

WRITTEN TESTIMONY OF

DAVID E. JACOBS, Ph.D., CIH

**Chief Scientist,
National Center for Healthy Housing**

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UNITED STATES SENATE**

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and Community Development**

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Thank you for the opportunity to discuss health and safety in federally assisted housing. My remarks today will show the enormous burden and cost associated with our nation's failure to construct, maintain, and preserve housing that supports good health. They will also show that proven and practical solutions exist yet remain to be implemented at the scale needed. After all, it makes no sense to treat a child's asthma attack or lead poisoning in a hospital emergency room, only to release that child back into the home that caused the illness in the first place.

Healthy Housing, Covid, and Overall Trends

There is alarming new evidence that the necessary increased time spent at home to help mitigate the Covid pandemic also led to increased housing-related illnesses such as lead poisoning from paint. Blood lead testing declined dramatically by 34% according to the latest data from CDC,¹ and one state reported that childhood lead poisoning has increased by 27% and a shocking 367% increase in hospitalizations for childhood lead poisoning.²

New data from HUD also show that the number of homes with deteriorated lead paint actually increased by 4.6 million homes from 2005 to 2018 as the housing stock continues to age.³ Homes in rural areas have about the same prevalence of lead paint hazards as do urban areas.

Children of color and those from low-income families are at much higher risk, a significant environmental justice concern.^{4 5}

HUD reported in 2017 that 7.7% of HUD-assisted housing was either severely or moderately inadequate. In public housing, the figure was 11.8% and in voucher housing it was 6.4% (these are likely underestimates because they do not include such recognized hazards such as lead paint, asthma triggers and mold).⁶

¹ Courtney JG, Chuke SO, Dyke K, et al. Decreases in Young Children Who Received Blood Lead Level Testing During COVID-19 — 34 Jurisdictions, January–May 2020. *MMWR Morb Mortal Wkly Rep* 2021;70:155–161. DOI: <http://dx.doi.org/10.15585/mmwr.mm7005a2external icon>

² Email to Leadnet from Ben Haygood, New Jersey Environmental Health Policy Director for Isles, Inc, March 30, 2021. Leadnet listserv is operated by the National Center for Healthy Housing

³ Presentation from HUD: Findings on Lead-Based Paint/Hazards from the American Healthy Homes Survey II. CDC Lead Exposure and Prevention Advisory Committee Meeting. Peter Ashley. May 14, 2021

⁴ Timothy Dignam, Rachel B. Kaufmann, Lauren LeStourgeon, Mary Jean Brown. Control of Lead Sources in the United States, 1970-2017: Public Health Progress and Current Challenges to Eliminating Lead Exposure. *Journal of Public Health Management and Protection*. January/February 2019. Volume 25, Number 1 Supp p. S13-S22.

⁵ Whitehead LS, Buchanan SD. Childhood lead poisoning: a perpetual environmental justice issue? *J Public Health Manag Pract*. 2019;25(1 Supp):S115-S120.

⁶ Eggers F. Characteristics of HUD-Assisted Renters and Their Units in 2017. HUD Office of Policy Development and Research. March 2020.

A recent study showed private water wells in rural areas, which are not regulated by EPA, showed that lead was detected in tap water in 48.3% homes.⁷

Nationally, 35 million homes have at least one safety or health hazard.⁸ The need for further action is urgent.

Housing and Health

These and other data demonstrate that the nation is faced with an affordable housing crisis and a health care crisis. In general, we have treated them as if they were separate issues. On the medical side, we often wait until people become seriously ill until treatment begins. On the housing side, we often wait until conditions become so bad that maintenance and capital improvement costs increase. Recognizing how the two are related and how each can be optimized will save billions of dollars and reduce needless pain and suffering if we rely on the evidence.

Housing is deteriorating. We have deferred both needed maintenance and capital improvements in both federally assisted housing and low-income unassisted housing and we have not constructed enough new housing. Moreover, we have not adopted sufficient smart healthy housing policies. As a result, we are faced with escalating housing costs and ever-increasing health care costs.

Improved investment in federally assisted and other low-income housing will help mitigate specific health hazards, preserving both housing affordability and reducing health care costs.

My Background

I am a scientist and a low-income housing provider. I am currently the Chief Scientist at the National Center for Healthy Housing (NCHH) and also board president of Lincoln Westmoreland Housing, a non-profit inter-racial faith-based housing organization here in DC. I also serve as director of a World Health Organization Collaborating Center on Healthy Housing in the US, an adjunct professor at the University of Illinois at Chicago School of Public Health and a board member of the nation's only professional association of lead paint inspectors and remediation businesses, the Lead and Environmental Hazards Association. Today I represent NCHH.

NCHH is a national technical, scientific and policy non-profit organization dedicated to developing and promoting practical scientifically validated measures to protect children from residential environmental hazards while preserving affordable housing and reducing inequities. NCHH develops valid and practical strategies to make homes safe from

⁷ Geiger SD, Bressler J, Kelly W, Jacobs DE, Awadalla SS, Hagston B, Onwuta U, Panier C, Dorevitch S. Predictors of Water Lead Levels in Drinking Water of Homes With Domestic Wells. J Public Health Manag Pract. 2020 Nov 27. doi: 10.1097/PHH.0000000000001255. Epub ahead of print.

⁸ National Center for Healthy Housing, State of Healthy Housing (data from American Housing Survey). Dec 31, 2020. <https://nchh.org/tools-and-data/data/state-of-healthy-housing/executive-summary/>

hazards, to alert low- income families and occupants about housing-related health risks, and to help parents protect their children from unhealthy housing.

Previously, I served as the Director of the Office of Healthy Homes and Lead Hazard Control at the U.S. Department of Housing and Urban Development from 1995 – 2004. I was the principal author of the first federal interagency strategy to address childhood lead poisoning for the President’s Task Force on Environmental Health and Safety Risks to Children in 2000, a report to Congress launching the healthy homes initiative and I have published many peer-reviewed scientific studies and policy analysis.⁹

Childhood Lead Poisoning Policy Improvements

Passing and implementing specific policy improvements can bring about an end to what can only be described as an epidemic of vast proportions, with over 500,000 children having blood lead levels above the CDC reference value.¹⁰

The solutions to childhood lead poisoning have been validated through extensive research (described later in detail) but they remain to be implemented at the scale needed to eliminate childhood lead poisoning as a significant public health problem. Specifically, Congress should:

- Provide increased appropriations for lead and healthy homes programs at HUD, CDC and EPA. The House recently provided \$460 million in its appropriations bill for HUD’s lead and healthy homes program, but the National Safe and Healthy Housing Coalition has recommended \$600 million.¹¹ Congress is to be commended for significantly increasing appropriations in recent years, but the need remains far greater. Failure to increase appropriations will mean increased future costs that could be avoided, as documented in many cost-benefit analyses.¹²
- Include lead paint in infrastructure plans and funding. Lead is unfortunately part of our housing infrastructure, not just in the air we all breathe and in the water we all drink. Both water pipes and lead paint need to be included in the infrastructure plan. The 2008 financial crisis showed that housing is part of our infrastructure; failure to invest in it adequately threatens our entire economy. The National Center for Healthy Housing recently sent a letter to Congress¹³ signed by over 80 housing, health, weatherization, environmental justice, and parent’s community

⁹ Partial listing available: <https://www.ncbi.nlm.nih.gov/myncbi/1JOvfKctLhqAv/bibliography/public/>

¹⁰ CDC Lead Exposure and Prevention Advisory Committee. May 14, 2021. <https://www.cdc.gov/nceh/lead/advisory/lepac-meeting-5-14-21.html>

¹¹ National Safe and Healthy Housing Coalition, FY 2022 Letter on HUD, CDC, and EPA Appropriations. June 30, 2021. <https://nchh.org/build-the-movement/nshhc/take-action/action-letter-archive/2021-letters/>

¹² 10 Policies to Prevent and Respond to Childhood Lead Exposure: An assessment of the risks communities face and key federal, state, and local solutions. Pew Charitable Trusts and Robert Wood Johnson Foundation. Aug 2017. <https://nchh.org/information-and-evidence/healthy-housing-policy/10-policies/>

¹³ Letter to Congress. Infrastructure Should Include Lead Paint And Healthy Homes. May 14, 2021 https://nchh.org/resource-library/letter_2021.05.14_fy22-request-to-congress-on-infrastructure-lead-and-healthy-homes.pdf

organizations requesting \$19 billion for lead paint hazard remediation and \$45 billion for lead water pipe replacement. Studies repeatedly demonstrate that eliminating lead paint on leaky old single-pane windows results in:

- Elimination of a major source of lead poisoning,
 - Job creation
 - Fuel bill reduction
 - Improved energy efficiency
 - Increased home value.
- Increase the supply of lead-safe and healthy homes in the private market, which would enable families in Housing Choice Voucher Section 8 units and other privately owned homes to prevent housing-related illness and injury. Increased appropriations and lead paint funding in infrastructure bills will help meet this need in Section 8 voucher units, because they are eligible for HUD's lead hazard grant programs. Most privately owned homes have not been inspected for lead paint hazards and have not been remediated.
 - Increase technical assistance to local jurisdictions. Local jurisdictions, such as Cleveland, Rochester, Rhode Island, Grand Rapids and many others are adopting new and exciting efforts to address lead and other health hazards in housing in their areas. We and others have provided much-needed technical assistance for such efforts, but the new appropriations and infrastructure funding have increased this need. The additional resources for lead and healthy homes should be accompanied by increased dedicated technical assistance so that local jurisdictions and HUD, EPA and CDC local grantees can spend their appropriations more expeditiously and implement new initiatives more wisely.
 - Update the Lead Paint Law. The nation's main lead paint law¹⁴ has not been updated significantly since it was passed in 1992. The main improvements should include:
 - Eliminating the loophole in the lead paint disclosure law by requiring lead inspections/risk assessments at the time of sale or lease, because most homes have not been inspected. This means parents do not have the information they need to protect their children because they do not know exactly where the lead is located in their own homes. It also means that landlords and owners do not know where their maintenance and capital improvements should be targeted.
 - Although the disclosure rule is a joint regulation between HUD and EPA, only the latter has subpoena authority, which makes compliance assistance and enforcement needlessly bureaucratic. Congress should grant HUD subpoena authority for the lead paint disclosure regulation.
 - Requiring HUD to end the practice of visual assessment of paint in HUD's Housing Choice Voucher Program, because lead paint is not visible to the naked eye. Instead, lead inspections and risk assessments should be required, as is currently the case in public housing and project-based section 8 housing, so that maintenance, rehabilitation, and financing can be directed to lead hazards. Congress has appropriated funding in recent

¹⁴ Title X of the 1992 Housing and Community Development Act

years for this purpose in HCV Section 8 units, but most housing choice voucher units are not assessed properly for lead hazards unless a child has an elevated blood lead level. Congress should explicitly state that HUD has the authority to reform its HCV Section 8 lead paint requirements. In short, taxpayer dollars should not be used to subsidize housing units that poison children.

- Reforming HUD’s single family mortgage insurance program, which was the only HUD program not to be reformed in 1999.¹⁵ It makes little sense to have different requirements in single and multi-family mortgage insurance programs.
- Requiring Fannie Mae, Freddie Mac and FHA to include lead paint risk assessment and remediation in their underwriting standards.
- Requiring housing authorities to integrate their lead inspection data into both maintenance and capital improvements in public housing.¹⁶
- Consolidate all HUD inspection protocols. More than three years ago, Congress asked HUD to consolidate all its housing inspection protocols, but the Department has failed to do so. Its demonstration was delayed, and it is unclear whether HUD has made significant progress.¹⁷ The proposed standards are far too weak. HUD should adopt the National Healthy Housing Standard, which was developed by the National Center for Healthy Housing and the American Public Health Association and introduced by two former HUD Secretaries. This model code is based on years of experience and is referenced to the extensive scientific literature on housing deficiencies and the methods that are proven to work.¹⁸
- CDC should update its blood lead surveillance data, which has not been done since 2017, 4 years ago.¹⁹ Some states still do not report their blood lead data to CDC.
- EPA should be tasked with conducting increased training so that local jurisdictions can improve their staffing, lead testing and remediation capacity.
- Streamline low-income eligibility criteria across all programs that influence lead hazards, instead of confusing and inconsistent requirements, including HUD’s lead hazard control and demonstration programs, CDBG, HOME, DOE’s weatherization assistance programs, LIHEAP, Medicaid, CHIP, and allied programs. There is no reason to have different definitions of “low-income” across these programs.

¹⁵ 24 CFR Part 35, subpart E, 1999

¹⁶ Jacobs DE. Lead poisoning in private and public housing: The legacy still before us. Invited editorial. American Journal of Public Health 109(6) 830-832. June 2019.

¹⁷ Department of Housing and Urban Development Real Estate Assessment Center. National Standards For The Physical Inspection Of Real Estate (NSPIRE).

https://www.hud.gov/program_offices/public_indian_housing/reac/nspire/demonstration

¹⁸ National Center for Healthy Housing & American Public Health Association. (2014, May 16). National healthy housing standard. Columbia, MD: National Center for Healthy Housing. Available at

<https://nchh.org/resource-library/national-healthy-housing-standard.pdf>

¹⁹ CDC National Childhood Blood Lead Surveillance Data. 2012-2017.

<https://www.cdc.gov/nceh/lead/data/national.htm>

- Create a lead hazard remediation tax credit. Current IRS regulations permit landlords to deduct lead remediation costs as a business expense, but low- and moderate-income households are not permitted to do so.
- Prohibit US corporations from continuing to manufacture new residential lead paint in other countries, such as Sherwin Williams.²⁰ The US should support the World Health Organization's and other's efforts to ban this dangerous product and other non-essential uses of lead.²¹

Trends in Childhood Lead Poisoning and Environmental Justice

Lead poisoning is a major example environmental injustice. In 1987, a major report on hazardous waste sites showed that Black and other minority communities were more highly exposed to lead.²² CDC data show that the average (geometric mean) blood lead levels in micrograms of lead per deciliter of blood ($\mu\text{g}/\text{dL}$) for Black children is 40% higher than for white children (1.8 $\mu\text{g}/\text{dL}$ and 1.3 $\mu\text{g}/\text{dL}$, respectively). For low-income children vs other children, the difference was 1.6 $\mu\text{g}/\text{dL}$ and 1.2 $\mu\text{g}/\text{dL}$, respectively.²³ The differences in blood lead levels by race, ethnicity and income have remained statistically (and stubbornly) significant.²⁴

This inequity has been reduced as has the overall population blood lead level, due primarily to modern lead hazard control efforts and policies that stopped the production of new residential lead paint in the US, eliminated lead from food canning and gasoline, reduced industrial emissions and others. From 1976-1980 to 2015-2016, the blood lead level of the US population aged 1 to 74 years declined 93.6%, from 12.8 to 0.82 $\mu\text{g}/\text{dL}$. In 2015-2016, 0.2% of children aged 1 to 5 years had blood lead levels of 10 $\mu\text{g}/\text{dL}$ or higher, and 1.3% were 5 $\mu\text{g}/\text{dL}$ or higher (these were the two blood lead trigger levels used in the 1990s and 2010s).²⁵

These improvements have demonstrated that solutions exist, but over half a million children have blood lead levels above the CDC reference value in 2021.²⁶

²⁰ DE Jacobs. Lead Poisoning: Focusing on the Fix. Invited Editorial. J Public Health Management Practice, 2016, 22(4), 326–330.

²¹ Global Alliance to End Lead Paint. UN and WHO. <https://www.unep.org/explore-topics/chemicals-waste/what-we-do/emerging-issues/global-alliance-eliminate-lead-paint>

²² Toxic Wastes and Race In The United States A National Report on the Racial and Socio-Economic Characteristics of Communities with Hazardous Waste Sites. Commission For Racial Justice. United Church of Christ. 1987. <https://www.nrc.gov/docs/ML1310/ML13109A339.pdf>

²³ Blood Lead Levels in Children Aged 1–5 Years — United States, 1999–2010. Morbidity and Mortality Weekly Report. Vol. 62, No. 13 April 5, 2013. p. 245. Reported by: William Wheeler and Mary Jean Brown

²⁴ Whitehead LS, Buchanan SD. Childhood lead poisoning: a perpetual environmental justice issue? J Public Health Manag Pract. 2019;25(1 Supp):S115-S120.

²⁵ Timothy Dignam, Rachel B. Kaufmann, Lauren LeSturgeon, Mary Jean Brown. Control of Lead Sources in the United States, 1970-2017: Public Health Progress and Current Challenges to Eliminating Lead Exposure. Journal of Public Health Management and Protection. January/February 2019. Volume 25, Number 1 Supp p. S13-S22.

²⁶ CDC Lead Exposure and Prevention Advisory Committee. May 14, 2021. <https://www.cdc.gov/nceh/lead/advisory/lepac-meeting-5-14-21.html>

In 1991-94, the Centers for Disease Control and Prevention (CDC) estimated that 890,000 children had blood lead levels greater than 10 µg/dL (micrograms of lead per deciliter of blood).²⁷ The data also showed that 16% of low-income children and 21% of African-American children living in older housing where lead-based paint is most prevalent were poisoned, compared to 4.4% for all children at the time. In December of 2000, CDC provided more recent data showing that while some counties had prevalence rates as high as 27%, the average blood lead level in young children had declined by 25% from 1996-99.²⁸ The data showed that the problem is most severe in older housing in both urban and rural areas.

The reason for this improvement is that the nation took action. Congress and government agencies mandated that lead exposures from lead solder in food and infant formula canning, gasoline and new residential and toy paint were eliminated. Lead in air emissions, occupational exposures and water all were controlled and older housing with lead paint is continually being rehabilitated, abated or demolished. Studies of the numerous (but often subtle and asymptomatic) harmful effects of lead were completed and a consensus emerged, reflected in a major report from the National Academy of Sciences.²⁹

Yet if no further action is taken, millions of children will be unnecessarily poisoned in the decades to come. The means and methods to solve this long-running problem are known and Congress should act.

Housing Is the Largest and Most Important Source of Childhood Lead Poisoning

The evidence is overwhelmingly clear that the major high dose source for most children in the U.S. today is existing lead-based paint in older housing and the contaminated dust and soil it generates.^{30, 31} The existing limit for lead in new residential house paint set by

²⁷ Centers for Disease Control and Prevention, "Update: Blood Lead Levels—United States 1991-1994," Morbidity and Mortality Weekly Report, U.S. Department of Health and Human Services/Public Health Service, Vol 46, No.7, Feb 21, 1997, p. 141-146 and erratum in vol 46, No. 26, p. 607, July 4, 1997. Also, Brody et al., Blood lead levels in the U.S. Population: Phase 1 of the third National Health and Nutrition Examination Survey, 1988 to 1991, Journal of the American Medical Association 272(4): 277-283, July 27, 1994 and Pirkle et al., The decline in blood lead levels in the United States, Journal of the American Medical Association 272(4):284-291, July 27, 1994

²⁸ Centers for Disease Control and Prevention, Blood lead levels in young children—United States and Selected States, 1996-1999, Morbidity and Mortality Weekly Report 49(50): 1133-1137, December 22, 2000

²⁹ National Academy of Sciences. Measuring Lead Exposure in Infants, Children, and Other Sensitive Populations, Report of the Committee on Measuring Lead in Critical Populations, Board on Environmental Studies and Toxicology, Commission on Life Sciences, National Academy of Sciences. Washington, DC: National Academy Press, 1993.

³⁰ Jacobs DE. Lead-based paint as a major source of childhood lead poisoning: A review of the evidence. In: Lead in Paint, Soil and Dust: Health Risks, Exposure Studies, Control Measures and Quality Assurance (Beard ME and Iske SDA, eds). Philadelphia: ASTM STP 1226, American Society for Testing and Materials, 1995;175-187.; Also: McElvaine MD, DeUngria EG, Matte TD, Copley CG, Binder S. Prevalence of radiographic evidence of paint chip ingestion among children with moderate to severe lead

the Consumer Product Safety Commission in the U.S. is 90 parts per million (ppm). But older paints already coating surfaces in housing can be more than 500,000 ppm. These older paints can produce extraordinarily high levels of lead dust, exceeding 9,300 micrograms of lead per square foot ($\mu\text{g}/\text{ft}^2$) from only a single square foot of lead paint in an average sized room.³² This is much, much higher than the existing EPA dust lead standard of 10 $\mu\text{g}/\text{ft}^2$.

The evidence that housing with lead paint hazards is the main problem comes from several sources. Together with others, I published a study showing that the reduction in childhood lead poisoning can be largely explained by trends in housing demolition, window replacement and other renovation, and lead paint abatement.³³ If housing were not the main contributor, then demolition, window replacement and abatement trends would not have tracked the trend in childhood lead poisoning as closely as it actually has.

Furthermore, the most recent HUD survey of the nation's housing stock (conducted in 2019) shows that there was a statistically significant improvement in the number of U.S. housing units, but 29 million homes still have a lead paint hazard in the form of deteriorated lead paint, or lead-contaminated house dust or bare soil. 21.6% of African-American households live in a home with lead paint hazards and 23.6% of households in poverty live in such homes. And 22% of homes with a child under six years old have lead paint hazards.³⁴

Even more alarming is the fact that the number of homes with deteriorated lead paint actually increased by 4.6 million homes from 2005 to 2018 as the housing stock continues to age. Government support matters. 21% of homes with some form of subsidy have lead paint hazards, compared to 25% of homes without support, presumably because government standards are in place for many subsidized homes. The main problem continues to be in unassisted low-income housing where such standards are lacking.

Regulation of Federally Assisted Housing

HUD issued a regulation that controlled exposures from federally assisted housing undergoing renovation, repair or painting (as well as other forms of assistance). The regulation was issued in 1999, had a one-year phase-in period and finally took full effect

poisoning, St. Louis, Missouri, 1989-90, *Pediatrics* 89:740-742 (1992). Also: Clark CS, Bornschein R, Succop P, Roda S, Peace B. Urban lead exposures of children in Cincinnati, Ohio, *Journal of Chemical Speciation and Bioavailability*, 3(3/4):163-171

³¹ President's Task Force on Environmental Health Risks and Safety Risks to Children. *Eliminating Childhood Lead Poisoning: A Federal Strategy Targeting Lead-based paint Hazards*. Washington DC: U.S. Department of Housing and Urban Development and U.S. Environmental Protection Agency, February 2000.

³² HUD Guidelines for the Evaluation and Control of Lead Based Paint Hazards in Housing. 1995. U.S. Department of Housing and Urban Development, Washington DC, Chapter 4.

³³ Jacobs DE and Nevin R. *Validation of a Twenty-Year Forecast of U.S. Childhood Lead Poisoning: Updated Prospects for 2010*, *Environ Res* 102(3) 352-364, Nov 2006.

³⁴ Presentation from HUD: Findings on Lead-Based Paint/Hazards from the American Healthy Homes Survey II CDC Lead Exposure and Prevention Advisory Committee Meeting. Peter Ashley. May 14, 2021

in 2001.³⁵ The experience with the HUD regulation shows that renovation and repair work can be done safely and is feasible and effective. But that regulation only covers federally assisted housing, which is only a small fraction of the houses at risk.

However, the EPA Renovation, Repair and Painting regulation does not require lead dust testing to ensure children are protected at the end of the job, unlike HUD's regulation for federally assisted housing. There are established cleaning and lead dust testing procedures³⁶ that are known to achieve very low dust lead levels, up to six years following the repairs.³⁷ In particular, dust testing after the work has been completed is essential to ensuring that cleaning has been adequate. Without dust testing, many houses will contain high levels of lead dust, which is not necessarily visible to the naked eye. The absence of dust testing places children at unnecessary risk. Therefore, lead dust testing should be included in EPA's Renovation Repair and Painting Regulation.

This regulation also needs better enforcement. A recent cost-benefit analysis demonstrated that better enforcement had the highest return on investment.³⁸

Incomplete HUD Regulation

It is worth noting that the HUD regulation remains incomplete. The public housing program requires that testing be completed and that hazards be eliminated in the course of maintenance and comprehensive modernization. But some housing authorities, such as the New York City Housing Authority did not remediate the hazards and are now being monitored to ensure it does so. This is largely because testing results were not integrated into planning processes and because of the large backlog in both maintenance and capital improvements as a result of inadequate funding.

Lead risk assessments are not currently required in the Section 8 Housing Choice Voucher Program, unlike public housing. Instead, the current requirements call for a mere visual examination, which cannot reliably detect lead problems. HUD has existing authority under the 1937 Housing Act (as amended) to assist states and subdivisions of states to "remedy the unsafe housing conditions" but did not exercise this authority when its rule was promulgated in 1999, because some believed HUD did not have the statutory authority to do so. Congress should explicitly authorize HUD to update the Housing Choice Voucher requirements.

³⁵ 24 CFR Part 35

³⁶ HUD Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing, Department of Housing and Urban Development, Washington DC, 1995, with update in 2012

³⁷ Wilson J, Pivetz T, Ashley PJ, Strauss W, Jacobs DE, Menkedick J, Dixon S, Tsai HC, and V. Brown, Evaluation of HUD-Funded Lead Hazard Control Treatments at Six Years Post-Intervention, Environ Res. 102(2) 237-48 Oct 2006.

³⁸ 10 Policies to Prevent and Respond to Childhood Lead Exposure: An assessment of the risks communities face and key federal, state, and local solutions. Pew Charitable Trusts and Robert Wood Johnson Foundation. Aug 2017. <https://nchh.org/information-and-evidence/healthy-housing-policy/10-policies/>

HUD also did not incorporate modern lead hazard control methods in its single-family mortgage insurance program. A section of the HUD regulation is reserved for final action for this program (24 CFR Part 35, Subpart E), but no such action has been forthcoming since 1999. Why should children who live in housing with multi-family mortgage insurance be covered, while children who live in housing with single-family mortgage insurance remain unprotected? HUD should complete its regulation so that all children in federally assisted housing are protected and so that taxpayers do not have to subsidize housing that poisons children.

The Federal Housing Administration (FHA), Department of Agriculture (USDA), the Department of Veterans Affairs (VA), the Federal National Mortgage Association (Fannie Mae) and the Federal Home Loan Mortgage Corporation (Freddie Mac) should require a lead risk assessment and abatement of lead-based paint hazards in pre-1978 structures and identification and replacement of lead service lines for government insured mortgages.

Currently, multifamily properties receiving FHA mortgage insurance are subject to the Department of Housing and Urban Development's (HUD) lead-safe housing rule, but for single-family properties, FHA only requires that the "[m]ortgagee must confirm that the Property is free of lead paint hazards," based on the absence of past reports and a visual assessment, not an actual lead paint risk assessment—and there is no abatement requirement. FHA requires lead-free pipes for new wells, but existing lead service lines are not addressed. Fannie Mae and Freddie Mac have a requirement that properties meet underwriting criteria of being "safe, sound, and structurally secure," but no effort is made to identify lead hazards and remediate them.

The Low-Income Housing Tax Credit Program

Furthermore, the Low-Income Housing Tax Credit program, which is perhaps the federal government's largest housing construction and rehabilitation program, does not have explicit lead-based paint requirements. This means that approximately 14,000 housing units are rehabilitated each year without regard to lead-based paint hazards.³⁹ Taxpayers should not be subsidizing housing rehabilitation that could poison children, either through tax credits or federally subsidized mortgage insurance. Congress should require the Internal Revenue Service to issue explicit lead paint requirements for the Low Income Housing Tax Credit Program.

Lead-Safe Window Replacement

With many other organizations and supporters, we have proposed that the infrastructure plan include window replacement.⁴⁰

³⁹ Jacobs DE. *The Low Income Housing Tax Credit and Childhood Lead Poisoning Prevention* Final Report, Prepared for the Centers for Disease Control and Prevention, Contract 200-2006-M-18771, April 15, 2007.

⁴⁰ Reddy A. Jobs, Climate, Health, Equity: The Case for (Healthy) Housing as Critical Infrastructure. April 30, 2021. https://nchh.org/2021/04/jobs-climate-health-equity_the-case-for-healthy-housing-as-critical-infrastructure/

Together with colleagues, I have published a study showing that window replacement is particularly important. Specifically, replacing single-pane windows in older housing (nearly all such windows are known to have lead paint) will achieve billions of dollars in savings.⁴¹ Window replacement has emerged as a major form of controlling lead-based paint hazards, because more than any other building component, windows are known to contain the highest levels of lead paint and lead-contaminated dust.⁴² The benefits come from reduced childhood lead poisoning, lower utility bills from heating and cooling, and increased market value. In short, a lead-safe window replacement incentive can make a major impact on preventing childhood lead poisoning, while also achieving improved energy conservation and increased home value--all at the same time.⁴³

Federal energy, environmental, and housing policies, together with local utility programs and policies should be modified to encourage homeowners and others to replace lead contaminated windows with new energy-efficient ones.

Other Health Issues in Housing

The solutions recommended above can and should be applied to other housing-related diseases and injuries, such as asthma, mold-induced illnesses, carbon monoxide poisoning and fire related injuries, trips and falls, and others.

These other housing-related health issues can be grouped around 10 key principles that make a home healthy and can guide future Congressional Policy. They are:

1. Free of excessive moisture and leaks
2. Adequately ventilated, both with fresh air and proper air distribution and exhaust
3. Free of excessive exposure to contaminants, such as lead, radon, and organic compounds such as formaldehyde
4. Free of pests
5. Clean
6. Well maintained
7. Safe and free of injury hazards
8. Affordable
9. Energy Efficient
10. Accessible for persons with disabilities⁴⁴

⁴¹ Nevin R, Jacobs DE, Berg M, Cohen J. Monetary benefits of preventing childhood lead poisoning with lead-safe window replacement, *Environ Res Environ Res*. 2008 Mar;106(3):410-419.

⁴² Jacobs DE, Clickner RL, Zhou JL, Viet SM, Marker DA, Rogers JW, Zeldin DC, Broene P and W. Friedman. The Prevalence of Lead-Based Paint Hazards in U.S. Housing, *Environ Health Perspect* 110:A599-A606, Sept 13, 2002.

⁴³ Nevin R and Jacobs DE. Windows of Opportunity: Lead Poisoning Prevention, Housing Affordability and Energy Conservation, *Housing Policy Debate* 17(1): 185-207, 2006.

⁴⁴ National Center for Healthy Housing. 2020. <https://nchh.org/information-and-evidence/learn-about-healthy-housing/healthy-homes-principles/>

For example, radon is an important healthy homes issue requiring Congressional action. Radon is the second-leading cause of lung cancer and is almost entirely a housing-related health problem. Congress should direct HUD to follow through on the April 2021 recommendations of the Inspector General to “develop and issue a department-wide radon policy that notes that radon is a radioactive substance” and is “designed to ensure that radon testing and mitigation are consistent and sufficient for all HUD programs, and align with HUD’s environmental regulations.”⁴⁵

Congress should also fund radon testing and mitigation over three years at scale in public housing and should explicitly require the use of certified professionals and compliance with the EPA-recommended ANSI-AARST standards. Congress should direct HUD FHA to implement radon testing, or buyer notification/warning requirement encouraging testing, in the single-family programs.

Emerging Lead Paint Threats

The nation is now faced with emerging exposures that threaten the progress we have made. New residential lead-based paint is now being manufactured in several Asian countries⁴⁶ and in Nigeria⁴⁷ and likely elsewhere. The concentrations of lead in these paints are enormous, exceeding 100,000 parts per million (ppm). By comparison, the existing US standard for lead in new residential paint is 90 ppm. It is bad enough that these countries are contaminating their own houses and putting their own workers and children at great risk. But in today’s global economy, it is only a matter of time before these products appear in the U.S., re-contaminating the very houses that taxpayers and parents have already spent billions cleaning up.

These emerging threats are not limited to paint. Lead contaminated toy jewelry has already caused death in at least one child⁴⁸ and has likely exposed many others. There is no reason for lead to be used in any children’s product, including plastic toys. Other non-toxic stabilizers and additives can and should be used, as has been done in house paint here in the U.S. The US should strongly support the Global Alliance to Eliminate Lead Paint, led by the World Health Organization and the United Nations.⁴⁹ It should also support implementation of the World Health Organization’s Housing and Health Guidelines.⁵⁰

⁴⁵ HUD Office of Inspector General’s 2021 evaluation of HUD Program Offices’ Policies and Approaches for Radon (Report Number: 2020-OE-0003).

⁴⁶ Clark CS, et al. 2006. The lead content of currently available residential paint in several Asian countries. *Environ Res* 102: 9-12

⁴⁷ Adebamowo EB, et al. 2007. Lead content of dried films of domestic paint currently sold in Nigeria. *Science of the Total Environ*. Article in Press. Available on line at www.sciencedirect.com

⁴⁸ KK Berg et al. 2006. Death of a child after ingestion of a metallic charm. *Morbidity and Mortality Weekly Report* 55(12) 340-341

⁴⁹ Global Alliance to End Lead Paint. <https://www.unep.org/explore-topics/chemicals-waste/what-we-do/emerging-issues/global-alliance-eliminate-lead-paint>

⁵⁰ WHO Housing and Health Guidelines. 2018.

<https://apps.who.int/iris/bitstream/handle/10665/276001/9789241550376-eng.pdf>

Background on Lead Toxicity and Remediation

Lead is one of the most extensively studied poisons, with over 25,000 studies and publications. The evidence is clear that lead causes a large number of health problems, particularly in young children. Perhaps the most recent review of lead toxicity is from EPA,⁵¹ but others are also available.^{52 53} Lead is a metal with no useful biological function in the body, unlike other metals such as zinc or iron. Its principal adverse health effects in young children include:

- Mental and thought impairment, such as declines in cognition (as measured by Full Scale IQ, academic performance, and executive function);
- Attention, Impulsivity and Hyperactivity disorders, Conduct Disorders in Children and Young Adults (criminal offenses in young adults ages 19-24 years and higher parent and teacher ratings of behaviors related to conduct disorders in children ages 8-17 years);
- Behavior problems, as shown in higher parent and teacher ratings of depression or anxiety or other related problems such as withdrawn behavior in children ages 8-13 years;
- Reduced hearing;
- Reduced coordination and stability;
- Delayed pubertal onset;
- Lower birth weight and increased spontaneous abortion (miscarriages).
- Higher probability of asthma and allergy;
- At higher exposures, death, coma, encephalopathy (brain dysfunction) and many other effects;
- In adults lead exposure is linked to reduced executive function (decision making skills), visual, learning and memory problems, depression and anxiety, reduced hearing, hypertension incidence and increased blood pressure, peripheral artery disease, coronary heart disease, reduced kidney function, decreased red blood cells, altered heme (blood forming) synthesis, and reduced function in both male and female reproductive systems;
- Cancer.⁵⁴

The American Academy of Pediatrics states that there are no effective medical treatments for lead poisoning and that prevention of exposure is needed.⁵⁵

⁵¹ EPA. Integrated Science Assessment for Lead. June 2013. EPA/600/R-10/075F

⁵² National Toxicology Program Monograph on Health Effects of Low-level Lead (June 2012)

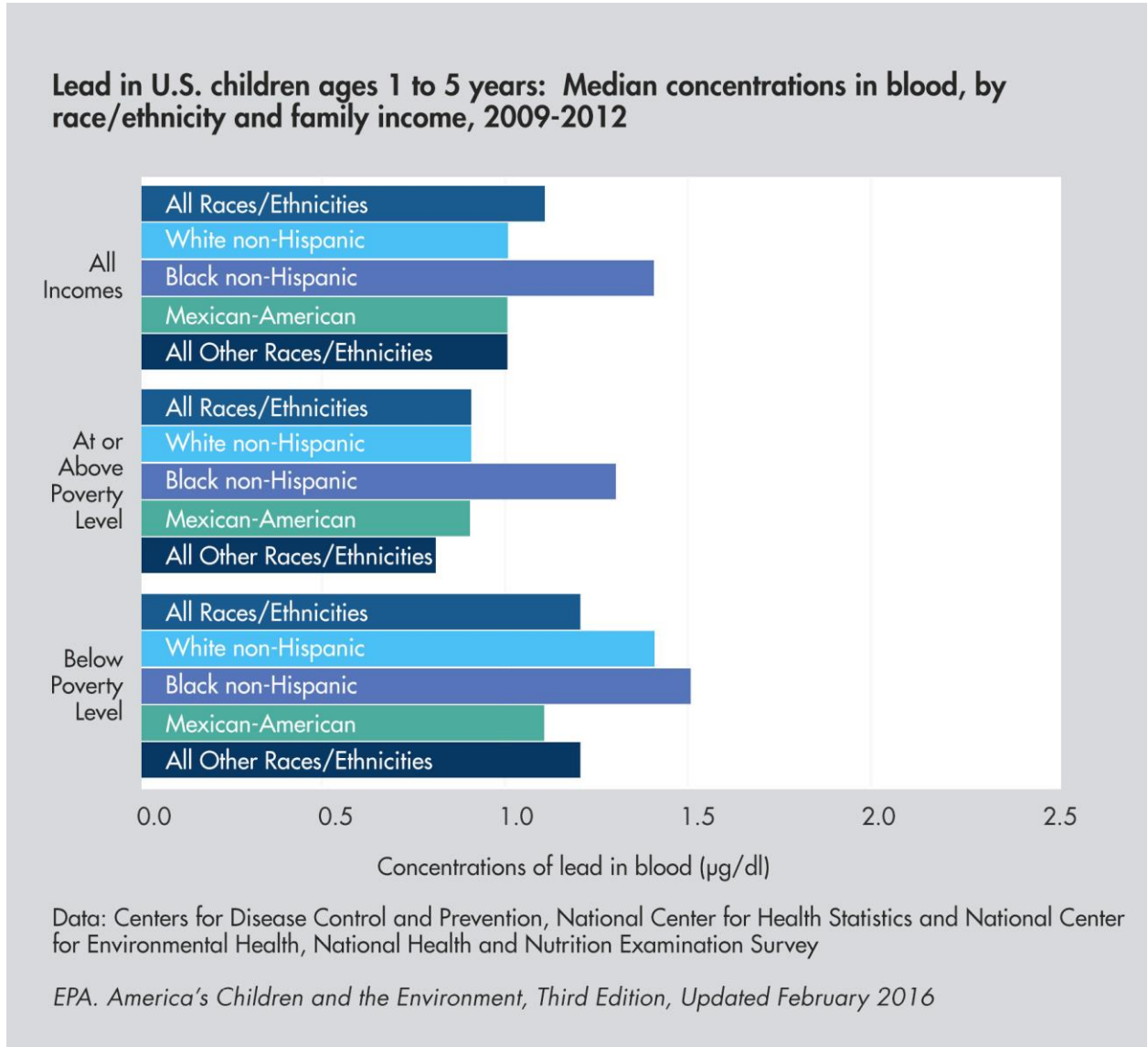
⁵³ Jacobs DE. Lead IN: Patty's Toxicology. (2012, July). Lead. In E. Bingham & B. Cohrssen (Eds.), Patty's Toxicology, 6th edition (pp. 381-426). New York: John Wiley and Sons. [ISBN: 978-0-470-41081-3]. 7th Edition pending, 2021.

⁵⁴ The International Agency for Research on Cancer has listed inorganic lead as a "probable" human carcinogen and the National Toxicology Program has listed it as "reasonably anticipated to be a human carcinogen."

⁵⁵ American Academy of Pediatrics, Council On Environmental Health. Prevention of Childhood Lead Toxicity. Pediatrics. 2016;138(1):e20161493

Lead Disparities by Race and Ethnicity

Blood lead levels are higher among younger children, those belonging to poor families, and those enrolled in Medicaid. Furthermore, blood lead levels for non-Hispanic black children were significantly higher compared with either non-Hispanic white or Mexican American children.⁵⁶



Lead Paint Identification and Remediation

The association between lead paint and blood lead has been extensively reviewed⁵⁷ and the National Academy of Sciences stated, “Lead-based paint is the largest source of high-dose

⁵⁶ Brown MJ and Wheeler. 2013. Blood Lead Levels in Children Aged 1–5 Years — United States, 1999–2010. *Morbidity and Mortality Weekly Report*, April 5, 2013, Vol. 62, No. 13, 245-248

⁵⁷ Jacobs DE. Lead-Based Paint as a Major Source of Childhood Lead Poisoning: A Review of the Evidence in Lead In Paint, Soil and Dust: Health Risks, Exposure Studies, Control Measures and Quality

lead exposure for children.”⁵⁸ Unlike earlier sources of lead exposure such as gasoline, food canning and industrial emissions that can all be controlled by eliminating its use in central refineries and factories, residential lead paint is widely dispersed (but highly concentrated on some surfaces) in homes throughout the nation, making finding and eliminating dangerous exposures difficult. General practice historically has been to wait until a child is found to have been exposed to lead in order to find and eliminate the source of lead in the home.

In general, there are two methods of identifying lead paint problems and two means of eliminating them.⁵⁹ The presence of lead paint in a home is determined by a lead-based paint inspection that measures lead paint on most surfaces with a common painting history. The second method is to conduct a lead paint risk assessment, which measures lead in deteriorated paint, dust and soil. The two methods can be combined.

There are also two broad methods of remediating lead paint problems—long term “abatement” and shorter term “interim controls.” These two methods can also be combined. The identification step informs the remediation step, so effectiveness of identification and remediation cannot be separated, as discussed later. Abatement and interim controls are not the same as renovation, remodeling and repainting. These latter activities typically occur without dust control or post-cleanup dust testing, resulting in significant exposures to children. Some forms of renovation and remodeling and repainting may also employ paint removal methods that are not allowed for abatement or interim controls, such as burning or torching lead paint, abrasive blasting and unlimited dry scraping. If scraping occurs as part of abatement or interim controls, it is done using wet methods to control dust (with the exception of scraping near electrical circuits, where wet methods could cause electrocution).

Evidence for abatement effectiveness can be gleaned from several studies: The largest is the Evaluation of the HUD Lead Hazard Control Grant program,⁶⁰ a study covering over 3,000 housing units in 14 jurisdictions. Blood lead levels declined 37% two years after treatment. But because blood lead levels are affected by all sources of exposure, dust lead levels are likely to be a better metric of abatement effectiveness because they are less confounded by other sources of lead. Blood lead and dust lead are well correlated with each other in numerous studies.^{61 62} Three years after intervention average (geometric

Assurance, Michael E. Beard and S.D. Allen Iske, Eds, American Society for Testing and Materials, Philadelphia, p. 175-187, 1995.

⁵⁸ Measuring Lead Exposure in Infants, Children, and Other Sensitive Populations Committee On Measuring Lead In Critical Populations, Board On Environmental Studies And Toxicology, Commission On Life Sciences, National Academy Press, Washington, D.C. 1993

⁵⁹ Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing. 2012. US Department of Housing and Urban Development.

http://portal.hud.gov/hudportal/HUD?src=/program_offices/healthy_homes/lbp/hudguidelines

⁶⁰ NCHH and University of Cincinnati. Dept. Environmental Health. (2004). Evaluation of the HUD Lead-Based Paint Hazard Control Grant Program Final Report

⁶¹ Lanphear, B. P., Matte, T. D., Rogers, J., Clickner, R. P., Dietz, B., Bornschein, R. L., Succop, P., Mahaffey, K. R., Dixon, S., Galke, W., Rabinowitz, M., Farfel, M., Rohde, C., Schwartz, J., Ashley, P.J., & Jacobs, D. E. (1998, October). The contribution of lead-contaminated house dust and residential soil to children's blood lead levels: A pooled analysis of 12 epidemiologic studies. *Environ Res* 79(1), 51-68.

mean) dust lead loadings on floors, window sills and window troughs were 9, 62 and 363 $\mu\text{g}/\text{ft}^2$, respectively (declines of 78%, 89%, and 95%, respectively compared to pre-intervention levels). These substantial declines were observed across all 14 jurisdictions in the study. The study also found that after controlling for other factors, full interior lead abatement was associated with the largest relative reductions in floor dust lead loadings over a year.

Another smaller scale study comparing interim controls and abatement⁶³ showed that immediately after intervention (intervention means lead hazard control) and at two years later, geometric mean dust lead loadings on floors and window sills in “Major Repair” houses (similar to abatement) were greatly reduced. Homes that received only minor repairs or cleaning had much smaller reductions in dust lead levels.

Another smaller scale study⁶⁴ compared three types of intervention and compared them to homes in two comparison groups. One type (which is similar to abatement) had median dust lead levels that declined dramatically before treatment to two years later. The interim control option had median dust lead levels that declined by an order of magnitude two years later. This study also measured blood lead and showed the same trend as dust lead. The interim control option showed children’s blood lead level declined from 17.9 $\mu\text{g}/\text{dL}$ to 10.3 $\mu\text{g}/\text{dL}$ two years later (a difference of 7.6 $\mu\text{g}/\text{dL}$). But the abatement option showed children’s blood lead level declined more (from 21.7 $\mu\text{g}/\text{dL}$ before treatment to 12.6 $\mu\text{g}/\text{dL}$ two years later, a difference of 9.1 $\mu\text{g}/\text{dL}$). Not surprisingly, trends in blood lead are influenced by many variables, including baseline (before treatment) blood lead level, other sources, season, endogenous bone lead levels and others. An EPA review⁶⁵ generally showed similar results across older studies, i.e., that more intensive treatments such as abatement were associated with greater declines in both blood and dust lead levels compared to less intensive treatments such as interim controls and that both interventions were beneficial.

A randomized controlled trial of lead hazard control reduced the dust lead loadings for the floor by 24%, windowsill by 40% and window troughs by 47%. Although some neurobehavioral test scores were not statistically different between children in the

⁶² Lanphear BP, Emond E, Weitzman M, Jacobs DE, Tanner M, Winter N, Yakir B, Eberly S. A Side-By-Side Comparison of Dust Collection Methods for Sampling Lead-Contaminated House Dust, *Environ Res* 68, 114-123, 1995.

⁶³ Farfel et al. 2000. An Extended Study of Interim Lead Hazard Reduction Measures Employed In The Baltimore Clinical Center of The Treatment Of Lead- Exposed Children (TLC)-Clinical Trial. April 2000. Prepared for US Department of Housing and Urban Development

⁶⁴ Farfel et al. 1997. Lead Based Paint Abatement and Repair and Maintenance Study. Environmental Protection Agency. EPA-747-R-97-005

⁶⁵ Review Of Studies Addressing Lead Abatement Effectiveness: Updated Edition, EPA 747-B-98-001, December 1998, Technical Programs Branch, Chemical Management Division Office of Pollution Prevention and Toxics, U.S. Environmental Protection Agency

intervention group than those in the control group, there was a significant improvement in anxiety scores. Blood lead concentrations in non-Hispanic black children were reduced.⁶⁶

Lead in Drinking Water

If lead is found in drinking water, the most likely reason is the corrosion of one of the following: 1. Lead Service Line (a pipe that connects homes to the water main in the street). A lead service line is the largest potential source of lead exposure in drinking water. 2. Lead Solder – solder commonly contains lead and is used to connect copper piping. 3. Brass Fixtures – almost all water meters, faucets, valves and fittings manufactured prior to 2014 may have brass components which contain lead.⁶⁷ Lead is present in plumbing infrastructure including lead service lines (LSLs), goose necks, lead solder, and brass fittings used in faucets and drinking water fountains. LSLs were installed in most houses built in the 1920s after which the use declined. LSLs were banned in 1986. Until 1986, brass fixtures and fittings could legally contain more than 8% lead, and solder could be made of more than 0.2% lead (most contained 40-50% lead). In 2014, federal regulations were updated so lead levels in brass fixtures and fittings had to be less than 0.25%. EPA recently updated its Lead and Copper Rule in 2020.

A recent study of lead in private wells in rural areas, which are not regulated by EPA, was widespread. It showed that lead was detected (>0.76 ppb) in tap water of 48.3% homes, and 3.3% exceeded 15 ppb.⁶⁸

Lead service lines were found to contribute 50 to 75% of the total lead mass in household tap water; premise plumbing was found to contribute an additional 20 to 35% (likely due to ‘seeding’ from LSLs); and faucets were found to contribute 1% to 3%.⁶⁹ The brass fittings and plumbing components have been implicated as the sources of lead in water at schools and large buildings, such as hospitals and universities, where LSLs are rarely present. Solder used to join various plumbing elements is known to be an occasional source of lead that can result in extremely high water concentrations.

Lead in Consumer Products

A large number of products have been reported to contain lead and only a few are discussed here. Products containing lead include (but are not limited to) the following:

⁶⁶ Braun JM, Yolton K, Newman N, Jacobs DE, Taylor M, Lanphear BP. Residential dust lead levels and the risk of childhood lead poisoning in United States children. *Pediatr Res.* 2020 Jul 28. doi: 10.1038/s41390-020-1091-3

⁶⁷ Lead in drinking water. Kellogg Foundation. <http://ww2.wkkf.org/2016/digital/Water-FS-Homeowner4.pdf>

⁶⁸ Geiger SD, Bressler J, Kelly W, Jacobs DE, Awadalla SS, Hagston B, Onwuta U, Panier C, Dorevitch S. Predictors of Water Lead Levels in Drinking Water of Homes With Domestic Wells. *J Public Health Manag Pract.* 2020 Nov 27. doi: 10.1097/PHH.0000000000001255. Epub ahead of print.

⁶⁹ Sandvig, A., Kwan, P., Kirmeyer, G., Maynard, B., Mast, D., Trussell, R. R., Trussell, S., Cantor, A., Prescott, A., (2008). Contribution of Service Line and Plumbing Fixtures to Lead and Copper Compliance Issues. Prepared for the American Water Works Research Foundation, Report 91229.

traditional folk remedies, toys, and other products with painted surfaces, including paint on plastic, fabric, or metal, key chains, cheap beads and artificial pearls, cultural or religious lead contaminated powders or products, new lead-based paint manufactured in other countries and metal jewelry for children. A list of lead in consumer products, including recalled products, is available from CDC and the Consumer Product Safety Commission (see:

https://cpsc.gov/Recalls?combine=lead&field_rc_date%5Bdate%5D=&field_rc_date_1%5Bdate%5D=

Several organizations have called for the elimination of non-essential uses of lead in consumer products, such as the American Public Health Association.⁷⁰ The elimination of the use of lead in new paint is addressed by the Global Alliance to End Lead Paint, led by the World Health Organization and the United Nations Environment Program (see: http://www.who.int/ipcs/assessment/public_health/gaelp/en/).

In 2010, over 1500 pieces of jewelry sampled from 42 major retailers in California over a one-year period, and found about 4% of the jewelry did not comply with California lead standards and 26 retailers were in violation.⁷¹ Effective August 2011, the current federal limit for the amount of total lead allowed in most new products for children 12 and younger is 90 ppm (parts per million). Lead in adult jewelry remains unregulated. Some hair dyes contain lead acetate. A 1991 review found that use of hair dye containing lead acetate can result in exposure to 600 µg of lead/use and 30.7 µg/day dermal absorption of lead. A 1997 study showed lead transferred to hands, objects and other surfaces (up to 436 µg/ft²), following controlled applications. The study found as much as 689 µg of lead/use on the hands and 26 to 79 µg of lead remaining even after washing.⁷²

Over the last decade, there have been several reports of adult poisoning from *ayurvedic* (Indian traditional) medicine, some of which (*Bhasmas* or *Rasa*) are prepared with high concentrations of several heavy metals, including lead. In 2012, there were 2 cases of children poisoned in US. Greta and Azarcon (also known as Alarcon, Coral, Luiga, Maria Luisa, or Rueda) are Hispanic traditional medicines taken for an upset stomach (empacho), constipation, diarrhea, and vomiting. They are also used on teething babies. Greta and Azarcon are both fine orange powders with lead content as high as 90%. Ba-baw-san is a Chinese herbal remedy that contains lead. It is used to treat colic pain or to pacify young children. Lead can also be present from earlier use, resulting in contaminated sites. Except for the EPA Superfund program, there is not a centralized listing of contaminated sites.⁷³ This can result in locating facilities (such as housing) on

⁷⁰ APHA Calling for a Global Ban on Lead Use in Residential Indoor and Outdoor Paints, Children's Products, and All Nonessential Uses in Consumer Products. Policy Date: 10/28/2008. Policy Number: 20084

⁷¹ Cox, C., & Green, M. (2010). Reduction in the Prevalence of Lead-Containing Jewelry in California Following Litigation and Legislation, *Environmental Science and Technology*, 44(16); 6042–6045.

⁷² Mielke, H. W., Taylor, M. D., Gonzales, C. R., Smith, M. K., Daniels, P. V. and Buckner, A. V., (1997). Lead-based hair coloring products: Too hazardous for household use. *Journal of the American Pharmaceutical Association*, 37(1); 85-89

⁷³ Lead at Superfund Sites. <https://www.epa.gov/superfund/lead-superfund-sites>

such sites, resulting in needless exposure. The most recent example of this problem is the East Chicago site in Indiana, the site of former lead facilities.⁷⁴

Conclusion

President Franklin Roosevelt, in dedicating the National Archives Building in 1941, said: “A Nation must believe in three things: It must believe in the past. It must believe in the future. It must, above all, believe in the capacity of its own people to learn from the past so that they can gain in judgment in creating their own future.”⁷⁵

Lead poisoning is ugly. It robs us of our most precious gift—our future and the children who inherit it. It has been over a century since the first medical diagnosis of lead paint poisoning in children occurred.⁷⁶ We have learned from that past by establishing the knowledge and systems to end the disease.

Our people’s capacity to solve the problem can be unleashed so that no child need face a future dimmed by inadequate unsafe and unhealthy housing. Lead hazards and other healthy home hazards belong in our past, not our future.

⁷⁴ Lyons C. Owners of former East Chicago lead factories named in suit. Chicago Tribune.

<http://www.chicagotribune.com/news/ct-ptb-east-chicago-class-action-st-1007-20161006-story.html>

⁷⁵ President Franklin Roosevelt. Dedication of the National Archives Building. Washington DC. 1941.

⁷⁶ Gibson L, Love W, Hardie D, Bancroft P, Turner AJ. Notes on lead poisoning as observed among children in Brisbane. Intercolonial Med Congress Aust 1892;78-83. Also: J. Lockhart Gibson, A Plea for Painted Railings and Painted Walls of Rooms as the Source of Lead Poisoning Amongst Queensland Children. Australasian Medical Gazette April 20, 1904. Also: Turner AJ. Lead poisoning among Queensland children. Australasia Med Gazette 1897;16:475-9.