An aerial satellite-style map of Los Angeles, California, showing major freeways (10, 15, 210, 710), highways, and city streets. The map is circular with a black border. Overlaid on the map is the title 'Blood Lead in Young Children: Cumulative Impacts' in large yellow font. Below the title, in black font, is the text 'Results of Analysis Conducted by the California Department of Public Health', 'Presented by: Gina M. Solomon, M.D., M.P.H.', 'Deputy Secretary for Science and Health', 'California Environmental Protection Agency', 'DTSC Independent Review Panel Meeting', and 'May 12, 2016'. A red location pin is visible on the map near the intersection of E Washington Blvd and Whittier Blvd.

Blood Lead in Young Children: Cumulative Impacts

Results of Analysis Conducted by the
California Department of Public Health

Presented by:

Gina M. Solomon, M.D., M.P.H.

Deputy Secretary for Science and Health

California Environmental Protection Agency

DTSC Independent Review Panel Meeting

May 12, 2016

Cumulative Impacts: Many Sources of Lead Add Up



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Blood Lead Level (BLL) Analysis

Background:

- CA law: All children in public programs must be tested at ages 1 & 2
- All data electronically reported to CDPH
- ~700,000 BLL reports statewide annually
- 2012 - most recent year with quality-checked data
- BLL reported as micrograms of lead per deciliter of blood ($\mu\text{g}/\text{dL}$)
- Reporting threshold varies by lab (3-5 $\mu\text{g}/\text{dL}$ or below)
- Data are medical-confidential



Elevated BLLs in Exide Area



LA County does an investigation when a child has:
One BLL $\geq 20 \mu\text{g/dL}$
Two BLLs $\geq 15 \mu\text{g/dL}$

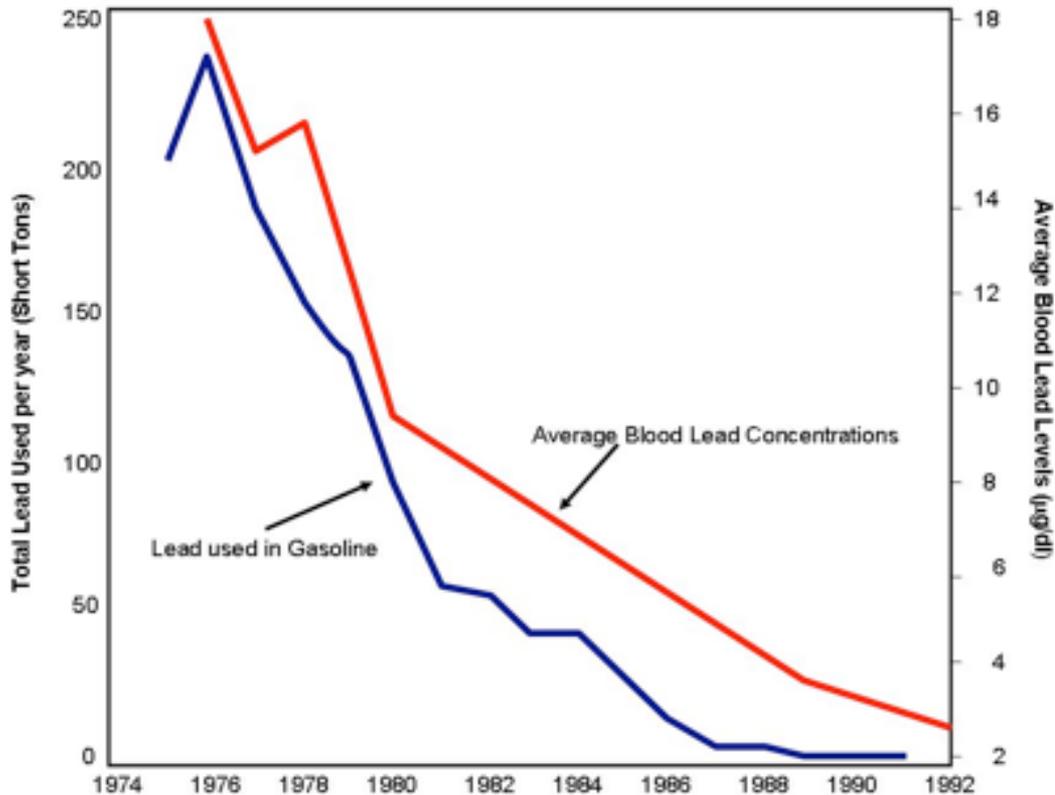
Number of children in the 8 zip code area around Exide with BLLs that triggered a health investigation by LA County between January 1, 2012 – October 1, 2015:

9 children

- 6 had pica
- 6 had deteriorated lead paint
- 2 had soil >400 ppm (both with lead paint)
- 3 more had soil >80 ppm (2 with lead paint)
- 3 had other sources (clay pots, Mexican candies, take home exposures)

Historical Blood Lead Trends

Blood lead levels are much lower today than they were decades ago...



- ...but we now know more about low dose levels of lead:
- Historically known to be toxic at high blood levels over 40 µg/dL (anemia, abdominal cramps, seizures, encephalopathy, kidney damage)
- Now recognized as a subtle neurodevelopmental toxicant at levels below 10 µg/dL

CDPH Analysis of Children's BLLs

April 8, 2016

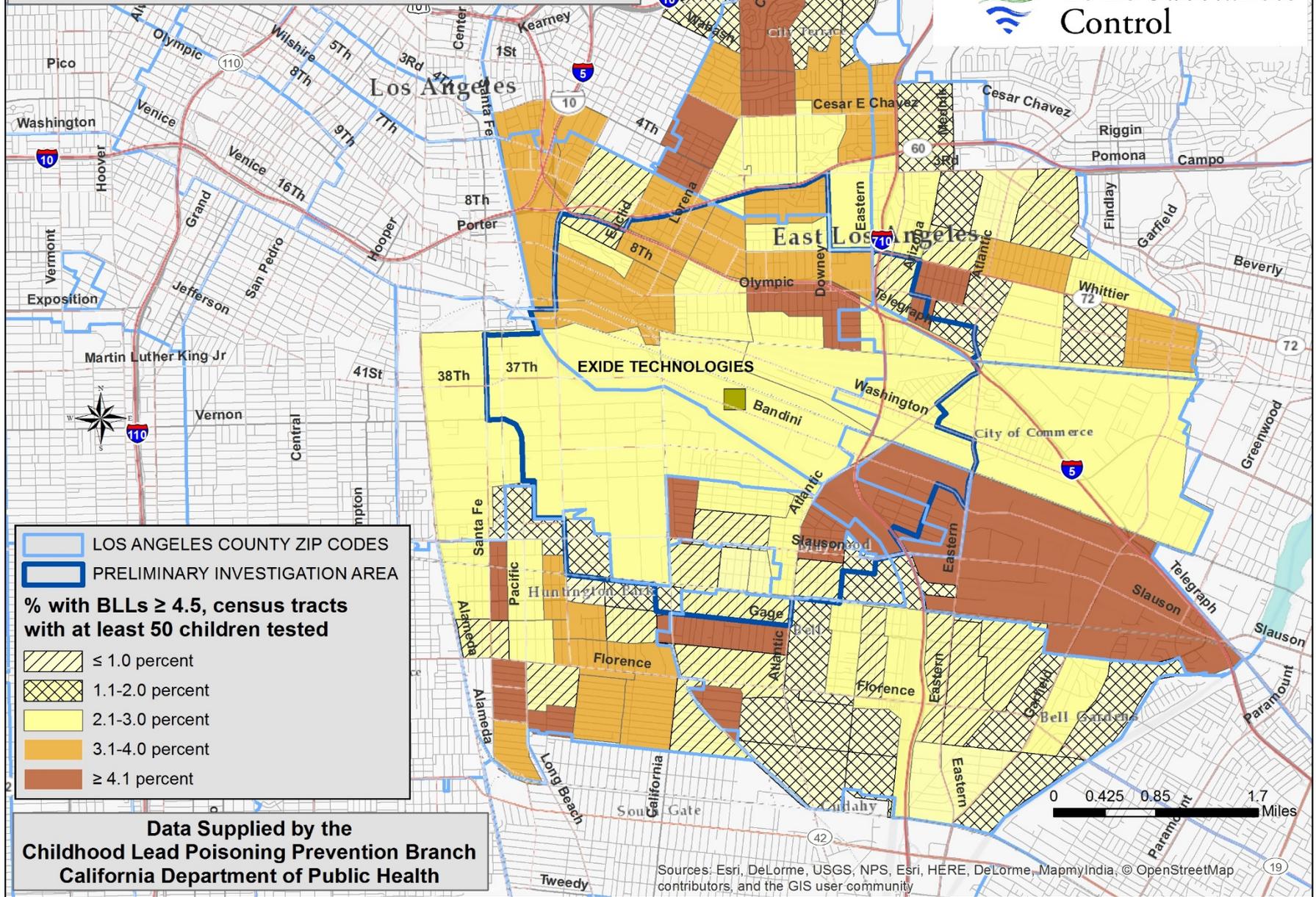
Methods

- 2012 data
- Children < age 6
- 11,702 children in the 8 zip codes (~100 census tracts) around Exide
- Percent of children with BLL ≥ 4.5 vs. < 4.5 $\mu\text{g}/\text{dL}$
- Evaluated:
 - Distance
 - Direction
 - Child's age
 - Child's sex
 - Age of housing

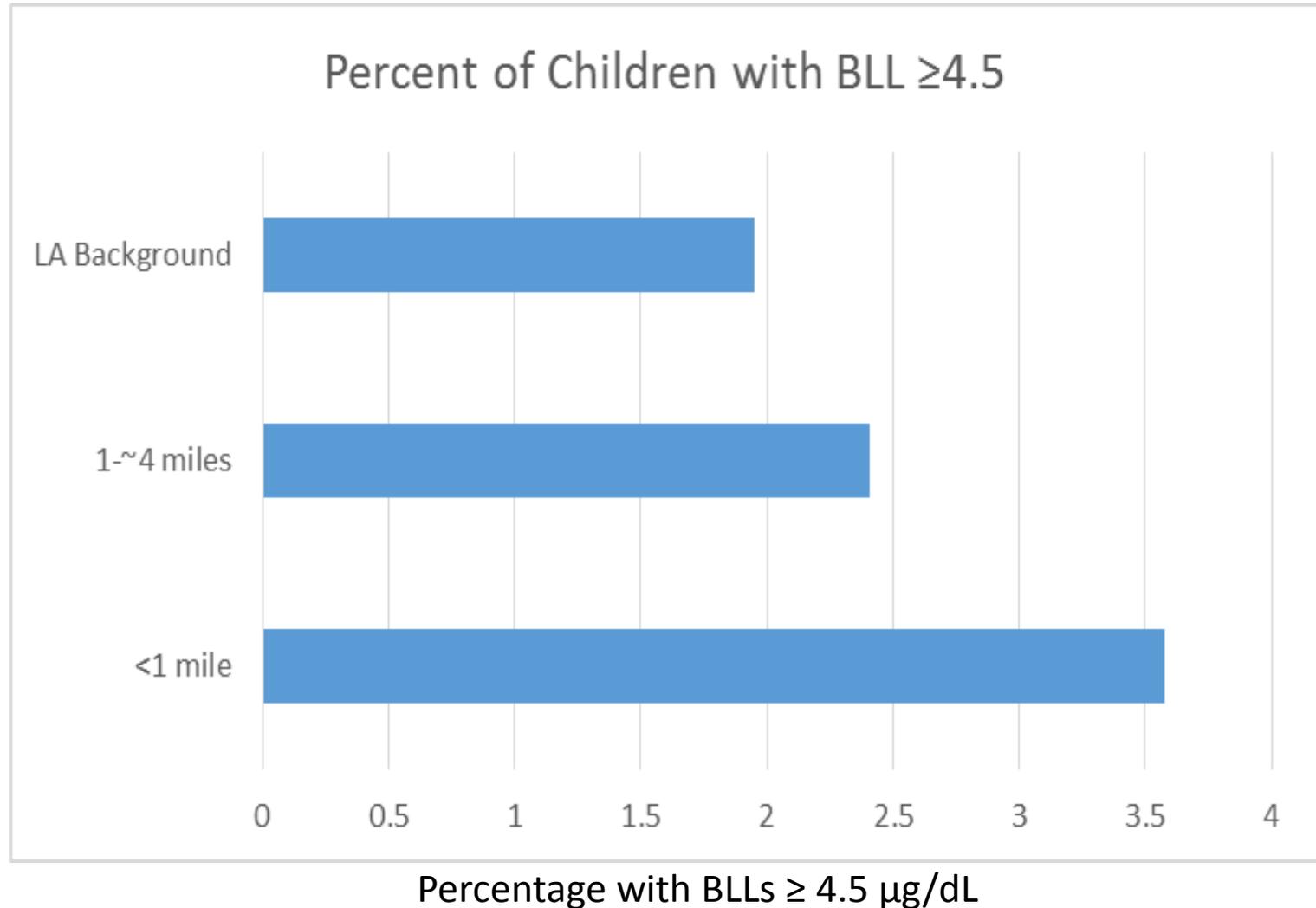
Percentage of Children under age 6 with Blood Lead Levels (BLLs) $\geq 4.5 \mu\text{g/dL}$ in 2012



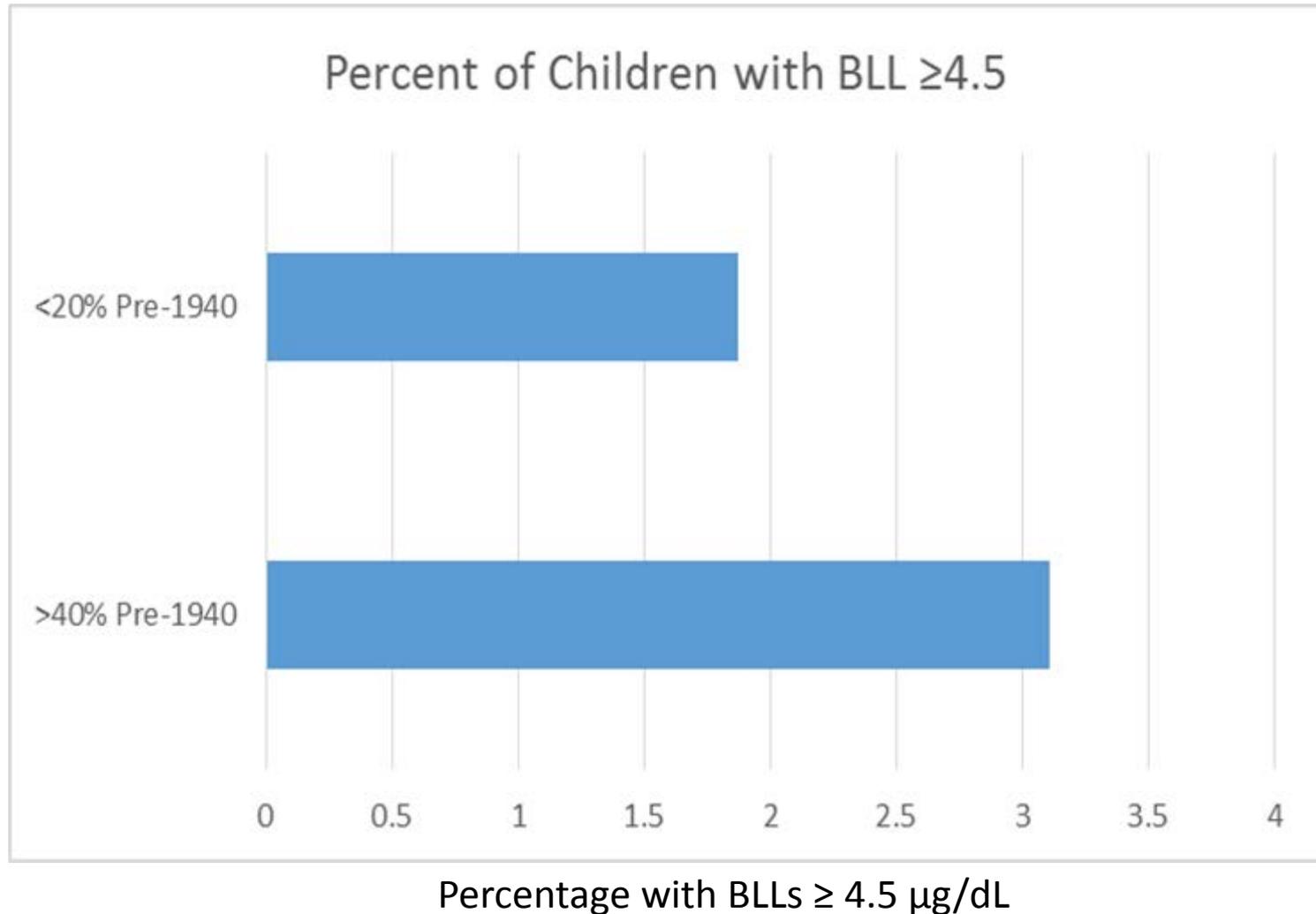
Department of
Toxic Substances
Control



Distance Effect (Univariate)



Age of Housing (Univariate)



Distance and Age of Housing (Multivariate)

Two approaches:

- 1) Census tract median age of housing (11,705 children)
 - 13% increase in probability of a child having a BLL ≥ 4.5 $\mu\text{g}/\text{dL}$ with each mile closer to Exide.
 - Distance not statistically significant ($p=0.10$)
 - Median age of housing highly significant ($p<0.01$)

- 2) Sub-study with actual age of housing (560 children):
 - 10% increase in probability of a child having a BLL ≥ 4.5 $\mu\text{g}/\text{dL}$ with each mile closer to Exide.
 - Distance not statistically significant ($p=0.36$)
 - Actual year of construction highly significant ($p<0.01$)

Distance, Housing, Direction, Age, Sex (Multivariate)

Census tract median age of housing (11,425 children):

- 9% increase in probability of a child having a BLL ≥ 4.5 $\mu\text{g}/\text{dL}$ with each mile closer to Exide.
- Distance not statistically significant ($p=.29$)
- Median year built borderline significant ($p=0.06$)
- Northern area statistically significant ($p=0.04$)
- Younger age highly significant ($p=0.01$)

Conclusion: Lead exposure comes from many sources, and housing is very important.

Potential Actions for DTSC

- When families self-identify with higher BLLs, prioritize those homes for testing and clean-up (if soil lead is elevated).
- Coordinate work to increase resources available for lead-based paint hazard controls.
- Work with university to convene group to identify better ways to report, track, and reduce BLLs in LA:
 - Government (local and state)
 - Community and NGOs
 - Clinicians and scientific experts

