

Trends in Childhood Blood Lead Levels: Grand Rapids

Junaid Maqsood, MPH

Martha Stanbury, MSPH

Division of Environmental Health

Michigan Department of Health and Human Services



Lead Poisoning: A Serious Health Threat

- Lead is the most common environmental threat to a child's health
- Lead is a neurotoxin – effects may be irreversible
 - ↑ Reductions in IQ
 - ↑ Learning disorders
 - ↑ Attention Deficit Hyperactivity Disorder (ADHD)
 - ↑ Violence and aggressive behavior
- Very high exposure can lead to coma and death

Sources of Lead Exposure

- **Most children are exposed to lead in paint in houses built before 1978**
- Other sources:
 - Soil
 - Drinking water
 - Parent **occupations** and **hobbies**: home remodeling, auto repair, construction, battery recycling, stained glass, making lead bullets & fishing lures, police and recreational shooters
 - Imported pottery, toys and jewelry, spices
 - Folk/home remedies

Exposure and Toxicity is Determined by a Blood Test

- A blood lead level can be determined by a **venous** or **capillary** test
 - Capillary tests are **screening tests** and not as accurate as venous tests – frequent “false positives”
- An Elevated Blood Lead Level (**EBLL**) is a blood test result of **5 micrograms per deciliter (ug/dL) of blood or more**
 - This “**reference value**” describes children with blood lead levels that are **higher than 97.5% of all** children in U.S.*
- All capillary EBLLs should be confirmed with a venous test

CDC says: There is no “safe” level of lead in the human body.

Elimination of lead in the environment is the key to prevention.

Roles of MDHHS in Childhood Lead Poisoning Prevention

- Compile reports from laboratories on blood lead tests in Michigan
 - Medicaid requires testing of children under age 6
 - All laboratories are required to report all blood lead test reports
 - The report includes name/address, demographics, blood lead test result
- Conduct epidemiologic analyses of the data
- Use analytical results to target clusters, high risk areas, and high risk groups
- Promote testing, education, and nursing case management for children with EBLLs
- Conduct environmental investigation to identify sources of lead in homes and other places that children frequent
- Fund lead abatement to remove or mitigate sources of lead exposure

Results of EBLL Data Analysis

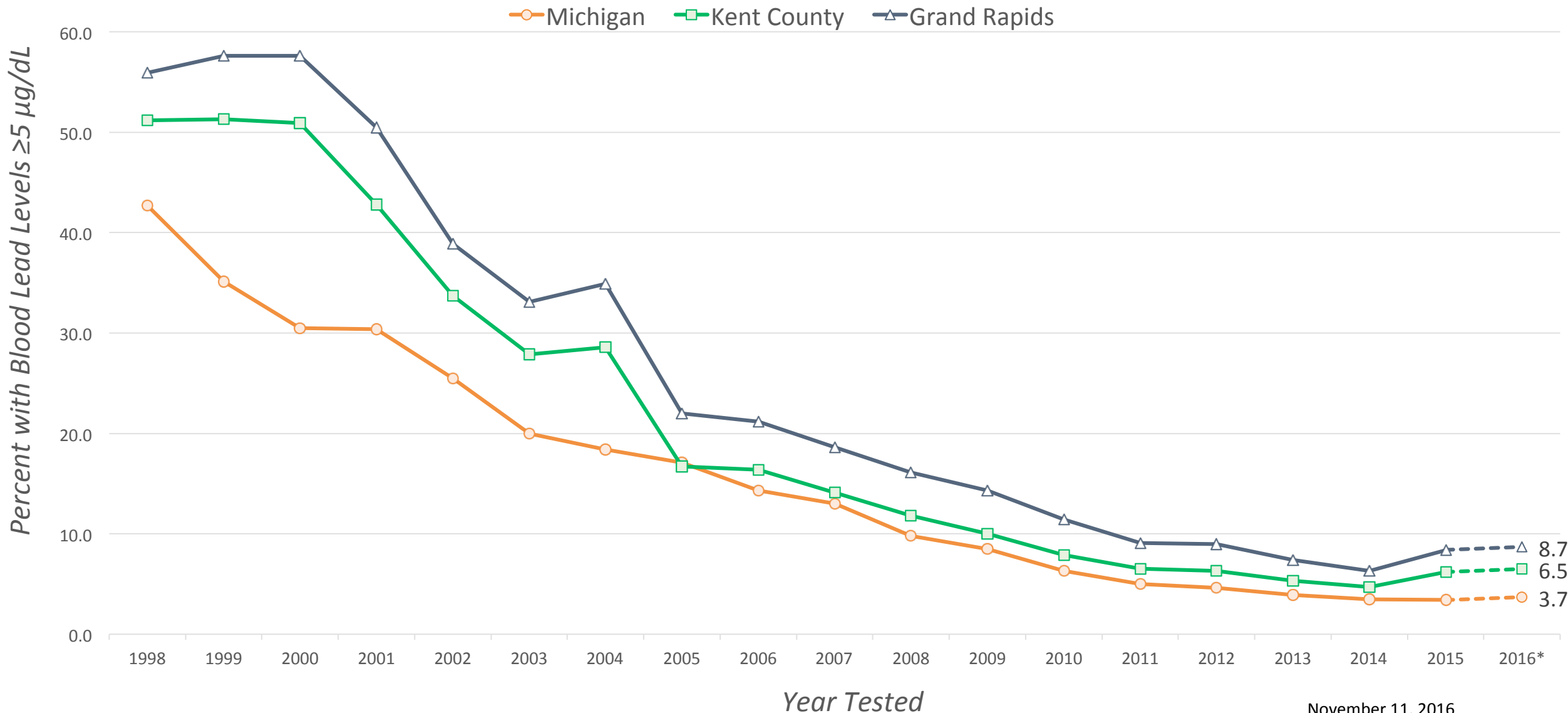
Analyzing Test Results

- Count one test per child per calendar year
- If child is tested more than once in a year, the highest venous test result is counted
 - If the child did not have a venous test, the highest capillary test result is counted

EBLL Data Analysis

- Routine data analysis showed unusual rise in the percent of children with EBLLs in Grand Rapids in 2015 after many years of downward trend
- Collaborated with Kent County Health Department by conducting additional data analyses to explain rise in 2015 by looking at:
 - Certain demographic group(s)
 - New testing patterns in the community
 - Geographic clustering
 - Water and other exposure sources

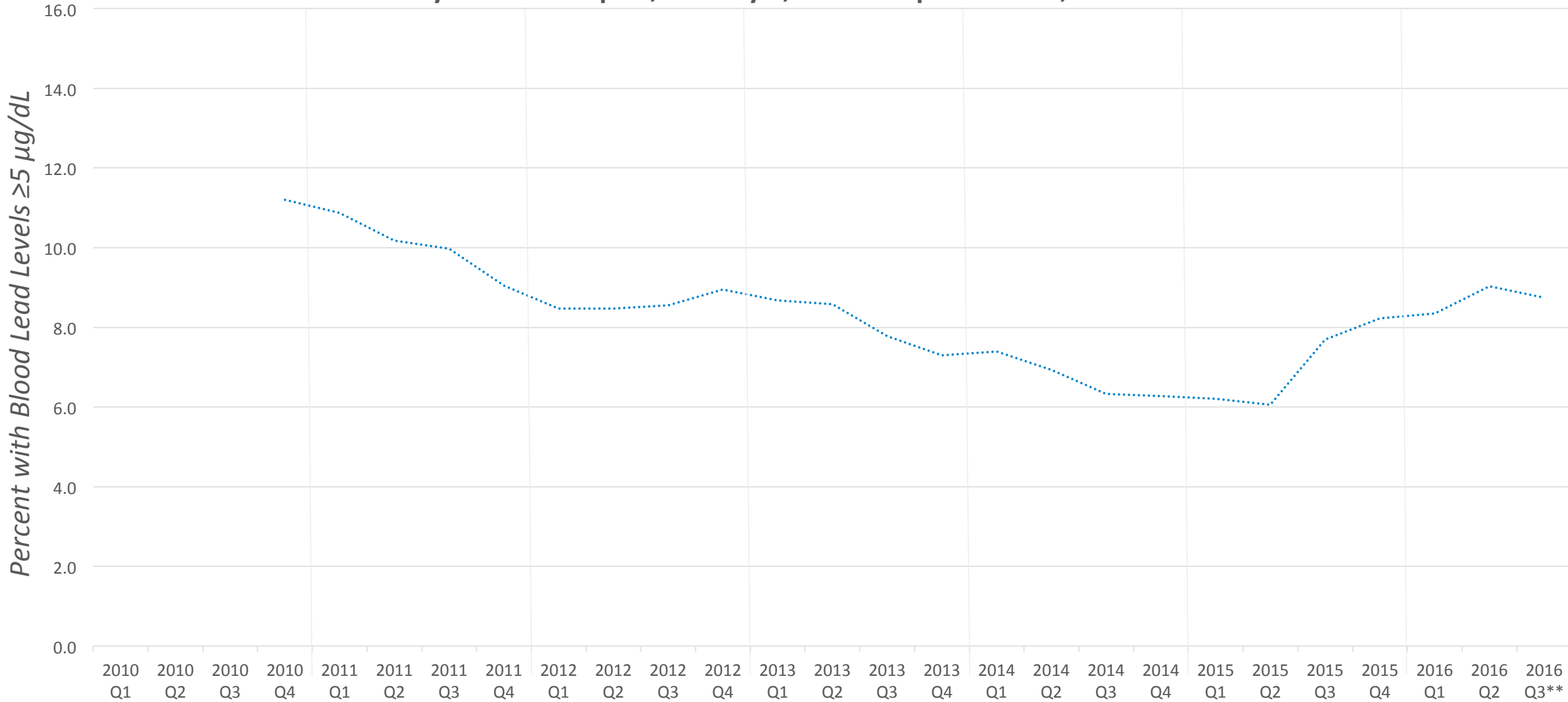
Percentage of Children Less than Age 6 with Blood Lead Levels $\geq 5 \mu\text{g}/\text{dL}$, State of Michigan, Kent County, and City of Grand Rapids, 1998 - 2016*



*Data for 2016 are incomplete and subject to change.

Children who have multiple tests are counted only once per year for annual counts. A child may be counted in more than one year.

Quarterly Average* of Children Less than Age 6 with Blood Lead Levels $\geq 5 \mu\text{g}/\text{dL}$ by Quarter, City of Grand Rapids, January 1, 1998 – September 30, 2016**



*The line displays the four-point moving average for each quarter. The four-point moving average is the average of the current quarter and the previous 3 quarters. It is used to even out fluctuations to make trends easier to identify.

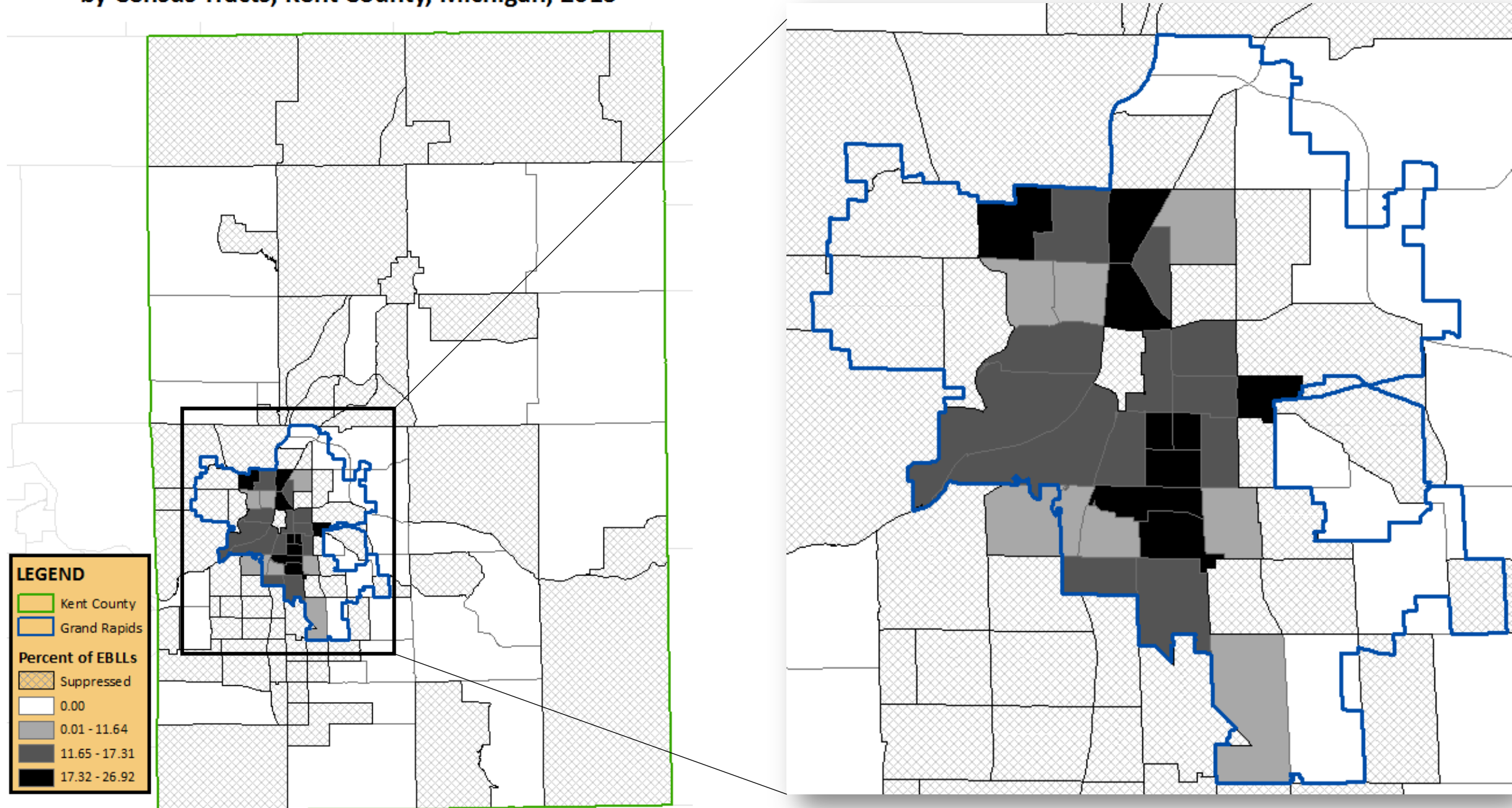
**Data for Quarter 3 of 2016 are incomplete and subject to change.

NOTE: Children who have multiple tests are counted only once per year for annual counts. A child may be counted in more than one year.

November 8, 2016

Source: Childhood Lead Poisoning data in MDHHS Data Warehouse

Percentage of Children <6 with Blood Lead Levels ≥ 5 $\mu\text{g}/\text{dL}$ by Census Tracts, Kent County, Michigan, 2015



Exploring Possible Explanations

- Is it being driven by age groups? No.
- Is it being driven by testing in certain clinics? No.
 - However, a large percentage of capillary tests ≥ 5 $\mu\text{g}/\text{dL}$ were not confirmed by a venous test. This might be driving the incidence of EBLLs in Grand Rapids.

Examination of Potential Lead Exposure

- Examined data for 70 children with an EBLL in 2015 in 2015
 - Most children had confirmed blood lead levels ≥ 10 $\mu\text{g}/\text{dL}$
 - Roughly 35% lived in an owner-occupied residence
 - Sources identified included:
 - Lead-based paint, contaminated soil, and dust hazards
 - Less common sources (for example, spices)
 - Do-It-Yourself Renovations
- CDC compared addresses of children with location of Combined Sewer Overflow (CSO) maintenance projects
 - Identified small number of EBLs near these projects
 - Does not account for total increase
 - Concluded there is not a relationship between CSO and EBLL numbers

Conclusion and Next Steps

- After years of overall reductions in Grand Rapids, the proportion of children with EBLL appears to be increased in 2015 and continuing in 2016
- Demographic and exposure data could not explain increase
- **Current hypothesis:** Increase in EBLL in Grand Rapids children could be related to housing renovations, particularly do-it-yourself renovations

Acknowledgement

- Kent County Health Department
- Healthy Homes Coalition of West Michigan
- Centers for Disease Control and Prevention

THANK YOU

For more information about the MDHHS Childhood Lead Poisoning Prevention Program, contact Martha Stanbury:

StanburyM@Michigan.gov