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# A LATENT CLASS ANALYSIS OF INFANTS REPORTED FOR MALTREATMENT

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Children's  
Data Network

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## RISK OF RE-REPORT: A LATENT CLASS ANALYSIS OF INFANTS REPORTED FOR MALTREATMENT

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### JOURNAL CITATION

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Although the findings reported and conclusions drawn from these data are solely those of the authors and should not be considered to reflect those of any agency of the California government, this analysis would not be possible without the partnership of the California Department of Social Services and the county child welfare departments, reflecting their ongoing commitment to data-driven program and policy development.

Finally, we wish to thank Armando Jimenez and Pegah Faed from First 5 LA - as well as Jeannine Balfour and the Conrad N Hilton Foundation - for their investments in generating new knowledge through administrative data.

### PROJECT OVERVIEW

The CDN is a data and research collaborative focused on the integration and application of administrative data to inform programs and policies for children and their families. The CDN receives essential infrastructure funding from First 5 LA and the Conrad N. Hilton Foundation, additional project support from the Robert Wood Johnson Foundation, the Laura and John Arnold Foundation, and the California Department of Social Services, and operates in partnership with the California Child Welfare Indicators Project at UC Berkeley.



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## SUMMARY

### BACKGROUND

Infants are at particularly high risk of child abuse and neglect, which can negatively affect development in the short and long term. Identifying infants who are at increased risk of maltreatment re-reporting would help the child protective services (CPS) system more accurately assess initial reports, allowing it to better tailor interventions and target supports.

### PURPOSE

The purpose of this study was to move from a focus on individual risk and protective factors to an examination of subgroups of infants with different risks of a follow-up maltreatment report during the first 5 years of life—a time of critical developmental importance.

### DATA

Birth records for all children born in Los Angeles in 2006 were linked to statewide child protection records through 2012. The outcome of interest was a CPS report within 5 years of an initial report during infancy. Seven family and infant characteristics known to be associated with CPS involvement and four characteristics of the initial report were modeled.

### ANALYSIS

Latent class analysis (LCA) is an analytic approach that allows researchers to model data to define 'classes' or subgroups of individuals that share characteristics. In the present analysis, LCA was used to identify classes of infants with variable risk of a follow-up maltreatment report.

### FINDINGS

Despite relatively high rates of re-reporting generally, the analysis identified four distinct subpopulations that varied significantly in their probability of a future CPS report during the first 5 years of life, from 37% to 79%. Two birth risk factors clustered in families in the medium- and highest-risk groups: lack of established paternity and delayed or absent prenatal care. Two factors from the initial CPS report (i.e., an initial allegation that was substantiated and a family history of CPS involvement) strongly defined classes of infants with very high risk of re-report within the first 5 years of life. The clustering of these two risk factors was associated with a 79% chance of re-report during this period.

### IMPLICATIONS

This study demonstrates that in an already high-risk subpopulation of children (i.e., infants with an initial report of alleged maltreatment), data can help identify classes of infants that are more likely to be re-reported and may be in greater need of preventive supports and services.



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## BACKGROUND

Infants (children from birth to age 1) have the highest rate of abuse and neglect victimization in the United States—nearly 2.5 times the rates for children of other ages. In 2013, an estimated 22 of every 1,000 infants were maltreated nationwide.<sup>1</sup> Child abuse and neglect during the first few years of life can negatively affect development and place children on a path to poorer outcomes throughout the life course.<sup>2-4</sup> Early maltreatment is associated with the development of attention problems,<sup>5</sup> internalizing and externalizing behaviors,<sup>6,7</sup> anxiety and depression,<sup>2,5,8</sup> lower educational achievement and lower earnings,<sup>9</sup> and a wide range of health problems.<sup>10</sup> Additionally, the earlier the onset of maltreatment, the stronger the association with adverse developmental outcomes.<sup>2</sup>



Child protective services (CPS) agencies have the difficult job of identifying, among a large number of children reported with risk factors present, those who are the most likely to experience future harm<sup>11</sup> and ensuring the appropriate intervention occurs on their behalf. To help CPS providers make those crucial determinations, researchers have isolated many discrete risk factors for future abuse and neglect, such as low socioeconomic status.<sup>12</sup> Children reported to CPS, however, rarely have just one risk factor present; they often have multiple risk factors as well as protective factors. And these various factors are constantly interacting—amplifying or diminishing one another’s effects—over time,<sup>13,14</sup> meaning that a variable may be a risk factor for one group of children but not for another because of the influence of other factors. For this reason, analyzing data at a group level—identifying the defining characteristics of a group of children that goes on to have future reports of alleged maltreatment—may be useful to ensuring resources are allocated properly.



A multivariable approach, called latent class analysis (LCA),<sup>15</sup> allows for the identification of classes or clusters of infants that have varying re-reporting risk at the time of the initial report of maltreatment. LCA also permits an examination of the characteristics that make each subgroup unique. Understanding subgroups of infants that are at increased risk of re-report can inform a more focused tailoring of interventions and supports to families most likely to experience future reports of maltreatment.

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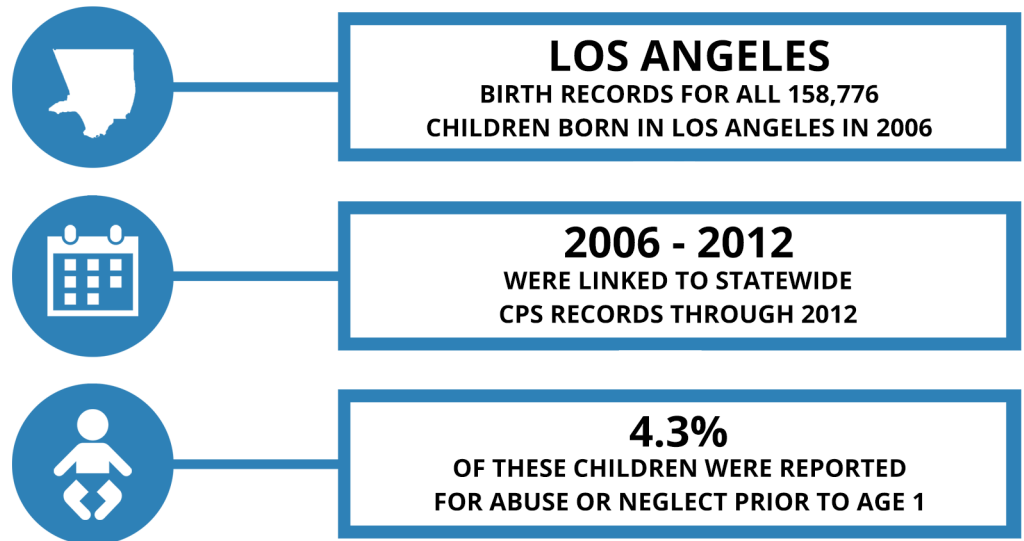
## RESEARCH OBJECTIVE

Building on previous work (described in Volume 3-1),<sup>16</sup> the present analysis used LCA to examine the constellation of factors that define infants who are at increased risk of a follow-up maltreatment report during the first 5 years of life.

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## DATA & ANALYSIS

Birth records for all children born in Los Angeles in 2006 were linked to statewide child protection records through 2012. These linkages revealed that 6,886 children—4.3% of all children born that year—were reported for abuse or neglect during the first year of life. The final population consisted of 5,403 (78.5%) infants who remained in the home. This subset of infants comprised the final study population.




An LCA approach was used to model the data. The outcome of interest was a CPS report within 5 years of the initial report. Given our focus on future involvement with CPS, all initial and follow-up reports were included, regardless of whether or not the report was investigated or substantiated. Seven family and infant characteristics previously shown to be associated with CPS system involvement<sup>16-22</sup> and four CPS initial report characteristics were used as predictor variables for the latent class model.

Family and infant characteristics included:

	<p><b>MATERNAL RACE/ETHNICITY</b>          WHITE, BLACK, U.S.-BORN HISPANIC, FOREIGN-BORN HISPANIC, ASIAN OR PACIFIC ISLANDER, NATIVE AMERICAN</p>		<p><b>PRENATAL CARE</b>          1ST TRIMESTER, 2ND TRIMESTER, 3RD TRIMESTER, NONE OR MISSING CARE</p>
	<p><b>MATERNAL AGE</b>          ≤ 19 YEARS, 20-24 YEARS, 25-29 YEARS, ≥ 30 YEARS</p>		<p><b>INSURANCE TYPE</b>          PRIVATE INSURANCE, PUBLIC INSURANCE</p>
	<p><b>MATERNAL EDUCATION</b>          LESS THAN HS, GED OR HS DIPLOMA</p>		<p><b>HEALTH CONDITION</b>          NONE, PRESENT</p>
	<p><b>PATERNITY</b>          ESTABLISHED, MISSING</p>		

Initial CPS report characteristics included:

	<p><b>INITIAL ALLEGATION TYPE</b>          ABUSE, NEGLECT, EMOTIONAL ABUSE, SIBLING AT RISK</p>
	<p><b>INITIAL DISPOSITION TYPE</b>          EVALUATED OUT, UNFOUNDED, INCONCLUSIVE, SUBSTANTIATED W/OUT SERVICES, SUBSTANTIATED W/ SERVICES</p>
	<p><b>INITIAL REPORTER TYPE</b>          NONMANDATED, MANDATED</p>
	<p><b>FAMILY CPS REPORTS PRIOR TO INFANT BIRTH</b>          FAMILIES WITH NO CHILDREN OTHER THAN THE INFANT, FAMILIES WITH TWO OR MORE CHILDREN AND NO HISTORY OF CPS INVOLVEMENT, FAMILIES WITH TWO OR MORE CHILDREN AND A HISTORY OF A CPS REPORTS</p>

## FINDINGS

Four classes of infants emerged in our population. LCA statistics indicated that these subgroups were meaningful, distinct, and correctly captured a majority of observations. Having identified the subgroups of infants based on the likelihood of a future report of maltreatment, the characteristics common within and between groups were examined.

### CLASS 1 - LOWEST RISK

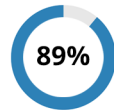
31% OF POPULATION (N=1,686) 37% PROBABILITY OF RE-REPORTING



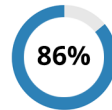
GED OR HS DIPLOMA



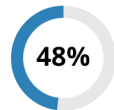
1ST TRIMESTER PRENATAL CARE



PATERNITY ESTABLISHED



MANDATED REPORTER



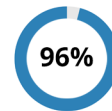
MOM WAS 30 OR OLDER



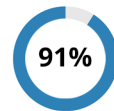
WHITE MOM

### CLASS 2 - LOWEST RISK

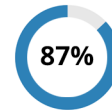
22% OF POPULATION (N=1,202) 45% PROBABILITY OF RE-REPORTING



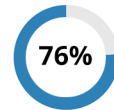
LESS THAN HS DIPLOMA



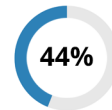
PUBLIC HEALTH INSURANCE



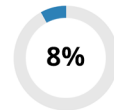
PATERNITY ESTABLISHED



FOREIGN-BORN HISPANIC MOM



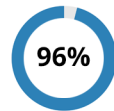
INFANT HAS SIBLING WITH CPS REPORT



HEALTH CONDITION PRESENT

### CLASS 3 - MEDIUM RISK

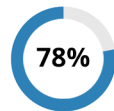
21% OF POPULATION (N=1,129) 55% PROBABILITY OF RE-REPORTING



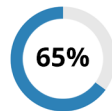
MOTHER AGE: UNDER 25



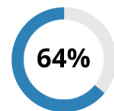
LESS THAN HS DIPLOMA



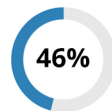
INFANT IS FIRST BORN



PATERNITY ESTABLISHED



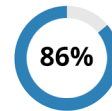
TEEN MOM



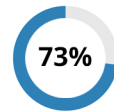
US-BORN HISPANIC MOM

### CLASS 4 - HIGHEST RISK

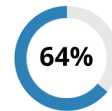
26% OF POPULATION (N=1,386) 79% PROBABILITY OF RE-REPORTING



INITIAL REPORT WAS FOR NEGLECT



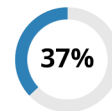
INFANT HAS SIBLING WITH CPS REPORT



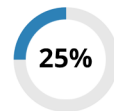
1ST TRIMESTER PRENATAL CARE



PATERNITY ESTABLISHED



INITIAL REPORT SUBSTANTIATED



HEALTH CONDITION PRESENT

*Class names were chosen based on the likelihood of a re-report within 5 years and factors concentrated in each class relative to other classes. The class names do not reflect the characteristics of all individuals in the class.*



## DISCUSSION

Infants with initial reports of alleged maltreatment are at high risk of subsequent reports and future CPS involvement.<sup>1,23</sup> But the characteristics and subsequent risk of being re-reported is not uniform. The purpose of this study was to use LCA to examine the constellation of factors that define subgroups of infants with varying risk of a follow-up maltreatment report during the first 5 years of life. Results underscore four key findings that improve our ability to conceptualize risk of future CPS reports among young children.

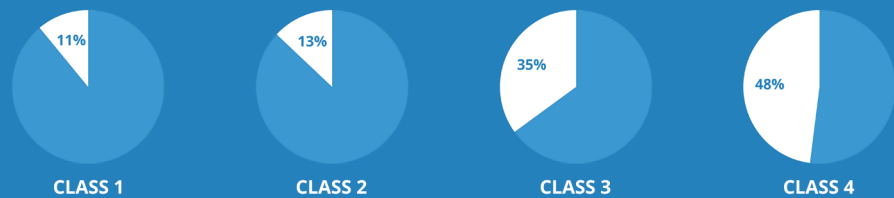
### FIRST

LCA can be useful when assessing the risk of re-report among infants with an initial report of maltreatment. Despite relatively high rates of re-reporting generally, the analysis identified four distinct subpopulations that varied significantly in their probability of a future CPS report during the first 5 years of life, from 37% (Classes 1) to 79% (Class 4).

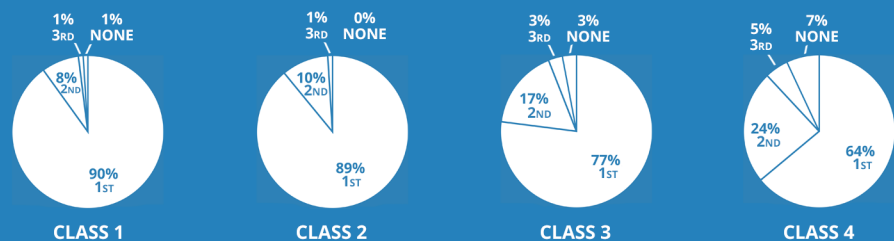
### SECOND

Two risk factors recorded at birth clustered in families in the medium- and highest-risk groups (Classes 3 & 4): lack of established paternity and delayed or absent prenatal care. One CPS case characteristic was present among the two highest risk classes: an initial allegation of neglect. These factors indicated infants in these families were more likely to be re-reported than not.

LACK OF ESTABLISHED PATERNITY BY CLASS



INITIATION OF PRENATAL CARE BY TRIMESTER AND CLASS



### THIRD

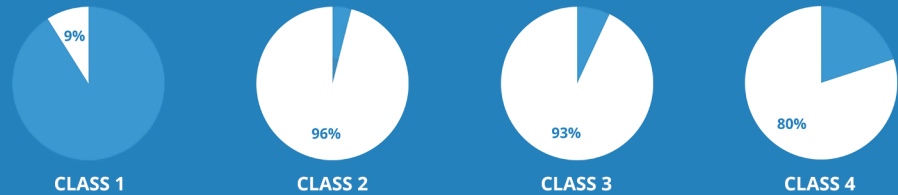
Findings suggest that infants in Class 2 had a relatively low probability of re-report in comparison to the two highest-risk classes, despite the presence of factors generally associated with CPS reports that are common in this population. Specifically, infants in Class 2, one of the two lowest-risk groups, had risk factors such as the lowest level of maternal education and the highest rate of public health insurance utilization (proxies for lower income). But infants in this



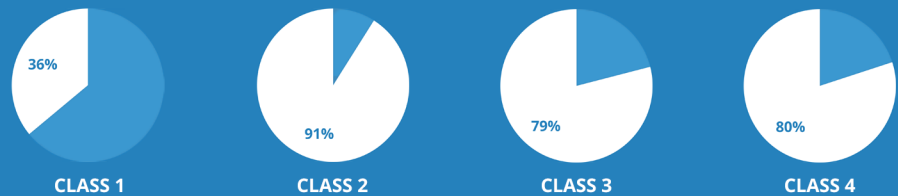


class also had higher rates of protective factors. These infants were more likely to have had paternity established at birth and mothers who received earlier prenatal care in comparison to those in the higher risk groups. And Class 2 infants had much higher rates of having foreign-born Hispanic mothers in comparison to all other groups, which also may help explain why this class had a lower risk of re-report in the presence of other risk factors.<sup>24-29</sup>

**MATERNAL EDUCATION: LESS THAN HIGH SCHOOL DEGREE**



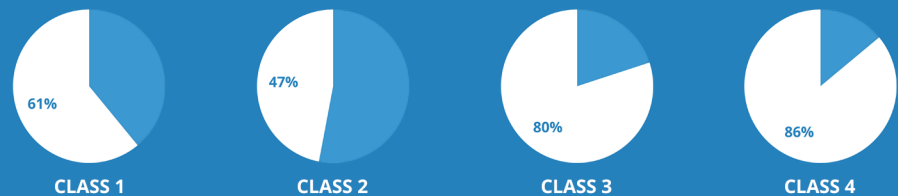
**METHOD OF PAYMENT FOR BIRTH: PUBLIC INSURANCE**



**FOURTH**

Two factors from the initial CPS report (i.e., an initial report that was substantiated with services and a family history of CPS involvement) strongly defined the class of infants with very high risk of re-report within the first 5 years of life. The clustering of these two risk factors was associated with a 79% chance of re-report during this period. The CPS family history variable is a particularly useful indicator of risk because this variable can be ascertained at the time of an initial report.

**INITIAL ALLEGATION TYPE: NEGLECT**



**HISTORY OF SIBLING INVOLVEMENT WITH CPS AMONG CHILDREN WITH SIBLINGS**



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## IMPLICATIONS

This study demonstrated that infants who have been reported for alleged maltreatment fall along a spectrum of risk of being re-reported, and that risk of re-report is related to clusters of characteristics observed at birth and initial CPS report. This is notable because it means that in an already high-risk subpopulation of children, data can help identify classes of infants that are more likely to be re-reported and may be in greater need of preventive supports and services.

Known family history of past CPS involvement for older siblings when the infant is initially reported is a potentially important signal, particularly when accompanied by other key risk factors. CPS systems presently have access to information about families' past involvement with CPS, making this variable even more meaningful. Other significant predictors of re-report were obtained from birth records that are universally collected in the United States, signaling a unique opportunity for administrative data linkage to inform CPS practices and policies.



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