

# A Birth Cohort Study of Involvement with Child Protective Services before Age 5

## Marin County, California

### INTRODUCTION

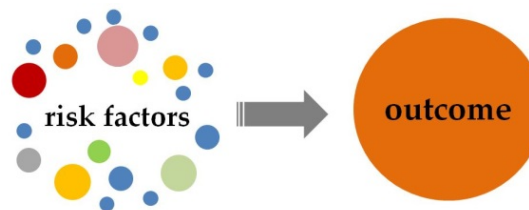
Much of what we know—or think we know—about risk factors for child abuse and neglect is based on cross-sectional and retrospective studies of children reported for maltreatment. Although these studies are useful for identifying and describing children reported for maltreatment, substantiated as victims, or placed in foster care, they do not offer information needed to understand how these children may (or may not) differ from other children in our communities. Without data concerning this broader population of children, we are unable to determine whether children with a particular combination of risk factors might have been identified or prioritized for early intervention services to prevent the conditions that led to involvement with child protective services.

Fortunately, the linkage and thoughtful configuration of administrative records can provide the necessary data for prevention focused studies. By linking CPS records to birth records from California, it is possible to answer prospective, population-based questions and generate information concerning the likelihood that children will be reported, substantiated, or placed in foster care because of maltreatment. In addition to providing information about the full population of children born in a given county and at risk of CPS involvement, birth records also include information not typically captured in administrative child protection systems, including infant weight at birth, maternal education, and whether paternity was established. Combining birth and CPS records allows us to better understand children involved with our local child protection systems and highlights opportunities

for being more strategic in our allocation and delivery of early intervention services.

#### Retrospective vs. Prospective Designs

The difference between a retrospective and prospective study design is a critical yet often misunderstood distinction. In a study with a retrospective design, individuals are sampled or studied because the outcome of interest has already occurred (e.g., a child has already been maltreated). They are selected based on the dependent variable. In contrast, a prospective study design identifies individuals who are at risk of the outcome and then follows them over time to see who does (and does not) experience the outcome. Prospective study designs can be employed using already collected, longitudinal administrative data.



### METHODOLOGY

This report series details findings from a project in which the birth records of all children born in California in 2006 and 2007 were matched to statewide child protection records through each child's fifth birthday. These linked records were then analyzed by county, allowing us to describe the characteristics of children at birth and generate longitudinal, cumulative estimates of how many children were involved with CPS during the first 5 years of life. Additionally, these data provide an opportunity to examine child- and family-level characteristics at a population level, helping us to identify attributes that are most

strongly correlated with later CPS-involvement. In this report, we document findings for Marin County, California.

#### Record Linkages 101

Quite simply, record linkage involves matching and integrating information about individuals (or other entities) from different data systems. An inherent limitation of administrative data is the scope of information contained in any one system. By linking records, it is possible to better understand the characteristics and trajectories of children over time and across service systems.



## FINDINGS

### Characteristics of Children Born (Table 1)

Table 1 presents descriptive information collected at birth for infants born during calendar years 2006 and 2007 in Marin County. The total number (N) of births and the percentage (%) of the county's full birth cohort are reported for different characteristics at birth. Given the strong relationship between socioeconomic status and CPS involvement, we also present this same descriptive information based on whether the cost of birth was covered by private or public health insurance.

- Between 2006 and 2007, 3,451 children were born.
- Although prenatal care began during the first trimester for a majority of children, 662 children (19.2%) were born to mothers who received prenatal care that started late or not at all.
- A plurality of children (53.3%) were born to mothers of White race/ethnicity. One third of children (37.9%) were born to Latina mothers.
- A total of 4.3% of children were born to teen mothers.

- 1,362 births were paid for by public health insurance, 39.5% of all children born.
- Paternity was missing for 4.7% of children overall, but 9.4% among births covered by public health insurance compared with 1.6% of births covered by nonpublic insurance.

#### Selected Variables

- ✓ **Birth Weight**  
A measure of infant weight at the time of birth. Low birth weight is defined as <2500 grams.
- ✓ **Prenatal Care**  
A measure of the trimester that prenatal care began. Late prenatal care is defined as care that began after the first trimester or not at all.
- ✓ **Paternity Establishment**  
A measure of whether paternity was established at birth through the legal naming of a father on the birth record.
- ✓ **Number of Births**  
A measure of the number of live births to this mother. If this was a first birth, it was coded as one.
- ✓ **Prior Pregnancy Terminations**  
A measure of whether or not the mother had terminated any earlier pregnancies.
- ✓ **Birth Payment Method**  
A measure of how the birth was paid for. Non-public includes private health insurance companies and self-pay. Public refers to Medi-Cal and other forms of public health insurance coverage. In California, mothers who give birth without health insurance coverage are retroactively enrolled in a public program.

### Cumulative Number of Children Reported for Alleged Abuse or Neglect before Age 5 (Table 2)

Table 2 presents the cumulative number (N) and percentage (%) of children born in 2006 and 2007 who were reported to CPS for alleged abuse or neglect before age 5. These data are stratified by the sociodemographic and health characteristics listed in Table 1. Additionally, we present unadjusted and adjusted risk ratios (RRs) to compare the likelihood that children with different characteristics were reported to CPS before age 5. These estimates of relative risk are accompanied by 95% confidence intervals (95% CI); statistical significance is reported and described in the table endnotes.

- 337 children were reported to CPS for alleged child abuse or neglect before the age of 5, 9.8% of children.
- Notable differences emerged in the likelihood of being reported to CPS. Overall, 11.5% of children who were low birth weight (< 2500g) were reported compared to 9.7% of children who were not. In relative terms, that meant that a low-birth-weight child had a 19.0% greater likelihood of being reported for abuse or neglect (RR: 1.19; 95% CI: 0.76, 1.86). This difference however, was not statistically significant.
- An inverse relationship was observed between a child's risk of being reported for alleged maltreatment and maternal age. Among children born to teen mothers, 27.7% were reported. In contrast, only 6.4% of children born to a mother age 30 or older were reported. Before adjusting for other factors, children of teen mothers were more than 4 times as likely to be reported to CPS as were those born to mothers 30 and older (RR: 4.34\*\*\*; 95% CI: 3.14, 5.90).

#### Unadjusted and Adjusted Risk Ratios

In this report, risk is conceptualized as the statistical likelihood that a child will experience various levels of involvement with child protective services (i.e., reported, substantiated, entered foster care).

A risk ratio (RR) is a measure used to compare risk across children with different characteristics. An unadjusted RR provides a simple comparison of the likelihood that a child in group A was reported, substantiated, or entered foster care versus a child in group B.

An adjusted RR attempts to isolate the measureable relationship of a particular factor to the outcome. Adjusted RRs estimate relative differences in the likelihood that a child in group A was reported, substantiated, or entered foster care compared to a child in group B, while holding constant the influence of other factors.

An RR of 1.0 (or a 95% confidence interval that includes 1.0) indicates that there is no discernible difference in risk between group A and B. An RR larger than 1.0 indicates that group A has a greater risk than group B. Meanwhile an RR of less than 1.0 indicates that group A has a lower risk than group B.

#### Cumulative Number of Children with Substantiated Reports of Abuse or Neglect before Age 5 (Table 3)

Table 3 presents the cumulative number (N) and percentage (%) of children born in 2006 and 2007 who were substantiated as victims of abuse or neglect before age 5. These data are separated by sociodemographic and health characteristics. Unadjusted and adjusted RRs (and 95% CIs) are used to compare the likelihood of substantiation across children with different characteristics. Statistical significance is reported and described in the table endnotes.

- 110 children were substantiated as victims of abuse or neglect before age 5, 3.2% of all children born.
- Notable differences emerged in the likelihood of being substantiated as victims. Among children whose births were covered by public insurance, 6.2% were substantiated as victims of maltreatment before age 5, compared to 1.2% among children with non-public insurance. Before adjusting for other factors, public insurance was associated with a nearly 5 times greater risk of substantiation (RR: 4.96\*\*\*; 95% CI: 3.21, 7.65). In the adjusted model, the risk ratio was attenuated (or weaker), but the relative difference was still large (RR: 2.89\*\*\*; 95% CI: 1.51, 5.54).
- Risk of substantiated maltreatment declined with maternal age. Children born to teen mothers were subsequently substantiated for abuse or neglect at 5 times the rate of children whose mothers were age 30 or older, before adjusting for other factors (RR: 5.36\*\*\*; 95% CI: 2.97, 9.70).

### Cumulative Number of Children Placed in Foster Care before Age 5 (Table 4)

Table 4 presents the cumulative number (N) and percentage (%) of children born in 2006 and 2007 who entered an out-of-home foster care placement before age 5.

*This table was excluded for Marin County due to small cell sizes. Summary statistics concerning the overall percentage of children who were born in the county and entered foster care before age 5 can be found in Table 5.*

### County Comparison Findings (Table 5)

Table 5 serves as a summary table for California and all 58 counties, presenting the overall number of births (N) as well as the cumulative percentage (%) of children reported to CPS, substantiated as victims of maltreatment, and entering foster care before age 5.

- Overall, 1,085,745 children were born in California in 2006 and 2007. Infants born in Marin County represented 0.3% of births statewide.
- In California, 14.8% of children were reported to CPS, 5.1% were substantiated as victims of abuse or neglect, and 2.2% spent time in foster care before age 5.

- The cumulative percentage of children reported for alleged abuse or neglect ranged from less than 8.0% to more than 30.0% across California counties.
- The cumulative percentage of children substantiated as victims of abuse or neglect varied by county, from less than 2.0% to more than 16.0% of all children born.
- Across counties, the percentage of children who spent time in foster care before reaching their fifth birthday ranged from less than 0.5% to more than 7.0%.

#### Marin County Quick Facts

Percentage of Children Reported to CPS before Age 5



Percentage of Children Substantiated before Age 5



Percentage of Children Entering Foster Care before Age 5



## IMPLICATIONS

Linked data for Marin County underscore that annual counts of children reported for maltreatment, substantiated as victims, and placed in foster care dramatically understate the number of children involved with the child protection system over time. In Marin, official cross-sectional data from 2013 indicate that 3.5% of children under age 5 were reported for maltreatment. However, when we longitudinally follow children from birth through age 5—data from the present report indicate that 9.8% of children were reported—significantly more children than previously appreciated.

Research increasingly points to children under age 5 as a population acutely vulnerable to the consequences of maltreatment. A better understanding of the sociodemographic and health characteristics of children most likely to experience abuse or neglect between birth and age 5 is critical to improving and garnering support for prevention efforts. Population-level knowledge concerning the distribution of risk can be leveraged to enable a strategic and equitable matching of public resources to community need.

Linked records can be used to develop automated triaging tools to ensure our most vulnerable children and families are prioritized for scarce service intervention slots.

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## QUESTIONS?

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## Children's Data Network

[www.datanetwork.org](http://www.datanetwork.org)

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**Table 1. Characteristics of Children born in Marin County by Birth Payment Method**

	Full Birth Cohort 2006 & 2007		Birth Payment Method			
	N	%	Public		Non-Public	
	N	%	N	%	N	%
<b>Gender</b>						
Female	1,705	49.4	679	49.9	1,026	49.1
Male	1,746	50.6	683	50.2	1,063	50.9
<b>Birth Weight</b>						
Normal	3,295	95.5	1,302	95.6	1,993	95.4
Low	156	4.5	60	4.4	96	4.6
<b>Birth Abnormality</b>						
None	2,435	70.6	894	65.6	1,541	73.8
One or More	1,016	29.4	468	34.4	548	26.2
<b>Prenatal Care</b>						
1st Trimester	2,789	80.8	994	73.0	1,795	85.9
2nd Trimester	198	5.7	138	10.1	60	2.9
3rd Trimester	22	0.6	16	1.2	6	0.3
None/Missing	442	12.8	214	15.7	228	10.9
<b>Paternity Establishment</b>						
Established	3,289	95.3	1,234	90.6	2,055	98.4
Missing	162	4.7	128	9.4	34	1.6
<b>Maternal Race/Ethnicity</b>						
White	1,838	53.3	134	9.8	1,704	81.6
Black	75	2.2	42	3.1	33	1.6
Latina, US-born	119	3.5	46	3.4	73	3.5
Latina, Foreign-born	1,186	34.4	1,097	80.5	89	4.3
Asian/Pacific Islander	229	6.6	40	2.9	189	9.1
Native American	<10	--	--	--	--	--
<b>Maternal Age</b>						
≤ 19 yrs	148	4.3	131	9.6	17	0.8
20-24 yrs	464	13.5	375	27.5	89	4.3
25-29 yrs	741	21.5	420	30.8	321	15.4
30+ yrs	2,098	60.8	436	32.0	1,662	79.6
<b>Maternal Education</b>						
< HS	871	25.2	840	61.7	31	1.5
HS or GED	689	20.0	380	27.9	309	14.8
Some College	257	7.5	68	5.0	189	9.1
College+	1,634	47.4	74	5.4	1,560	74.7
<b>Number of Births</b>						
One	1,472	42.7	524	38.5	948	45.4
Two	1,298	37.6	467	34.3	831	39.8
Three+	681	19.7	371	27.2	310	14.8
<b>Prior Pregnancy Terminations</b>						
None	3,023	87.6	1,253	92.0	1,770	84.7
One+	428	12.4	109	8.0	319	15.3
<b>Birth Payment Method</b>						
Non-Public	2,089	60.5	--	--	--	--
Public	1,362	39.5	--	--	--	--

**Table Notes:**

1. Cell sizes < 10 masked as indicated by [--]
2. Table based on the full population of children born in a given county in 2006 and 2007

**Table 2. Characteristics and Comparisons of Children born in Marin County and Reported to CPS**

	Reported to CPS		Risk Comparisons			
	Before Age 5		Unadjusted		Adjusted	
	N	%	RR	95% CI	RR	95% CI
<b>Gender</b>						
Female	169	9.9	ref.	---	ref.	---
Male	168	9.6	0.97	(0.79, 1.19)	0.91	(0.75, 1.11)
<b>Birth Weight</b>						
Normal	319	9.7	ref.	---	ref.	---
Low	18	11.5	1.19	(0.76, 1.86)	1.13	(0.72, 1.77)
<b>Birth Abnormality</b>						
None	216	8.9	ref.	---	ref.	---
One or More	121	11.9	1.34**	(1.09, 1.66)	1.23*	(1.00, 1.52)
<b>Prenatal Care</b>						
1st Trimester	260	9.3	--	--	--	--
2nd Trimester	25	12.6	--	--	--	--
3rd Trimester	<10	--	--	--	--	--
None/Missing	47	10.6	--	--	--	--
<b>Paternity Establishment</b>						
Established	292	8.9	ref.	---	ref.	---
Missing	45	27.8	3.13***	(2.39, 4.10)	1.56**	(1.14, 2.12)
<b>Maternal Race/Ethnicity</b>						
White	126	6.9	--	--	--	--
Black	22	29.3	--	--	--	--
Latina, US-born	26	21.9	--	--	--	--
Latina, Foreign-born	144	12.1	--	--	--	--
Asian/Pacific Islander	18	7.9	--	--	--	--
Native American	<10	--	--	--	--	--
<b>Maternal Age</b>						
≤ 19 yrs	41	27.7	4.34***	(3.19, 5.90)	1.97***	(1.32, 2.96)
20-24 yrs	90	19.4	3.04***	(2.37, 3.89)	1.74***	(1.31, 2.32)
25-29 yrs	72	9.7	1.52**	(1.16, 2.00)	1.01	(0.76, 1.36)
30+ yrs	134	6.4	ref.	---	ref.	---
<b>Maternal Education</b>						
< HS	125	14.4	4.26***	(3.14, 5.79)	3.46***	(2.20, 5.45)
HS or GED	128	18.6	5.52***	(4.08, 7.47)	4.03***	(2.75, 5.91)
Some College	29	11.3	3.35***	(2.18, 5.15)	2.74***	(1.75, 4.30)
College+	55	3.4	ref.	---	ref.	---
<b>Number of Births</b>						
One	146	9.9	ref.	---	ref.	---
Two	105	8.1	0.82	(0.64, 1.04)	1.05	(0.82, 1.34)
Three+	86	12.6	1.27	(0.99, 1.64)	1.51**	(1.14, 1.99)
<b>Prior Pregnancy Terminations</b>						
None	307	10.2	ref.	---	ref.	---
One+	30	7.0	0.69*	(0.48, 0.99)	0.87	(0.61, 1.22)
<b>Birth Payment Method</b>						
Non-Public	121	5.8	ref.	---	ref.	---
Public	216	15.9	2.74***	(2.22, 3.38)	1.53*	(1.08, 2.18)

**Table Notes:**

1. RR = Risk Ratio; 95% CI = 95% Confidence Interval; ref = Reference group for Risk Ratio calculations; [---] indicates no corresponding statistic given reference group status.
2. Cell sizes < 10 masked as indicated by [--]; statistical significance denoted as: *P* < .05\*; *P* < .01\*\*; *P* < .001\*\*\*.

**Table 3. Characteristics and Comparisons of Children born in Marin County and Substantiated**

	Substantiated		Risk Comparisons			
	Before Age 5		Unadjusted		Adjusted	
	N	%	RR	95% CI	RR	95% CI
<b>Gender</b>						
Female	48	2.8	ref.	---	ref.	---
Male	62	3.6	1.26	(0.87,1.83)	1.17	(0.82,1.68)
<b>Birth Weight</b>						
Normal	103	3.1	--	--	--	--
Low	<10	--	--	--	--	--
<b>Birth Abnormality</b>						
None	68	2.8	ref.	---	ref.	---
One or More	42	4.1	1.48*	(1.01,2.16)	1.25	(0.85,1.84)
<b>Prenatal Care</b>						
1st Trimester	81	2.9	--	--	--	--
2nd Trimester	10	5.1	--	--	--	--
3rd Trimester	<10	--	--	--	--	--
None/Missing	15	3.4	--	--	--	--
<b>Paternity Establishment</b>						
Established	88	2.7	ref.	---	ref.	---
Missing	22	13.6	5.08***	(3.27,7.88)	1.85*	(1.10,3.11)
<b>Maternal Race/Ethnicity</b>						
White	37	2.0	--	--	--	--
Black	<10	--	--	--	--	--
Latina, US-born	12	10.1	--	--	--	--
Latina, Foreign-born	45	3.8	--	--	--	--
Asian/Pacific Islander	<10	--	--	--	--	--
Native American	<10	--	--	--	--	--
<b>Maternal Age</b>						
≤ 19 yrs	14	9.5	5.36***	(2.97,9.70)	2.04	(0.95,4.37)
20-24 yrs	34	7.3	4.15***	(2.64,6.55)	1.99**	(1.22,3.23)
25-29 yrs	25	3.4	1.91*	(1.16,3.16)	1.10	(0.66,1.82)
30+ yrs	37	1.8	ref.	---	ref.	---
<b>Maternal Education</b>						
< HS	45	5.2	--	--	--	--
HS or GED	48	7.0	--	--	--	--
Some College	<10	--	--	--	--	--
College+	<10	--	--	--	--	--
<b>Number of Births</b>						
One	37	2.5	ref.	---	ref.	---
Two	40	3.1	1.23	(0.79,1.91)	1.79*	(1.13,2.84)
Three+	33	4.9	1.93**	(1.22,3.06)	2.35***	(1.42,3.91)
<b>Prior Pregnancy Terminations</b>						
None	98	3.2	ref.	---	ref.	---
One+	12	2.8	0.86	(0.48,1.56)	1.05	(0.60,1.86)
<b>Birth Payment Method</b>						
Non-Public	26	1.2	ref.	---	ref.	---
Public	84	6.2	4.96***	(3.21,7.65)	2.89**	(1.51,5.54)

**Table Notes:**

1. RR = Risk Ratio; 95% CI = 95% Confidence Interval; ref = Reference group for Risk Ratio calculations; [---] indicates no corresponding statistic given reference group status.
2. Cell sizes < 10 masked as indicated by [--]; statistical significance denoted as: *P* < .05\*; *P* < .01\*\*; *P* < .001\*\*\*.



**Table 5. Summary of County Data for California: Children Born in 2006/2007 and Reported to Child Protective Services, Substantiated as Victims, or Entering Foster Care before Age 5**

County of Birth	Births 2006 & 2007	% Reported	% Substantiated	% Entering Foster Care
California	1,085,745	14.8%	5.1%	2.2%
Alameda	42,000	10.7%	2.9%	1.6%
Alpine	--	--	--	--
Amador	619	24.4%	7.8%	3.2%
Butte	5,940	25.1%	10.3%	5.7%
Calaveras	107	41.1%	16.8%	--
Colusa	456	14.5%	5.7%	3.5%
Contra Costa	23,219	10.3%	3.4%	1.4%
Del Norte	709	28.3%	15.2%	6.8%
El Dorado	2,403	19.7%	9.7%	4.7%
Fresno	35,056	19.2%	5.0%	2.7%
Glenn	--	--	--	--
Humboldt	3,202	22.3%	7.1%	3.4%
Imperial	6,205	13.2%	5.4%	2.8%
Inyo	451	16.4%	3.5%	--
Kern	28,099	22.3%	10.7%	4.3%
Kings	5,182	16.6%	5.0%	3.2%
Lake	1,084	27.1%	8.5%	5.4%
Lassen	453	21.9%	7.9%	3.8%
Los Angeles	310,700	14.6%	5.2%	2.4%
Madera	4,014	22.0%	9.0%	5.1%
Marin	3,451	9.8%	3.2%	0.8%
Mariposa	--	--	--	--
Mendocino	1,980	23.3%	11.1%	4.1%
Merced	6,804	21.6%	7.6%	3.9%
Modoc	--	--	--	--
Mono	279	7.9%	--	--
Monterey	14,196	8.9%	2.4%	1.0%
Napa	2,593	11.2%	3.5%	1.7%
Nevada	1,990	14.2%	4.3%	2.0%
Orange	93,963	11.5%	4.9%	1.4%
Placer	6,771	13.8%	5.2%	1.7%
Plumas	210	23.3%	10.5%	--
Riverside	57,031	18.3%	7.1%	3.5%
Sacramento	47,277	17.1%	6.5%	3.2%
San Benito	1,191	17.0%	6.3%	2.9%
San Bernardino	57,807	17.4%	5.3%	2.6%
San Diego	85,349	15.9%	5.0%	1.8%
San Francisco	25,776	8.2%	2.6%	1.3%
San Joaquin	21,183	17.4%	6.1%	2.2%
San Luis Obispo	5,445	17.3%	5.1%	2.1%
San Mateo	10,599	6.0%	1.3%	0.5%
Santa Barbara	11,903	12.6%	4.3%	2.0%
Santa Clara	56,832	9.8%	2.4%	1.2%

County of Birth	Births 2006 & 2007	% Reported	% Substantiated	% Entering Foster Care
Santa Cruz	7,379	14.3%	4.7%	1.9%
Shasta	4,556	27.6%	12.9%	6.6%
Sierra	--	--	--	--
Siskiyou	805	30.7%	13.5%	5.7%
Solano	10,978	15.2%	4.0%	1.5%
Sonoma	11,397	10.3%	3.9%	1.2%
Stanislaus	19,632	16.9%	6.3%	1.4%
Sutter	4,481	18.4%	6.8%	2.6%
Tehama	1,412	30.7%	11.8%	7.1%
Trinity	--	--	--	--
Tulare	14,900	18.8%	5.0%	2.6%
Tuolumne	1,169	23.9%	9.5%	4.4%
Ventura	21,713	13.0%	2.8%	1.4%
Yolo	4,097	12.8%	4.6%	2.1%
Yuba	--	--	--	--

**Table Notes:**

1. Cell sizes < 10 masked as indicated by [--].