MICHIGAN STATE UNIVERSITY | HURLEY CHILDREN'S HOSPITAL

PEDIATRIC PUBLIC HEALTH INITIATIVE

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Committee on Ways and Means

Subcommittee on Select Revenue Measures

"Hearing on Examining the Economic Impact of Federal Infrastructure Investment"

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Good afternoon. Thank you Chairman Mike Thompson, Ranking Member Mike Kelly, and all of the distinguished Members of the Select Revenue Measures subcommittee for the opportunity to testify at today's hearing. A special thank you to Ways and Means Committee member, Michigan Congressman Dan Kildee, for his steadfast leadership and support. I would also like to thank your respective staff members for their dedicated work on this issue. This is an important topic, and I am pleased this subcommittee has chosen to devote today's hearing to the benefits of infrastructure investment, especially as it relates to the safety of our nation's drinking water and public health.

I would like to begin by heralding the bipartisan Infrastructure Investment and Jobs Act[1] as landmark legislation. As you know, the Act includes nearly $36 billion in investments in EPA's programs for drinking water infrastructure. This includes $30.7 billion to be allocated to states to disburse to applicants, divided as follows: $15 billion for lead service line replacement for the Drinking Water State Revolving Fund (DWSRF); $11.7 billion for general DWSRF funds, and $4 billion for PFAS/emerging contaminants allocated to the DWSRF. There is an additional $5 billion in targeted funding for EPA's Safe Drinking Water Act (SDWA) grant program to assist drinking water systems in small and disadvantaged communities to address PFAS/emerging contaminants.

In regards to lead in water, **the $15 billion for lead service line replacement is a game changer**; it is the largest federal investment ever in lead in water elimination. While I will discuss the economic impact of this federal infrastructure investment, as a public health pediatrician, I would be remiss if I did not first share the impact of this investment on the true foundation of our country - not pipes, nor roads, nor bridges - but our children.

FLINT & LEAD

As a pediatrician in Flint, Michigan, it is the greatest privilege of my life to be able to wake up everyday to care for Flint kids. Much of that work centers around making sure our kids are healthy today; but more importantly, my work is nestled in protecting and promoting the promise of our children's futures. Yet in Flint, there was something in our water - something that you couldn't see or taste or smell - that was threatening the potential of our children. By now, you all know that what happened in Flint was the signature environmental disaster of our time - it is the emblematic example of the consequences of infrastructure disinvestment and environmental racism. In a breakdown of democracy and driven by austerity, our drinking water source was switched without proper corrosion control treatment. The water was so

[1] Infrastructure Investment and Jobs Act, Pub. L. No. 117-58, 135 Stat 429 (2021). https://www.congress.gov/117/plaws/publ58/PLAW-117publ58.pdf

corrosive that it corroded engine parts at a Flint auto plant.[2] The corrosive water leached lead from our aged and outsized infrastructure into our drinking water, in the hundreds and thousands of parts per billion.[3,4] Hazardous waste levels of lead.

Science has taught us that there is **no safe level of lead exposure.**[5,6,7] A well-studied poison, lead is an irreversible neurotoxin - with lifelong, multisystem, and multigenerational impacts. Lead exposure diminishes intelligence, alters development and behavior, impacts growth and hearing and decades later, can manifest in adults with hypertension, kidney disease, dementia and more.[8,9] Besides the well-recognized neurodevelopmental and health implications of lead exposure, it can also cause adverse pregnancy outcomes including fetal death, prematurity, and small birth weight.[10]

I wish there was something I could prescribe to take away what happened in Flint; but when it comes to lead, the only cure is prevention. And that is why in Flint, after our infrastructure failure, our work has been about moving forward, to mitigate the impact of the crisis and to create a sanctuary where our children can recover and thrive. We are grateful for Congress's continued, bipartisan support of Flint's recovery, especially with your support of the CDC-funded Flint Registry - a built public health infrastructure asset to identify and support victims of the Flint water crisis and to share our best practices with similarly impacted communities.

FLINTS EVERYWHERE: A HISTORIC FAILURE

Our decades-long inaction to invest in infrastructure failed the children of Flint. However, our work has also been about shining a spotlight on the pervasive inadequacy of our drinking water infrastructure. The overall state of our country's

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[2] Fonger R. General Motors shutting off Flint River water at engine plant over corrosion worries. Oct 13, 2014. Updated Jan 20, 2019. mlive.com. https://www.mlive.com/news/flint/2014/10/general_motors_wont_use_flint.html

[3] Pieper KJ, Martin R, Tang M, Walters L, Parks J, Roy S, Devine C, Edwards MA. Evaluating water lead levels during the Flint water crisis. *Environ Sci Technol*. 2018;52(15):8124-8132. https://doi.org/10.1021/acs.est.8b00791

[4] State of Michigan. Flint residential testing report - results collected through July 5, 2016. https://www.michigan.gov/documents/flintwater/Test_Results_Flint_Sorted_by_Lead_Concentration_513930_7.pdf

[5] Centers for Disease Control and Prevention, Advisory Committee on Childhood Lead Poisoning Prevention. *Low Level Lead Exposure Harms Children: A Renewed Call for Primary Prevention*. Atlanta, GA: Centers for Disease Control and Prevention; 2012. www.cdc.gov/nceh/lead/ACCLPP/Final_Document_030712.pdf.

[6] See, e.g., National Institute of Environmental Health Sciences, Lead, https://www.niehs.nih.gov/health/topics/agents/lead/index.cfm

[7] AAP Council on Environmental Health. Prevention of childhood lead toxicity. *Pediatrics*. 2016;138(1):e20161493. https://doi.org/10.1542/peds.2016-1493

[8] National Institute of Environmental Health Sciences. Lead. https://www.niehs.nih.gov/health/topics/agents/lead/index.cfm

[9] Agency for Toxic Substances and Disease Registry. Toxic substances portal: Public health statement for lead. https://wwwn.cdc.gov/TSP/PHS/PHS.aspx?phsid=92&toxid=22

[10] Ettinger AS, Wengrovitz AG, eds. *Guidelines for the Identification and Management of Lead Exposure in Pregnant and Lactating Women*. Atlanta, GA: Centers for Disease Control and Prevention; 2010. https://www.cdc.gov/nceh/lead/publications/leadandpregnancy2010.pdf

drinking water infrastructure is a national public health crisis. Flint's water crisis was an extreme case, but it was not the **first, the last, or the worst.** Here, in our nation's capital, there was an even worse lead-in-water crisis in the early 2000s. That crisis, at the heart of policy making, should have prompted the removal of lead pipes nationwide and robust investment in our drinking water infrastructure.

The United States was stubbornly slow to limit the use of lead in plumbing. The lead industry, the water industry, and even the plumbers' unions fought regulations.[11] Lead service lines were not restricted until 1986. Chicago, which has the most known lead service lines in the country at an estimated 400,000, was still requiring their installation until 1986.[12] Because there has been no regulatory requirement of a lead service line inventory, there is not an accurate national count. However, there are an estimated 6.5 to 10 million lead service lines nationally, with the greatest concentration of lead lines in the Midwest and Northeast.[13,14] Lead is in other plumbing materials, like solder, fixtures and faucets; however, when a lead service line is present, it is the greatest contributor of lead in the water.[15,16,17]

With so much lead in our national drinking water delivery system and with a chronically lax Lead and Copper Rule that does not even strive for lead-free water, millions of children continue to drink water through poisonous lead straws. The recommended best practice for lead exposure is primary prevention[18] - eliminating lead in the environment before a child is exposed. **The Infrastructure Investment and Jobs Act is primary prevention**; it is exactly what needs to be done to protect children - eliminating the source of lead before baby bottles and sippy cups are filled with lead-tainted water.

Beyond lead pipes, our overall drinking water infrastructure is old, fragile, and underfunded; and a constant threat to our public health. According to the American Society of Civil Engineers, the United States' drinking water infrastructure gets a

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[11] Rabin R. The lead industry and lead water pipes "A Modest Campaign". *Am J Public Health*. 2008;98(9):1584-1592. https://doi.org/10.2105/ajph.2007.113555

[12] Caine P. Chicago has more lead service pipes than any other US city, Illinois the most of any state. Mar 24, 2021. WTTW News. https://news.wttw.com/2021/03/24/chicago-has-more-lead-service-pipes-any-other-us-city-illinois-most-any-state

[13] United States Environmental Protection Agency Office of Water. *Lead and Copper Rule Revisions White Paper*. Washington, DC: EPA; Oct 2016. https://www.epa.gov/sites/production/files/2016-10/documents/508_lcr_revisions_white_paper_final_10.26.16.pdf

[14] Cornwell DA, Brown RA, Via SH. National survey of lead service line occurrence. *J Am Water Works Assoc*. 2016;108(4):E182-E191. https://doi.org/10.5942/jawwa.2016.108.0086

[15] Lytle DA, Schock MR, Wait K, Cahalan K, Bosscher V, Porter A, Del Toral M. Sequential drinking water sampling as a tool for evaluating lead in flint, Michigan. *Water Res*. 2019;157:40-54. https://doi.org/10.1016/j.watres.2019.03.042

[16] Sandvig A, Kwan P, Kirmeyer G, Maynard B, Mast D, Trussell RR, Trussell S, Cantor A, Prescott A. *Contribution of Service Line and Plumbing Fixtures to Lead and Copper Rule Compliance Issues*. AWWA Research Foundation; 2008. Report No. 91229. https://archive.epa.gov/region03/dclead/web/pdf/91229.pdf

[17] Tully J, DeSantis MK, Schock MR. Water quality-pipe deposit relationships in Midwestern lead pipes. *AWWA Water Sci*. 2019;1(2): e1127. https://doi.org/10.1002/aws2.1127

[18] Centers for Disease Control and Prevention. Childhood lead poisoning prevention: Lead poisoning prevention. https://www.cdc.gov/nceh/lead/prevention/default.htm

barely passing grade of "C-."[19] Many remote, rural, and tribal communities completely lack access to safe and reliable drinking water. Emerging contaminants, like the "forever chemicals" PFAS, are increasingly being recognized throughout our nation's drinking water; Michigan has the most identified PFAS contaminated drinking water sites in the country (largely due to aggressive testing).[20] PFAS exposure has been associated with multiple health conditions including cancer, immunodeficiency, and hormone disruption.[21] In addition, our outdated and poor water infrastructure system is increasingly stressed by climate change-induced extreme weather conditions. For example, the recent power outages associated with the "Texas Freeze" resulted in the disruption of 800 public water systems servicing 13.1 million people.[22] The images of water bottles being used for bathing babies and brushing teeth were eerily similar to Flint's crisis. **Time and time again, failures to invest in our drinking water infrastructure continue to impact our public health.**

FLINT HAS BECOME A NATIONAL MODEL: THE TIME IS NOW

As much as the story of Flint is the story of a failure of our drinking water infrastructure and decision making, it is also a story of how we can do better, especially on behalf of our children. That is what we are trying to model in Flint and that is why I am so excited to be here with you today celebrating the benefits of the Infrastructure Law. Following the examples of Madison, Wisconsin and Lansing, Michigan and a handful of other cities, Flint will soon replace all their lead pipes. Another post-crisis city, Newark, New Jersey may finish replacing their lead pipes before Flint. Utilizing the expertise of a workforce of highly skilled plumbers and pipefitters, Flint and Newark are both replacing lead pipes faster than previously thought possible. As a pediatrician, I know that families with good-paying jobs are one of the most potent medications we can prescribe. With an over 60% child poverty rate in Flint,[23] the deleterious consequences of child poverty and income inequality also manifest in the bodies and blunted potential of children. That is why we must require prevailing wages for this important work.

But it shouldn't take crises to reactively ensure safe drinking water or living wage jobs. As such, Michigan's model Lead and Copper Rule now mandates the proactive replacement of all the state's lead pipes by 2041, yet funding for this work at the state and local level was always precarious.[24] Despite best intentions, states and cities have not and cannot afford to do this work alone, nor do they have the capacity and resources to do this work as quickly as possible. **Finally, the**

[19] American Society of Civil Engineers. 2021 Report Card for America's Infrastructure: Drinking water. https://infrastructurereportcard.org/cat-item/drinking-water/
[20] Gardner P. Michigan has more PFAS sites than other states. There's a reason. Aug 25, 2019. Updated Aug 26, 2019. mlive.com. https://www.mlive.com/news/2019/08/michigan-has-more-pfas-sites-than-other-states-theres-a-reason.html
[21] Agency for Toxic Substances and Disease Registry. Per- and polyfluoroalkyl substances (PFAS) and your health. https://www.atsdr.cdc.gov/pfas/index.html
[22] Healy J, Fausset R, Dobbins J. Cracked pipes, frozen wells, offline treatment plants: A Texan water crisis. Feb 18, 2021. Updated Feb 20, 2021. NYT.com. https://www.nytimes.com/2021/02/18/us/texas-water-crisis-winter-storm.html
[23] State of Flink Kids. Young children living below poverty level: Flint, 2015-2019. http://www.stateofflintkids.com/indicators/index/view?indicatorId=532&localeId=139057
[24] University of Michigan Lead and Copper Project. What you need to know about Michigan's 2018 Lead and Copper Rule. http://graham.umich.edu/project/revised-lead-and-copper-rule

Infrastructure Law provides resources to remove lead service lines and to prevent future generations of children from suffering lead's silent toxicity. It is only with the full funding, requirements, and support of the federal government that the millions of lead pipes in this country can be efficiently replaced. Every day that goes by is a missed opportunity.

In addition to removing lead pipes, the federal funding to upgrade and modernize our drinking water infrastructure is critical. From preventing, identifying, and remediating emerging contaminants like PFAS to ensuring safe drinking water during extreme weather conditions, investments in water infrastructure directly impact our public's health.

AN EQUITY AND JUSTICE ISSUE

In cities, both rural and urban areas of this country, communities of color are more likely to suffer the environmental and health injustice of poorer water quality and increased drinking water violations.[25] Public water utilities further widen these disparities by *charging* individuals for lead pipe replacement on their own property, turning safe drinking water into a privileged luxury for affluent residents who can afford it. The consequence is worse quality of water for communities and households without means, which disproportionately impacts low income people and people of color.[26] As an added burden, many of the poorest and most vulnerable individuals spend their limited resources on costly bottled water and filtration systems. In fact, following the Flint water crisis, bottled water outsold soda for the first time in our nation.[27]

It is well recognized that poor and predominantly children of color disproportionately suffer from lead exposure and, consequently, its pernicious and potentially life-altering impacts. In addition to the exposures I've highlighted through drinking water, children also face exposure to lead from other sources, including lead-based paint and lead in soil from legacy industrial uses. These exposures compound and add to those from drinking water, and also disproportionately affect children of color and those in low-income families. This means that the deleterious health and neurodevelopmental manifestations of lead exposure are further concentrated in children and communities who are already struggling with other systemic inequities such as historic disinvestment in minority neighborhoods, and access to safe affordable housing, quality education, nutrition, and health care. According to a recent CDC publication, "the

[25] Natural Resources Defense Council. New drinking water report: Communities of color more likely to suffer drinking water violations for years. Sept 24, 2019. https://www.nrdc.org/media/2019/190924

[26] Baehler KJ, McGraw M, Aquino MJ, Heslin R, McCormick L, Neltner T. Full lead service line replacement: A case study of equity in environmental remediation. *Sustainability*. 2022;14(1):352. https://doi.org/10.3390/su14010352

[27] Shoup M. Bottled water surpasses soda in consumption with 86% purchase rate among Americans. Mar 13, 2017. BeverageDaily. https://www.beveragedaily.com/Article/2017/03/13/Bottled-water-surpasses-soda-in-consumption-for-the-first-time

pernicious and irreversible effects of lead exposures perpetuate ongoing structural inequities and injustices.[28] Thus, lead exposure can be considered both a result and cause of health inequity and environmental injustice."[29]

Drinking water infrastructure work, and especially lead pipe replacement work, should be prioritized in historically disadvantaged communities. This will serve to actively implement the administration's environmental justice priorities. **Drinking water infrastructure investments are not just about pipes and plumbing, but about people and our potential to address historic and socioeconomic disparities.**

THE COST OF INACTION & THE RETURN ON INVESTMENT

This hearing is fundamentally about dollars and some have argued about the cost of the Infrastructure Investment Act. I want to emphasize that the significant cost of *inaction* was unaffordable. Besides the incalculable cost to the health and development of children, the economic costs of preventable lead in water exposure includes lost future worker productivity and earnings and greater health care, mental health, criminal justice, and special education costs. The costs of inaction are borne by everyone, including federal and state government budgets, which are affected by increased health care needs and lost future tax revenues from reduced earnings. When the long-term benefits for children are included in the societal savings of lead pipe elimination, it has been estimated that **every lead pipe replaced can generate up to $9,900 in economic benefits**.[30] When compared to the cost of replacement, this equates to a **33% societal return on investment (ROI)**. **As a result, this initial $15 billion investment in lead service line replacement across the US is expected to generate a net societal return of $4.95 billion dollars.** Moreover, the targeting of this investment with priority for disadvantaged communities and low-income homeowners and renters puts the investment where it's needed most as research has shown lead exposure risks and blood lead levels are typically greatest in these areas.

In addition, repairing water infrastructure problems after they occur (crises, water main breaks, leaks, contamination, power outages, etc) is more costly and less effective than proactive investment in the "pipeline inventories to replace the aging infrastructure."[31] Simply put, this robust investment in our drinking water infrastructure makes economic sense.

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[28] Sampson RJ, Winter AS. The racial ecology of lead poisoning: Toxic inequality in Chicago Neighborhoods, 1995-2013. *Du Bois Review: Social Science Research on Race*. 2016;13(2):261-283. https://doi.org/10.1017/S1742058X16000151

[29] Ruckart PZ, Jones RL, Courtney JG, LeBlanc TT, Jackson W, Karwowski MP, Cheng PY, Allwood P, Svendsen ER, Breysse PN. Update of the blood lead reference value — United States, 2021. *MMWR Morb Mortal Wkly Rep*. 2021;70(43):1509-1512. https://doi.org/10.15585/mmwr.mm7043a4

[30] The Health Impact Project. *10 Policies to Prevent and Respond to Childhood Lead Exposure: An Assessment of the Risks Communities Face and Key Federal, State, and Local Solutions*. Washington, DC: The Pew Charitable Trusts; Aug 2017. https://www.pewtrusts.org/-/media/assets/2017/08/hip_childhood_lead_poisoning_report.pdf

[31] Ambler A. The economics of water main failures. Apr 13, 2020. Water Finance & Management. https://waterfm.com/the-economics-of-water-main-failures/

UNFINISHED WORK

I am thrilled about this once-in-a-generation investment in water infrastructure; however, we cannot wait another generation to complete this work. Contrary to President Biden's initial infrastructure proposal in 2021,[32] the Infrastructure Investment and Jobs Act will not be sufficient to replace 100% of our nation's lead pipes. The House-passed Build Back Better (BBB) Act includes an additional $10 billion for lead service line replacement and lead in school water funding. I encourage ongoing deliberations with the Senate and am hopeful that any pared-back version of the BBB would retain this additional funding and make good on the promise of eliminating all lead service lines in this country, both for the critical human impact and to capture the additional return on investment. Alternatively, a stand-alone bill to finish the work should be considered.

In addition, lead in water is only one source of lead; children are also poisoned by other sources of lead (paint, dust, soil, aviation fuel, bullets, etc). Robust primary prevention investments are necessary and achievable to eliminate all sources of lead. According to a recent report, the maximum potential future economic benefits of eliminating all sources of lead before children are exposed, "could reach $84 billion."[33]

I also support efforts to further clarify and strengthen the enacted Infrastructure Investment and Jobs Act by encouraging the administration to 1) require completing lead service line replacement as soon as possible - at least within 10 years - and offer technical assistance and workforce development to disadvantaged communities that may not be as "shovel ready" as other well-resourced communities, 2) allocate funding based on the estimated number of lead service lines in each state, 3) prioritize disadvantaged communities since this funding does not replace 100% of lead pipes, 4) provide this funding as grants (not loans) and bar programs from requiring residents to pay for their replacements, and 5) ban partial line replacements. Partial lead line replacements can result in higher lead contamination after replacement and have been advised against by the EPA's Science Advisory Board.[34] The 2021 Lead and Copper Rule Revisions do not allow partial lead service line replacements to be counted towards replacement goals.[35] Similarly, the Department of the Treasury's recent rule for funding under the American Rescue Plan Act prohibits funding for partial lead service line replacements.[36]

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[32] The White House. *Fact Sheet: The American Jobs Plan*. Mar 31, 2021. https://www.whitehouse.gov/briefing-room/statements-releases/2021/03/31/fact-sheet-the-american-jobs-plan/

[33] The Health Impact Project. *10 Policies to Prevent and Respond to Childhood Lead Exposure: An Assessment of the Risks Communities Face and Key Federal, State, and Local Solutions*. Washington, DC: The Pew Charitable Trusts; Aug 2017. https://www.pewtrusts.org/-/media/assets/2017/08/hip_childhood_lead_poisoning_report.pdf

[34] EPA Science Advisory Board. *Science Advisory Board Evaluation of the Effectiveness of Partial Lead Service Line Replacements*. EPA; September 2011. EPA-SAB-11-015. https://www.epa.gov/sites/default/files/2015-09/documents/sab_evaluation_partial_lead_service_lines_epa-sab-11-015.pdf

[35] National Primary Drinking Water Regulations: Lead and Copper Rule Revisions, 86 Fed. Reg. 4198 (January 15, 2021). https://www.govinfo.gov/content/pkg/FR-2021-01-15/pdf/2020-28691.pdf

[36] Coronavirus State and Local Fiscal Recovery Funds, 87 Fed. Reg. 4338 (January 27, 2022). https://www.govinfo.gov/content/pkg/FR-2022-01-27/pdf/2022-00292.pdf

CONCLUSION

The state of our drinking water infrastructure is a public health crisis. Water is a medical and public health necessity, yet for too many people in too many communities, they are denied the basic human right of access to safe and affordable drinking water. A positive ripple effect of Flint's crisis has been the growing awakening that our fragile and outdated drinking water infrastructure system can sicken and diminish our nation's competitiveness and our public health. In some ways, the condition of our drinking water infrastructure is a threat to our viability as a nation. For example, when lead was finally restricted from paint, the nation's collective IQ increased. The same will be said when we finally invest in our drinking water infrastructure and eliminate lead pipes.

Throughout time, and within these great rooms of Congress, we have respected science, learned from history, and boldly taken steps to protect our nation's children. The bipartisan Infrastructure Investment and Jobs Act does exactly that - it is a testament to your visionary and proactive leadership. The return on investment of the Infrastructure Act will be rewarded not only with profound societal savings, but also with generations of children who are healthier, stronger, and smarter. What is infrastructure if not the building of a robust foundation for our nation's greatest and most valuable resource: our children.

Thank you again for the opportunity to address the committee today. I look forward to your questions.

DR. MONA HANNA-ATTISHA

Mona Hanna-Attisha, MD, MPH, FAAP is founder and director of the Michigan State University and Hurley Children's Hospital Pediatric Public Health Initiative, an innovative and model public health program in Flint, Michigan. A pediatrician, scientist, public health advocate and author, Dr. Hanna-Attisha has testified four times before the United States Congress, and been named one of *Time* magazine's 100 Most Influential People in the World, and *USA Today's* Woman of the Century for her role in uncovering the Flint Water Crisis and leading recovery efforts. She is the 2020 recipient of the CDC Foundation's Fries Prize for Improving Health. The founding donor of the Flint Child Health and Development Fund (flintkids.org), she is the author of the 2018 *New York Times* 100 Notable book, *What The Eyes Don't See: A Story of Crisis, Resistance, and Hope in an American City*.

Trained in environmental health and health policy, Dr. Hanna-Attisha received her Bachelor's and Master of Public Health degrees from the University of Michigan and her medical degree from Michigan State University College of Human Medicine. She completed her residency and chief residency in pediatrics at Children's Hospital of Michigan in Detroit. She is currently an Associate Professor of Pediatrics and Human Development and a C.S. Mott Endowed Professor of Public Health at Michigan State University College of Human Medicine in Flint, Michigan.