

STAGE 1: Understanding public epidemiology responses

- **Shadowing and conducting case investigations** for pertussis, hepatitis, legionellosis, campylobacteriosis, measles, and **lead**
 - Phone interviews, data entry in VEDSS, etc.
- Studying the **VA Disease Control Manual** and **VDH Case Definitions** to gain familiarity of various reportable diseases
- **Field work** at campground in our district to conduct **diarrheal disease case investigations** on-site

epidemiology team

STAGE 2: Identifying gaps in childhood lead investigations

- Less attention given to “**non-acute**” and **non-infectious** reportable diseases such as lead exposure, compared to infectious disease outbreaks
- Structural bias towards response over prevention in public health
- Limited time and resources in our district dedicated to **understanding trends** in childhood lead exposure, which could inform proactive measures and education
- Higher burden of **patient follow-up** and **provider communication** needed for lead exposure compared to easily treatable diseases; **lead recovery requires a long-term approach**

Stage 3: Data Analysis in R

Export data from VEDSS

Clean the “raw” data

Filter for childhood cases

Match lab data to cases

Graph and plot trends

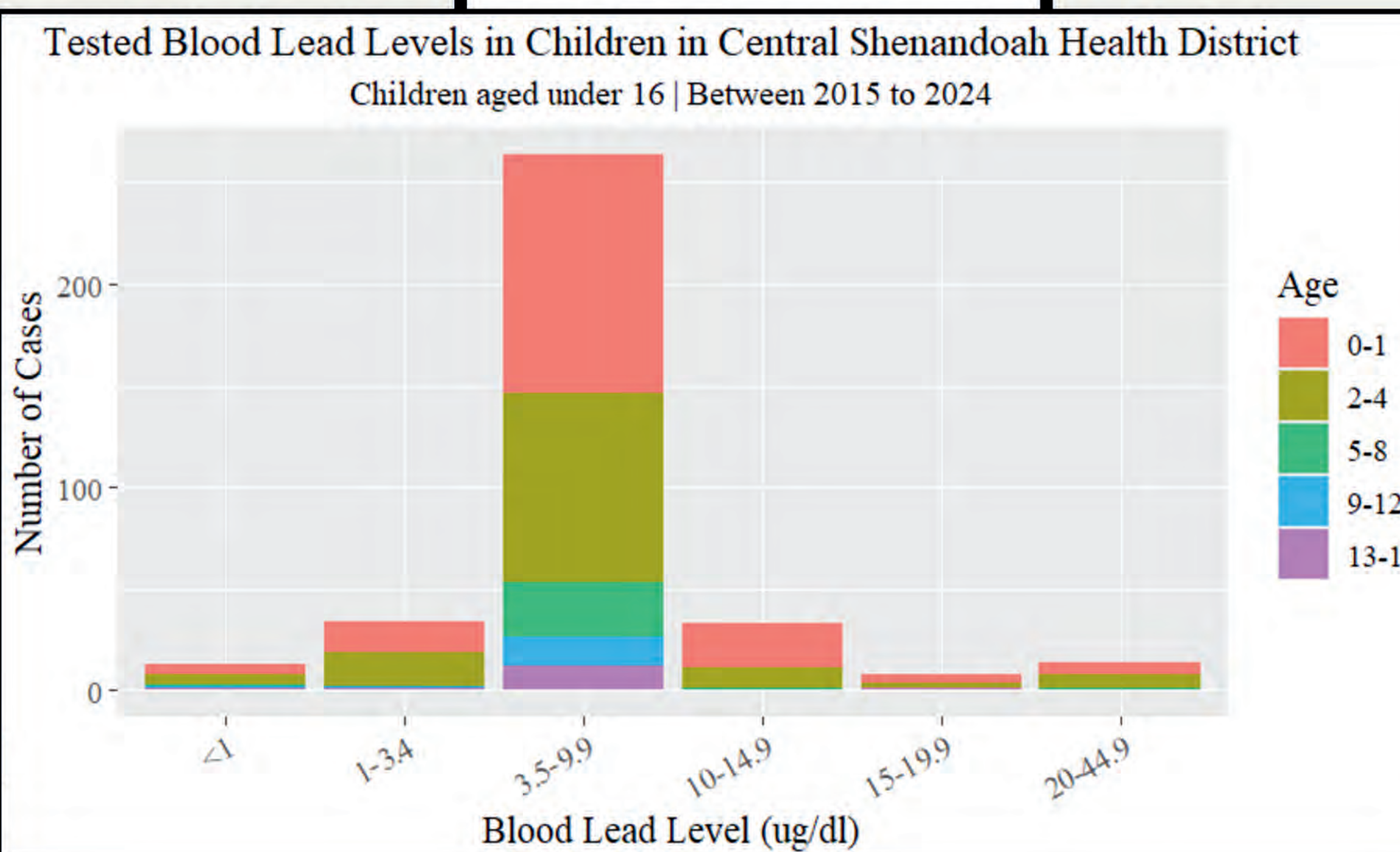
Conducted analysis on 10 years* of lead exposure data in VEDSS for the Central Shenandoah Health district, including:

- **Over 750 case investigation entries**
- **Over 11,100 laboratory reports**

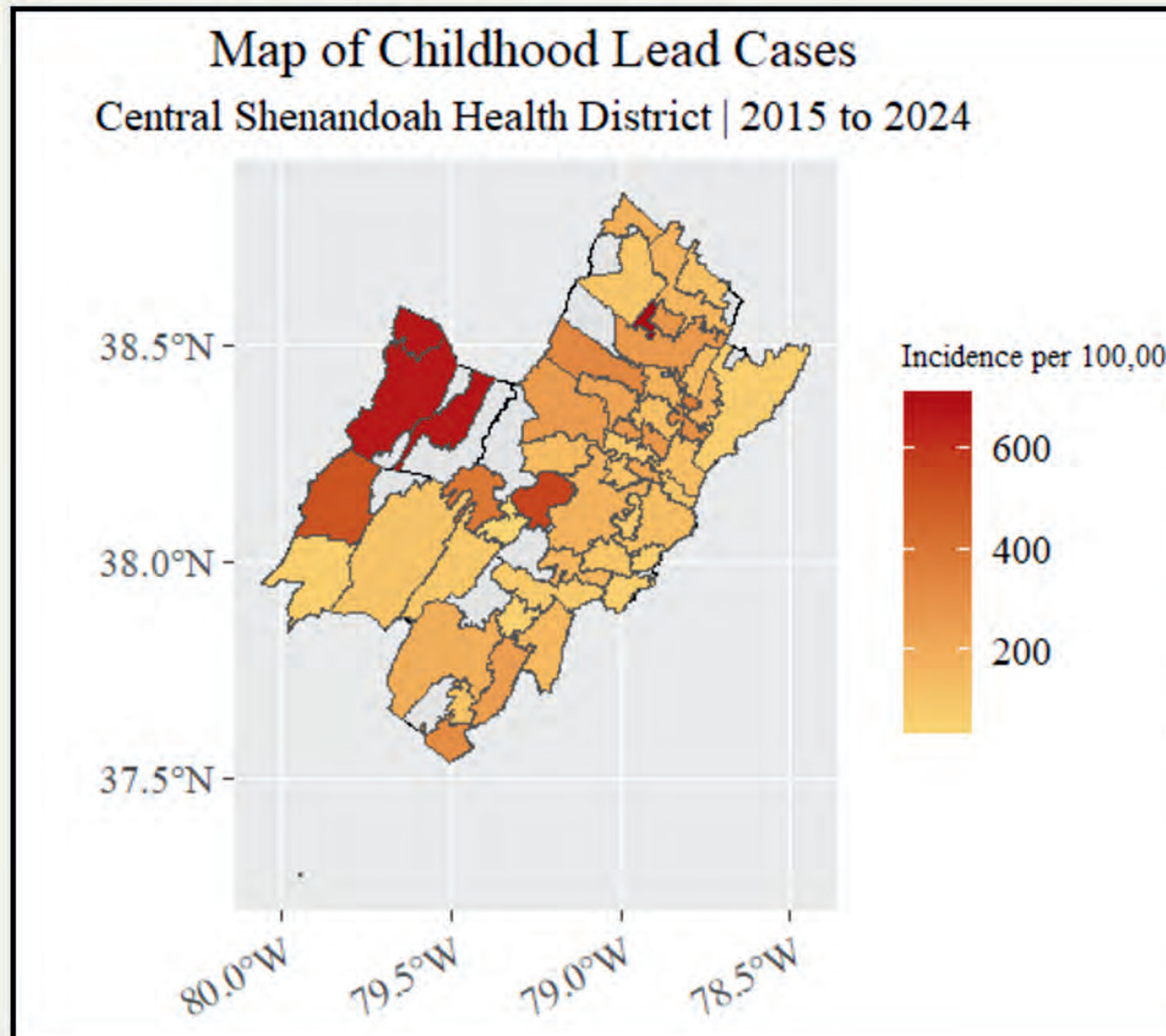
**Between January 1 2015
and December 31 2024*

★ How do children get exposed to lead?

Ingestion or inhalation of lead via many different sources: lead paint in old homes, handmade goods, foreign/imported jewelry, candy, makeup, etc.



STAGE 4: Outputs + Outcomes



Remember: Blood lead levels in children >10 ug/dl should be met with a more urgent response, but there is no “safe” level of lead!

- Removed duplicate entries and **matched multiple records to the individual patient**
- Observed and mapped trends on a **district and individual level**, such as any changes in blood lead levels over time through laboratory testing data

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Challenges + takeaways

- **EHR data is messy.** Often, the most important step in data analysis is cleaning the data BEFORE making (potentially incorrect) conclusions.
- **Time constraints.** There are many unanswered questions that could be tackled with more time and iterations.
- **Large volumes of data.** Analyzing large datasets requires innovative, coding-based approaches to improve efficiency.



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