Lead in Paint/Dust

Lead & Healthy Homes Program

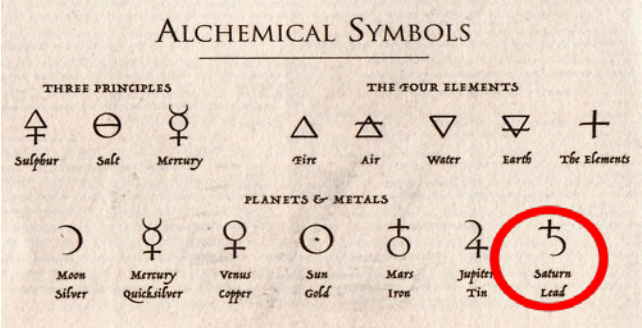
Kim Roe, *Health Educator*

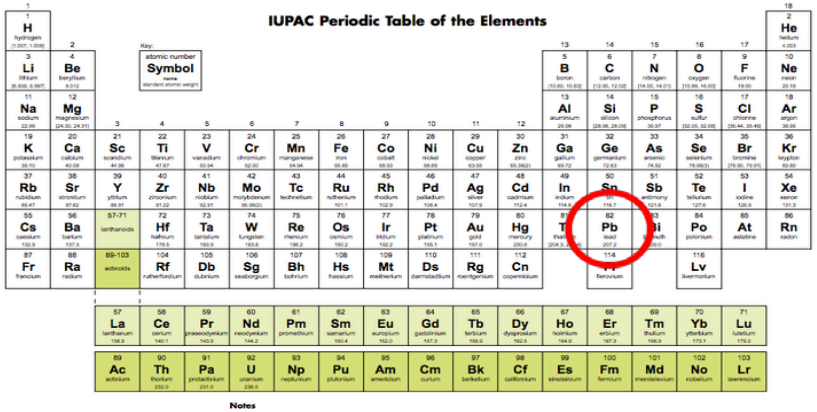
Environmental Public Health

Indiana State Department of Health

Lead in EVERYTHING!

- Ancient Alchemists were combining principles, elements, planets & metals.





- Although aware of the danger, modern scientists and chemists continue to find uses for Lead.

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How did Lead get into everything?

Ride with **ETHYL**

and get the benefits of *High Compression*

MORE than a million motorists are now enjoying the benefits of high compression through Ethyl Gasoline. In two ways:

1 *Through high compression automobiles.* The advent of Ethyl Gasoline has at last given car manufacturers the opportunity mechanically to raise the compression of their engines. For cars now in use they can offer special high compression cylinder heads which greatly increase performance.

2 *Through carbon formation.* By letting carbon form in the cylinders of a car of ordinary compression, you automatically increase compression. And since Ethyl Gasoline is a high compression fuel, those deposits which heretofore have meant "knocking" and power loss become a source of *extra* power and driving satisfaction.

Ethyl Gasoline is motor gasoline containing Ethyl brand of anti-knock compound, the ingredient which eliminates the "knocking" characteristics of ordinary gasoline and makes it a high compression fuel.

In terms of you and your car, high compression and Ethyl Gasoline mean a more powerful and flexible car, less gear-shifting, faster pick-up, less vibration and lessened depreciation. In short, a performance and economy impossible with ordinary compression and ordinary gasoline.

Ethyl Gasoline is distributed in the United States and Canada by responsible oil companies. *It has absolutely no ill effect on the motor or its parts.*

The first tankful will prove every claim. On sale at pumps which bear the "ETHYL" trademark shown on this page. There's one near you.

ETHYL GASOLINE CORPORATION
25 Broadway, New York City

ETHYL GASOLINE

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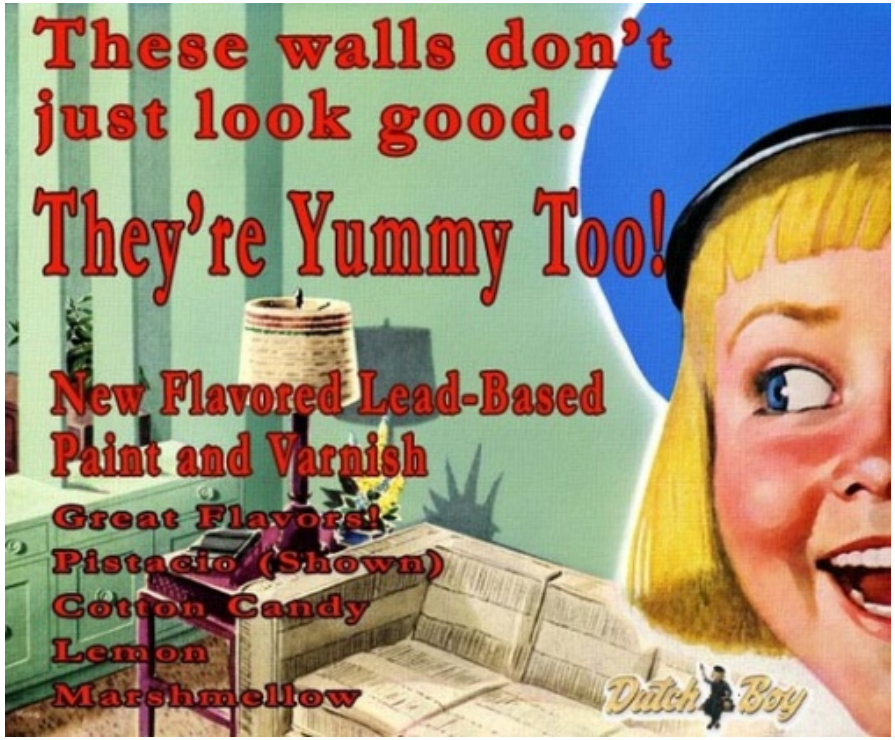
“Just ask, Sherwin Williams!”

In 1866, Lead was added to paint and was used by consumers for almost 50 years before leaded gasoline appeared on the U.S. market.



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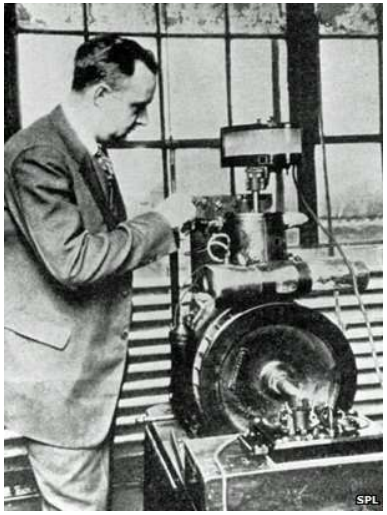
“This episode brought to you by: EXXON”

In 1921, it was the combination of General Motors, Du Pont and Standard Oil of New Jersey, (which formed EXXON), that were looking for a way to make auto engines stop knocking.



Thomas Midgley, Jr. – General Motors Engineer & Chemist

Ride with ETHYL

and get the benefits of *High Compression*

ETHYL

MORE than a million motorists are now enjoying the benefits of high compression through Ethyl Gasoline. In two ways:

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25 Broadway, New York City

ETHYL GASOLINE

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TESTING YOUR CHILD FOR LEAD

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Testing the children for lead . . .

Hoosier Healthwise/Medicaid

Test all children at 1 and 2 years of age, and children 3 to 6 years of age if never tested ***regardless of their risk factors!***

It is required by law.

410 IAC 29

Indiana State Department of Health

Rule 410 IAC 29-2-1

- The Rule by ISDH (410 IAC 29-2-1) states:

  "Local health officers shall ensure the provision of case management to all children under seven (7) years of age in their jurisdictions, including the following . . ."

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Rule 410 IAC 29-2-1

- The Rule by ISDH (410 IAC 29-2-1) continues:
  1. Outreach and identification of EBLL children.
  2. Child case management service planning and resource identification.
  3. Confirmatory testing.
  4. Child case management service implementation and coordination.
  5. Retesting.
  6. Monitoring of child case management service delivery, program advocacy, and program evaluation.

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Solve the Mystery

- If a child is identified with an elevated blood lead level of 10 µg/dL or greater, a Risk Assessment must be performed by a *Licensed Risk Assessor.* http://www.in.gov/isdh/19153.htm

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How are we exposed to lead?

- Dust from paint
- Dust from soil
- Water pipes containing lead pipes, brass faucets, or lead solder
- Imported home remedies and cosmetics

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How are we exposed to lead?

- **Jobs that involve lead:**
  - Mining or smelting
  - Construction and remodeling
  - Automobile repair
  - Plumbing
  - Police/Military

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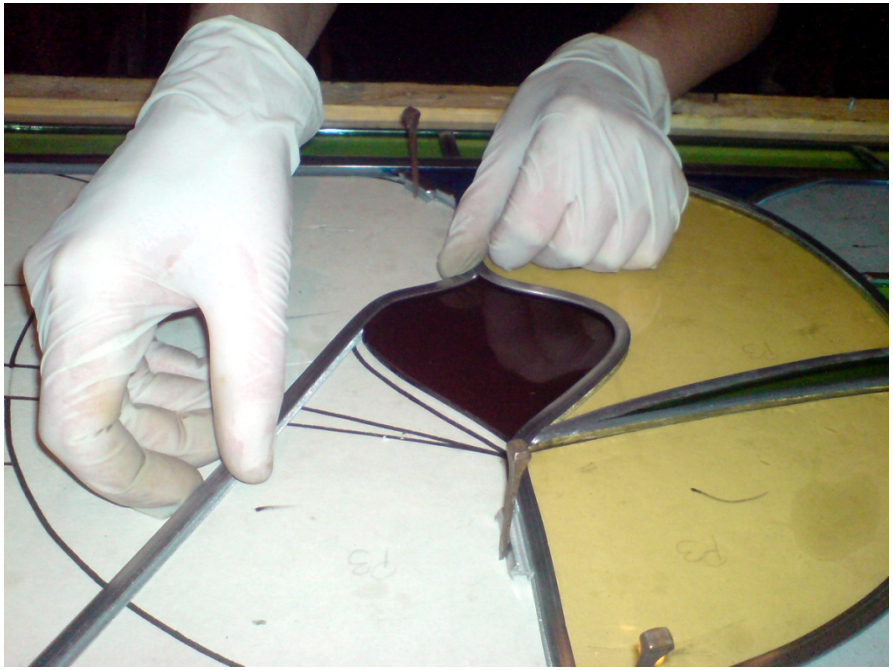
How are we exposed to lead?

- **Hobbies that involve lead:**
  - Car repair
  - Painting
  - Stained glass
  - Pottery glazing
  - Soldering
  - Target shooting
  - Making bullets, slugs or fishing sinkers



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Lead is still used in many Commercial products . . .

Bridge Paint

Computers

Solder

Pewter

Ceramic glazes

Jewelry

Automotive batteries

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TESTING YOUR HOME FOR LEAD

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Environmental Investigation
(410 IAC 29-1-14)

- A risk assessment of the CEBLL child's primary and secondary addresses . . . is to include the following:
  - Recommendations to mitigate identified lead hazards
  - Written report to the family and the owner if the family does not own the home
  - Identification and evaluation of exposure sources within the child's environment

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Environmental Investigation
(410 IAC 29-1-14)

- A risk assessment of the CEBLL child's primary and secondary addresses . . .to include the following:
  - Presentation of results of the environmental investigation including recommendations for reducing or eliminating exposure.
  - Education of the family on hazards found and education on temporary and permanent measures to protect the child from further exposure.

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What is a lead hazard?

- Lead Hazard: Dangerous conditions or circumstances that cause lead exposure at levels that would result in adverse human health effects. Lead hazards could include deteriorated lead-based paint, lead-contaminated dust, and lead-contaminated soil.

http://cdn.shopify.com/s/files/1/0329/0333/products/caution_LEAD-HAZARD-DO-NOT-ENTER-WORK-AREA-UNLESS-AUTHORISED.png?v=1406240386

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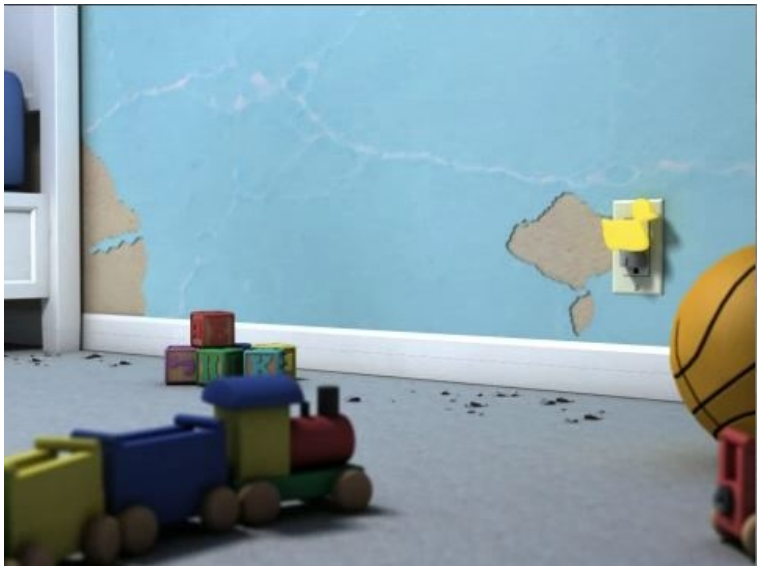
Department of Health

Levels for Lead-Hazards

Paint



- Residential property or child-occupied facility
  - Paint in poor condition
    - > 20 square feet on exterior components
    - > 2 square feet on interior components; or
    - > 10% of the total surface area of the component (interior/exterior)

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Levels for Lead-Hazards

Dust

- Residential property or child-occupied facility
  - Floor
  - Window Sill
  - Window Troughs

- 40 µg/square foot
- 250 µg/square foot
- 400 µg/square foot

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Levels for Lead-Hazards

Soil

- Residential property or child-occupied facility
  - Play area soil-lead concentration

    > 400 ppm; or

    >1200 ppm bare soil composite of non-play areas in yard

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Levels for Lead-Hazards

Water

- Residential property or child-occupied facility
  - Potable water

    =/> 15 ppb

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Small amount, right?!

ppb?

Consider common prescription medicines

- Paxil 30 ppb
- Cialis 30 ppb
- Albuterol 2.1 ppb
- Birth Control pills 0.035 ppb

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Rule 410 IAC 32
The Abatement Rule

- 410 IAC 32-2-2
  A. "The purpose of the lead-based paint program is to ensure that a person conducting lead-based paint activities in target housing or child-occupied facilities does so in a manner that safeguards the environment and protects the health of the building's occupants, especially children who are six (6) years of age and younger."

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Rule 410 IAC 32
The Abatement Rule

- 410 IAC 32-2-3
  A. "To become licensed by the department as an inspector, risk assessor, project designer, supervisor, workers, clearance examiner, or dust sampling technician . . ."

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Nationally: The Age of the House vs. Lead-based Paint Hazards

Construction Year	% Houses with Hazard
1978-1998	3%
1960-1977	8%
1940-1959	43%
Before 1940	68%

Over 30% of housing had dust lead hazards although the interior lead-based paint was in good condition

Source: National Housing Survey 1999-2000
Jacobs D.E

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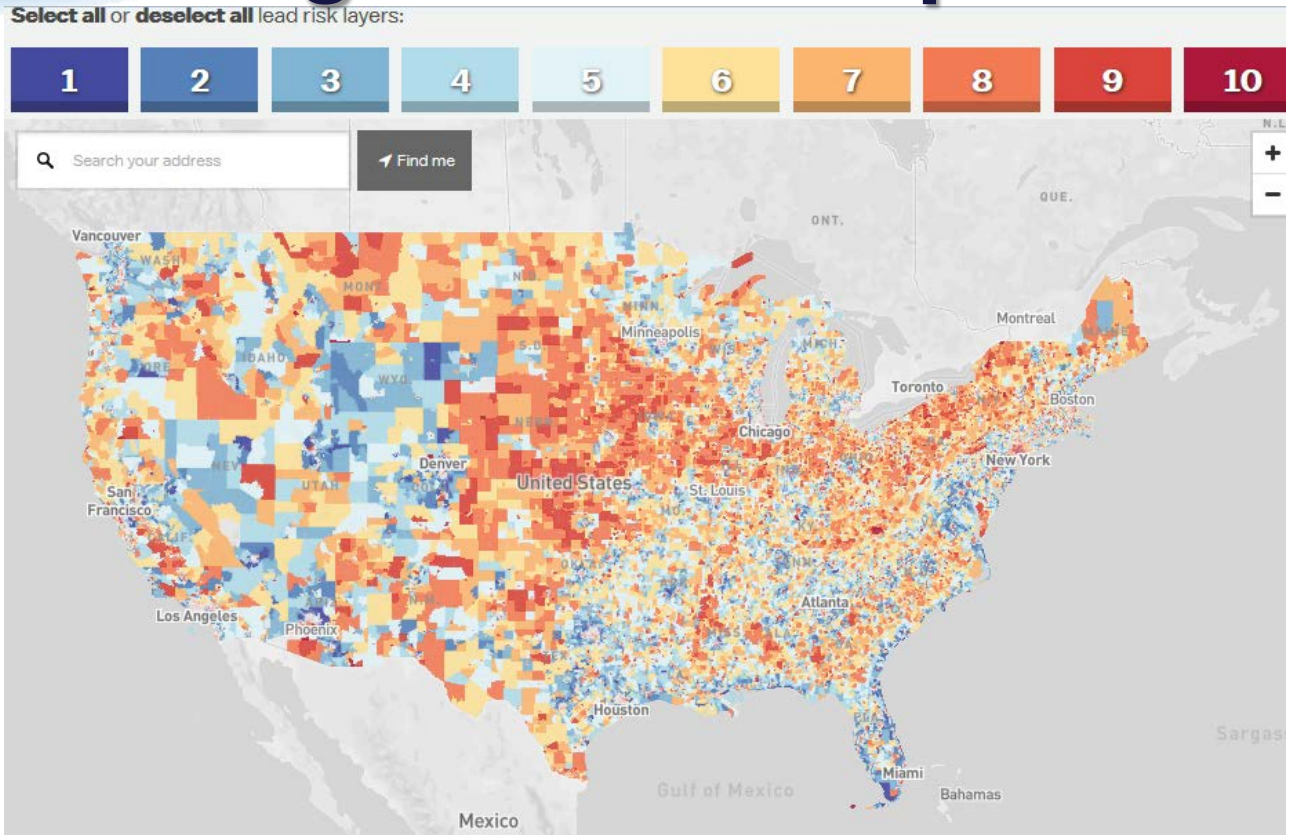
Interactive Map by VOX and the Washington State Dept of Health



http://www.vox.com/a/lead-exposure-risk-map

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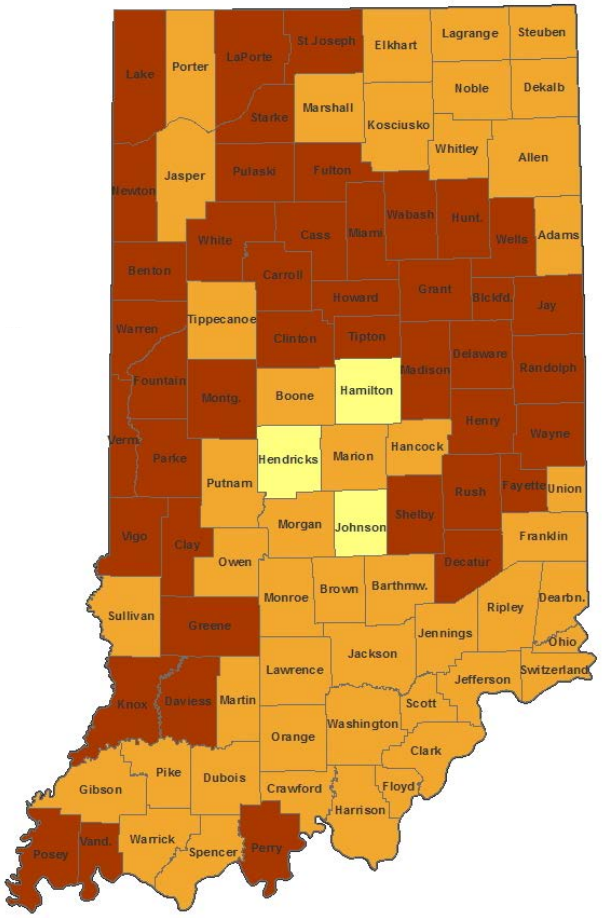
ISDH Data Collection



Environmental Public Health Division 3.14.16

Percentage of Pre-1980 Housing

Less than 45%

45% to < 60%

65% and higher

Is there a risk for lead poisoned children in Indiana?

YES!

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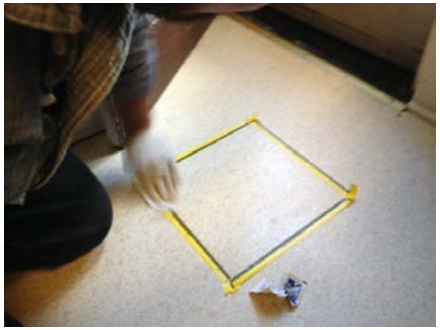
ISDH Lead Risk Analysis & Tools

- 4 Sections
  - Home Demographics
  - Personal Demographics
  - Exterior Risk Assessment
  - Interior Risk Assessment
- Years 2013 - 2015
- I-LEAD
- Lead Data Flow
- Excel



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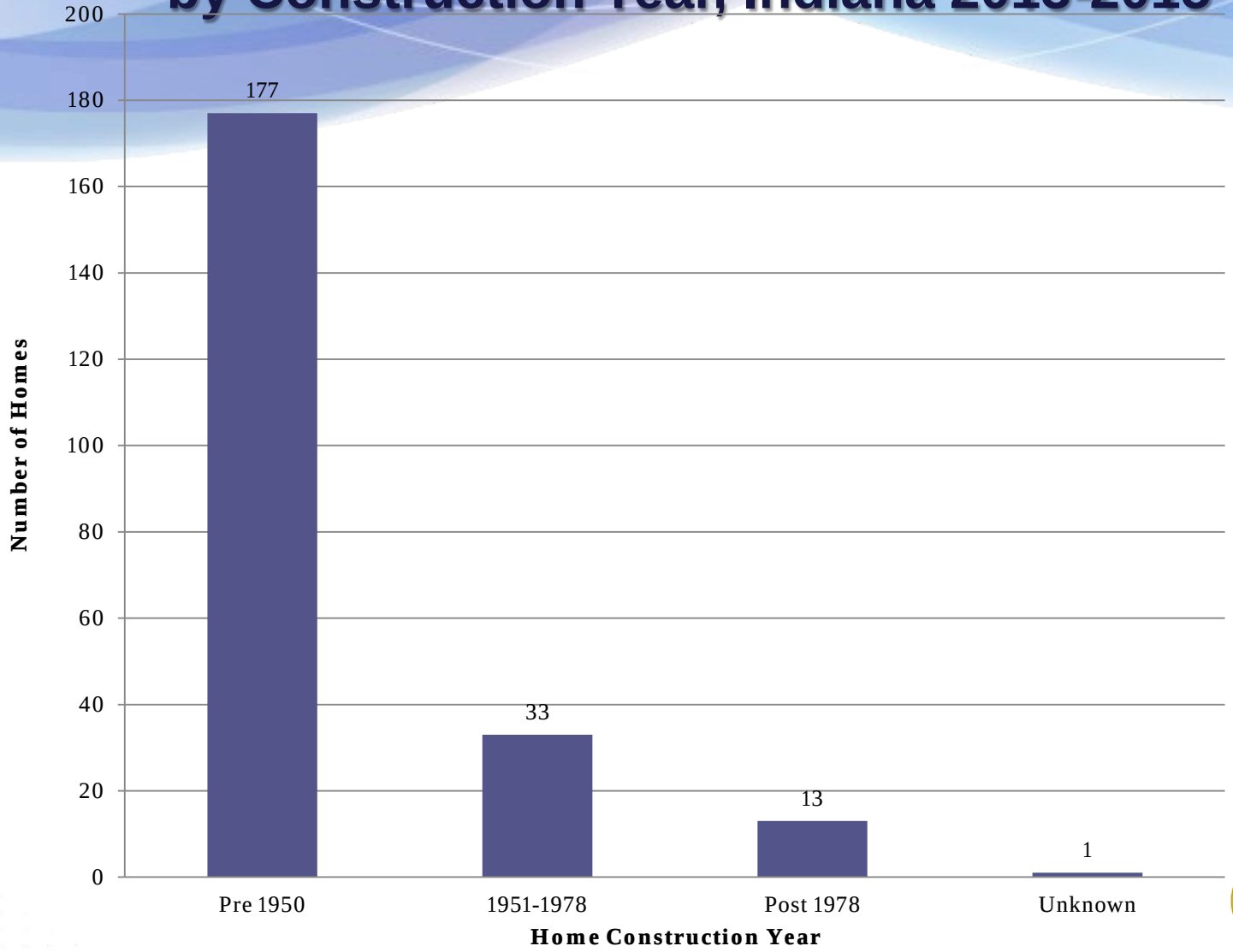
Number of Risk Assessments with EBLLs ≥10ug/dL by Construction Year, Indiana 2013-2015



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Population

- Children ≤6 years of age
- Indiana residents
- Only children tested with elevated blood lead levels of ≥10µg/dL
  - 2013: 78 risk assessments from 71 homes
  - 2014: 72 risk assessments from 70 homes
  - 2015: 74 risk assessments from 72 homes
- Risk assessments were extracted and analyzed per child, not per home

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Population Continued

- Not all children with elevated blood lead levels ≥10µg/dL were included
- Below are the number of identified children within I-LEAD out of the total number of lead poisoned children in the state of Indiana
  - 2013 – 78 out of 165 children, 47%
  - 2014 – 72 out of 125 children, 58%
  - 2015 – 74 out of 127 children, 58%
- For this presentation the focus is on the percent that was identified within the I-LEAD database

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Age of Children

- Most cases of EBLLs occur early in a child's life; between 1 and 3 years of age with most occurring the first year.
- Percent between <1 and 3 years of age
  - 2013: 86%
  - 2014: 80%
  - 2015: 84%
- 2013 and 2014 predominantly had more cases in the <1 year age range while 2015 had more cases in the 2 year range.

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Elevated Blood Lead Levels

	2013	2014	2015
Average EBLL Per Child	15.8	16.35	14.3
Range	10 - 54	10 – 45.5	10 - 38

- Average EBLL ranged from 14.3 – 16.35 µg/dL
- Decreasing trend among the range

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Gender

- EBLL children of ≥10µg/dL are more likely to be male
- An increasing trend among the males in this population demonstrates the above statement

	2013	2014	2015
Male	50%	57%	61%
Female	50%	42%	39%
Unknown	0%	1%	0%
Number of Cases	78	72	74

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Race

- 2013: 4 race categories
  - 65% white (51/78)
  - 17% unknown (13/78)
- 2014: 6 race categories
  - 73% white (50/72)
  - 13% unknown (9/72)
- 2015: 5 race categories
  - 61% white (45/74)
  - 20% unknown (15/74)

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Exterior Hazard Statistics

- Total hazards identified: 945 (2013 – 2015)
- Average number of hazards: 3.96 per risk assessment
  - Range: 0 – 22 hazards
- Soil lead loading average: 2,281.7 ppm per risk assessment
  - Range: 0 ppm – 27,000 ppm
  - Results were entered in ppm or mg/kg
    - 1:1 so no conversion necessary

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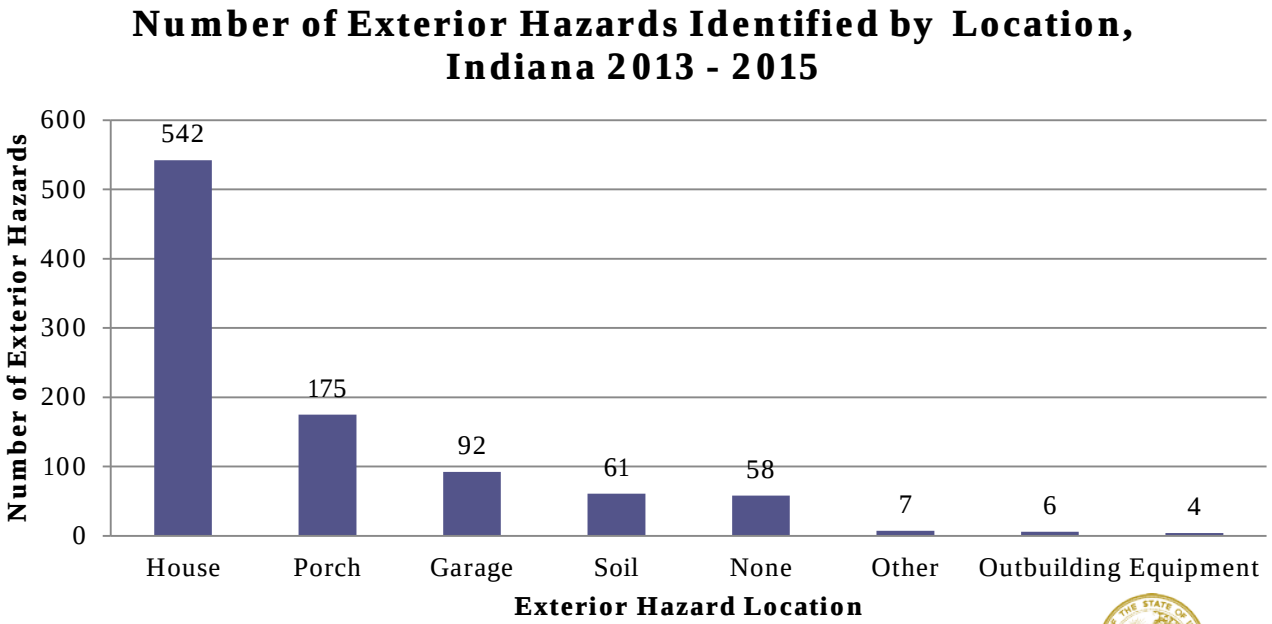
Exterior Hazard Location 2013-2015

- Most exterior hazards were identified from the outside surface of the home, ~57%



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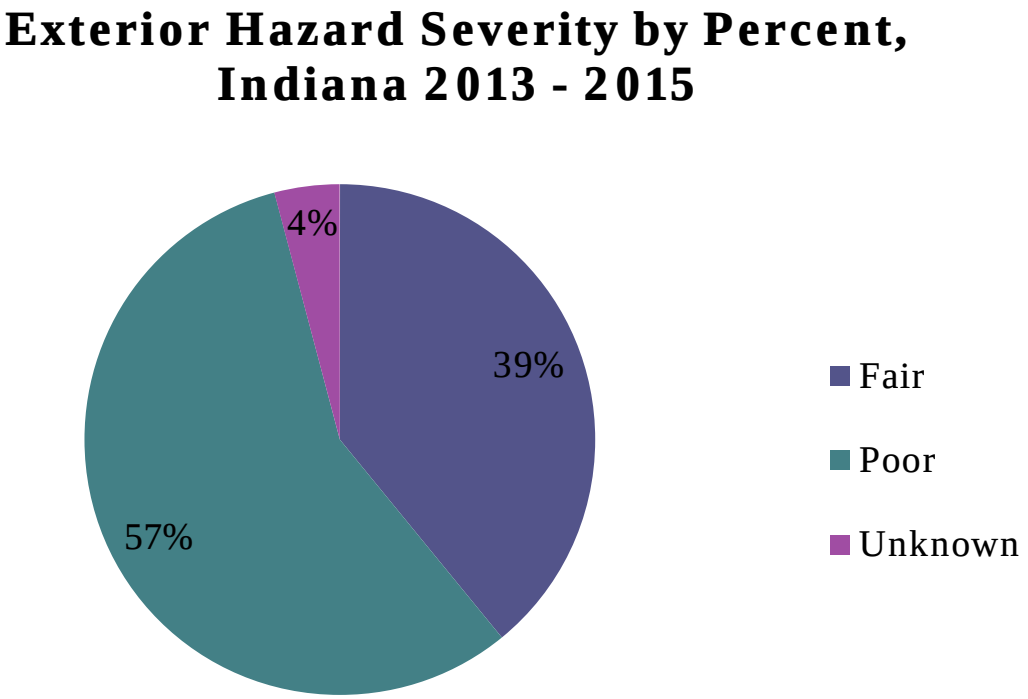
Exterior Hazard Severity

57% of exterior hazards are in poor condition or covering more than 20 square feet



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Exterior Risk Assessment Overview

- Total number of hazards varied per year
- Variation of average number of hazards per RA
- No patterns among severity percentages
- House location % decreased through three year period
- Garage location % increased through three year period

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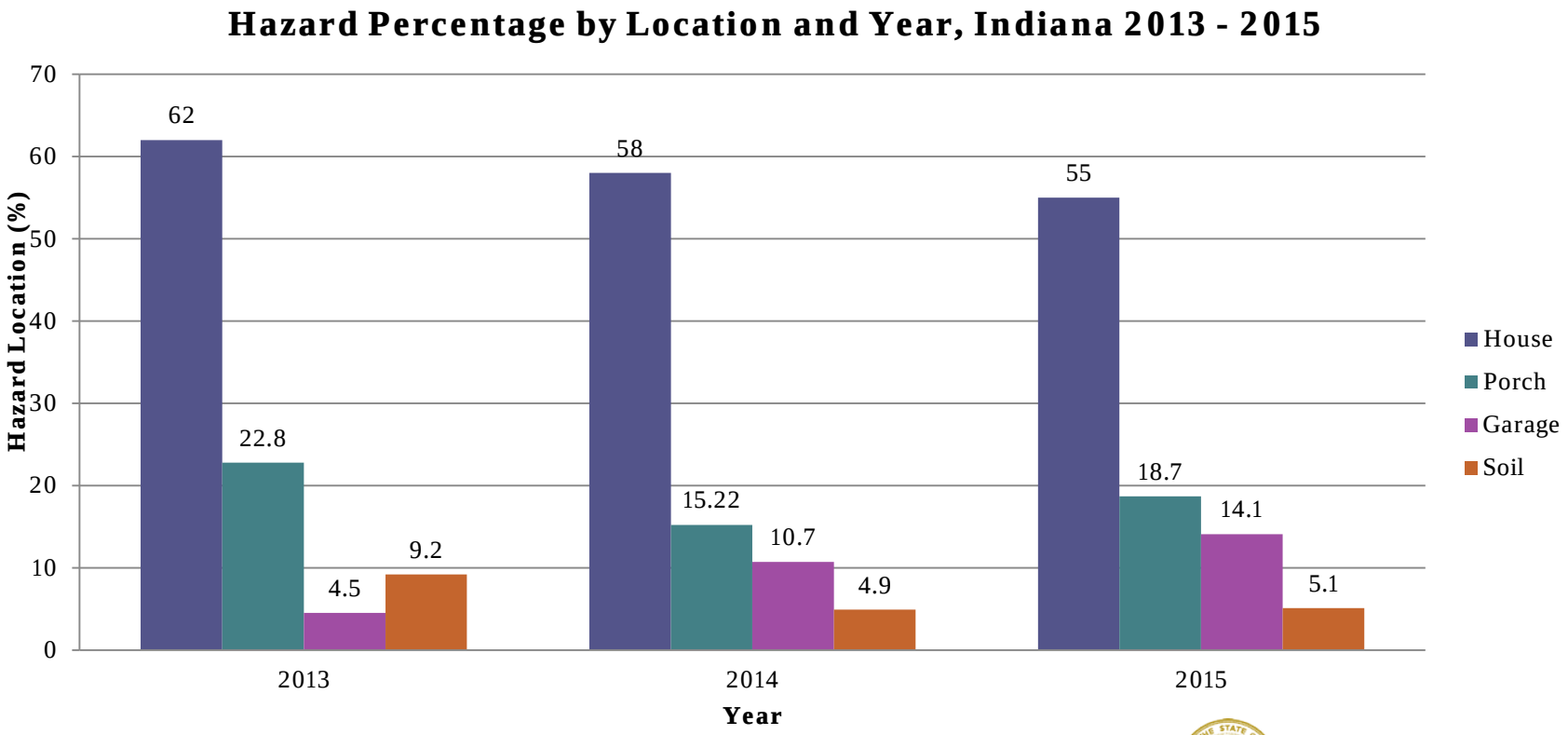
Exterior Risk Assessment Overview



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Interior Hazard Statistics

- Total interior hazards identified: 1,720 (2013 - 2015)
  - Paint: 1,243 hazards or 72.3% of interior hazards
  - Dust: 477 hazards or 27.7% of interior hazards
- Average number of hazards: 7.44 per risk assessment
  - Range: 0 – 44 hazards
- Dust lead loading average: 3,722.7 µg/ft^2 per risk assessment
  - Range: 5.4 µg/ft^2 – 68,000 µg/ft^2

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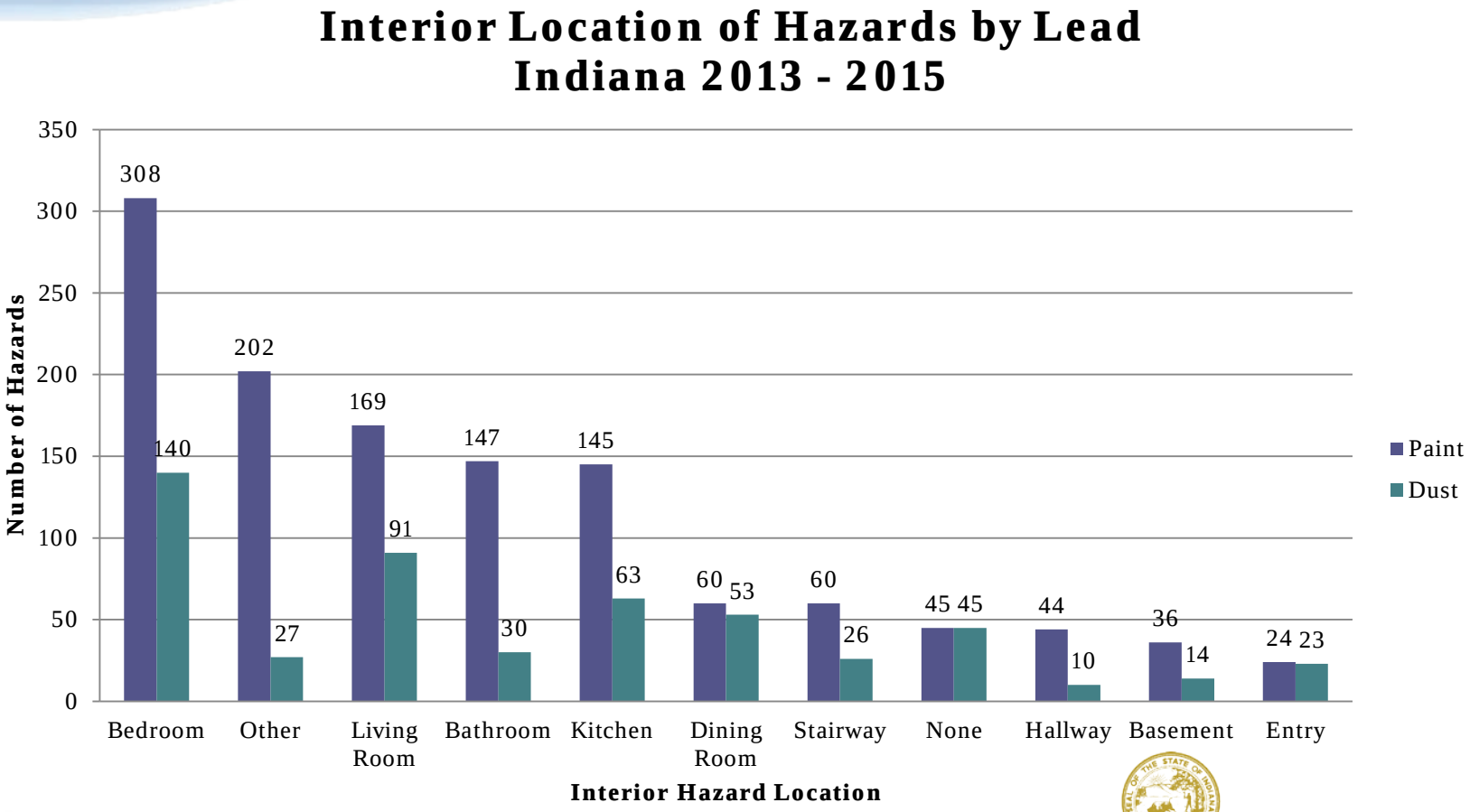
Interior Hazard Location



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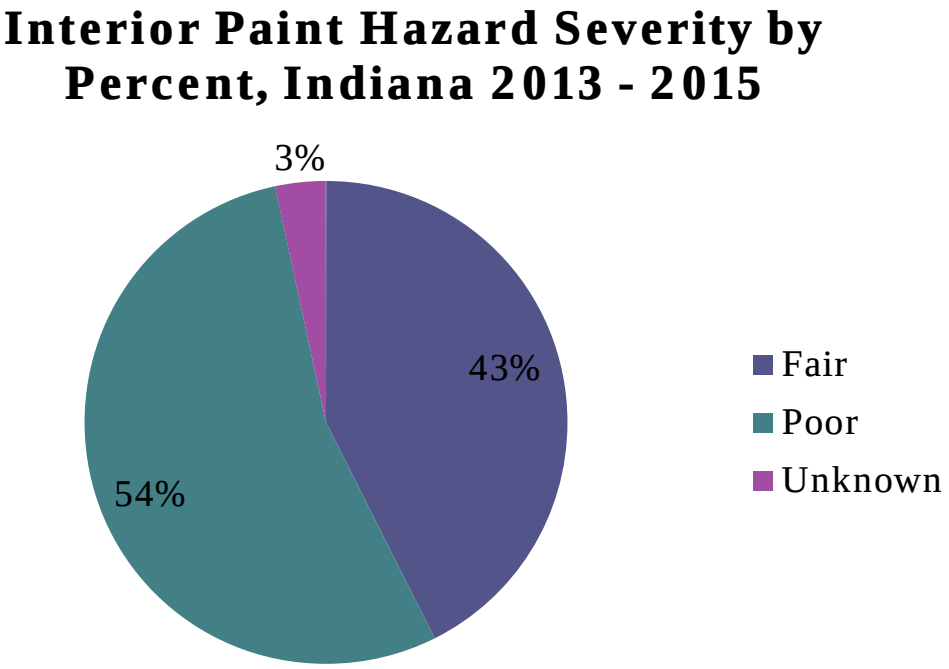
Interior Hazard Location

- Similar percentages to interior hazard severity, 54% are poor or covering more than 2 square feet



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Interior Hazard Risk Assessment Overview

- Interior hazards are generally from paint or paint chips
- Bedrooms are the “best: place to look for lead hazards
  - Other (2nd) and Living Room (3rd)
- Most of these hazards are found in predominant living areas

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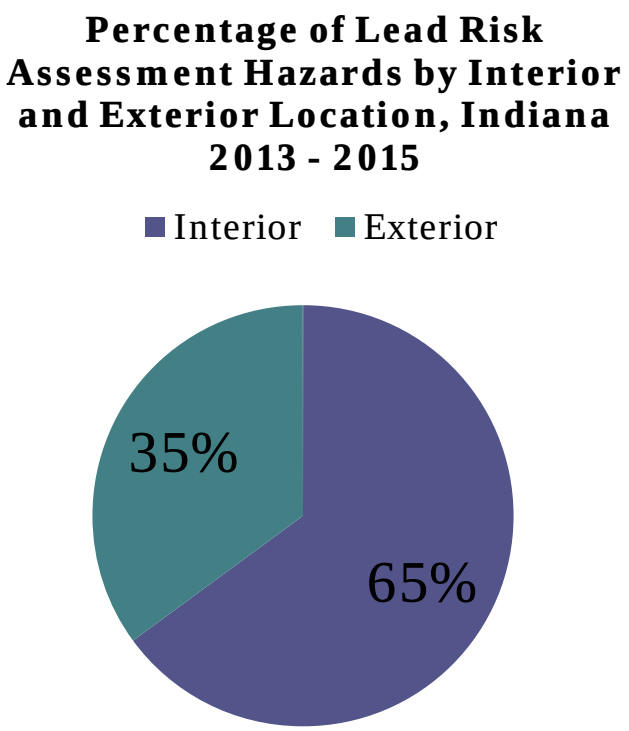
Interior vs. Exterior Hazards

- Total hazards: 2,650
- 224 risk assessments
- 213 homes
- Most risk assessment hazards are located inside the home
  - Children spend more time indoors
  - Might have increased risk for lead poisoning



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Guidance & Resources

- Indiana State Department of Health, www.eph.in.gov, Lead & Healthy Homes Program
- Improving Kids' Environment, www.ikecoalition.org
- Centers for Disease Control and Prevention, www.cdc.gov
- Environmental Protection Agency, www.epa.gov
- Risk Assessor training can be obtained from Environmental Management Institute (EMI) in Indianapolis. http://www.envtlmgmt.org

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Lead Poisoning is . . .

The **#1**

PREVENTABLE

Illness in Children

Get your home tested. Get your child tested. Get the facts.

Kim Roe, Health Educator
Lead & Healthy Homes Program
Environmental Public Health
www.eph.in.gov

Indiana State Department of Health

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