CHILDREN'S EXPOSURE TO LEAD IN SANTA CLARA COUNTY

SANTA CLARA COUNTY OFFICE OF EDUCATION

August 2021

Contents

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Summary

There is no safe level of lead exposure in children. Despite research demonstrating effects on children's educational attainment, cognitive function, and behavioral and emotional regulation at concentrations well below the current reference level of 5µg/dL, almost half a million children in the U.S. are expected to have blood lead levels (BLL) above it. Children continue to be exposed to lead from historical sources, such as leaded gasoline and paint, and ongoing pollution from leaded aviation fuel. California's BLL testing and reporting program shows elevated BLL among young children in a number of zip codes in Santa Clara County, and critics suggest the issue may be more common and widespread than the currently reported data reflects. Within Santa Clara County, the area around Reid-Hillview Airport – which serves the kind of piston-driven small aircraft that continue to use leaded aviation gasoline – is of particular concern due to the number of children, childcare providers, and schools in close proximity to the airport.

Introduction

Despite decades of research demonstrating the damaging effects of lead exposure on children, it continues to be a significant public health concern. Lead is a toxic metal that has been used in a variety of products, including paint, gasoline, plumbing pipes and fixtures, and tableware. These products can result in lead, in household dust or soil, in drinking water, or in food stored or served in these dishes, being ingested or inhaled. Once in the body, even at very low concentrations, lead dysregulates nervous system signaling. Lead exposure in children can cause permanent changes in central nervous system development, resulting in cognitive and behavioral impairments, learning disabilities, and attention problems[i]. Public policy, including banning of lead paint and leaded gasoline, has led to dramatic reductions in children's blood levels (BLL) over the past 50 years[ii], however many sources of lead exposure remain, and current population estimates indicate that approximately 472,000 children, ages 1-5, have elevated BLL in the United States. Based on the results of blood lead testing in children ages 1-5 in Santa Clara County, as many as 2,000 children under age 6 in our community may have elevated BLL.

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The Santa Clara County Office of Education (SCCOE) is committed to serving, inspiring, and promoting student and public school success. The SCCOE works to reduce inequities that lead to racial, and other, disparities in students' education outcomes. This report is designed to provide an overview of research on the impact of lead exposure on children's cognitive and educational outcomes, to describe the most prevalent sources of lead exposure, and to present the current public data on BLL in children and education outcomes in Santa Clara County.

There is No Safe Level of Lead

Between 1960 and 1991, the Centers for Disease Control and Prevention (CDC) lowered the blood lead level (BLL) requiring intervention (the "level of concern") from 60µg/dL to 15µg/dL as evidence of the toxic impacts of lead exposure, particularly in children, mounted. In 2005, the CDC considered lowering the level of concern again but determined against it. In 2010, in the face of additional evidence of cognitive and other physiological impacts of BLL below 10µg/dL in children, the CDC convened a working group that recommended ending the concept of the level of concern "because no measurable level of blood lead is known to be without deleterious effects". Instead of an absolute level, the working group recommended using a reference value to "characterize individual results as "elevated" or "not elevated" in comparison to the population average or mean value" and defined "elevated" for children ages 1-5 as a BLL higher than that of 97.5% of the population average[iii]. Based on data from the National Health and Nutrition Examination Survey (NHANES), this reference level is 5µg/dL.

No measurable level of blood lead is known to be without deleterious effects

Damaging Effects of Lead

Symptoms of Lead Exposure

The Agency for Toxic Substances and Disease Registry (ATSDR) Toxicological Profile for Lead states "Toxic effects of [lead] have been observed in every organ system that has been rigorously studied", that adverse effects have been found in these systems at BLL less than 10µg/dL, and that the strongest evidence is of adverse effects on children's cognitive function at exposures less than 5µg/dL[iv]. Short-term exposure to high levels of lead in children and adults (above 10µg/dL) can lead to a variety of symptoms including abdominal pain or constipation, tiredness, headaches and irritability, loss of appetite, memory loss, pain or tingling in the hands and/or feet, and muscle weakness. Very high exposures can lead to anemia, kidney and brain damage, and even death. Long-term exposure to high levels of lead can cause depression, distractibility, and nausea and increases risk for high blood pressure, heart disease, kidney disease, cancer and reduced fertility. In general, the adverse effects of lead exposure are greater for children than adults, both because children seem to be more sensitive to similar levels of exposure and because lead has particularly damaging effects on the developing nervous system[v].

Developmental Effects of Lead Exposure: Cognition

There is substantial literature on the effects of early childhood lead exposure on cognition, as measured by IQ scores. One particularly impactful study (cited over 2,000 times) found that "IQ declined by 7.4 points as lifetime average blood lead concentrations increased from 1 to 10µg per deciliter"[vi]. This effect would be sufficient to move someone of average intelligence (50th percentile) into the bottom third of the population (31st percentile). More specific effects have been found on attention and executive function. Elevated BLL have been associated with significantly increased risk of later diagnosis of Attention Deficit / Hyperactivity Disorder, especially in boys[vii], and prenatal exposure to very low levels of lead (less than 1µg per deciliter) has been shown to result in poorer performance on tests of the ability to plan/organize and shift tasks, and increased emotional problems, in children assessed at approximately eight years of age[viii].

Developmental Effects of Lead Exposure: Education

Given the effects of BLL on cognition, it is not surprising that it has effects on children's academic performance. Lanphear et al. (2000) reported that reading and arithmetic scores (as measured by standardized tests) declined as BLL increased, and that reading scores were especially sensitive to lead exposure and "are of particular importance, because they are potent predictors of academic achievement" [ix]. Recent studies based on estimated cumulative lead exposure from drinking water in Flint, MI suggest that the mean exposure during that crisis resulted in 12 to 14 percent declines in the number of elementary students proficient in reading, and 6 to 9 percent declines in the numbers of students proficient in mathematics, as measured by state standardized tests[x]. BLL in the 2-5µg/dL range have negative effects on end-of-grade test scores with a BLL of 3µg/dL and 4µg/dL having impacts roughly equal to 59% and 90% of the impact of eligibility for the free or reduced-price lunch program (FRPL), respectively[xi]. Given racial inequities in lead exposure, lead remediation has been suggested as a strategy to close the racial

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opportunity gap in education[xii]. BLL have also been demonstrated to have dose-dependent effects on diagnosis of learning disabilities (LD). Approximately 9% of children with BLL between 0 and 1µg/dL are diagnosed with LD, compared with 13% of children with BLL between 1 and 1.5µg/dL and 17% of children with BLL above 1.5µg/dL[xiii].

Lead Exposure During Pregnancy and Breastfeeding

The American College of Obstetricians and Gynecologists (ACOG) Committee on Obstetric Practice has published, and subsequently reaffirmed, guidelines on lead screening that describes the current understanding of effects of lead exposure during pregnancy and breastfeeding[xiv]. It cites findings that approximately 1% of women of childbearing age have elevated BLL, that lead easily crosses the placenta into the nervous system of the developing fetus, and that lead exposure during pregnancy has adverse effects for mother and child including gestational hypertension, spontaneous abortion, low birth weight, and impaired neurodevelopment. For example, babies born to mothers with BLL above 4.9µg/dL showed poorer performance on neonatal behavioral neurological assessments that were administered when the infants were 3 days old, in comparison with mothers with BLL below 2.0µg/dL[xv]. The effects of in utero exposure can persist with some studies finding effects on IQ and even classroom behavior.

Breast milk lead is a significant and important source of infant lead exposure

One Canadian study found that children exposed to lead in utero (measured using cord blood samples) demonstrated greater attentional problems and behaviors consistent with the inattentive subtype of Attention Deficit Hyperactivity Disorder in ratings assigned by their classroom teachers in elementary school[xvi]. The research on lead exposure that can result from breastfeeding is less extensive. Longer breastfeeding duration has been associated with higher BLL in infants[xvii], infant BLL has been shown to be correlated with maternal breast milk lead levels, and "breast milk lead is a significant and important source of infant lead exposure accounting for approximately 30% of variation in infant blood lead levels" [xviii]. A particular concern is that lead that has been absorbed into the mother's bones during prior exposure years or even decades earlier can be mobilized into the bloodstream due to increased bone turnover associated with pregnancy and lactation. This lead can then pass across the placenta into the developing fetus. The ACOG guidelines recommend that pregnant or lactating women who have ever had BLL above 5µg/dL receive calcium and iron supplementation to reduce this risk of transgenerational lead exposure.

Sources of Lead Exposure

Leaded Aviation Fuel

Leaded aviation gasoline (avgas) is the largest remaining source of lead emissions in the U.S. Sixteen million people live, and three million children attend school, within 1,000m of an airport serving planes using leaded avgas[xix]. There are 167,000 piston-driven airplanes (typically with six seats or fewer) using avgas in the United States, while helicopters, turbo-propeller aircraft (typically with more than six seats) and jet engine planes use unleaded jet fuel[xx]. A population-level study in Michigan has shown that, after adjusting for other known sources of lead exposure, child BLL increased dose-responsively in proximity to airports, declined measurably among children sampled in the months after 9/11, increased dose-responsively with the flow of piston-engine aircraft traffic, and increased with the percentage of prevailing wind days in the direction of a child's residential location[xxi]. Modeling and monitoring studies show increased lead levels approximately 450m beyond the airport property in summer and fall[xxii].

Leaded aviation gasoline is the largest remaining source of lead emissions in the U.S.

There are three airports in Santa Clara County that serve small airplanes of the type that use leaded avgas: Palo Alto Airport, owned by the City of Palo Alto, and Reid-Hillview Airport and San Martin Airport, owned by the County of Santa Clara. Reid-Hillview (RHV) is a significant source of airborne lead pollution in the Santa Clara Valley[xxiii] and is the greatest concern due to its relatively high level of activity and close proximity to residential areas. A 2008 study by the EPA ranked RHV 25th out of 3,414 airport facilities across the country with an estimated 580 kilograms of lead emitted annually[xxiv]. Census data show that over 34,000 people, including more than 2,300 children ages zero to five, live in the seven census tracts including and adjacent to RHV. In February 2020, the County of Santa Clara commissioned a study on whether there is a significant relationship between leaded fuel emissions and BLL in children residing within a ten-kilometer radius of both Reid-Hillview and San Martin airports. The results of that study are expected in Summer 2021[xxv].

Paint

In 1978, the U.S, banned consumer use of lead paint. Lead paint was used in 24% of homes built between 1960 and 1978, and 87% of homes built before 1940[xxvi]. In many of these homes, the paint is still present and presents a hazard if the paint is damaged, chipping, or damp. Areas that receive significant wear, such as window and door frames, are particularly problematic. Additionally, exterior lead paint can contaminate soil around the around the base of the house. Approximately 67% of housing in Santa Clara County[xxvii], and more than 60% of housing in the San Jose – Sunnyvale – Santa Clara metropolitan statistical area[xxviii], was built before 1979 and may contain lead paint.

There is no corresponding ban on the industrial use of lead paint, which can be used on a wide variety of applications including on steel structures such as bridges, ships and playground equipment, in road markings, and on consumer products like automobiles[xxix]. This lead can contaminate air, soil and water as it chips and peels and creates the risk of lead exposure, especially when it is removed during repairs and repainting. In 2010, nine painters working on Bay Area bridges were found to have been lead poisoned while working on bridge retrofit projects[xxx]. Some automobile paint (particularly red, orange, and yellow colors on older cars) contains lead and there have been cases of children being lead exposed after playing in areas contaminated with dust from car paint[xxxi].

Drinking Water

Lead in pipes, fixtures and solder can corrode into drinking water and is regulated by the Safe Drinking Water Act and the Environmental Protection Agency. San Jose Water's 2019 annual Consumer Confidence Report (CCR) indicated 2 samples collected at consumer's taps with lead levels in excess of the Regulatory Action Level (AL) of 15 parts per billion (15µg/L)[xxxii]. The City of Gilroy indicated no samples in excess of the AL[xxxiii]. System level testing cannot identify lead exposure due to distribution pipes leading to individual homes or from plumbing and fixtures within buildings, which requires testing water from each faucet.

Leaded Gasoline

Leaded gasoline, used until 1996, distributed millions of tons of lead dust which is disproportionately concentrated in the core and inner suburbs of cities[xxxiv]. Soil lead and lead dust, which are primarily due to exhaust from cars using leaded gasoline, are associated with population lead levels in children. Geographic studies have demonstrated higher levels of soil lead in areas close (within 150 meters) to freeways and arterial roads[xxxv]. Congressional testimony from the manufacturer of tetraethyl lead, the additive used in leaded gasoline, in 1984 has allowed researchers to develop estimates of the amount of lead pollution dispersed into US urbanized areas during the peak use of leaded gasoline, from 1950 through 1982[xxxvi], which accounts for 86% of leaded gasoline usage from 1927 until 1994[xxxvii]. In this study, San Jose was ranked 21 of 90 urban areas for the mass of gasoline lead aerosols, with over 13,000 metric tons of lead emitted from tail pipes into the community, suggesting that this form of contamination may be of particular concern in Santa Clara County.

Industrial Sites

Lead is, and has been, used in a variety of industrial processes and pollution from these sources can contaminate both the specific site and surrounding areas. California's Department of Toxic Substance Control (DTSC) EnviroStor database lists 92 sites contaminated with elemental or tetraethyl lead in Santa Clara County, of which 17 are "active", i.e., an investigation and/or remediation is currently in progress and that DTSC is actively involved. Six of the 17 active listings are school sites[xxxviii] including Mountain View High School and Los Altos High School in Mountain View-Los Altos High School District, the Agnews East development in Santa Clara Unified School District, the proposed San Antonio elementary school in Los Altos School District, Mabel Matos Elementary School in Milpitas Unified School District and South Valley Middle School in Gilroy Unified School District. Note that the DTSC EnviroStor database is not a complete list of polluted sites in California as it does not include the State Water Board's lists of underground waste storage tanks and solid waste disposal sites where hazardous waste has leaked, sites contaminated with pollutants that are not hazardous waste (e.g. domestic sewage or food processing waste) and two additional sites subject to a specific clause in state law[xxxix].

Artificial Turf

In 2008, the New Jersey Department of Health and Senior Services found that artificial turf made of nylon could weather and release lead dust[xl]. In 2010, the State of California entered into a consent decree with artificial turf manufacturers and installers to stop selling and installing existing turf immediately and to reduce the levels of lead artificial turf to "negligible levels"[xli]. While artificial turf is used in a variety of settings, including indoor and outdoor sports fields, residential landscaping, and dog runs, the consent decrees specifically mention daycare centers, schools and playgrounds as locations where these products were used and should be replaced. Artificial turf fields typically last 8 to 10 years and so it is likely that most fields with high lead levels have been replaced.

Preventing Lead Exposure

The Need for Prevention Focused Policy

The American Academy of Pediatrics (AAP) Council on Environmental Health policy statement "Prevention of Childhood Lead Toxicity"[xlii] provides an overview of the recommended medical approach to preventing lead exposure in children. It notes that the neurological and developmental effects of lead exposure occur at much lower doses than overt symptoms, meaning that this damage can occur without being noticed. Additionally, it acknowledges that there are no treatments for reducing the developmental adverse effects of lead exposure in children. A series of studies examining the effects of chelation therapy (using chemicals to bind to lead circulating in the blood stream and remove it) in 780 children who, at 12 to 33 months of age had BLL between 20 and 44µg/dL, found no effects of treatment at 3 years after exposure or at age 7, despite chelation reducing BLL during the treatment[xliii]. Similarly, iron and/or zinc supplementation did not improve performance on cognitive tests in lead exposed school children[xliv]. Other approaches, including parent education and providing households with dust control measures, have also not been successful in reducing children's BLL[xlv] and the policy statement references research that lead screening questionnaires "fail to identify children who have elevated BLL".

No effective treatments ameliorate the permanent developmental effects of lead toxicity

The AAP policy statement recommended that "the focus of prevention should be on reducing the sources of childhood lead exposures rather than identifying children who have already been unduly exposed or attempting to ameliorate the toxic effects of lead exposure". It recommends a public health approach focused on blood lead surveillance, community, and residential characteristics (such as the age of housing or presence of known sources of lead pollution), and analysis of electronic medical records to identify children who should be screened with a blood lead test.

The focus of prevention should be on reducing the sources of lead exposures rather than identifying children who have already been unduly exposed or attempting to ameliorate the toxic effects of lead exposure

The California Code of Regulations (17 CCR § 37100) implements this prevention-focused approach by requiring health care providers to inform parents of the risks of lead exposure at children's 12-month and 24-month well check visits, to ask the following question: "Does your child live in, or spend a lot of time in, a place built before 1978 that has peeling or chipped paint or that has been recently renovated?", and by requiring blood lead level tests when caregivers answer "yes" to this question or when "the child receives services from a publicly funded program for low-income children … as the child is presumed to be at risk of lead poisoning."[xlvi]

Prevention Resources for Families

Given the emphasis on reducing sources of lead exposure identified in the AAP policy statement referenced above, it is not surprising that resources for families produced by various public health agencies emphasize information about sources of lead in their homes. The Santa Clara County's Public Health Department Childhood Lead Poisoning Prevention Program webpage has a simple Frequently Asked Questions (FAQ) list for families[xlvii]. The California Department of Public Health's (CDPH) Childhood Lead Poisoning Prevention Branch (CLPPB) begins their Resources for Staying Lead Safe During COVID-19 page (https://www.cdph.ca.gov/Programs/CCDPHP/DEODC/CLPPB/Pages/COVIDResources.aspx) with "Many potential sources of lead can be found in or around the home, such as lead-based paint, dust, and soil"[xlviii]. This web site also includes a checklist for sources of lead in the home[xlix] including paint, house dust, and other sources. In addition to caregiver education, the site contains multi-media resources designed for children, curriculum for childcare and early elementary providers to use with children, and guides to safe paint removal and renovation. The web site also provides specific steps for caregivers to take to reduce the risk of lead exposure[l] including avoiding letting children chew on painted surfaces; frequent hand washing; including calcium, iron and Vitamin C in their diet; using water from the cold tap for cooking and drinking; cleaning dust with a damp cloth; and avoiding bare dirt in the garden and bringing soil into the house on shoes or clothes. Finally, the site emphasizes the importance of blood lead testing for children who may be at risk for lead exposure[li].

LEAD EXPOSURE PREVENTION RESOURCES FOR PARENTS AND CAREGIVERS

California Department of Public Health Childhood Lead Poisoning Prevention Branch Me and My Family webpage

https://www.cdph.ca.gov/Programs/CCDPHP/DEODC/CLPPB/Pages/me_and_my_family.aspx

Centers for Disease Control and Prevention Childhood Lead Poisoning Prevention Program Parents and Caregivers webpage

https://www.cdc.gov/nceh/lead/audience/parents.html

American Academy of Pediatrics Lead Exposure: Steps to Protect Your Family webpage

https://www.healthychildren.org/English/safety-prevention/all-around/Pages/Lead-Screening-for-Children.aspx

The Federal government also has caregiver-focused resources intended to reduce the risk of lead exposure in children, available at the Centers for Disease Control and Prevention's Childhood Lead Poisoning Prevention Program website (https://www.cdc.gov/nceh/lead/default.htm). The Parents and Caregivers section includes topics on sources of lead, lead poisoning prevention, health effects of lead exposure, blood lead levels in children, and an FAQ. Similar to the CDPH CLPPB web site, the CDC site lists sources including lead paint, water pipes, toys, jewelry, candies, traditional remedies, and certain hobbies as sources of lead, but also includes lead in air and soil from aviation gasoline as a source for children who live near airports[lii]. In keeping with other guidance, the "Lead Poisoning Prevention" section of the website emphasizes removing sources of potential lead exposure from children's environments and blood testing for children who may have been exposed[liii].

In addition to its policy statement, the American Academy of Pediatricians (AAP) also provides information intended for caregivers on lead exposure prevention[liv], lead testing, blood lead levels[lv], and lead in tap water and plumbing[lvi], via its healthychildren.org website. This information emphasizes the need to prevent lead exposure by addressing potential sources, that pediatricians should be screening for possible sources of lead exposure, and that the only way to know if a child has been exposed to lead is with a blood test.

Lead Exposure Data in Santa Clara County

Child Demographic Data

Santa Clara County is home to over 400,000 children from a diverse array of ethnic and racial backgrounds. Table 1 presents data on child population by various age ranges and Table 2 shows the child populations in various racial and ethnic groups [lvii].

Table 1: Santa Clara County Child Population, by Age and Gender

Age Group	Female	Male	Total
Ages 0-2	30,728	32,457	63,185
Ages 3-5	34,632	37,201	71,833
Ages 6-10	61,096	63,285	124,381
Ages 11-13	38,650	40,247	78,897
Ages 14-17	51,245	52,050	103,295
Total for Ages 0-17	216,351	225,240	441,591

Table 2: Child Population by Race/Ethnicity

	Number	Percentage
African American/Black	8,997	2.0%
American Indian/Alaska Native	1,202	0.2%
Asian American	156,967	36.2%
Hispanic/Latino	139,879	31.7%
Native Hawaiian/Pacific Islander	1,337	0.3%
White	106,375	24.1%
Multiracial	26,834	6.1%
Total Child Population	441,591	100%

Those children are served by over 400 traditional and charter public schools. Table 3[lviii] shows public school enrollment by grade in Santa Clara County. In addition, over 2,000 licensed childcare centers and family childcare homes, with a combined capacity of 74,471 children, provide early care and education and out-of-school time care to children ages 0-12[lix].

Table 3: 2020-21 Enrollment by Grade

Grade	Enrollment
K	19,111
1	17,893
2	18,175
3	18,706
4	18,832
5	18,867
6	18,305
7	19,626
8	19,695
9	20,745
10	20,744

11	20,634
12	22,292
Total	253,625

Blood Lead Levels in Children

California has a Childhood Lead Poisoning Prevention (CLPP) Program within the California Public Health Department (CDPH)[lx] that provides regular data updates from a statewide BLL testing program, administered by the California Department of Health Care Services (DHCS), focused on children under age 6 years who receive services through a publicly funded health program for low-income children. These programs include Medi-Cal, CHDP, WIC and any federally- or state-funded program that provides medical services or preventive health care to children in income-eligible families. The most recent report from the CLPP program includes county-level data from 2016-2018[lxi] and shows a statewide decline of over 50% in the number of children under age 6 with BLL above 4.5µg/dL between 2010 and 2018.

Table 4 compares 2018 data from Santa Clara County against statewide averages for the number and percentage of children under age 6 with BLL below and above a 4.5µg/dL threshold, the number of children tested, the estimated number of children under 6 enrolled in Medi-Cal, and the estimated total number of children under age 6. Santa Clara County falls within the bottom third of local health jurisdictions on this measure.

Table 4: Number and Percentage of Children Under Age 6 With BLL Above 4.5µg/dL

	# < 4.5	% < 4.5	# > 4.5	% > 4.5	# Tested	# MediCal	Total under 6
Santa Clara County	18,542	98.53%	277	1.47%	18,819	40,116	141,833
California	473,813	98.52%	7,141	1.48%	480,954	1,354,097	2,922,681

The report also includes data on BLL above 9.5µg/dL. Table 5 compares 2018 data from Santa Clara County against statewide averages for the number and percentage of children under age 6 with BLL below and above 9.5µg/dL. Santa Clara County falls within the highest quarter of local health jurisdictions on this measure.

Table 5: Number and Percentage of Children Under Age 6 With BLL Above 9.5µg/dL

	# < 9.5	% < 9.5	# > 9.5	% > 9.5	# Tested
Santa Clara County	18,750	99.63%	69	0.37%	18,819
California	479,663	99.73%	1,291	0.27%	480,954

This report also includes zip code level data, however, following the California Health and Human Services Agency Data De-Identification guidelines (DDG), these data are only available for 7.3% of zip codes. Four of the 107 zip codes listed in the report are in Santa Clara County and their data are presented in Table 6.

Table 6: Child BLL Data for Identified Santa Clara County Zip Codes, 2020 CLPP Report

Zip Code	City	School District	# > 4.5	% > 4.5	# Tested
94087	Sunnyvale	Sunnyvale ESD, Cupertino SD	23	5.35%	430
95014	Cupertino	Cupertino SD	13	4.48%	290
95051	Santa Clara	Santa Clara USD	18	2.71%	664
95035	Milpitas	Milpitas USD	20	2.55%	783

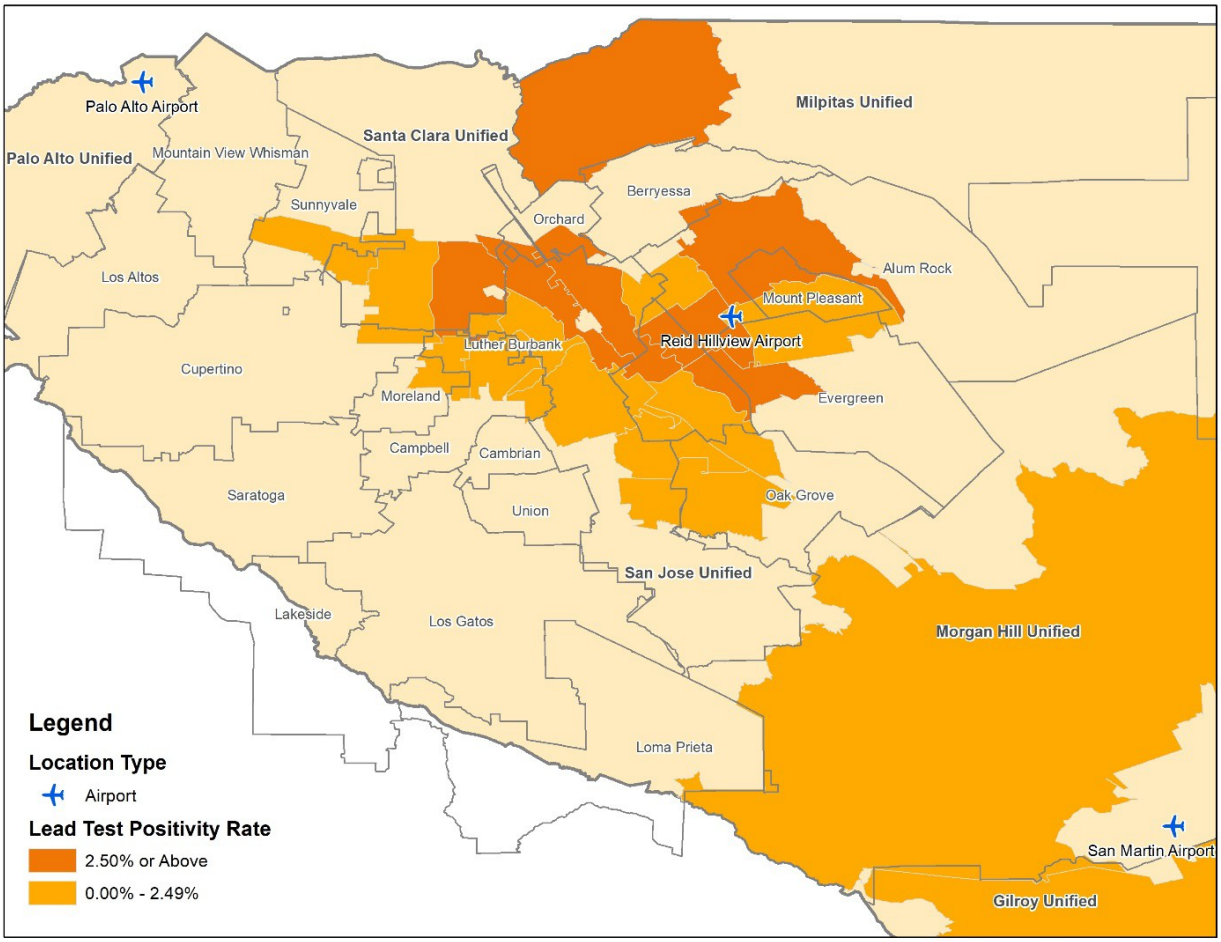
A separate link on the CDPH CLPP web site[lxii] with data from 2012 shows data for 20 zip codes in Santa Clara County with test results for > 250 children. These data are presented in Table 7 and as a map in Figure 1 (below).

Table 7: Child BLL Data for Identified Santa Clara County Zip Codes, 2012

Zip Code	City	School District	# > 4.5	% > 4.5	# Tested
95112	San Jose	San Jose USD	20	4.21%	475
95110	San Jose	San Jose USD	10	3.70%	270
95121	San Jose	Evergreen SD	9	3.04%	296
95127	San Jose	Alum Rock UESD	26	3.02%	862
95050	Santa Clara	Santa Clara USD	7	2.75%	255
95035	Milpitas	Milpitas USD	9	2.54%	355
95122	San Jose	Alum Rock UESD	27	2.48%	1,087
95117	San Jose	Moreland SD	9	2.27%	397
95128	San Jose	Campbell USD	7	2.12%	330
95116	San Jose	Alum Rock UESD	19	1.93%	985
95111	San Jose	Franklin McKinley SD	17	1.81%	939
95051	Santa Clara	Santa Clara USD	6	1.71%	350
95020	Gilroy	Gilroy USD	16	1.68%	954
95148	San Jose	Evergreen SD	4	1.51%	265
95125	San Jose	San Jose USD	4	1.41%	283
95126	San Jose	San Jose USD	4	1.20%	333
95037	Morgan Hill	Morgan Hill USD	4	1.08%	369
95136	San Jose	San Jose USD	3	0.83%	363
95123	San Jose	Oak Grove SD	4	0.77%	520
94086	Sunnyvale	Sunnyvale SD	2	0.63%	315

This difference in the number of zip codes reported is notable and may reflect reduced childhood lead exposure in Santa Clara County. However, there are two alternative explanations. First, the CLPP 2020 report notes a significant drop in the number of children being tested (from 727,042 in 2010 to 528,813 in 2018) and that it is unclear whether this represents fewer children being considered at-risk or fewer at-risk children being tested. Second, the DDG (first released in 2016) requires masking of data with fewer than 11 individuals in a cell[lxiii], which would prevent 70% of the 2012 data from being reported. Alone, or in combination, reduced testing and suppression of data in cells with a small number of tests could create the incorrect impression that fewer children are being exposed to lead and that lead exposure is more geographically restricted than is the case.

Figure 1: Map of 2012 Child BLL Data in Identified Santa Clara County Zip Codes

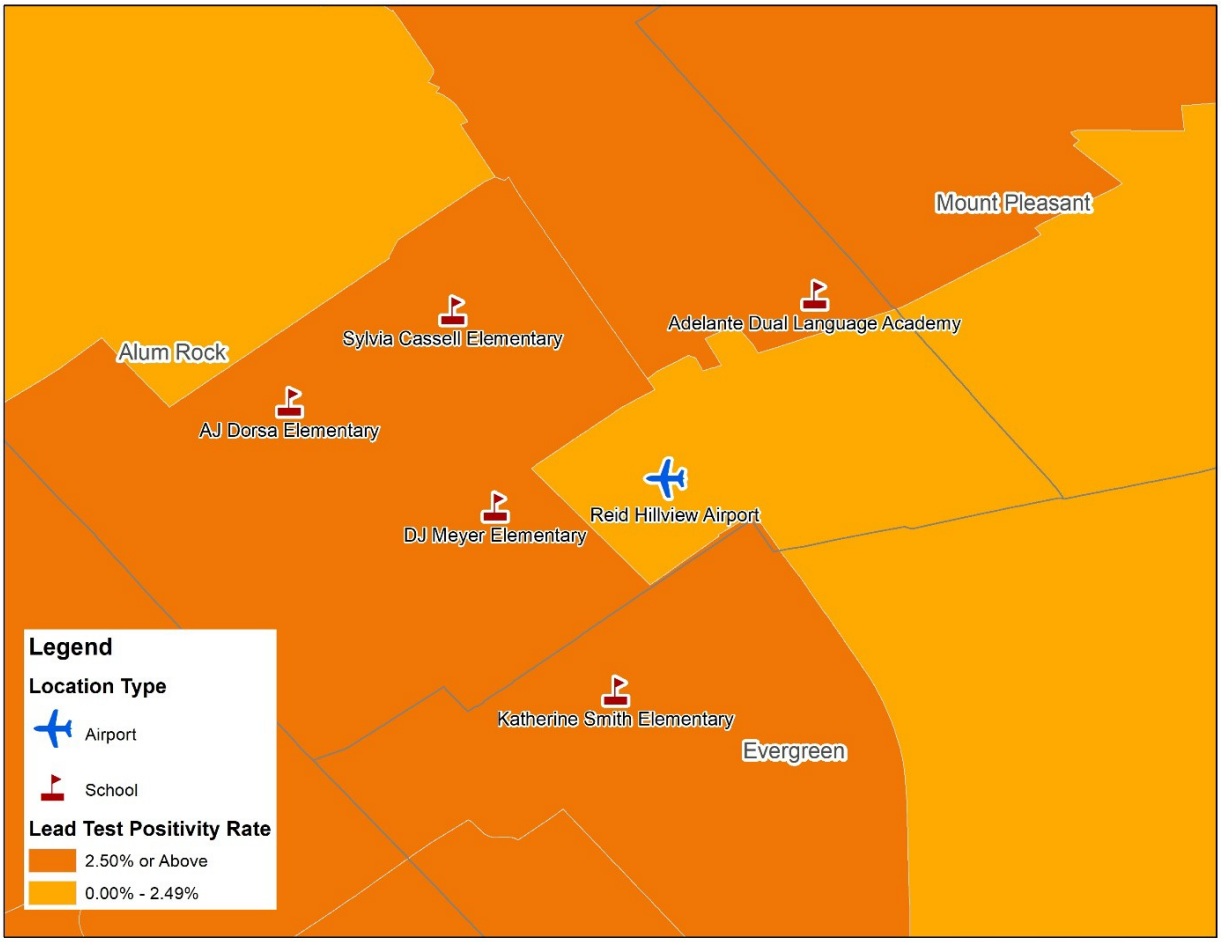


Additional limitations to the state's BLL testing program were highlighted in a recent critical report by the State Auditor[lxiv]. Despite a requirement that all children enrolled in Medi-Cal be tested for elevated blood levels at ages of one and two years, from 2009-10 until 2018-18 almost half the 2.9 million children eligible received no testing at all and a quarter received only one of the two required tests. At the time the report was written, DHCS had only recently begun developing performance standards for the managed care plans that implement Medi-Cal to ensure that the tests were performed. The report is similarly critical of the work of CDPH in reducing lead exposure. It cites the lack of published reports on geographic areas where children are at higher risk for lead exposure, that are required by state law, and lead remediation efforts that focus on homes where children have already been exposed, rather than proactive efforts. These flaws in the state's BLL testing, reporting and remediation efforts suggest that childhood lead exposure may be more common and more widespread than CDPH data indicate.

Schools Near Reid-Hillview Airport

There are five public elementary schools, traditional and charter, in the seven census tracts including and adjacent to Reid-Hillview Airport (RHV). Four of the schools are in the Alum Rock Union Elementary School District: A. J. Dorsa Elementary (365 students), Adelante Dual Language Academy (522 students), Donald J. Meyer Elementary (320 students) and Sylvia Cassell Elementary (336 students). The fifth school, Katherine R. Smith Elementary (486 students), is in the Evergreen School District[lxv].

Figure 2: Public Elementary Schools Near Reid-Hillview Airport



Demographic information for each school and district, using the most recent data available from the California Department of Education's Dataquest portal, is presented in Table 8. These data show that student demographics in the schools in Alum Rock UESD are comparable to the district averages. Katherine R. Smith Elementary School has larger proportions of low-income, English Learner, and students with disabilities, and higher absence rates, than the Evergreen School District average.

Table 8: Demographic information for schools near Reid-Hillview Airport

	%FRPL	%ELL	%with Disabilities	%White	Avg. Days Absent
ALUM ROCK UNION ESD	76.4	36.5	11.9	1.6	9.4
A.J. Dorsa Elementary	85.2	47.7	10.4	0.5	8.9
Adelante Dual Language Academy	53.1	32.0	7.3	1.7	7.6
Donald J. Meyer Elementary	75.3	35.6	16.3	0.9	9.2
Sylvia Cassell Elementary	80.7	50.6	13.4	0.0	10.1
EVERGREEN SD	24.6	23.9	8.6	4.9	7.0
Katherine R. Smith Elementary	56.8	60.3	16.5	3.5	10.2

Glossary of Terms

Blood lead level	the concentration of lead in a blood sample
Census tract	a stable, geographically contiguous area defined by the U.S. Census to support statistical comparisons over time
Executive function	a set of mental skills that include working memory, flexible thinking, and self-control
Free/Reduced Price Lunch program	a Federal program that can be used as a proxy for children living in low-income families. Eligibility is typically based on a family income being less than 185% of the Federal poverty level
IQ	an intelligence quotient (IQ) is a relative performance measure on a set of standardized tests designed to measure human intelligence. An individual's performance is transformed to a scaled score on a normal distribution with a mean of 100 and standard deviation of 15, resulting in approximately two thirds of the population scoring between IQ 85 and IQ 115
Lead exposure	the presence of lead in a person's blood
Opportunity gap	the ways in which race, ethnicity, socioeconomic status, or other factors perpetuate lower educational aspirations and achievement for certain groups of students
Reference level	the blood lead concentration above which is considered "elevated" based on population averages, currently 5µg/dL
Tetraethyl lead	a lead-based compound added to gasoline to improve performance of internal combustion engines

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