LEAD ASTRAY

California's Broken Promise To Protect Children From Lead Poisoning

ENVIRONMENTAL WORKING GROUP™

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Environmental Working Group

EWG is a nonprofit environmental research organization with offices in Washington, DC, Oakland, CA, and Seattle, WA. EWG conducts cutting-edge research on environmental health issues, especially those affecting children.

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Executive Summary

• Despite a 1991 lawsuit settlement in which the State of California promised to ensure blood testing and treatment for lower-income children threatened by lead poisoning, since 1992 the state has failed to identify or provide care for an estimated 200,000 lead-poisoned children ages 1 to 5. About 212,000 one-to-five-year-olds in California had harmful blood lead levels between 1992 and 1998, but the state identified only 14,900.

Of 212,000 children with dangerous blood lead levels, the state has failed to identify or treat more than 90 percent.

• More than 43,700 California children ages 1 to 5 live in critical lead risk "hot spots" with the highest percentage of older housing, poverty and people of color. These hot spots are found in San Francisco, Alameda County, Los Angeles, Long Beach, San Diego, Sacramento and Fresno. An additional 239,000 children live in very high risk areas. Our analysis has produced a searchable database of lead poisoning risk in all California neighborhoods, available online at www.ewg.org/california.

• Statewide, no more than 1 in 5 children is tested for lead poisoning. This abysmal performance in dealing with a serious, yet entirely preventable, public health problem is primarily the result of the Department of Health Services' failure to enforce state and federal law requiring blood tests for all young children receiving public assistance and to require reporting of all blood test results to the state. Doctors and health maintenance organizations (HMOs) are also failing in their legal responsibility to provide testing for all lower-income children; the state is complicit in this neglect because it has yet to adopt standards to hold health care providers accountable.

• This tragedy costs the state vast sums for special education, medical care and lost earnings for lead-poisoned children. Reducing the average level of lead in California children's blood by just 10 percent would save more than $800 million a year.

• EWG urges the state to adopt regulations requiring blood tests for all children and reporting of all blood lead levels. All health care providers must comply with state laws on testing and reporting, and the state must adopt standards that will allow health officials to enforce compliance. The state should increase its funding of lead poisoning prevention programs, should take legal action against health care providers who do not obey the law, and should consider joining lawsuits by Santa Clara County and the State of Rhode Island against lead polluters to recover damages to fund lead programs.

Is Your Child At Risk?

Every child, of every socioeconomic status, is at risk of lead poisoning. Most insurance and HMO plans cover blood tests for lead poisoning, but even families who lack coverage can obtain a test for about $10. All children should be tested at between 12 and 24 months old, and retested at up to 6 years old if they meet any of the following criteria:

1. Your child lives in a ZIP code where about one-fourth or more of the housing was built before 1950*. For a list of applicable California ZIP codes, see Table 2, pages 6 and 7, or search EWG's online database at www.ewg.org/california.

2. Your child receives services from public assistance programs for low-income families such as Medi-Cal, supplemental food for Women, Infants and Children (WIC) or the state's Childhood Health and Development Program.

3. If you answer "yes" or "don't know" to any of the following questions:

- **Does your child live in or regularly visit a house that is built before 1950? (This can include a daycare center, preschool, school, barn, home of babysitter, relative, friend, etc.)**
- **Does your child live in or regularly visit a house built before 1978 with recent or ongoing renovations or remodeling?**
- **Does your child have a parent, brother, sister, housemate or playmate who is being treated or followed for lead poisoning?**
- **Does your child live with someone whose job or hobby involves exposure to lead (i.e, painting soldering, automobile repair manufacturing or recycling, vehicle radiator repair)?**
- **Does your child live near an active lead smelter or battery recycling plant or other industry likely to release lead?**

Adapted from California Dept. of Health Services Interim Childhood Lead Poisoning Targeted Screening Guidelines, October 1998.* U.S. Centers for Disease Control. DHS' guidelines are for housing before 1960.

Lead Astray

In 1991, after a federal lawsuit by civil rights advocates and environmentalists, the State of California promised to overhaul its lead-poisoning prevention program, which had systematically failed to protect thousands of high-risk children. But according to a 10-month computer-assisted investigation by Environmental Working Group (EWG), nothing has changed: Since 1992, the state has failed to identify or provide care for an estimated 200,000 lead poisoned children ages 1 to 5.

EWG calculates that about 212,000 one-to-five-year-olds in California had dangerous blood lead levels between 1992 and 1998, the latest year for which data are available. In that period, state records show that the California Department of Health Services (DHS) has identified only about 14,900 of the children with elevated blood levels — about 7 percent of the total.

State policy failures have produced a generation of children who have been neither identified as lead-poisoned nor treated.

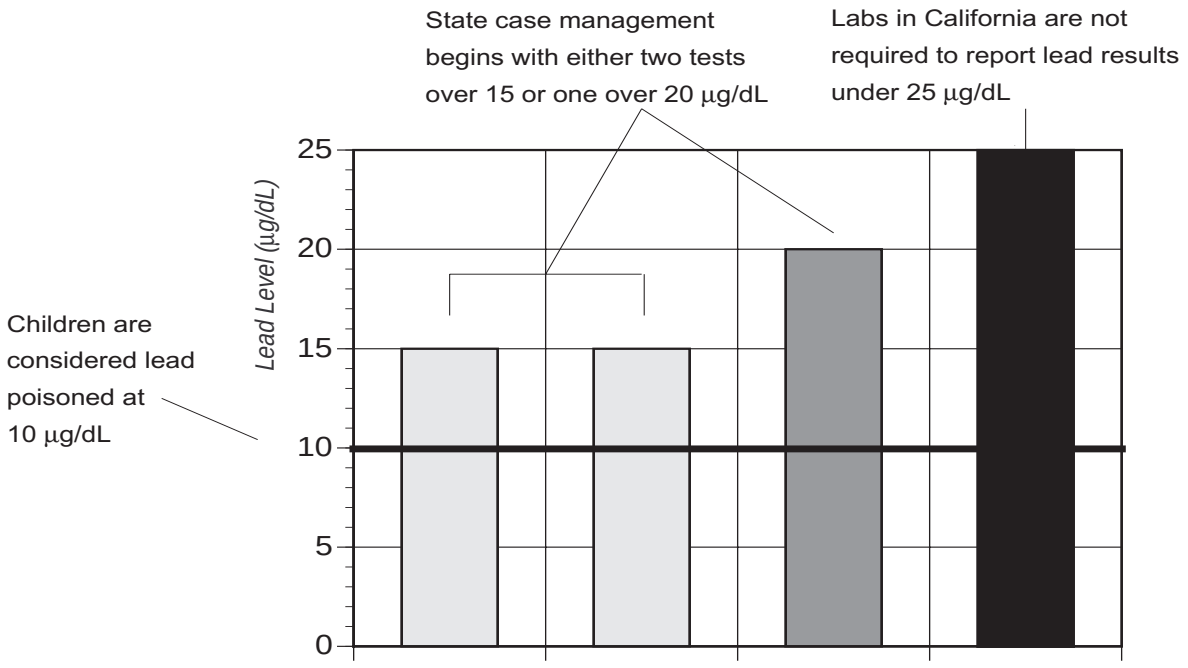
These are conservative estimates. DHS' Childhood Lead Poisoning Prevention Program (CLPPP) estimates that the number of lead poisoning cases statewide increases by as many as 70,000 children a year — since 1992, a total of half a million kids who may have suffered learning impairment, reduced IQ, hearing loss or other severe effects of lead poisoning.

This abysmal performance in dealing with a serious, yet entirely preventable, public health problem is primarily due to two serious policy failures by the state: failure to enforce state and federal law requiring blood testing of all children who are statistically at risk of lead poisoning and failure to require reporting of all blood lead levels that meet the U.S. Centers for Disease Control threshold for lead poisoning.

In fact, the blood lead level (BLL) at which California requires health care providers to report a poisoning case to the state is 2.5 times higher than the lead poisoning threshhold recognized by the CDC. (Figure 1.) Local programs in some cities and counties attempt to identify and treat children with lower BLLs, but they lack the authority and resources needed to enforce universal testing of at-risk children by health care providers or lead-hazard mitigation by landlords.

Applying federal lead poisoning criteria to California census tracts, EWG has produced the first detailed, neighborhood-level estimates of lead poisoned children throughout the state. This report also makes public for the first time local maps of the neighborhoods where children are at the highest risk of lead poisoning. (Figures 2-7, pgs. 21-26.) The maps — based on risk

Figure 1. California requires reporting of poisoning cases only when blood lead levels are 2.5 times the amount that can damage children's health.



SOURCE: EWG, from state health department regulations.

formulas used by the Alameda County lead program, considered one of the best in the state — identify the census tracts that rank highest in factors CDC says are are accurate predictors of high rates of lead poisoning: percentage of housing built before 1950, percentage of residents whose income falls below poverty levels and percentage of residents who are people of color.

Findings

• More than 43,700 California children ages 1 to 5 live in critical lead risk "hot spots" — areas with the highest percentage of older housing, poverty and people of color. (Table 1.) These hot spots are found in south-central and east Los Angeles; the Mission and Tenderloin districts of San Francisco; east and west Oakland and south Berkeley; near Long Beach Harbor; San Diego's Barrio Logan; in south Sacramento; and west Fresno. An additional estimated 239,000 children statewide live in very high risk areas.

• More than 645,000 California children ages 1 to 5 live in ZIP codes where, based on the percentage of pre-1950 housing, the CDC recommends that all children be tested for lead poisoning. (Table 2). A searchable database of lead poisoning risk in all California ZIP codes is available online at www.ewg.org/california.

• In no county has the state identified more than 13 percent of the estimated number of lead poisoned children. Only in Kern, Santa Cruz, Santa Barbara and Sierra counties has the state identified at least 10 percent of lead poisoned children. (Table 3.) In Los Angeles County alone, more than 78,000 lead poisoned children — 91 percent of the estimated total — have not been identified.

Table 1. More than 282,000 California children live in areas of very high or critical risk of lead poisoning.

County	Very High Risk Tracts	Children in Very High Risk Tracts	Critical Risk Tracts	Children in Critical Risk Tracts
Los Angeles	245	147,543	58	27,319
Alameda	37	10,698	34	11,656
San Francisco	31	9,019	12	2,631
Fresno	19	14,433	2	663
San Diego	18	13,127	2	614
Sacramento	14	5,819	2	904
Kern	13	7,937	0	0
Contra Costa	8	3,892	0	0
San Joaquin	7	3,418	0	0
San Bernardino	6	3,666	0	0
Monterey	5	4,458	0	0
Riverside	5	4,049	0	0
Merced	3	2,586	0	0
Kings	2	820	0	0
Santa Clara	2	1,327	0	0
Solano	2	690	0	0
Stanislaus	2	1,150	0	0
Tulare	2	1,555	0	0
Butte	1	208	0	0
Humboldt	1	310	0	0
Imperial	1	431	0	0
Madera	1	685	0	0
San Mateo	1	334	0	0
Santa Barbara	1	706	0	0
Total	**427**	**238,861**	**110**	**43,787**

SOURCE: EWG, from state health and federal census data.

• Not surprisingly, among the state's larger cities, Los Angeles has the highest estimated number of lead poisoned kids, with more than 35,000. But Oakland, with an estimated 7,900 lead-poisoned children, and San Francisco, with more than 6,500, have the highest percentages of lead-poisoned children compared to population. (Table 4.) Compared to the rest of the state, the two Bay Area cities have a much higher percentage of housing built before 1950, and Oakland has a higher concentration of low-income neighborhoods and communities of color.

• The percentage of lead-poisoned children who have not been identified by state or local officials is very high even in the three wealthiest counties in the state — Contra Costa (98 percent), Marin (99 percent) and San Mateo (98 percent). This lack of action may reflect the common belief, still promoted by the lead industry, that lead poisoning is primarily a problem of inner-city or minority children — when in fact, says the CDC, "no socioeconomic group, geographic area, or racial or ethnic population is spared." According to EWG's calculations, more than 10,000 children in those three counties have elevated blood lead levels.

• Most doctors, health maintenance organizations (HMOs) and other medical providers in California fail to test children for lead poisoning. Federal and state law require health care providers who participate in Medicaid, Medi-Cal or the Child Health and Disability Prevention (CHDP) program to test all 1- and 2-year-olds covered by those programs, and 3- to 6-year-olds who

Table 2. California ZIP codes where, based on age of housing, all children should be tested for lead poisoning.

County	Zip Codes (* denotes zip codes that cross county lines)	Number of Children 1-5 Years Old
Alameda	94501*, 94530*, 94541, 94577, 94580, 94586, 94601, 94602, 94603, 94605, 94606, 94607, 94608, 94609, 94610, 94611*, 94612, 94618, 94619, 94621, 94702, 94703, 94704, 94705, 94706*, 94707, 94708, 94709, 94710	51,912
Alpine	None	
Amador	95629*, 95642	349
Butte	95914, 95920*, 95928*, 95938, 95941*, 95948, 95953*, 95963*	5,035
Calaveras	95222	281
Colusa	95679*, 95912, 95920*, 95932, 95955*, 95970*, 95979*, 95987*	1,426
Contra Costa	94525, 94530*, 94569, 94572, 94611*, 94706*, 94801, 94804, 94805	11,427
Del Norte	None	
El Dorado	95629*, 95720, 95735, 96141*	82
Fresno	93242*, 93450*, 93609, 93616, 93621, 93625, 93701, 93702, 93704, 93706, 93721, 93728	17,414
Glenn	95920*, 95955*, 95963*, 95970*, 95979*, 95988	2,218
Humboldt	95411, 95414, 95501, 95525, 95528, 95536, 95540, 95547, 95549, 95550, 95551, 95558, 95562, 95564, 95565	5,297
Imperial	92233	458
Inyo	93526, 93545	220
Kern	93206, 93224, 93263, 93268*, 93287, 93301, 93305, 93519, 93528, 93531, 93554	8,453
Kings	93202, 93242*, 93450*	543
Lake	95441*, 95485, 95493, 95979*, 95987*	767
Lassen	95947*, 96006*, 96020*, 96056*, 96101*, 96104*, 96121*, 96123, 96128, 96130*	2,447
Los Angeles	90001-90011, 90013-90019, 90021-90023, 90026-90029, 90031-90033, 90035-90048, 90057-90059, 90061-90066, 90068, 90071, 90210-90212, 90220, 90221, 90232, 90245, 90254,90255, 90262, 90266, 90270 90272, 90280, 90290, 90291, 90304, 90305, 90401-90403, 90405, 90601, 90602, 90606, 90704*, 90731, 90744, 90802-90808, 90810, 90813, 90814, 91001, 91006, 91011, 91016, 91020, 91024, 91030, 91103-91108, 91201, 91202, 91204, 91205, 91207, 91208, 91214, 91340, 91501, 91505, 91506, 91601, 91602, 91604, 91606, 91768, 91770, 91775, 91776, 91780, 91801, 91803, 93553, 93563	360,287
Madera	93610*, 93653*, 95333*	1,138
Marin	94901, 94924, 94930, 94933, 94937*, 94938, 94939, 94940, 94941, 94946, 94952*, 94960, 94963, 94965, 94970, 94973	8,651
Mariposa	93623, 93653*, 95325, 95333*, 95369*	309
Mendocino	95420, 95432, 95437, 95449*, 95455, 95459, 95466, 95488, 95494	1,222
Merced	93610*, 95303, 95322, 95333*, 95369*	1,872
Modoc	96006*, 96015, 96056*, 96101*, 96104*, 96108, 96112, 96115, 96134*	955
Mono	93517*	61

SOURCE: EWG, from U.S. Census data.

Table 2. California ZIP codes where, based on age of housing, all children should be tested for lead poisoning.

County	Zip Codes (* denotes zip codes that cross county lines)	Number of Children 1-5 Years Old
Monterey	93450*, 93901, 93923, 93950, 95043*	3,248
Napa	94515*, 94559, 94574	2,864
Nevada	95728*, 95945*, 96111*	1,442
Orange	92651, 92661, 92662, 92666	2,086
Placer	95714, 95717, 95728*, 95945*, 96141*	1,504
Plumas	95947*, 95983, 96020*, 96121*, 96122, 96130*	2,070
Riverside	92501	1,560
Sacramento	94571*, 95615, 95641, 95652, 95690*, 95814, 95815, 95816, 95817, 95818, 95819, 95820	12,177
San Benito	93450*, 95043*	173
San Bernardino	91759, 92267, 92304, 92327, 92339, 92358, 92368, 92394, 92401, 92405, 92410, 92411, 93562	13,317
San Diego	91917, 91934, 91950, 92066, 92070, 92086, 92101, 92102, 92103, 92104, 92106, 92107, 92113, 92116, 92118, 92135	24,379
San Francisco	94102, 94103, 94104, 94107, 94108, 94109, 94110, 94112*, 94114, 94115, 94116, 94117, 94118, 94121, 94122, 94123, 94124, 94127, 94129, 94131, 94132, 94133, 94134, 94501*, 94937*	40,187
San Joaquin	95202, 95203, 95204, 95205, 95206, 95215, 95231, 95236, 95320*, 95690*	14,411
San Luis Obispo	93268*, 93430, 93431, 93450*, 93461	1,838
San Mateo	94005, 94010, 94014, 94020*, 94021*, 94025*, 94027, 94030, 94060, 94062, 94063, 94070, 94074, 94112*, 94301*, 94401, 94402	23,702
Santa Barbara	90704*, 93001*, 93101, 93103, 93108	6,620
Santa Clara	94020*, 94025*, 94301*, 95110, 95112, 95125, 95126, 95140*, 95360*	13,541
Santa Cruz	94020*, 94021*, 95005, 95006, 95017, 95018, 95060, 95062	6,744
Shasta	96019, 96025*, 96028*, 96047*, 96056*, 96057*, 96063*, 96076*, 96087	1,315
Sierra	95728*, 95922*, 96111*, 96118, 96124, 96125, 96126	270
Siskiyou	96014, 96025*, 96027, 96028*, 96031*, 96034, 96038, 96056*, 96057*, 96058, 96086, 96094, 96134*	1,768
Solano	94512, 94571*, 94590	3,771
Sonoma	94515*, 94922, 94952*, 94972, 95404, 95412, 95421, 95436, 95441*, 95442, 95444, 95446, 95448, 95449*, 95450, 95462, 95465	7,993
Stanislaus	95140*, 95230, 95313, 95320*, 95323, 95326, 95354, 95360*	4,602
Sutter	95645*, 95668, 95674*, 95953*, 95957	1,131
Tehama	95928*, 95963*, 96020*, 96047*, 96063*, 96076*	3,378
Trinity	96031*, 96076*	47
Tulare	93235, 93244, 93247	1,728
Tuolumne	93517*, 95309, 95335	65
Ventura	93001*, 93015	3,815
Yolo	95606, 95607, 95612, 95645*, 95679*, 95698	452
Yuba	95674*, 95922*, 95941*, 95953*	891

SOURCE: EWG, from U.S. Census data.

Table 3. In most counties, the state has failed to identify 90 percent or more of lead-poisoned children.

Rank	County	Total Estimated Lead Poisoned Children	Lead Poisoned Children Identified by the State	Children Missed by the State
1	Los Angeles	85,421	7,296	91%
2	Alameda	13,639	1,052	92%
3	San Diego	13,385	814	94%
4	Orange	10,003	630	94%
5	San Bernardino	9,756	555	94%
6	Santa Clara	7,440	491	93%
7	Sacramento	6,689	191	97%
8	San Francisco	6,266	534	91%
9	Riverside	6,264	325	95%
10	Fresno	5,472	502	91%
11	Contra Costa	5,174	109	98%
12	Kern	4,349	554	87%
13	San Mateo	3,998	95	98%
14	San Joaquin	3,288	174	95%
15	Ventura	3,178	204	94%
16	Monterey	2,558	196	92%
17	Solano	2,424	78	97%
18	Stanislaus	2,345	50	98%
19	Tulare	2,275	224	90%
20	Santa Barbara	1,862	221	88%
21	Sonoma	1,757	40	98%
22	Merced	1,447	100	93%
23	Santa Cruz	1,174	156	87%
24	Marin	929	6	99%
25	Butte	838	49	94%

Table 4. Percentage of lead-poisoned children in the largest California cities.

City	Estimated Number of Lead Poisoned Children 1992-98	Estimated Percent of Children Lead Poisoned 1992-98 (1-5 yr olds)
Oakland	7,879	11.0%
San Francisco	6,569	7.7%
Long Beach	5,527	6.2%
Los Angeles	35,167	5.3%
Sacramento	3,835	5.1%
San Bernardino	1,910	4.6%
Stockton	1,894	3.8%
San Diego	7,066	3.6%
Fresno	3,127	3.6%
Glendale	1,015	3.5%
Riverside	1,510	3.1%
Bakersfield	1,296	3.1%
San Jose	4,654	2.9%
Oxnard	919	2.8%
Garden Grove	814	2.7%
Santa Ana	1,814	2.6%
Modesto	948	2.6%
Anaheim	1,318	2.5%
Fremont	785	2.3%
Huntington Beach	470	1.9%

SOURCES: EWG, from U.S. CDC and Census data.

have not previously been tested. Approximately 70 percent of California's 1- to 5-year-olds are covered by one of the two programs (State Auditor 1999). Children not covered by the programs are also supposed to be tested if they match known risk factors in a verbal screening questionnaire. But DHS estimates that no more than 1 in 5 children in any risk category are actually tested.

Despite state and federal law requiring doctors and HMOs to provide blood lead testing for all lower-income children, no more than 1 in 5 children in California are tested.

• The state is complicit in this neglect by health care providers because it has failed to establish, as required by law, a minimum and mandatory "standard of care" which could be used to hold providers accountable. In the 1991 legislation establishing the state lead prevention program, adoption of a standard of care was required by 1993.

• The state's Childhood Lead Poisoning Prevention Program is woefully underfunded. Almost three-fourths of its budget comes from fees paid by companies who formerly made leaded paint or gasoline or whose operations emit lead. In 1995 and again this year, these companies sued to avoid paying the fees, undermining the program's financial stability, and today DHS collects only three-fourths of the $16 million it is authorized to collect from lead polluters annually. The program receives less than 20 percent of its funding from the state treasury.

• California's failure to protect children from lead poisoning costs the state hundreds of millions of dollars annually in special education, medical care and lost earnings for children who suffer learning impairment or other conditions as a result of lead poisoning. Based on calculations by national experts, EWG estimates that by reducing the statewide average level of lead in children's blood by just 10 percent of the CDC's risk level, California could save more than $800 million a year — enough to test every 1- to 5-year old in the state and have $576 million left over. (Schwartz 1994).

No Safe Level of Exposure

Although average levels of lead in the blood of America's children have dropped dramatically in the last 20 years, few people realize that, according to the CDC, lead paint remains the number one environmental threat to children's health. For young children, there is no known safe level of exposure to lead; even low levels can cause reduced IQ and attention span, learning disabilities, and a wide range of other health effects. Lead is most dangerous to children under six, whose brains and nervous systems are still developing and whose outdoor activities and tendency to put things in their mouths can expose them to a disproportionate amount of lead in soil, paint and dust.

CDC estimates that nationwide, about 4.4 percent, or 900,000, of children ages 1 to 5 have harmful levels of lead in their blood. But national averages mask the severity of the problem in many communities. Children from poor families are eight times more likely to be lead poisoned than kids from higher-income families. Nationally, African-American children are five times more likely, and Mexican-Americans almost twice as likely, to be poisoned than Anglo children. Of the approximately 15,000 surnames in DHS' limited state database with elevated blood levels, about 70 percent appear to be Latino.

Even if health care providers complied with state law requiring testing of the lower-income children covered by Medi-Cal or CHDP, the vast majority of lead poisoning cases would not be reported to the state health department. California requires reporting if a child's blood lead level is at least 25 micrograms per deciliter of blood (μg/dL), but since 1991 CDC has defined lead poisoning cases at 10 μg/dL.

The state's failure to identify the overwhelming majority of children with dangerous levels of lead in their blood makes it impossible to develop an effective statewide program to reduce lead poisoning. As a result, despite significant advances in the diagnosis and prevention of lead poisoning, a generation of high-risk California children have suffered needlessly.

One California county is suing for damages from lead paint manufacturers, who, like tobacco companies, covered up the truth about their products' danger to human health.

This tragedy is intolerable, not only for its effect on public health but on other areas of public policy. Continuing to allow hundreds of thousands of children to suffer from lead poisoning has serious consequences for the future of California's schools, health care, economy and criminal justice system. Gov. Gray Davis has repeatedly declared that education is his utmost priority; if so, the Davis Administration could make no better investment than ensuring that all lead-poisoned children are identified and treated.

Recommendations

• The state should immediately codify regulations requiring the screening of all children and adopt regulations that require reporting of all blood levels, at least until health officials have enough information to design a comprehensive, effective statewide program of lead poisoning prevention, treatment and abatement.

• All health care providers must comply with existing state law to test low-income and other at-risk children and report the results to the state. The state should adopt an official standard of care that can be used by DHS and local lead programs to enforce compliance. The state should take HMOs and other providers who fail to follow the law to court.

• The state should take a leading role in legal efforts to ensure adequate funding for a comprehensive program of testing, reporting and treatment. In March 2000, Santa Clara became the first county in the U.S. to sue paint manufacturers — including Los Angeles-based Atlantic Richfield Co. — for damages, on the model of the nationwide lawsuits against tobacco companies. Santa Clara has asked that the suit be certified as a class action, meaning all California jurisdictions could be awarded damages. Last year Rhode Island filed a similar suit, and has invited other states to join.

• Regardless of legal strategies, the Davis Administration and the Legislature should significantly increase public funding for the state lead program and to local programs. This must include increased funding for programs to educate the public and health care providers about the causes, prevention and treatment of lead poisoning. Many low-income Californians have little or no contact with the health care system, where they might learn about lead hazards. Unfortunately for those with health-care access, a 1996 DHS survey found that fully half of California doctors did not even know that peeling house paint is the most common source of lead poisoning.

A Slow Poisoning

There is no disagreement about the adverse health affects of lead. It is a highly toxic heavy metal that can cause permanent neurological and behavioral problems and affects virtually every system in the body (CDC 1991). Young children are particularly susceptible to the effects of lead because they explore their world with hands and mouth, increasing the chances for ingestion. In addition, a child or fetus absorbs up to four times more lead than an adult (DHS 1998a). Adults typically absorb 10 to 15 percent of ingested lead, but for children and pregnant women, it's as high as 50 percent (Royce and Needleman 1985).

The state of California lists lead as a developmental and reproductive toxin because of its potential for causing infertility and spontaneous abortion in adults and developmental defects in children. Some studies also suggest a relationship between rising blood lead levels and pre-term delivery, low birth weight and fetal growth retardation (Schettler et al 1998). Lead can affect children at extremely low levels, and there is no evidence of a threshold dose below which developmental effects do not occur. Levels as low as 10 micrograms per cubic deciliter (μg/dL) — currently considered the threshold for elevated blood lead level — have been associated with decreased intelligence and impaired neurobehavioral development (CDC 1994).Consumption of as little as 10 micrograms -- one-millionth of a gram, which is 1/28 of an ounce-- of lead a day can poison a child.

Lead can affect children at extremely low levels, and there is no evidence of a threshold dose below which developmental effects do not occur.

Since lead has been removed from gasoline and food containers, its most common source is lead-based house paint. About 10 billion pounds of lead paint were used in the United States between its introduction in 1889 and the imposition of federal restrictions in 1970 -- 61 years after France, 48 years after Australia and 44 years after Great Britain. House dust is often contaminated by lead-based paint that is peeling or deteriorating, or is disturbed during renovation or the preparation of painted surfaces for repainting without proper safeguards. Soil contamination can be traced to deteriorating exterior paint or the past widespread use of leaded gasoline.

Lead was a major ingredient in most interior and exterior oil house paint before 1950 and was still used in some paints until 1978, when the residential use of lead paint was banned. The Department of Housing and Urban Development (HUD) estimates that three-quarters of pre-1980 housing units contain some lead-based paint, and that the likelihood, extent, and concentration of lead-based paint increase with the age of the building. In

1995, a federal task force on lead-based paint in the United States estimated that 6 percent to 16 percent of the nation's housing units contained lead-based paint hazards. Nor are exposures limited to the home: In California, a 1998 DHS survey found 78 percent of schools have paint with lead content exceeding the safety threshold of 5,000 parts per million. (DHS 1998b.)

Other sources of lead in a child's environment include lead-contaminated drinking water, lead-contaminated soil, imported ceramic tableware with lead glaze, old and imported toys or furniture painted with lead-based paint, the clothing of parents whose work or hobby involves high levels of lead, and even home remedies used by some ethnic groups. In California, state officials estimate that about one-sixth of lead-poisoned children were exposed through "contact with ethnically associated products such as home remedies, cosmetics, ceramic pottery, cookware and food." (DHS 1999).

Lead Poisoning in Communities of Color

About 11percent of African-American children and 4 percent of Mexican-American children nationwide have lead poisoning, compared to 2.3 percent of white children.

Communities of color and low-income communities bear a much greater burden of lead poisoning. In 1997, the CDC's National Health and Nutrition Examination Survey (NHANES) found that while 1 to 2 percent of middle- and high- income children in the U.S. have lead poisoning, 8 percent of low-income children do. On average, low-income children have blood lead levels twice that of high-income children — 3.8µg/dL vs. 1.9 µg/dL. Similarly, 11.2 percent of African-American children and 4 percent of Mexican-American children nationwide have lead poisoning, compared to 2.3 percent of white children. (The CDC's national figures do not account for Latinos of other ancestries.) (CDC 1997). In California, DHS says 70 percent of lead-poisoned children in its limited database are Latino, although Latinos make up only 45 percent of the state's one-to-five-year-olds (DHS 1999).

There are no overt symptoms of lead poisoning. The only way to identify and treat lead- poisoned children is through early and periodic testing, diagnosis and treatment. In 1991, the CDC recommended that all young children get blood-lead tests. At that time, one in six children in the U.S., and as many as 67 percent of black inner-city children, had lead poisoning high enough to cause significant impairment to their neurological development. (NAACP 1991.) Dramatic reductions in the prevalence of lead poisoning led the CDC in 1997 to alter its guidelines and recommend targeted testing of at-risk children based on housing, income and race. rather than "universal" testing.

CDC's risk factors apply to a large percentage of California children. According to the state auditor, 70 percent of the 1.1 million 1- and 2-year-olds in the state are covered by Medi-Cal or the Child Health and Disability Prevention programs, and CDC continues to recommend testing for all children on public assistance. Nationally, the rate of lead poisoning for children served by federal health programs is five times that of children not covered. (GAO 1999). About 650,000 children live in California

neighborhoods where at least 27 percent of the housing was built before 1950, another of CDC's indicators. Thirteen percent of all Californians have incomes below the federal poverty level, another CDC indicator.

This evidence of a higher-than-average number of at-risk children in California suggest that a targeted testing program still may fail to identify many poisoning victims. In 1997, the state convened an expert panel to develop recommendations for blood lead testing, Although the panel endorsed CDC's targeted testing approach, some panel members from high-risk communities dissented, recommending that universal testing continue throughout the state, based on "concern that lead poisoning was too common to adopt a more targeted screening approach, or . . . a belief that universal screening must continue until local communities have adequate, high quality local prevalence data for estimating community specific risk." (DHS 1999 Attachment 1.)

Failures of the State Lead Poisoning Prevention Program

California passed the Childhood Lead Poisoning Prevention Act in 1986 and subsequently established the Childhood Lead Poisoning Prevention Branch within DHS. State law says the branch is supposed to "compile information concerning the prevalence, causes, and geographic occurrence of high childhood blood lead levels; identify and target areas of the state where childhood lead exposures are especially significant; [and] . . . design and implement a program . . . [to] reduce the incidence of excessive childhood lead exposures in California." (Health and Safety Code sections 372, et seq).

In 1990, a federal civil rights lawsuit was filed against DHS by the NAACP Legal Defense and Educational Fund on behalf of two Oakland children, charging that the state had failed to comply with federal Medicaid law requiring blood lead testing and treatment for low-income children. The NAACP was joined by the Natural Resources Defense Council, the National Health Law Program and American Civil Liberties Union, and eventually by the U.S. Department of Health and Human Services. Said NRDC attorney Joel Reynolds: "The state cannot continue to ignore the slow poisoning of our children by lead contamination." (LA Times 1990.)

"The state cannot continue to ignore the slow poisoning of our children by lead contamination."
-- NRDC lawsuit, 1990

In November 1991, the state settled the case by agreeing to a court order to improve lead-poisoning education, to "expand the laboratory-based reporting system to include all blood lead tests (not just elevated blood lead tests) for children," and to comply with CDC recommendations by directing health care providers to test all eligible children at age 1 and periodically screen all eligible 1- to 5-year-olds by asking a set of standard questions to identify kids at high risk.

Although the CDC's policy recommendations have changed since 1991, it is clear that the state has not complied with either the letter or the spirit of the court order settling the lawsuit. In April 1999, the California State Auditor issued a report documenting DHS' failures:

As a direct result of the state's policy failures, "thousands of lead-poisoned children have been allowed to suffer needlessly."
-- State Auditor's report

> "After more than 12 years [since passage of the state lead-poisoning prevention law], the department is no closer to achieving the goal of determining the extent of childhood lead poisoning. . . . [This is the] direct result of [DHS'] failure to ensure (1) children receiving services from its Medi-Cal and Child Health and Disability Prevention programs receive blood-lead testing as required, and (2) the State's remaining children receive an evaluation for the risk of lead poisoning during periodic health assessments. . . . As a result, thousands of lead-poisoned children have been allowed to suffer needlessly." (State Auditor 1999.)

In a report on the California audit, Dr. Susan K. Cummins of DHS, head of the California program and chair of the federal Advisory Committee on Childhood Lead Poisoning Prevention, told *The New York Times* that only 20 percent of eligible children in the state were being tested, "and that's probably an optimistic estimate." (NYT 1999.)

The state auditor's indictment of DHS was sweeping and blunt. It said the department had failed to adopt regulations establishing a standard of care requiring health care providers to verbally screen all children; failed to ensure that health care providers give blood tests to eligible lower-income 1- and 2-year-olds; failed to follow CDC guidance on testing and blood-lead levels; failed to develop a reporting system that tracks the results of all blood-lead tests; and failed to adequately monitor the case management and treatment of the few lead-poisoned children it had identified. Finally, it said DHS was in danger of losing federal grants because the state had failed to provide adequate matching funding and staffing.

Local Programs

Most of the state's counties and some cities also have childhood lead poisoning prevention programs. When a medical provider reports a lead poisoning case, the state is responsiblefor ensuring the investigation and and abatement lead hazards, with the local programs providing treatment if necessary — although in practice it is often the local program doing the investigation and mitigation. In his report on the shortcomings of the DHS lead program, the State Auditor said:

> "Fortunately, we found in our review of selected (poisoning) cases that local programs have provided adequate care. However, in a number of instances, the local programs were unable to ensure that the source of the poisoning was eliminated or reduced because they require assistance in their eforts to compel property owners to do so. . . . [T]he Legislature should grant California's cities and counties the authority to compel property owners to eliminate or reduce lead hazards."

Some local programs maintain their own data, and may have better figures than the state due to informal arrangements with blood labs to report cases that don't reach the state-mandated reporting level. However, EWG checked the data of the lead programs in the 10 counties with the largest numbers of children and found little difference with the state's numbers. For example, between 1992 and 1996 the San Francisco CLPPP identified 381 children with elevated blood lead levels; the state had records of 341. EWG's calculations yield an estimate of 6,300. In its most recent data report, the San Francisco CLPPP says it is "anxiously waiting for DHS to set up electronic data transfer from laboratories to DHS and to the county lead programs in order to capture all (testing) data." (SF CLPP 1998.)

The one instance where numbers provided by a county were significantly different from state data was in San Bernardino County. The county identified 2,207 lead poisoned children between 1992 and 1999, compared to the state's 664. According to EWG's calculations, the estimated number of lead poisoned children in the county 1992 to 1998 was 9,756.

Costs

The failure to identify and prevent childhood lead poisoning costs California enormous sums in medical costs, compensatory education, lost earnings, increased infant mortality and neonatal care. Medical costs for children with high blood lead levels include physician visits, laboratory testing, chelation therapy, neuropsychological testing, and follow-up testing. Children with high blood lead levels are also more likely to require speech therapy and other special education. (HUD 1999).

If all California children with lead poisoning were treated, the state would save up to $2.5 billion a year in lost earnings alone.

At $10 each, providing a blood test to every 1- to 5-year old in California would cost less than $25 million a year. Reporting, treatment and lead abatement would certainly add significantly to the cost of the program. But if all of the state's estimated 211,000 children with elevated blood lead levels since 1992 had been identified, treated and their blood lead levels were reduced by 5 µg/dL, the state could have saved between $576 million and $2.5 billion in lost earnings alone. (See Chapter 4, Methodology.) In that same period, 4,200 children with severe blood lead levels (25µg/dL or above) were reported to the state. If medical intervention had prevented the blood lead of those children from reaching the 25µg/dL mark, the state would have saved an estimated $24 million in medical and special education costs. Since this only takes into account reported cases, the actual savings are greater.

Failures by Medical Providers

Primary responsibility for the widespread failure to screen and test lies with the state lead program, which is responsible for setting standards and ensuring that health care providers follow them. But health care providers are also failing to meet their responsibilities.

A 1996 survey of 821 California pediatricians and family practice doctors conducted for DHS found that only 29 percent order blood tests for eligible lower-income children and only 58 percent conduct verbal screening for all children. The survey found a startling lack of knowledge about lead poisoning: More than half of the doctors did not know that lead-based paint is the primary cause of lead poisoning for young children, and 45 percent did not know the minimum blood lead level that requires drug treatment. Clearly, California doctors need better education about lead poisoning — under state and federal law, another responsibility of DHS. (DHS 1996)

The survey included both doctors in private practice and those working for health maintenance organizations. The state has no data or other reliable information on HMOs' compliance with testing requirements, but a reliable source in the state health department said they believe HMOs have a lower compliance rate than fee-for-service doctors and clinics.

The state's largest HMO has no blood-lead testing policy, and has argued that better lead poisoning prevention programs should not be a priority.

EWG contacted spokespersons for California's three largest HMOs — collectively serving 10.5 million patients, with total revenues of more than $21.5 billion for the year ending September 1999 — and was told that Kaiser Permanente and Pacificare have no specific policies on lead tests or reporting, but leave the decisions to individual doctors. In medical journals, Kaiser has criticized CDC's and DHS's methods for estimating numbers of lead-poisoned children, arguing that "spend[ing] billions of dollars on complex and controversial lead screening, treatment and abatement programs [instead of] the many more serious, unaddressed health needs of U.S. children is to misprioritize current health issues." (Schoen 1992.)

Health Net provided EWG a copy of its written policy, which directs its physicians to test all children determined through verbal screening to be high risk. The Health Net policy did not address requirements for reporting elevated blood lead levels to the state.

Recently, the State of Missouri filed suit against a leading HMO, Prudential Health Care Plan, charging it had failed to obey law requiring blood tests for all children on Medicaid. A source in the Davis Administration said California is also considering legal action against one or more HMOs that fail to provide the required tests.

Lead Polluters Fight Fees; Local Governments Fight Back

In its defense, DHS points out that progress in complying with the NAACP settlement was halted in 1995, when Sinclair Paint Co. of Los Angeles, joined by the Western States Petroleum Association and other lead-related industry groups, challenged the legality of the fees assessed on past and present lead polluters. These fees make up about 80 percent of the lead program's budget, and when a state superior court ruled that they were unauthorized taxes, the program's viability — in the absence of an adequate safety net from the Legislature and the Wilson Administration — was seriously threatened. In 1997, the California Supreme Court re-established the legality of the fees, but not soon enough to prevent serious cutbacks in the program, which DHS says it is still recovering from.

Lawsuits by lead polluters threaten the viability of California's severely underfunded lead poisoning prevention program.

Earlier this year, Behr Process Corp. of Santa Ana and Textured Coatings of America, of Los Angeles, filed separate Superior Court lawsuits against the state, arguing they should be exempted from paying the fees because historically they are responsible for only a minimal amount of lead pollution. Behr's suit says Behr paid a total of $678,000 in lead fees between 1993 and 1999, in annual assessments based on the number of gallons of it paint sold in the previous two years. Textured Coatings is seeking a refund of about $38,5000 in fees paid from 1993 to 1995. DHS says the outcome of the suits "will significantly affect the funding available to the Department to administer (the program)," because other lead polluters would also be allowed to seek exemptions.

The state Board of Equalization, which collects the lead program fees for DHS, denied EWG's request under the California Public Records Act for a list of all lead polluters and how much each pays. A Board attorney said information about the feepayers' "business affairs [and] operations" is confidential under state law. Overall the state collects about $12 million a year in lead fees, although it is authorized by law to collect $16 million.

The legal tide may be turning. In March, Santa Clara became the first county in the U.S. to sue for damages from paint manufacturers, citing a "callous disregard of the health and welfare of people, especially children" and their "fraudulent concealment of facts" surrounding the health hazards of lead paint. In its suit against eight paint companies and a trade group, the Lead Industries Association, the county charged that U.S. paint manufacturers knew of the danger of lead as early as 1904, yet conspired to cover it up and continued to promote the use of lead paint — even claiming health benefits from its use and marketing it to children. (Figure 2.) Said Donald F. Gage, chair of the Santa Clara County Board of Supervisors: "Like the tobacco industry, paint manufacturers knew their product was harmful to people's health, yet they took measures to conceal that knowledge from the public. It's time they stand accountable." (Santa Clara 2000.)

Santa Clara County did not request a specific amount of damages from the paint companies. It has asked a Superior Court judge to certify the suit as a class action, meaning that all governmental jurisdictions in California that spend public funds for lead poisoning programs could receive damages. Meanwhile, the State of Rhode Island and the City of New York have filed similar suits. Rhode Island officials say they expect up to a dozen other states to join that state's lawsuit.

Figure 2. Lead Industries Association ad, The Saturday Evening Post, 1941 (Exhibit in Santa Clara Co. lawsuit)

California's Lead Risk Hot Spots

Between 1992 and 1998, an estimated 211,858 children from 1 to 5 in California suffered from blood lead levels high enough to cause learning disabilities, loss of IQ and other problems. However, due to the state's failure to ensure adequate testing and reporting, only 14,915 of these children — just 7 percent — were identified by the state. All should have received some sort of treatment or preventative action, but because the state does not adequately monitor the case management efforts of local lead programs, it is not known how many of those identified were treated.

About 4,200 of identified children had severe blood lead levels of 25 ug/dL, the state's mandatory reporting level, which is 2.5 times higher than the lead poisoning level adopted by the CDC and most states. The remainder, about 10,000 had blood levels between 10 ug/dL and 25 ug/dL, and were reported to the state voluntarily. This does not mean, however, that almost one-third of California's lead-poisoned children had the higher blood lead levels, since reporting of higher levels is mandatory and of lower levels voluntary. Nationwide, CDC estimates that no more than 0.2 to 0.3 percent of 1-to-5-year-olds have blood levels of 25 ug/dL or above, which would be about 11,611 to 17,416 children in California between 1992 and 1998.

The estimated number of lead poisoned children in the period analyzed was greatest in Los Angeles County (85,421), Alameda County (13,639), San Diego County (13,385) and Orange County (10,003). During that period, the state identified 7,296 victims in Los Angeles County, 1,052 in Alameda County, 814 in San Diego County and 630 in Orange County. Of the children identified by the state, the counties with the highest number of victims with severely elevated blood levels (above 25 ug/dL) were Los Angeles (2,046), San Diego (264), Alameda (251), Kern (175) and Fresno (171).Relatively high percentages of identified lead poisoned children could indicate either a high prevalence of poisoning or of the relative effectiveness of the state lead program in identifying and testing kids - most likely, a combination of the two factors.

Areas where children are at critical risk of lead poisoning are found in Southern California, the Bay Area and the Central Valley.

During that same period, EWG estimated that as a percentage of lead poisoned children to the total population of 1-to-5-year-olds, San Francisco (7.4 percent), Alameda (5.8 percent), Los Angeles (4.9 percent) and San Mateo (3.7 percent) counties ranked highest.

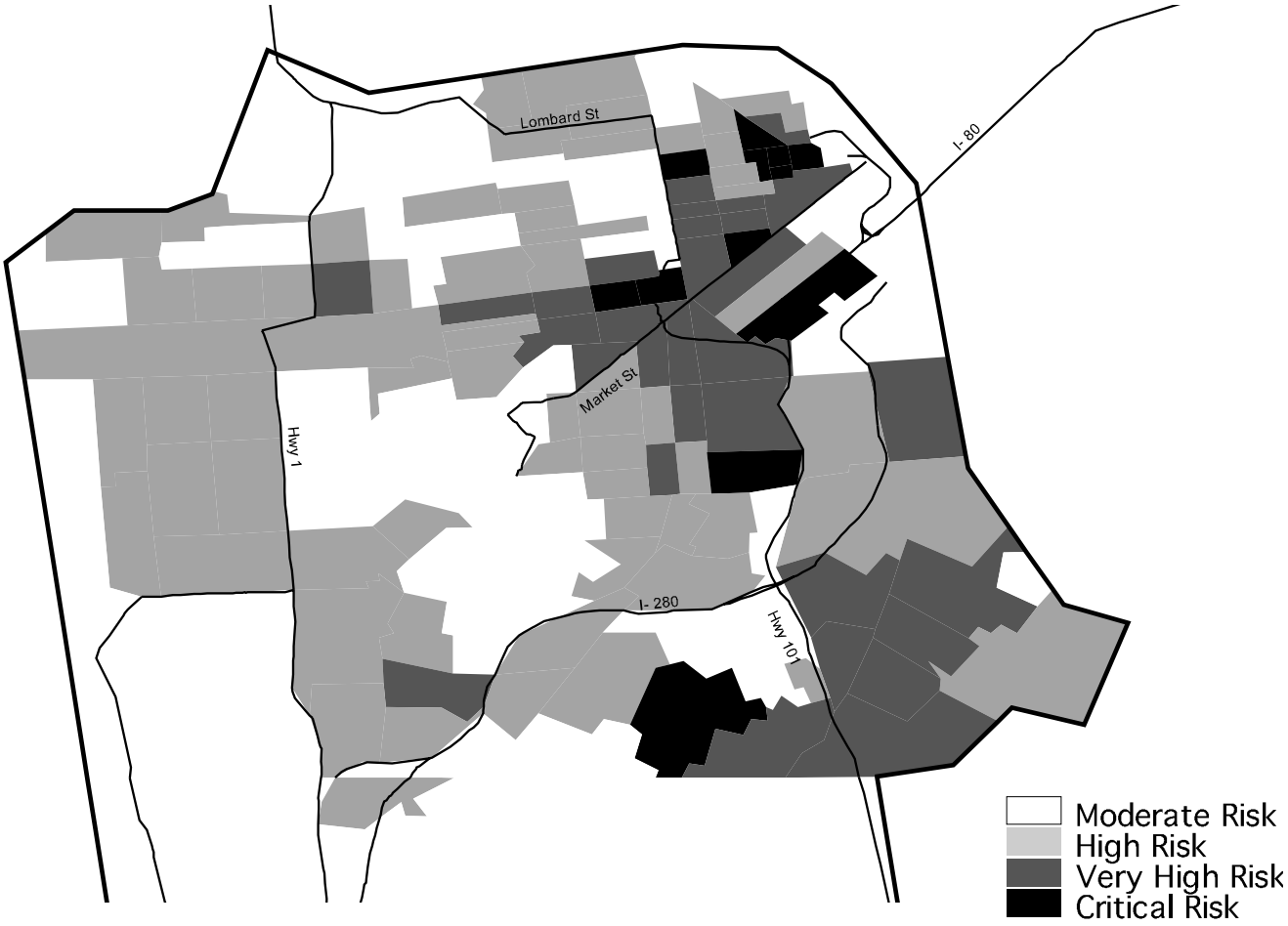
While the CDC recommends considering a number of factors in determining risk of lead poisoning, its 1997 guidelines give special emphasis to old housing. The guidelines recommend testing all children who live in ZIP codes where 27 percent or more of the housing was built before 1950 in the absence of good local data on prevalence. In California, 646,000 children live in 460 ZIP codes where a least 27 percent of the housing is pre-1950. About 266,660 of these children live in ZIP codes where at least 30 percent or more of the population have incomes below the federal poverty level, a second CDC risk factor. Finally, about 114,995 of those children live in areas where at least 75 percent of the population are persons of color, the third of the CDC's risk factors.

Even children in affluent areas, including Beverly Hills 90210, are at risk for lead poisoning.

Every child in California is at risk of lead poisoning, even in areas with high average incomes and mostly white populations. For example, in the California ZIP code that is a national symbol of affluence and privilege — Beverly Hills 90210 — about 34 percent of the housing was built before 1950, well above CDC's 27 percent threshold for testing all children in an area. Although it is likely that in wealthier neighborhoods many homes have had lead hazards abated, an unknown number of children remain at risk in the most privileged areas. Nevertheless, lead risk is greater in older, low-income, predominantly non-Anglo neighborhoods, which as expected are concentrated in central cities.

On the following pages are closer looks at some of the "hot spots" where children are at the most severe risk. These risk categories are based on 1990 U.S. Census tracts, which typically contain 2,500 to 8,000 in population, but may be any geographic size, A searchable database that provides lead risk factors for every ZIP code in California is at www.ewg.org

Figure 2. Lead poisoning risk in San Francisco.



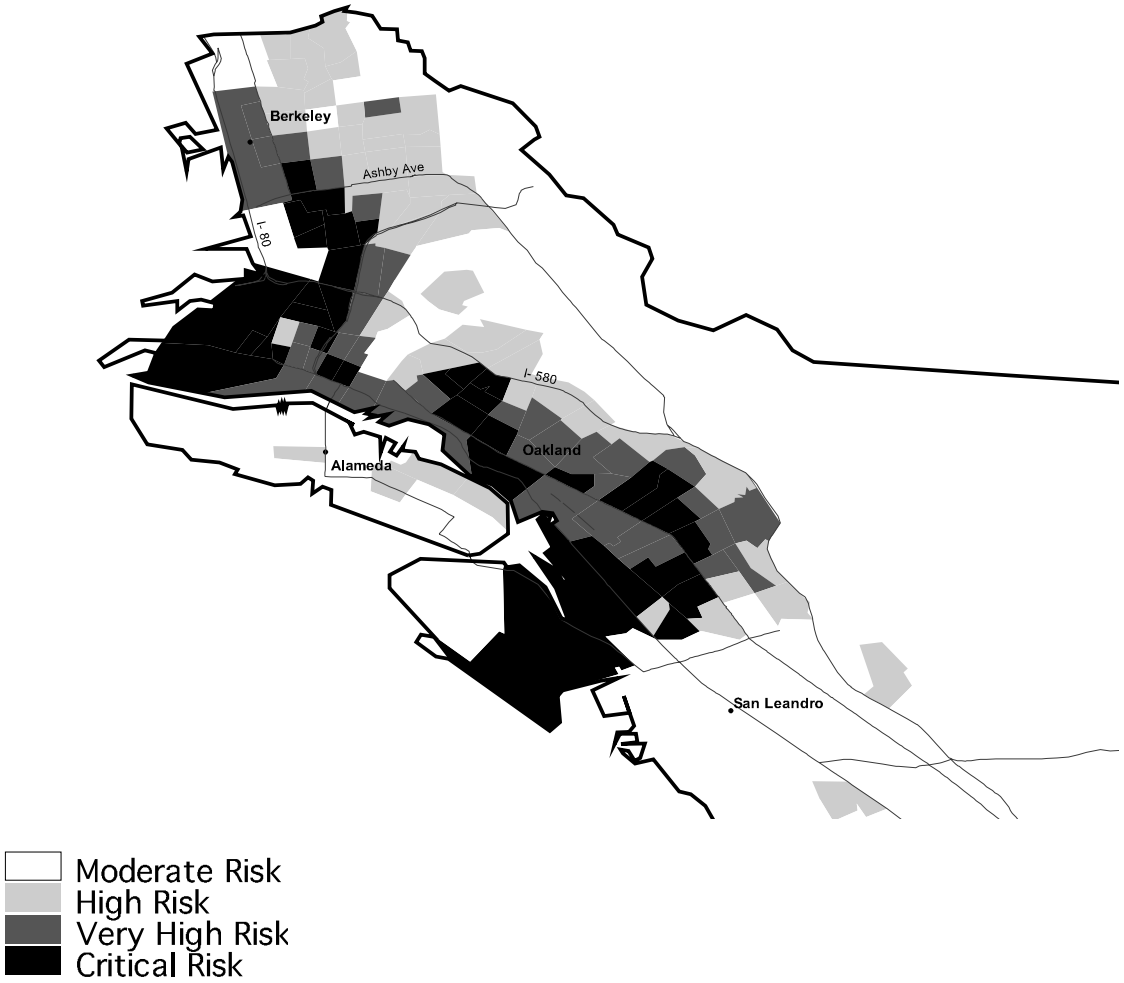
SOURCE: EWG, from CDC and Census data.

San Francisco

The City and County of San Francisco has a higher percentage of old housing than any other county in California. Approximately 65 percent of San Francisco housing was built before 1950. Combining this factor with poverty and non-Anglo population, hot spots are found in the Mission District, South of Market, Tenderloin, Chinatown and Crocker-Amazon. However, much of the rest of the city is categorized as high or very high risk. (Fig. 3) Approximately 646 children in these criticial risk areas were poisoned by lead exposure from 1992 to 1998.

Between 1992 and 1998, an estimated 6,266 kids in San Francisco were lead poisoned. The state identified only 534, just 8.5 percent, mostly in the Mission.

Figure 3. Lead poisoning risk in Alameda County.



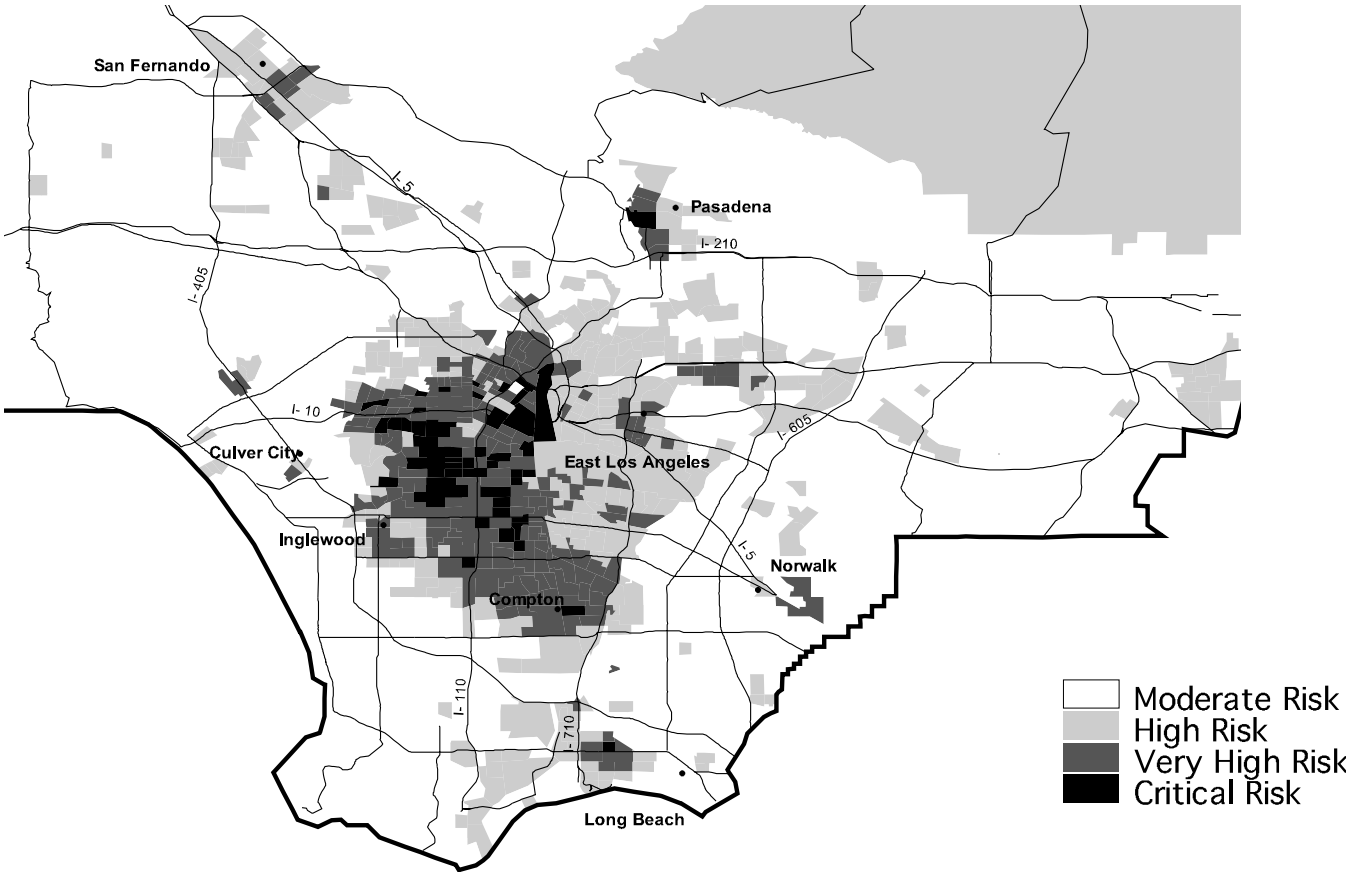
SOURCE: EWG, from CDC and Census data.

Alameda County

Alameda County, particularly parts of Oakland and Berkeley, also have a high percentage of housing built before 1950 — about 34 percent. Oakland also has a high percentage of households below the poverty level and communities of color. In Oakland, lead risk hot spots are found in east Oakland, west Oakland, the Fruitvale district and downtown. An estimated 3,660 children were lead poisoned in these critical-risk areas of the county. However, much of the remainder of Oakland, as well as west Berkeley, includes areas of very high risk. (Fig. 4.)

An estimated 13,639 children had lead poisoning in Alameda County in 1992-98. The state identified a total of 1,052, or 7.7 percent, mostly in west and east Oakland.

Figure 4. Lead poisoning risk in Los Angees County.



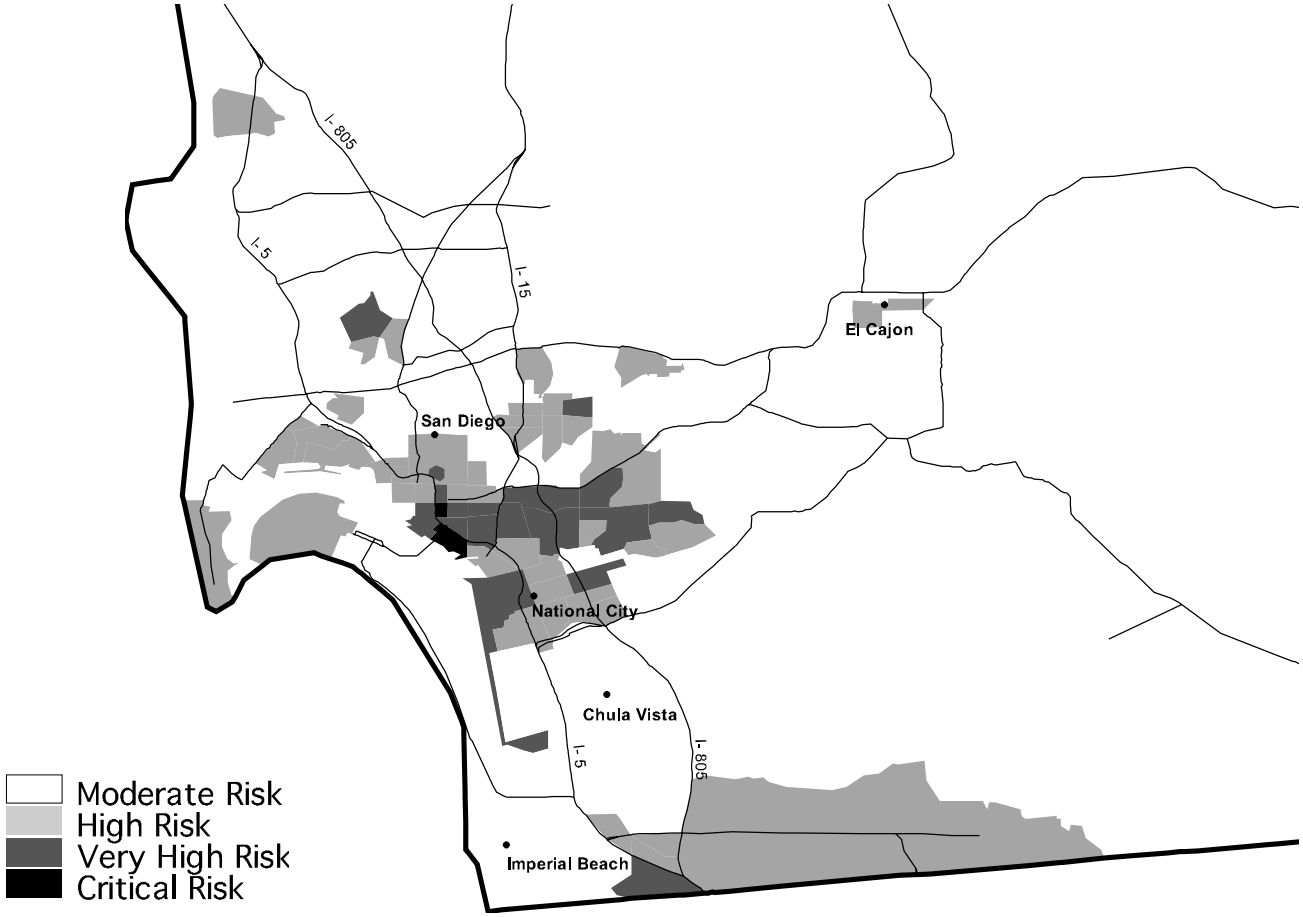
SOURCE: EWG, from CDC and Census data.

Los Angeles County

Compared to the central cities of the Bay Area, Los Angeles County has less pre-1950 housing, but many areas still have high percentages of old housing, poverty and minority populations. Critical lead risk hot spots are found in east and south-central Los Angeles and near Long Beach Harbor. Approximately 7,382 children in these hot spots were lead poisoned from 1992 to 1998. High and very high risk areas, however, were found throughout the county, including Santa Monica, the San Fernando Valley, Pasadena and Rosemead.

Between 1992 and 1998, Los Angeles County had an estimated 85,421 lead poisoned children. The state identified 7,296, or 8.5 percent. (Fig. 5.)

Figure 5. Lead poisoning risk in San Diego County.



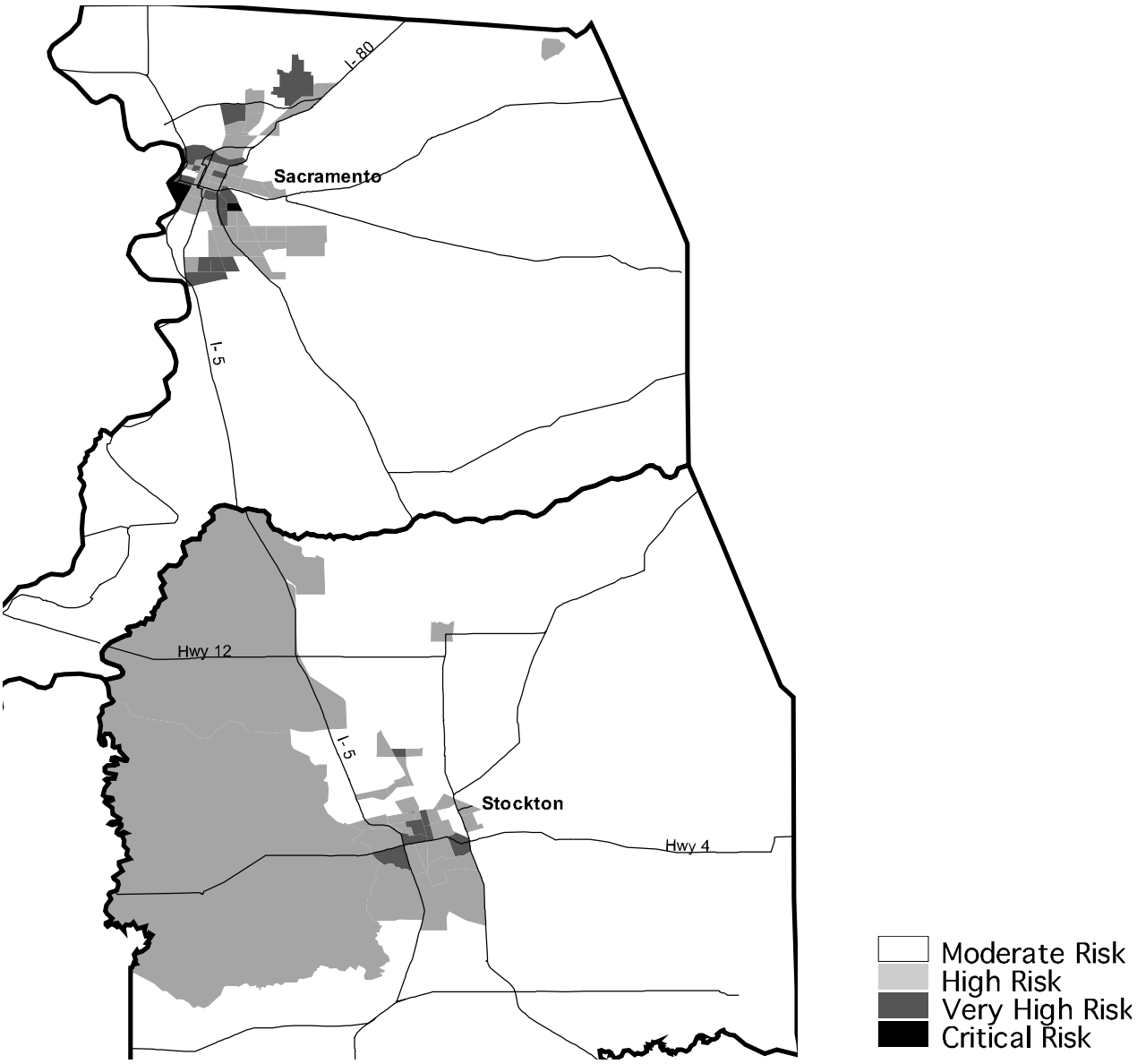
SOURCE: EWG, from CDC and Census data.

San Diego County

Children in the Barrio Logan neighborhood, between downtown San Diego and the airport, are at critical risk of lead poisoning. Approximately 89 children in this area were lead poisoned from 1992 to 1998. Other areas of the county with high to very high lead risk include central and east San Diego between National City and Balboa Park, and San Ysidro ner the Mexican border. (Figure 6.)

Between 1992 and 1998 an estimated 13,385 children were lead poisoned in San Diego County. The state identified 814, or 6.1 percent.

Figure 6. Lead Poisoning Risk in the Sacramento-Stockton Area.



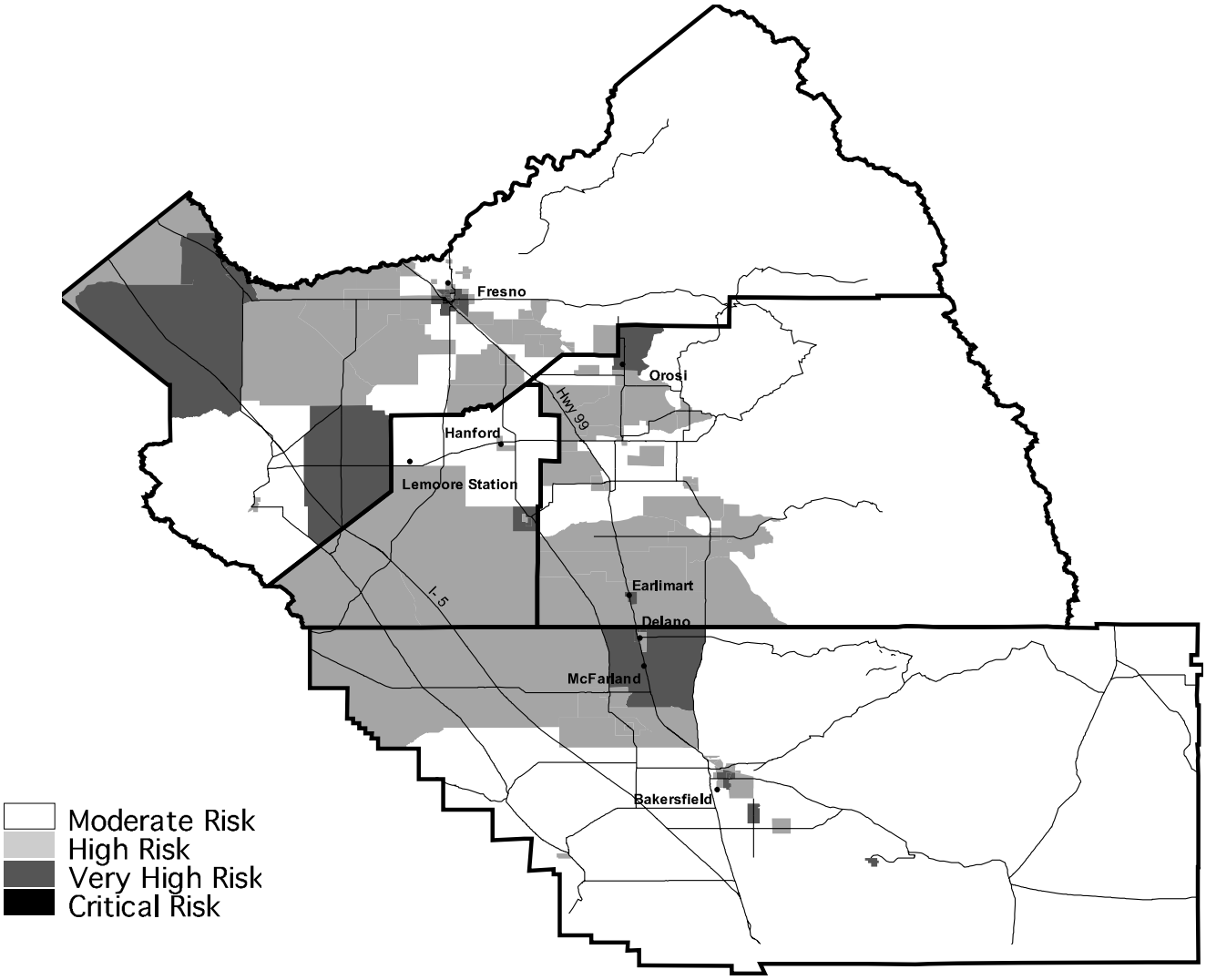
SOURCE: EWG, from CDC and Census data.

Sacramento-Stockton Area

Two areas of south Sacramento - between Riverside Boulevard and the American River, and in the Oak Park neighborhood — are categorized as critical risk areas. An estimated 230 children in these areas were lead poisoned from 1992 to 1998. Other areas with very high lead risk levels, however, were found in northern and southern Sacramento County. Although there were no critical risk spots in Stockton or San Joaquin County, several tracts in and around the city were classified as high or very high risk.

Between 1992 and 1998 an estimated 6,689 children were lead poisoned in Sacramento County. The state identified 191, or 2.8 percent.In that period, an estimated 3,288 children were lead poisoned in San Joaquin County. The state identified 174, or 5 percent.

Figure 7. Lead Poisoning Risk in the San Joaquin Valley.



SOURCE: EWG, from CDC and Census data.

The San Joaquin Valley

In the San Joaquin Valley, the most critical risk of lead poisoning is in west Fresno, where approximately 151 children were lead poisoned from 1992 to 1998. However, large parts of the region between and around Fresno and Bakersfield, including the communities of Reedley, Selma, Dinuba, Delano and Wasco, were at high or very high risk.

From 1992 to 1998, an estimated 5,472 children were lead poisoned in Fresno County. The state identified 502, or 9.2 percent. An estimated 4,349 children were lead poisoned in Kern County in that period. The state identified 554, or 12.7 percent. An estimated 2,275 children were lead poisoned in Tulare County, of which the state identified 224, or about 10 percent. In the same period an estimated 746 children were lead poisoned in Kings County; the state identified 22, or 3 percent.

Methodology

Determining Estimated Numbers of Lead Poisoned Children

This analysis utilizes the 1990 U.S. Census data, which is the most recent population data available at the census tract level, and the DHS Response and Surveillance System for Childhood Lead Exposures (RASSCLE) data. We also used blood lead level prevalence estimates derived from Phase 2 of the National Health and Nutrition Examination Survey III (NHANES) and published in the CDC's Morbidity and Mortality Weekly Report of Feb. 21, 1997.

We applied lead prevalence estimates, broken down by race and age of housing, to all California census tracts. While CDC's numbers are traditionally used to estimate the aggregate number of lead poisoned children nationwide and not on a smaller scale, national and statewide numbers mask risk patterns and fail to identify possible hot spots. After discussions with lead poisoning experts we elected to apply the more specific national prevalence numbers based on race and housing. This approach yields a smaller estimated number of lead poisoned children in California but also provides more detail on a neighborhood basis. (Table 5.)

Race	Children (1-5 yrs)	Percentage of People Per Housing Category	Prevalence of Lead Poisoning*	Estimated Lead Poisoned Children
		Pre-1950		
Black	352	75.8%	21.9%	58
White	67	75.8%	5.6%	3
Other	131	75.8%	8.6%	9
		1950-1970		
Black	352	14.5%	13.7%	7
White	67	14.5%	1.4%	0
Other	131	14.5%	4.6%	1
		Post 1970		
Black	352	9.7%	3.4%	1
White	67	9.7%	1.5%	0
Other	131	9.7%	1.6%	0
Total (one year)				**79**

Table 5. Racial and Housing Mix in Sample Census Tract

By applying the estimates we determined the estimated number of lead poisoned kids at a given point in time in each tract. In order to find the total number of kids lead poisoned throughout the seven years of this analysis we assumed that the lead poisoned kids were evenly distributed among the 1 to 5 year olds and that 1/5 "graduated" (became 6 years old) with each year while an even number became 1-year-olds for 7 years.

Limitations of Census and CDC data

The housing and racial categories used by CDC do not match up perfectly with the Census data. For example, the three housing categories identified by the CDC are 1) housing built before 1946, 2) housing built between 1946 and 1973 and 3) housing built after 1973. The housing data published by the US Census Bureau, on the other hand, is identified in decade blocks.

CDC only provides a detailed breakdown of blood lead level estimates for blacks and whites. All other races were included in the category "other,"which results in a conservative estimate because of the large number of Latinos in California. Table __ shows how the number of lead-poisoned children of different races in one high-risk tract were estimated.

Finally, the Census data do not break down the ages of people in housing categories. In order to estimate the number of children in various housing categories, we multiplied the number of kids in a census tract by the percentage of total people in that tract living in the housing categories.

Mapping Lead Risk in California

Patterned after maps and analyses conducted by the Alameda County lead program and the Public Health Institute, we assigned census tracts to risk categories based on the prevalence of old housing, minority and poverty status. Table 6 shows how each census tract was ranked for lead poisoning risk, and how those rankings determined its risk category.

Criteria for Poverty-Related Risk		*Risk*
Percent ≥ 125% of poverty	*Tier*	*Points*
≥30%	1	3
20-29%	2	2
15-19%	3	1
Criteria for Housing Related Risk		*Risk*
Percent pre-1950 housing	*Tier*	*Points*
≥75%	1	3
67-74%	2	2
50-66%	3	1
Criteria for Minority-Related Risk		*Risk*
Percent non-anglo	*Tier*	*Points*
≥75%	1	3
67-74%	2	2
50-66%	3	1

Risk	**Total Points**
Moderate Risk	0-2
High Risk	3-4
Very High Risk	5-6
Critical Risk	7-9

Table 6. Ranking Census Tracts for Lead Poisoning Risk.

Cost Analyses

Schwartz (1994) estimates the total national benefit of reducing blood lead concentrations across the childhood population by just 1µg/dL add up to $6.9 billion annually. Assuming an even distribution of benefits among the states, California's share adds up to approximately $800 million. Federal officials estimate between $544 and $2,367 is lost in annual learnings for each "point" of elevated blood level, and an annual savings of $5,800 in medical and special education costs for every child prevented from reaching a blood lead level above 25 µg/dL.

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