12.8	Ref	–	–	–
Paternity								
Missing	96.3	6.60	(6.37, 6.84)	102.1	3.88	(3.72, 4.04)	2.28	(2.11, 2.46)
Established	14.6	Ref	–	26.3	Ref	–	–	–
Children born to mother								
Three children	39.4	2.82	(2.70, 2.94)	58.5	2.37	(2.25, 2.50)	2.67	(2.39, 2.97)
Two children	15.9	1.14	(1.08, 1.20)	30.7	1.25	(1.17, 1.32)	1.60	(1.44, 1.78)
One child	13.7	Ref	–	24.3	Ref	–	–	–

Notes. "Adjusted risk ratios" have been adjusted for race/ethnicity, sex, birth weight, prenatal care, birth abnormality, maternal age at birth, maternal education, paternity, and the number of children born.

during the first trimester, whereas those with prenatal care that began during the third trimester or not at all were 2.04 and 3.92 times as likely to have been referred, respectively. The risk disparities were even starker for substantiations and entries to foster care. Children without any prenatal care were 14.66 times as likely to have entered foster care by the age of 5 as those with first-trimester care.

Crude and adjusted models for publicly insured births. Across all three levels of CPS system contact, crude racial/ethnic disparities were significantly attenuated upon stratification by public health insurance coverage. These disparities diminished further upon inclusion of covariates (see Fig. 3 and the adjusted risk columns in Tables 2–4), such that the relative risk of referral, substantiation, and entry to foster care was significantly lower for Black and Latino children compared with the White reference group. After adjusting for covariates in the public health insurance model, Black children were less likely than other sociodemographically similar White children to be referred for maltreatment (RR: 0.95; 95% CI [0.92, 0.97]), substantiated as victims (RR: 0.79; 95% CI [0.76, 0.83]), or placed in foster care (RR: 0.81; 95% CI [0.76, 0.86]). Latino children had a consistently lower risk of referral, substantiation, and placement in foster care regardless of covariate adjustments or maternal nativity. Among Latino children, risk across all three levels of contact with CPS was significantly lower for children of foreign-born mothers than those with U.S.-born mothers, both before and after adjusting for other risk and protective factors at birth.
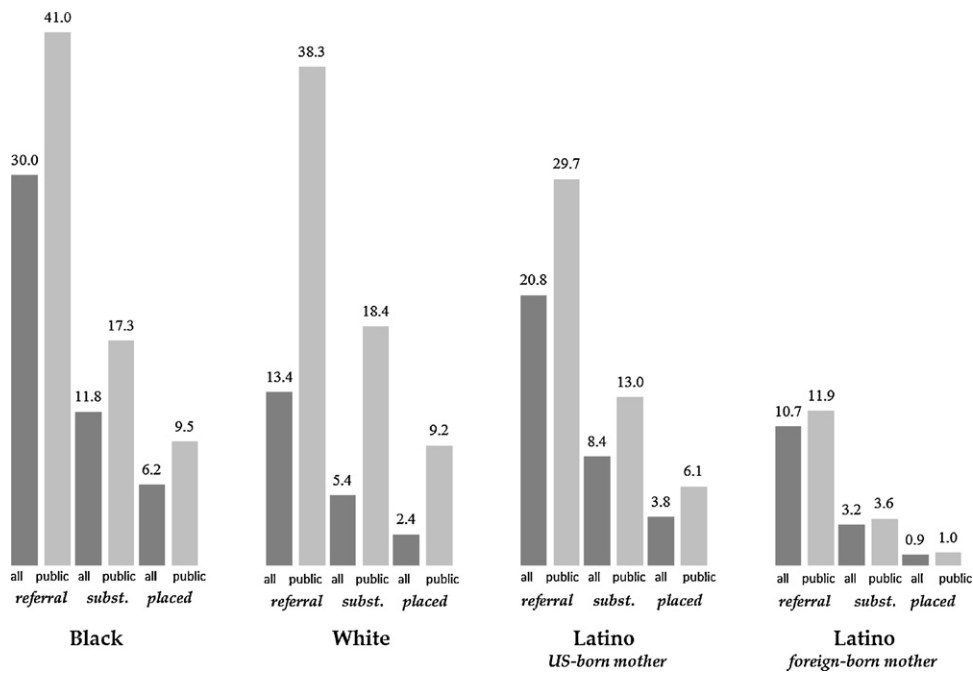
Fig. 2. Cumulative percentage of children referred, substantiatiated, and entering foster care by age 5 in the overall birth cohort vs. those covered by public health insurance at birth (*by race*, *ethnicity*, and *maternal nativity*). *Notes*: 1. "All" refers to the overall population of children in the 2002 birth cohort. 2. "Public" refers to those children covered by public health insurance at birth.
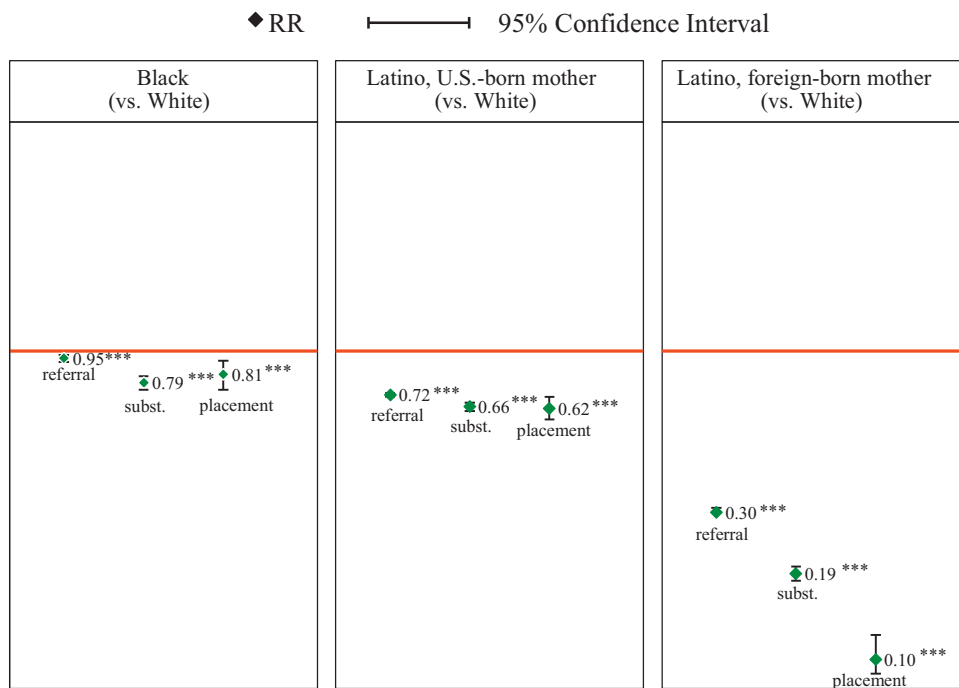

Fig. 3. Adjusted relative risk of referral, substantiation, and foster care placement by age 5 among children covered by public health insurance at birth (*by race*, *ethnicity*, and *maternal nativity* vs. *White children*). Notes. 1. *$^*p$* < .05; *$^{**}p$* < .01; *$^{***}p$* < .001. 2. Risk ratios for referral, substantiation, and foster care placement are plotted relative to the risk observed for White children (i.e., the line value of 1.0). 3. Covariate adjustments made for child sex, birth weight, prenatal care, birth abnormality, maternal age, maternal education, paternity, and number of children born to mother.

Discussion

The purpose of this study was to advance an understanding of the interplay between race/ethnicity, maternal birth place, and indicators of SES and health in order to determine the extent to which individual and family-level risk and protective factors contribute to aggregate variations in rates of CPS involvement. Our first objective was to assess whether crude Black/White CPS disparities were attributable to the distribution of risk and protective factors observed at birth. Findings both supported and contradicted well-established understandings of racial disparities. Consistent with published data reflecting aggregate racial differences (Needell et al., 2012; Putnam-Hornstein, 2012), these population-based data indicated that between birth and age five, Black children in California were more than twice as likely as White children to: (1) be referred for maltreatment, (2) be substantiated as victims, and (3) enter foster care. Yet, an examination of the distribution of risk and protective factors at birth highlighted corresponding disparities for many well-established correlates of child maltreatment and CPS involvement, including low SES, young maternal age, absent fathers, and poor child health. Black children were born with a significantly higher concentration of correlates of child maltreatment compared to their White (and Latino) counterparts. Previous research has demonstrated that controlling for SES diminishes or even reverses Black/White disparities, both at the individual (Ards, Myers, Chung, Malkis, & Hagerty, 2003; Ards, Myers, Malkis, Sugrue, & Zhou, 2003; Dettlaff, Rivaux, Baumann, Fluke, Rycraft, & James, 2011; Dworsky, Courtney, & Zinn, 2007; Slack et al., 2007) and neighborhood/county level (Drake et al., 2009; Wulczyn, Gibbons, Snowden, & Lery, 2013). When adjustments for these correlates were modeled, we found that low SES Black children were significantly *less likely* than low SES White children to be referred, substantiated, or enter foster care. Although observed Black/White racial disparities in aggregate statistics are very real, these data suggest that race/ethnicity may not be the most salient factor, but rather a proxy for entrenched and systemic racial differences in the prevalence of other correlates of child maltreatment. This finding has important implications for efforts to reduce racial disparities.

A second objective of this study was to determine if an epidemiologic health paradox exists in referral, substantiation, and foster care placements between Latinos and Whites based on protective effects associated with maternal nativity. In California, there have been minimal or nonexistent Latino/White disparities documented (Needell et al., 2012), an unexpected finding given that Latinos have a socioeconomic profile more consistent with Black than White families (Putnam-Hornstein & Needell, 2011). The term epidemiologic or health paradox typically refers to a pattern of morbidity and/or mortality for a particular group (e.g., Latinos, immigrants) at odds with expectations based on the group's socioeconomic profile (Acevedo-Garcia & Bates, 2007). Health paradoxes have been observed among Latinos and immigrants for several health outcomes, including maternal and child health indicators such as low birth weight and infant mortality (Franzini, Ribble, & Keddie, 2001; Hayes-Bautista, 2002; Jasso, Massey, Rosenzweig, & Smith, 2004; Palloni & Arias, 2004; Palloni & Morenoff, 2001).

Data from our study indicated that the absence of aggregate Latino/White racial disparities in California statistics reflects divergent risks by maternal nativity. Before adjusting for any risk or protective factors, Latino children with U.S.-born mothers were referred, substantiated, and entered foster care at roughly 1.55 times the rate of White children. In contrast, Latino children with foreign-born mothers were involved with the CPS system at .20 to .65 the rate of White children. Upon controlling for socioeconomic and health indicators, and in keeping with what was observed for Black/White disparity, risk differences reversed for Latino children of U.S.-born mothers (i.e., low SES Latino children were less likely to be referred, substantiated, or enter foster care than low SES white children) and became even more extreme for children of foreign-born mothers.

Possible explanations for Latino epidemiologic paradoxes have not been subject to rigorous empirical testing, largely due to the interplay of conceptual and data limitations. In the context of child maltreatment, only a handful of studies have attempted to broach the topic (Dettlaff, Earner, & Phillips, 2009; Dettlaff & Johnson, 2011; Johnson-Motoyama, Dettlaff, & Finno, 2012; Osterling & Han, 2011; Vericker, Kuehn, & Capps, 2007). Health paradoxes have been widely attributed to social and cultural protective factors present among Latinos (e.g., familism, religiosity, social support) and immigrants (e.g., strong social network ties and salutary health behavior), associated with health advantages (Alegría, Mulvaney-Day, Torres, Polo, Cao, & Canino, 2007; Grant, Stinson, Hasin, Dawson, Chou, & Anderson, 2004; McGuire & Miranda, 2008; Vega, Alderete, Kolody, & Aguilar-Gaxiola, 1998). Identification with Latino cultural values and beliefs appear to play a role in these protective processes (De La Rosa, 2002; Holleran & Waller, 2003). This social-cultural explanation is often presented in association with an acculturation hypothesis that predicts an erosion of protective factors with time spent in the United States and across generations, resulting in the deterioration of health outcomes.

This socio-cultural explanation, coupled with an acculturation hypothesis, largely comports with the results from our analysis. Findings suggest that although Latino children of foreign-born mothers are born into lower socioeconomic conditions than their White counterparts, as reflected by high levels of public health insurance eligibility and low levels of maternal educational attainment, a number of protective factors – including paternal presence at birth, older maternal age, healthy birth weight, and low rates of birth abnormalities – may offset the risks typically associated with the utilization of means-tested public health insurance programs. Likewise, while protective factors are attenuated for Latino children of U.S.-born mothers when compared with children of foreign-born mothers, we observed significant differences in the distribution of risk and protective factors for Latino children of U.S.-born mothers relative to Black and White children, consistent with the broader maternal and child health literature. Although it is unknown whether what has been measured as paternity establishment, child health advantages, and maternal age actually protect against maltreatment and CPS involvement, or simply reflect other unobserved maternal and familial attributes associated with the selection of foreign-born mothers

into the United States, Latino children appear to benefit from an increased likelihood of being born with these conditions met. Benefits that may differentially accrue for Latino children, especially children of foreign-born mothers, is of particular salience given the implications this has for disentangling etiologic risk factors for maltreatment, as well as the identification of markers for targeted interventions.

Limitations

Despite the strengths of this large, population-based, longitudinal examination of children born in California, a number of limitations must be considered when interpreting findings. Limitations are primarily related to the use of state-specific administrative data, which not only restricts the generalizability of findings, but is also accompanied by a number of established shortcomings, including variables that are narrow in scope and errant or missing record entries (Brady, Grand, Powell, & Schink, 2002; Drake & Jonson-Reid, 1999). During the creation of the linked dataset, 16% of CPS records meeting linkage inclusionary criteria were not matched to a birth record (Putnam-Hornstein et al., 2011). Although some may have been true false negatives, reflecting children born in another state and then referred for maltreatment in California, some matches were certainly missed. Our birth cohort analysis was unable to account for children born in California who may have died or moved to another state. Although we were able to control for a range of sociodemographic covariates, such as public health insurance eligibility and paternity, these covariates were captured at birth and may have changed over time, accompanied by corresponding changes in a child's risk profile. By and large, the covariates we were able to measure were merely proxy variables for more complex dynamics we would have ideally measured (e.g., public health insurance as a proxy for income; paternity as a proxy for the likelihood of unrelated male caregivers in the home). Finally, it should be noted that our findings are specific to racial disparities observed at the front-end of the system among young children under the age of five – the influence of socioeconomic status and other risk factors may be different for older children, or once children have been removed from the home.

We were unable to rule out the possibility that these data reflect a systematic undercount of Latino births to foreign-born mothers stemming from a series of initiatives directed at immigrant eligibility for public services. Specifically, California Proposition 187, a 1994 ballot initiative that sought to prohibit undocumented residents from accessing health care, public education, and other social services in the state (Gibbs & Bankhead, 2001), and the Personal Responsibility and Work Opportunity Reconciliation Act of 1996, which restricted the eligibility of undocumented immigrants, as well as many legal immigrants, for various public programs. National and local evaluations suggest that the eligibility restrictions embedded in these initiatives successfully reduced participation of immigrant families in public programs (Borjas, 2011; Fix & Passel, 2002; Zimmerman & Fix, 1998). The "chilling effect" of these complex reforms may have led to a potential undercount of Latino children with foreign-born mothers in vital statistics records while simultaneously reducing exposure to mandated reporters. In California, more than three quarters of maltreatment referrals involving children under the age of 5 arise from professional service providers (Needell et al., 2012). The differential access and utilization of health, social services, and formal child care among immigrant Latinos suggests patterns of involvement with professionals that may differ from other groups (Flores et al., 2002; Karoly & Gonzalez, 2011).

Additionally, we cannot rule out biases that may arise from the differential mobility of racial/ethnic groups in California, particularly Latinos. In modeling group differences in the risk of referral, substantiation, and entries to foster care, we assumed that we were able to consistently capture contacts with the CPS system through each child's fifth birthday. In California, 84.3% of Latinos are of Mexican origin, and many Mexican immigrants cross the U.S.-Mexico border throughout the year in seasonal patterns that correspond with U.S. labor demand (Dockterman, 2011; Passel & Cohn, 2009). Latino children, particularly those with foreign-born mothers, may be at lower risk for CPS involvement when compared to Whites and children of native-born Latino mothers due to these migration patterns, which increase the likelihood of out-of-state residence and therefore limit the exposure window.

Implications for Practice and Policy

Our work raises more questions than it answers. It is readily apparent that crude racial disparity risk ratios mask important variations in correlates of child abuse and neglect. It is striking that only 19% of White children in California's birth cohort utilized public health insurance at birth, a surrogate marker of low SES, whereas nearly half of Black and Latino children of U.S.-born mothers (with a still higher proportion among Latinos with foreign-born mothers) utilized public insurance. But why these racial variations in the correlates of maltreatment are observed – and whether they hold the same implications for child safety and well-being across racial/ethnic groups – is complex.

Parenting in a resource-deprived environment does not bode well for child development, well-being, or child safety. So it is perhaps not surprising that this and other studies have found that most children who are reported to CPS are born into families with limited economic, social, and human resources (Coulton, Crampton, Irwin, Spilsbury, & Korbin, 2007; Jonson-Reid et al., 2009; Sedlak et al., 2010; U.S. Department of Health and Human Services, 2011). Yet, the reasons that a family may be poor, and the degree to which those reasons for poverty correlate with parenting capacity and child risk, are manifold. If the antecedent reasons for poverty differ by race/ethnicity, as Drake et al. (2009) have suggested, then the measures of low SES used in this analysis may serve as proxies for different latent risk factors for child maltreatment. Among White mothers, public health insurance, low education, the absence of established paternity, and late or absent prenatal care may be fairly

direct measures of maternal and familial characteristics and behaviors that place a child at risk of maltreatment. Yet, among Black and Latino mothers, these measures of poverty and resources may be confounded by systemic, non-maternal barriers to economic opportunities, and therefore less predictive of a child's risk of maltreatment. Further differential sorting may occur based on maternal nativity.

This hypothesis is partly supported by data from the National Surveys of Child and Adolescent Well-being (NSCAW), population-based studies of children and families involved in the CPS system in the United States. When compared to Whites, Black and Latino caregivers who participated in the NSCAW II had a lower prevalence of alcohol abuse and serious mental health or emotional problems. Within the Latino population, immigrant Latino caregivers were significantly less likely to engage in active alcohol and/or drug abuse (Dettlaff et al., 2009; Dettlaff & Johnson, 2011; Johnson-Motoyama et al., 2012) and to have physical, intellectual, or cognitive impairments (Dettlaff et al., 2009) when compared to their U.S.-born counterparts. If there is a "differential sorting" of Blacks, Latinos, and Whites by socioeconomic status, then the absence or reversal of observed racial differences following risk adjustments should not be interpreted as an indication that there is no bias in the racial distribution of children who have contact with the child protection system in California. We have no basis for claiming that these data indicate children of all races/ethnicities are being treated equally by CPS. Nor can we argue that aggregate disparities suggest that one or more groups are being treated unfairly.

Our findings do, however, suggest research that examines racial disparities, but ignores the role of the socioeconomic conditions into which a child is born, is incomplete at best. The association between race and CPS involvement is strongly confounded by socioeconomic differences; studies that lack even the crudest indicators of SES deliver results that have limited application in the practice and policy arena. Increasing attention is now being paid to the reduction and eventual elimination of racial disparities (Black/White racial disparities, in particular) (Bartholet, 2009; Wulczyn, 2009). Legislators, foundations, and even courts have implemented or are considering interventions to address racial disparities. Yet, many of these interventions focus primarily on the detection and amelioration of biased decision-making on the part of mandated and community reporters, staff, judges, and others who come in contact with children and families. Our findings suggest that although working to address these biases is in no way inappropriate, these efforts, in isolation, are unlikely to achieve the desired effects. If we want overall Black/White disparity ratios to change, it would appear that poverty and its correlates must also be the targets of our efforts.

Summary

In the United States, racial disparity discussions have been largely based on ecological data which correctly demonstrate that, in aggregate, Black children are disproportionately represented among children referred for maltreatment, substantiated as victims, and entering foster care. Yet, population-based, individual data used in this study suggests that the risk of referral, substantiation, and entry to foster care for individual children is far more dependent on the presence of multiple risk factors at birth and the socioeconomic conditions into which they are born than race/ethnicity. Although far from precluding the role of racial bias, the results of this California study point to real racial/ethnic differences in maltreatment risk as an important contributor to observed disparities. Our findings indicate that efforts to reduce racial/ethnic disparities must consider the role of children's differential exposure to risk factors associated with maltreatment.

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