WELCOME

2021 VIRTUAL

LEARNING COLLABORATIVE

ON CHILDHOOD LEAD POISONING PREVENTION

AUGUST 25TH, 2021

9:00AM - 4:30PM

IDPH
IOWA Department of PUBLIC HEALTH

IOWA
Institute of Public Health Research and Policy

WELCOME

This event is supported by the Centers for Disease Control and Prevention grant funds under Cooperative Agreement Number, NUE2EH001367-03-03. Content presented during this event is solely the responsibility of the presenters and does not necessarily represent the official views of the Centers for Disease Control and Prevention or the Department of Health and Human Services.

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981 children under 6 had a confirmed elevated blood lead level above 5 µg/dL in Iowa in 2019

That is enough to fill 13.5 school buses

Iowa Public Health Tracking Portal. (2019). Children Tested. Retrieved from https://tracking.idph.iowa.gov/Health/Lead-Poisoning/Annual-Blood-Lead-Testing-Children-Under-6/Children-Tested

AGENDA

9:00am - 9:15am	Welcome
9:15am - 10:15am	Promoting Pediatric Lead Screening: Using the Collective Impact model to close the gap in testing
10:15am - 10:30am	Break
10:30am - 11:00am	Lead in Drinking Water: Opportunities for improving Iowans' public health
11:00am - 11:30am	Iowa Lead Exposures linked to Contaminated Spices
11:30am - 12:00pm	Baby Shoes to Work Boots - 2020 Lead Exposure in Iowa
12:00pm - 12:30pm	Discussion Session
12:30pm - 1:00pm	Lunch

AGENDA

1:00pm - 2:00pm	Its time to look upstream; the role of housing in the health of children
2:00pm - 2:15pm	Break
2:15pm - 2:45pm	Bringing Together Partners for a Successful Lead Hazard Control Program
2:45pm - 3:15pm	Growing a Coalition by Engaging Community Partners
3:15pm - 3:45pm	Black Hawk County Health Department and Waterloo Community Development Healthy Homes Collaboration
3:45pm - 4:15pm	Discussion Session
4:15pm - 4:30pm	Wrap-up & closing

DISCLOSURES

The Iowa Institute of Public Health Research and Policy strives to ensure balance, independence, objectivity and scientific rigor in all of its educational programs. All planners, faculty members, moderators, discussants, panelist and presenters participating in this program have been required to disclose any real or apparent conflict(s) of interest that may have a direct bearing on the subject matter of this program. This includes relationships with pharmaceutical companies, biomedical device manufacturers or other corporations whose products or services are related to the subject matter of the presentation topic. The intent of this policy is to identify openly any conflict of interest so that the attendees may form their own judgments about the presentation with full disclosure of the facts. In addition, faculty is expected to openly disclose any off-label, experimental and/or investigational uses of drugs or devices in their presentation.

Disclosures, Conflict of Interest (COI) and Resolution of COI policies are available via the APHA's website and in the printed program.

DISCLOSURES

Medicine (CME) Accreditation Statement

This activity has been planned and implemented in accordance with the Essential Areas and Policies of the Accreditation Council for Continuing Medical Education through the joint sponsorship of the American Public Health Association (APHA) and the (insert your organization). The APHA is accredited by the ACCME to provide continuing medical education for physicians.

Designation Statement: The APHA designates this live web educational activity for a maximum of 6 AMA PRA Category 1 Credit (s)™.

Nursing (CNE) Accreditation Statement

American Public Health Association's Public Health Nursing Section (APHA/PHN), is accredited as an approver of nursing continuing professional development by the American Nurses Credentialing Center's Commission on Accreditation.

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Sponsored by the American Public Health Association (APHA), a designated approver of continuing education contact hours (CECH) in health education by the National Commission for Health Education Credentialing, Inc. This program is designated for Certified Health Education Specialists (CHES®) to receive up to 6 total Category I contact education contact hours. Maximum advanced-level continuing education contact hours available are 0.

OBTAINING CEU

Participants must complete the evaluation online in order to earn credit hours and obtain a CE certificate. A link to the online evaluation system will be sent to all registered participants who attend the activity that will contain instructions and a personal ID number for access to the system. All online evaluations must be submitted by 09/25/21 to receive continuing education credit for this activity.

Promoting Pediatric Lead Screening: Using the Collective Impact model to close the gap on testing
A brief review of lead and child health with an update on guidelines

Iowa's 2021 Learning Collaborative on Childhood Lead Poisoning Prevention

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BEST CHILDREN'S HOSPITALS U.S.News RANKED IN 10 SPECIALTIES 2020-21

MAGNET RECOGNIZED AMERICAN NURSES CREDENTIALING CENTER

UMKC School of Medicine

KU SCHOOL OF MEDICINE The University of Kansas

LOVE WILL.

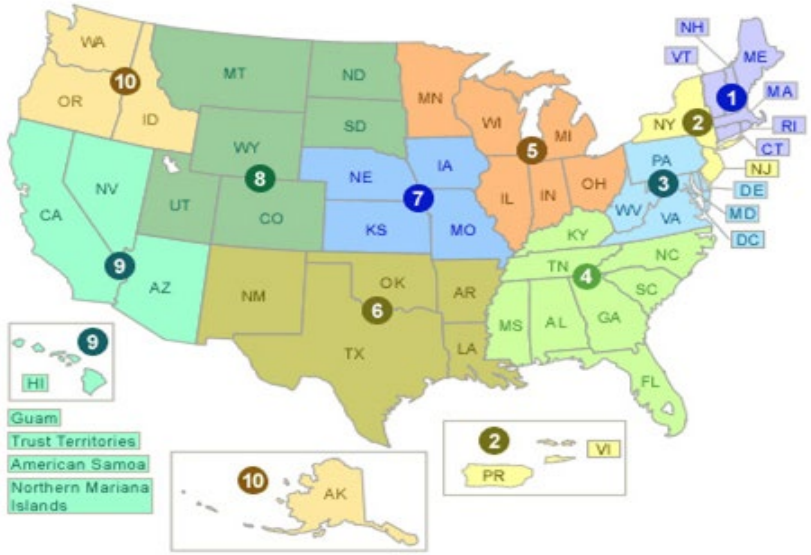
Children's Mercy

Pediatric Environmental Health Specialty Units (PEHSU)

- CDC/EPA sponsored network of interdisciplinary pediatric EH specialists based at academic medical centers corresponding to federal regions – www.pehsu.net

- MA PEHSU based at Children's Mercy Hospital, Kansas City, MO

- Provide free consultation, referral, outreach and education
  - Public Health Depts
  - Clinicians, healthcare professionals
  - Public health and medical trainees
  - Communities
  - Families



Website: https://cmh.edu/mapehsu

MA-PEHSU: 1-800-421-9916; mapehsu@cmh.edu

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Lead (Pb+)

Source: http://www.mindat.org/photo-288819.html; Image by Robert Lavinsky & irocks.com

You Can't Judge Very Well

how a color will look on your house by the way it looks on the color card. The better way is to have your painter try the color on a few boards of the surface to be covered. Change it till it suits you. You can do this if your paint is mixed on the job, of

COLLIER
White Lead
(Dutch Boy Painter Trade-Mark)

and pure linseed oil. White lead paint may be tinted any conceivable color. It is the standard long-wear paint that has proven its worth through generations of use. It is blotch-proof, scale proof, crack-proof.

Come to us for your paint supplies and

Ask for our Painting Points

containing color schemes and many helpful painting suggestions.

T. N. COLEMAN,
Druggist
C. W. BIGERT

Source: *The Daily Ardmoreite. [volume]* (Ardmore, Okla.), 20 Sept. 1912. *Chronicling America: Historic American Newspapers*. Lib. of Congress. <https://chroniclingamerica.loc.gov/lccn/sn85042303/1912-09-20/ed-1/seq-3/>

Who should receive a blood test for lead exposure?

Does the child have any of the following <u>risk factors</u>?

- Lives in or regularly visits home built before 1978.
- From a low-income family - federal law mandates BLL testing for all children in Head Start or covered by Medicaid.
- Has a sibling or frequent playmate with elevated BLL.
- In foster care, a recent immigrant, refugee, or a foreign adoptee.
- Has a parent or caregiver working professionally or recreationally with lead.
- Uses traditional, folk or ethnic remedies or cosmetics.
- Eats wild game such as deer or waterfowl that has been shot with lead bullets.

Consider testing additional children per clinical judgement, such as:

- Children whose parents have concerns or request lead testing (including older children)
- Children living within a kilometer of lead emitting industry such as a current or former mining or smelter site or an airport
- Children with pica behavior
- Children with neurodevelopmental disabilities or conditions such as autism, ADHD and learning delays

Hobbies and Occupational Take Home as a Lead Source

- Plumbing
- Stained glass
- Radiator repair
- Pottery glazing
- Chemical preparation
- Police officers/military
- Soldering and welding
- Target shooting, hunting
- Auto repair and remodeling
- Painting - art or infrastructure
- Construction, remodeling and demolition
- Making ammunition, slugs or fishing sinkers

Source: https://www.osha.gov/workers

Source: https://www.osha.gov/sites/default/files/publications/OSHA3885.pdf

Lead in Commercial Goods

- Pipes
- Bullets
- Pewter
- Computers
- Jewelry/Toys
- Automotive batteries
- Bridge and boat paint
- Ceramic glazes/Dishes
- Solder - water systems
- Imported food products, cosmetics (next slide)

Source: https://www.cpsc.gov/Recalls/2007/Fisher-Price-Recalls-Licensed-Character-Toys-Due-To-Lead-Poisoning-Hazard-

Lead in Ethnic and Imported Products

Food products including spices, candy and herbal remedies, ceremonial powders

- Mexican - azarcon, greta, liga, Maria Luisa, alarcon, coral, rueda
- Asian - chuifong, tokuwan, ghasard, bali goli, kandu, surma, ba-baw-san, daw tway
- Middle Eastern - kohl, saoott, cebagin

Source: https://www.fda.gov/safety/recalls-market-withdrawals-safety-alerts

Source: KCMO Health Dept.

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LOVE WILL.

Hore, Paromita PhD, MPH; Alex-Oni, Kolapo MPH; Sedlar, Slavenka MA; Nagin, Deborah MPH A Spoonful of Lead: A 10-Year Look at Spices as a Potential Source of Lead Exposure, Journal of Public Health Management and Practice: January/February 2019 - Volume 25 - Issue - p S63-S70 doi: 10.1097/PHH.0000000000000876
NIOSH. Lead Information for Workers. Electronic Reference: https://www.cdc.gov/niosh/topics/lead/jobs.html

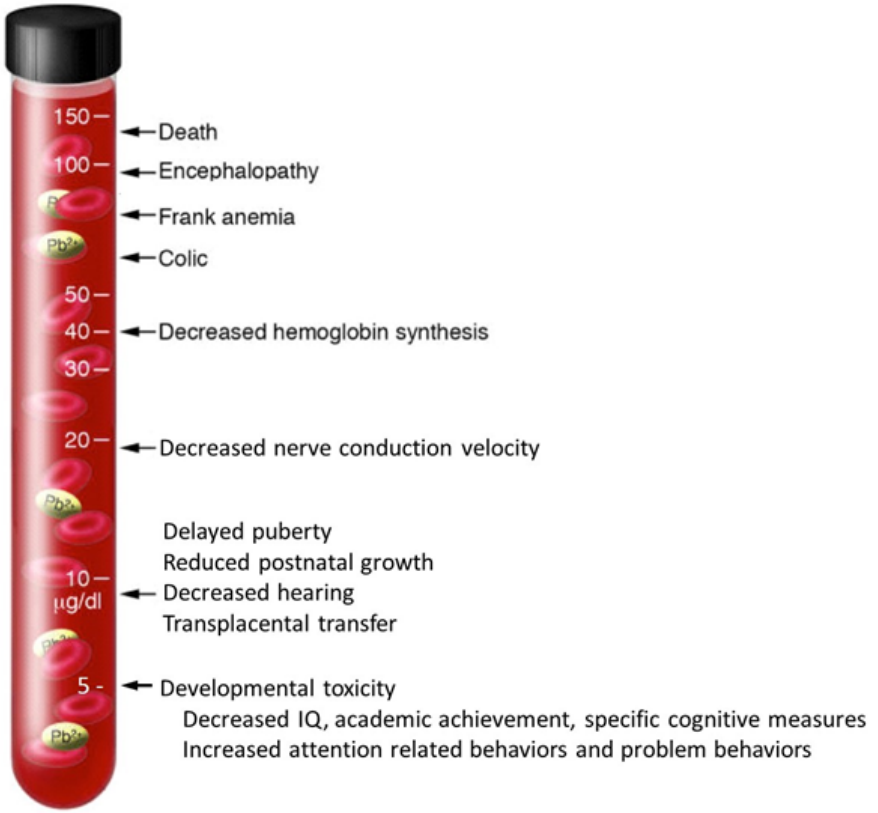
Children's Mercy

Lead in soil (not from house-paint)

- Varies from place to place
- Soil near roadways (pre-1976 gasoline)
- **Elevated in soil, water, or air near mining or smelting facilities OR mining or smelting waste site
- Near businesses and industries that involve lead
- Near airports with small aircraft that use aviation gas

Key Pediatric Health Concerns

- May be asymptomatic
- <u>Possible symptoms:</u> constipation, fatigue, anemia, headaches.
- <u>Serious health consequences:</u> neurological disorders, fatal lead encephalopathy
- Acute and high dose exposures are rare, but possible
- Most lead toxicity in US children is “subclinical” necessitates blood test to determine exposure.



WHO. Childhood Lead Poisoning. 2010.

We have sufficient evidence for the following low-level health effects:

Neurological Effects

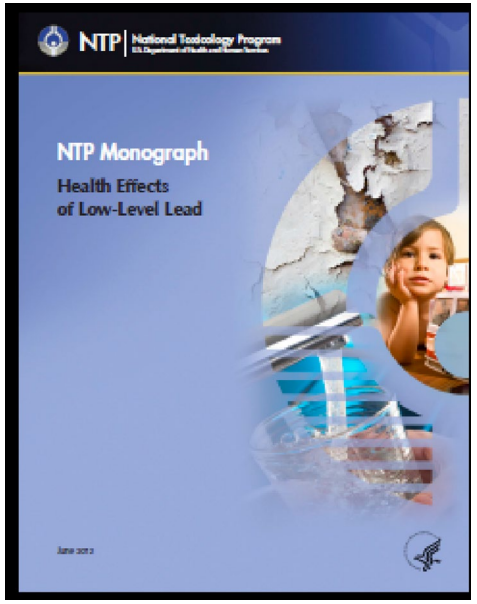
- Attention related problems
- Anti social behavior
- Criminal Behavior
- Decreased cognitive ability
- Decreased academic achievement
- Decreased Hearing

Reproductive Effects

- Reduced fetal growth
- Adverse changes in sperm parameters; increased time to pregnancy

Other Effects

- Decreased postnatal growth
- Delayed puberty



National Toxicology Program 2012

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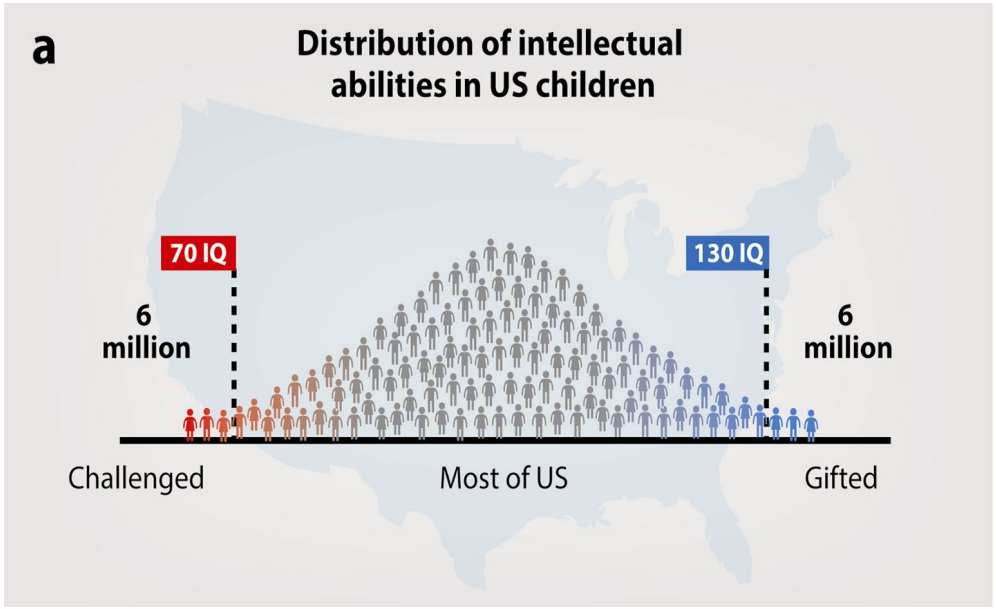
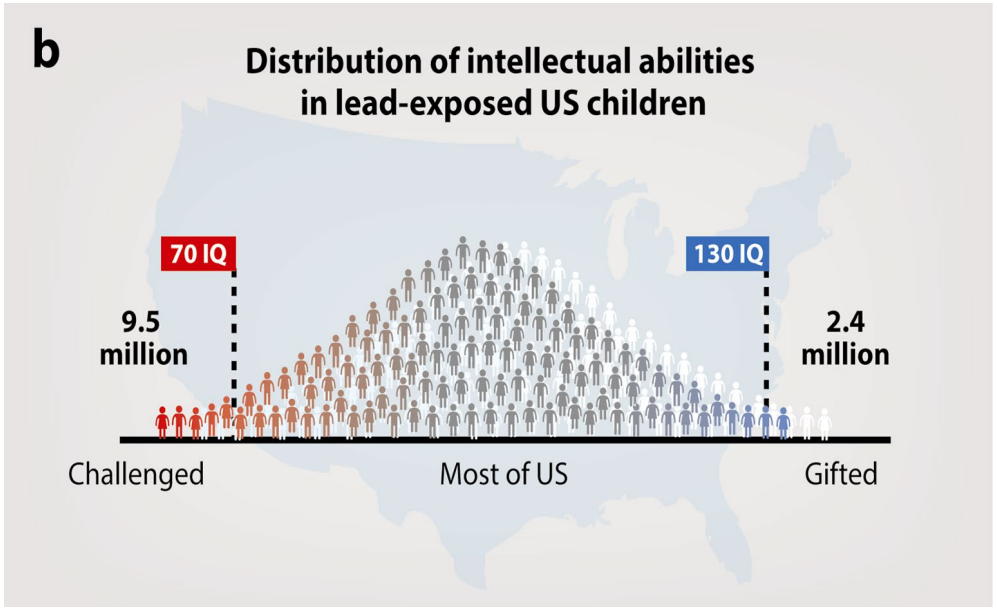
The Significance of a 5 Point IQ Reduction



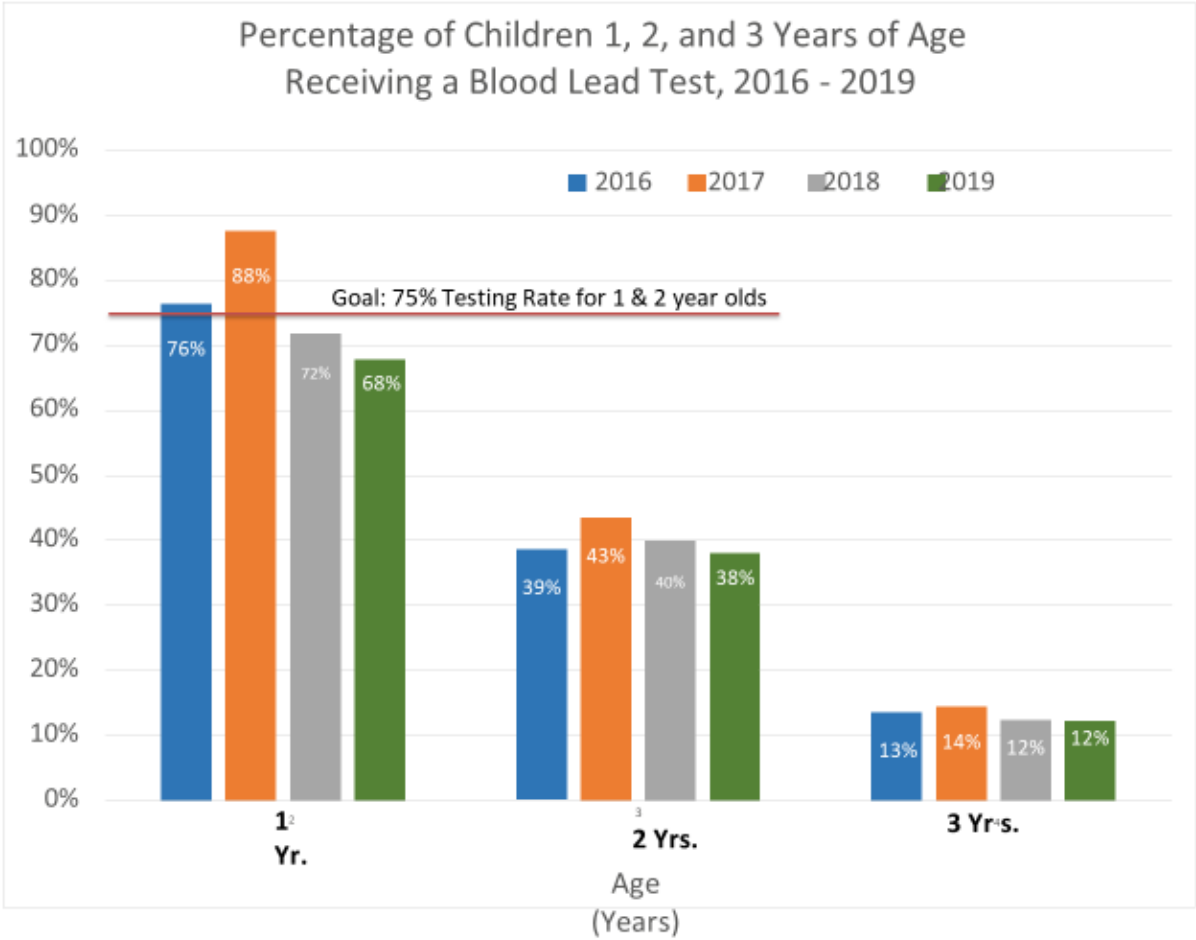


Reference:
Evens, A., Hryhorczuk, D., Lanphear, B.P. et al. The impact of low-level lead toxicity on school performance among children in the Chicago Public Schools: a population-based retrospective cohort study. Environ Health 14, 21 (2015). https://doi.org/10.1186/s12940-015-0008-9

Summary: why address lead exposure in pediatric patients?

- There is no threshold – potential harm exists even at low levels.
- Lead exposure to children is common
- Lead exposure is preventable.
  - Detecting elevated BLLs leads to investigation and elimination of the source.

Iowa State Statistics



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Source: Healthy Homes and Lead Poisoning Surveillance System, Iowa Department of Public Health

Children's Mercy

Common Barriers to BLL testing

- Belief among clinicians that their patients are not at risk for lead exposure and would be symptomatic if they were exposed
- Blood testing was off site from clinic location
- Parents want to limit the frequency of blood testing at time of vaccines
- Parents unaware of importance of testing
- Remoteness of residence
- Language barriers

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References
Kemper AR1, Clark SJ. Physician barriers to lead testing of Medicaid-enrolled children.Ambul Pediatr. 2005 Sep-Oct;5(5):290-3.
Polivka BJ1, Gottesman MM. Parental perceptions of barriers to blood lead testing. J Pediatr Health Care. 2005 Sep-Oct;19(5):276-84.

Federal Rules

- Federal law mandates lead testing test for all children covered by Medicaid at 12 and 24 months.

- **HEDIS Measure** for Lead Screening in Children:

  Number of children 2 years of age who had one or more blood tests for lead poisoning by their second birthday.

Testing Requirements for Children in IA

IA Medicaid Children

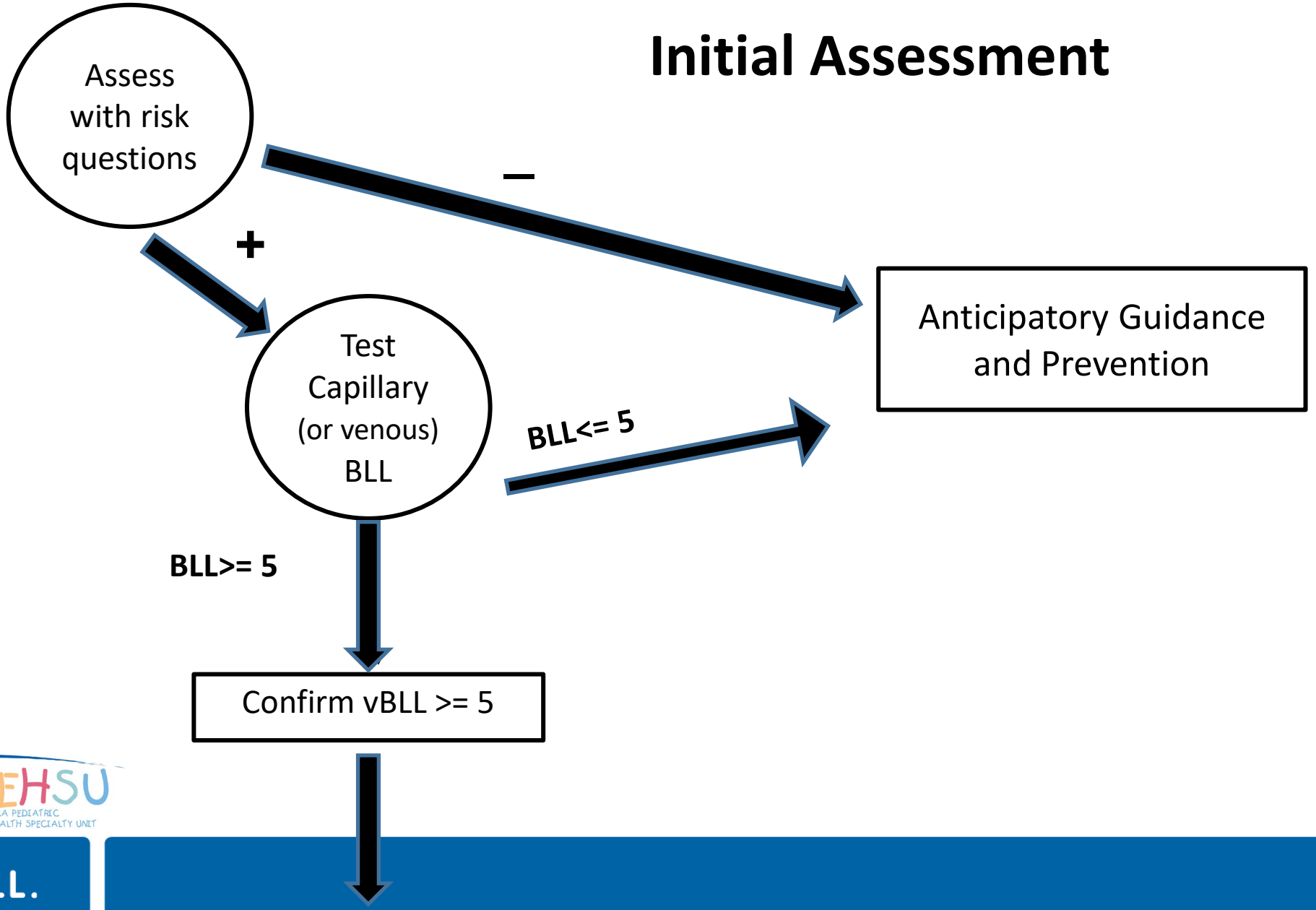
- Blood test at 12 and 24 months
- One blood test between ages of 12 and 72 months if no previous test

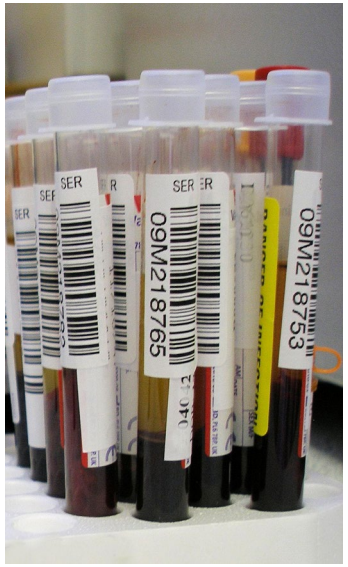
- Annual blood lead test for high-risk until age of five (based on answers to questionnaire)

All Children in IA

- Every child should have at least one BLL by the age of 5 years. This is a **state law**.
- Children identified as low risk, should receive testing at 12 at 24 months. If older with no previous test, they should be tested once.
- Children identified as high risk should be tested at 12, 18, 24 months and then at 3, 4, and 5 years.

Initial Assessment





By GrahamColm [CC BY-SA 3.0 (https://creativecommons.org/licenses/by-sa/3.0)], from Wikimedia Commons

Responding to abnormal BLLs

Timeline

Identify Risk Factors

↓

Obtain BLL and confirm ≥5 with vBLL

↓

Lab (or clinic) reports all BLLs at all levels to state

↓

State reports to County Public Health

↓

Public Health Response

↓

Clinician monitors BLL
BLLs continue to be tracked

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Work-Up and Clinical Management of Lead Exposed Children

For 5 << BLL << 44 mcg/dL

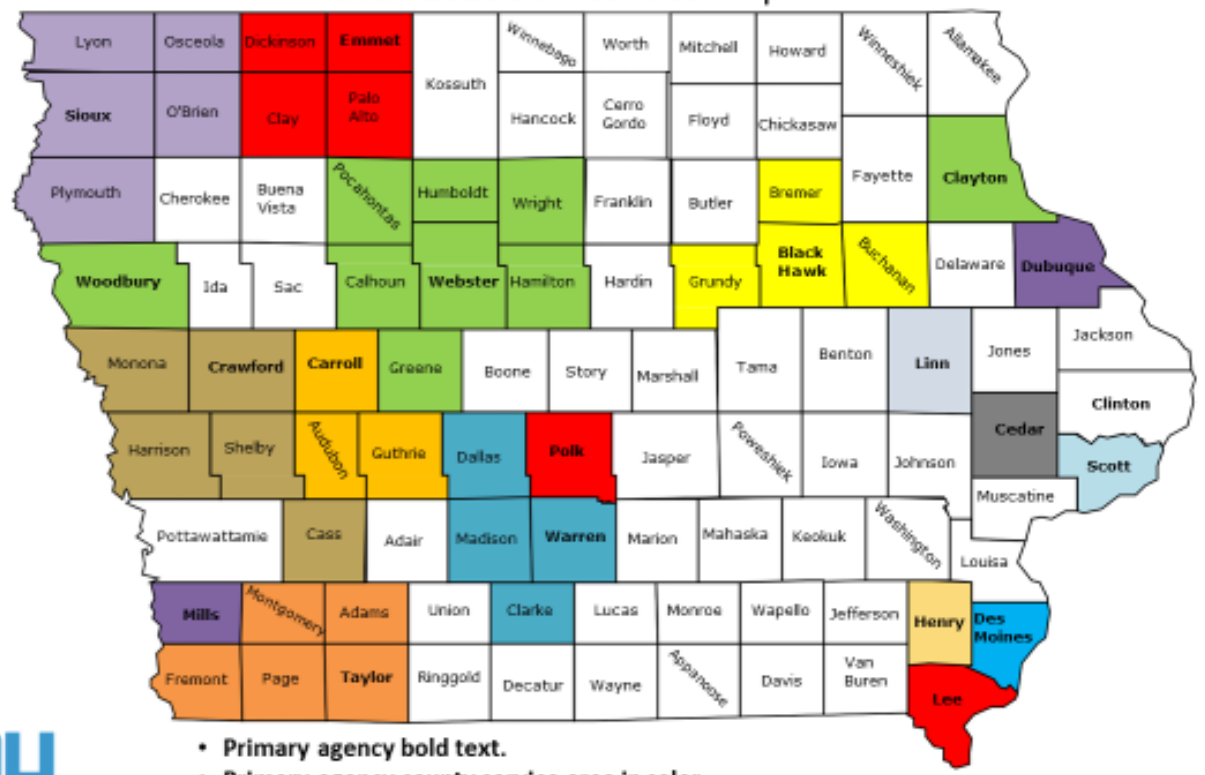
- Labs: CBC, iron, ferritin, CRP
- Consider abdominal X-ray
- Consult specialist if > 20 mcg/dL
- Monitoring repeat BLLs
- **Conduct exposure history**
- Ensure good nutrition
- Promote healthy neurocognitive development
  - ***Consider referring for educational enrichment***

Overall Management of Lead Exposed Children in Iowa

- Children up to age 5 with BLL of 10 mcg/dL or greater are assigned a case manager
- Children with BLLs of 20 mcg/dL or greater are provided a home lead assessment
- **Case managers, are responsible for coordinating care**

Lead Risk Assessor Regions

Childhood Lead Poisoning Prevention Program
2020-2021 Service Area Map



- **Primary agency bold text.**
- **Primary agency county service area in color.**
- **IDPH Lead Program service area non-colored counties.**

Source: Iowa Department of Public Health, Childhood Lead Poisoning Prevention Program, July 2020

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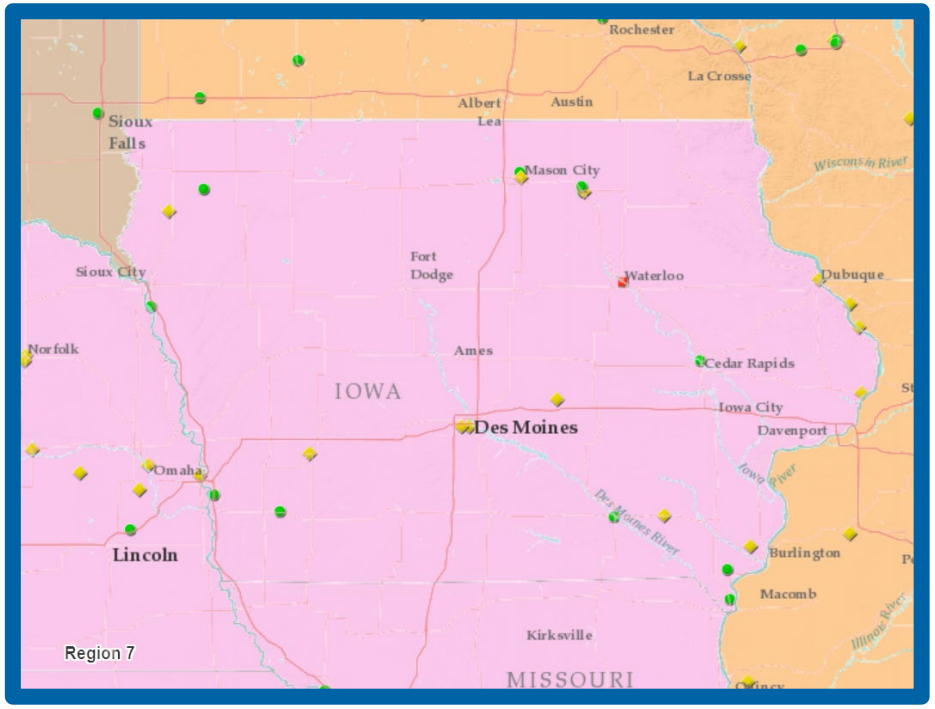
Children's Mercy

Federal Partners

- Environmental Protection Agency (EPA)
- Health and Human Services (HHS)
- Agency for Toxic Substances and Disease Registry (ATSDR)

National Priorities List



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SoilSHOP

soilSHOP
Screening, Health, Outreach and Partnership

Other Partners

- US Dept of Housing and Urban Development (HUD)
  - Public Housing Authority
- Medical Legal Partnership

Image source: https://www.vdh.virginia.gov/leadsafe/lead-in-the-home/

Addressing Lead Exposure Sources – Methods for removing lead from the home

- Frequent wet dusting and wet mopping
- Frequent hand washing
- Remove shoes at domicile
- Wash produce
- Keep painted surfaces dust-free
- Clean surfaces weekly
- Lead Safe Certified renovation firms

- IA guidance on renovation

Source: https://www.niehs.nih.gov/health/topics/agents/lead/index.cfm

Promoting Healthy Neurocognitive Growth - including Anticipatory Guidance

- Speaking with parents constructively
- Promote healthy neuro-cognitive development
  - Good nutrition
  - Educational enrichment
  - Physical activity
  - Limited screen time
  - Safe environments
  - Good sleep
- Reduce risk of future exposure (i.e. with home lead reduction opportunities)

Resources

- PEHSU National Fact Sheet: Lead – http://www.pehsu.net/_Childhood_Lead_Exposure.html
- AAP: Detection of Lead Poisoning
  - https://www.aap.org/en-us/advocacy-and-policy/aap-health-initiatives/lead-exposure/Pages/Detection-of-Lead-Poisoning.aspx
- MAPEHSU – factsheets for parents on managing indoor and outdoor lead exposure
- US EPA: Lead Sources - https://www.epa.gov/lead
- Iowa Childhood Lead Poisoning Prevention Program
  - *https://idph.iowa.gov/Environmental-Health-Services/Childhood-Lead-Poisoning-Prevention* (main website)
  - MAP identifying assessors - https://idph.iowa.gov/Portals/1/userfiles/106/FY21-CLPPP-Service-Area-Map.pdf
  - Summary of Guidelines for Treatment and Follow up on Childhood BLLs - https://idph.iowa.gov/Portals/1/userfiles/106/Guidelines-for-Treatment-Follow-Up-on-Child-BLL-Tests_082020.pdf
  - BLL Testing and Follow up Charts (more detailed guidelines) - https://idph.iowa.gov/Portals/1/userfiles/106/Risk%20Questionnaire%2C%20Blood%20Lead%20Test%20Charts%2C%20%26%20Physicians%20Guidelines.pdf
- Protect Your Family from Lead booklet
  - https://www.epa.gov/sites/production/files/2020-04/documents/lead-in-your-home-portrait-color-2020-508.pdf *(available in multiple languages)*
- Fight Lead with a Healthy Diet –
  - https://www.epa.gov/sites/production/files/2020-01/documents/fight_lead_poisoning_with_a_healthy_diet_2019.pdf.

References

Bellinger, D. Putting it into Practice: Pediatric Environmental Health Training Resource. “Childhood Lead Poisoning.” Children’s Environmental Health Network. 2014.

CDC Advisory Committee on Childhood Lead Poisoning Prevention. Preventing Lead Poisoning in Young Children. 1991 and 2005.

Council on Environmental Health. Prevention of Childhood Lead Toxicity. Pediatrics 2016;138.

Odom, S. Oregon Health Authority. Personal Communication. July 2020.

Hauptman, M. Bruccoleri R. Woolf A. An Update on Childhood Lead Poisoning. Clinical Pediatric Emergency Medicine 18(3) · July 2017. 18(3)181-191.

PEHSU Factsheet 1: Recommendations on Medical Management of Childhood Lead Exposure and Poisoning. National PEHSU, 2013.

PEHSU Factsheet 2: Interpreting and managing low blood lead levels: Supplemental Information for Clinicians. NW PEHSU, 2013.

Roberts, J. et al. Time Required for Blood Lead Levels to Decline in Non-chelated Children Clinical Toxicology, 39(2), 153–160 (2001).

Schmidt, C. After the Screening: What Happens Next for Children with Elevated Blood Lead? Environmental Health Perspectives.

A Targeted Approach to Blood Lead Screening in Children, Washington State. 2015 Expert Panel Recommendations: November 2015

Slides and transcript developed by

- Elizabeth Friedman, MD, MPH

Disclaimer and acknowledgements

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- Acknowledgement: The U.S. Environmental Protection Agency (EPA) supports the PEHSU by providing partial funding to ATSDR under Inter-Agency Agreement number DW-75-95877701. Neither EPA nor ATSDR endorse the purchase of any commercial products or services mentioned in PEHSU publications.

Questions?

Please contact us at mapehsu@cmh.edu

MORNING BREAK

10:15AM - 10:30AM

Check out all of the resources we have put together!

https://idph.iowa.gov/Environmental-Health-Services/Childhood-Lead-Poisoning-Prevention/resources

Lead in drinking water: Opportunities for improving public health in Iowa's schools

David Cwiertny
Director, Center for Health Effects of Environmental Contamination (CHEEC)

CHEEC: Who we are

Established through the 1987 Iowa Groundwater Protection Act, CHEEC is a multidisciplinary environmental health research center that supports and conducts research to identify, measure and study adverse health outcomes related to exposure to environmental toxins.

CHEEC: What we do

- Data Visualization & Dissemination
- Student Training & Professional Development
- Community-engaged Research Projects
- Iowa-centric Research

Drinking water is an important, but often overlooked, source of lead exposure

- Lead is a potent neurotoxin that is harmful to human health
- Children are particularly vulnerable
- There is **no safe blood lead level** for children
- EPA estimates that drinking water can make up 20% or more of a person's total exposure to lead
- Infants who consume mostly mixed formula can receive 40-60% of their exposure from drinking water

Lead in Drinking Water Guidelines & Regulations

American Academy of Pediatrics

1 ppb[a]

FDA U.S. FOOD & DRUG ADMINISTRATION

5 ppb[b]

World Health Organization

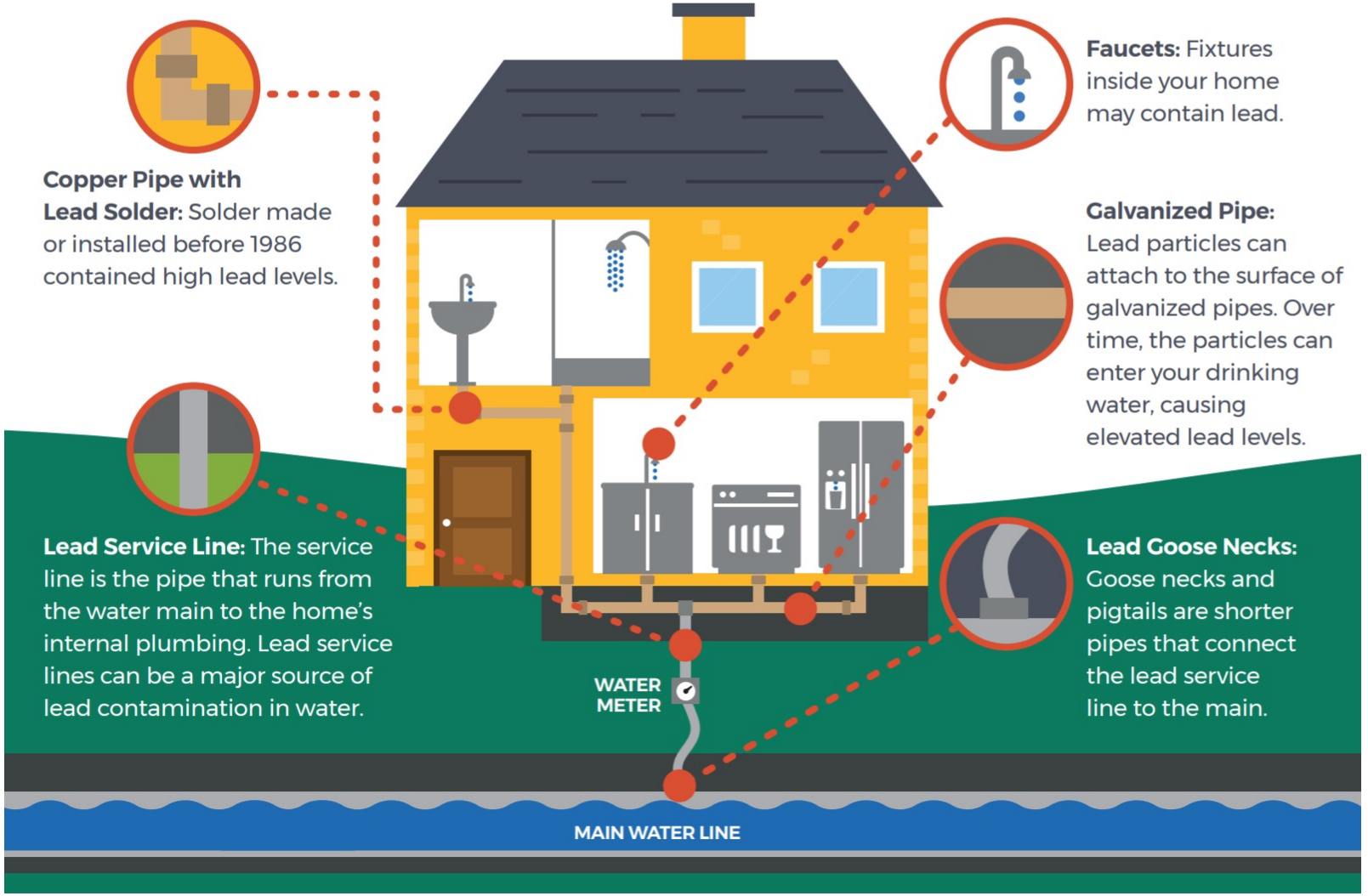
10 ppb

EPA United States Environmental Protection Agency

15 ppb

*"For every $1 invested to reduce lead hazards in housing units, society would benefit by an estimated $17-$221, a cost-benefit ratio that is comparable with the **cost-benefit ratio for childhood vaccines."** – AAP 2016*

Unlike other contaminants, lead is derived from the distribution system and premise plumbing



Water from Treatment Plant (compliance point under SDWA)

Why would Iowa be immune to this nationwide problem?

2 KUTV NEWS WEATHER SPORTS CONTESTS CHIME IN WATCH

Lead found in water at 90% of Utah schools sampled, now DEQ wants to test it all

by Ginna Roe | Tuesday, January 21st 2020

Sports Connect

HOME & BACKYARD PA OUTDOOR LIFE PODCASTS COMMUNITY WELLNESS

LACKAWANNA-COUNTY

Parents in Scranton School District Concerned Over Lead, Asbestos Found in Schools

SCRANTON, Pa. — Parents in the Scranton School District are voicing their anger and concerns after learning asbestos and unsafe levels of lead have turned...

LOCAL NEWS

FEBRUARY 5, 2020

Schools take action after finding lead in water

By Katy Savage

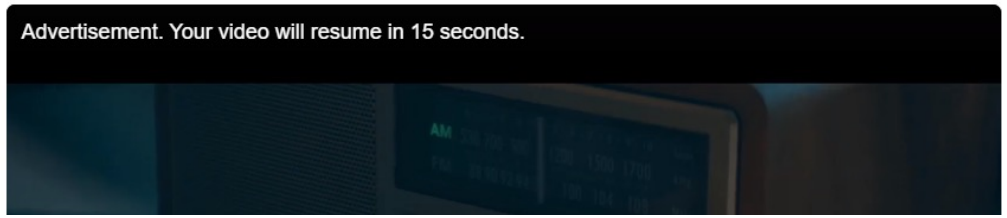
Multiple schools are replacing drinking water fountains and sinks after elevated lead was found in the water.

So far, 79% of the schools tested for lead in the state have had at least one tap test positive.

Tests are required on every tap at all schools and childcare centers under Act 66, which passed in 2019. Those with test results at or above 4 parts per billion are required to remove or replace the fixture until the level drops below 4 ppb.

FOX 13 Weather News Sports Seen on 13 Fox13 Investigates Live Stream Level Up

New information revealed about lead in water within SCS schools



Pennsylvania Capital-Star

Honest, aggressive reporting for Pennsylvania

Election 2020 COVID-19 Civil Rights & Social Justice Criminal Justice Education Energy & Environment Government & Politics

Health Care Working & The Economy Commentary #PennForward Estrella-Capital

Education Energy & Environment Health Care

Map: 100 Pa. schools found lead in their drinking water. Here's how they responded.

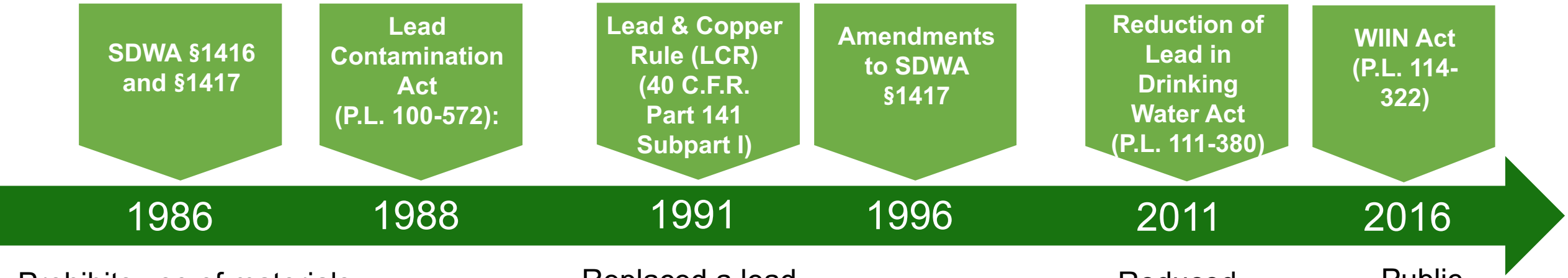
By **Elizabeth Hardison** - January 12, 2020

A Twitter List by Pennsylvania Capital-Star

Morning Coffee

Get the latest news and commentary from the Capital-Star, hot and fresh in your inbox M-F morning.

How did we get here?
A crash course in lead in water policy



Prohibits use of materials not "lead free"

"Lead free":
< 0.2% solders
<8% for pipes & fittings

Replaced a lead standard of 50 µg/L measured at the water utility

Non-health based "action level" of 15 µg/L (or ppb)

Reduced **allowable lead level** in products in contact with drinking water to **0.25%**

Public information, grants for repairs & testing (including schools)

Lead & Copper Rule

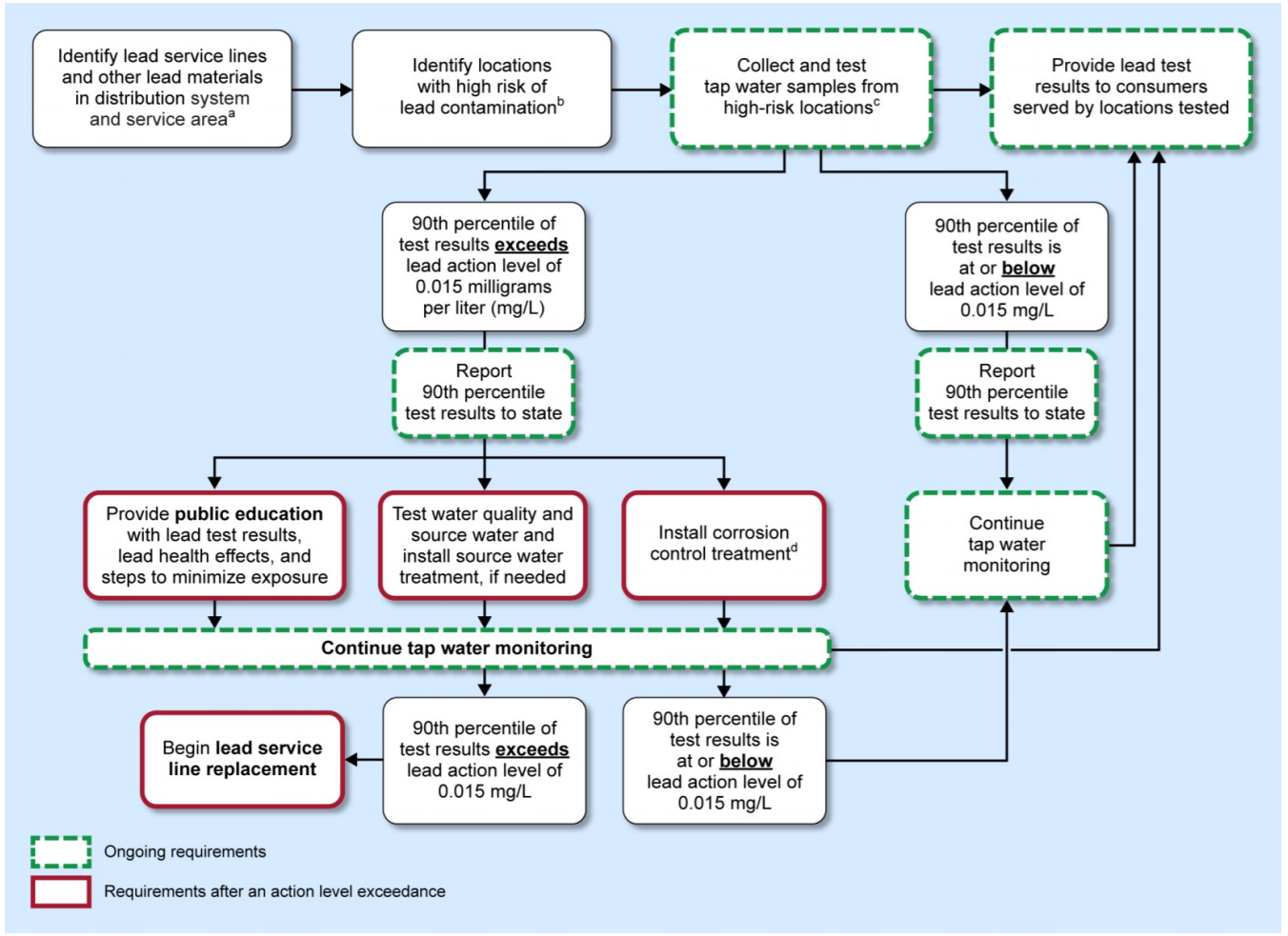
(40 C.F.R. Part 141 Subpart I)

US GAO : *"…one of the most complex drinking water regulations under the SDWA"*

What about schools?

Unless schools are their own public water system, they are not tested under the current LCR

Figure 2: Lead and Copper Rule Requirements for Water Systems, Including Schools and Day Care Centers with Their Own Water Supplies



EPA's proposed revisions to the LCR would require testing in schools and child cares

- Community Water Systems (CWSs) must test at **20% of K-12 schools and licensed child cares every year**
- Samples from **5 outlets at each school and 2 outlets at each child care facility**
- Complete sampling at all schools and child care facilities in CWS distribution system every five years.
- Excludes facilities built after Jan 1, 2014
- Implementation currently paused by Biden Administration

“Every school has lead in it, but not every water sample will.”

Dr. John Tobiason, Director, Massachusetts DEP 2016 School Testing Program

3Ts for Reducing Lead in Drinking Water in Schools and Child Care Facilities

A Training, Testing, and Taking Action Approach

Revised Manual

*"**There is no safe level of lead for children.** EPA encourages schools to prioritize remediation efforts based on lead sample results and to use the steps in the toolkit to pinpoint potential lead sources to **reduce their lead levels to the lowest possible concentrations**". (3Ts page 36)*

*"...**schools and child care facilities should not use sample results from one outlet to characterize potential lead exposure from all other outlets in their facility.** This approach could miss localized lead problems that would not be identified." (3Ts page 31)*

CHEEC Grants to Schools Program

- Initiated Spring FY2019
- Free lead and copper testing Iowa elementary schools with older drinking water infrastructure
- **Up to $10k/school** for testing and to remove/replacement high priority drinking water outlets with unsafe levels of lead or copper.
- Comprehensive **sampling of every outlet** in each school.

HOME | ABOUT | DATA | RESEARCH | OPPORTUNITIES | OUTREACH | CONTACT

CHEEC announces grant program to test for lead in school drinking water

Home » Outreach » News » CHEEC announces grant program to test for lead in school drinking water

CHEEC announces grant program to test for lead in school drinking water

The University of Iowa Center for Health Effects of Environmental Contamination (CHEEC) is offering free lead testing for up to five Iowa elementary schools with older drinking water infrastructure, thanks to Grants to School Program funding that will provide up to $10,000 per school to cover the

Events Calendar
Conferences
Seminars

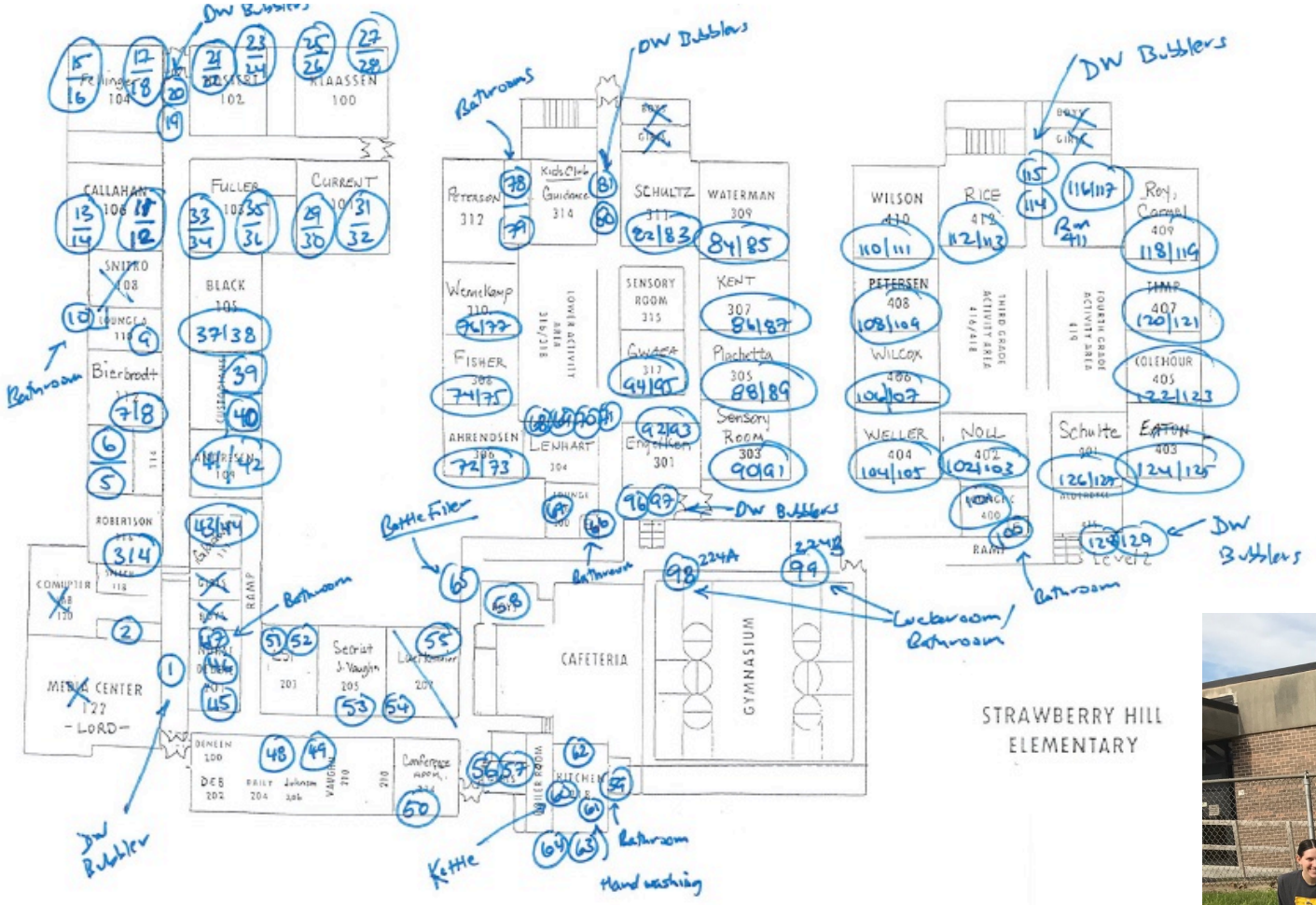
The Gazette

NEWS ›

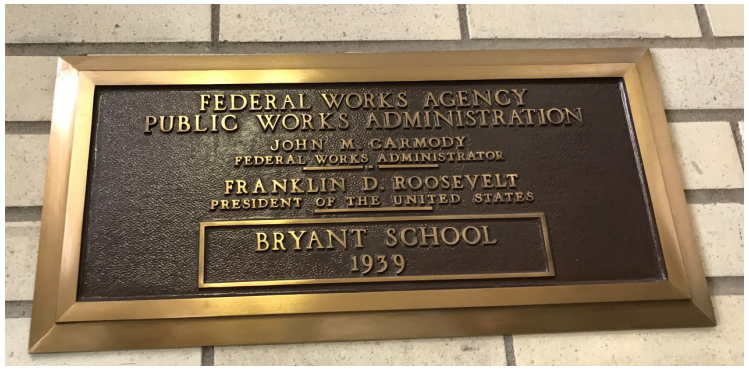
Iowa schools test for lead in drinking water

UI program offers free testing and remediation up to $10K

Amina Grant, a third-year Ph.D. environmental engineering student at the University of Iowa, collects a sample from a classroom water fountain during a Nov. 23 retest for lead levels at Strawberry Hill Elementary School in Anamosa on Saturday. All faucets and fountains in the school were tested earlier this year, and the one faucet that tested above federal standards had the pipe and fixture replaced. (Liz Martin/The Gazette)


DW Bubblers
Restrooms
DW Bubblers
DW Bubblers
Bathroom
Bottle Filler
DW Bubblers
DW Bubblers
Bathroom
Bathroom
Bathroom
Bathroom
DW Bubbler
Kettle
Bathroom
Hand washing
CAFETERIA
GYMNASIUM
STRAWBERRY HILL
ELEMENTARY


GEORGE WASHINGTON SCHOOL
IOWA


FEDERAL WORKS AGENCY
PUBLIC WORKS ADMINISTRATION
JOHN M. CARMODY
FEDERAL WORKS ADMINISTRATOR
FRANKLIN D. ROOSEVELT
PRESIDENT OF THE UNITED STATES
BRYANT SCHOOL
1939

What are we finding in Iowa schools?

- Oxford Junction
  - Sampled 41 water outlets on Saturday, April 27
  - Lead: 0 samples above EPA Action Level of 15 ppb, 2 above 5 ppb
  - **Copper: 8 equal to or above EPA Action Level of 1.3 mg/L**
  - Remediation: Signage & 3 new bottle fillers
- Anamosa
  - 129 water outlets for sampling on Saturday, May 18
  - **Lead: 1 sample above EPA Action level of 15 ppb**, 3 other locations between 3-8 ppb
  - Copper: 0 samples above EPA Action Level
  - Remediation: 1 new bottle filler & replacement of fixtures at 3 locations

What are we finding in Iowa schools?

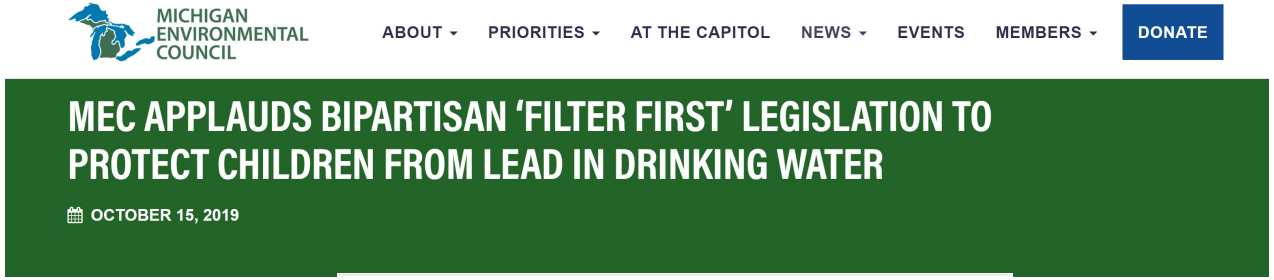
- Keokuk
  - Sampled 137 water outlets on Saturday, October 19
  - **Lead: 5 samples above EPA Action level of 15 ppb**, 47 other locations between 1-14 ppb
  - Copper: 0 samples above EPA Action Level
  - Remediation: Fixture replacement, filters, no drinking at some outlets

- Dubuque
  - Sampled 105 water outlets on Saturday, December 21
  - **Lead: 5 samples above EPA Action level of 15 ppb**, 12 other locations between 1-8 ppb
  - Copper: 0 samples above EPA Action Level
  - Remediation: Fixture replacement

Average of $2,800 per school for testing and remediation

Opportunities exist to improve public health through school drinking water improvements

- Define safe level for lead in schools that is more consistent with EPA's 3Ts guidance
- Financial assistance for expanded testing at *all* outlets in schools
- Technical and financial assistance to allow schools to respond effectively to testing results
- Ensure long-term safety of school drinking water (e.g., "Filter First" programs in Michigan)
- Leverage COVID funding to install bottle fillers with filtration



Community

Fairview Park targets CARES Act funding toward new doors, water bottle fillers and employee overtime

Updated Oct 02, 2020; Posted Oct 02, 2020

Thanks and questions

David Cwiertny
david-cwiertny@uiowa.edu
319-335-1401
www.cheec.uiowa.edu
@dcwiertny @uicheec

Lead in Drinking Water:
Opportunities for improving Iowans' public health

Michelle Scherer
Professor
Civil and Environmental Engineering

Iowa State Fair (2019)
Amina Grant
Danielle Land
Drew Latta

We *can* address lead in Iowans' drinking water.

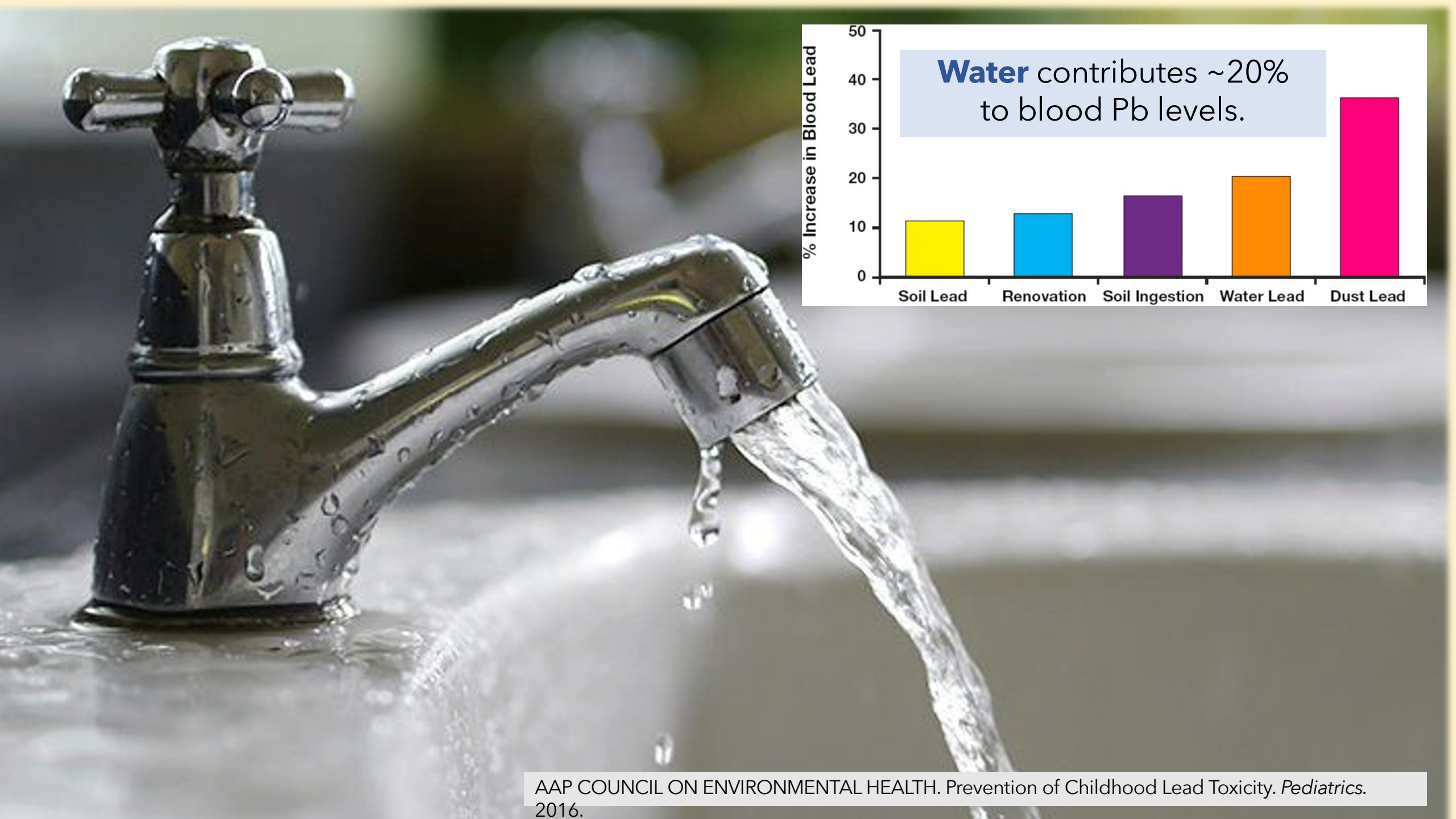
1. Recognize **water** as a potential Pb source and include it in healthy homes interventions.

2. Promote **Pb water testing** of high risk homes.

3. Digitally map **LSLs** and make them available.

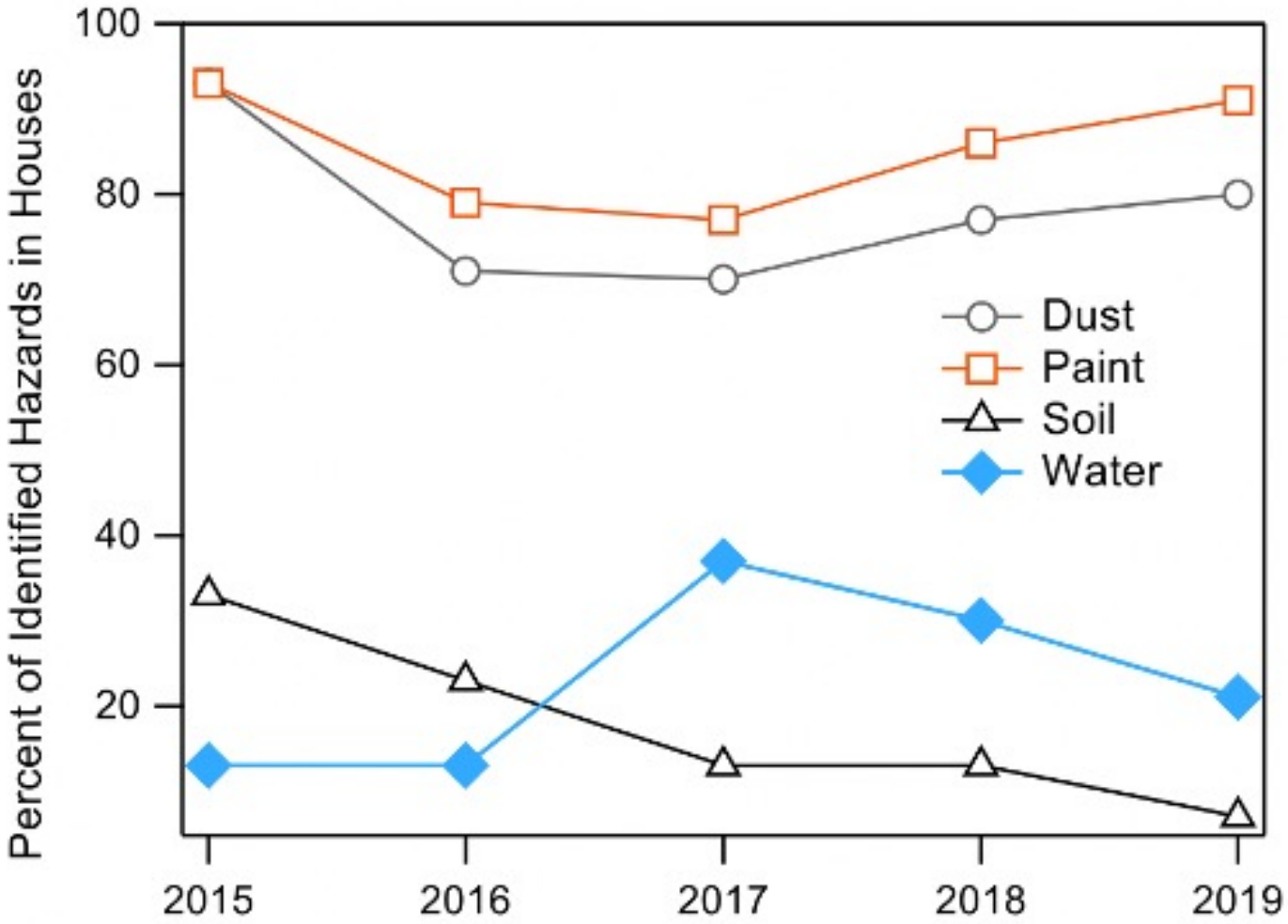
4. Make lead water testing eligible for **Grants to Counties** funding.

5. Intervene at blood lead level of **5 ug/dL** (CDC) and test home water.



AAP COUNCIL ON ENVIRONMENTAL HEALTH. Prevention of Childhood Lead Toxicity. *Pediatrics*. 2016.

We need to think beyond paint, soil, and dust.



Water was identified as a lead hazard in 10% to 40% of homes in Flint over 5 years.

We are **talking with Iowans about lead** in drinking water.

Drinking water is a significant source of **lead exposure**.

How much is in yours?

Researchers at the University of Iowa are providing FREE water sampling kits starting the week of January 4th, 2021.

Request your water sampling kit by emailing **get-the-lead-out@uiowa.edu**.

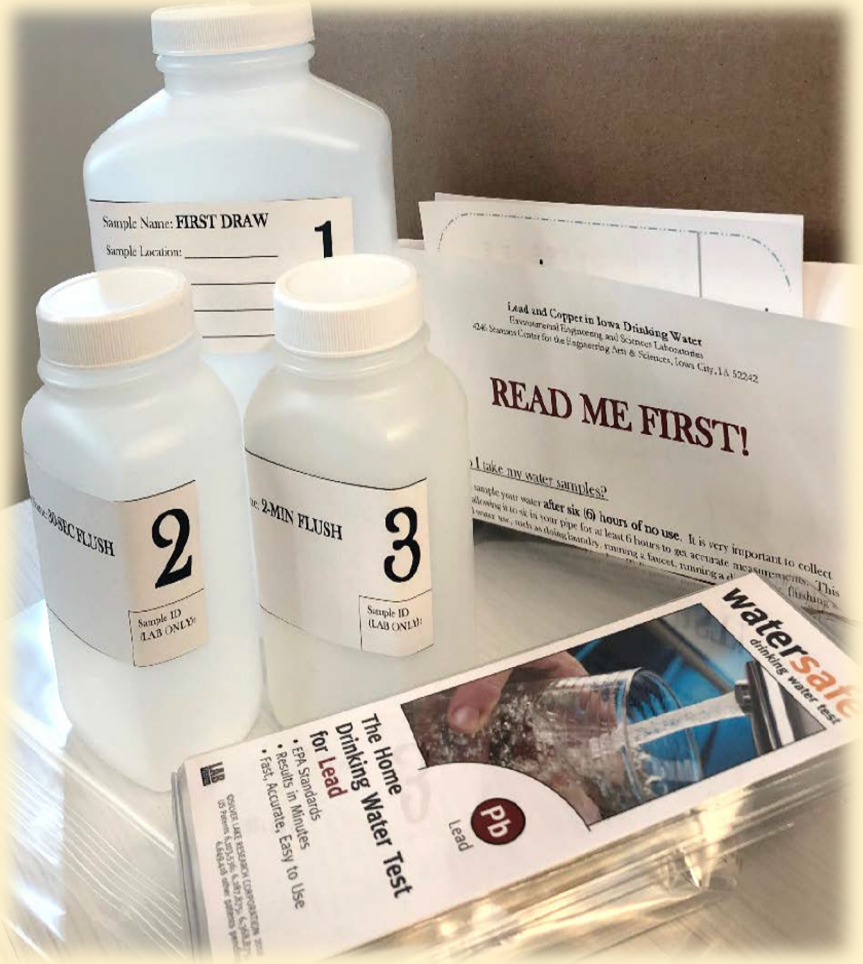
Your participation will help us understand whether commercially-available lead tests can provide an alternative to lab testing. You will be provided two test strips to test your tap water and additional water we send you. Our research is independently-funded by the Environmental Protection Agency and the University of Iowa.

**Priority will be given to participants with older homes, young children, or known lead plumbing or service lines.*

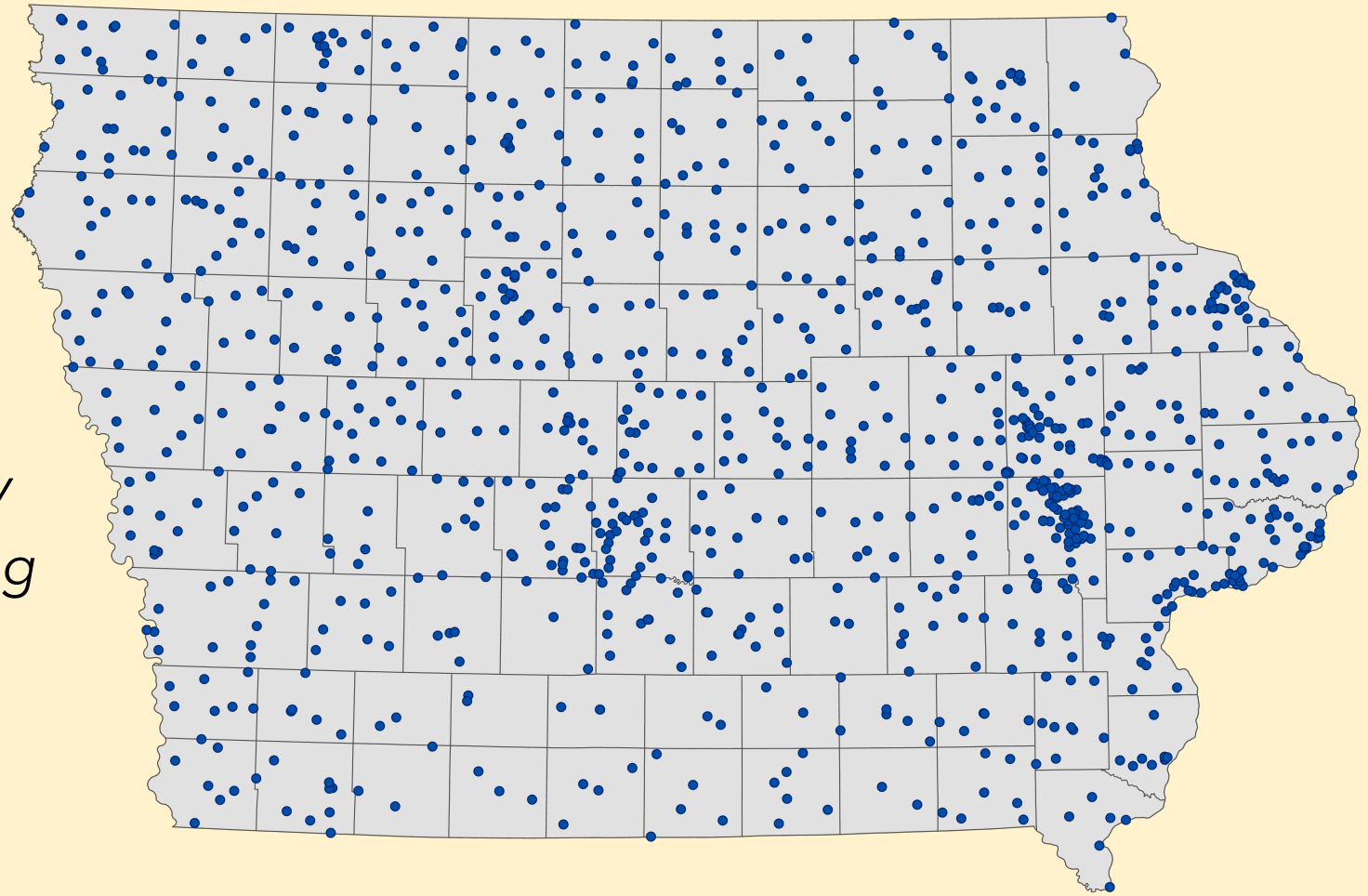
GET THE LEAD OUT

The only way to know if you have lead in your water is to **test**.

And, we are **measuring lead** in Iowans' drinking water taps.



Let’s start with public drinking water, which is regulated by the LCR.



There are 1,075 community water systems in Iowa serving ***2.8 million*** *people.*

Community water systems in Iowa annually sample about **0.5%** of the **1.15 million households** on public water as part of LCR compliance.

So, we have **166,607** LCR lead measurements in Iowa from the last 29 years.

We used the LCR data
to assess
lead in Iowans' water.

BUT,
There are many lead guidelines/regulations.

This is a <u>Problem</u>.

Environmental Science & Technology Letters

pubs.acs.org/journal/estlcu Letter

Estimating Consumers at Risk from Drinking Elevated Lead Concentrations: An Iowa Case Study

Amina Grant, Michelle M. Scherer, Danielle Land, David M. Cwiertny, Marc A. Edwards, Jerry Mount, and Drew E. Latta*

Cite This: *Environ. Sci. Technol. Lett.* 2020, 7, 948–953 Read Online

From the LCR data, we know Iowans are drinking water with lead above lead guidelines/regulations.

% of taps tested by LCR

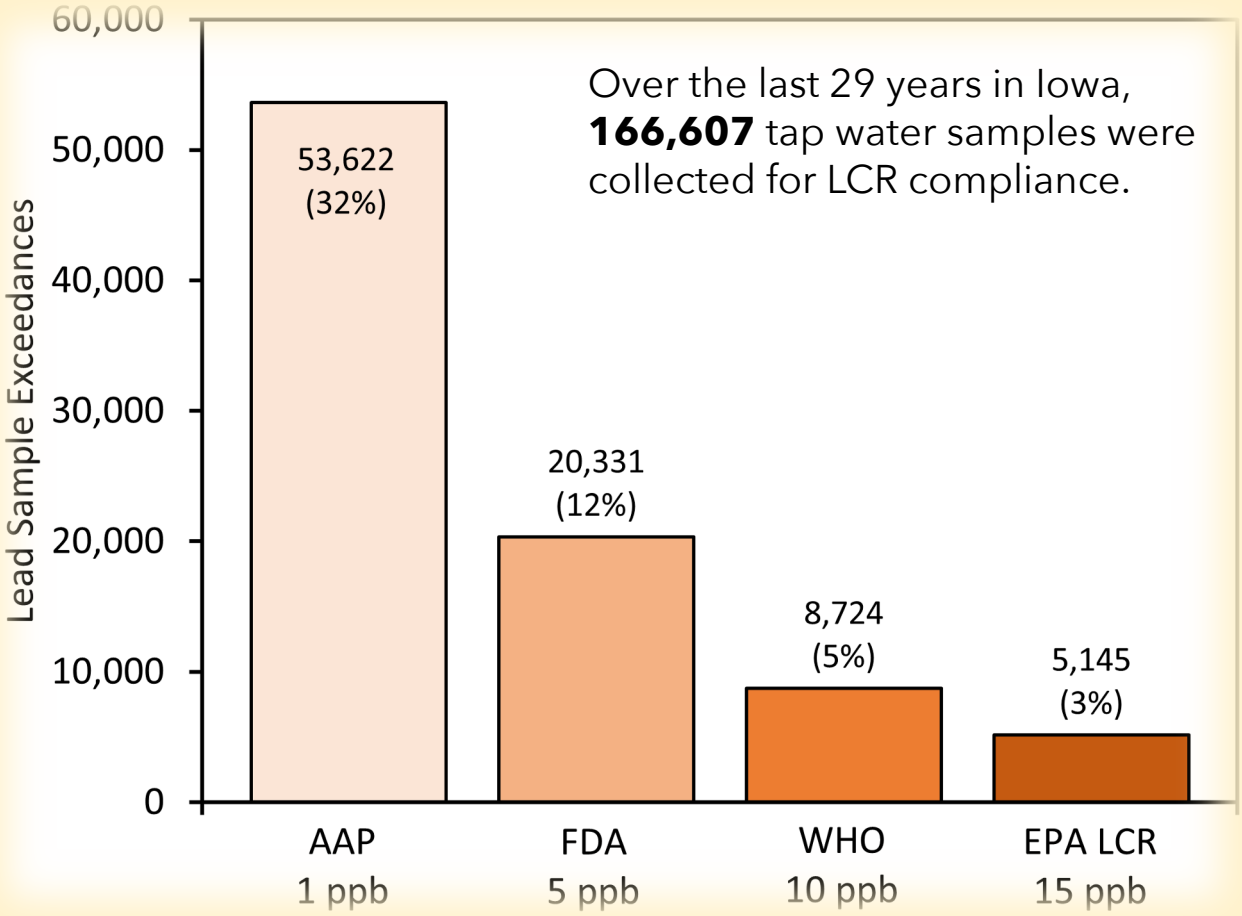
3% > EPA's LCR action level of 15 ppb.

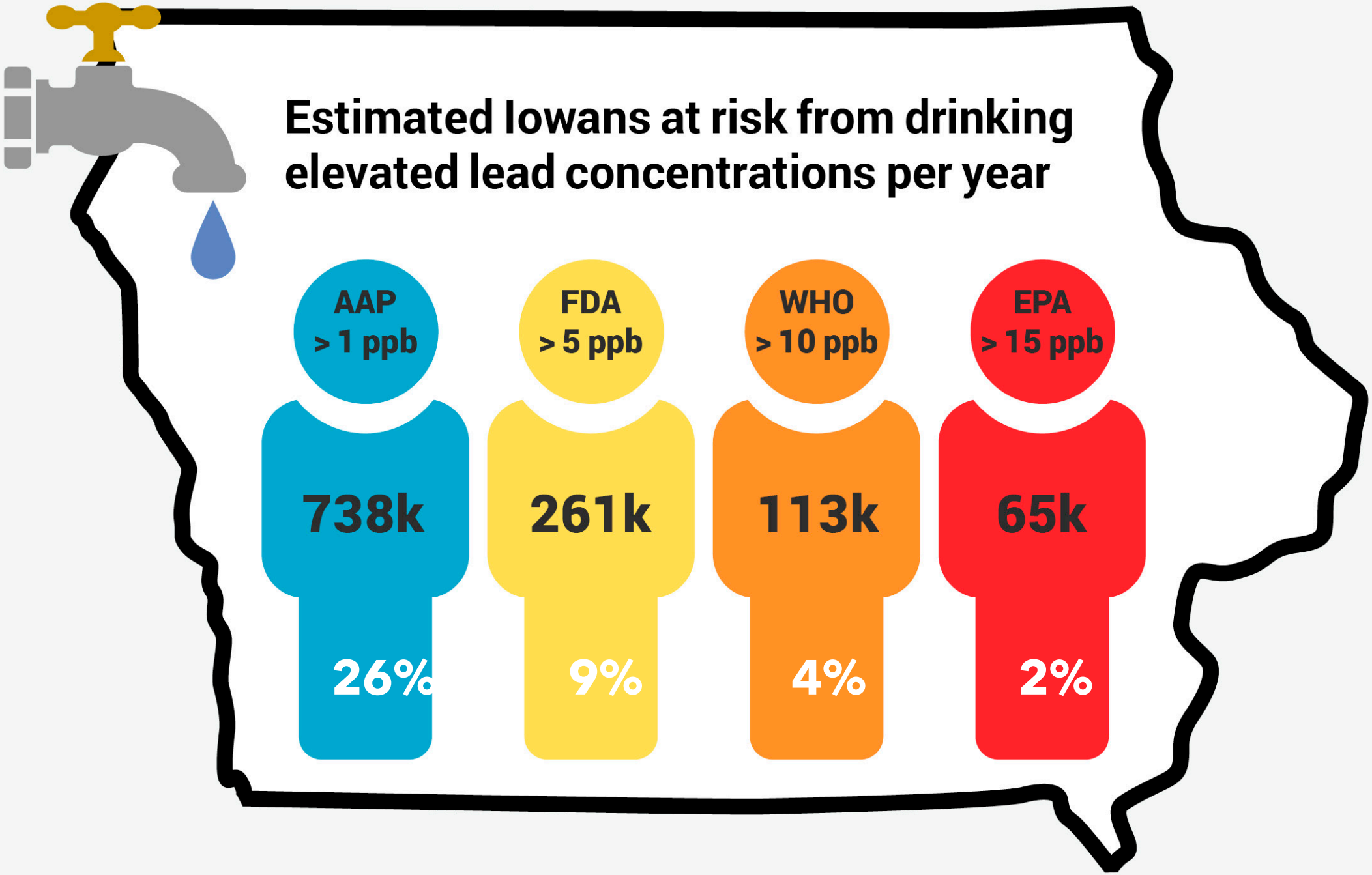
5% > WHO's 10 ppb guideline.

12% > FDA & Canada regulation of 5 ppb.

32% > AAP guideline for schools of 1 ppb.

48% < 1 ppb.

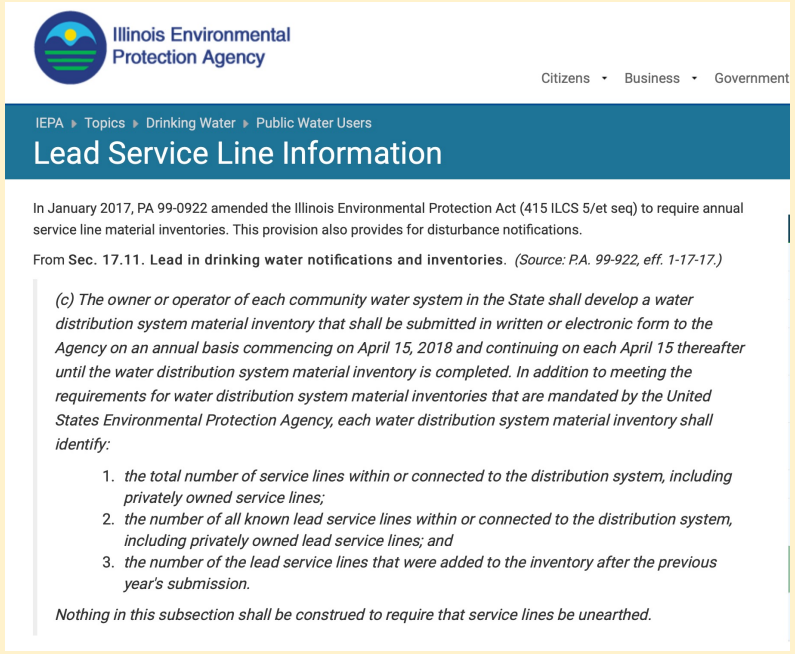



Estimated Iowans at risk from drinking elevated lead concentrations per year
AAP
> 1 ppb
738k
26%
FDA
> 5 ppb
261k
9%
WHO
> 10 ppb
113k
4%
EPA
> 15 ppb
65k
2%

Do an inventory of LSLs and provide Iowans with that information.

Iowa has the 13th most LSLs in Nation

~160,000



Illinois Environmental Protection Agency

Citizens ▾ Business ▾ Government

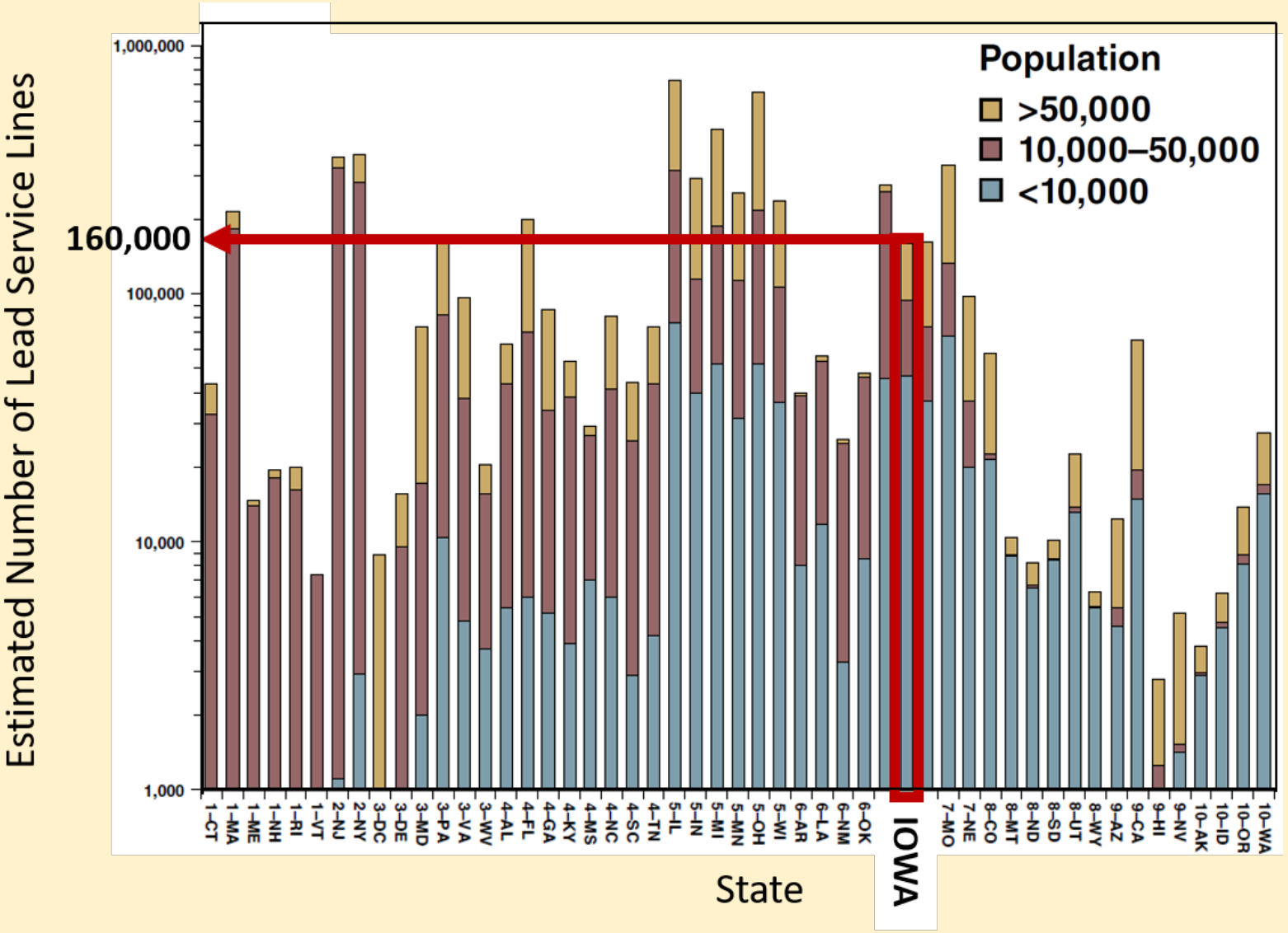
IEPA ▸ Topics ▸ Drinking Water ▸ Public Water Users

Lead Service Line Information

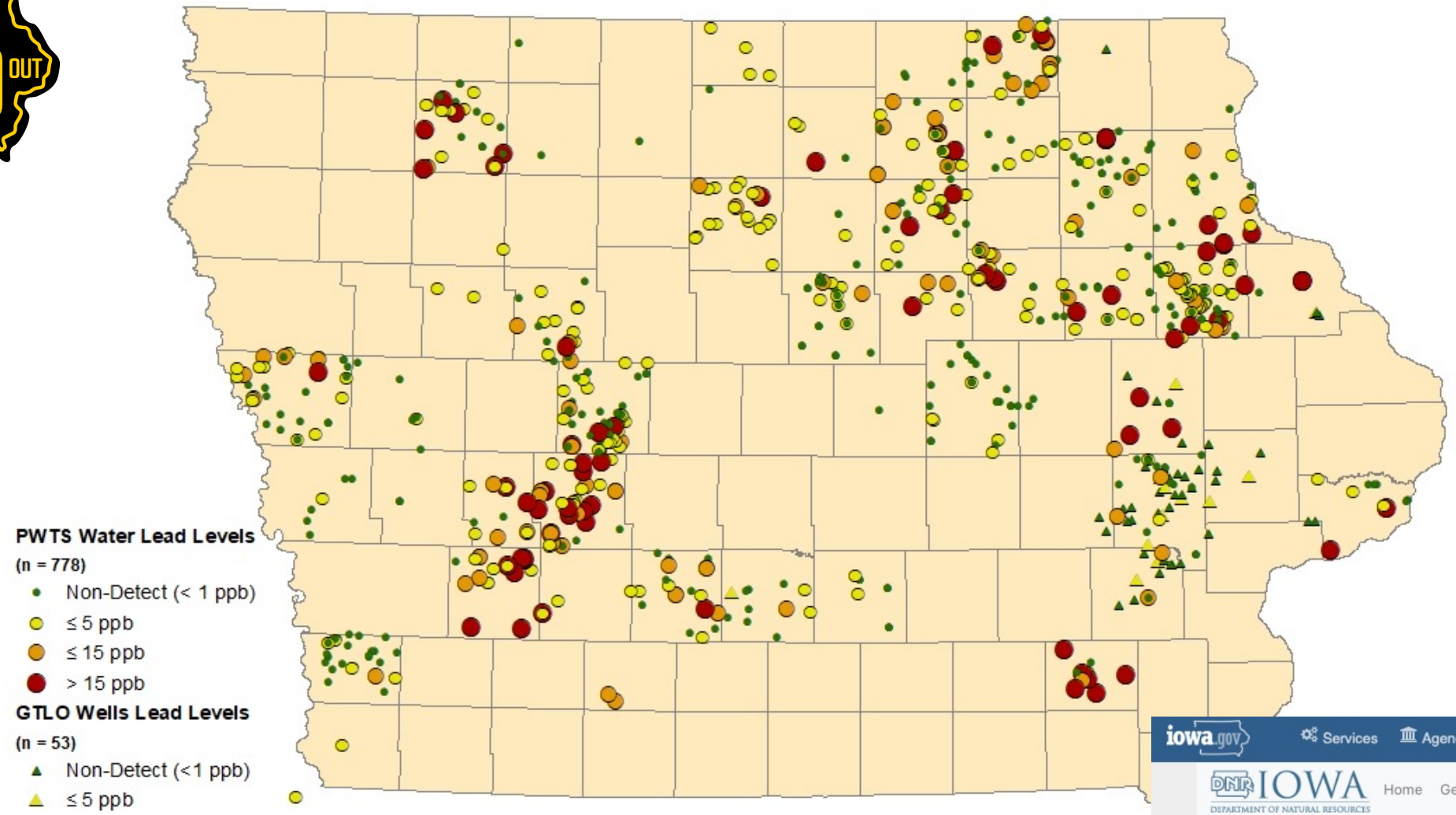
In January 2017, PA 99-0922 amended the Illinois Environmental Protection Act (415 ILCS 5/et seq) to require annual service line material inventories. This provision also provides for disturbance notifications.

From **Sec. 17.11. Lead in drinking water notifications and inventories**. *(Source: P.A. 99-922, eff. 1-17-17.)*

> *(c) The owner or operator of each community water system in the State shall develop a water distribution system material inventory that shall be submitted in written or electronic form to the Agency on an annual basis commencing on April 15, 2018 and continuing on each April 15 thereafter until the water distribution system material inventory is completed. In addition to meeting the requirements for water distribution system material inventories that are mandated by the United States Environmental Protection Agency, each water distribution system material inventory shall identify:*
>
> 1. *the total number of service lines within or connected to the distribution system, including privately owned service lines;*
> 2. *the number of all known lead service lines within or connected to the distribution system, including privately owned lead service lines; and*
> 3. *the number of the lead service lines that were added to the inventory after the previous year's submission.*
>
> *Nothing in this subsection shall be construed to require that service lines be unearthed.*



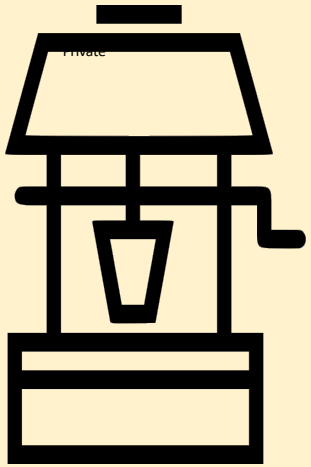
There is limited data on lead in **private wells** in Iowa.



Private wells are not regulated and are at **higher risk** for lead.

Public CWSs

~ 2.8 M people



Private Wells

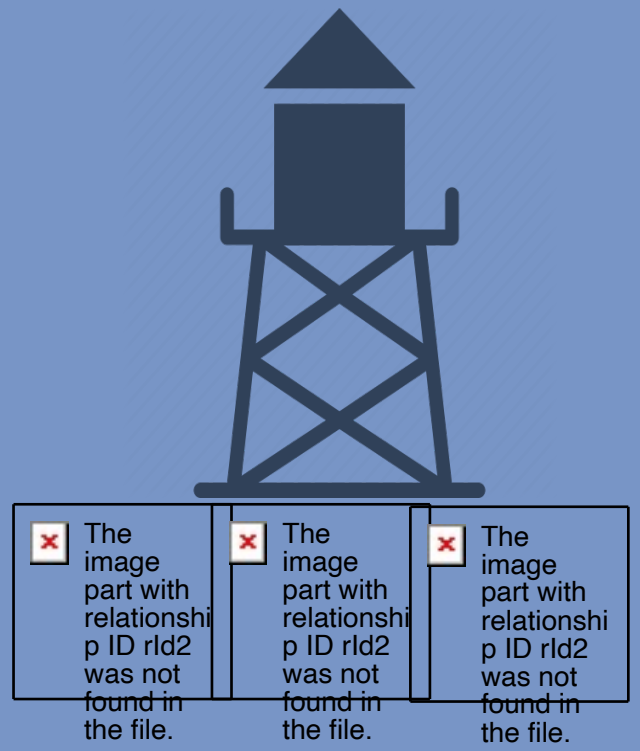
~300 k people

Source	AAP	FDA	WHO	EPA
Private Wells	38.4	18.8	12	8.8
CWSs	32	12	5.2	3.1

Out of every 100 homes . . .

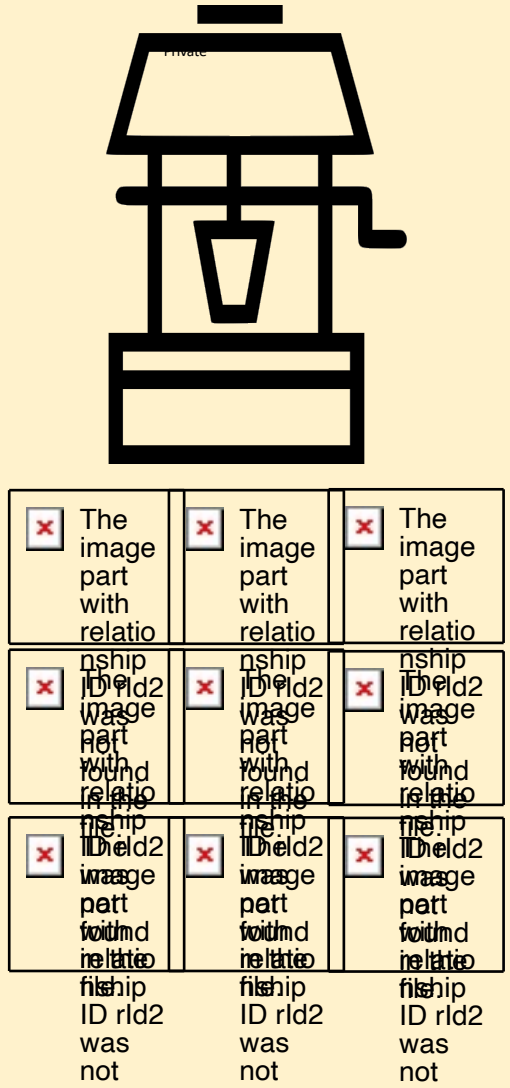
Public CWSs

3 exceed EPA action level



Private Wells

9 exceed EPA action level



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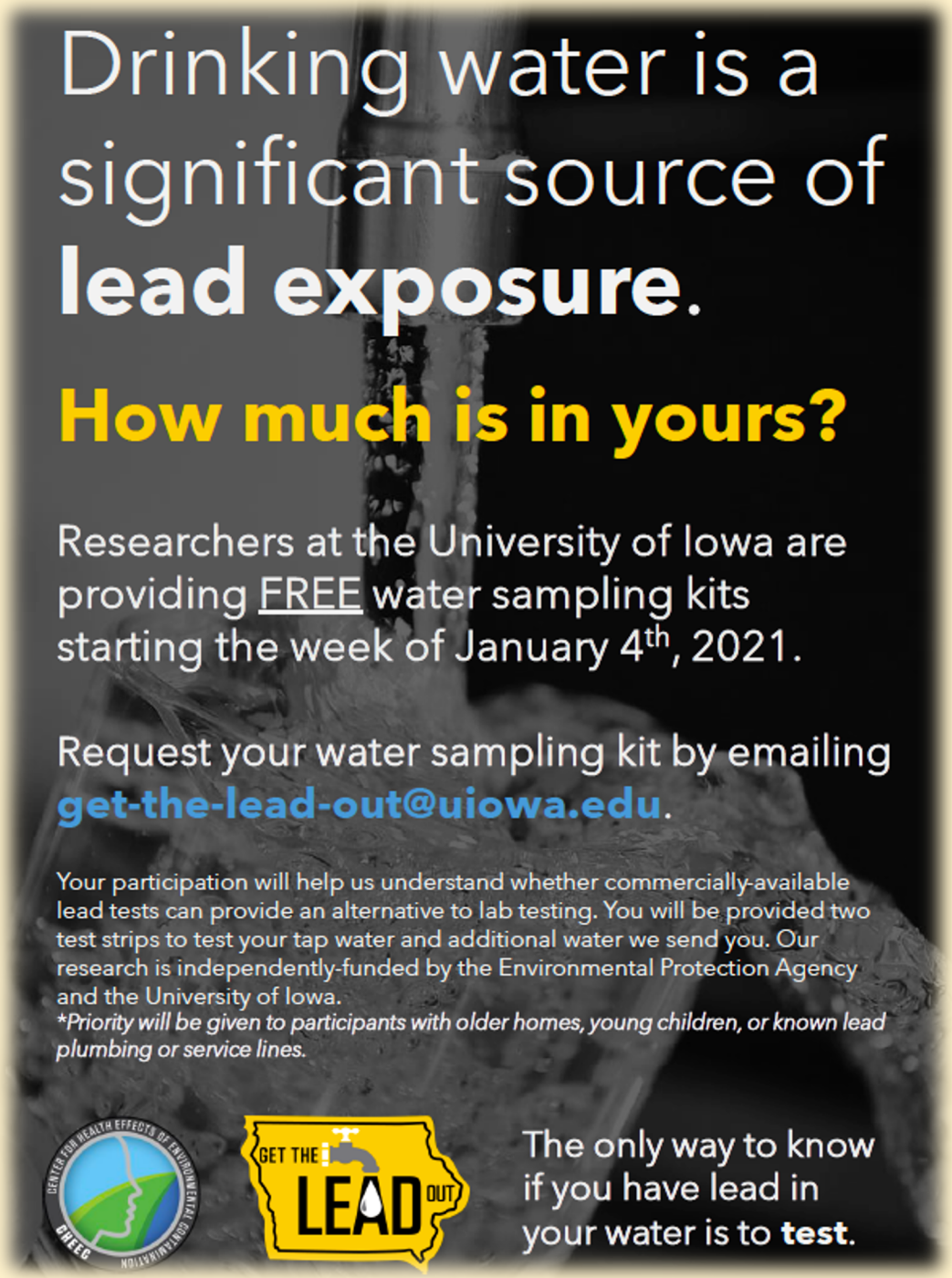


GET THE LEAD OUT

get-the-lead-out@uiowa.edu

Michelle Scherer
michelle-scherer@uiowa.edu
319.335.5654

Iowa Lead Exposures linked to Contaminated Spices

Presenters:
Kevin Officer (for Kathy Leinenkugel), IDPH
Kelsey Marmon, Warren County Health Services

Lead in Spices – Learning Objectives

Image: https://www1.nyc.gov/content/leadfree/pages/food-spices

1. Learn about two common spices linked to lead poisonings in Iowa.
2. Understand how certain micro-populations and cultures utilize these spices on a daily basis.
3. Name two recommendations for reducing the risk of lead exposure from spices.

Lead in Spices

Image: https://www1.nyc.gov/content/leadfree/pages/food-spices

- In the U.S., there are no standards for the level of lead contamination in spices.
- The FDA limit for lead in natural-source food color additives (e.g., paprika, saffron, and turmeric) is 10 mg/kg.
- Spices are often grown in countries polluted by leaded gasoline, smelters, battery manufacturing plants, and mines.
- Lead contamination occurs from:
  - Contaminated soil & water
  - Lead dust from grinding machinery
  - Deliberate adulteration to enhance color or add weight to the product

Lead in Spices – Permissible Limits of Lead

WHO	FDA
Infant Formula	Food Color Additives - Natural
0.02 mg/kg lead	10 mg/kg
Salt	Candy or other foods (action level)*
2 mg/kg	0.1 mg/kg, 0.5 mg/kg
*The FDA action levels = levels at which an investigation is undertaken, or a recall is issued for products intended for consumption by children. However, spices are not considered food intended for consumption by children.	

Who is At Risk?

Products may be used in food preparation, alternative medicines or supplements, or for cultural practices, so the at-risk population can vary:

- Immigrants or refugees who obtain products in person when visiting a foreign country or from family members who bring or send
- Immigrants or refugees who purchase products through specialty stores or online
- Non-immigrants utilizing alternative medicine practices that may obtain products manufactured in other countries and purchased online
- Non-immigrants cooking with spices processed in other countries from specialty stores or online suppliers

Who is At Risk?

EPA Consumption Survey – What We Eat in America		
Daily Consumption	Non-immigrant	Immigrant
• Cumin	0.09 g/day	1.22 ± 1.14 g/portion
• Turmeric	0.03 g/day	0.60 ± 0.46 g/portion
In immigrant populations some spices are also used as home remedies and for ceremonial activities.		

Environmental Protection Agency (EPA). 2012a. What we eat in America –Food Commodity Intake Database, 2003-2006 (WWEIA-FCID 2003-2006). Available at: http://fcid.foodrisk.org/. Accessed 5 Sep. 2012.

Case #1: SE Iowa Family – suspected exposure from spices or other imported items

- Family in SE Iowa emigrated from Nepal in 2016 - child tested and BLL 1.2 mcg/dL
- 2019-2021: Child has an elevated BLL (6-8 years of age)
- Live in 2010 apartment building since in Iowa (no LBP)
- No work-related or hobby exposures
- No pre-1978 childcare or other family housing exposures
- No other EBLs at apartment buildings in complex and age of complex makes it unlikely that there were lead water pipes
- No recent travel outside of USA

Case #1: SE Iowa Family – suspected exposure from spices or other imported items

- As of 2020, was purchasing turmeric, tea and other products from store in Illinois – family did not have any remaining products for testing.
  - Similar store in IA is regulated by DIA
- Child sometimes puts toys in mouth
- Unknown risk: family routinely used pressure cooker purchased in India in 2016

Notes	Family Member (Birth Year)	Age at Test	Blood Lead Test Date	Blood Lead Level (mcg/dL)
2016: Family Immigrates from Nepal				
	Child (2012)	3 yo	8/17/16	1.2
	Child (2012)	6 yo	2/23/19	12.1
	Child (2012)	6 yo	6/29/19	11.6
	Child (2012)	7 yo	1/25/20	28.3
	Child (2012)	7 yo	5/4/20	27.1
May 2020: Medical provider recommends stopping the use of spices purchased at area India supermarket				
	Child (2012)	7 yo	8/5/20	27
December 2020: Verified that family stopped purchasing spices and tea from area India market. Family states leftover products at home were discarded.				
	Child (2012)	8 yo	12/4/20	27
December 2020: Advised that parents be tested.				
	Mom (1984)	36 yo	1/11/21	33.6
	Dad (1981)	39 yo	1/11/21	28
	Child (2012)	8 yo	1/14/21	25.5
	Child (2012)	8 yo	5/6/21	15.9

Case #2: Greater Des Moines Area Family – Exposure from Spices

Test Date	Result	Sample Type	Patient Address on Draw Date
7/19/2021	8.9	Venous	Residential Home- built 2013
4/26/2021	13.7	Venous	
3/19/2021	18.2	Venous	
3/18/2021	‡15	Capillary	
8/30/2019	<2	Capillary	

- Child was referred to local public health for lead poisoning case management following a capillary lead level of 15 mcg/dL, later confirmed at 18.2 mcg/dL.

Case #2: Greater Des Moines Area Family – Exposure from Spices

- Other members of the family tested positive for lead poisoning
  - 8 year old = 16.7 micrograms per deciliter (venous), prior test in 2019 was <2 micrograms per deciliter
  - Father (38 yrs. old) = 14 venous, only test on record in HHLPSS

Case #2: Greater Des Moines Area Family – Exposure from Spices

- Lead exposure from use of turmeric and chili powder, both purchased in India in 2019 and used by the family on a daily basis in prepared foods.
- Results from SHL on the products were:
  - Turmeric = 4,370,000 ng/g
  - Chili powder = 120 ng/g

Spices Tested in 2021 by State Hygienic Lab

Iowa Poison Control Center Analysis

(Sample #A – Chili powder) If one gram of chili powder has a volume of 1 mL, the amount of chili powder to reach the child's threshold would be 0.8 ounces. An adult would need to ingest 3.5 ounces.

(Sample #B - Turmeric) If one gram of turmeric has a volume of 1 mL, the amount of turmeric to reach both the child's and the adult's thresholds would be <1/1,000 teaspoon.

Sample	Quantity of lead in sample	Amount of product needed to be ingested to achieve a daily dose of:			
		Children 3 mcg/day		Adults 12.5 mcg/d	
		Weight	**ESTIMATED** Amount	Weight	**ESTIMATED** Amount
#A Chili powder	120 ng/g	25 grams	0.8 ounces	104 grams	3.5 ounces
#B Turmeric	4,370,000 ng/g	0.68 **mg**	< 1/1,000 teaspoon	2.86 **mg**	< 1/1,000 teaspoon

Case #3: Ayurvedic Products & Spices used - 2021 Case

Background:

- 76 year old female, white, non-Hispanic lives in a mobile home in SE Iowa and participates in Ayurvedic medical practices.
- She was tested for blood lead in mid-February at the county health clinic due to health concerns she was experiencing.
- Her blood lead level (BLL) on 2/18/21 was 48 mcg/dL. Adult case **management was started.**
- A repeat BLL on 3/10/21 was 42 mcg/dL. The case plans to ask for a repeat test in the next few weeks and may also consult a neurologist.

Case #3: Ayurvedic Products & Spices used - 2021 Case

- The person routinely used Ayurvedic products purchased locally in SE Iowa and purchased products made in India off the internet.
- No other sources of lead were identified in or around the home.
- This person was part of the Ayurvedic elevated blood lead cluster in 2011. Across is a list of all tests on record at IDHP – they were all venous specimens:

BLL Test Date	BLL Result (Venous)
3/10/2021	42 mcg/dL
2/18/2021	48 mcg/dL
1/22/2019	4 mcg/dL
4/27/2018	4 mcg/dL
7/16/2014	5 mcg/dL
10/10/2013	6 mcg/dL
5/13/2013	11 mcg/dL
2/3/2012	8 mcg/dL
8/17/2011	13 mcg/dL
6/21/2011	17 mcg/dL

Case #3: Ayurvedic Products & Spices used - 2021 Case

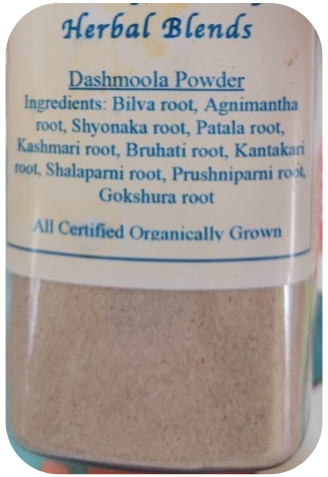
- A home visit was made April to collect samples of various products used in October to December 2020.
- At that time the persons recall of dates and products used varied.
- Other than the turmeric spice, the person has not used these supplements in 2021.
- Samples were analyzed by the State Hygienic Laboratory in Ankeny.
- The Iowa DIA and FDA have been investigating manufactures and distributors of some of the spices and Ayurvedics products.

Case #3: Ayurvedic Products & Spices used - 2021 Case

FDA investigated product #1, which was distributed by a Nevada Co and sold online, private recall the product was done by company.

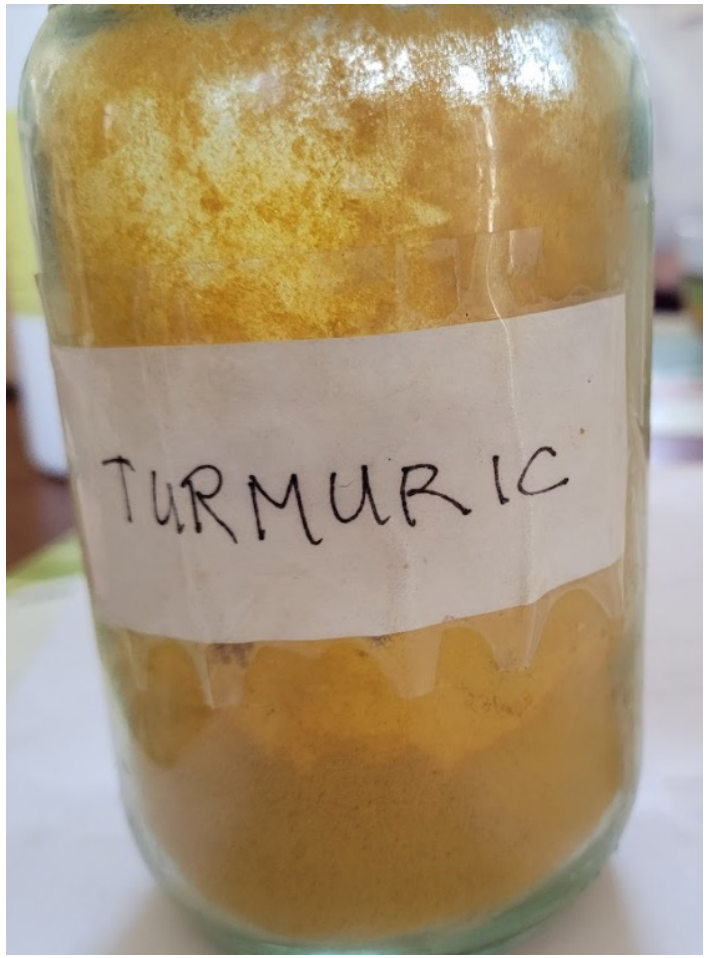
•How taken: 2 capsules twice daily,
•Duration used: October-December 2020

Sample	Quantity of lead in sample	Amount of product needed to be ingested to achieve a daily dose of:			
		Children 3 mcg/day		Adults 12.5 mcg/d	
		Weight	**ESTIMATED** Amount	Weight	**ESTIMATED** Amount
#1 mayayograj capsule	12,200 mg/kg	0.24 mg	<<1 capsule	1.02 mg	<<1 capsule
#2 maharasnadi tablet	260 ng/g	11.5 grams	11-20 tablets	48 grams	46-83 tablets
#3 dashmoola powder	240 ng/g	12.5 grams	2+ tablespoons	52 grams	1.7 ounces
#4 mahanaryana oil	100 ng/g	30 grams	1+ fl.oz.	125 grams	3.75 fl.oz.
#5 dhanwantara tablet	3900 ng/g	0.769 grams	<1-5 tablets	3.2 grams	3-21 tablets
#6 turmeric bulk spice	45 ng/g	66.7 grams	2+ ounces	278 grams	>9 ounces



•How taken: 1/3 to 1 cup of water with 1 teaspoon herb powder, boiled down to 1/3; with 5 drops of Mahanaryana oil added
•Duration used: October-December 2020

•How taken: 1 tablet twice daily
•Duration used: used prior to October 2020 for a few months



Bulk Turmeric – purchased locally, Iowa
2021 Ayurvedic case

Sample	Quantity of lead in sample		Amount of product needed to be ingested to achieve a daily dose of:			
			Children 3 mcg/day		Adults 12.5 mcg/d	
			Weight	**ESTIMATED** Amount	Weight	**ESTIMATED** Amount
#6 turmeric bulk spice	45 ng/g		66.7 grams	2+ ounces	278 grams	>9 ounces

- An adult would have to ingest over 9 ounces.

References

- “A Spoonful of Lead: A 10-Year Look at Spices as a Potential Source of Lead Exposure. Journal of Public Health Management and Practice: January/February 2019 - Volume 25 - Issue - p S63-S70 online: https://journals.lww.com/jphmp/pages/articleviewer.aspx?year=2019&issue=01001&article=00011&type=Fulltext.
- Cowell, Whitney, et al. “Ground Turmeric as a Source of Lead Exposure in the United States – Whitney Cowell, Thomas Ireland, Donna Vorhees, Wendy Heiger-Bernays, 2017.” SAGE Journals, https://journals.sagepub.com/doi/abs/10.1177/0033354917700109.
- “Lead in Spices, Herbal Remedies, and Ceremonial Powders Sampled from Home Investigations for Children with Elevated Blood Lead Levels – North Carolina, 2011–2018 | MMWR.” Centers for Disease Control and Prevention, Centers for Disease Control and Prevention, https://www.cdc.gov/mmwr/volumes/67/wr/mm6746a2.htm.
- FDA: "DETENTION WITHOUT PHYSICAL EXAMINATION OF SPICES AND SPICE PRODUCTS DUE TO LEAD CONTAMINATION“ Published Date: 07/09/2021 www.accessdata.fda.gov/cms_ia/importalert_1143.html
- FDA: Lead in Food, Foodwares, and Dietary Supplements. https://www.fda.gov/food/metals-and-your-food/lead-food-foodwares-and-dietary-supplements

References

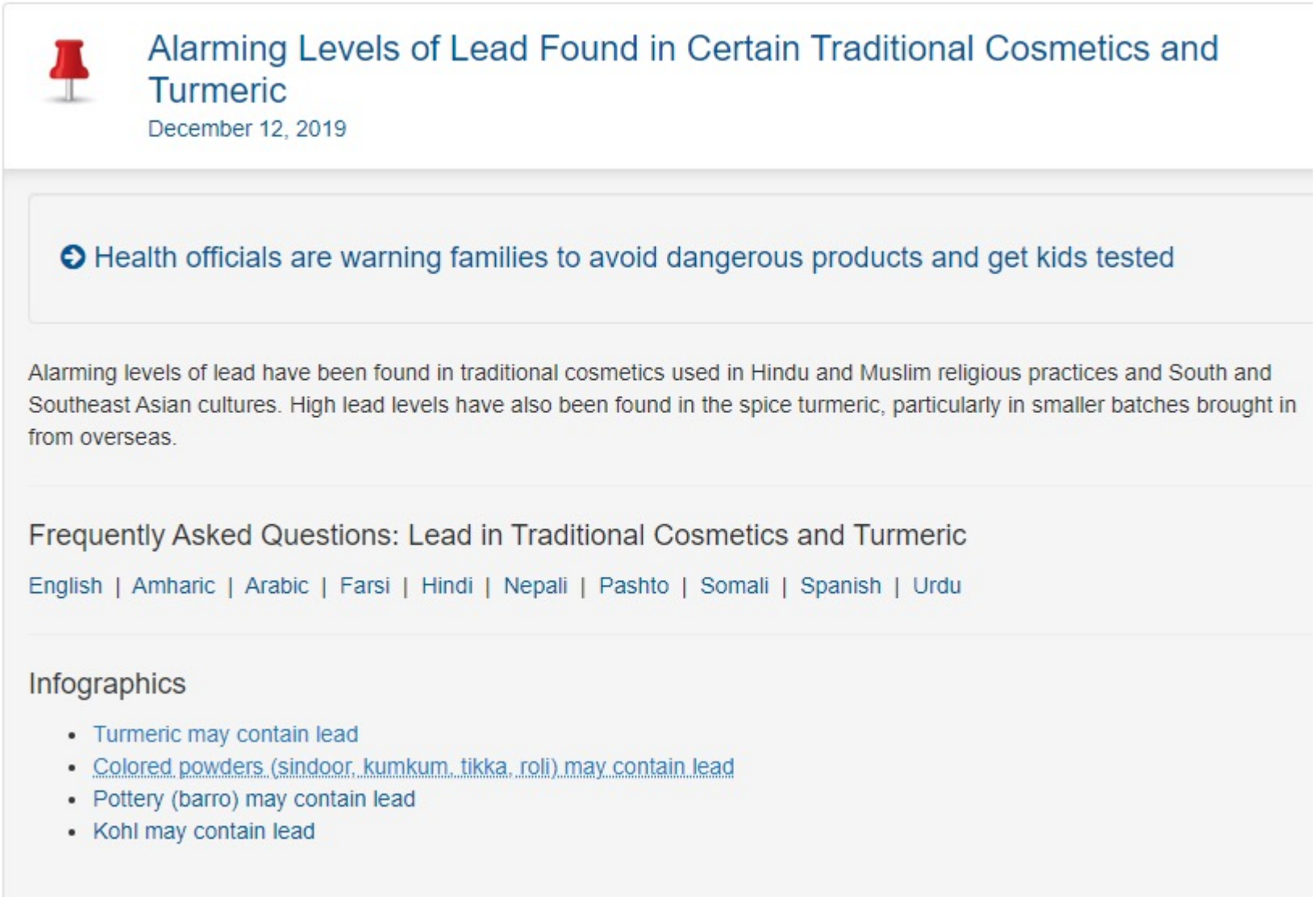
- 2019 Journal article: Turmeric means “yellow” in Bengali: Lead chromate pigments added to turmeric threaten public health across Bangladesh. https://www.sciencedirect.com/science/article/pii/S0013935119305195?via%3Dihub
- 2020. Lead Concentrations in Mexican Candy: A Follow-Up Report. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7047762/

FDA Importation Surveillance: "DETENTION WITHOUT PHYSICAL EXAMINATION OF SPICES AND SPICE PRODUCTS DUE TO LEAD CONTAMINATION“

Published Date: 07/09/2021

www.accessdata.fda.gov/cms_ia/importalert_1143.html

- Bangladesh
- Canada
- China
- India
- Indonesia
- Lebanon
- Syrian Arab Republic
- Thailand
- Trinidad & Tobago
- Vietnam
- Yemen



Alarming Levels of Lead Found in Certain Traditional Cosmetics and Turmeric

December 12, 2019

Health officials are warning families to avoid dangerous products and get kids tested

Alarming levels of lead have been found in traditional cosmetics used in Hindu and Muslim religious practices and South and Southeast Asian cultures. High lead levels have also been found in the spice turmeric, particularly in smaller batches brought in from overseas.

Frequently Asked Questions: Lead in Traditional Cosmetics and Turmeric

English | Amharic | Arabic | Farsi | Hindi | Nepali | Pashto | Somali | Spanish | Urdu

Infographics

- Turmeric may contain lead
- Colored powders (sindoor, kumkum, tikka, roli) may contain lead
- Pottery (barro) may contain lead
- Kohl may contain lead

https://www.oregon.gov/oha/PH/HEALTHYENVIRONMENTS/HEALTHYNEIGHBORHOODS/LEADPOISONING/PARENTSFAMILIES/Pages/sourcesoflead.aspx

Iowa Lead Exposures linked to Contaminated Spices

Kelsey Marmon, RN, CCNC	Kevin Officer (for Kathy Leinenkugel)
Warren County Health Services 301 N. Buxton, Ste. 203 Indianola, IA 50125 p: (515) 961-1074 c: (515) 537-8783 f: (515) 961-1083 kelseym@warrencountyia.org	Iowa Department of Public Health 321 E. 12th Street Des Moines, Iowa 50319 p: 800-972-2026 Kevin.officer@idph.iowa.gov Kathy.Leinenkugel@idph.iowa.gov

2021 VIRTUAL

LEARNING COLLABORATIVE

ON CHILDHOOD LEAD POISONING PREVENTION

AUGUST 25TH, 2021

9:00AM - 4:30PM

IDPH IOWA Department of PUBLIC HEALTH

IDPH IOWA Institute of Public Health Research and Policy

Baby Shoes to Work Boots
2020 Lead Exposure in Iowa

IDPH
IOWA Department of PUBLIC HEALTH

Learning Objectives:

1. Identify most common industries in Iowa where adult lead exposure occurs.
2. Gain a better understanding of adult lead data and factors influencing data trends.
3. Learn case guidelines and interventions for adult lead exposures when children are involved.

No safe blood lead level in children or adults has been identified.

– Center for Disease Control & Prevention (CDC)

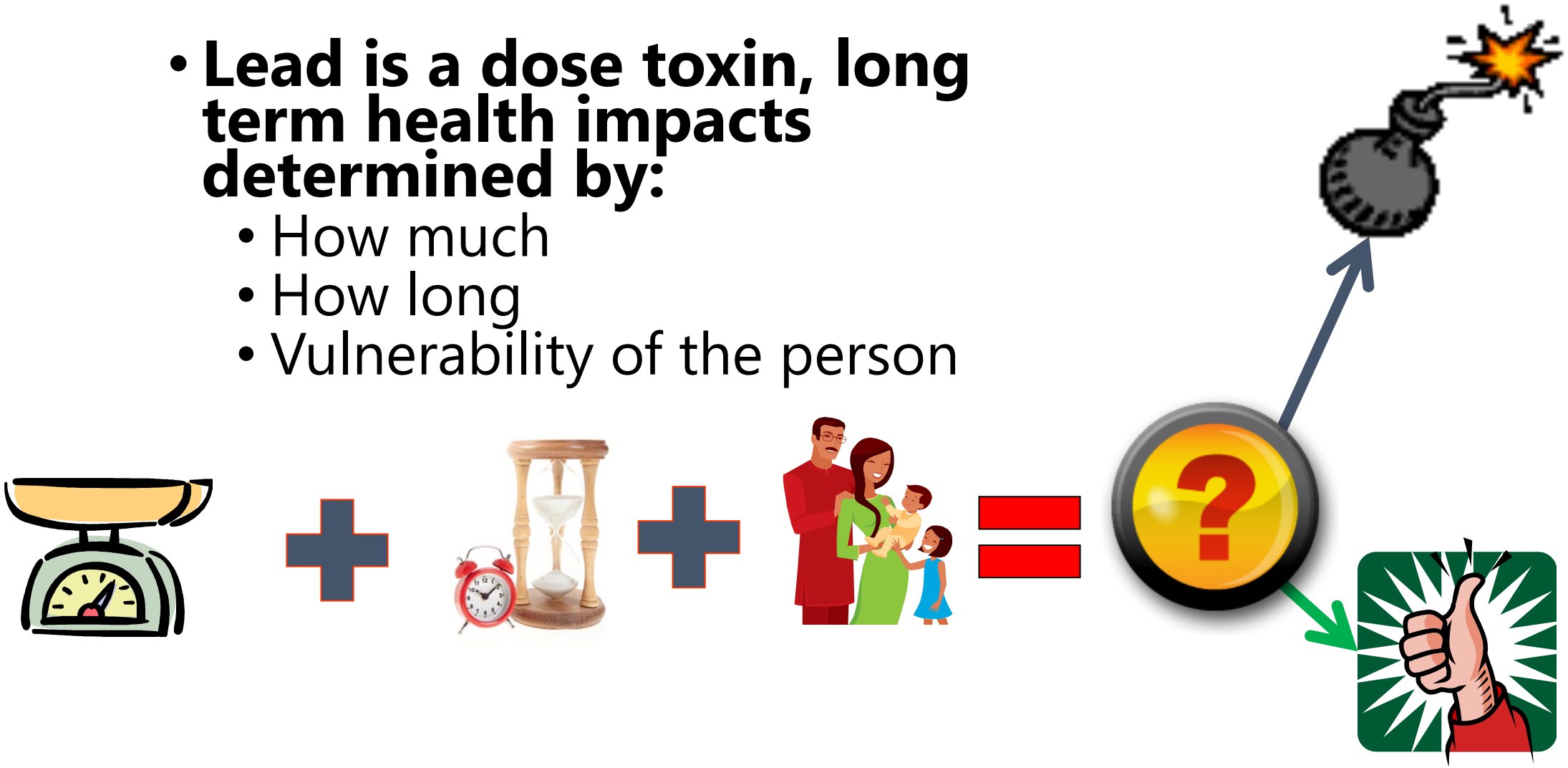
Current CDC reference value for all ages

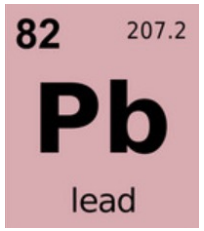
Note: “reference” level is not the same as “action” level.

Venous Blood lead level 5 micrograms per deciliter or higher

Lead 101

- **Lead is a dose toxin, long term health impacts determined by:**
  - How much
  - How long
  - Vulnerability of the person



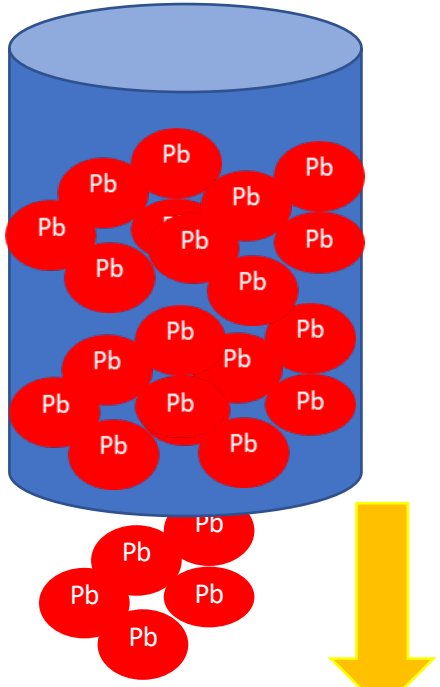


Lead In, Lead Out

Lead in the Environment that has a route into your body

Lead enters the body much faster than it leaves the body.

Lead into the Body

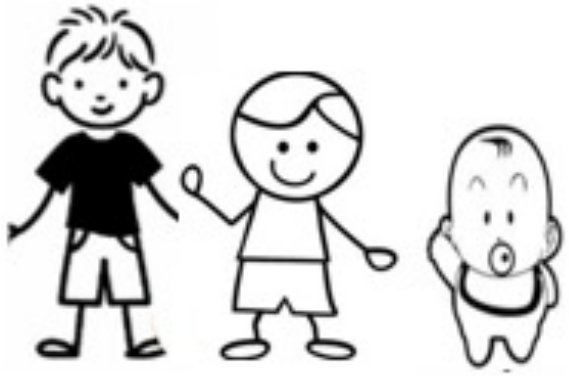


If you are exposed to lead on a regular basis, your blood lead level and total "body load" of lead will be elevated.

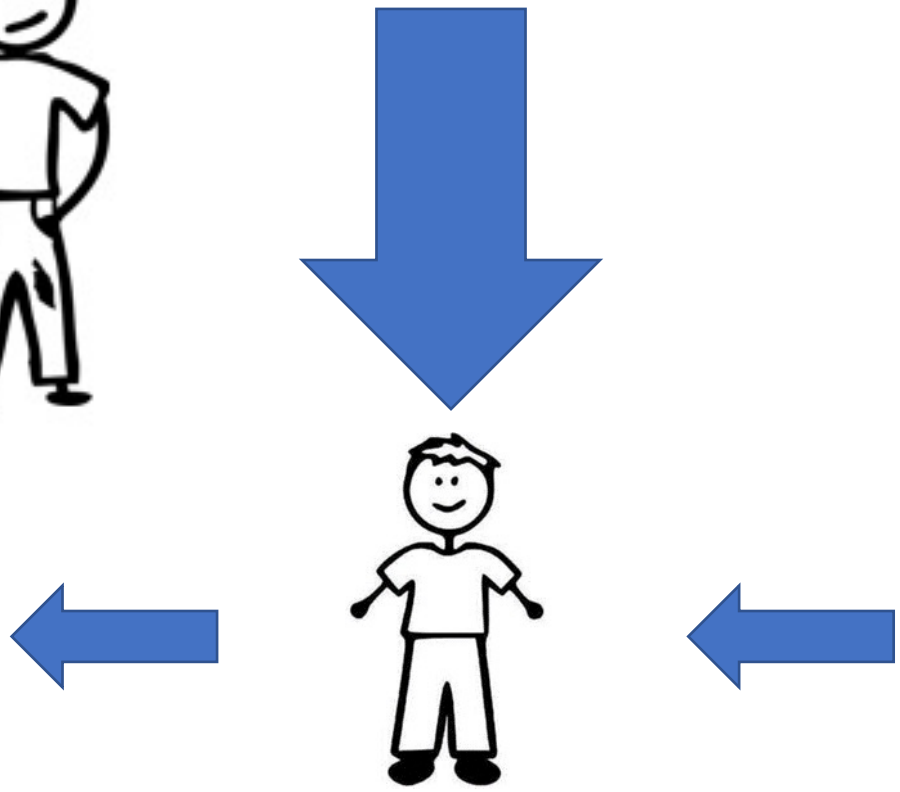
Adults (16+) compared to Preschoolers

Oral Absorption:

10%

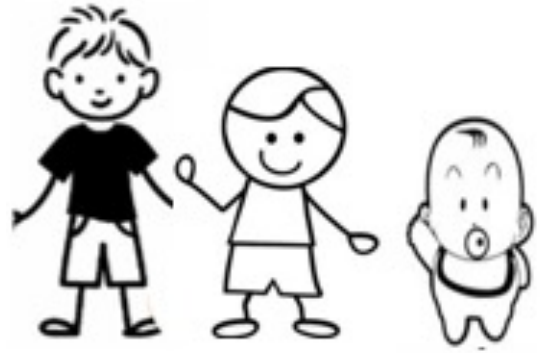


30-50%



Adults compared to Preschoolers

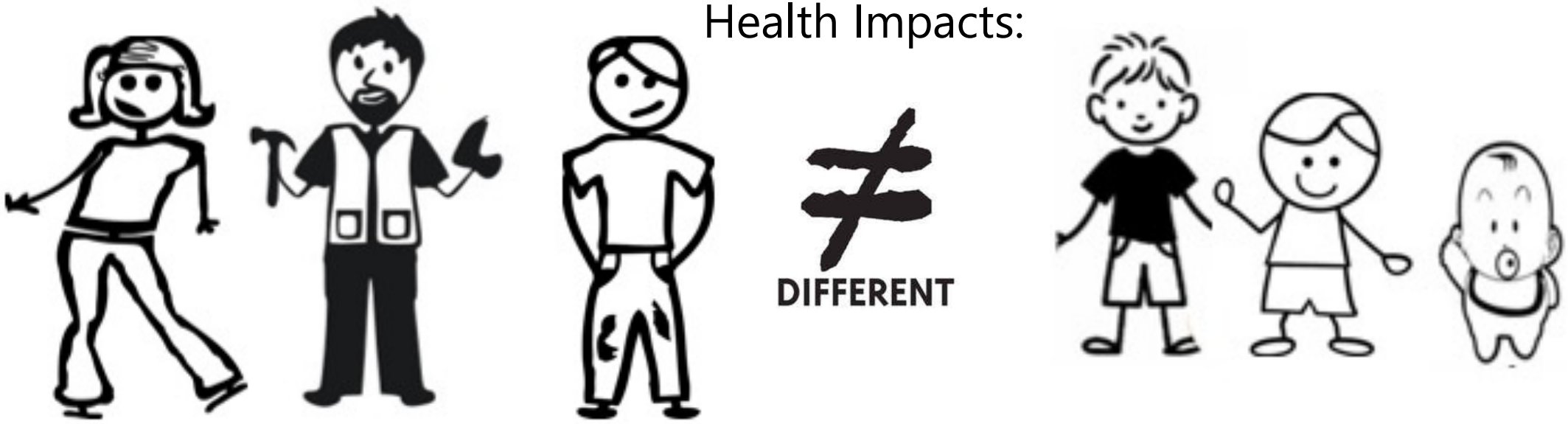
Respiratory Absorption:



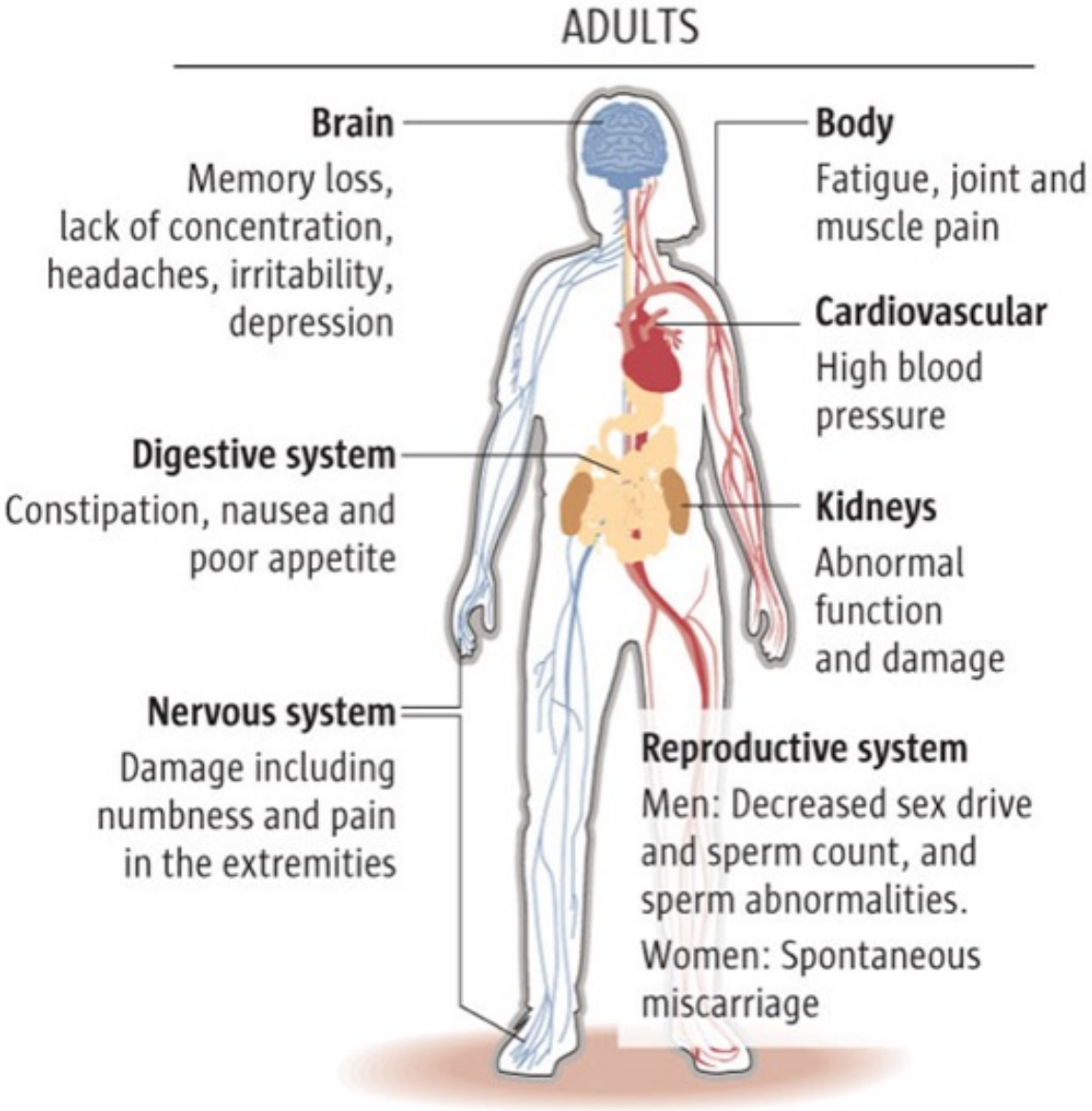
Up to 100% of lead inhaled is absorbed, depending on particle size.

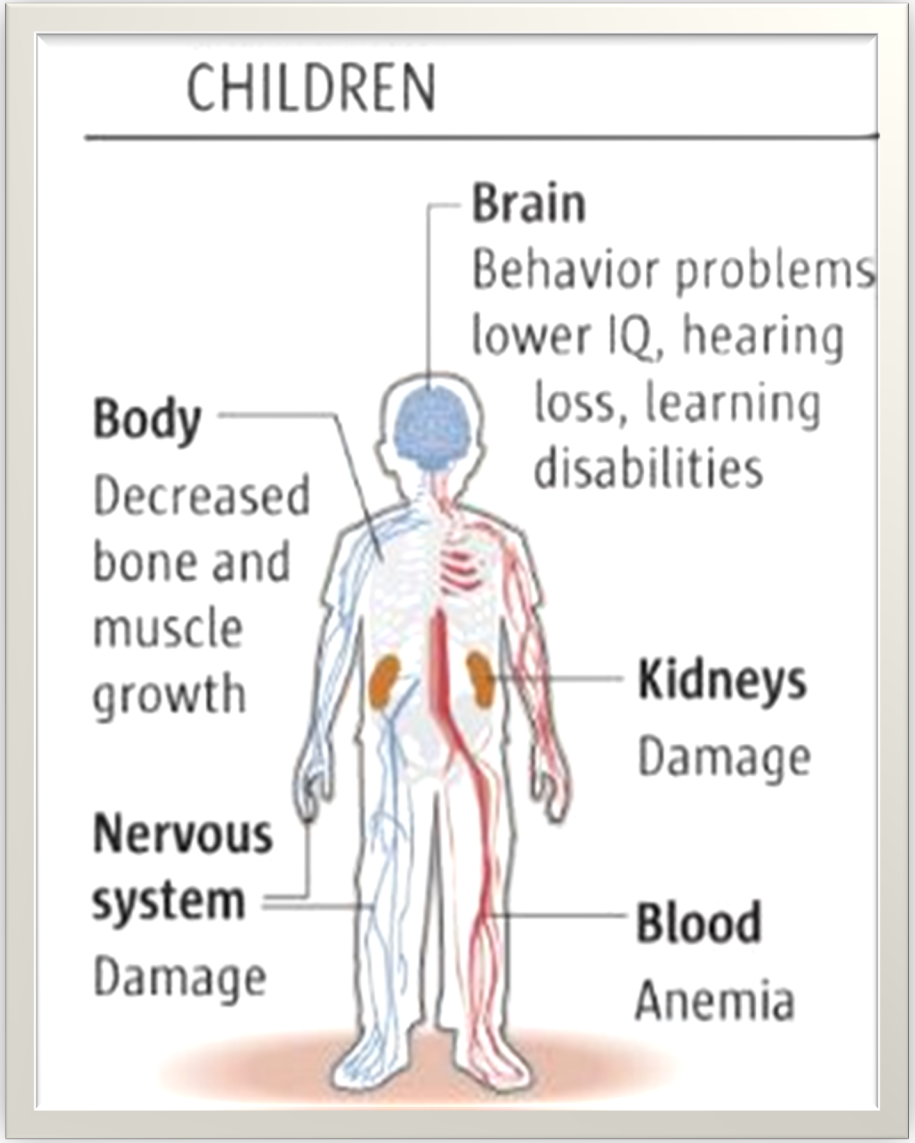
Adults compared to Preschoolers

Health Impacts:



Lead is Bad for both Adults & Children









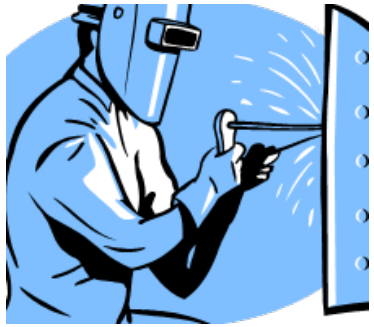


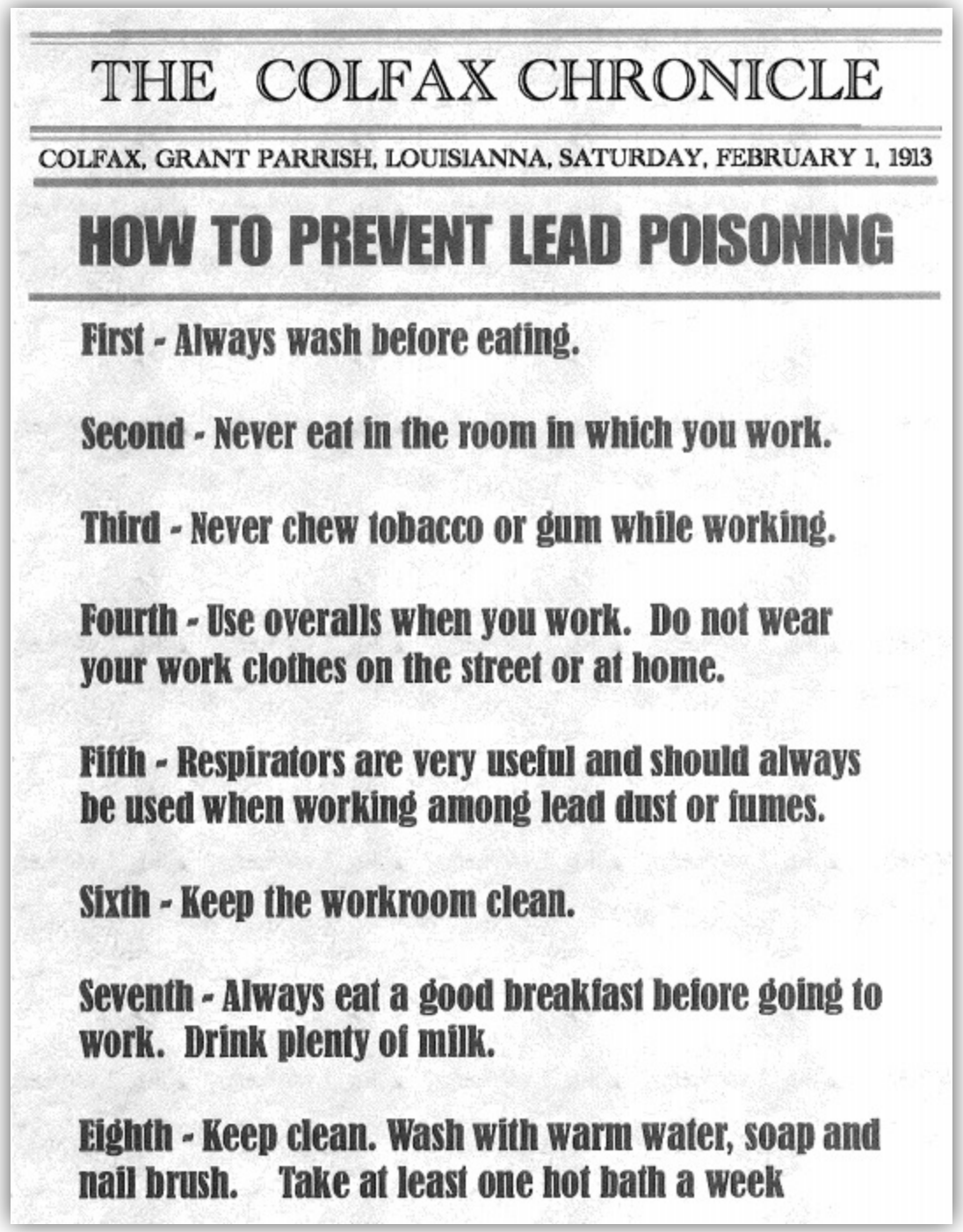
ABLES

Adult Blood Lead Epidemiology & Surveillance









THE COLFAX CHRONICLE

COLFAX, GRANT PARRISH, LOUISIANNA, SATURDAY, FEBRUARY 1, 1913

HOW TO PREVENT LEAD POISONING

First - Always wash before eating.

Second - Never eat in the room in which you work.

Third - Never chew tobacco or gum while working.

Fourth - Use overalls when you work. Do not wear your work clothes on the street or at home.

Fifth - Respirators are very useful and should always be used when working among lead dust or fumes.

Sixth - Keep the workroom clean.

Seventh - Always eat a good breakfast before going to work. Drink plenty of milk.

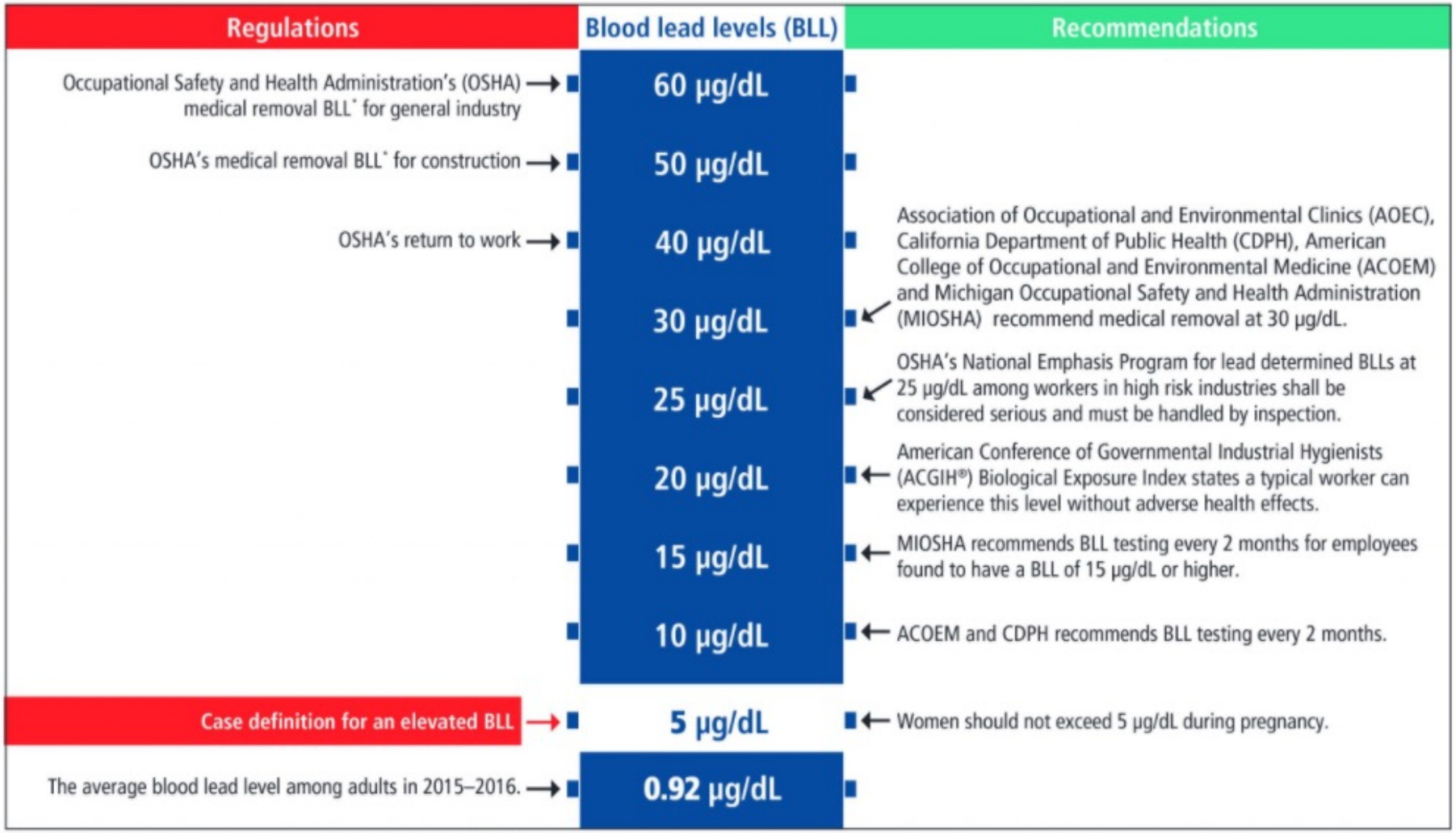
Eighth - Keep clean. Wash with warm water, soap and nail brush. Take at least one hot bath a week

Lead poisoning of adults through work is nothing new.

Many of the basic prevention messages are still the same as 100 years ago.

(except take a bath more often)

Regulations Versus Recommendations Related to Adult Lead Exposure in the Workplace



*The OSHA Lead Standards state that the examining physician has broad flexibility to tailor protections to the worker's needs.

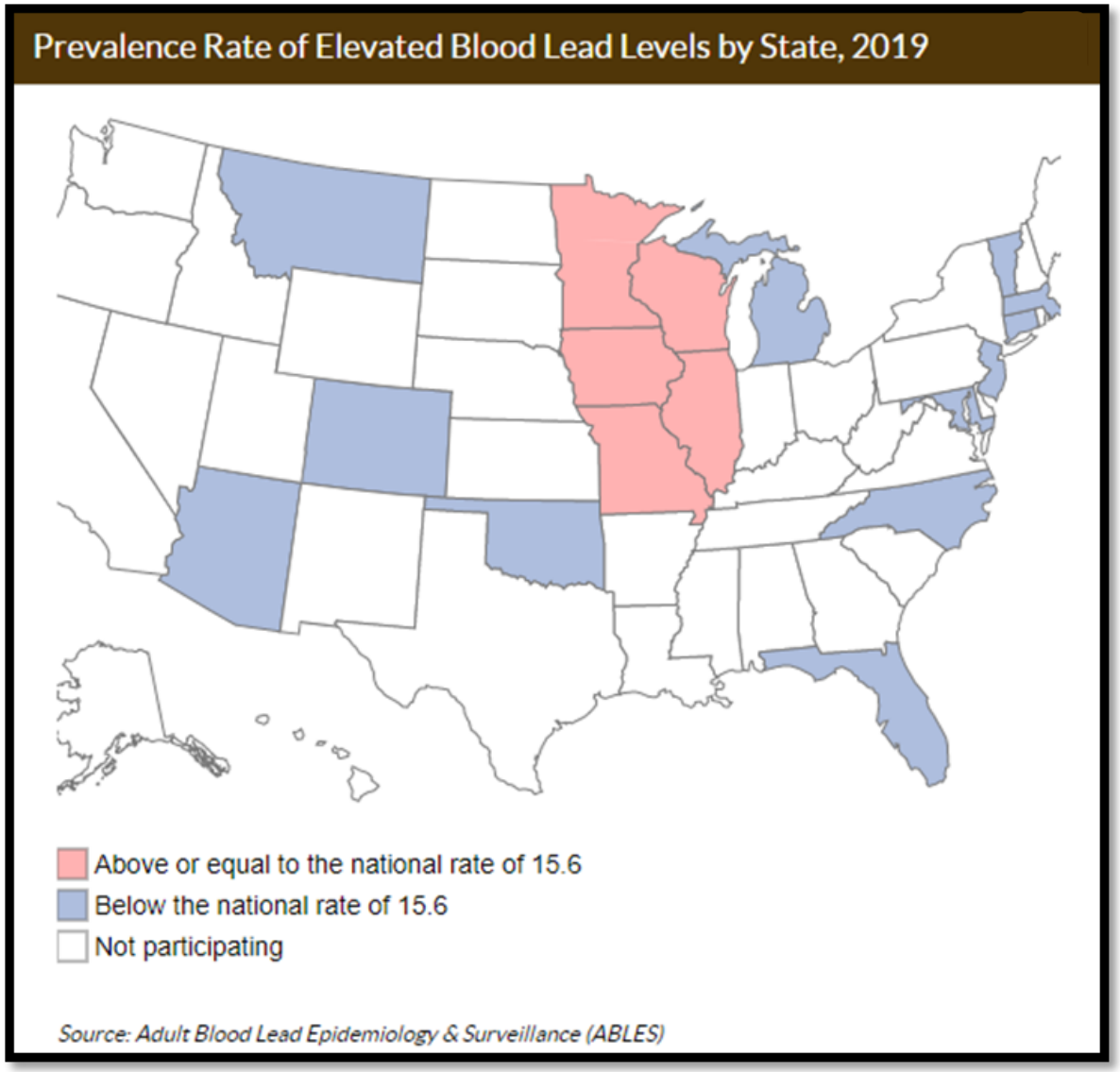
IDPH adopted use of the CDC/NIOSH case definition in April 2016

Adult Reference Level or Elevated Blood Level (EBL) = 5 mcg/dL or higher

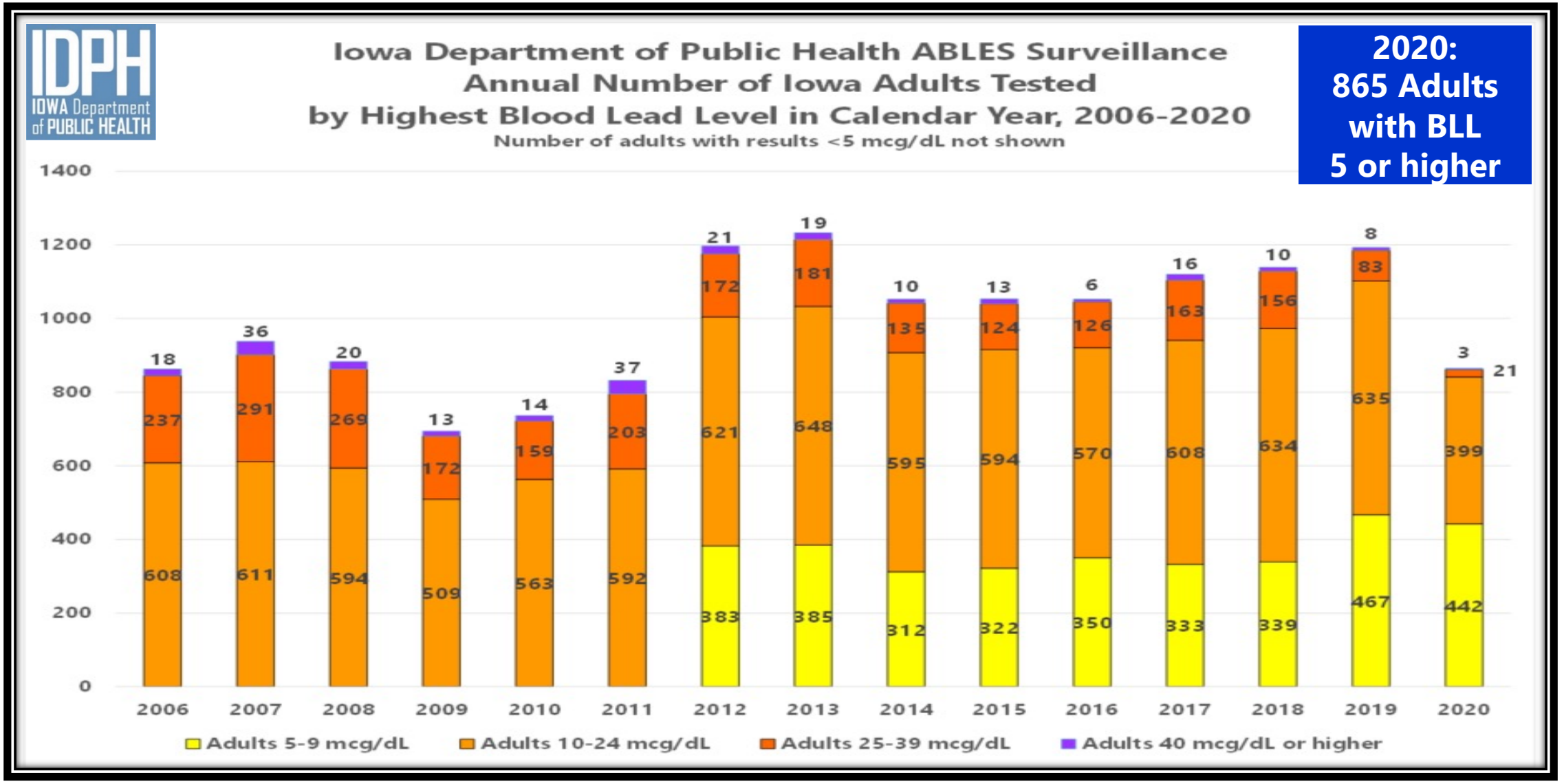
www.cdc.gov/niosh/topics/ables/ReferenceBloodLevelsforAdults.html

Prevalence Rate of Elevated Blood Lead Levels by State, 2019

State (a)	# of Cases	# of Employed Adults	Prevalence Rate Per 100,000 Employed Adults
Arizona	218	3,384,504	6.4
Colorado	66	3,062,098	2.2
Connecticut	276	1,842,164	15.0
Florida	1,220	10,016,060	12.2
Illinois	1,345	6,190,757	21.7
Iowa	726	1,691,016	42.9
Maryland	249	3,143,967	7.9
Massachusetts	489	3,706,556	13.2
Michigan	546	4,735,826	11.5
Minnesota	594	3,009,156	19.7
Missouri	1,706	2,981,688	57.2
Montana	36	514,917	7.0
New Jersey	244	4,333,333	5.6
North Carolina	633	4,883,875	13.0
Oklahoma	159	1,780,551	8.9
Vermont	33	334,070	9.9
Wisconsin	587	3,001,215	19.6
All participating states	**9,127**	**58,611,753**	**15.6**

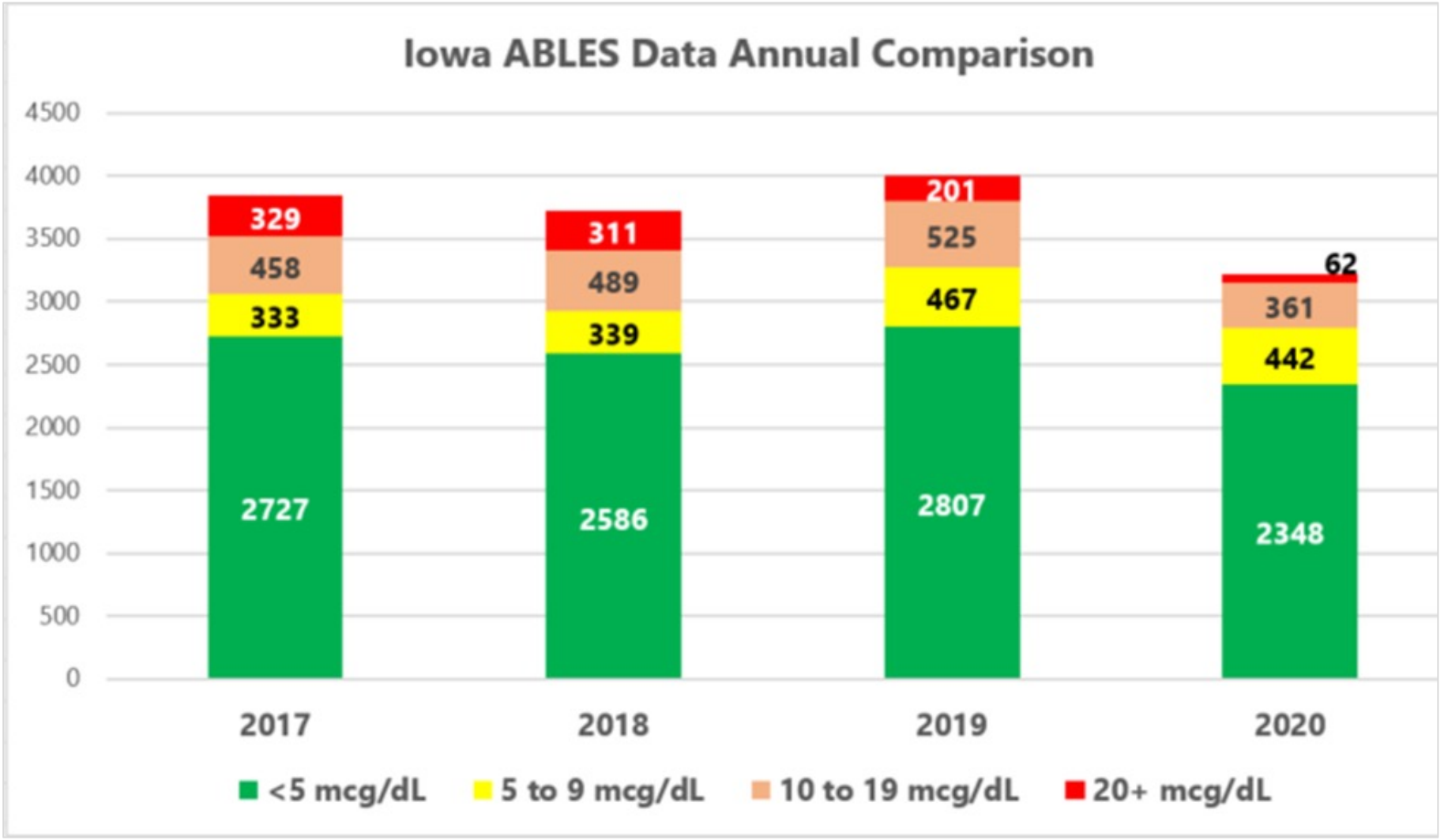


(shown is data at BLL 10+)



Report based on the highest blood lead level in the calendar year of an Iowa resident 16 years of age or older at the time of test.
Test results reported in micrograms per deciliter (mcg/dL)
IDPH Adult Blood Lead Epidemiology & Surveillance Program data as of April 2021 – subject to revision.
https://idph.iowa.gov/Environmental-Health-Services/Occupational-Health-and-Safety-Surveillance/Adult-Blood-Lead-Epidemiology

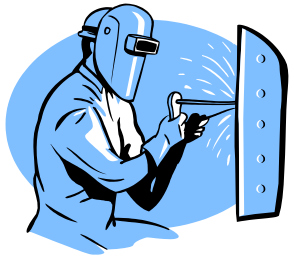
2015 Public Health Reference Level 5 mcg/dL
2009 Public Health Reference Level 10 mcg/dL, 2008 OSHA National Emphasis Program Level 25 mcg/dL



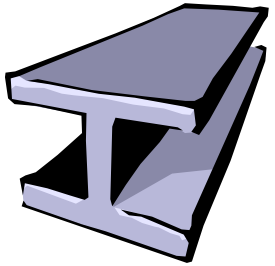
2020 Data
COVID Impact?
(Possibly from less testing and work interruptions)

<5: down
5 to 9: down
10 to 19: down
20+: down
Testing: down

Typical Adult Exposure Sites



- Work involving Lead
- Hobbies involving Lead



Some of the Industries With Adult Pb Exposures in Iowa

- **Plumbing fixture Mfg**
- **Industrial Machinery Mfg**
- **Iron, Brass & Aluminum foundry**
- **Valve & Pipe fittings**
- **Lead smelter/Primary**
- **Storage Battery Mfg**
- **Lead Pigment Mfg**
- **Inorganic Chemicals Mfg**
- **Radiator Shops**
- **Stained Glass Artisans**
- **Firing Range Employees/users**
- **Residential Construction Industry (Renovators, Home Repairs, Painting Contractors)**
- **Industrial Construction**

Battery Plant Manufacturing

Iowa ABLES Data as of 4/30/2021	2020	2020 Pct	2019	2019 Pct	Change
Workers tested, 3 major battery plants **Pct of total adults tested**	660	21%	704	18%	-44
# 5+ EBL Pct of Battery plant workers tested	535	81%	632	90%	-97
# 10+ EBL Pct of Battery plant workers tested	300	45%	480	68%	-180
# 20+ EBL Pct of Battery plant workers tested	33	5%	143	20%	-110
# 40+ EBL	1	**	0	**	1

Kudos: One battery plant had 93 workers tested in 2020, with a total of 617 BLLs reported.

Based on the highest BLL for each worker in 2020, blood lead tests ranged from 1-12 mcg/dL:

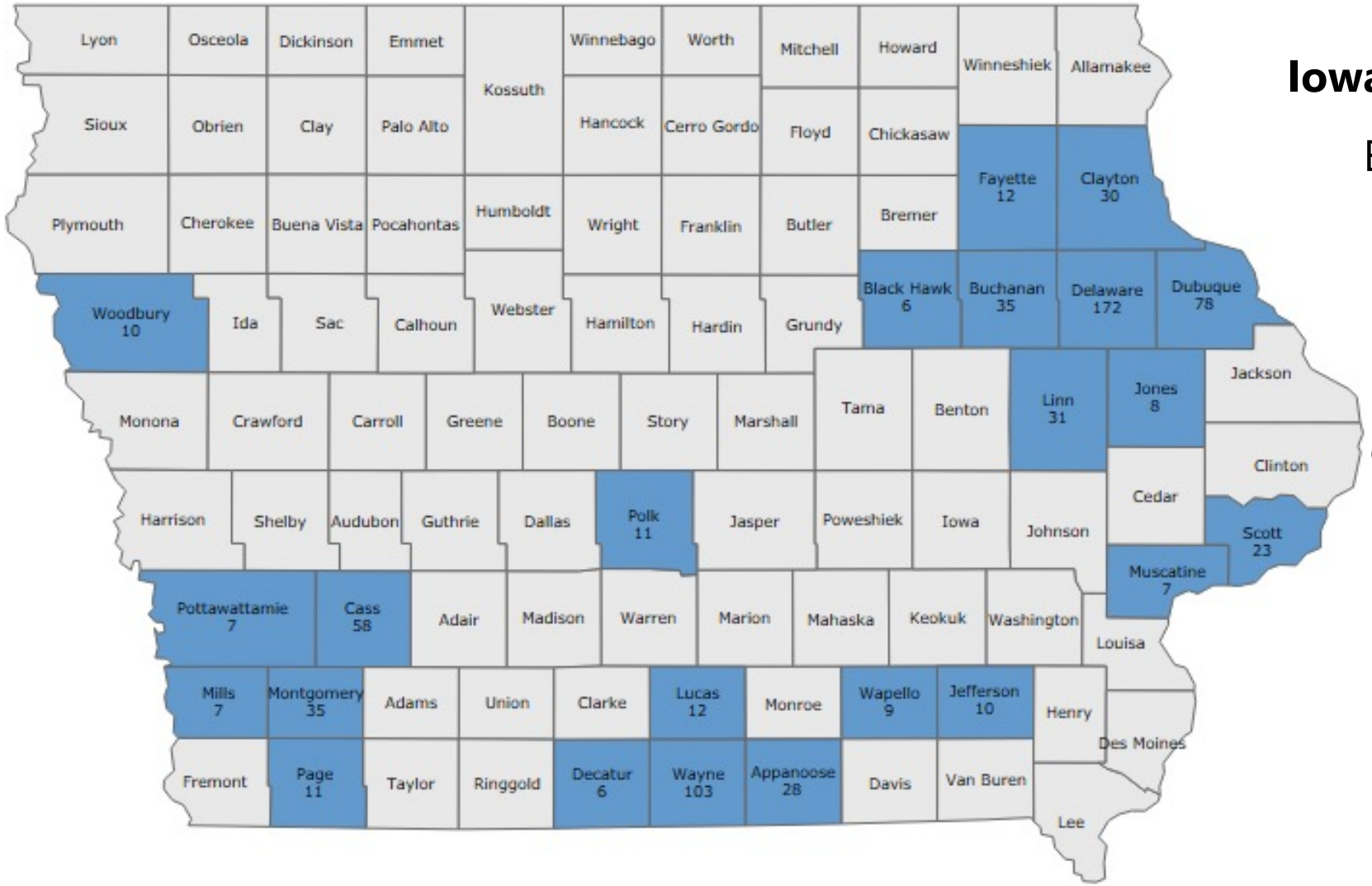
8 workers at 10-12 mcg/dL

57 workers at 5-9 mcg/dL

28 workers at 0-4 mcg/dL

Annual Blood Lead Testing: Persons with a Confirmed Elevated BLL
Adult (16 and Older) - 2019

Hover over a County to see the County Name and values for that County.



https://tracking.idph.iowa.gov/Health/Lead-Poisoning/

Iowa Public Health Tracking Portal

EBL data shown is ≥ 10 µg/dL

Numbers Tested shown if hover over county (on the live portal)

Less than 6 EBL numbers per county are not shown per portal data confidentiality protocols.

2020 data pending on this data portal

Workers in the Construction Industry at risk for Lead Exposure

- Millwrights
- Welders
- Demolition work
- Lead abatement
- Plumbers
- HVAC maintenance and repair

- Electricians
- Carpenters
- Residential and industrial Painters
- Renovation, and remode work
- Industrial coatings

Status of Iowa Housing

Table 1 – Characteristics of Iowa Housing Compared to Other States

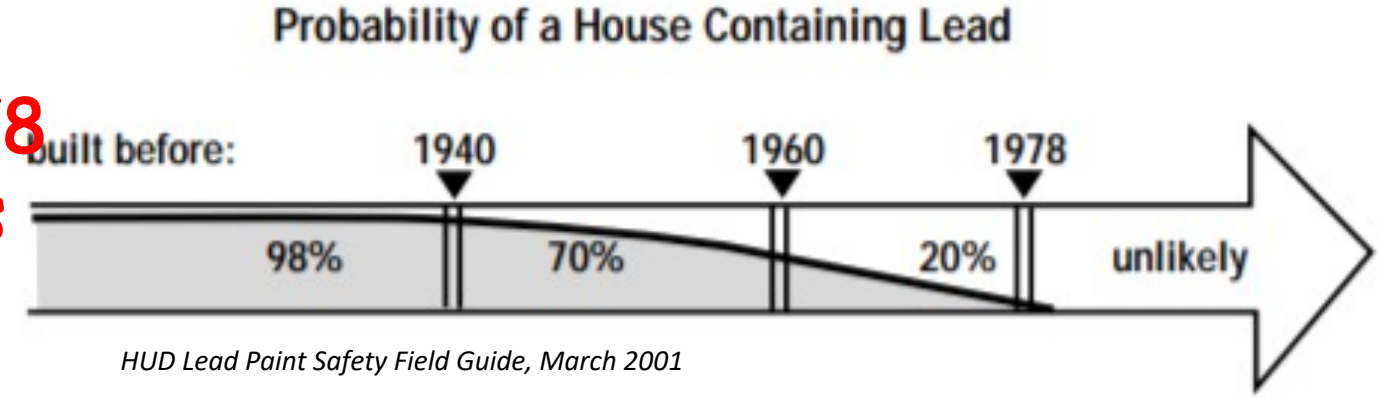
State	% Pre-1940 housing units	% Pre-1950 housing units	% Of pre-1950 housing that is rental
Illinois	22.6	31.8	37.5
Nebraska	25.3	32.3	30.0
Vermont	30.0	34.5	39.2
Maine	29.1	35.8	35.8
Rhode Island	29.4	39.2	46.3
Iowa	**31.6**	**39.3**	**26.1**
Pennsylvania	30.3	40.3	31.3
Massachusetts	34.5	42.8	43.6
New York	31.2	43.1	52.1
District of Columbia	34.6	51.4	46.7
National Average	15.0	22.3	37.3

Source: State of Iowa Strategic Plan for the Elimination of Childhood Lead Poisoning in Iowa, July 2010

Most homes built before 1978 contain some lead-based paint and residual lead dust, regardless of prior renovations.

Homes built before 1950 used paint that had a higher concentration of lead.

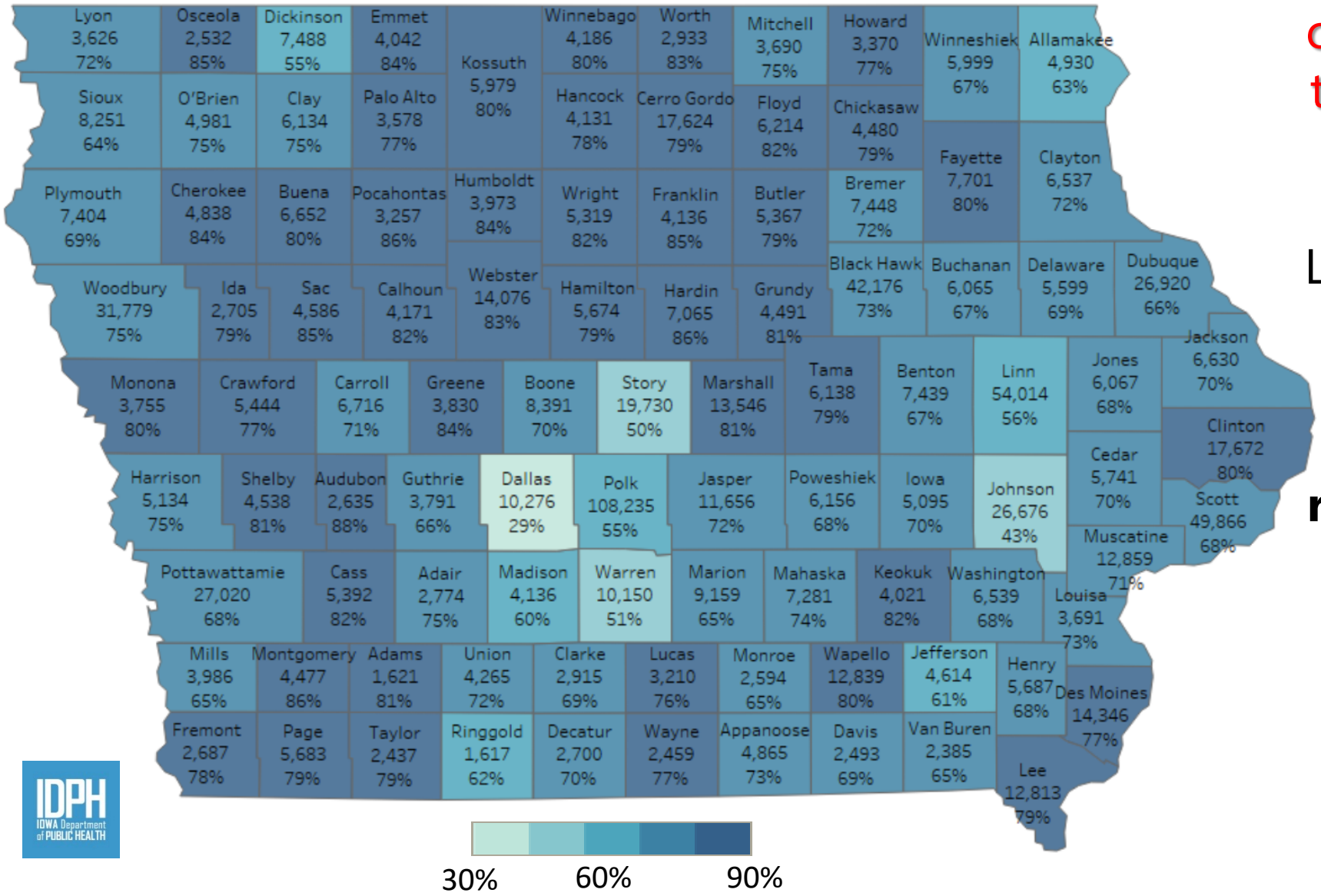
Assume a house built before 1978 has lead present until testing is done to prove it isn't.



HUD Lead Paint Safety Field Guide, March 2001

Number and Percentage of Housing Units Built Prior to 1979, by County

2018 American Community Survey, 5-Year Estimate



Rarely are residential construction workers in Iowa tested or monitored for lead exposure.

Lead-contaminated dust and paint found in pre-1978 housing that is **disturbed during renovation, remodeling and painting** is one of the biggest risks of lead exposure for Iowa **workers.**

Iowa Adult Women Exposures –2020 Data

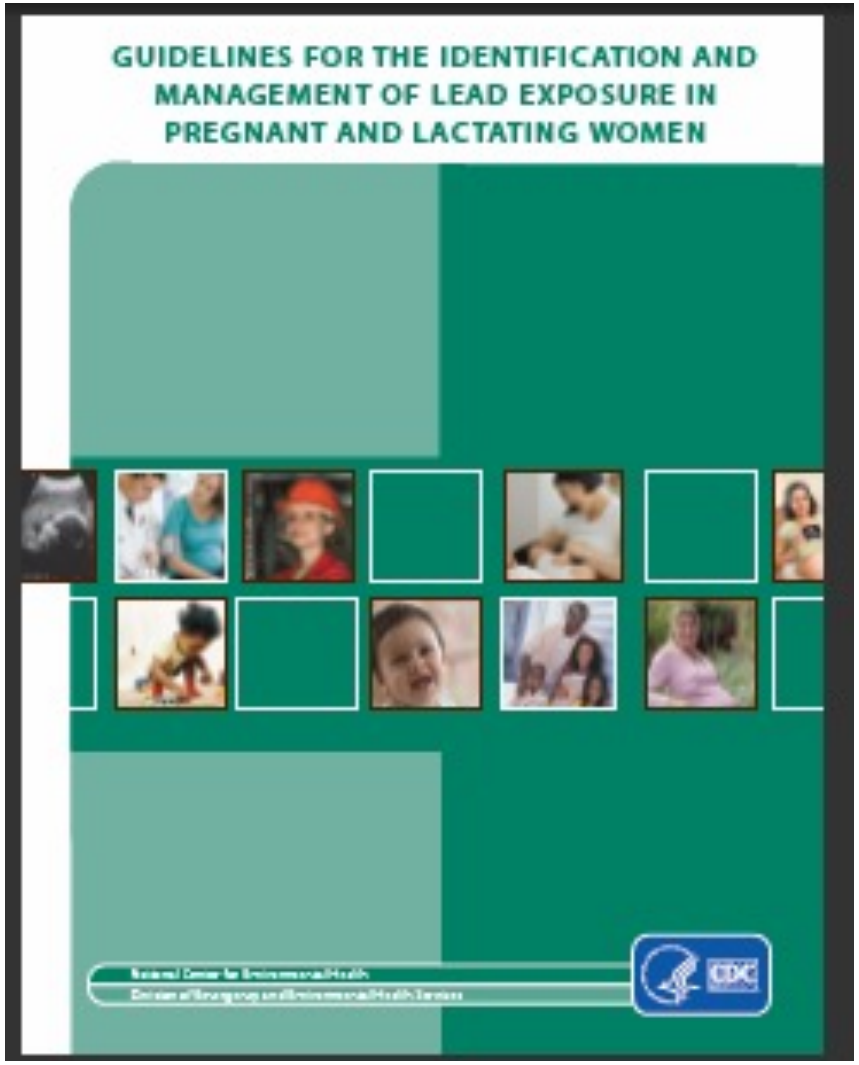
- **1038 women tested, 121(12%) EBL**
  - 484 were 16-45 years old (usual reproductive age range)
    - 55 (5%) EBL
- **204 women tested known to be work-related (all ages)**
  - 121 of 204 (59%) EBL (all ages)
  - 101 of 204 tested were 16-45 years old
    - 55 of 101 EBL (54%)

Lead can pass from a mother to her unborn baby

- Increase the risk of miscarriage
- Cause babies to be born early or underweight
- Hurt the baby's brain, kidneys and nervous systems
- Cause learning or behavior problems for children

Current BLLs do not reflect how much lead is stored in the mother's body from past exposure

Women and Lead Exposure



- **CDC Guidelines for the Identification and Management of Lead Exposure in Pregnant and Lactating Women – Nov. 2010**

"Pregnant women with blood lead concentrations of 10 µg/dL or higher should be removed from occupational lead exposure."

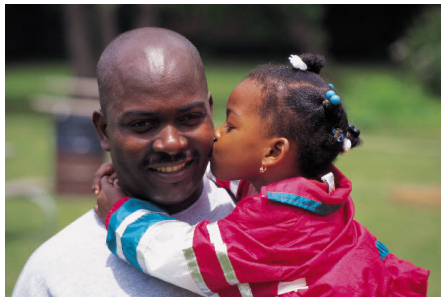
The OSHA Lead Standards state that the examining physician has broad flexibility to tailor protections to the worker's needs.

www.cdc.gov/nceh/lead/publications/leadandpregnancy2010.pdf

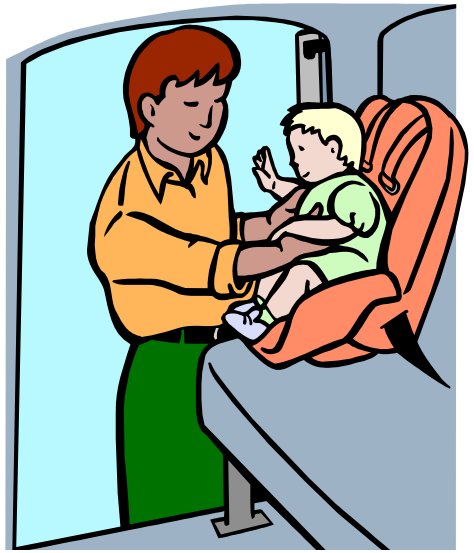
IA 2011 Indoor Firing Range
Take-Home Lead Case

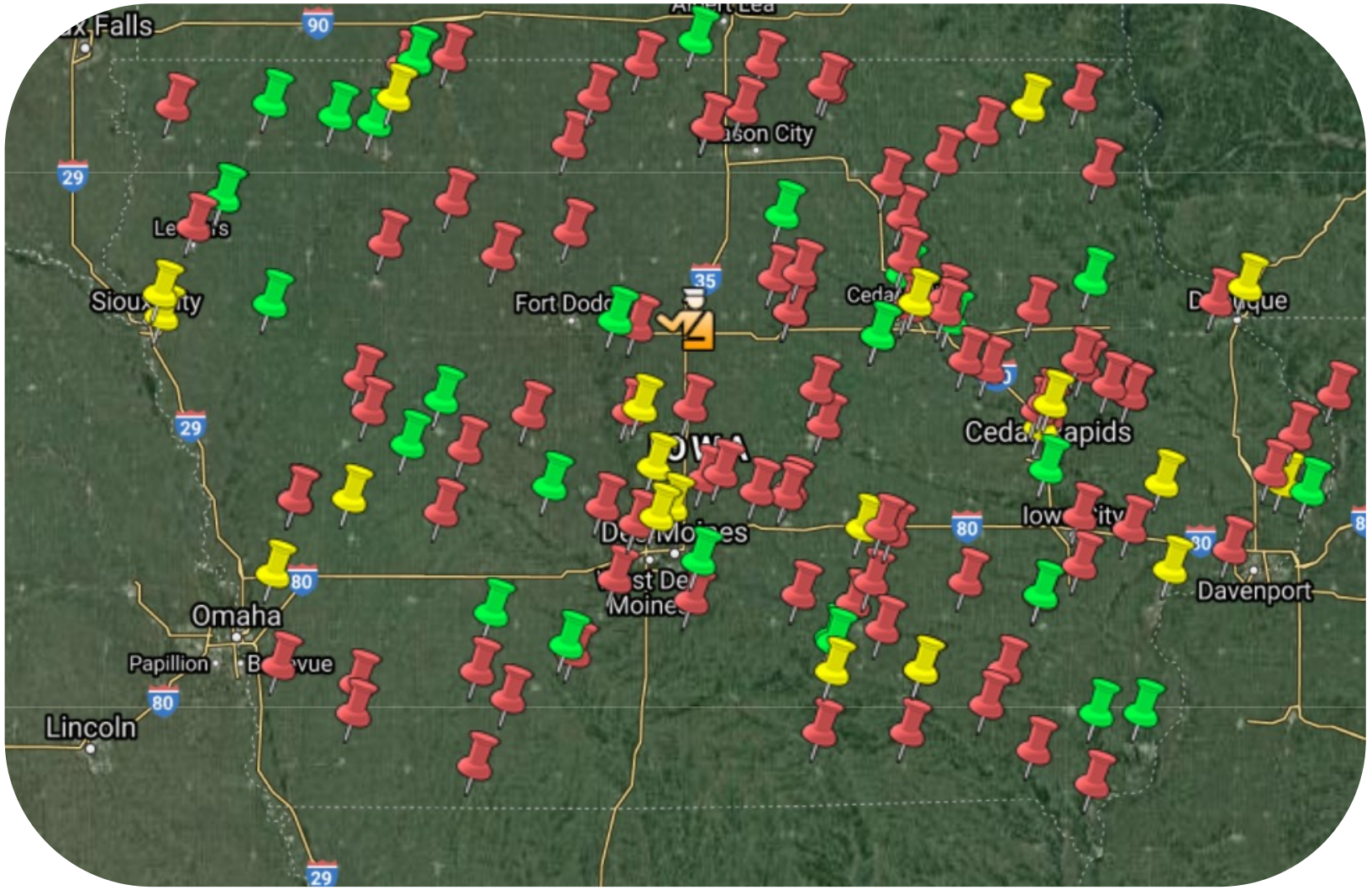
12 month old with BLL 30, lived in 1998 apartment BUT dad worked for firing range

- Dust wipes showed take-home lead, including
  - Dad's work sweat-shirt: 370 µg/ft sq
  - Dad's work blue jeans: 340 µg/ft sq
  - Child's car seat arm area: 540 µg/ft sq
  - Dad's work shoes (bottom, sides): 7700 µg/ft sq
- Dad tested at 22 µg/dL
- Firing range inspection by OSHA - fined for non-compliance



Compare to the EPA dust lead hazard level for floors of 40 µg/ft sq (new std is 10 µg/ft sq)





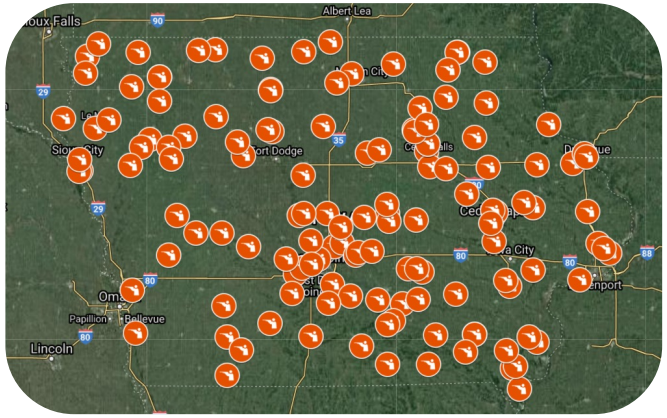
MAP OF IOWA RANGES

Iowa Shooters LLC

IAShooters.com

Green = public ranges
Red = members-only ranges
Yellow = businesses.

Left: Screen shot of map 5/4/21



Right: https://www.iowadnr.gov/Hunting/Places-to-Hunt-Shoot/Iowa-Shooting-Ranges

Consumer Health Information
www.fda.gov/consumer

www.fda.gov/consumer/updates/ayurvedic101608.html

Use Caution With Ayurvedic Products

Associated Press

Lead, mercury, and arsenic have been found in some Ayurvedic products. Certain populations, including children, are particularly at risk for the toxic effects of heavy metals.

Ayurvedic medicine is a traditional system of healing arts that originated in India. It involves using products such as spices, herbs, vitamins, proteins, minerals, and metals (e.g., mercury, lead, iron, zinc). Some preparations combine herbs with minerals and metals. These products are commonly sold on the Internet or in stores and are represented as "Indian" or "South Asian."

"Consumers should know that Ayurvedic products are generally not reviewed or approved by the Food and Drug Administration (FDA)," says Mike Levy, Director of the Division of New Drugs and Labeling Compliance in the Office of Compliance, part of FDA's Center for Drug Evaluation and Research (CDER).

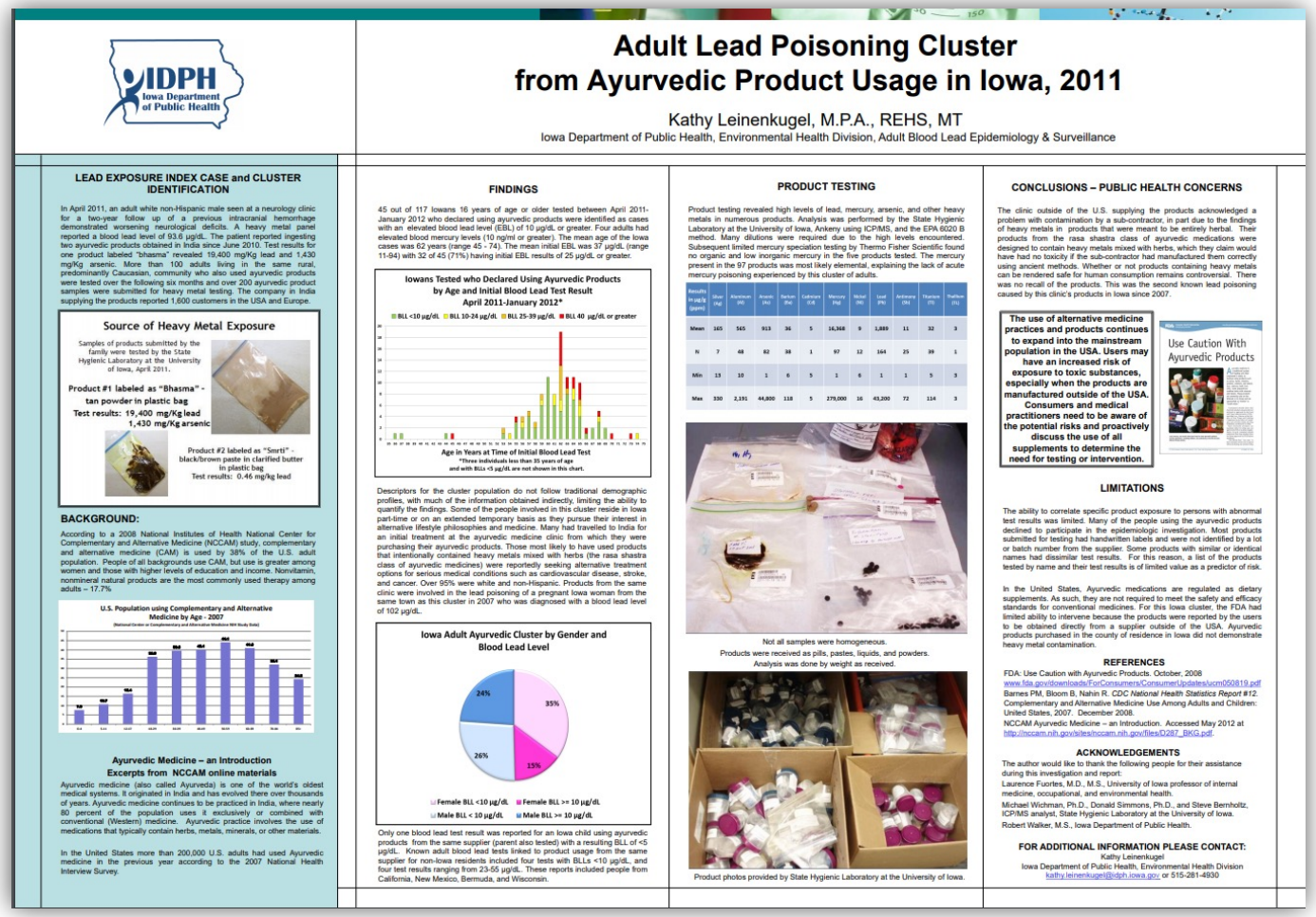
Most Ayurvedic products are marketed either for drug uses not approved by FDA or as dietary supplements. As such, consumers should understand that these products have not been approved by FDA before marketing.

"The bottom line," Levy says, "is that consumers need to be on guard when purchasing any product using

Lead and Ayurvedic Products

"Ayurvedic medicine is a traditional system of healing arts that originated in India. It involves using products such as spices, herbs, vitamins, proteins, minerals, and metals (e.g. mercury, lead, iron, zinc."

www.fda.gov/downloads/ForConsumers/ConsumerUpdates/ucm050819.pdf



Adult Lead Poisoning Cluster from Ayurvedic Product Usage in Iowa, 2011

Kathy Leinenkugel, M.P.A., REHS, MT
Iowa Department of Public Health, Environmental Health Division, Adult Blood Lead Epidemiology & Surveillance

IDPH Iowa Department of Public Health

LEAD EXPOSURE INDEX CASE and CLUSTER IDENTIFICATION

In April 2011, an adult white non-Hispanic male seen at a neurology clinic for a two-year follow up of a previous intracranial hemorrhage demonstrated worsening neurological deficits. A heavy metal panel reported a blood lead level of 93.6 µg/dL. The patient reported ingesting two ayurvedic products obtained in India since June 2010. Test results for one product labeled "bhasma" revealed 19,400 mg/Kg lead and 1,430 mg/Kg arsenic. More than 100 adults living in the same rural, predominantly Caucasian, community who also used ayurvedic products were tested over the following six months and over 200 ayurvedic product samples were submitted for heavy metal testing. The company in India supplying the products reported 1,600 customers in the USA and Europe.

Source of Heavy Metal Exposure

Samples of products submitted by the family were tested by the State Hygienic Laboratory at the University of Iowa, April 2011.

Product #1 labeled as "Bhasma" - tan powder in plastic bag
Test results: 19,400 mg/Kg lead
1,430 mg/Kg arsenic

Product #2 labeled as "Smrti" - black/brown paste in clarified butter in plastic bag
Test results: 0.46 mg/kg lead

BACKGROUND:

According to a 2008 National Institutes of Health National Center for Complementary and Alternative Medicine (NCCAM) study, complementary and alternative medicine (CAM) is used by 38% of the U.S. adult population. People of all backgrounds use CAM, but use is greater among women and those with higher levels of education and income. Nonvitamin, nonmineral natural products are the most commonly used therapy among adults – 17.7%

U.S. Population using Complementary and Alternative Medicine by Age - 2007

Ayurvedic Medicine – an Introduction
Excerpts from NCCAM online materials

Ayurvedic medicine (also called Ayurveda) is one of the world's oldest medical systems. It originated in India and has evolved there over thousands of years. Ayurvedic medicine continues to be practiced in India, where nearly 80 percent of the population uses it exclusively or combined with conventional (Western) medicine. Ayurvedic practice involves the use of medications that typically contain herbs, metals, minerals, or other materials.

In the United States more than 200,000 U.S. adults had used Ayurvedic medicine in the previous year according to the 2007 National Health Interview Survey.

FINDINGS

45 out of 117 Iowans 16 years of age or older tested between April 2011-January 2012 who declared using ayurvedic products were identified as cases with an elevated blood lead level (EBL) of 10 µg/dL or greater. Four adults had elevated blood mercury levels (10 ng/ml or greater). The mean age of the Iowa cases was 62 years (range 45 - 74). The mean initial EBL was 37 µg/dL (range 11-94) with 32 of 45 (71%) having initial EBL results of 25 µg/dL or greater.

Iowans Tested who Declared Using Ayurvedic Products by Age and Initial Blood Lead Test Result April 2011-January 2012*

BLL <10 µg/dL BLL 10-24 µg/dL BLL 25-39 µg/dL BLL 40 µg/dL or greater

Age in Years at Time of Initial Blood Lead Test
*Three individuals less than 35 years of age and with BLLs <5 µg/dL are not shown in this chart.

Descriptors for the cluster population do not follow traditional demographic profiles, with much of the information obtained indirectly, limiting the ability to quantify the findings. Some of the people involved in this cluster reside in Iowa part-time or on an extended temporary basis as they pursue their interest in alternative lifestyle philosophies and medicine. Many had travelled to India for an initial treatment at the ayurvedic medicine clinic from which they were purchasing their ayurvedic products. Those most likely to have used products that intentionally contained heavy metals mixed with herbs (the rasa shastra class of ayurvedic medicines) were reportedly seeking alternative treatment options for serious medical conditions such as cardiovascular disease, stroke, and cancer. Over 95% were white and non-Hispanic. Products from the same clinic were involved in the lead poisoning of a pregnant Iowa woman from the same town as this cluster in 2007 who was diagnosed with a blood lead level of 102 µg/dL.

Iowa Adult Ayurvedic Cluster by Gender and Blood Lead Level

24% 35% 26% 15%

Female BLL <10 µg/dL Female BLL >= 10 µg/dL
Male BLL < 10 µg/dL Male BLL >= 10 µg/dL

Only one blood lead test result was reported for an Iowa child using ayurvedic products from the same supplier (parent also tested) with a resulting BLL of <5 µg/dL. Known adult blood lead tests linked to product usage from the same supplier for non-Iowa residents included four tests with BLLs <10 µg/dL, and four test results ranging from 23-55 µg/dL. These reports included people from California, New Mexico, Bermuda, and Wisconsin.

PRODUCT TESTING

Product testing revealed high levels of lead, mercury, arsenic, and other heavy metals in numerous products. Analysis was performed by the State Hygienic Laboratory at the University of Iowa, Arkeny using ICP/MS, and the EPA 6020 B method. Many dilutions were required due to the high levels encountered. Subsequent limited mercury speciation testing by Thermo Fisher Scientific found no organic and low inorganic mercury in the five products tested. The mercury present in the 97 products was most likely elemental, explaining the lack of acute mercury poisoning experienced by this cluster of adults.

Results in µg/g (ppm)	Silver (Ag)	Aluminum (Al)	Arsenic (As)	Barium (Ba)	Cadmium (Cd)	Mercury (Hg)	Nickel (Ni)	Lead (Pb)	Antimony (Sb)	Thorium (Th)	Thallium (Tl)
Mean	165	565	913	36	5	16,368	9	1,889	11	32	3
N	7	48	82	38	1	97	12	164	25	39	1
Min	13	10	1	6	5	1	6	1	1	5	3
Max	330	2,191	44,800	118	5	279,000	16	43,200	72	114	3

Not all samples were homogeneous.
Products were received as pills, pastes, liquids, and powders.
Analysis was done by weight as received.

Product photos provided by State Hygienic Laboratory at the University of Iowa.

CONCLUSIONS – PUBLIC HEALTH CONCERNS

The clinic outside of the U.S. supplying the products acknowledged a problem with contamination by a sub-contractor, in part due to the findings of heavy metals in products that were meant to be entirely herbal. Their products from the rasa shastra class of ayurvedic medications were designed to contain heavy metals mixed with herbs, which they claim would have had no toxicity if the sub-contractor had manufactured them correctly using ancient methods. Whether or not products containing heavy metals can be rendered safe for human consumption remains controversial. There was no recall of the products. This was the second known lead poisoning caused by this clinic's products in Iowa since 2007.

The use of alternative medicine practices and products continues to expand into the mainstream population in the USA. Users may have an increased risk of exposure to toxic substances, especially when the products are manufactured outside of the USA. Consumers and medical practitioners need to be aware of the potential risks and proactively discuss the use of all supplements to determine the need for testing or intervention.

Use Caution With Ayurvedic Products

LIMITATIONS

The ability to correlate specific product exposure to persons with abnormal test results was limited. Many of the people using the ayurvedic products declined to participate in the epidemiologic investigation. Most products submitted for testing had handwritten labels and were not identified by a lot or batch number from the supplier. Some products with similar or identical names had dissimilar test results. For this reason, a list of the products tested by name and their test results is of limited value as a predictor of risk.

In the United States, Ayurvedic medications are regulated as dietary supplements. As such, they are not required to meet the safety and efficacy standards for conventional medicines. For this Iowa cluster, the FDA had limited ability to intervene because the products were reported by the users to be obtained directly from a supplier outside of the USA. Ayurvedic products purchased in the county of residence in Iowa did not demonstrate heavy metal contamination.

REFERENCES

FDA: Use Caution with Ayurvedic Products. October, 2008
www.fda.gov/downloads/ForConsumers/ConsumerUpdates/ucm050819.pdf
Barnes PM, Bloom B, Nahin R. *CDC National Health Statistics Report #12*. Complementary and Alternative Medicine Use Among Adults and Children: United States, 2007. December 2008.
NCCAM Ayurvedic Medicine – an Introduction. Accessed May 2012 at http://nccam.nih.gov/sites/nccam.nih.gov/files/D287_BKG.pdf.

ACKNOWLEDGEMENTS

The author would like to thank the following people for their assistance during this investigation and report:
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Michael Wichman, Ph.D., Donald Simmons, Ph.D., and Steve Bernholtz, ICP/MS analyst, State Hygienic Laboratory at the University of Iowa.
Robert Walker, M.S., Iowa Department of Public Health.

FOR ADDITIONAL INFORMATION PLEASE CONTACT:

Kathy Leinenkugel
Iowa Department of Public Health, Environmental Health Division
kathy.leinenkugel@idph.iowa.gov or 515-281-4930

Poster of 2011 Ayurvedic Cluster in Iowa
IDPH ABLES web page

2021 Ayurvedic Investigation: Older woman with history of exposure in 2011

BLL 2021: 48 mcg/dL

- highest BLL in 2011 was 17 mcg/dL
- BLLs 4-11 mcg/dL from 2012 -2019

2021 products purchased through internet, made in India, distributed by business in Nevada

Pb content: 12,200 mg/kg
(12,200,000 ppb)

Compare to EPA lead in water alert level of 15 ppb

When should adults be tested?

Adults should consider getting tested for lead at work **or** by their personal medical provider if they:

- Work with lead
- OSHA requires some employers to provide "medical monitoring"
- Have a hobby that exposes them to lead
- Do renovation, repair or painting on a home built before 1978
- Recently moved to the US from a foreign country
- Use foods, spices, cosmetics, etc. from other countries with known lead risk
- Use Ayurvedic or non-traditional medicine products (teas, powders, salves or lotions) especially those not made in the US
- Have a child or other household member with an EBL
- Have medical signs or symptoms that could be from lead exposure

Some states recommend screening for risk and testing pregnant women

http://idph.iowa.gov/Environmental-Health-Services/Occupational-Health-and-Safety-Surveillance/Adult-Blood-Lead-Epidemiology

Questions

- **Kathy Leinenkugel, ABLES Manager**
  - 515-380-0331
  - Kathy.Leinenkugel@idph.iowa.gov
  - idph.iowa.gov
  -

Online Information & Resources

Childhood Lead: idph.iowa.gov/Environmental-Health-Services/Childhood-Lead-Poisoning-Prevention

Adult Lead: idph.iowa.gov/Environmental-Health-Services/Occupational-Health-and-Safety-Surveillance/Adult-Blood-Lead-Epidemiology

Lead Data: idph.iowa.gov/Environmental-Health-Services/Environmental-Public-Health-Tracking

DISCUSSION SECTION

Send your questions for presenters In the chat!

LUNCH BREAK

12:30PM - 1:00PM

Check out all of the resources we have put together!

https://idph.iowa.gov/Environmental-Health-Services/Childhood-Lead-Poisoning-Prevention/resources

It’s Time to Look Upstream:
The Role of Housing in Children’s Health

Kevin Kennedy, MPH CIEC

Environmental Hygienist

Environmental Health Program Director

2015 Winner-
HUD Secretary’s Award
for Healthy Homes

UMKC School of Medicine

KU SCHOOL OF MEDICINE
The University of Kansas

Children’s Mercy KANSAS CITY

Disclosures

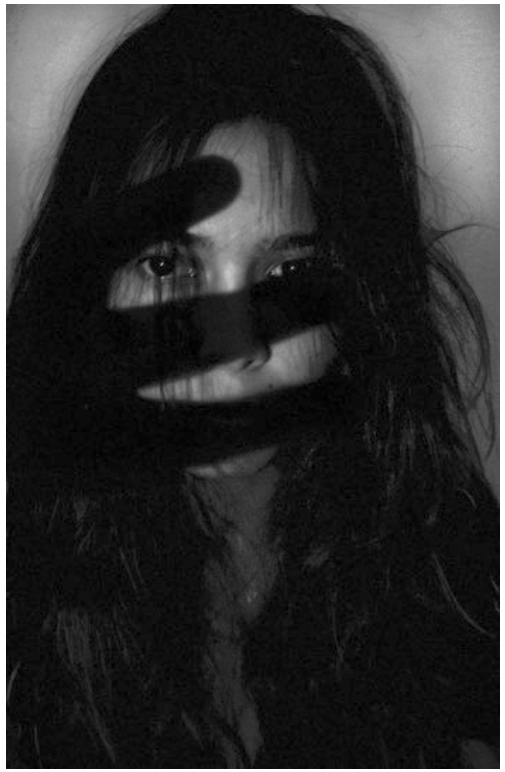
I have no disclosures relevant to this presentation

We will all likely experience chronic health problems in our lifetime

>80% of older adults of one chronic disease

>70% of older adults on Medicare have two

Yet, less than 1% of U.S. health care dollars is spent on prevention to improve overall health



National Council on Aging, 2020

https://www.pexels.com/creative-commons-images/
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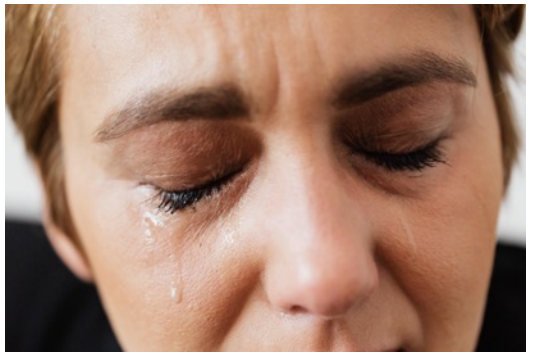
Children's Mercy KANSAS CITY

Where do People Manage Their Health?

- Not in the hospital, not in a clinic, but
- People experience illness in their community
  - in their neighborhoods
  - in their homes



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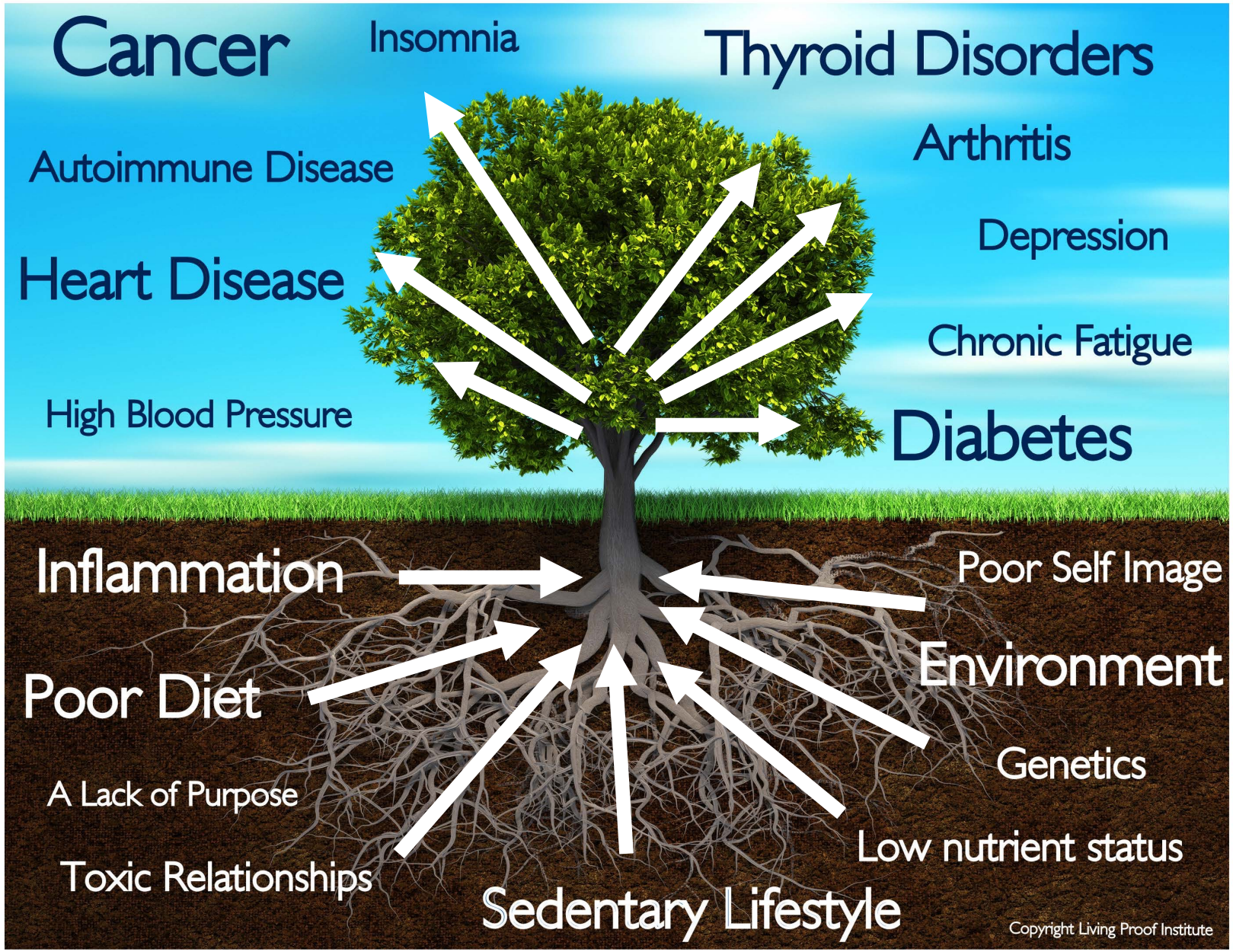
If not addressed

Result in poor health outcomes and difficult times later in life

The roots of chronic disease grow through life



Jeremy Accumulates Risk

Lives in poverty

Lead paint in his bedroom

Home has roaches

Squalid neighborhood

Mom works 2 jobs

Highway runs through neighborhood

Does not have access to fresh produce

Nearest park is 5 miles away

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Little Jeremy ≠ Big Jeremy: The impact is Greater on Children

Per pound of body weight, children:

- Eat more food
- Have a higher metabolism
- Drink more liquid
- Breathe more air
- Have higher respiration rate

≠

Children's behavior patterns make them more susceptible to exposure:

- They crawl and play close to the ground
- More likely to put their hands in their mouths – a lot
- Have more years of life than adults to develop disease
- Natural defenses less developed

Children's Environmental Health, CDC.gov

https://www.pexels.com/creative-commons-images/
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Children's Mercy

Lack of Biodiversity Outside Your Home Means Low Biodiversity Indoors

Robb Dunn, Never Home Alone, © 2018

https://www.pexels.com/creative-commons-images/ Pexel photos are free for use

As biodiversity has declined over the last 50 years, prevalence of inflammatory diseases have increased

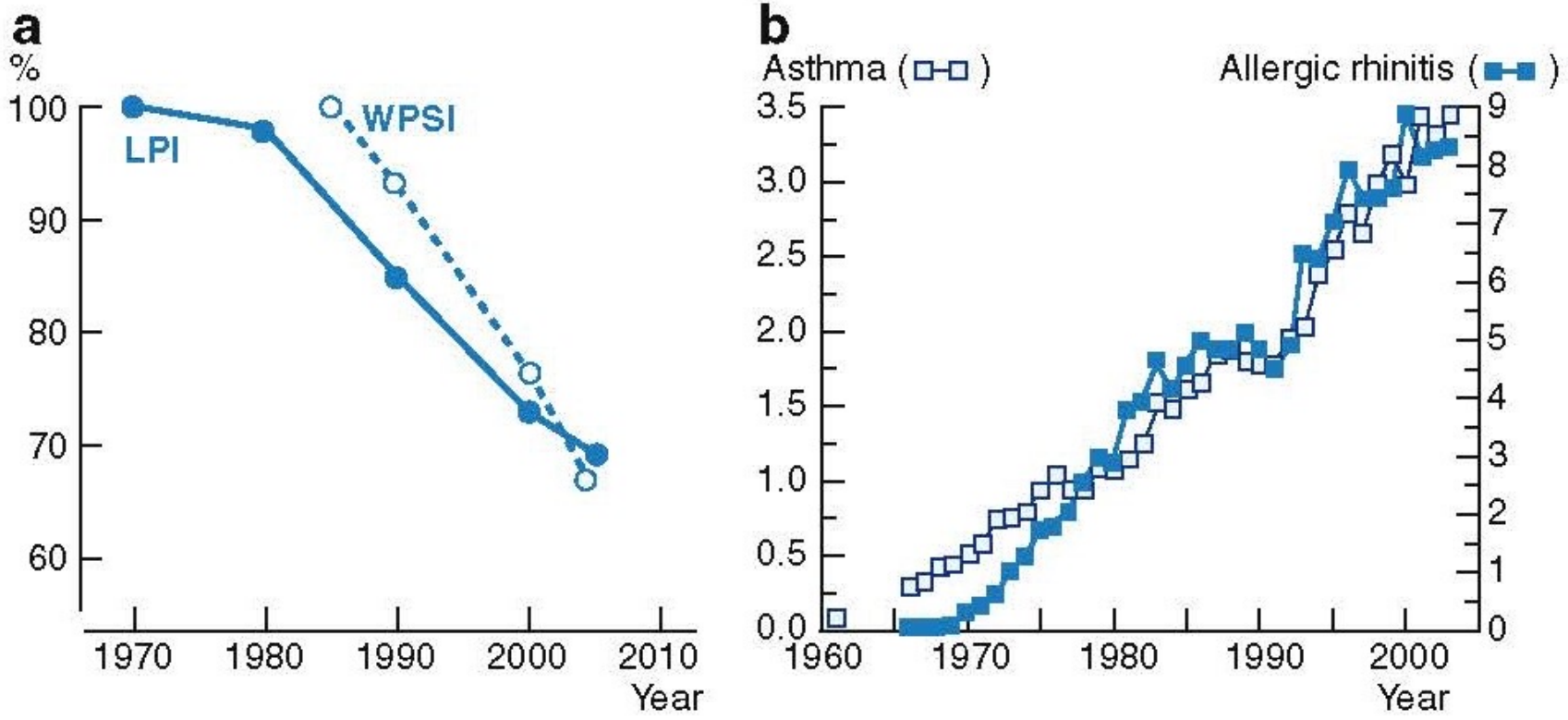
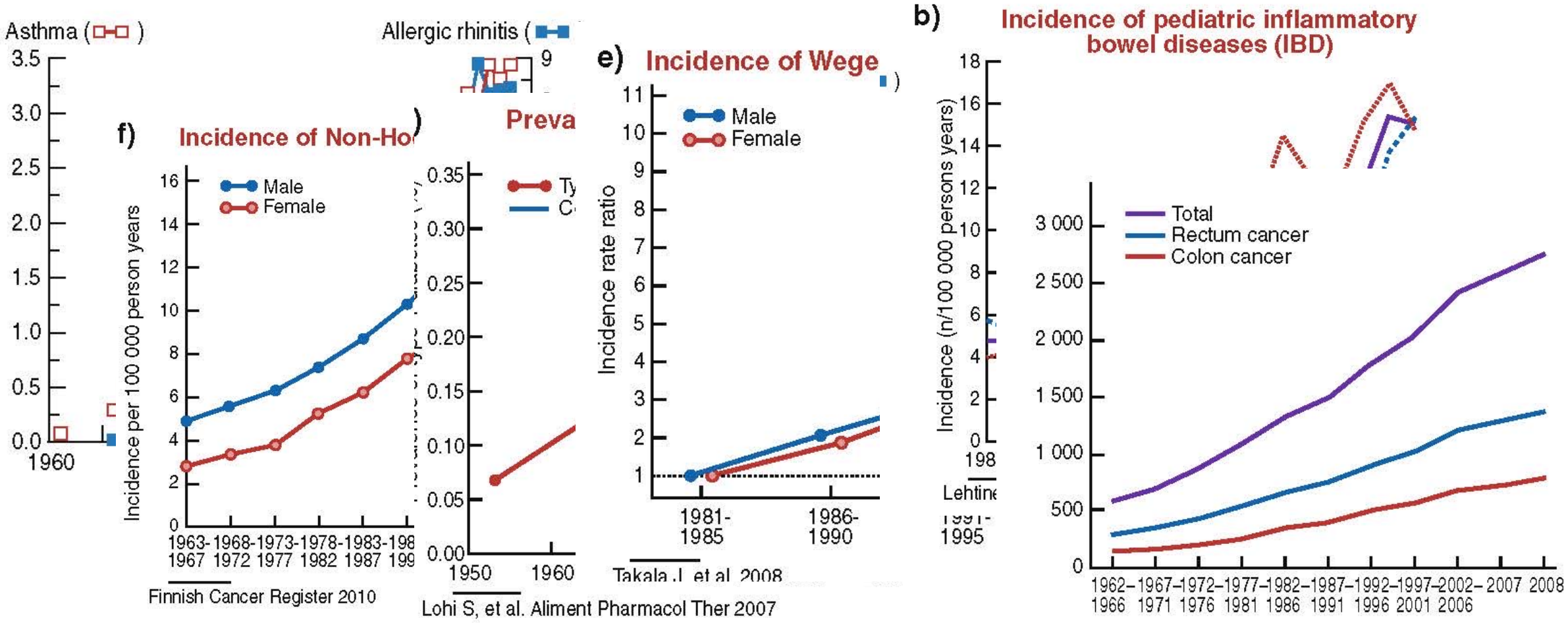


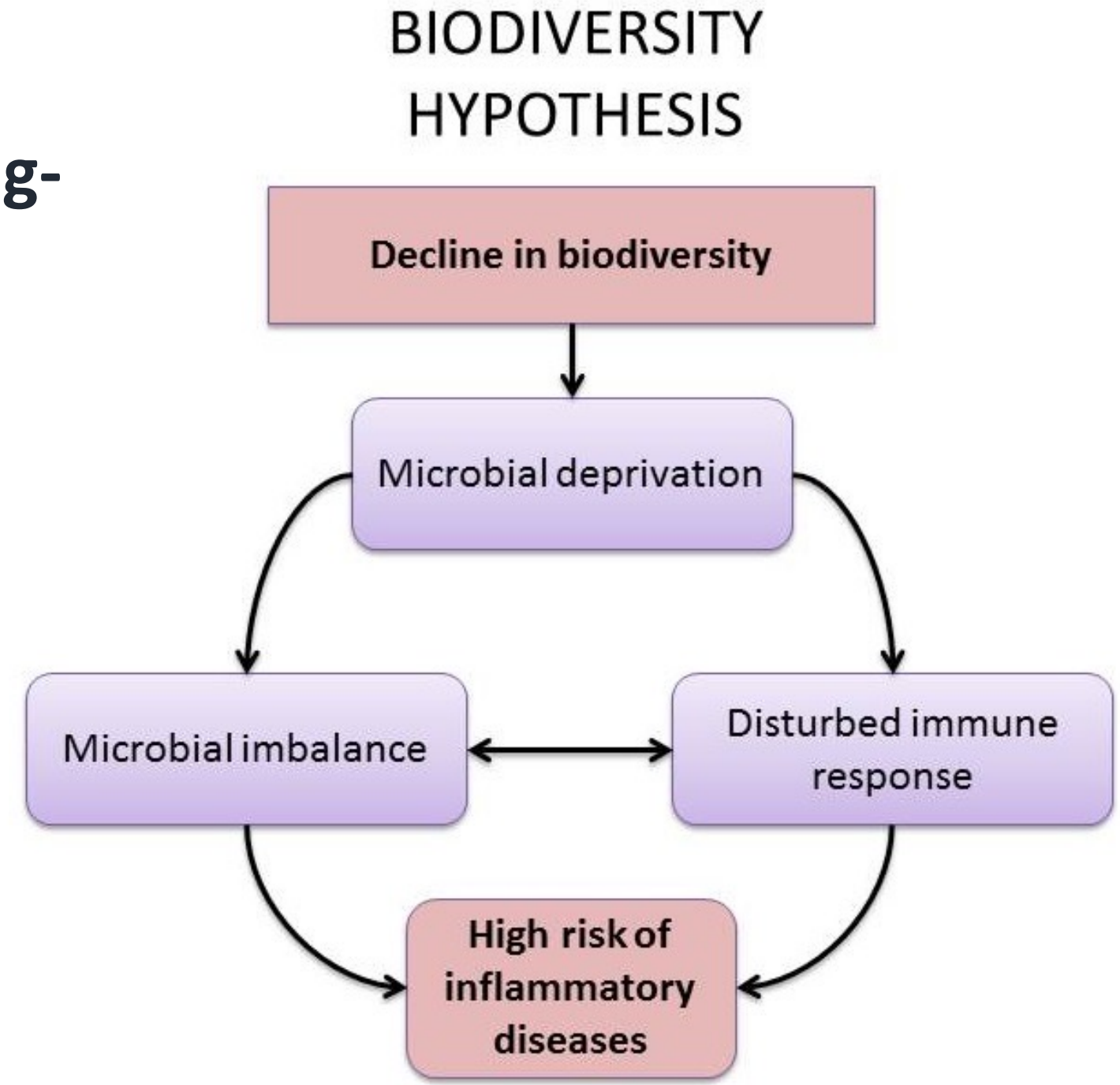
Figure 1 Two global megatrends in biodiversity and public health. (**a**) Declining biodiversity (percentage change) since 1970 as measured by two indices. WPSI=Waterbird Population Status Index; LPI=Living Planet Index [14]. (**b**) Increasing trends in the prevalence of inflammatory civilization diseases, asthma and allergic rhinitis among military conscripts in 1966-2003 [165] as an example (modified from ref. [14]).

Source- Haahtela et al. World Allergy Organization Journal 2013

A wide array of chronic diseases have exploded in prevalence over the last 40 years

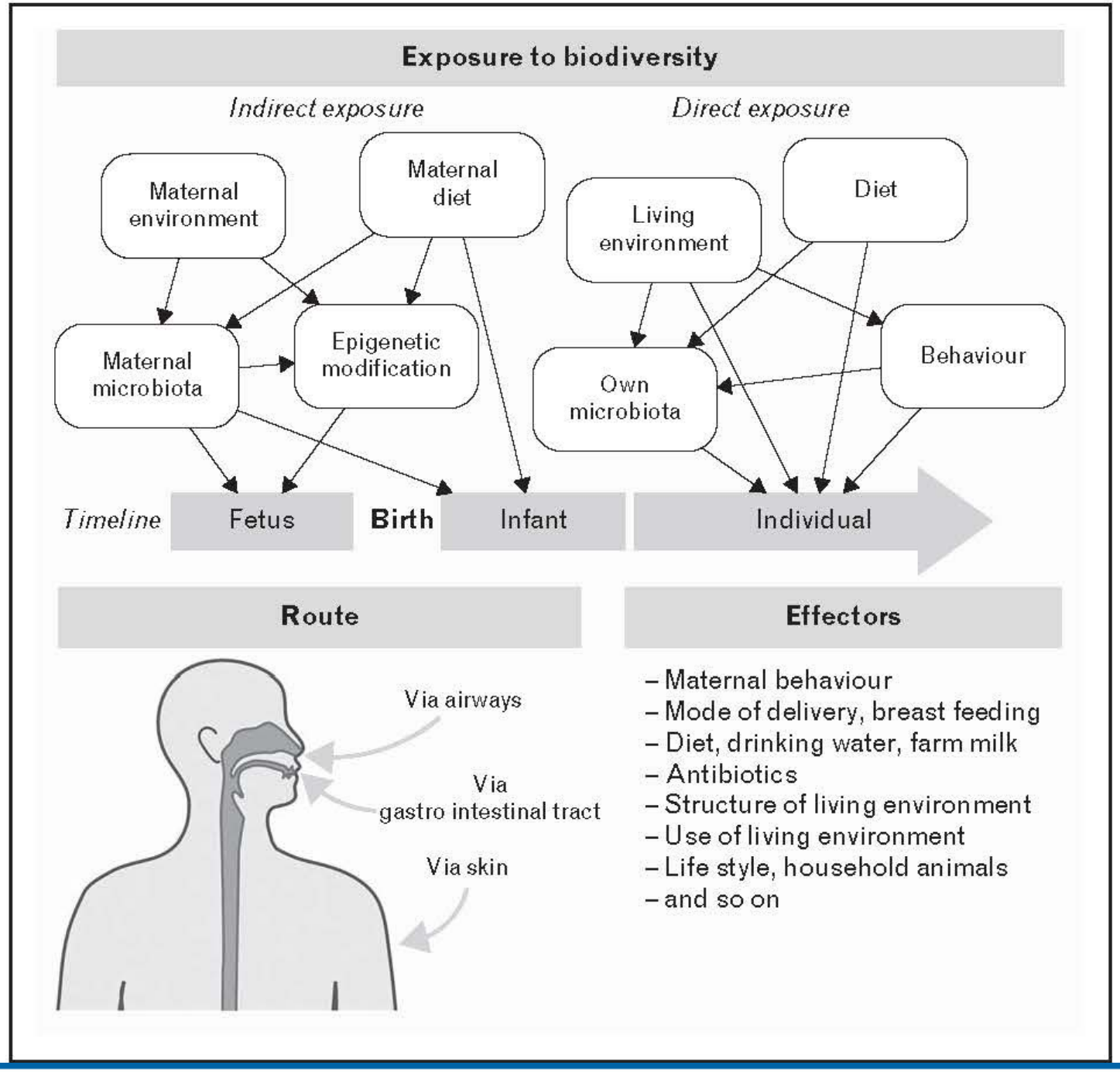


There is a critical relationship for our long-term health between exposure to less biodiversity and risk of inflammatory diseases



From- Haahtela et al. World Allergy Organization Journal 2013

There appears to be a direct relationship between exposure to biodiversity loss and risk of inflammatory diseases



From- Ruokolainen et al. 2011

If you are under 40, you are part of the indoor generation, you grew up indoors.

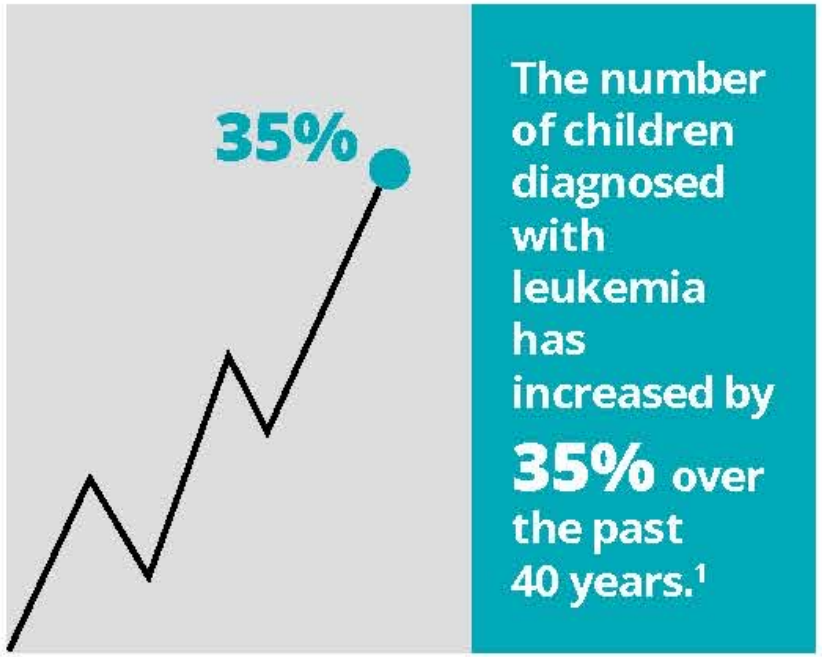
90% of time spent indoors* means 9/10 breaths inhaled were of indoor air

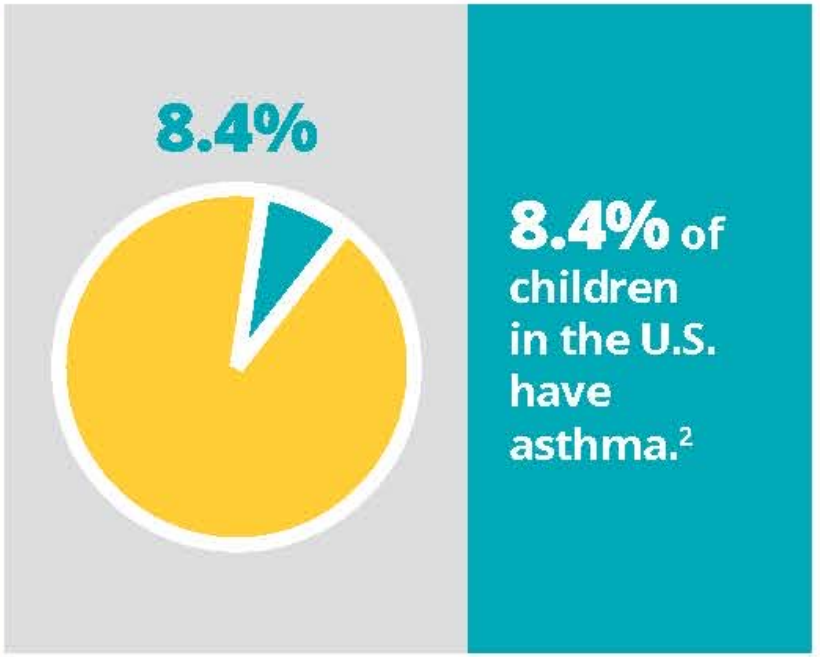
328 / 365 days each year spent indoors

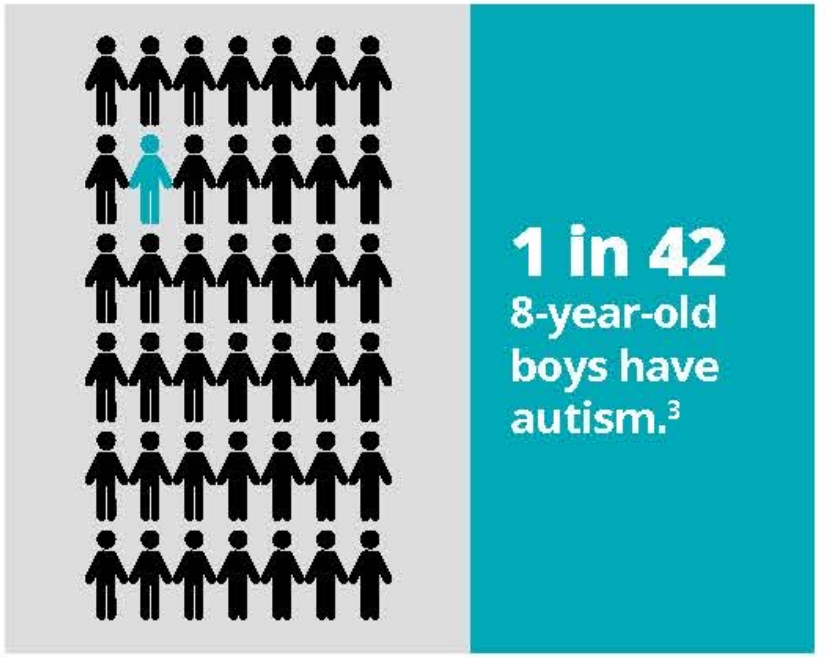
Image from Velux https://www.youtube.com/watch?v=ygHU0mQGuJU

* Klepeis, NE, et.al, 2001, NHAPS

Children in US are at high risk of chronic disease, likely in part because of exposure to environmental toxicants







U.S. Environmental Protection Agency. (2017). NIEHS/EPA Children's Environmental Health and Disease Prevention Research Centers Impact Report: Protecting children's health where they live, learn, and play. EPA Publication No. EPA/600/R-17/407.

60% of respiratory infections in children worldwide are related to environmental conditions

Children's Mercy

>60 million people have allergies and/or asthma in US

9% of the US Population
has Asthma- 1 in 11
56% Atopic (Allergic)

~10% of the US population
have Environmental Allergies

From: www.aafa.org

~10% Allergic
To Mold

~10% Allergic
To Pollen

~10% Allergic
to Dust Mites

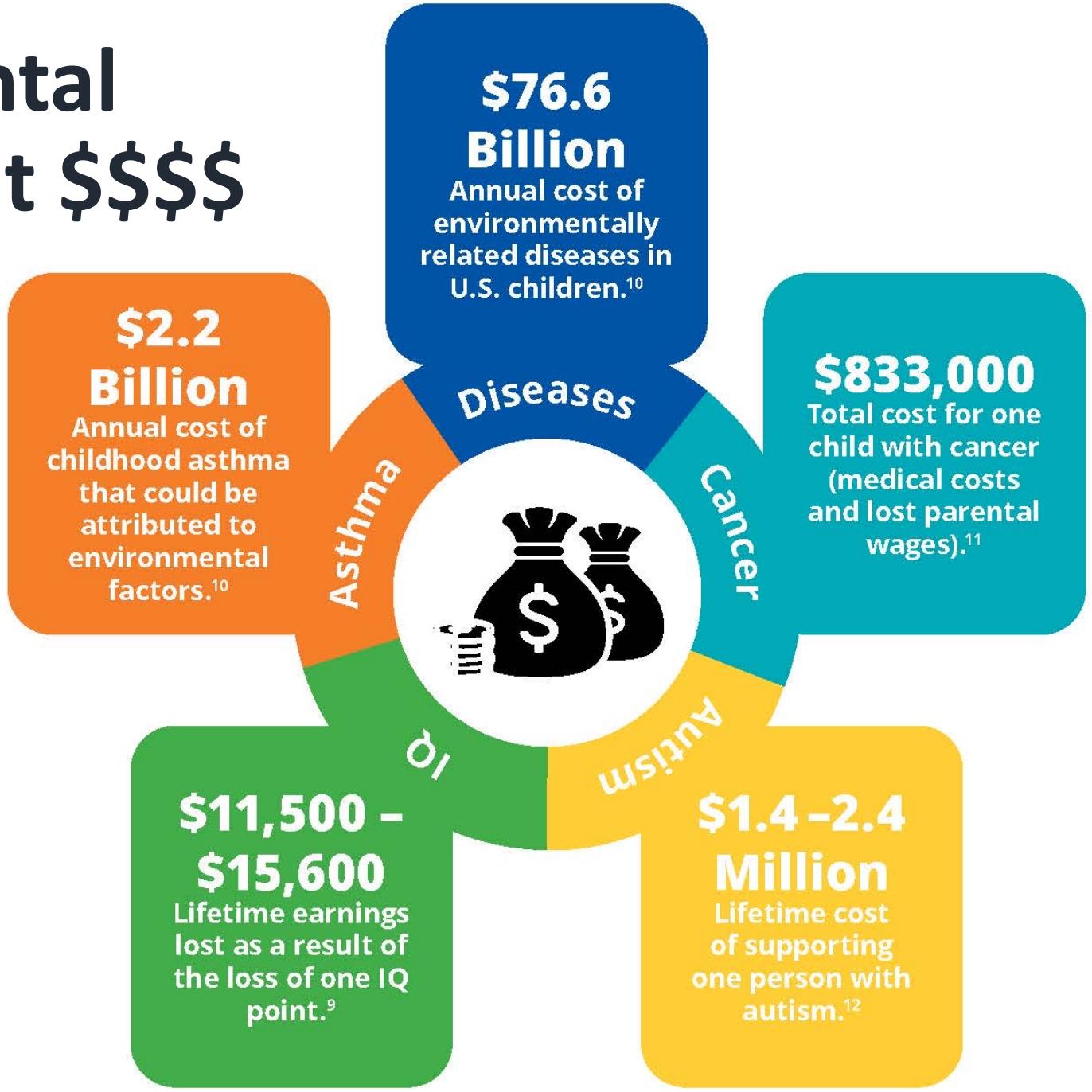
~10% Allergic
To Pets

~25% of
Asthmatics
Have a smoker
in the home

~75% of urban homes
have mouse allergen
in the dust

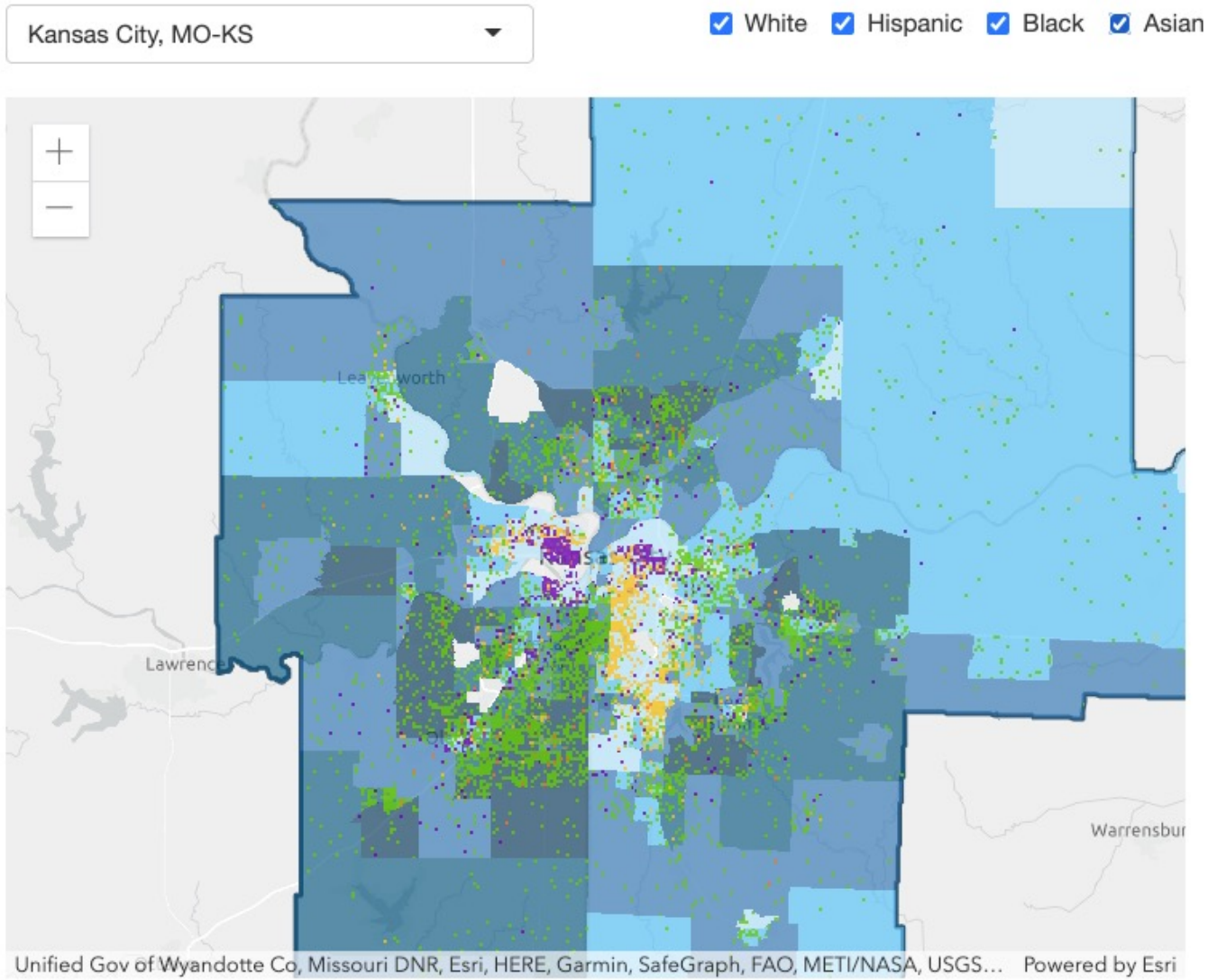
~25 - 60% of asthmatics in
urban areas allergic to roaches

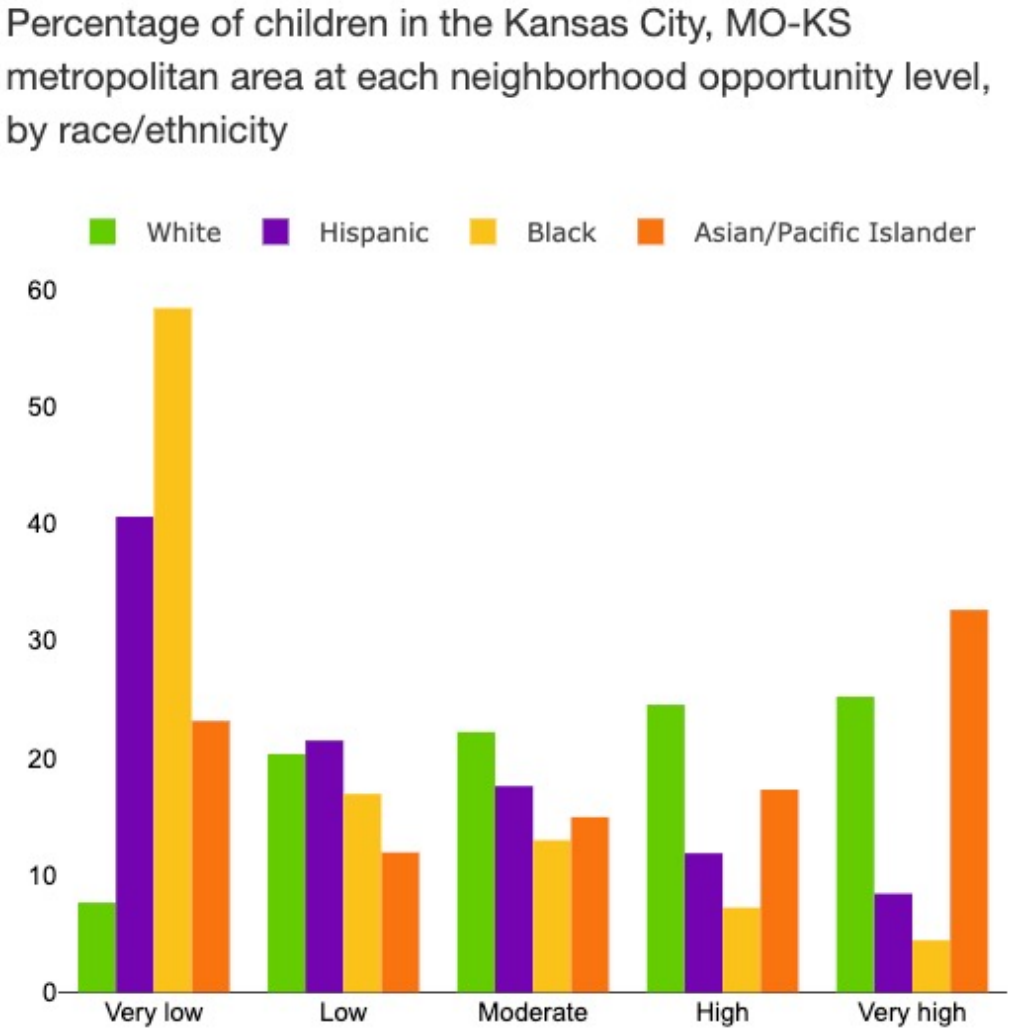
Children's environmental health has a significant $$$$ impact on US society



U.S. Environmental Protection Agency. (2017). NIEHS/EPA Children's Environmental Health and Disease Prevention Research Centers Impact Report: Protecting children's health where they live, learn, and play. EPA Publication No. EPA/600/R-17/407.

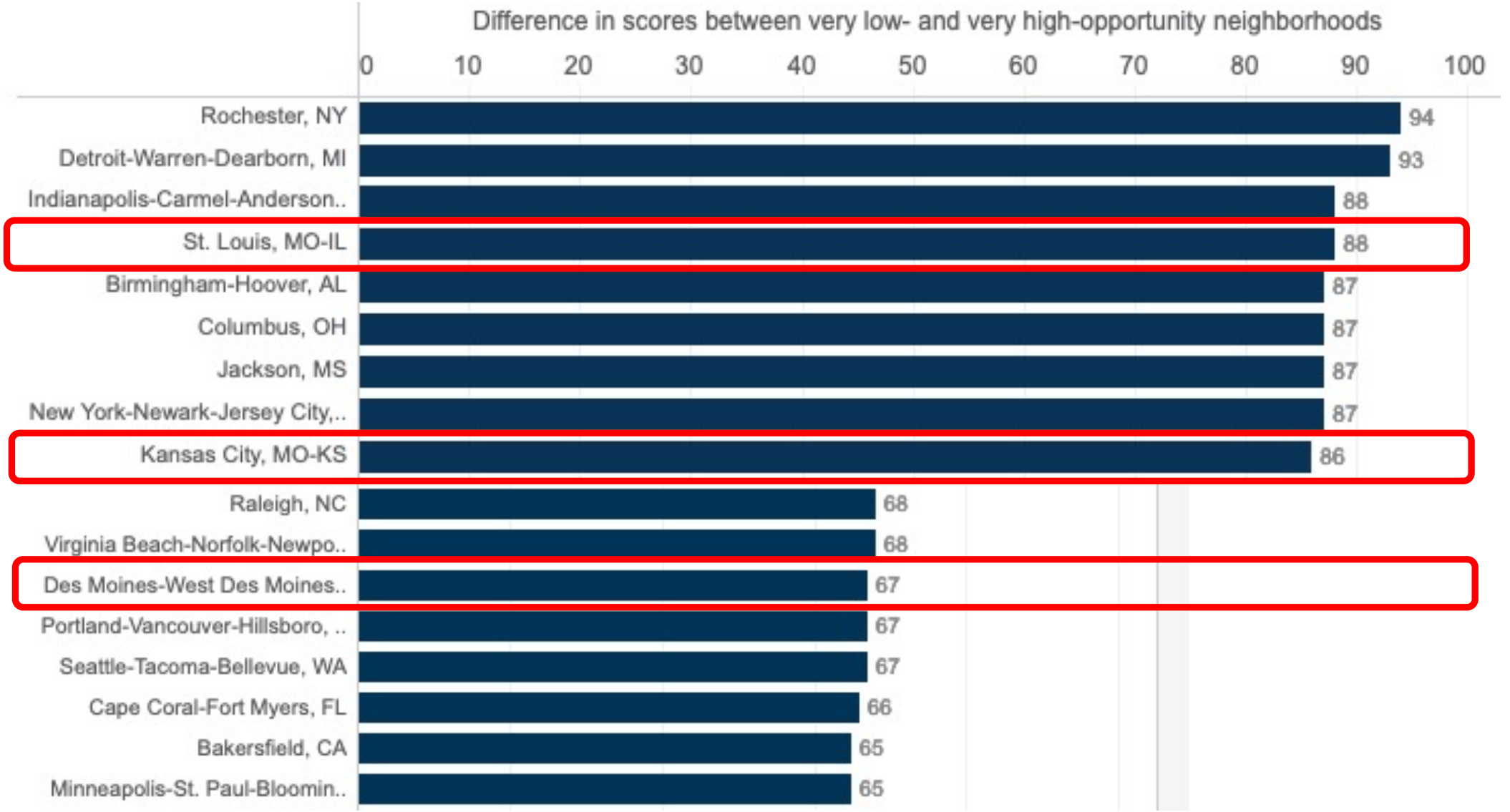
The Child Opportunity Index for Kansas City, like most large cities in the US, shows wide gaps by race in 3 opportunity domains: education, health and environment, and social and economic level





Institute for Child, Youth and Family Policy at the Heller School for Social Policy and Management at Brandeis University

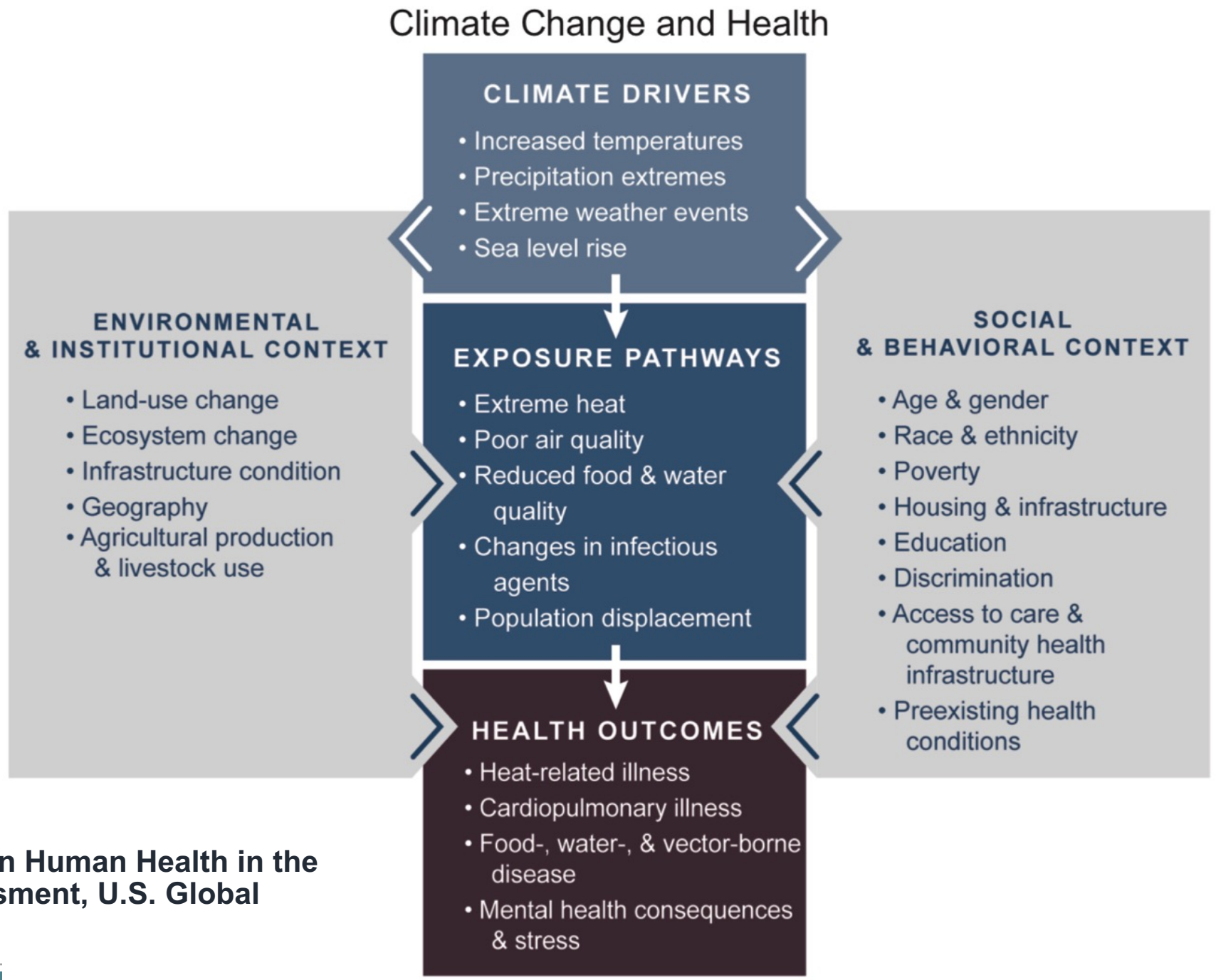
The Child Opportunity Gap in most major American cities shows dramatic differences in opportunity for access to high quality schools, access to parks and playgrounds, clean air, access to healthy food, health care and safe housing



http://diversitydatakids.org/research-library/data-visualization/child-opportunity-gap

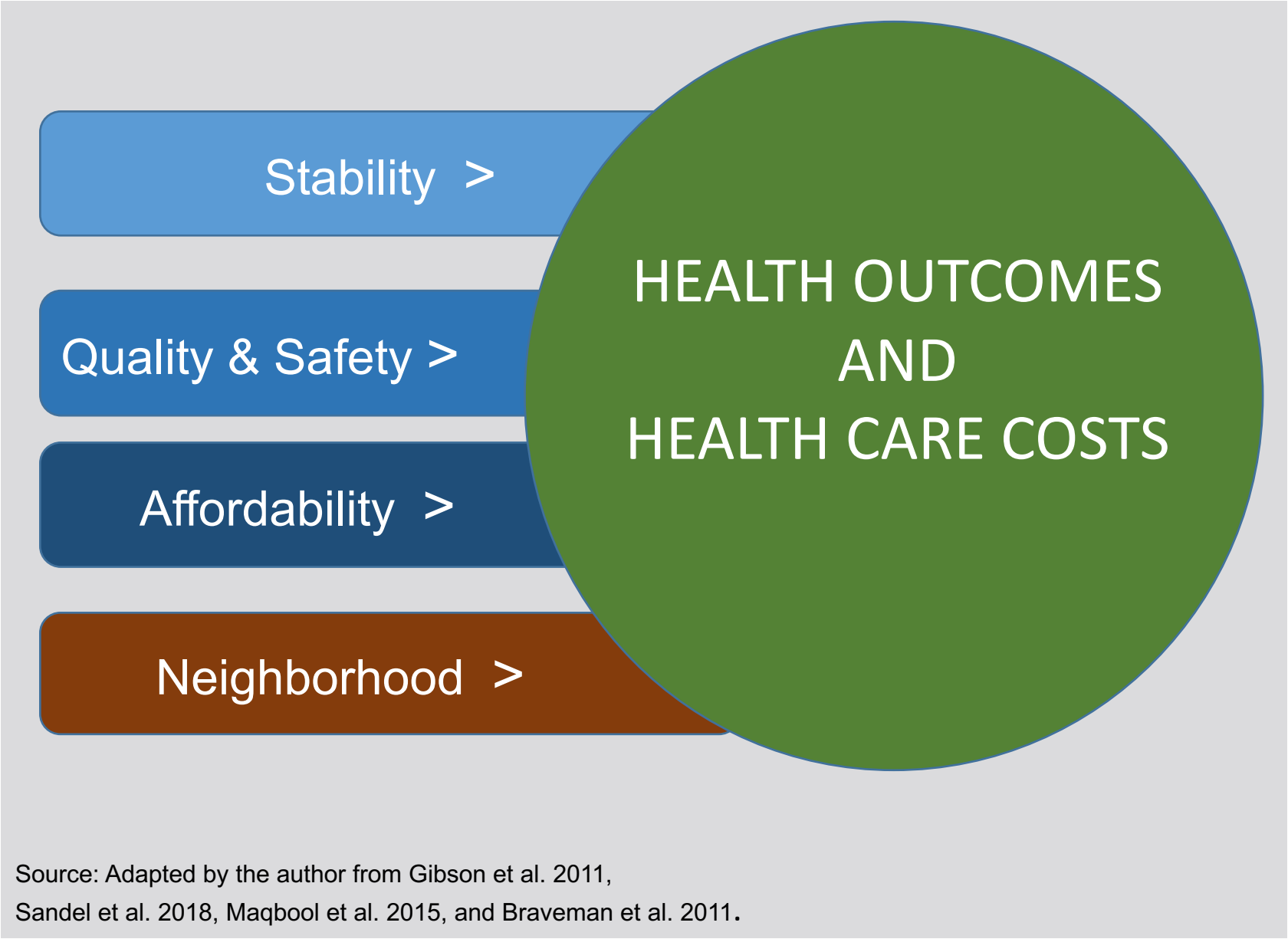
Climate change will force humans to create mitigating strategies to minimize environmental exposure

Improving housing will be a critical strategy



The Impacts of Climate Change on Human Health in the United States: A Scientific Assessment, U.S. Global Change Research Program, 2016

Four important pathways that connect health and the built environment



Source: Adapted by the author from Gibson et al. 2011, Sandel et al. 2018, Maqbool et al. 2015, and Braveman et al. 2011.

Housing and Health: An Overview of the Literature, Culture of Health, Health Affairs, Health Policy Brief, 2018

Children's Mercy

What does the latest housing data tell us? (AHS 2019)

Demographics

- 124.1 million homes
- 36.1 million homes with children
- 37% rental
- 52.7% built pre-1980
- 21.6% basement under all of house*

Housing Problems

- 17.3% exterior physical problems
- 9.5% exterior water leakage
- 3% mold in the last 12 mo.
- 11.9% signs of rodents last 12 months
- 11.3% signs of roaches last 12 months

The American Housing Survey

American Housing Survey – Census Bureau: https://www.census.gov/programs-surveys/ahs.html

American Housing Survey Details-2019

Housing Quality

by Age

32% built before 1970 (Iowa 52%)

17% built before 1950 (Iowa 26%)

2019 National - Housing Quality - All Occupied Units

Characteristics		Year Built											
		Total	2018 to 2019	2016 to 2017	2010 to 2015	2000 to 2009	1990 to 1999	1980 to 1989	1970 to 1979	1960 to 1969	o 1959	o 1949	< 1939
		Estimate (all values X 1000)											
Total	%	124,135	986	2,474	5,459	17,348	15,979	16,435	17,967	13,190	12,835	5,566	15,896
Housing Adequacy[1]													
Severely inadequate[2]	1.17%	1,458	.	S	S	89	107	131	203	166	188	137	395
Plumbing	0.3%	405	.	S	S	S	42	31	S	43	S	S	144
Heating	0.6%	768	.	S	S	65	53	69	124	101	99	83	166
Electric	0.1%	116	.	S	S	S	S	S	S	S	S	S	S
Wiring		S	.	.	.	.	.	S	S	S	S	S	S
Upkeep	0.2%	250	.	.	S	S	S	32	59	S	S	S	71
Moderately inadequate[2]	3.6%	4,500	S	S	132	266	398	577	669	525	563	318	988
Upkeep		2,415	.	.	47	83	198	307	360	253	335	168	664
Other		2,211	S	S	87	194	217	287	330	280	242	163	345
Adequate		118,177	963	2,413	5,303	16,992	15,475	15,728	17,095	12,499	12,084	5,111	14,514
Selected Deficiencies[2]		**124,135**											
Percent of total		**0.314**	**0.683**	**0.0041**	**0.0123**	**0.0736**	**0.1091**	**0.1147**	**0.1437**	**0.1117**	**0.1220**	**0.0617**	**0.2444**
Signs of mice or rats in last 12 mo.	0.119	14,787	S	61	182	1,088	1,613	1,696	2,125	1,651	1,804	912	3,614
Percent of total		**0.407**	**0.537**	**0.0116**	**0.0331**	**0.0987**	**0.1162**	**0.1470**	**0.1580**	**0.1240**	**0.1114**	**0.0455**	**0.0981**
Signs of cockroaches in last 12 mo	11.3%	13,994	S	172	489	1,459	1,718	2,174	2,337	1,834	1,647	673	1,450
Holes in floors	1.2%	1,518	S	S	44	82	146	248	281	167	143	100	299
Open cracks or holes (interior)	5.4%	6,761	S	82	126	459	615	881	1,064	732	840	414	1,520
Broken plaster or peeling paint (inter	2.1%	2,627	S	S	38	117	194	264	380	313	429	198	691
No electrical wiring	0.04%	52	.	.	.	S	S	S	.	S	.	S	S
Exposed wiring	2.7%	3,378	S	S	116	448	365	353	448	391	383	232	564
Rooms without electric outlets	1.9%	2,376	S	S	80	283	261	307	359	296	226	161	354

https://www.census.gov/programs-surveys/ahs/data/

American Housing Survey Details-2019

Housing Quality

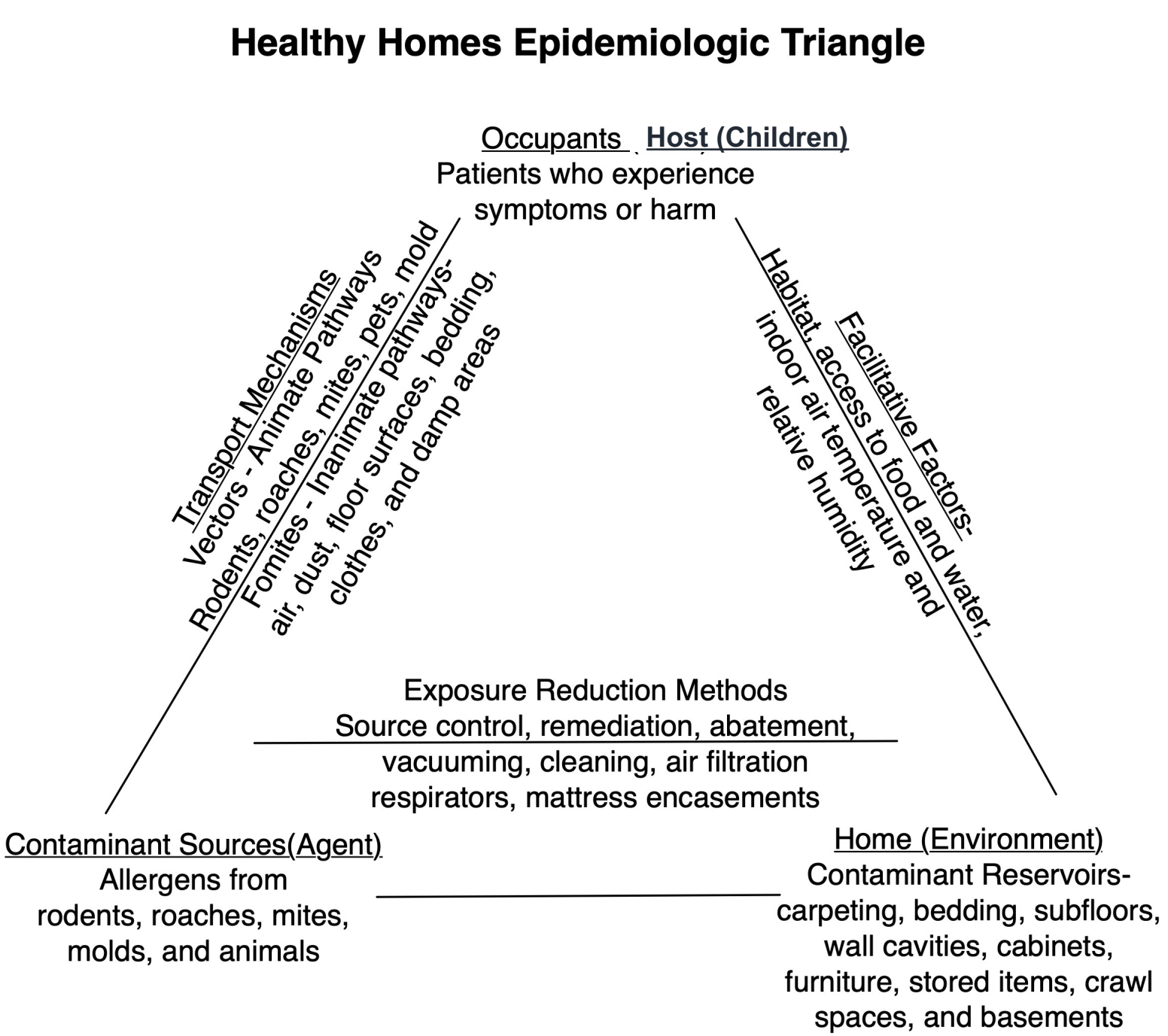
by Age

https://www.census.gov/programs-surveys/ahs/data/

2019 National - Housing Quality - All Occupied Units

Characteristics		Year Built											
		Total	2018 to 2019	2016 to 2017	2010 to 2015	2000 to 2009	1990 to 1999	1980 to 1989	1970 to 1979	1960 to 1969	o 1959	o 1949	< 1939
		Estimate (all values X 1000)											
Heating Problems													
Had heating equip. last winter:		114,553	761	2,237	4,749	16,084	14,863	15,105	16,519	12,396	12,067	5,155	14,619
Uncomfortably cold for >24 hours	6.05%	7,513	S	82	122	644	742	853	1,137	947	925	480	1,547
Equipment breakdowns	2.33%	2,892	S	S	41	282	269	303	420	392	362	236	554
Inadequate heating capacity	0.69%	858	S	S	S	47	47	129	137	89	99	63	220
Inadequate insulation	0.75%	930	S	.	S	44	70	111	80	107	143	82	276
Cost of heating	0.43%	530	.	S	S	S	40	63	148	51	45	S	130
Water Leakage During Last 12 Mo													
No leakage from inside structure		114,693	953	2,362	5,240	16,402	14,818	14,963	16,468	12,134	11,772	5,169	14,412
With leakage from inside structure[2]	0.076	9,442	S	112	218	946	1,161	1,473	1,498	1,056	1,063	397	1,485
Fixtures backed up or overflowed	1.75%	2,178	S	S	36	205	257	325	339	281	288	90	340
Pipes leaked	3.21%	3,988	S	63	80	337	474	515	675	464	455	189	719
Broken water heater	0.70%	875	.	.	S	113	119	193	129	81	101	S	114
Other or unknown (includes not rep	2.32%	2,883	S	S	93	329	357	517	419	290	293	136	395
No leakage from outside structure		112,399	942	2,371	5,197	16,429	14,745	15,018	16,397	11,810	11,328	4,879	13,283
With leakage from outside structure[2]	0.095	11,736	44	103	261	919	1,235	1,418	1,569	1,380	1,507	687	2,613
Roof	4.44%	5,511	S	37	118	526	665	764	669	635	711	357	1,017
Basement	2.78%	3,456	S	S	54	110	186	230	416	448	608	211	1,181
Walls, closed windows, or doors	1.65%	2,052	S	S	69	235	203	282	330	186	160	91	438
Mold													
Housing units with mold in last 12 m	2.95%	3,664	S	S	60	244	380	454	610	467	537	205	681
Kitchen	0.52%	647	.	S	S	49	92	100	112	74	78	37	100
Bathroom(s)	1.33%	1,647	.	S	S	101	143	207	276	258	262	85	280
Bedroom(s)	0.72%	892	.	S	S	57	102	121	165	126	145	46	111
Living room	0.38%	473	.	.	S	S	50	73	87	58	70	S	74
Basement	0.54%	675	.	S	S	S	43	30	90	77	111	41	244
Other room	0.43%	532	S	S	S	S	69	90	101	63	56	33	55

An epidemiologic triangle provides a good representation of how exposure to home hazards might result in health impacts



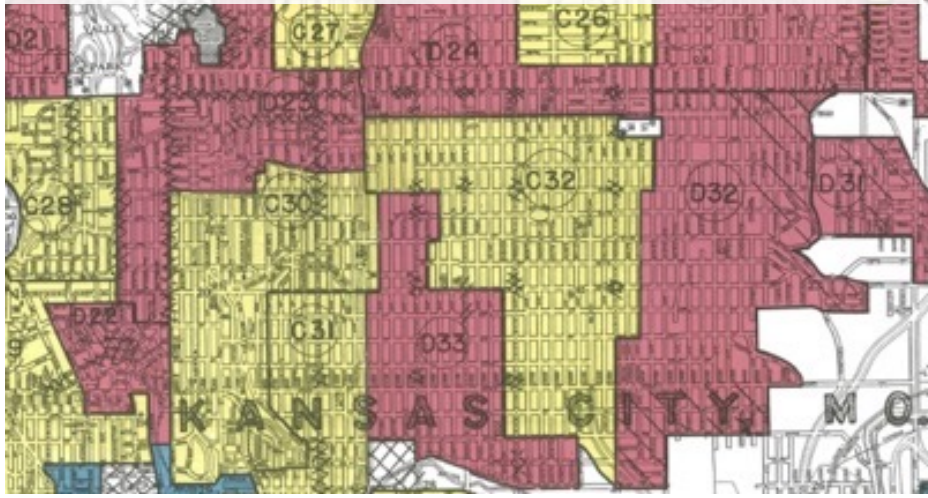
Kennedy, et. al., The Role of Home Environments in Allergic Disease, Clinical Reviews in Allergy and Immunology, 2019

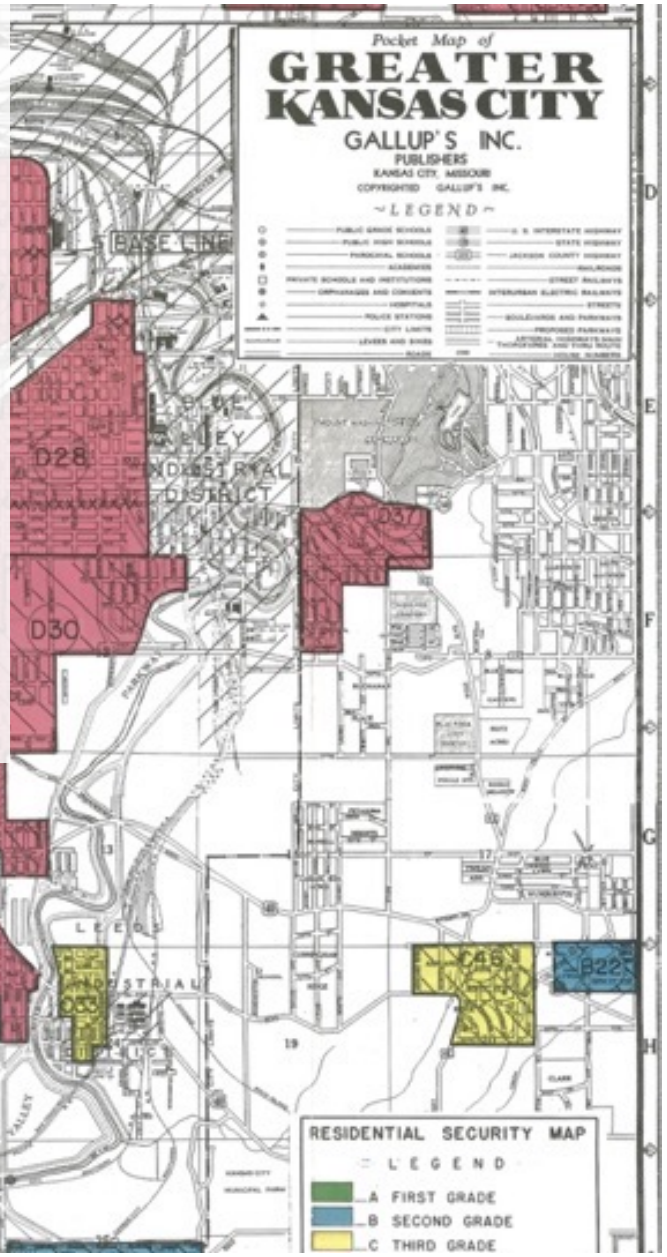
If we're honest about our history, we need to recognize that most health disparities are partly an environmental justice issue

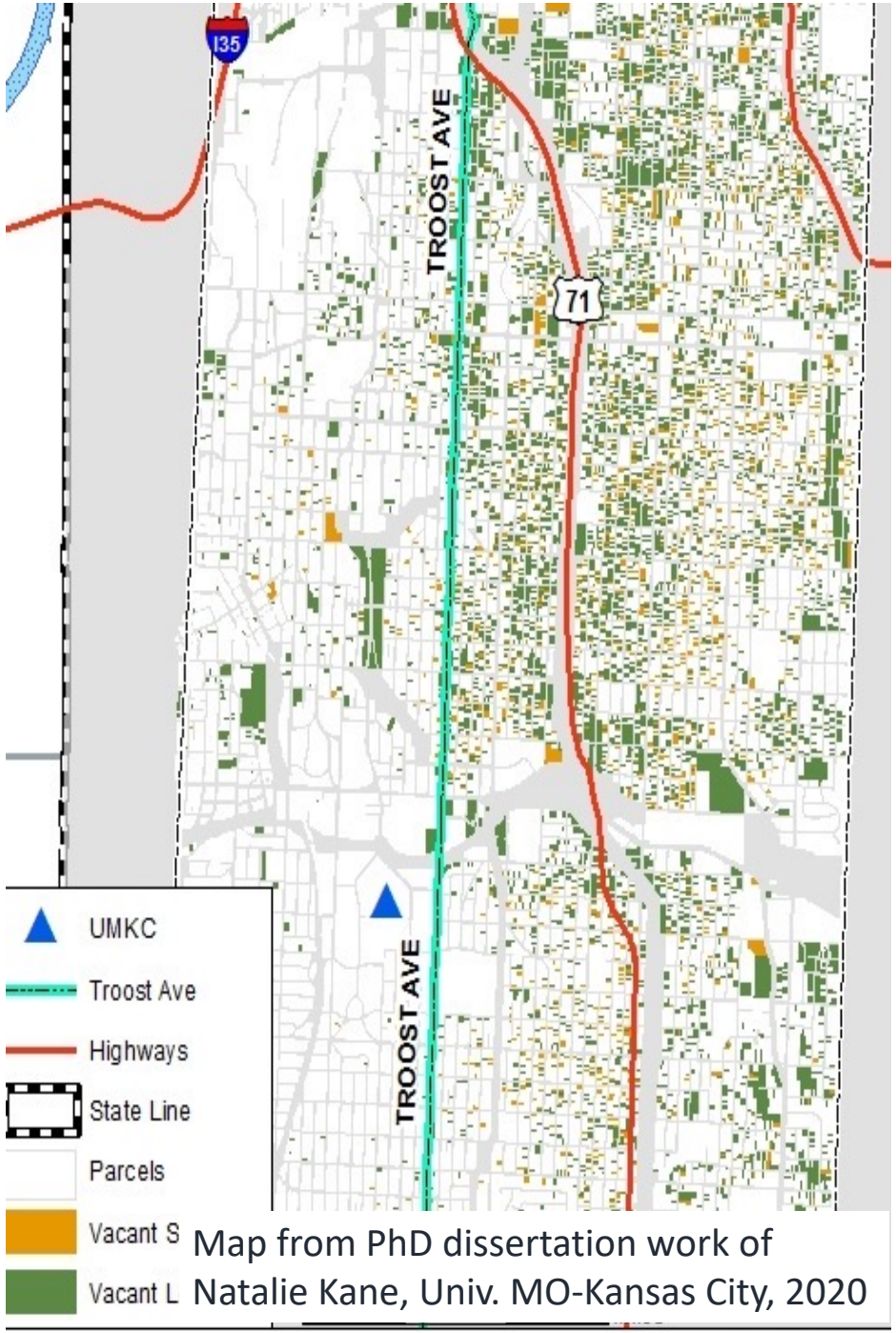
- Persuasive evidence has shown disparate disease rates in the underserved for decades
- Some factors affecting the disparity include:
  - Economic security
  - Health care and insurance access
  - Resources for personal and family care
  - Perceived discrimination
  - Environmental conditions

Sampselle, Carolyn, *Nickeled and Dimed in America: Underserved, Understudied, and Underestimated, Fam. Community Health,* 2007, V30.

Kansas City has a long history of racial injustice and housing inequality that has created large areas today of neighborhoods in the urban core with as much as 40% vacant lots.







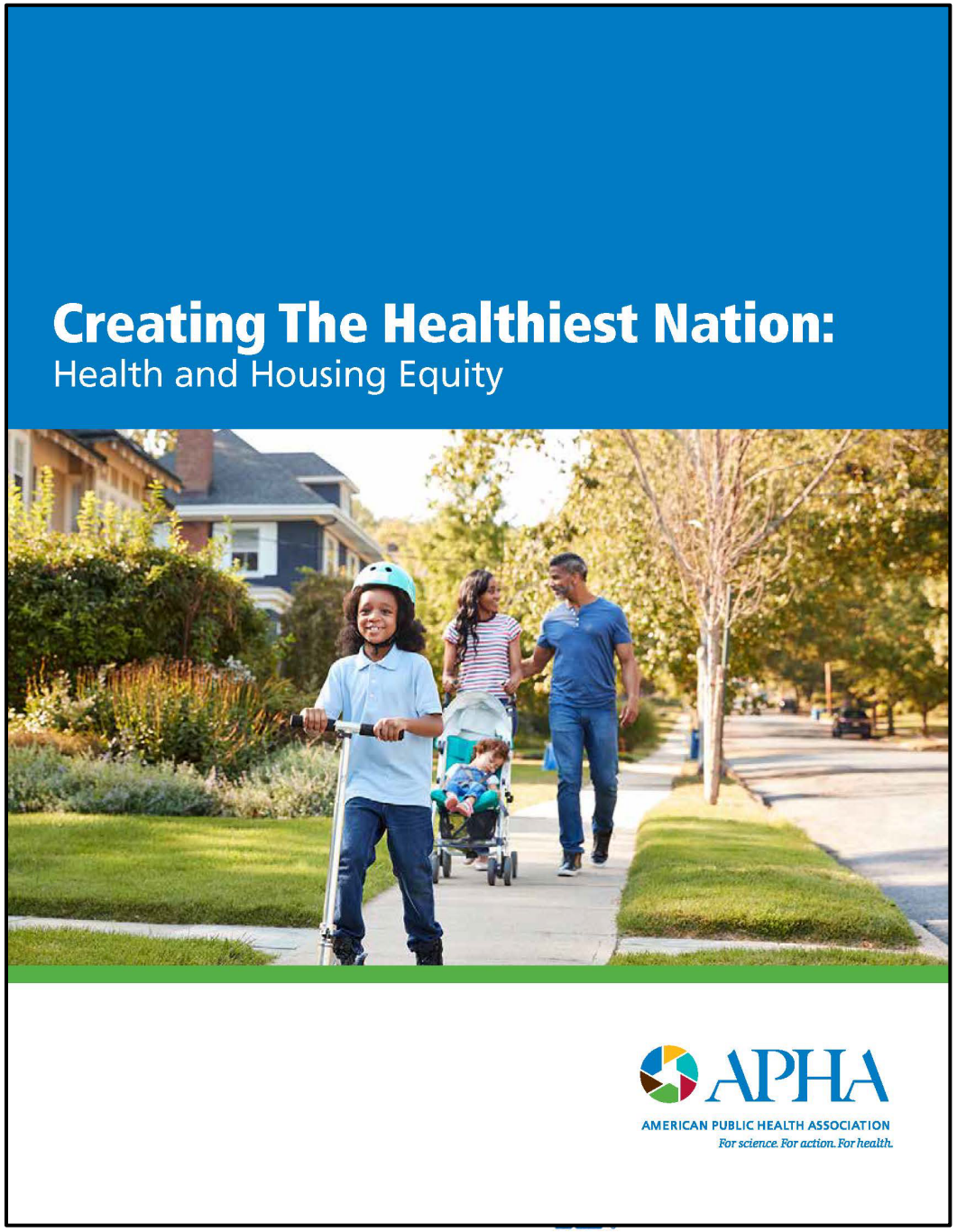
https://dsl.richmond.edu/panorama/redlining/#loc=13/39.096/-94.631&city=greater-kansas-city-mo&text=downloads

KC HEALTHCORE
COMMUNITY-ORGANIZED RESOURCE EXCHANGE

Map from PhD dissertation work of Natalie Kane, Univ. MO-Kansas City, 2020

New APHA Report on Health and Housing Equity

- Provides an overview of the direct relationship between housing equity and its impact on health.
- Offers specific guidance for the role of public health agencies in facilitating collaboration with other community organizations to promote health equity
- Identifies some solutions for improving health equity through housing



There are many well-known health effects associated with poor housing conditions today

- Respiratory infections
- Asthma
- Injuries and burns
- Reactions to extreme cold and extreme heat
- Irritations, allergy, rashes
- Poisonings, asphyxiation
- Neurotoxic exposures
- Cancer
- Death

National Center for Healthy Housing (NCHH)

Children's Mercy

There is clear evidence that environmental exposure leads to Asthma development and exacerbation

2015- Sufficient evidence of a causal relationship:

- between exposure to dust mite allergen and exacerbation of asthma in children sensitized to dust mites.
- between cat allergen exposure and exacerbation of asthma in individuals specifically sensitized to cats.
- between cockroach allergen exposure and exacerbations of asthma in individuals specifically sensitized to cockroaches, especially adults.

2015- Sufficient evidence of a causal association:

- causal association between dampness or dampness-related agents and exacerbation of asthma in children
- between outdoor culturable fungal exposure and exacerbation in asthmatics sensitized to fungi

Kanchongkittiphon, et.al., Indoor Environmental Exposures and Exacerbation of Asthma: An Update to the 2000 Review by the Institute of Medicine. EHP, Vol. 123, #1, 2015.

Children's Mercy

There is clear evidence that environmental exposure leads to Asthma development and exacerbation

2015- Sufficient evidence of an association:

- between chronic environmental tobacco smoke exposure and exacerbations of asthma in preschool-age children.
- indoor bacterial endotoxin exposure and the exacerbation of asthma.
- between dog allergen exposure and exacerbations of asthma in children sensitized to dogs
- between brief high-level exposures to nitrogen dioxide and increased airway responses to nonspecific chemical irritants and inhaled allergens among asthmatic subjects.

Kanchongkittiphon, et.al., Indoor Environmental Exposures and Exacerbation of Asthma: An Update to the 2000 Review by the Institute of Medicine. EHP, Vol. 123, #1, 2015.

Health Outcome	IOM 2004 conclusion	WHO 2008 conclusion	Mendel (2011)	Additional evidence
Sufficient evidence of a causal relationship	(None)	(None)	(None)	(None)
asthma exacerbation	Sufficient evidence of association	Sufficient evidence of association	Sufficient evidence of association	More studies of strong design (suggestive of causation)
Cough	Sufficient evidence of association	Sufficient evidence of association	Sufficient evidence of association	Many new studies, some of strong design
Wheeze	Sufficient evidence of association	Sufficient evidence of association	Sufficient evidence of association	Many new studies, many of strong design
Upper respiratory tract symptoms	Sufficient evidence of association	Sufficient evidence of association	Sufficient evidence of association	Many new studies, some of strong design
Asthma development	Limited or suggestive evidence of association	**Sufficient evidence of association**	**Sufficient evidence of association**	More studies of strong design
Dyspnea	Limited or suggestive evidence of association	Limited or suggestive evidence of association	Limited or suggestive evidence of association	More studies
Current asthma	Not evaluated	Not evaluated	Sufficient evidence of association	Initial evaluation
Ever-diagnosed asthma	Not evaluated	Not evaluated	Sufficient evidence of association	Initial evaluation
Respiratory infections	Not evaluated	Not evaluated	Sufficient evidence of association	Initial evaluation
Bronchitis	Not evaluated	Limited or suggestive evidence of association	Sufficient evidence of association	Initial evaluation
Allergic rhinitis	Not evaluated	Limited or suggestive evidence of association	Sufficient evidence of association	Initial evaluation
Eczema	Not evaluated	Not evaluated	Sufficient evidence of association	Initial evaluation
Common cold	Not evaluated	Not evaluated	Limited or suggestive evidence of association	Initial evaluation
Allergy/atopy	Not evaluated	Not evaluated	Limited or suggestive evidence of association	
Altered lung function	(Association based on clinical evidence)	(Association based on clinical evidence)	Inadequate or insufficient	

Table modified from Mendell MJ, et.al., Respiratory and Allergic Health Effects of Dampness, Mold, and Dampness-related Agents: A Review of the Epidemiologic Evidence, Environ. Health Perspect., 2011 (6):748–756

Credible research has documented a causal relationship between living in damp buildings and asthma in previously unaffected occupants

Not exposure to this

Clean this up and solve the moisture problem

Exposure to this

Do not live this. Get help with clean up and solve the moisture problem

Kanchongkittiphon, et.al., Indoor Environmental Exposures and Exacerbation of Asthma: An Update to the 2000 Review by the Institute of Medicine. EHP, Vol. 123, #1, 2015.

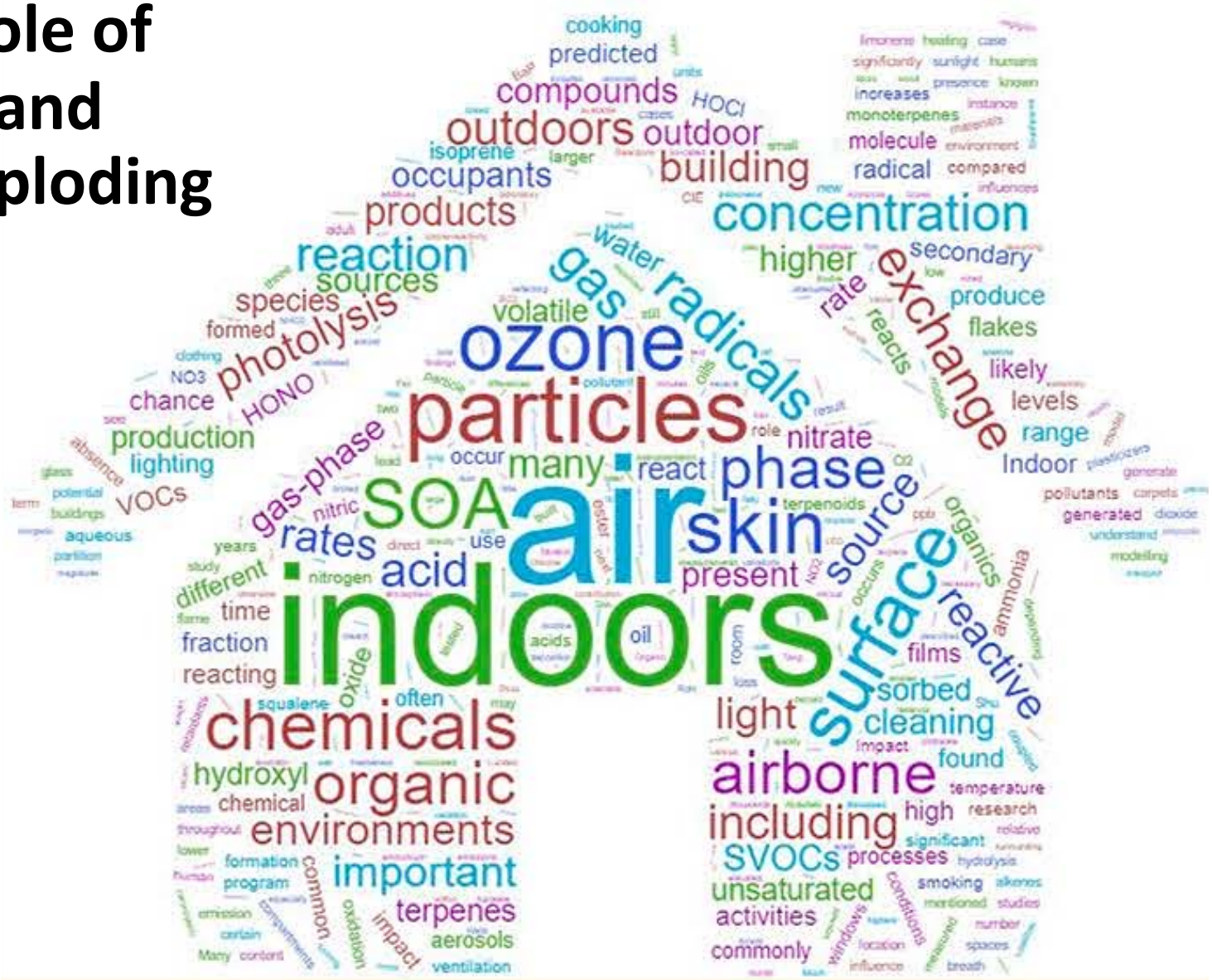
Our knowledge about the role of indoor chemistry exposure and human health impacts is exploding

~30,000 chemicals in indoor dust

But ONLY 280 chemicals have been identified

A large amount of chemicals produced are from the reaction of household products with the biofilm on surfaces

Many harmful exposures are a result of reaction of household products with building materials



Science, 29 NOVEMBER 2019 • VOL 366 ISSUE 6469

From Weschler and Carslaw, Indoor Chemistry, Environ. Sci. Technol. 2018, 52, 2419−2428

Children's Mercy

We likely ingest at least 45 chemicals found in household dust that come from a variety of household products

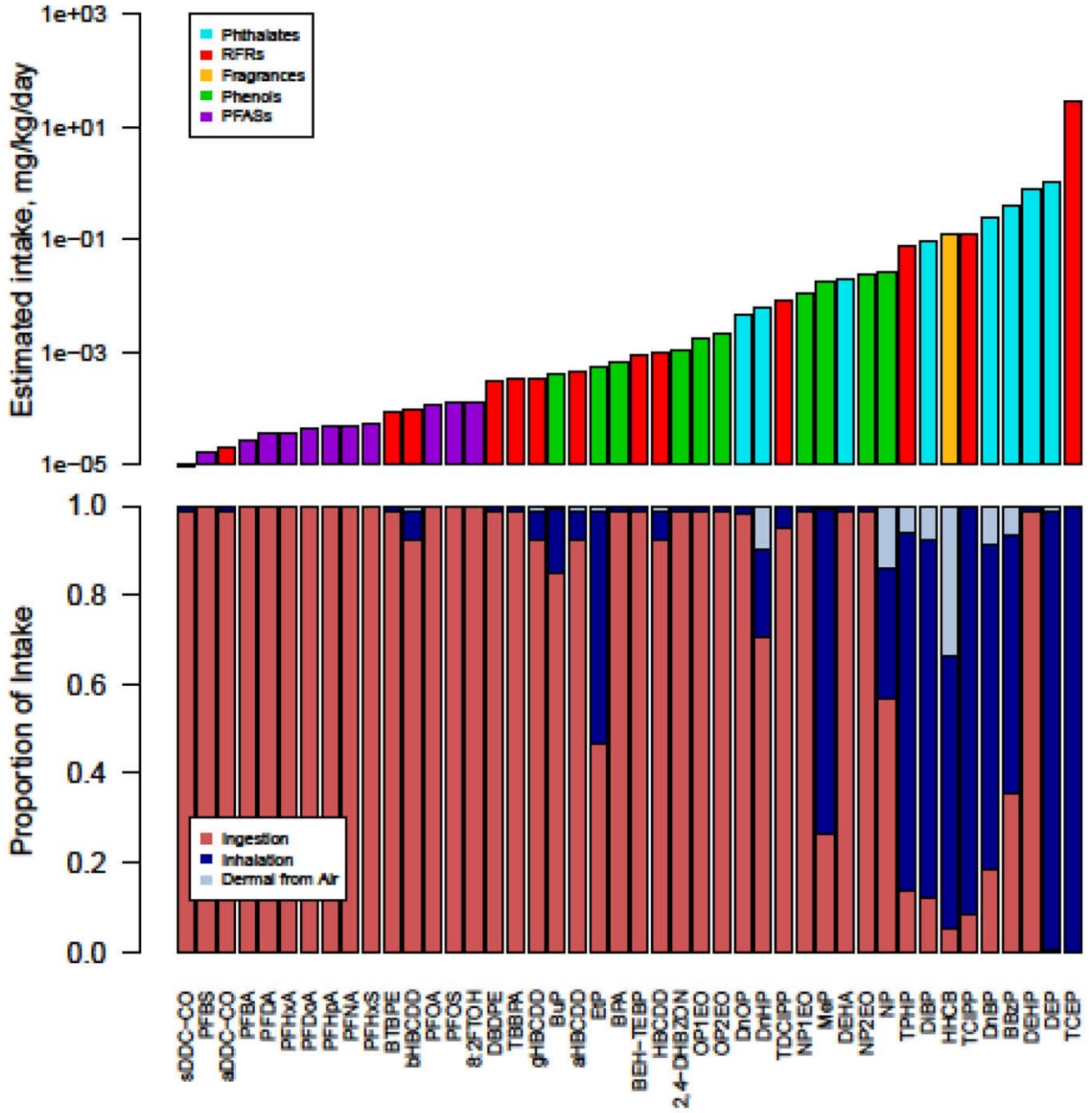
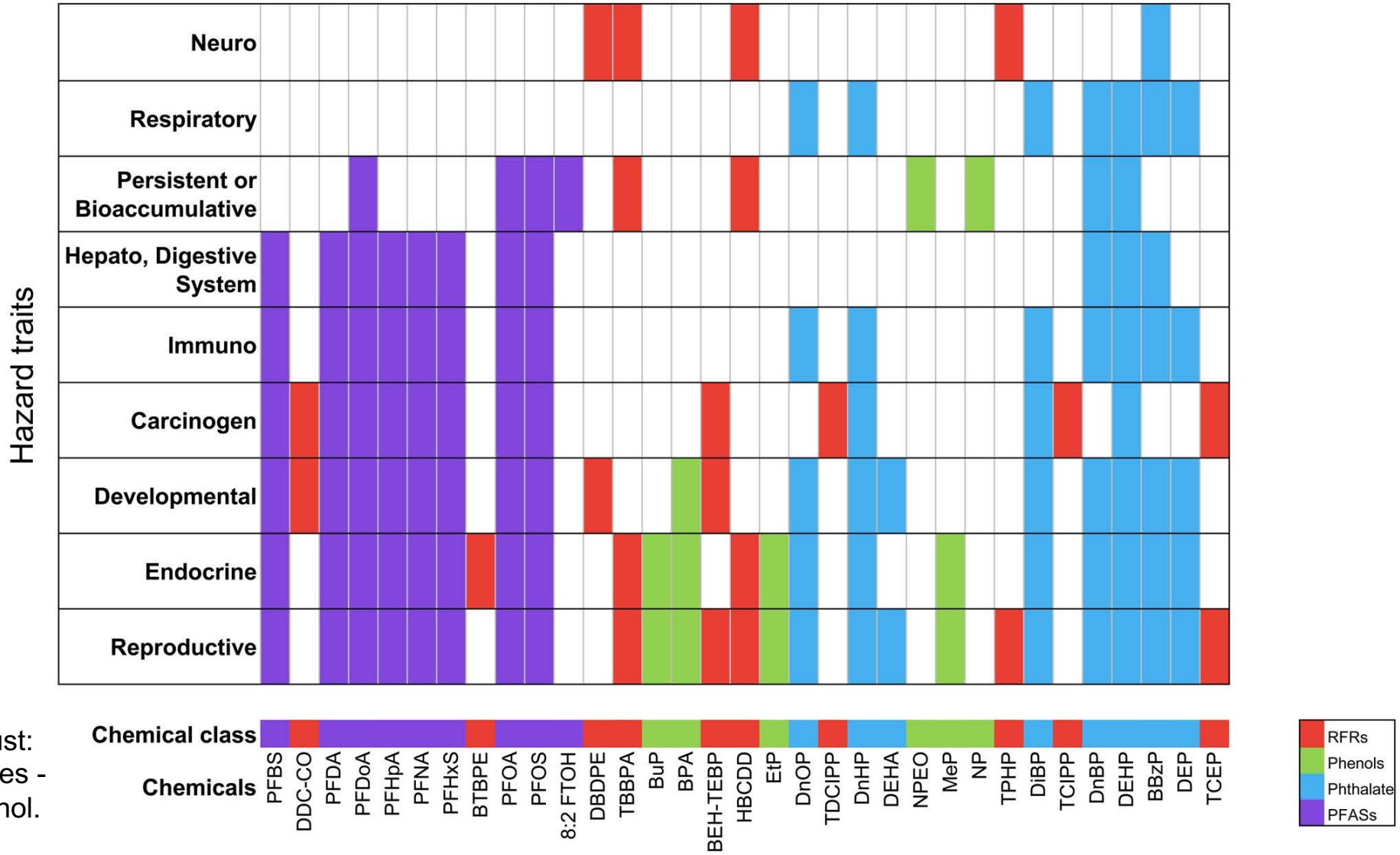


Figure 3. Top panel of the graph shows the estimated daily residential intake of each chemical for a 3−6 year old child (mg/kg/day), based on the pooled GM concentrations of each chemical in dust from the meta-analysis. The bottom panel shows the proportion of intake from three pathways: ingestion, inhalation, and dermal exposure from air. In both panels, PFAS intake estimates were based solely on estimated ingestion.

Consumer Product Chemicals in Indoor Dust: A Quantitative Meta-analysis of U.S. Studies - Mitro, Susanna D. et.al. Environ. Sci. Technol. 2016, 50, 10661−10672

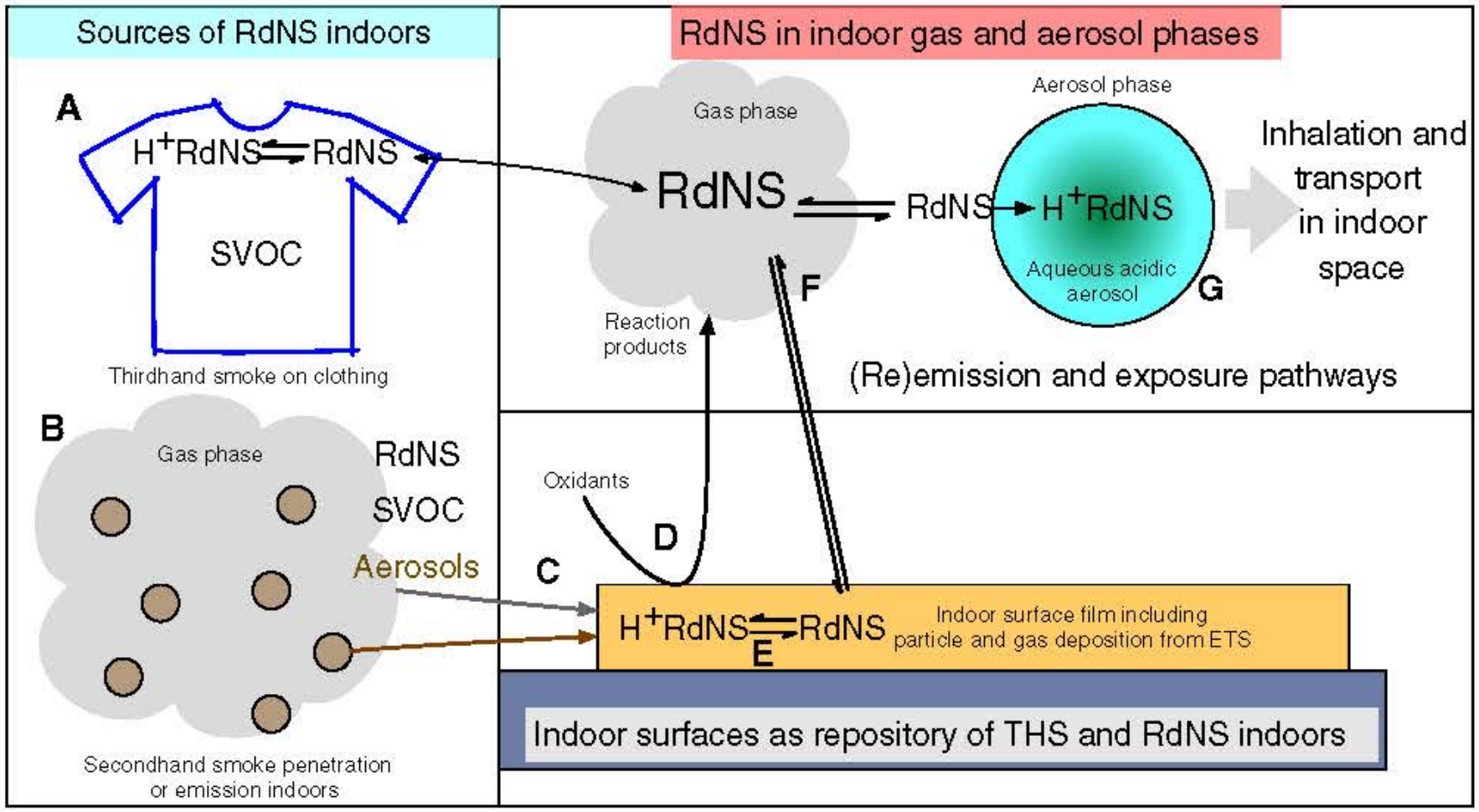
33 of these chemicals in household dust represent these 9 very general types of exposure risk for health

Figure 4. Each row on the chart represents potential chemical hazard traits, and each column represents a chemical. Chemicals are listed in order of estimated adult daily residential intake phthalates, phenols, RFRs, fragrances, and PFASs.



Consumer Product Chemicals in Indoor Dust: A Quantitative Meta- analysis of U.S. Studies - Mitro, Susanna D. et.al. Environ. Sci. Technol. 2016, 50, 10661−10672

3rd hand tobacco smoke is a very real hazard and can remain on surfaces for long periods

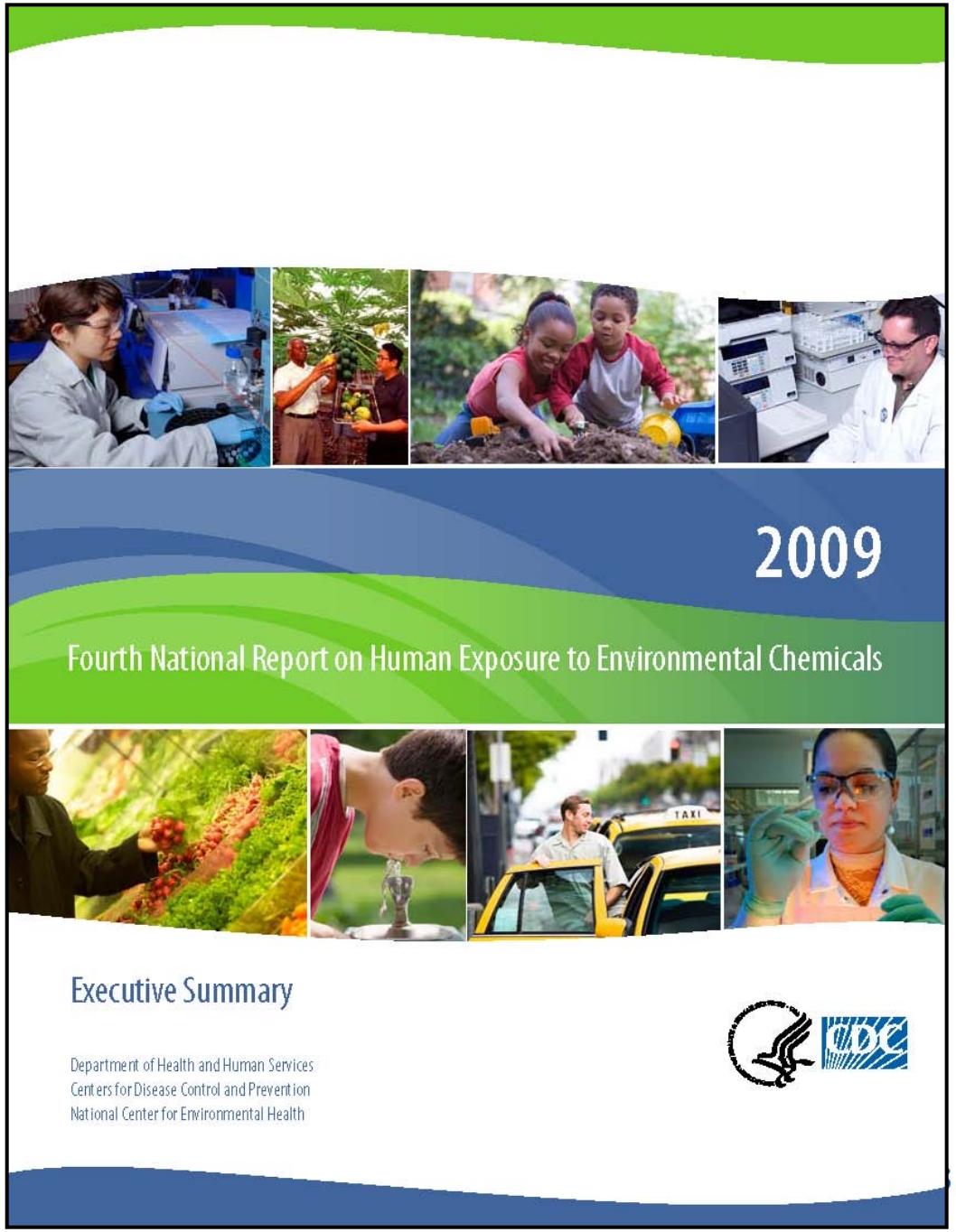


DeCarlo, Peter F. , et. al. Thirdhand smoke uptake to aerosol particles in the indoor environment, Science Advances, 9 May 2018

The US population shows extensive evidence of exposure to chemicals

- Blood and Urine analysis from participants

- First samples collected in 1999, new sample analyses and report generated ~every 2 years.

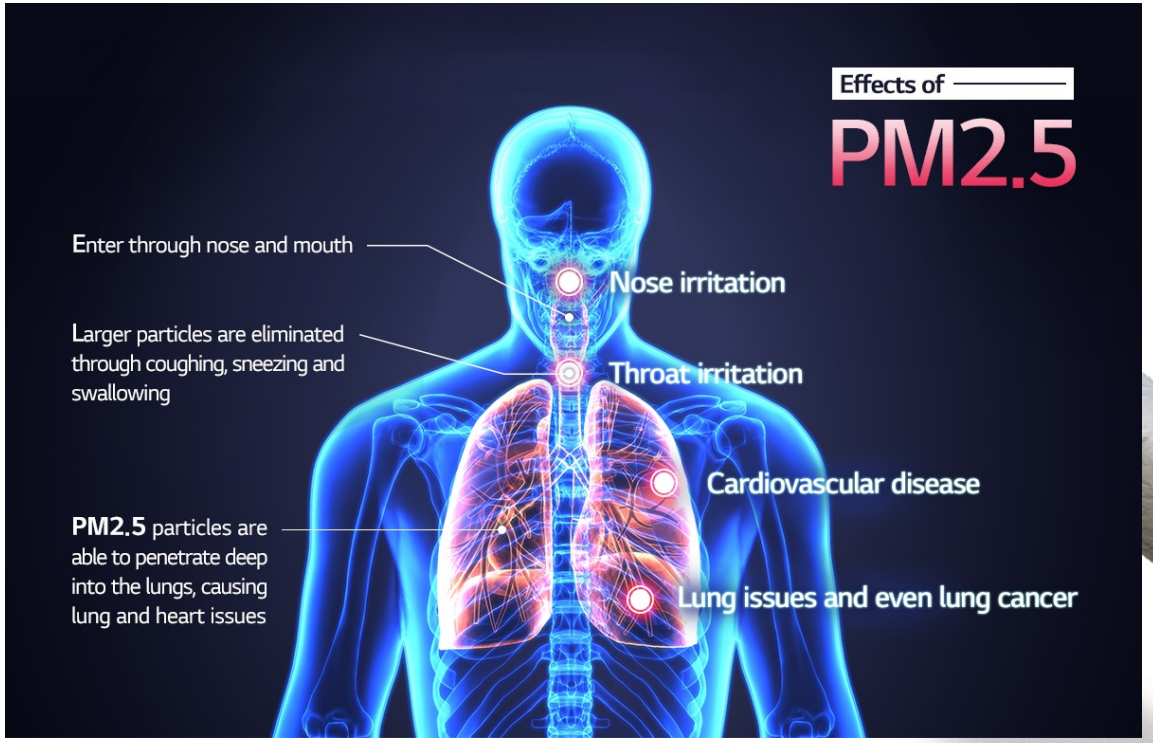


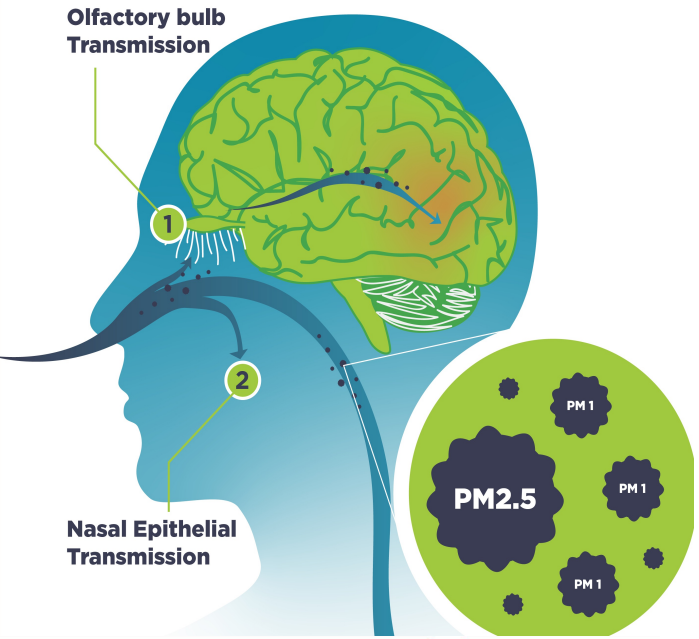
Mercy

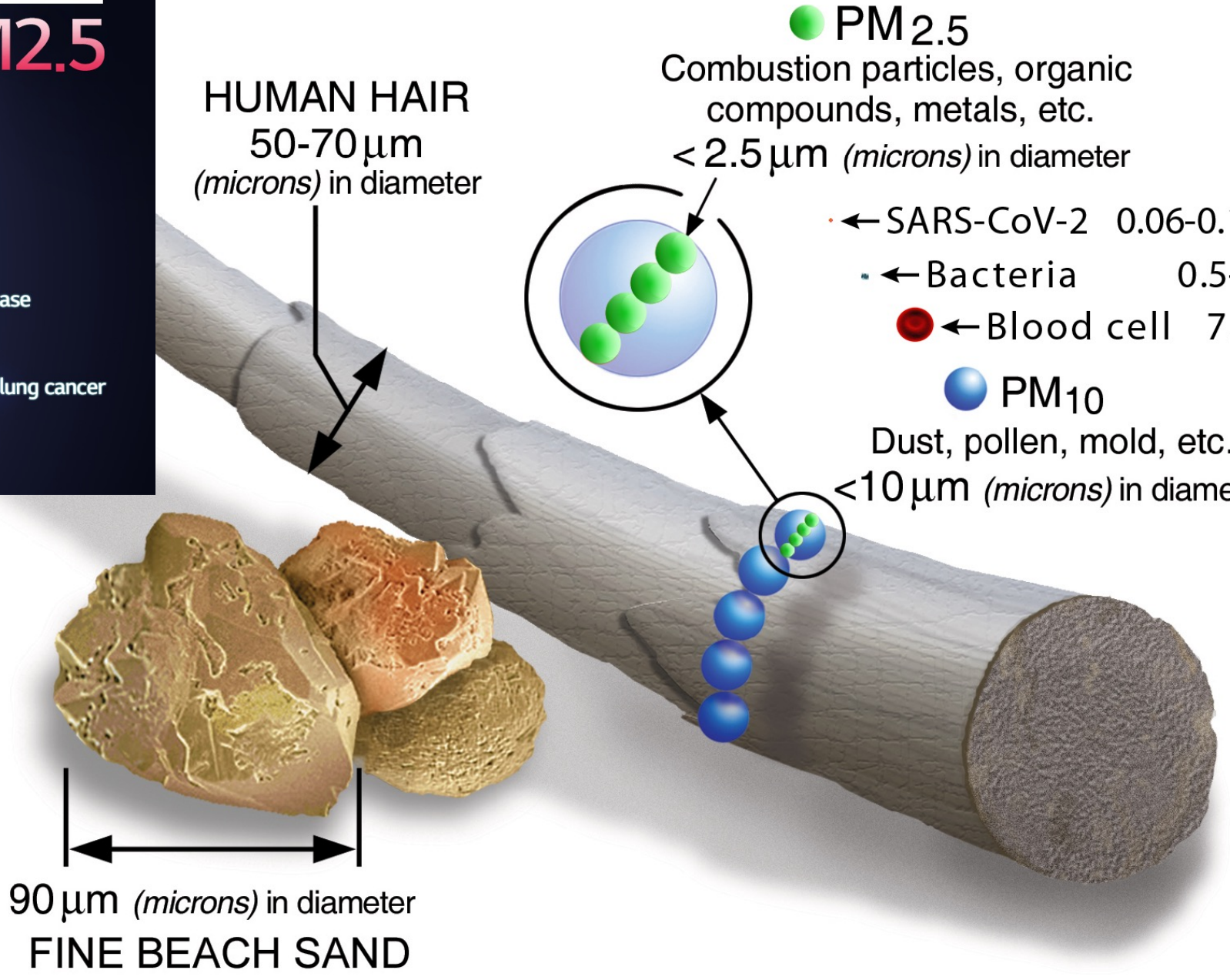
Highlights of the most recent report

- Blood lead has maintained downward trend
- Cotinine (from nicotine metab.) maintained downward trend
- Chlorpyrifos (banned for homes in 2000) detected in 50% of pop.
- Pyrethroids detected in 76% of population

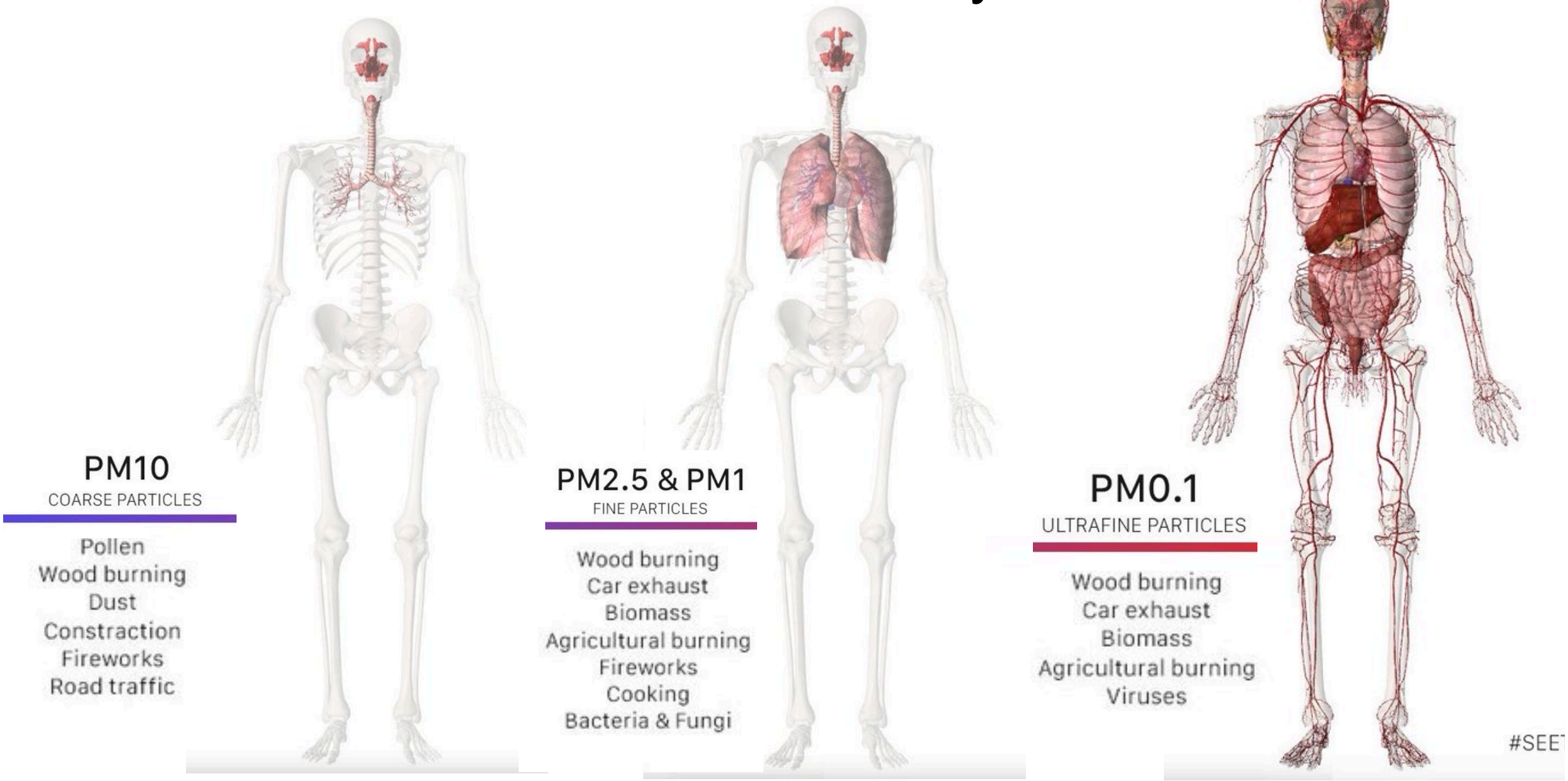
- Nearly all NHANES part. had the following detected:
    - Pthalates
    - Bis Phenyl-A (BPA)
    - 1 Polybrominated diphenyl ether (fire retardants)
    - Perfluorooctoanoic acid (PFAS) [no-stick cookware]


Effects of
PM2.5
Enter through nose and mouth
Nose irritation
Larger particles are eliminated through coughing, sneezing and swallowing
Throat irritation
Cardiovascular disease
PM2.5 particles are able to penetrate deep into the lungs, causing lung and heart issues
Lung issues and even lung cancer


Olfactory bulb Transmission
1
2
Nasal Epithelial Transmission
PM2.5
PM 1
PM 1
PM 1


HUMAN HAIR
50-70 µm
(microns) in diameter
PM2.5
Combustion particles, organic compounds, metals, etc.
< 2.5 µm (microns) in diameter
SARS-CoV-2 0.06-0.
Bacteria 0.5
Blood cell 7
PM10
Dust, pollen, mold, etc.
<10 µm (microns) in diame
90 µm (microns) in diameter
FINE BEACH SAND

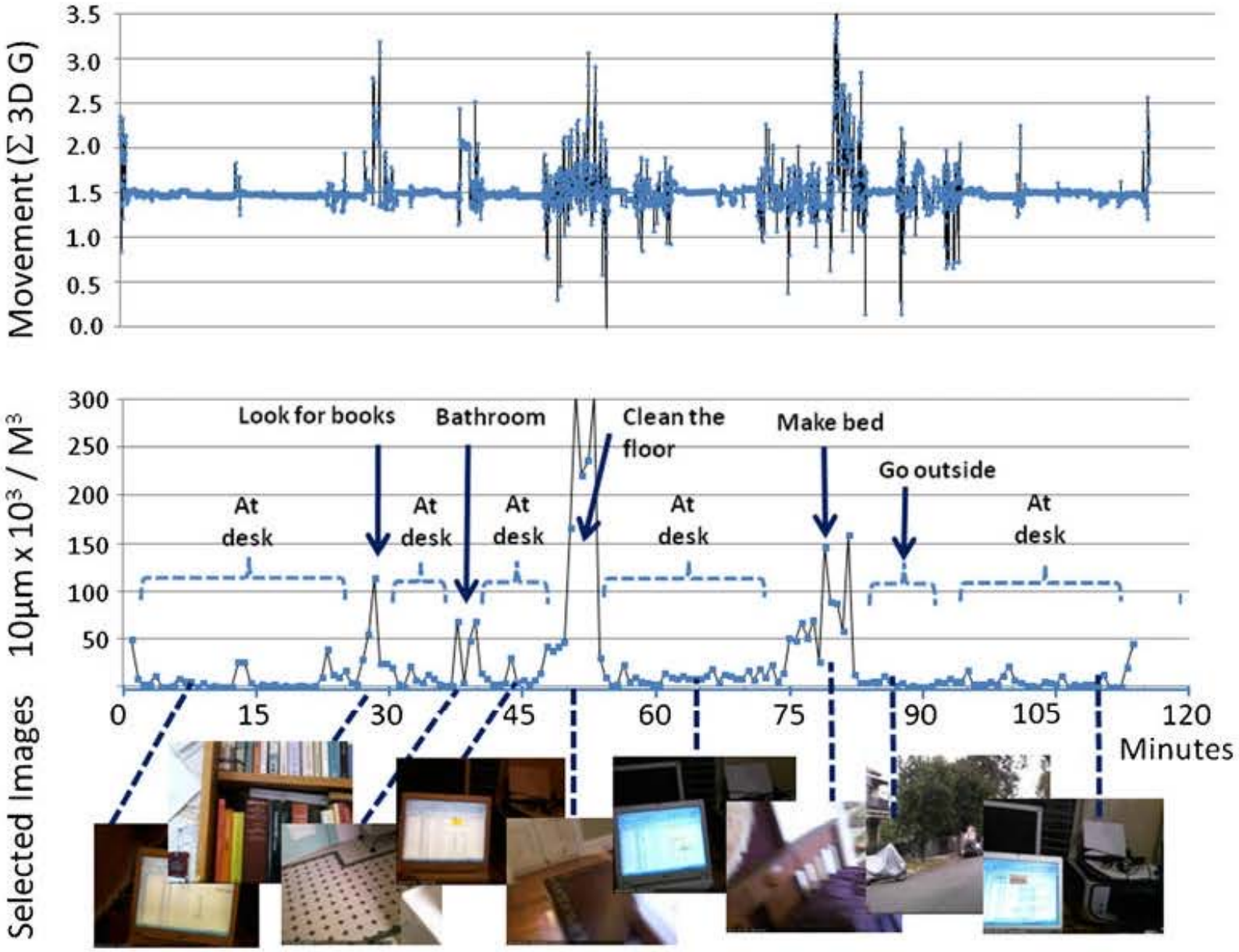
Penetration of Particles into the Body



https://seetheair.files.wordpress.com/2021/03/particle-penetration.jpg

Our daily activities enhances our exposure to particles and contaminants

We are all Pig Pen!



Undisturbed & disturbed particles in children's bedrooms

2 Feet Undisturbed Particle Concentrations

	0.5um	0.7um	1.0um	2.0um	5.0um	10.0um
MEAN	7091	2918	1334	834	114	41
STD	15449	4955	1619	582	95	34
MEDIAN	3100	1527	790	531	93	32

2 Feet Disturbed Particle Concentrations

	0.5um	0.7um	1.0um	2.0um	5.0um	10.0um
MEAN	8100	4099	2209	1732	372	178
STD	16261	5189	2147	1463	385	177
MEDIAN	3709	2718	1322	1269	237	106

T - TEST

	0.5um	0.7um	1.0um	2.0um	5.0um	10.0um
P - VALUE	NS	NS	0.05	<0.01	<0.01	<0.01

Unpublished data compiled from home assessments in Kansas City

The inside of our homes are covered in oobleck!

- The combination of the biome, water, chemicals and biological debris creates a microscopic mixture that we live in everyday
- This should be a normal and healthy part of our home indoor environment
- It has been corrupted by excess chemicals and a routine moisture imbalance that leads to unwanted exposures
- We are still learning the health impacts.

Bartholomew and the Oobleck, Dr. Suess, ©1949

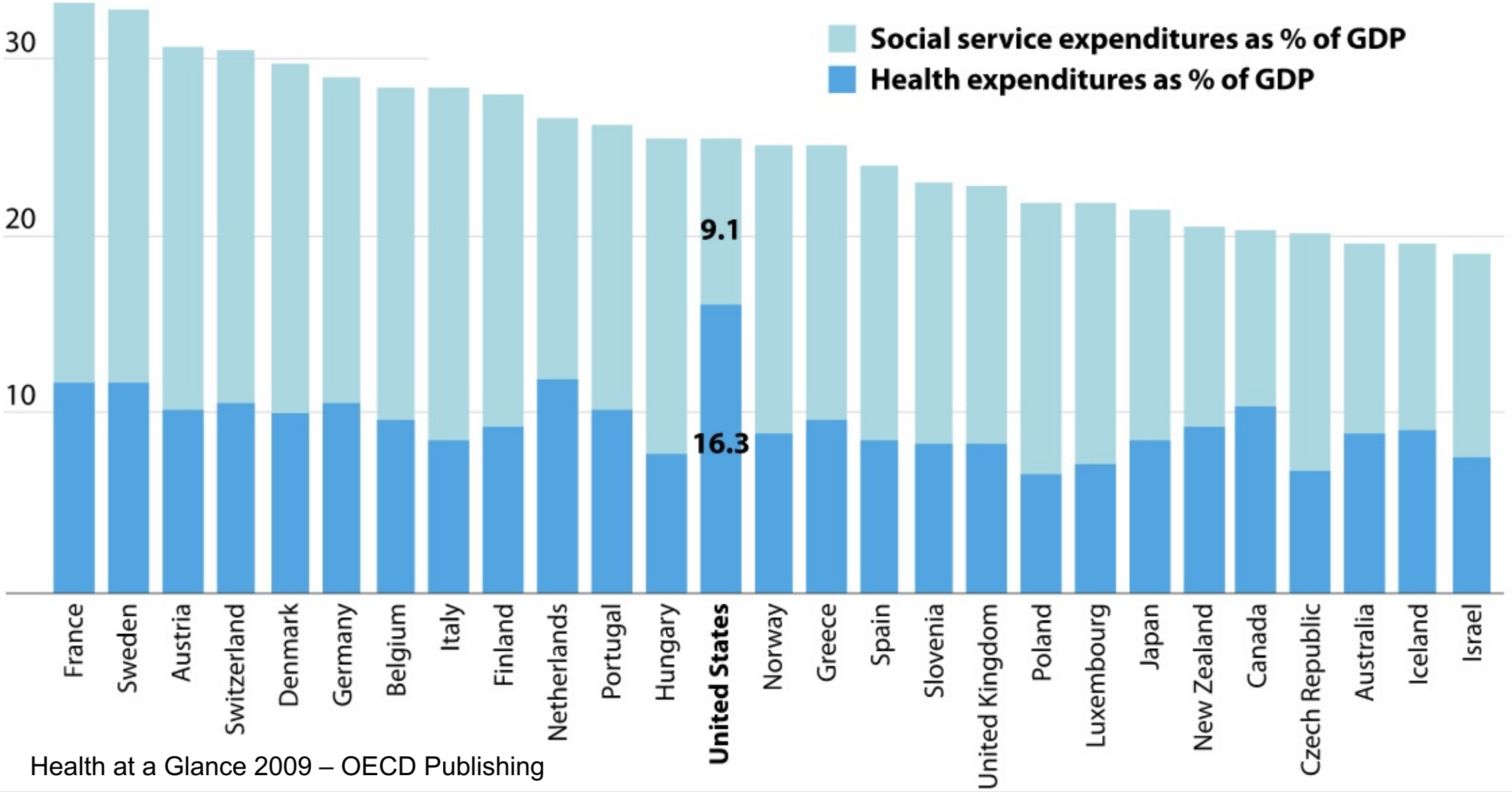
Is this our future?

What can we do?

Image from “How human biology and behavior affect indoor air quality” - Nina Notman, PNAS | September 15, 2020 | vol. 117 | no. 37 | 22619–22622

Children's Mercy KANSAS CITY

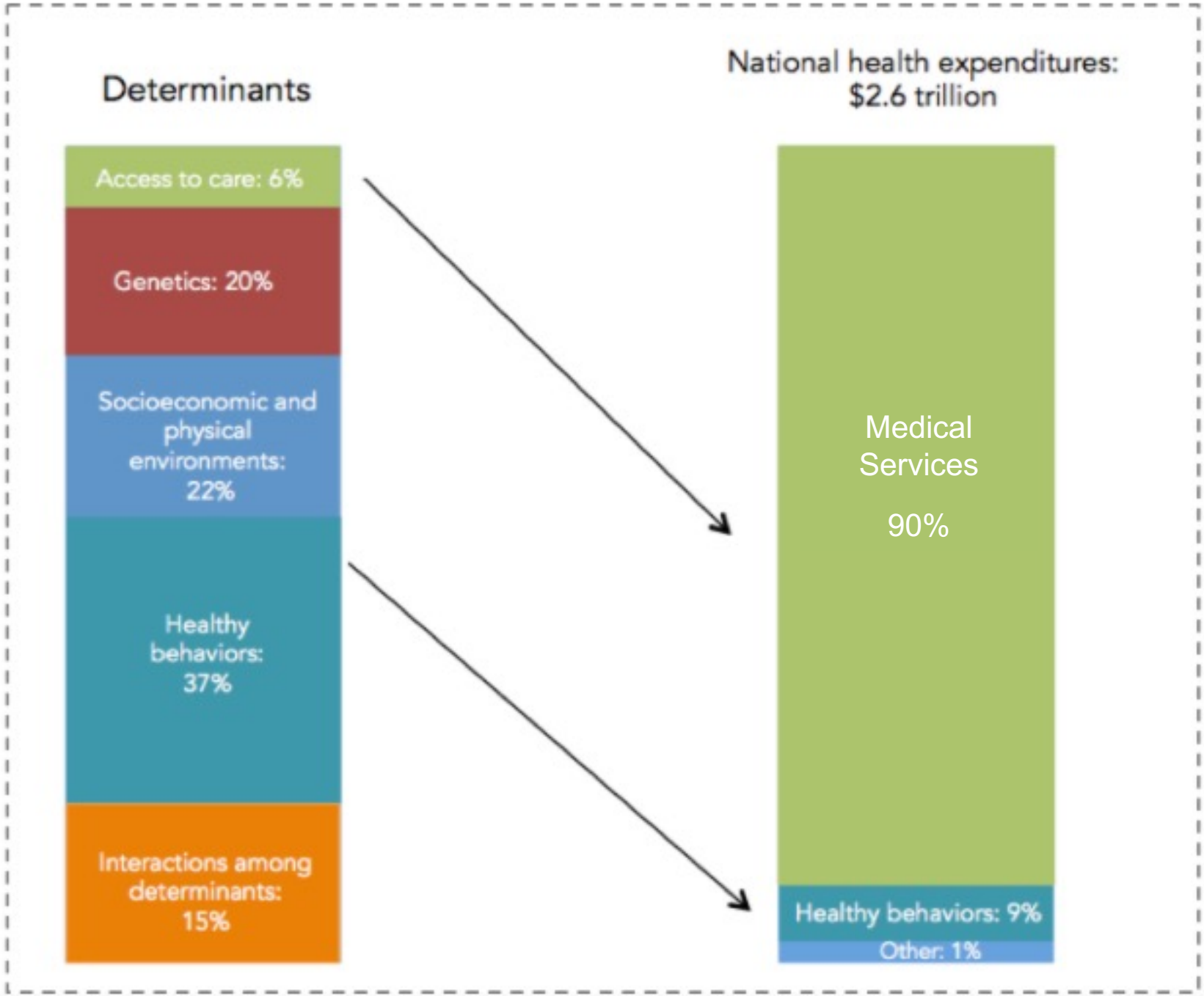
We need to transfer focus, and funds, to environment and community improvement to help reduce health care costs and improve children's lives



Health at a Glance 2009 – OECD Publishing

Health care spending mismatch:

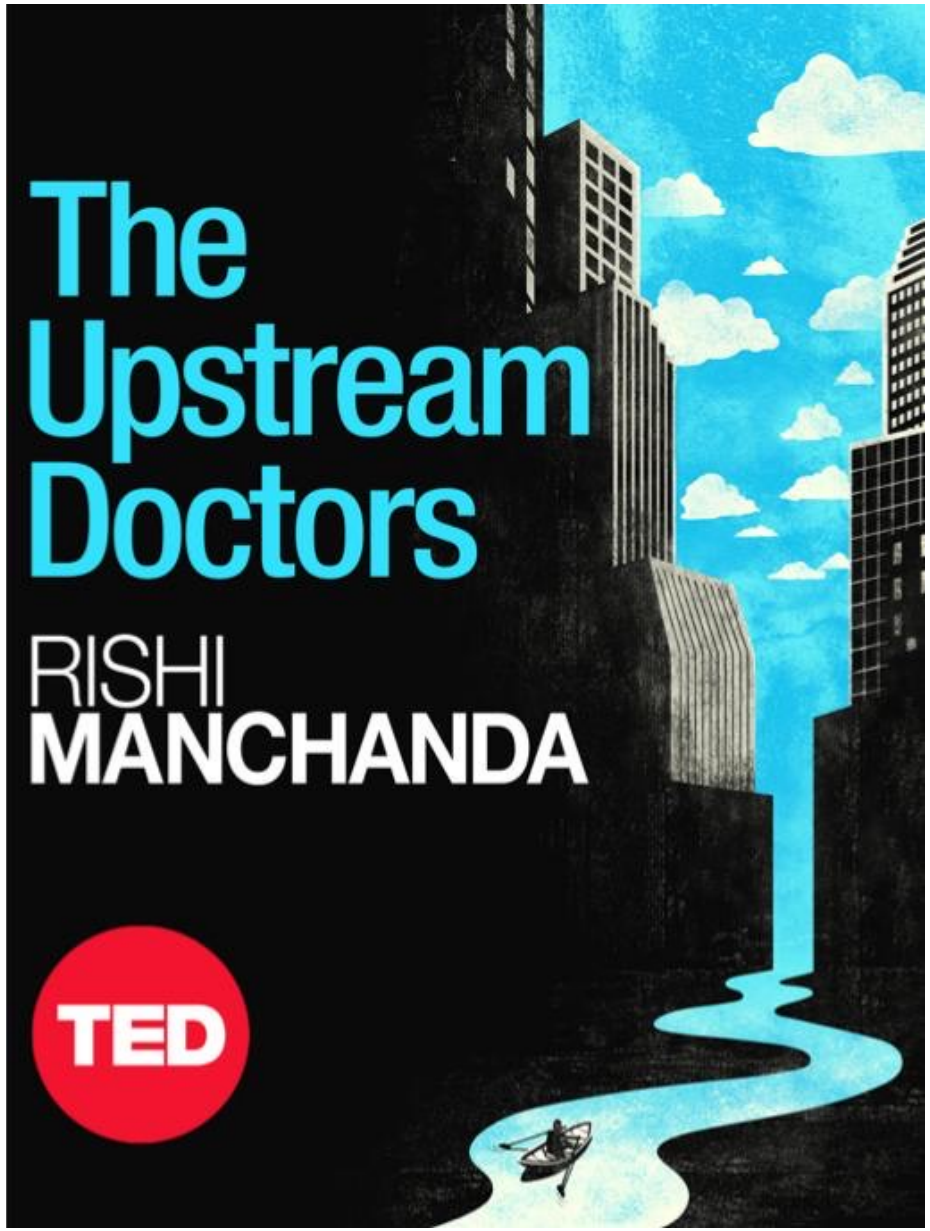
Health care service expenditures don't match the areas that are known to impact health

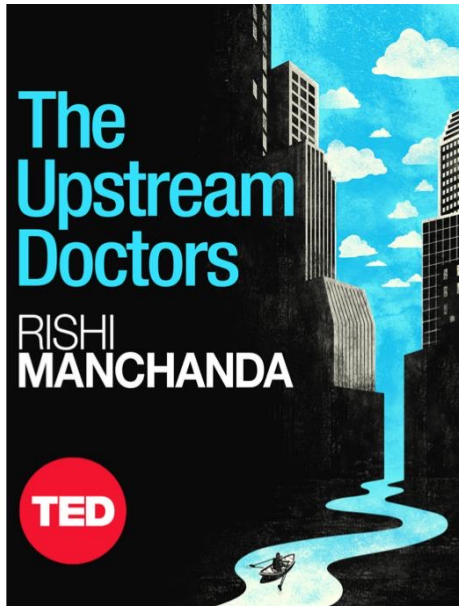


Healthy People/Healthy Economy: An Initiative to Make Massachusetts the National Leader in Health and Wellness. 2015

The way forward is smarter indoor environmental management of our homes

Upstream Health Care





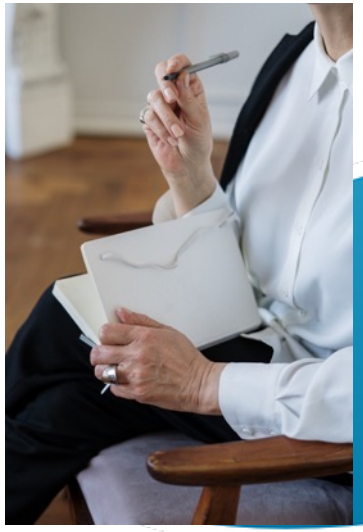
Find the root causes of health problems

Home environmental assessments and interventions are

Upstream Health Care

Image from Children's Mercy Kansas City

Clinical care is often not enough



https://www.pexels.com/creative-commons-images/ Pexel photos are free for use

Image from Velux https://www.youtube.com/watch?v=ygHU0mQGuJU

“Clean indoor air as important as medications in controlling kids’ asthma”

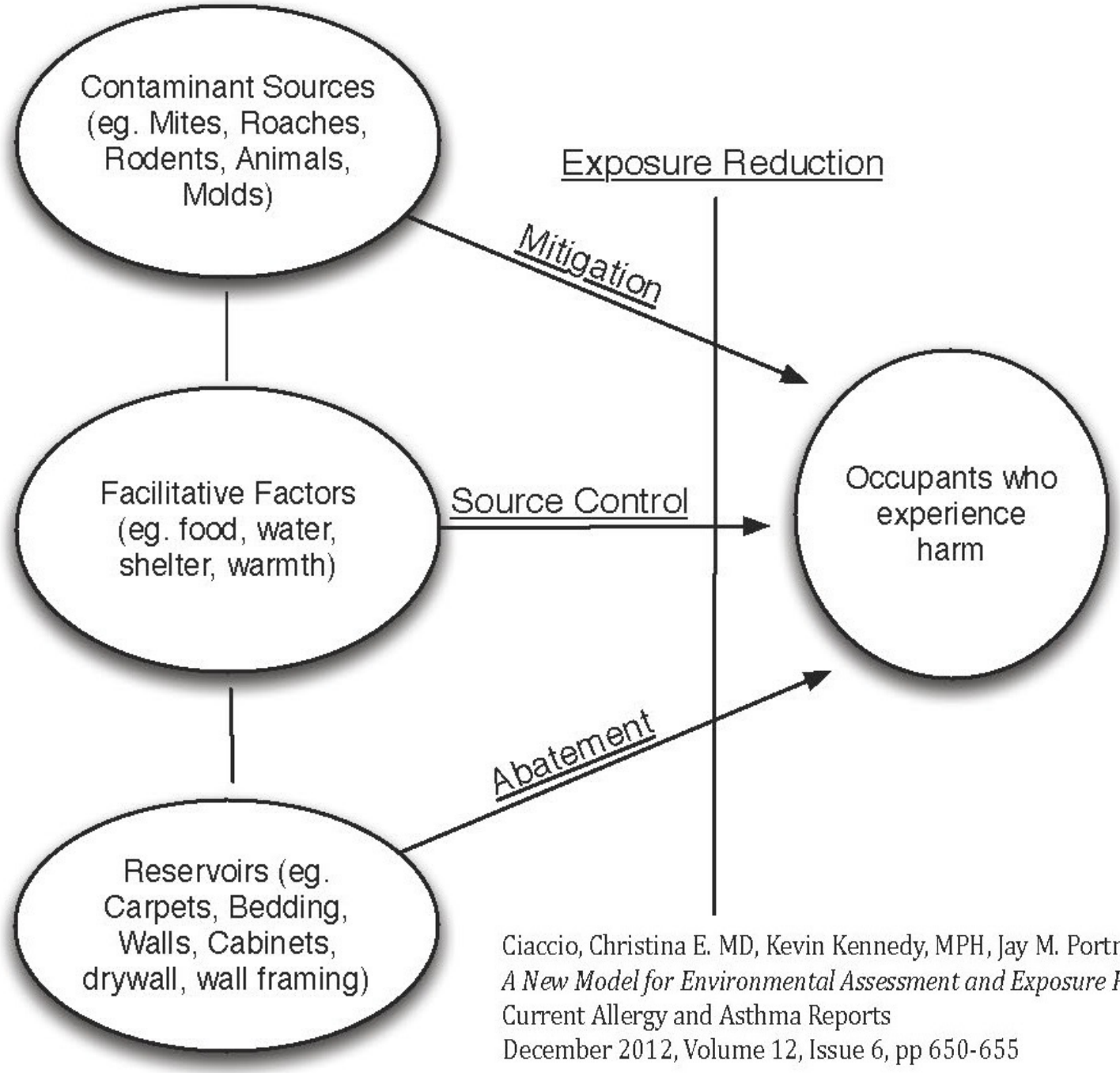
"Reducing exposure to things like second-hand cigarette smoke, dust mites and furry pets may be as effective as medications at controlling asthma"

- Match interventions to child’s Immunoglobulin E (IgE) or skin test allergy results
- Reduces asthma symptoms with the same efficacy as medication
- Effects sustained for 1 year after interventions

Matsui et al. 2016. Section on Allergy and Immunology. AAP Council on Environmental Health. Indoor Environmental Control Practices and Asthma Management. Pediatrics.

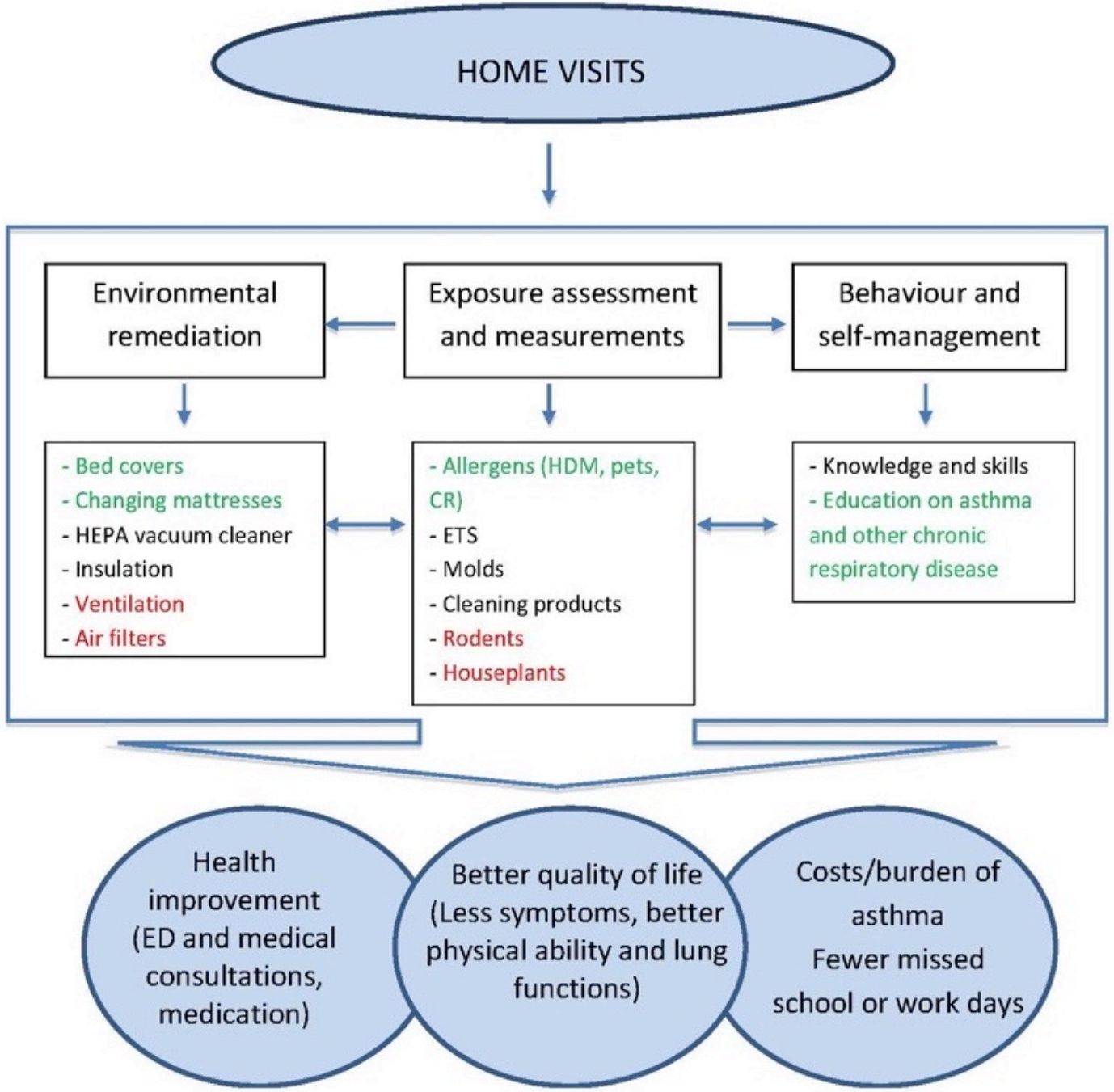
Children’s Mercy KANSAS CITY

Housing improvements known to have good health outcomes are based on interventions that reduce exposure to environmental risks



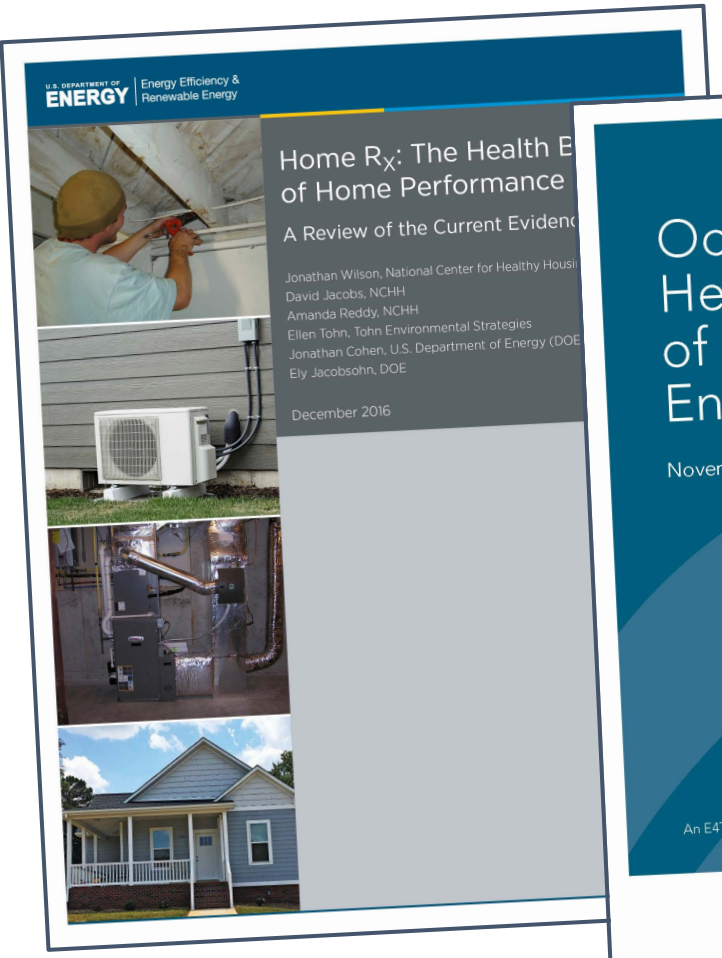
Ciaccio, Christina E. MD, Kevin Kennedy, MPH, Jay M. Portnoy, MD,
A New Model for Environmental Assessment and Exposure Reduction
Current Allergy and Asthma Reports
December 2012, Volume 12, Issue 6, pp 650-655

Home assessments and interventions should be a systematic, evidence-based process with specific goals to reduce exposure and improve health

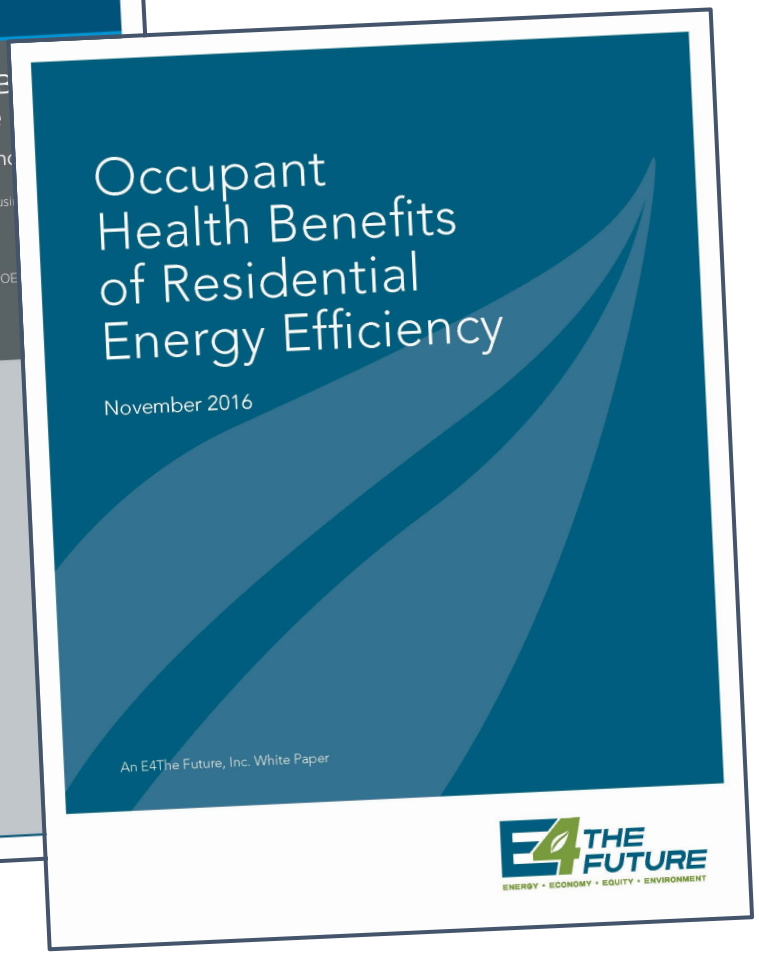


Le Cann, et. al., Home Environmental Interventions for the Prevention or Control of Allergic and Respiratory Diseases: What Really Works, 2016, J Allergy and Clinical Immunology Practice 2017 (5), 66-79.

Home Performance is Health Performance



https://betterbuildingssolutioncenter.energy.gov/sites/default/files/attachments/Home%20Rx%20The%20Health%20Benefits%20of%20Home%20Performance%20-%20A%20Review%20of%20the%20Current%20Evidence.pdf



https://e4thefuture.org/wp-content/uploads/2016/11/Occupant-Health-Benefits-Residential-EE.pdf

http://ma-eeac.org/wordpress/wp-content/uploads/TXC50-Low-Income-Multfamily-Health-and-Safety-NEI-Preliminary-Findings-Report_15OCT2018.pdf

https://weatherization.ornl.gov/wp-content/uploads/pdf/WAPRetroEvalFinalReports/ORNL_TM-2014_345.pdf

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How energy efficiency can reduce health risks

- Insulation
- Air Sealing
- Heating System Upgrades
- Ventilation
- Vent Dryers
- Efficient Cooking Appliances

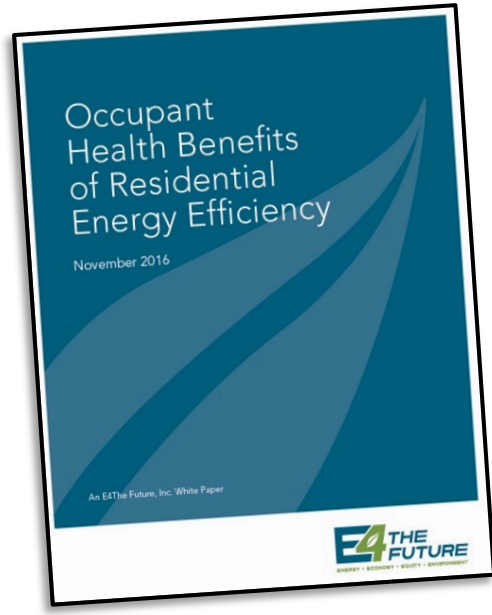
→ Warmer drier air, improved indoor temperatures & relative humidity

→ Less moisture, mold, particulates, pollutants, combustion by-products, allergens

→ Lower bills, better comfort

- Fewer heat or cold related deaths
- Less hypertension, heart disease
- Fewer asthma symptoms, respiratory risks, COPD
- Fewer heart disease risks
- Fewer cancer risks due to radon, formaldehyde, other sources
- Less stress, better mental health

Reduced hospital and medical visits



https://e4thefuture.org/wp-content/uploads/2016/11/Occupant-Health-Benefits-Residential-EE.pdf

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Energy Upgrades = Healthier Homes

- Residents w/ asthma reported fewer hospitalizations and ER visits after weatherization
- Children missed fewer school days after their homes received energy efficiency services from WAP
- Reducing energy costs means families have more money to spend on food, medicine & other essentials

- After weatherization, families' out-of-pocket medical expenses decreased by an average of $514
- Weatherization returns $2.78 in health-and-safety related benefits for every $1 invested
- Energy efficient homes lead to $82.4 billion in healthcare costs savings annually.
- Weatherization leads to significant health benefits.

https://nascsp.org/wp-content/uploads/2019/09/Final-Toolkit-Weatherization-Day-2019-Update.pdf

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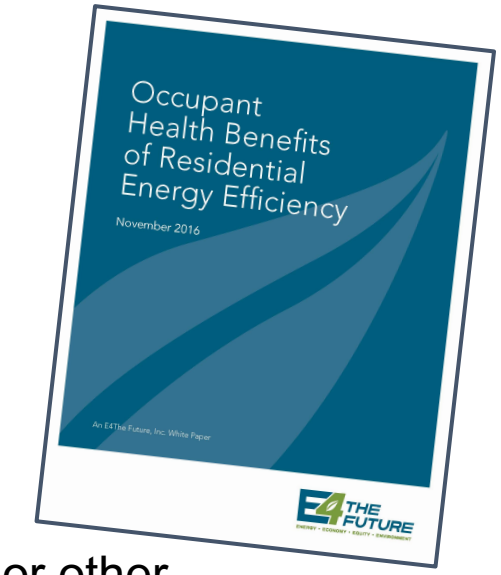
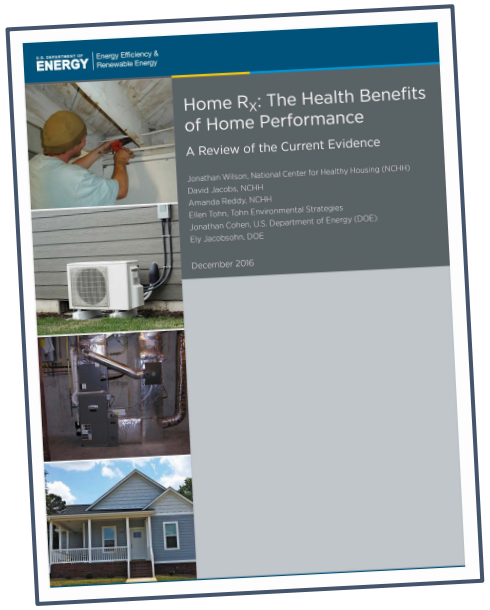
Air Sealing, Thermal upgrades and Heating Tune-Up can lead to:



Contaminants reduced through assessment, education and interventions

gases and particulates
less medications
dampness
mold
risk of cancer
arthritis
depression
energy bill
pollutants
days off work / school
cardiovascular issues
dust mites that are known to cause asthma
exposure to particulate and
contaminants that cause symptoms
use of chemicals



Improvements

savings / more income
general health
mental health
lower respiratory symptoms
blood pressure/hypertension or other
upper respiratory symptoms and headaches.
cooler climates improve comfort with less humidity
human health by reducing thermal stress
daily exposure to cleaner air
less stress and worry about “unknown” indoor air

most studies recommended IAQ Testing

Better quality of life

Remember for these health outcomes it’s about long-term health impact and long-term costs in health care $$ and quality of life.

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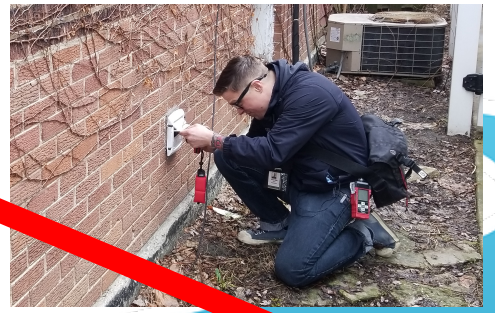
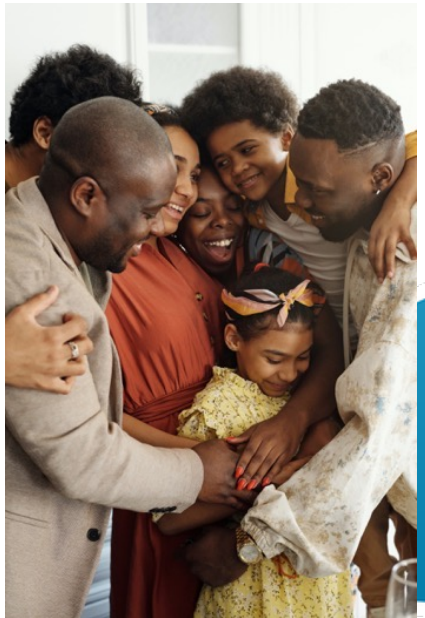
Collaboration between heath systems, public health and housing programs to solve problems

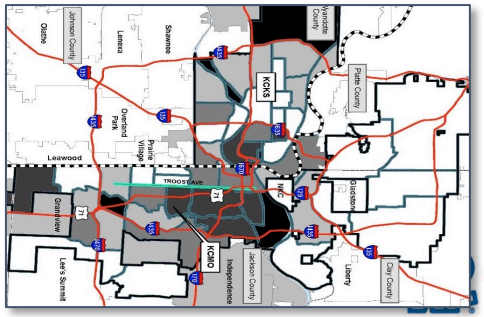
Upstream Health Strategies

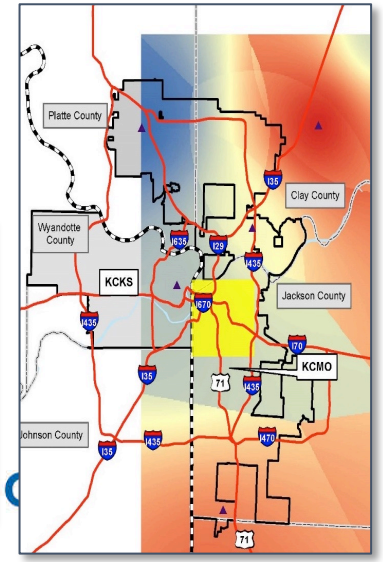




Use community-based specialists to educate

Use community data to target resources





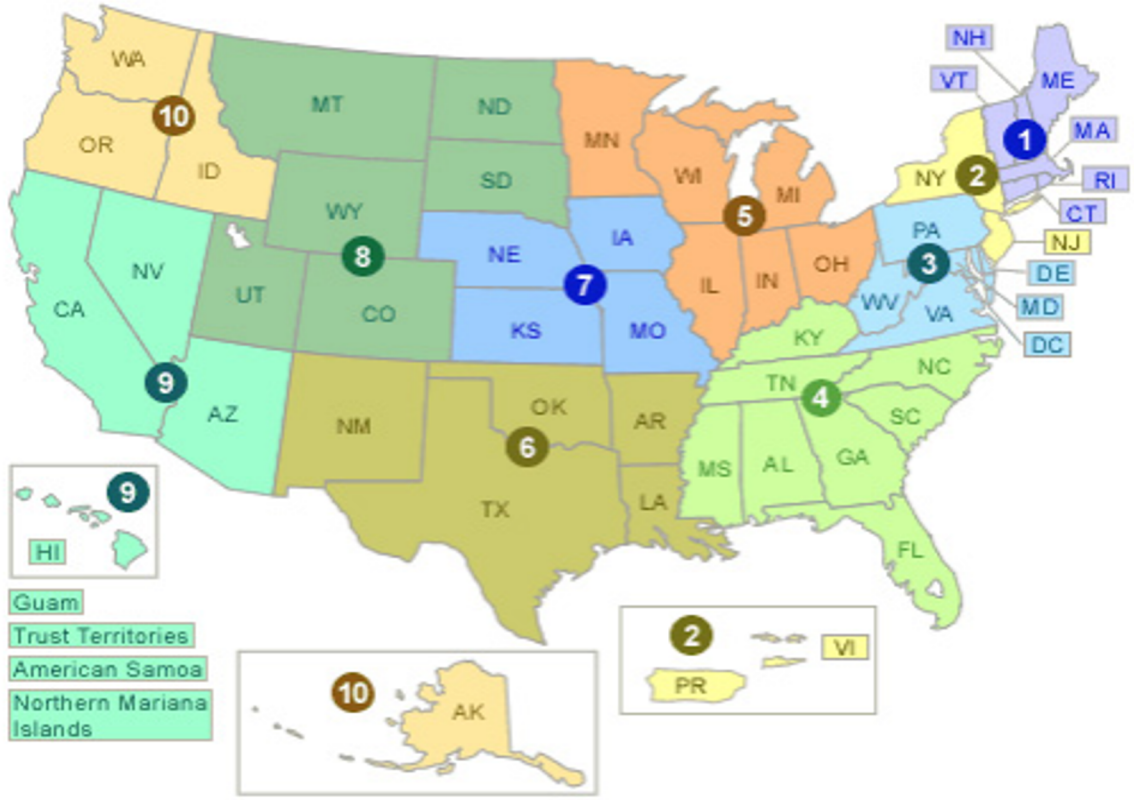
Upstream thinking will both improve home environments and lead to positive, long-term health outcomes

Kevin Kennedy

Section of Toxicology & Environmental Health
kkennedy@cmh.edu
816-302-8556

Pediatric Environmental Health Specialty Units (PEHSUs)

- CDC/EPA sponsored network of interdisciplinary pediatric EH specialists based at academic medical centers corresponding to federal regions – www.pehsu.net
- Partnerships include Regional EPA and ATSDR offices as well as local and state level health departments
- Provide free consultation, referral, outreach and education



PEHSU
Pediatric Environmental Health Specialty Units

MAPEHSU
MID-AMERICA PEDIATRIC ENVIRONMENTAL HEALTH SPECIALTY UNIT

New Healthy Housing Principles Reference Guide

- Clean
- Dry
- Pest-Free
- Contaminant-Free
- Safe
- Ventilated
- Comfortable
- Maintained

Target Audiences

- Housing Professionals
- Community Health Workers
- Home Performance Contractors
- Public Health Workers
- HVAC Technicians/Office Staff
- In-Home Nurses
- Nurse Practitioners
- Insulation/Air Sealing Technicians
- Utility Program Representatives
- Home Inspectors
- Realtors
- Parent Teacher Advocacy
- Students
  - Technical High School
  - Community College

Images from Building Performance Institute, used with permission

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A short summary of healthy home strategies using the Eight Healthy Home Principles

KEEP IT CLEAN

KEEP IT DRY

KEEP IT PEST-FREE

KEEP IT CONTAMINANT-FREE

KEEP IT SAFE

KEEP IT VENTILATED

KEEP IT COMFORTABLE

KEEP IT MAINTAINED

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We have to recognize houses are systems

Systems where:

- Heat transfer drives airflow
- Air pressure creates circulation and movement
- Water moves from wet to dry
- Dust settles and is easily dispersed by air movement

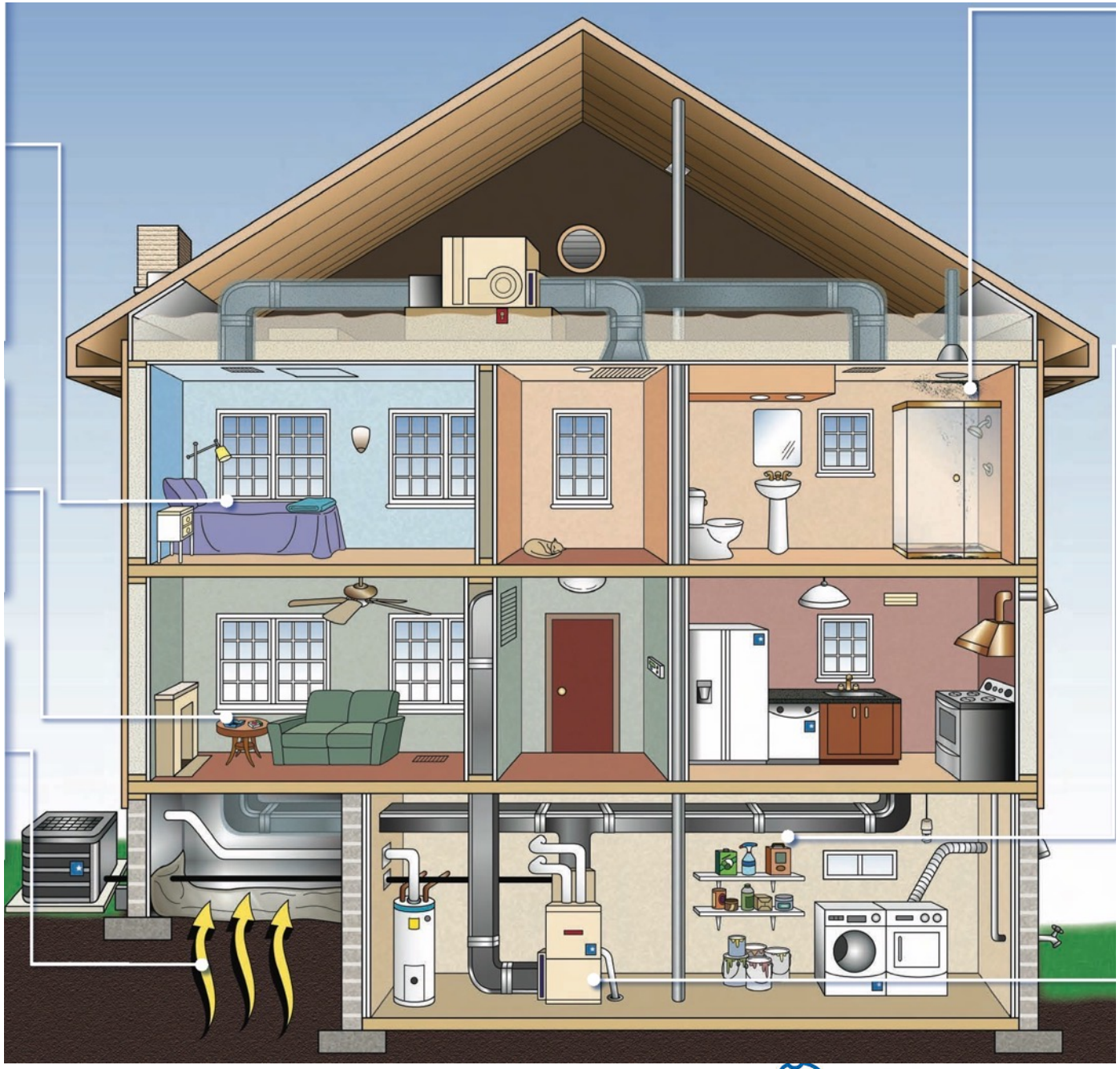

Image from, “Care for Your Air” www.epa.gov/iaq

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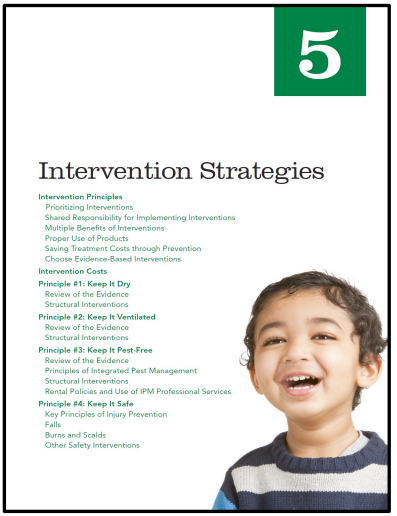
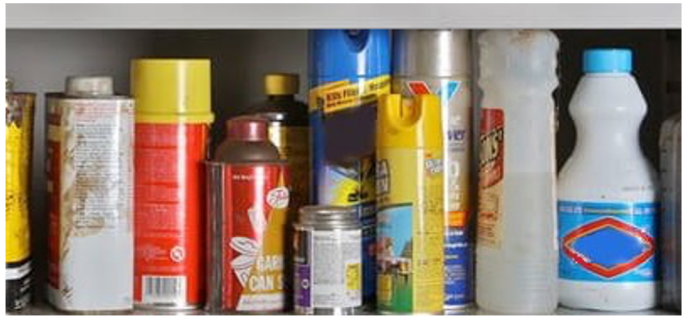
Keep it Clean

Residents and Owners

- “Swipe”, don’t dry sweep, to reduce airborne dust
- Use damp cloth for dusting surfaces
- Use non-toxic cleaners – soap and water
- Don’t mix ammonia and bleach
- Avoid products with strong fragrances
- Avoid using air fresheners
- Don’t smoke in house or hallways

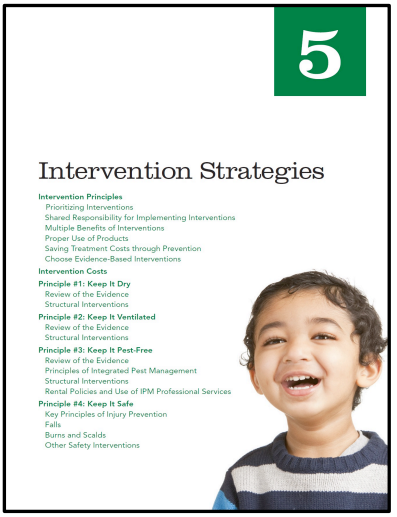


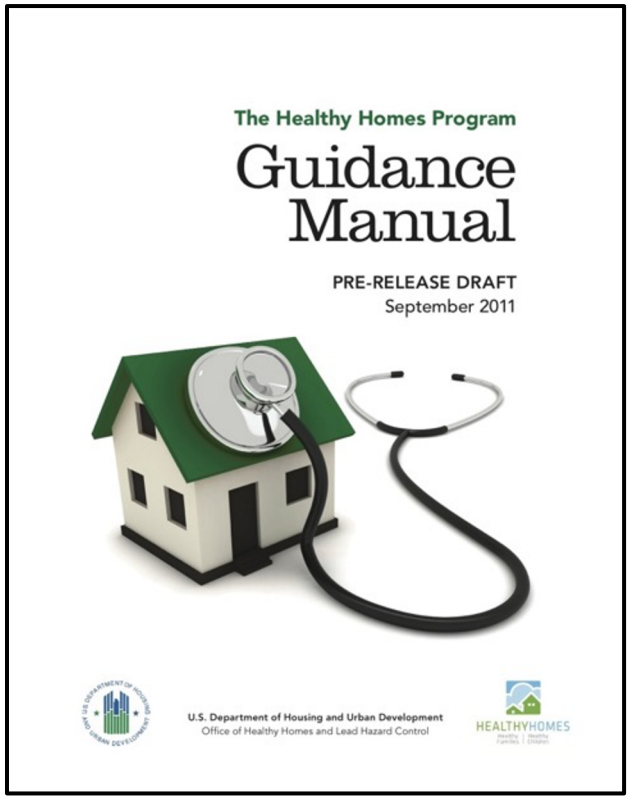


Keep It Clean

Consider changes to buildings

- Smooth and cleanable surfaces throughout buildings
- No carpets in wet areas
- Keep drains clear
- Clean fans and other cooling systems





Keep it Clean

Furry animals? Keep away?

If patient is sensitive to animals, treatment of choice is removal of pet from home

If removal not acceptable:

- Keep pets out of patient's bedroom
- Keep patient's bedroom door closed
- Remove upholstered furniture or carpet from home, or isolate pets from these areas as much as possible
- Weekly washing of the pet removes large quantities of dander & dried saliva
- Vacuuming and cleaning daily

Particle and dust control

Vacuum regularly (daily in high-traffic areas)

- >12 amp. motor
- Bag vs. bagless?
- Buy one with a HEPA filter on exhaust
- Micro-filtration bags for regular vacuums
- Vacuum slowly

Dust mite mitigation – multi-component

Encase the mattress/pillow in an allergen-impermeable cover, AND

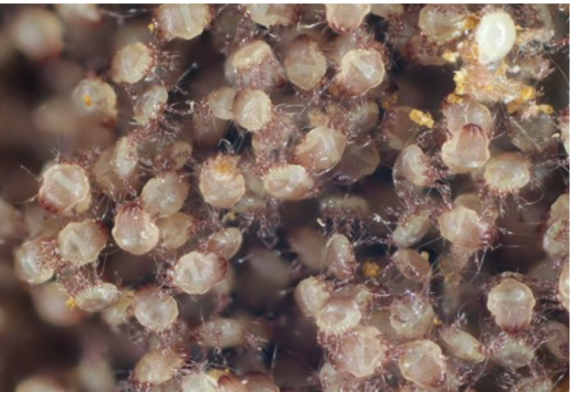
Wash sheets and blankets on patient's bed weekly in hot water and in hot clothes dryer, AND

Temp >130°F is NOT necessary for killing house-dust mites

Prolonged exposure to dry heat or freezing can also kill mites but does not remove allergen

Reduce indoor humidity, ideally <60%, dehumidifier, AND

Consider recommending carpet removal from patient bedroom



(Dust mites magnified 500 times.)

Portnoy, et. al., Annals of Allergy, Asthma & Immunology, 2016

Dust mite mitigation cont'd

Avoid sleeping or lying on upholstered furniture or carpet

Remove from home carpets laid on concrete

Minimize stuffed toys in children's beds and wash weekly

Vacuuming removes mite allergen from carpet, but may be inefficient at removing all live mites

Chemical agents denature the allergen, but effect not dramatic and not maintained for long periods

Portnoy, et. al., Annals of Allergy, Asthma & Immunology, 2013

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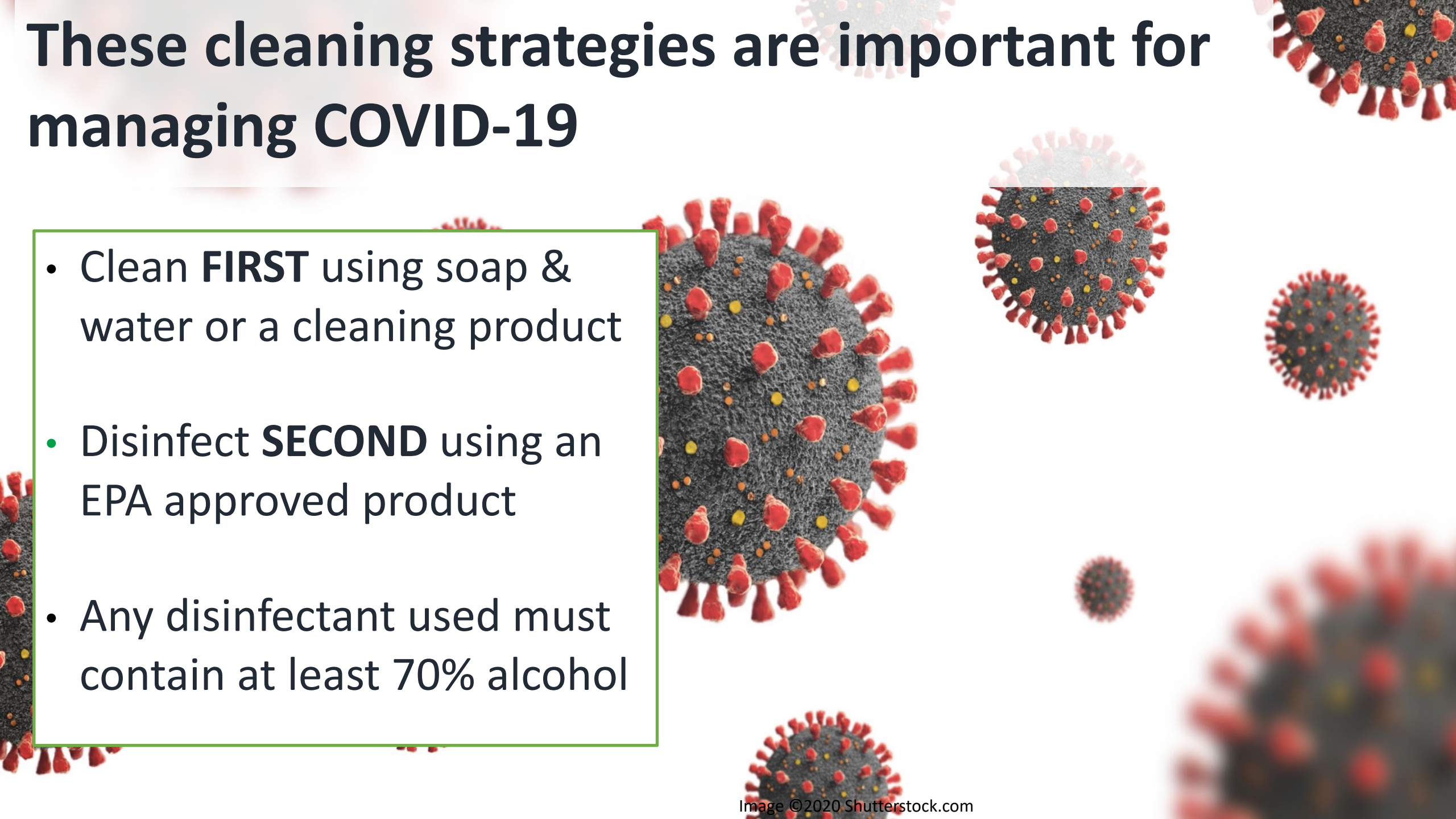
These cleaning strategies are important for managing COVID-19

- Clean **FIRST** using soap & water or a cleaning product
- Disinfect **SECOND** using an EPA approved product
- Any disinfectant used must contain at least 70% alcohol



Keep it Ventilated

Changes to Building

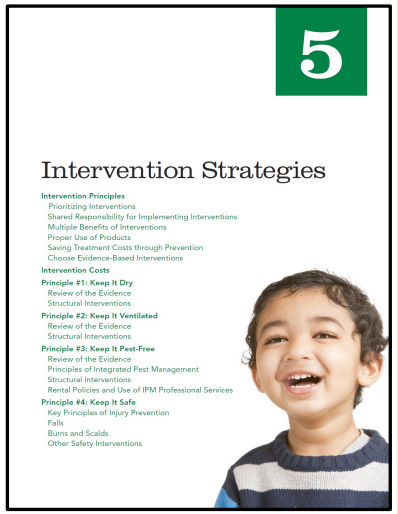


Figure 5.7 Ventilation Interventions

- Remove airborne contaminants through proper exhaust ventilation.
- Supply fresh air through dilution ventilation.
- Test for and conduct radon remediation as needed.

Residents and Owners

- Check that fans vent to outside
- All stoves/furnaces in good working condition
- Don’t run gas, oil, charcoal heaters inside
- Change filters on furnaces regularly

Filters have a common rating system for determining their efficiency at removing particles from the air.

Minimum Efficiency Rating Value* (MERV)

ASHRAE Standard 52.2 – Efficiency in collecting very small particles

Standard MERV Ratings

MERV Ratings		
MERV	**Particle size**	**Typical controlled contaminant**
1-4	>10.0	*Pollen, sanding dust, textile and carpet fibers*
5-8	**3.0-10.0**	*Mold, spores, hair-spray, cement dust*
9-12	**1.0-3.0**	*Legionella, lead dust, welding fumes*
13-16	**0.3-1.0**	*Bacteria, most tobacco smoke, insecticide dust, copier toner*
17-20	≤ 0.3	*Virus, combustion particles, radon progeny*

Filtration – What you should know

- Higher rating does help filter important particles and allergens from the air
- But studies in actual homes show A LOT of variation. Factors to consider:
  - Run time
  - Filter seated and sealed
  - Filter thickness
  - Filter media

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When furnace filters are installed it’s important to make sure it is properly seated and some kind of cover is in place over the filter access panel. If not, the air will bypass the filter making it useless

Portable Room Air Cleaners

Portable room purifiers can work well for removing airborne particles, fibers, pollen, molds, allergens, smoke and other debris.

But you must be careful when purchasing and do your research. Not all devices work the same or as well.

Portable room purifiers should be purchased based on their **Clean Air Delivery Rate** (CADR) for smoke, dust and pollen. The CADR is based on the approximate area and volume of the room the device will work best in.

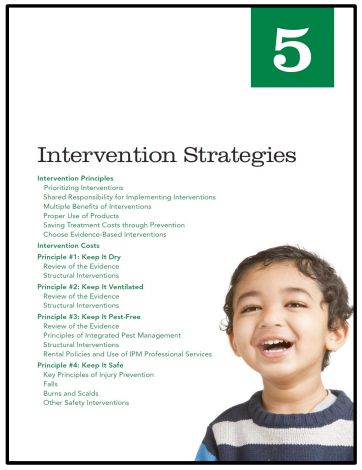
Rated Voltage:	120V~
Rated Frequency:	60HZ
Rated Power:	45W
CADR(Smoke):	280CFM
CADR(Dust):	280CFM
CADR(Pollen):	280CFM
Noise:	29-53db

Here are some interesting ways to build your own simple portable room air purifier

- Can use one filter 1” thick or even 4” thick
- There are 3 filter and 4 filter designs
- Reduces airborne particle by as much as 85%

https://www.energyvanguard.com/blog/how-make-high-merv-diy-portable-air-cleaner

Keep it Contaminant-free



Residents and Owners

Figure 5.19 Principles to Keeping It Contaminant-Free

- Safely address lead-based paint hazards.
- Be aware of volatile organic compounds when making purchases.
- Control occupational take-home hazards.

Changes to Buildings

- Use low VOC paint, adhesives, and other construction materials
- HEPA cleaners and central vacuum systems
- Use lead-safe work practices and hire trained professionals
- Hire asbestos professionals to deal with friable asbestos
- Install radon control in new and existing homes
- Set smoke-free policies

There are now many excellent alternative products for home use that don't have VOCs, but are they healthy?

Review third-party certifications to help choose the right product for you.

- ECOLOGO
- Environmental Stewardship Program (ESP)
- EPA Design for the Environment (DfE)
- EPA Safer Choice
- Green Label Plus
- Green Seal
- Green Shield Certified
- QualityPro for Pest Management

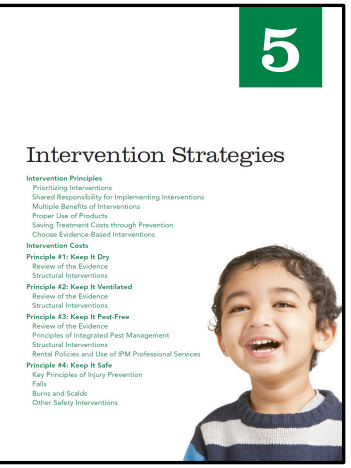
Keep it Dry

Resident and Owners

Check for moisture and condensation regularly

Tenants - report leaks to landlord at first sign of problem

Simple steps to control moisture



Changes to Building

Figure 5.2 Key Structural Controls for Moisture

1. Limit water entry (e.g., maintain gutter systems).
2. Dehumidify damp spaces such as basements.
3. Repair leaks and assure that drains work properly.
4. Clean or properly remove wet or moldy building components.
5. Manage ventilation systems so that moisture is removed at the source.

Controlling indoor molds & microbial agents

Dry up wet areas within 48 hours

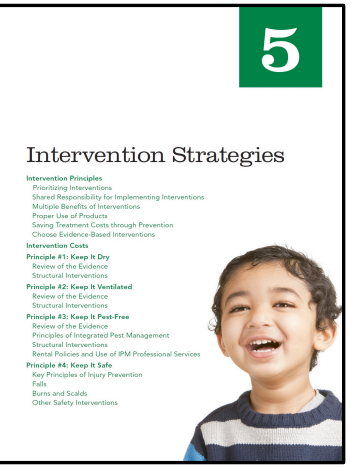
Ventilate moisture sources

Replace mold-contaminated materials

Don’t let warm, dark, humid places serve as incubators

Consider using a dehumidifier

Maintain and service moisture-generating appliances



Barnes CS, Horner WE, Kennedy K, Grimes C, Miller JD., Home assessment and remediation. J Allergy Clin Immunol Pract 2016;4:423-31

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KEEP IT DRY

When water gets in and can't dry out, it leads to microbial growth on surfaces

Image ©2020 Building Performance Institute

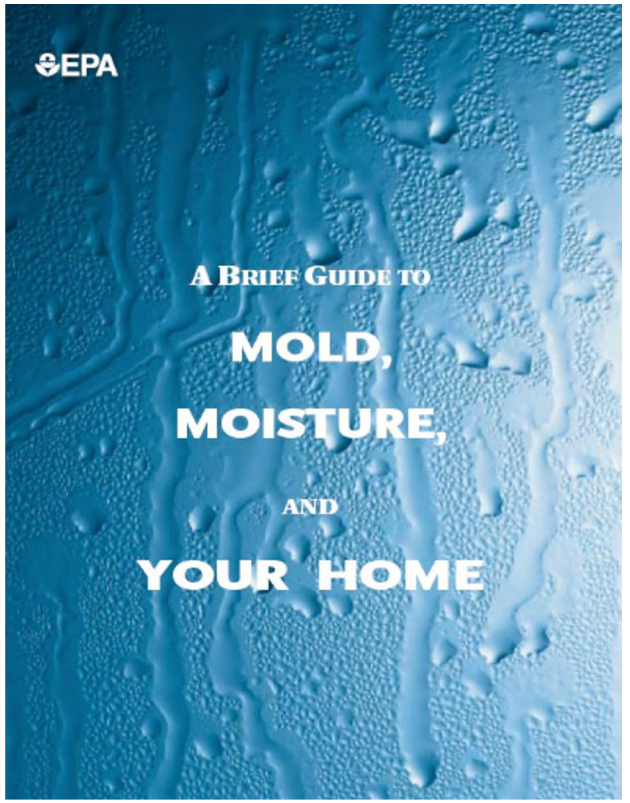
People have a lot of misconceptions about mold

Common misconceptions:

- “It’s ok - it’s dried up.”
- “I have to use bleach on it.”
- "Dead mold is no longer a concern”
  Important – dormant or dead molds still contain allergens that can cause allergic reactions

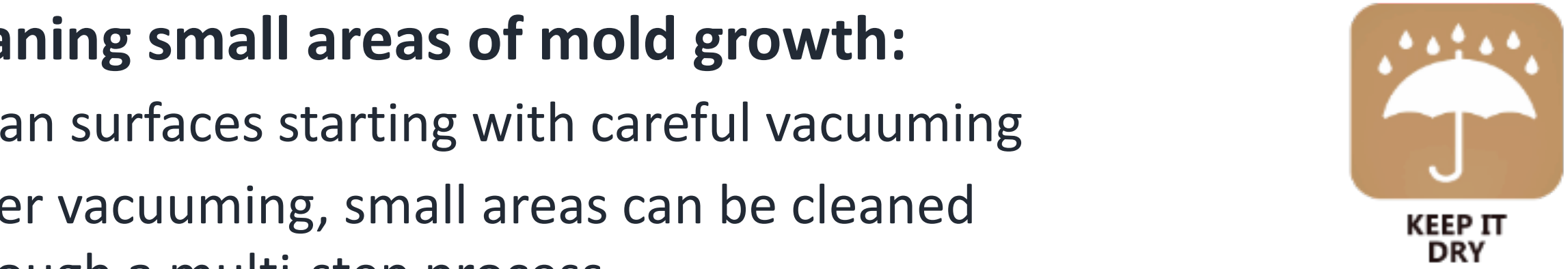
Mold clean up – what's size area is safe for a homeowner to address?

Look for guidance from EPA

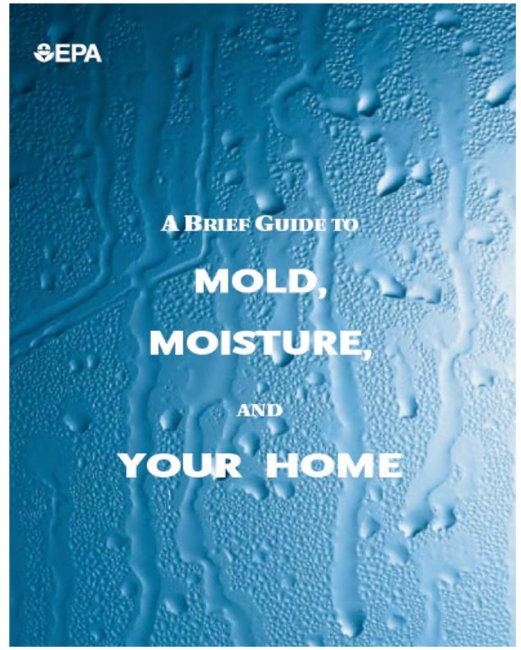


Cleaning small areas of mold growth:

- Clean surfaces starting with careful vacuuming
- After vacuuming, small areas can be cleaned through a multi-step process



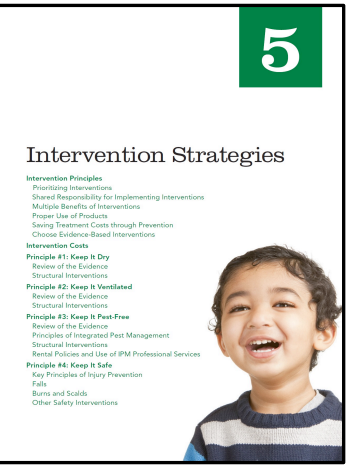
From EPA guidance



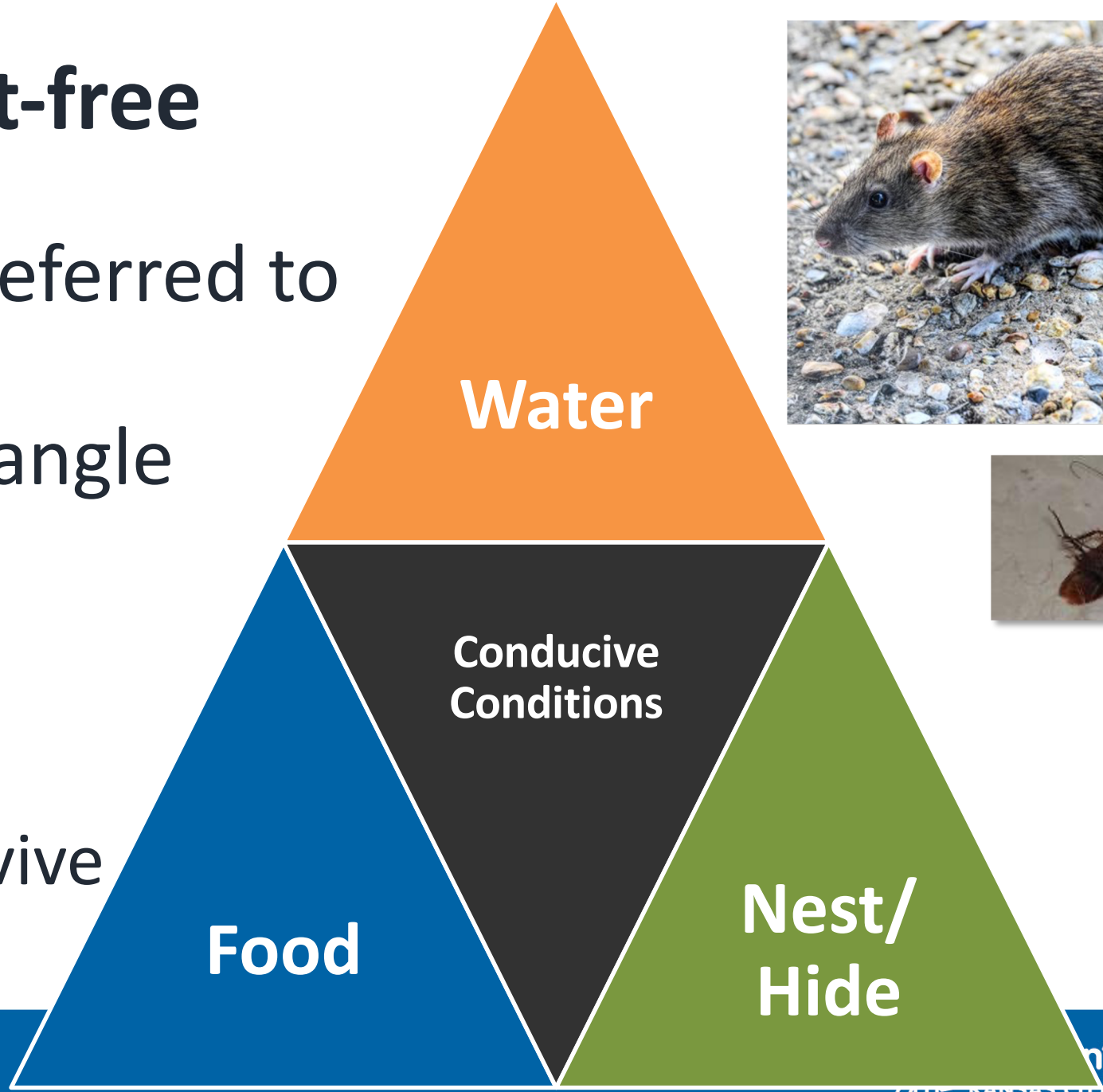
Keep it Pest-free

KEEP IT
PEST-FREE

This is referred to as the
Pest Triangle



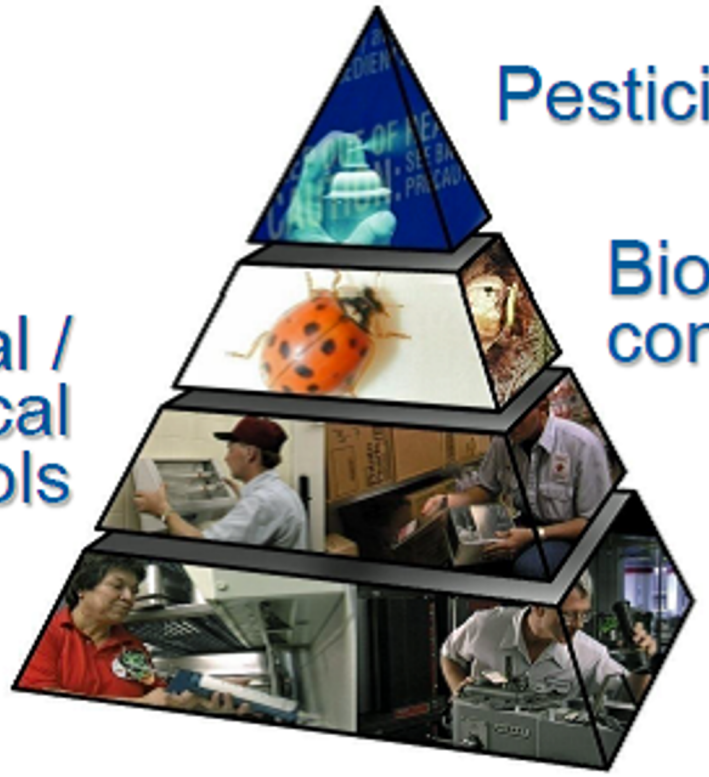
These are required for pests to survive



The best way to address pests is

Integrated Pest Management* (IPM)

- The best approach to managing pests
- HUD, CDC, EPA, the National Pest Management Association all consider it the best practice in managing pests
- Not new, unproven or radical
- HUD has implemented IPM since 1995

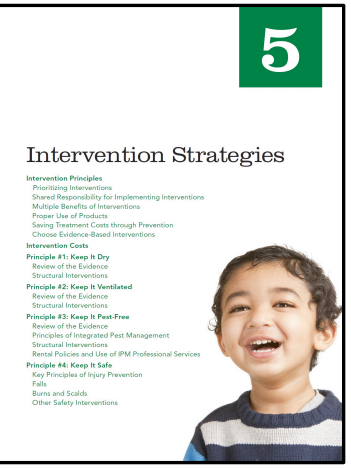


Keep it Pest-free: use Integrated Pest Management (IPM)

Residents and Owners

Figure 5.10 Principles for Keeping It Pest-Free

- Educate residents/tenants
- Reduce moisture
- Remove harborages
- Eliminate food sources
- Use low toxicity pesticides as needed
- Monitor

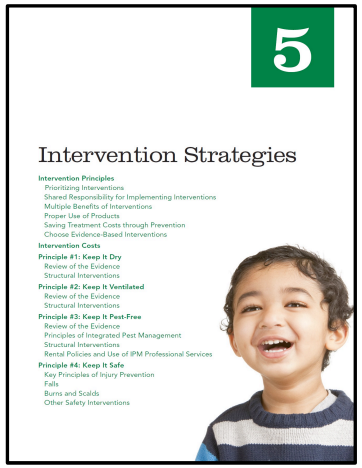


Changes to Buildings

- Use gel baits and traps
- Seal holes with low VOC caulk and copper mesh screens
- Correct all water leaks
- Trash cans with tight-fitting lids
- Clean trash chutes regularly
- Place trash dumpsters on pads at least 50 ft. from building
- Seal rat burrows

Cockroach integrated pest management (IPM)

KEEP IT PEST-FREE



Close <u>all</u> points of access

- Especially under sinks

Remove food sources

- Remove trash nightly
- Covered garbage containers
- Food in sealed containers
- Limit areas for eating & drinking
- Don't leave pet dishes out

Teach caution

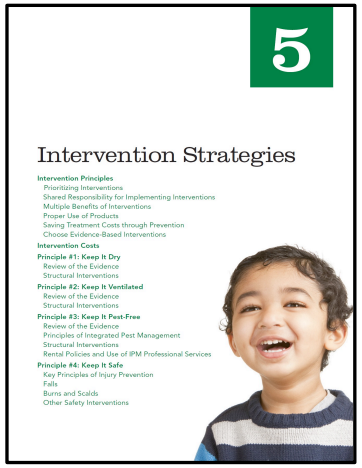
- Try bait stations, gel baits first
- Boric acid in hidden areas
- Sprays only for major infestations
- Targeted application
- NO bug bombs

Mouse IPM - similar to roaches

KEEP IT PEST-FREE

Close <u>all</u> points of access

- Especially near water sources



Remove food & water sources

- Remove trash; cover containers
- Food stored in sealed containers
- Eating & drinking in limited areas
- Don't leave pet dishes out

Traps, not chemicals

- Snap traps first
- Pick up traps every 5 days, put back after 3 days

Keep it Safe

KEEP IT SAFE

Residents and Owners

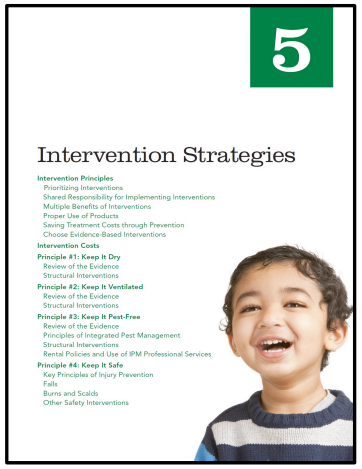


Figure 5.12 Principles for Keeping It Safe

- Educate residents/tenants.
- Prevent falls by installing railings on stairways and grab bars in bathrooms.
- Keep hot water temperature maximum at 120 degrees.
- Ensure that smoke and carbon monoxide alarms are working and in the right locations.
- Store chemicals and medicines properly.

Changes to Building

- Stairs and railings in good repair
- Grab bars
- Good lighting
- Non-skid flooring
- Anti-scald controls
- Fences around pools
- Smoke and CO alarms on all floors
- Cord ties for blinds
- Cabinet locks under sinks

KEEP IT COMFORTABLE

Keep it Comfortable

manage heat transfer, air flow and moisture

- Air sealing reduces infiltration of pollutants and improves source control

- Insulating to maintain thermal control and energy use

Insulation reduces heat transfer but is much more effective if air sealing has taken place first!

Keep it Maintained

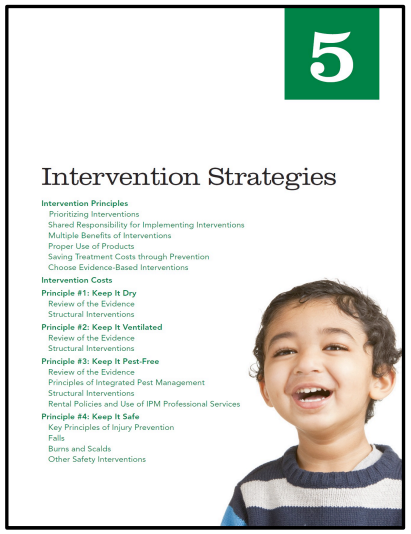


Figure 5.25 Principles for Keeping It Maintained

- Conduct preventive maintenance and regular inspections.
- Respond to maintenance concerns in a timely manner.
- Keep dust levels low through regular cleaning.
- Address hoarding behavior.

AFTERNOON BREAK

2:00PM - 2:15PM

Check out all of the resources we have put together!

https://idph.iowa.gov/Environmental-Health-Services/Childhood-Lead-Poisoning-Prevention/resources

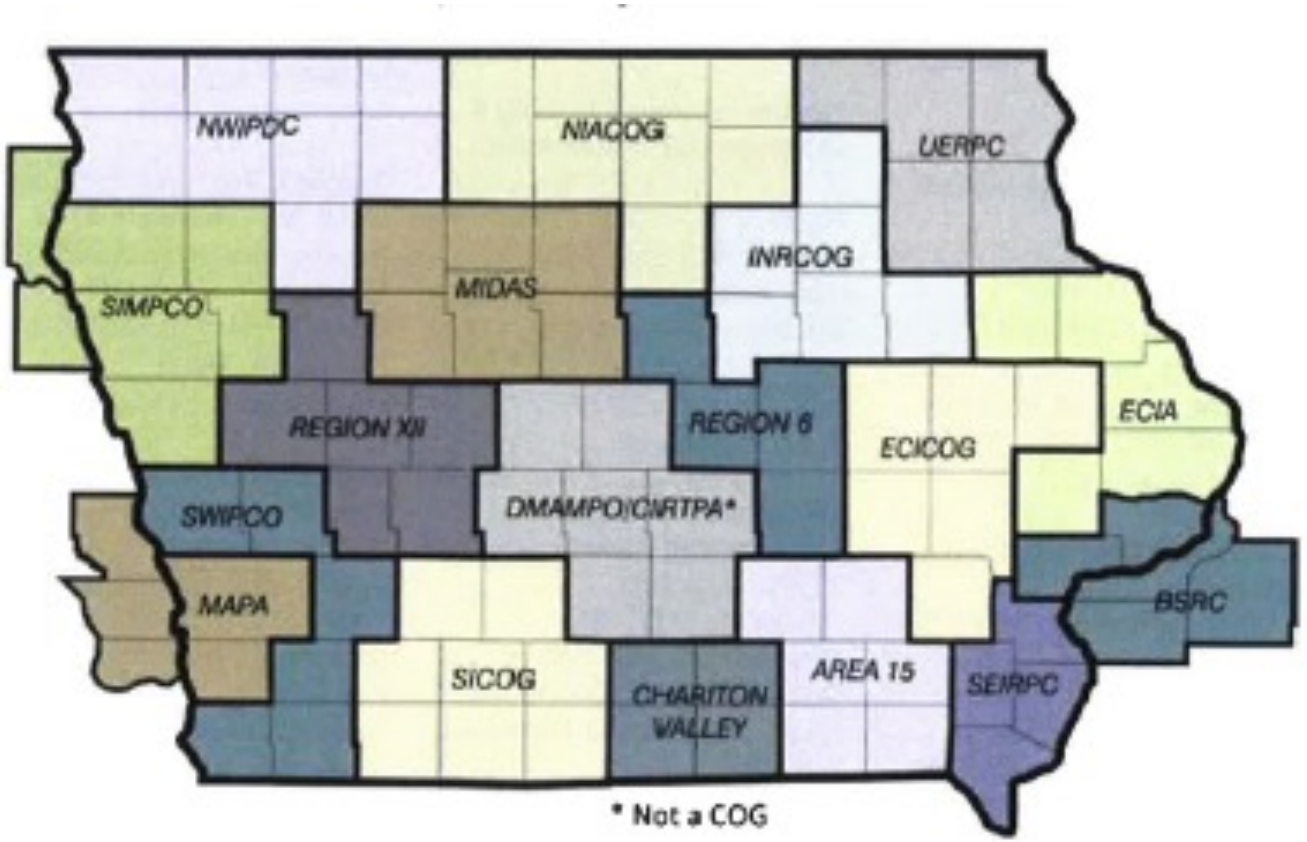
Bringing Together Partners for a Successful Lead Hazard Control Program

Presented by: Elizabeth Kemp & Kim Glaser

Learning Objective

- This presentation will explain how to identify partners and how ECIA has been successful.

Iowa Council of Government Map



https://www.iowacog.com/

ECIA Service Area

Cedar, Clinton, Delaware, Dubuque, and Jackson Counties

East Central Intergovernmental Association
a regional response to local needs

ECIA SERVICES

Individual Services

- Housing (Rental) Assistance
- Homeless Assistance
- Food Insecurity Hotline
- Transit Services
- Home Buyer Down Payment Assistance
- Business Loans – expansion and new start- up projects

City Services

- SUPPORT SERVICES
  - City Treasurer Duties
  - Audit Assistance
  - Mayor/City Council Orientation
- TECHNICAL SERVICES
  - Brownfields Assessment & Cleanup
  - Building Inspections & Code Enforcement
  - City Code Updates & Ordinances
  - Economic Development
  - Grant & Loan Application
  - Transportation & Planning

Lead & Healthy Homes Program

- 2017 Clinton awarded $1,650,000 for lead hazard control and $150,000 healthy homes supplemental funds
  - City of Maquoketa is a partner in this award and is included in the target area and commits to contributing to the required match
  - 54 housing units were made lead safe at program close end of 2020
- 2019 Dubuque County awarded $2,999,996 lead hazard control and $300,000 healthy homes supplemental funds
  - Delaware County requests to be included in the target area 2020 and commits to contributing to the required match
  - Goal is to make 120 Lead safe by program by July 2023
- 2020 Clinton awarded $2,400,000,000 for lead hazard control and $400,700 healthy homes supplemental funds
  - City of Maquoketa is a partner in this award and is included in the target area and commits to contributing to the required match
  - Goal is to make 86 units lead safe by program close July 2024

HUD Lead Hazard Control & Healthy Homes

U.S. Department of Housing and Urban Development

Lead Hazard Control and Healthy Homes

Lead Hazard Reduction Grant Program
FR-6500-N-13
07/12/2021

Before

After

Elizabeth Kemp ekemp@ecia.org or 563-690-5720

Kim Glaser kglaser@ecia.org or 563-690-5774

ECIA https://www.ecia.org/

SIOUXLAND DISTRICT HEALTH DEPARTMENT

A Healthy Community for All.

Siouxland Healthy Homes Coalition

Growing a Successful Coalition = Community Partnerships

Alicia Sanders

Environmental Specialist

EBL Inspector/Risk Assessor

Learning Objective

- Provide tools for coalition building as well as sustaining a coalition.

SIOUXLAND DISTRICT HEALTH DEPARTMENT

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Siouxland Healthy Homes Coalition

- **3 Phases:**
  1. Growing the Coalition.
  2. How Can the Coalition Help You?
  3. Sustaining and Continuing to Grow the Coalition.

SIOUXLAND DISTRICT HEALTH DEPARTMENT

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Phase 1: Growing the Coalition

- The Siouxland Healthy Homes coalition began meeting in July 2013.
- Previously was the Siouxland Childhood Lead Poisoning Prevention Coalition.
- A Few Months Before the Meeting:
  - Recruitment, invite individuals and organizations.
  - Schedule meeting.
  - Promote the meeting.
  - Research and follow the National Center for Healthy Homes standard of 7 principles (more principles have been added since 2013).
  - The fun begins….

SIOUXLAND DISTRICT HEALTH DEPARTMENT

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Phase 1: Growing the Coalition

- **The first meeting:**
  - 20 people attended.
  - Presentation about what is a healthy home. Shared information from the National Center for Healthy Housing and the CDC (presentation included information about childhood lead poisoning prevention).
  - After the presentation we discussed and learned about each agency and how that agency fits into the idea of Healthy Homes.
  - Discussed recruitment of individuals and agencies.
  - Discussed meeting days/times.
  - Healthy homes is a topic that the group wants to continue to work on and grow.
- **Homework:**
  - Coalition members were tasked with thinking about goals/objectives for next meeting.
  - Recruitment of members.

Phase 2: How Can the Coalition Help You?

- **Researched the CDC's "Developing a Healthy Homes Program".**
  - The Coalition Created: Vision, Mission Statement and Core Values.
- **2014 Survey to professionals who conduct home visits.**
  - Utilized survey monkey.
  - 35 surveys received.
  - Questions were focused on the 7 principles of a healthy home.
- **Due to the survey:**
  - 2014: Bi-monthly newsletters.
  - 2015: Healthy Homes Checklist (English and Spanish).
  - Both can be found at www.siouxlanddistricthealth.org search for "Healthy Homes".
- **Meetings began to have "Presentations".**
  - Presenters from area agencies.
  - Topics included a variety of healthy homes issues: Pest Management, City of Sioux City HUD grant, Iowa Poison Control Center, Radon, Prescription Take Back programs, Animal Control, etc.

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Phase 2: How Can the Coalition Help You?

Healthy Homes Issues the coalition has worked on:

- **Prescription take back programs:**
  - Contacted pharmacies and area hospitals.
  - Promote the DEA prescription take back program in spring and fall.
  - In partnership with Jackson Recovery Centers and the City of Sioux City Police Department; a prescription drug take back lock box is now offered at the Sioux City Police Department (2015).
- **Hoarding:**
  - Created a hoarding resource hand out.
  - A separate hoarding coalition started meeting at area hospitals.
- **Radon:**
  - Promote testing.
  - Worked with area builders to encourage radon systems in new homes.

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Phase 2: How Can the Coalition Help You?

Healthy Homes Issues the coalition has worked:

- **Emergency Contact Information:**
  - Magnet created to assist emergency personnel when responding to residences.
  - Partnered with local Emergency Responders to create magnet.
  - Funds to create magnets provided by a local grant.
- **Partner with the City of Sioux City HUD/Lead Grant**
  - Representative would share updates at coalition meetings.
  - Newsletter focused on lead prevention and promoting the HUD grant.
  - Annual letters to property owners includes flyer about HUD grant.
- **Childhood Lead Poisoning Prevention Education.**
  - Always on-going.
  - Included in every bi-monthly newsletter, every coalition meeting, and on the coalition checklist

SIOUXLAND DISTRICT HEALTH DEPARTMENT

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Phase 3: Sustaining and Continuing to Grow the Coalition

- Continue partnerships.
- 2013 – 2020 Continued to hold bi-monthly coalition meetings.
- Continue to send out bi-monthly coalition newsletters.
- In 2018 conducted a second survey to in-home professionals:
  - A lot of staff changes from 2014.
  - Survey questions were the same.
  - Not as many responses in 2018.
  - Responses were very similar to the 2014 survey.
  - Newsletters and coalitions meetings were focused on survey responses.
- January 2020: Presentations to realtors:
  - Geared towards lead education when buying/selling a home.
  - Also provided Healthy Homes information.
  - Realtors became members of the coalition.

Phase 3: Sustaining and Continuing to Grow the Coalition

- This will be an interesting year!
- The coalition has not met since January 2020.
- Potentially begin meeting again in fall 2021 or winter 2022.
  - Follow Phase 1.
  - Recruitment of new/existing members.
    - Coalition members have moved on.
    - Roles have changed.
    - More people are at home now.
  - Promotion and education to other agencies.
  - Update newsletters, checklist, provide additional resources.
  - Setting new goals.
- On-going: newsletters, checklist, education and outreach, partnering with agencies, childhood lead poisoning prevention.
- 2021: Began partnering with Maternal Child Health Program.

SIOUXLAND DISTRICT HEALTH DEPARTMENT

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Where You Can Find Us:

- www.siouxlanddistricthealth.org
  - Search for “Healthy Homes” or
  - Search for “Lead”.

SIOUXLAND DISTRICT HEALTH DEPARTMENT

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Thank You!

Contact Information:

Alicia Sanders

asanders@siouxlanddistricthealth.org

712-279-6119

SIOUXLAND DISTRICT HEALTH DEPARTMENT

A Healthy Community for All.

BLACK HAWK COUNTY HEALTH DEPARTMENT AND WATERLOO COMMUNITY DEVELOPMENT: HEALTHY HOMES COLLABORATION

Andrea Magee
Black Hawk County Health Department
Healthy Homes Coordinator
(319) 292-2224
amagee@blackhawkcounty.iowa.gov

Matt Chesmore
Waterloo Community Development
Senior Rehabilitation Specialist
(319) 291-4429
matt.chesmore@waterloo.ia.org

LEARNING OBJECTIVE:

Discuss increase in positive EBL outcomes due to collaborative efforts in the city of waterloo between waterloo community development and the black hawk county health department.

Waterloo Community Development and Black Hawk County Health Department Collaboration

Waterloo Community Development

- Recent recipient of an approximately $3million grant from the U.S. Department of Housing and Urban Development (HUD).
- Focus on keeping families and their children safe from lead-based paint and other home health and safety hazards.
- 3-year grant, goal of serving over 100 families.
- Emphasis on serving low-moderate income neighborhoods with homes older than 1978.

Black Hawk County Public Health

- Certified Lead Inspection/Risk Assessors (LIRA).
- Healthy Homes Assessors
- Conduct education and outreach activities
- Clinical service for blood tests for children.

History of the Partnership

- Waterloo Community Development
  - Waterloo Eliminates Lead Hazards
    - 2003, 2007, 2011

- Lead Hazard Control and CDBG Funding

- Current Model
  - Black Hawk County
  - ~ 4 years
    - 2017 & 2020
  - 2nd Grant Cycle

Lead-Based Paint Hazard Control Program

Help your child stay safe from lead.

- ✓ If lead paint removal is needed, hire trained and certified professionals to remove it.
- ✓ Keep children away from the area.
- ✓ Pregnant women should also stay away.

Keep your home clean.

- ✓ Ask at a hardware store about lead-specific cleaning products.
- ✓ Clean weekly. Use a solution of water and cleaner to wet-mop floors and wipe windowsills and other surfaces. Don't reuse cloths or sponges on dishes or counters.
- ✓ Avoid dry-dusting and sweeping. This can spread lead dust. Use standard vacuums only of you can't see any dust or flaking paint on floors or carpets.
- ✓ If you work with lead, shower and change before coming home and wash work clothes separately.
- ✓ Wipe dirt off shoes before coming inside.

Lead Program, Housing Rehabilitation Program, Emergency Repairs Program, and Home Buyer Program Income Guidelines

Maximum Annual Income Equals 80% of Waterloo Median	
Household Size	Maximum Annual Gross Income
1	$33,900.00
2	$38,750.00
3	$43,600.00
4	$48,400.00
5	$52,300.00
6	$56,150.00
7	$60,050.00
8	$63,900.00
Income Guidelines Change Annually	

For more information on any of our housing programs, contact us at 291-4429.

WaterLoo Eliminates LeAd HazarDs

LEAD-BASED PAINT HAZARD CONTROL PROGRAM

Waterloo Community Development
319-291-4429

Black Hawk County Health Department
319-291-2413

Homebuyer and Housing Rehabilitation Programs

Why learn about your child's lead level?

Lead can be very harmful to children.

- ✓ Low to moderate levels of lead may damage a child's brain and nervous system. This may cause problems with hearing, behavior, and learning.
- ✓ High levels of lead may cause coma, convulsions, and death.

Lead may be around your home.

- ✓ There are many possible sources, including paint, water, food, and soil. Some cosmetics, hobby supplies, antiques, and toys may also be sources.

Free testing for exposure to lead is available at the Black Hawk County Health Department: 319-291-2413.

What the test results mean.

If blood lead level is...	A child needs...
0-9 mcg/dL	No further action. Re-screen as recommended.
10-14 mcg/dL	Follow-up testing within 3 months.
15-19 mcg/dL	Follow-up testing within 2 months.
20-44 mcg/dL	Medical evaluation and care. Inspection for and removal of lead hazards in the child's environment.
45-69 mcg/dL	**All started within 48 hours:** Medical evaluation and care. Inspection for and removal of lead hazards in the child's environment.
70 mcg/dL or higher- **MEDICAL EMERGENCY**	**Immediate:** Hospitalization and treatment. Inspection for and removal of lead hazards in the child's environment.

(mcg/dL means micrograms of lead per deciliter of blood)

City of Waterloo Available Programs

Lead-based Paint Hazard Control

The Lead Program will contract with Black Hawk County Health Department to identify lead hazards in your home, free of charge. A licensed contractor will remove identified hazards through our program. All Lead Program clients must meet income eligibility requirements. See chart on back for income limits.

Housing Rehab Loan Program

The Housing Rehabilitation Program helps to correct housing code violations, improve energy efficiency, and provide a safer and healthier environment for the residents of Waterloo. Lead-based paint hazards must be addressed.

Emergency Repairs Program

Funds are used to eliminate safety and health code violations, which include but are not limited to the following types of repairs:

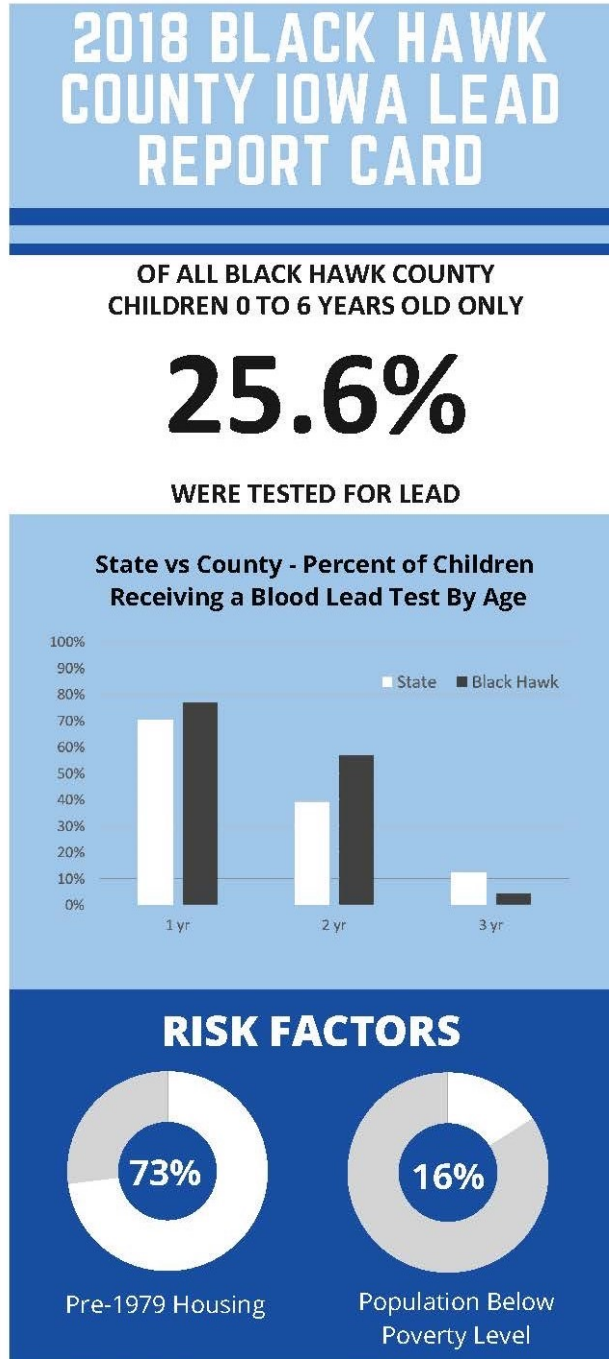
- ✓ Heating, Roofing, Plumbing, Electrical

Home Buyer Program Waterloo Housing Partnership

The Home Buyer Program is designed to assist low-income households, one time only per household, when purchasing a home with down payment assistance. Lead-based paint hazards must be addressed.

Black Hawk County CLPPP

- Program goal is to provide services to increase community awareness about the hazards of lead exposure and increase the number of children assessed and appropriately blood tested for lead poisoning through monitoring and surveillance.
- Lack of resources to communities (rural) when it comes to remediation/mitigation repairs regarding funding for residents with EBL child.
- Referrals are given to WCD when child meets criteria for environmental investigation where lead hazards can be identified and remediated.



Healthy Homes (LHC) and CLPPP

Referrals

- Waterloo Children and families
- Provide information on the Healthy Homes (Lead-Based Paint Hazard Control Program

Alerts via HHLPSS (Healthy Homes and Lead Poisoning Surveillance System)

- Environmental investigation is required after two venous levels of 15-19mcg/dL or one venous level over 20 mcg/dL
- Contact family and property owner to give information on WCD program, if interested Community Development will take homeowner and/or tenants through qualifying process
- EBL cases take priority, lead inspection/risk assessment is set up and conducted
- Repairs are made to property and clearance testing followed

Referrals

- Reducing and or mitigating lead exposure for families, EBL children and future inhabitants
- Improving quality of life of homeowners and renters who live in the community
- Neighborhoods may increase housing value as home improvements are made
- BHCHD has referred **32** families to WCD since 2018
- **4** have utilized program for lead hazard remediation

Lead Free KIDS for a Healthy Future

Benefits

- Reduces lead exposure for children, especially those identified through CLPPP with EBL
- Collaboration between various organizations withing the community
- Provides a safer and healthier home for family and children to live
- Identifies lead hazards and other necessary repairs needed to make home safer.

Challenges

- Hesitation from area landlords to participate in program
- Limitation regarding meeting qualifications
- Finding quality contractors who meet or willing to complete the lead abatement certification

Outcomes

- Reducing and or mitigating lead exposure for families, EBL children and future inhabitants
- Improving quality of life of homeowners and renters who live in the community
- Benefits the community interactions and stabilizes Waterloo neighborhoods

Thank You!

DISCUSSION SECTION

Send your questions for presenters In the chat!

THANK YOU!

Check out our website!

Don't forget to fill out your CEU evaluation.

The recording of today's learning collaborative will be posted online for viewing with CEUs available until October 16th!

IDPH
IOWA Department of PUBLIC HEALTH

IOWA
Institute of Public Health Research and Policy