THE COST OF CHILDHOOD LEAD POISONING IN NEW JERSEY

The scientific evidence is clear: no amount of lead in the blood is safe. Yet, the majority of state and federal policies require children to develop lead poisoning and suffer permanent brain damage *before* any meaningful lead hazard inspection or remediation is triggered.

Age of New Jersey's Housing Stock

Over 67.22% of New Jersey's housing stock was built before 1980, meaning there are 2,150,452 occupied housing units in New Jersey that contain possible lead-based paint hazards.[i] Of these housing units, approximately 257,854 occupied units contain both children under six and possible lead hazards.[ii]

Extent of Childhood Lead Poisoning in New Jersey

According to the Centers for Disease Control and Prevention (CDC), 3.22% of New Jersey's children under six had blood lead levels above the CDC reference value of 5 micrograms per deciliter (µg/dL) in 2014.[iii] Applying this percentage to the state's under six population, it is estimate that approximately 21,016 children are likely to have elevated blood lead levels (EBLL) above the CDC's reference value.[iv]

Societal Costs of Lead Poisoning in New Jersey

For one cohort of children ages one to two years old who are estimated to have EBLLs above the CDC reference value, the costs could be as high as **$234,372,720.94** with children in Housing Choice Voucher (HCV) program accounting for **$28,016,438.47** of these costs.[v] These costs accrue each year to children when they first develop lead poisoning and repeat themselves every year as new children ages one to two years old develop lead poisoning. The potential costs for a single birth cohort of children in New Jersey age one to two years old include:

- $207,905.34 in costs associated with immediate medical intervention,[vi]
- $1,562,526.03 in costs associated with treatment of lead-related ADHD,[vii]
- $863,434.39 in parental work loss due to time taken off to care for child with an EBLL above 5 µg/dL,[viii]
- $641,576.73 in costs associated with additional special education services for children with lead poisoning,[ix]
- $231,097,278.44 in potential earnings over a lifetime.[x]

Taxpayers would shoulder up to **26.2** %, or **$61,281,848.07**, of these total costs.[xi]

These cost estimates do not include pain and suffering for the child or criminal justice costs. Additionally, these estimates do not include EBLLs between 2 µg/dL and 5 µg/dL and, according to a 2019 study by Altarum, the costs associated with children who have EBLLs above 2 µg/dL could be as high as **$2.8** billion, including $1.2 of local, state, and government spending, and impact **10**% of all births in New Jersey in 2019.[xii]

Societal Costs of Lead Poisoning in the Housing Choice Voucher Program

Under current regulations, in the Housing Choice Voucher (HCV) program and project-based Section 8 receiving less than $5,000, meaningful lead hazard inspections are only triggered after a child is lead poisoned. In all other federally assisted housing programs, lead hazards must be identified and addressed before children are exposed. Applying the CDC's state BLL percentage[xiii] to the state's under five population of children in the HCV program, approximately 2,094 children in the program are estimated to have EBLLs above the CDC reference value.[xiv, xv] The potential costs for a single cohort of children aged 1-2 years old in HCV program units in New Jersey are **$28,016,438.47**, including:

- $24,981.38 in costs associated with immediate medical intervention,[xvi]
- $186,749.80 in costs associated with treatment of lead-related ADHD,[xvii]
- $103,207.70 in parental work loss due to time taken off to care for a child with an EBLL above 5 µg/dL,[xviii]
- $76,008.45 in costs associated with additional special education services for children with lead poisoning,[xix]
- $27,625,491.13 in potential earnings over a lifetime.[xx]

Taxpayers would shoulder up to **26.2** %, or **$7,327,559.93**, of these costs for children in the HCV program.[xxi]

Cost of Identifying Lead Hazards Before a Child is Lead Poisoned

The cost of lead poisoning prevention is a fraction of the individual, family, and societal costs incurred annually due to lead poisoning. In fact, it would cost between $116 million and $180.5 million to perform a lead hazard risk assessment in these units in order to identify lead hazards *before* a child develops lead poisoning.[xxii] This cost could be lower due to any laws in New Jersey that already require pre-occupancy lead inspection and remediation of homes. More importantly, no amount of spending can account for

the preservation of, or recover the loss of, a child's quality of life. Identifying lead hazards *before* a child is poisoned is the only way to protect children from lead poisoning and the permanent harm it causes.

THE COST OF CHILDHOOD LEAD POISONING IN NEW JERSEY

Data Sources & Calculations

Table 1: Potential Blood Lead Levels				
	Confirmed	**% of EBLL**	**Estimate of Total Children**	**Estimated number of Children in Cohort**
5 - 9 µg/dL	4,778	2.76%	18,040	3,007
10 - 14 µg/dL	473	0.27%	1,786	298
15 - 19 µg/dL	156	0.09%	589	98
20 - 24 µg/dL	76	0.0440%	287	48
25 - 44 µg/dL	72	0.0417%	272	45
44 - 69 µg/dL	9	0.0052%	34	6
70 µg/dL and above	2	0.0012%	8	1
TOTAL	5,566	-	21,016	3,503
HCV Potential Blood Lead Levels				
	Confirmed	**% of EBLL**	**Estimate of Total Children**	**Estimated number of Children in Cohort**
5 - 9 µg/dL	4,778	2.76%	1,797	300
10 - 14 µg/dL	473	0.27%	178	30
15 - 19 µg/dL	156	0.09%	59	10
20 - 24 µg/dL	76	0.0440%	29	5
25 - 44 µg/dL	72	0.0417%	27	5
44 - 69 µg/dL	9	0.0052%	3	1
70 µg/dL and above	2	0.0012%	1	0
TOTAL	5,566	-	2,094	351

Table 1: According to the CDC, the number of children under 72 months in New Jersey who were tested and confirmed for BLLs greater than or equal to 5 µg/dL is 3.22% of children.[xxiii] The CDC also provided a breakdown of the BLL groups and children that tested in those ranges. The confirmed rates were used to estimate the prevalence in the population. The cohort represents all children born in 2014 and their lifetime economic costs.

Table 2: Potential Costs Associated with Immediate Medical Intervention				
Blood Lead level in µg/dL	Number of Children age 1-2	Recommended treatment[xxiv]	Cost of recommended treatment[xxv]	Total Cost
5 - 9 µg/dL	3,007	Diagnostic testing	$10.87	$32,682.47
10 - 14 µg/dL	298	Diagnostic testing, venipuncture, lead assay, nurse-only visit	$94.20	$28,039.10

15 - 19 µg/dL	98	Diagnostic testing, venipuncture, lead assay, nurse-only visit	$94.20	$9,247.61
20 - 24 µg/dL	48	Above treatments, plus 8 visits for diagnostic testing, nurse follow-up	$1,313.26	$62,817.60
25 - 44 µg/dL	45	Above treatments, plus 8 visits for diagnostic testing, nurse follow-up	$1,313.26	$59,534.45
44 - 69 µg/dL	6	Above treatments plus oral chelation	$1,711.34	$9,697.59
70 µg/dL and above	1	Above treatments, except oral chelation is replaced with intravenous chelation	$4,414.88	$5,886.51
			TOTAL	**$207,905.34**
HCV Children				
5 - 9 µg/dL	359	Diagnostic testing	$10.87	$3,906.68
10 - 14 µg/dL	36	Diagnostic testing, venipuncture, lead assay, nurse-only visit	$94.20	$3,351.26
15 - 19 µg/dL	12	Diagnostic testing, venipuncture, lead assay, nurse-only visit	$94.20	$1,105.15
20 - 24 µg/dL	6	Above treatments, plus 8 visits for diagnostic testing, nurse follow-up	$1,313.26	$7,616.91
25 - 44 µg/dL	5	Above treatments, plus 8 visits for diagnostic testing, nurse follow-up	$1,313.26	$7,091.60
44 - 69 µg/dL	1	Above treatments plus oral chelation	$1,711.34	$1,026.80
70 µg/dL and above	0	Above treatments, except oral chelation is replaced with intravenous chelation	$4,414.88	$882.98
			TOTAL	**$24,981.38**

Table 2: The following table shows the recommended treatment for children whose test results show elevated BLLs between above 5 µg/dL and the estimated costs of that treatment. The number of children with elevated BLLs is taken from Table 1. The treatment comes from CDC recommendations and Kemper's 1998 paper and the cost is drawn from Gould's 2009 paper (cost is inflated to reflect 2019 prices). The estimated costs of these treatments are applied to the number of children in our cohort who are estimated to have the corresponding blood levels.[xxvi]

Table 3: Potential Health Care Costs Associated to ADHD					
	Total Children aged 1-2[xxvii]	Estimated 9.4% diagnosed with ADHD[xxviii]	21.1% of cases associated with EBLL[xxix]	Healthcare Costs for Medication and Counseling per child for 1 year[xxx]	Total Cost
New Jersey	108,770	10,224	2,157	$724.28	**$1,562,526.03**
HCV	13,000	1,222	258	$724.28	**$186,749.80**

Table 3: According to the CDC, 9.4% of children aged 3-17 in the US have been diagnosed with ADHD.[xxxi] Gould (2009) estimates 21.1% of ADHD cases in children aged 4-15 are associated with elevated BLLs and the cost of medication and counseling for 1 year per child to be $724.28 (inflated to reflect 2019 cost).[xxxii]

Table 4: Potential Parental Work Loss				
	Children with immediate medical intervention	Children with ADHD medical Intervention	Parent Work Loss[xxxiii]	Total Cost

New Jersey	3,503	2,157	$152.55	**$863,434.39**
HCV	419	258	$152.55	**$103,207.70**

Table 4: According to Gould (2009) the cost of parental work loss is estimated to be $152.55 (inflated to reflect 2019 cost) per year for every child that has medical treatment due to lead poisoning. This cost was applied to children who received immediate medical attention and ADHD medication and counseling, see Tables 2 and 3 for the calculation of those numbers.

Table 5: Potential Costs of special education related to lead exposure			
	Children with BLL 25+ µg/dL	Cost per year of special education	Total cost for 3 years of special education for 20% of children with blood lead level 25+ µg/dL
New Jersey	52	$20,432.38	**$641,576.73**
HCV	6	$20,432.38	**$76,008.45**

Table 5: Childhood lead exposure is associated with declines in IQ and an associated need for special education. Gould (2009) drawing from Schwartz (1994) estimates that 20% of children with BLLs of 25 µg/dL and higher will require special education for an average of 3 years.[xxxiv]

Table 6: Potential Reduction in lifetime earnings				
Blood Lead level in µg/dL	Number of Children in Cohort[xxxv]	IQ points loss per child[xxxvi]	Value of IQ Points	Total loss of Lifetime Earnings
5 - 9	3,007	2.565	$58,800.91	$176,794,725.39
10 - 14	298	3.90	$89,404.89	$26,611,811.64
15 - 19	98	5.8	$132,961.11	$13,052,792.56
20 - 24	48	5.8	$132,961.11	$6,359,973.29
25 - 44	45	6.9	$158,177.88	$7,170,730.42
45 - 69	6	6.9	$158,177.88	$896,341.30
70 +	1	6.9	$158,177.88	$210,903.84
				$231,097,278.44
HCV				
Blood Lead level in µg/dL	Number of Children in Cohort	IQ points loss per child	Value of IQ Points	Total loss of Lifetime Earnings
5 - 9	359	2.565	$58,800.91	$21,133,045.78
10 - 14	36	3.90	$89,404.89	$3,180,668.26
15 - 19	12	5.8	$132,961.11	$1,559,899.79
20 - 24	6	5.8	$132,961.11	$771,174.46
25 - 44	5	6.9	$158,177.88	$854,160.54
45 - 69	1	6.9	$158,177.88	$94,906.73
70 +	0	6.9	$158,177.88	$31,635.58
				$27,625,491.13

Table 6: The decline in IQ points caused by childhood lead poisoning is correlated to a reduction in a child's lifetime earnings.[xxxvii] In order to determine the total loss of lifetime earnings, children were divided into groups based on the BLL. The associated decline in IQ points for the groups applies the standard from Gould (2009), with the conservative assumption that all children in the 5-9 µg/dL group tested at 5 µg/dL, and so on. The loss of lifetime earnings is calculated using the standard in Gould (2009), inflated to 2019 costs, assuming each IQ point lost equates to $22,924.33.[xxxviii]

Table 7: Summary of costs associated with lead exposure			
New Jersey			
	Amount	Cost to the Taxpayer	Description of assumed taxpayer costs
Increases in health care			
Blood Lead Treatment	$207,905.34	$187,114.80	Estimated 90% of US children with EBLL are on Medicaid
Treatment of lead-related ADHD	$1,562,526.03	$1,406,273.43	Estimated 90% of US children with EBLL are on Medicaid
Parental work loss	$863,434.39	**$47,747.92**	**Estimated 5.53% Income Tax**
Increases in special education	$641,576.73	$641,576.73	Estimated 100% of costs will be through public education
Reduction in lifetime earnings	$231,097,278.44	**$12,779,679.50**	**Estimated 5.53% Income Tax**
		$46,219,455.69	Estimated 20% Federal Tax
TOTAL	**$234,372,720.94**	**$61,281,848.07**	
HCV			
	Amount	Cost to the Taxpayer	Description of assumed taxpayer costs
Increases in health care			
Blood Lead Treatment	$24,981.38	$24,981.38	Estimated 100% of US children with EBLL in the HCV program are on Medicaid
Treatment of lead-related ADHD	$186,749.80	$168,074.82	Estimated 90% of US children with EBLL are on Medicaid
Parental work loss	$103,207.70	**$5,707.39**	**Estimated 5.53% Income Tax**
Increases in special education	$76,008.45	$76,008.45	Estimated 100% of costs will be through public education
Reduction in lifetime earnings	$27,625,491.13	**$1,527,689.66**	**Estimated 5.53% Income Tax**
		$5,525,098.23	Estimated 20% Federal Tax
TOTAL	**$28,016,438.47**	**$7,327,559.93**	

Table 7: This table is a summary of Tables 1-8. Description of assumed taxpayer burden is drawn from the calculations used in Tracy Swinburn's Economic Impacts of Lead Exposure and Remediation in Michigan (2014).[xxxix] Tax rates were calculated from the 2019 state individual tax rates for someone who makes $60,000 a year.[xl]

[i] According to the American Community Survey and Census Bureau's Population Estimates Program, the total number of housing units in New Jersey built before 1980 is 2,150,452 and the total number of housing units in New Jersey is 3,199,111 this means 67.22% of housing units were built before 1980. U.S. Census Bureau,

American FactFinder https://factfinder.census.gov/bkmk/table/1.0/en/ACS/17_5YR/S2501/0400000US36 (using 2013-2017 American Community Survey 5-Year Estimates).

[ii] According to the American Community Survey and Census Bureau's Population Estimates Program, the total number of occupancies of families with a child under 6 in New Jersey is 383,595 U.S. Census Bureau, American FactFinder, https://factfinder.census.gov/bkmk/table/1.0/en/ACS/17_5YR/S2501/0400000US36 using 2013-2017 American Community Survey 5-Year Estimates). By applying 67.22% to 383,595 families, we can estimate that there are 257,854 housing units that have children under 6 and potential lead-based paint hazards.

[iii] The calculations in this document were performed by Virginia Morgan, MPH, for the Columbia Law School Health Justice Advocacy Clinic and Morningside Heights Legal Services. In order to determine the annual costs of lead poisoning among children in New Jersey in both the public and private housing market, data was used from the 2014 Centers for Disease Control and Prevention (CDC) report on children tested and confirmed with blood lead levels (BLL) over 5 micrograms per deciliter (µg/dL).

[iv] In 2014, the most recent year for complete CDC data, 5,566 of the 172,846 tested children younger than 72 months had BLL above 5 µg/dL (3.22%). (Number of Children Tested and Confirmed BLL's ≥ 10 µg/dL by State, Year, and BLL Group, Children < 72 Months Old, (2015), Center for Disease Control and Prevention. https://www.cdc.gov/nceh/lead/data/Website_StateConfirmedByYear_1997_2014_01112016.htm). However, not all children are tested for lead. Assuming that these rates of EBLL prevalence apply to all children under 72 months in New Jersey yields an estimate of 21,016 EBLL children state wide (not including children over 72 months of age). This estimate provides an upper bound for the number of children with BLL over 5 µg/dL, since testing rates are typically higher among higher risk children.

[v] According to the National and State Housing Fact Sheets and Data from the Center on Budget and Policy Priorities, 65,000 children under 5 are part of the New Jersey's HCV program. https://www.cbpp.org/research/housing/national-and-state-housing-fact-sheets-data To calculate the number of children who are estimated to be lead poisoned, we used the calculated rate to determine the prevalence of lead poisoning in the state. Please see **Table 1: Potential Blood Lead Levels** in Appendix

[vi] According to CDC recommendations and Kemper (1998), the cost (from Gould 2009) for treatment of children with BLL between 10-19 would be $94.20, the cost for children with BLL between 20-45 would be $1,313.26, the costs for children with BLL between 44-69 be $1,711.34, and the costs for children with BLL above 70 would be $4,414.88. Costs were inflated to reflect 2019 prices. Please see **Table 2: Potential Costs Associated with Immediate Medical Intervention** in Appendix for calculations. Kemper AR. Bordley WC, and Downs SM (1998). "Cost Effectiveness Analysis of Lead Poisoning Screening Strategies Following the 1997 Guidelines of the Center for Disease Control and Prevention." Archives of Pediatric Adolescent Medicine. 152:1202-08. Elise Gould, Childhood Lead Poisoning: Conservative Estimates of the Social and Economic Benefits of Lead Hazard Control, 117 Envtl. Health Persp. 1162–67 (2009).

[vii] According to the CDC (2016), 9.4% of children aged 3-17 in the US have been diagnosed with ADHD. From https://www.cdc.gov/ncbddd/adhd/data.html. Gould (2009) estimates 21.1% of ADHD cases in children aged 4-15 are associated with elevated BLLs and the cost of medication and counseling for 1 year per child to be $724.28 (inflated to reflect 2019 cost). Please see **Table 3: Potential Health Care Costs Associated with ADHD** in Appendix.

[viii] According to Gould's (2009) estimates, parents will lose $152.55 (inflated to 2019 cost) per year for every child that has medical treatment due to lead poisoning. This cost was applied to children who received immediate medical attention and ADHD medication and counseling. Please see **Table 4: Potential Parental Work Loss** in Appendix.

[ix] Schwartz (1994) estimates that 20% of children with BLL of 25 µg/dL or above require special education for an average of 3 years.
Schwartz (1994) "Societal Benefits of Reducing Lead Exposure." Environmental Research 66: 105-124. Please see **Table 5: Potential Costs of Special Education Related to Lead Exposure** in Appendix.

[x] These estimates applied the standards established in Lanphear et al (2005) and Gould (2009) to estimate lead-associated IQ loss and lifetime earnings loss for Children 0-5 year olds in 2017. Lanphear BP, Hornung R, Khoury J et al (2005). Low-level environmental lead exposure and children's intellection function: An international pooled analysis. Environmental Health Perspectives 113(7): 849-9 Please see **Table 6: Potential Reduction in Lifetime Earnings** in Appendix.

[xi] Numbers in this summary are based off the calculations used in Tracy Swinburn's Economic Impacts of Lead Exposure and Remediation in Michigan (2014). Swinburn, Tracy. (June 2014). Economic Impacts of Lead Exposure and Remediation in Michigan. University of Michigan Risk Science Center and the Michigan Network for Children's Environmental Health. Tax rates were calculated based on the state income tax rate for an individual who makes $60,000 a year. Loughead, Katherine, March 2019, State Individual Income Tax Rates and Brackets for 2019. https://taxfoundation.org/state-individual-income-tax-rates-brackets-2019/

[xii] According to Altarum's VALUE of Lead Prevention Calculator New Jersey's estimated burden is **$2.8** billion with **9,861** children in their cohort of children born in 2019 with BLL of 2 µg/dL or greater. From http://valueofleadprevention.org/calculations.php?state=New Jersey

[xiii] In 2014, the most recent year for complete CDC data, 5,566 of the 172,846 tested children younger than 72 months had BLL above 5 µg/dL (3.22%). (Number of Children Tested and Confirmed BLL's ≥ 10 µg/dL by State, Year, and BLL Group, Children < 72 Months Old, (2015), Center for Disease Control and Prevention. https://www.cdc.gov/nceh/lead/data/Website_StateConfirmedByYear_1997_2014_01112016.htm). However, not all children are tested for lead. Assuming that these rates of EBLL prevalence apply to all children under 72 months in New Jersey yields an estimate of 21,016 EBLL children district wide (not including children over 72 months of age). This estimate provides an upper bound for the number of children with BLL over 5 µg/dL, since testing rates are typically higher among higher risk children.

[xiv] According to the National and State Housing Fact Sheets and Data from the Center on Budget and Policy Priorities, 65,000 children under 5 are part of the New Jersey's HCV program. https://www.cbpp.org/research/housing/national-and-state-housing-fact-sheets-data To calculate the number of children who are estimated to be lead poisoned, we used the CDC rate of 1.07% to determine the prevalence of lead poisoning in the state. Please see **Table 1: Potential Blood Lead Levels** in Appendix

[xv] Current HUD regulations only require an ineffective "visual" assessment of lead hazards before approving units for occupancy by children in the HCV program and project-based Section 8 receiving less than $5,000. Scientists and doctors, including HUD Secretary Ben Carson, agree that visual assessments alone fail to identify lead dust and lead-dirt, which are the primary sources of lead poisoning. Thus, due to the shortcomings of visual assessments, we assume that HCV housing units do not have a higher probability of being lead-safe than the general housing stock.

[xvi] According to CDC recommendations and Kemper (1998), the cost (from Gould 2009) for treatment of children with BLL between 10-19 would be $94.20, the cost for children with BLL between 20-45 would be $1,313.26, the costs for children with BLL between 44-69 be $1,711.34, and the costs for children with BLL above 70 would be $4,414.88. Costs were inflated to reflect 2019 prices. Please see **Table 2: Potential Costs Associated with Immediate Medical Intervention** in Appendix for calculations. Kemper AR. Bordley WC, and Downs SM (1998). "Cost Effectiveness Analysis of Lead Poisoning Screening Strategies Following the 1997 Guidelines of the Center for Disease Control and Prevention." Archives of Pediatric Adolescent Medicine. 152:1202-08. Elise Gould, Childhood Lead Poisoning: Conservative Estimates of the Social and Economic Benefits of Lead Hazard Control, 117 Envtl. Health Persp. 1162–67 (2009).

[xvii] According to the CDC (2016), 9.4% of children aged 3-17 in the US have been diagnosed with ADHD. From https://www.cdc.gov/ncbddd/adhd/data.html. Gould (2009) estimates 21.1% of ADHD cases in children aged 4-15 are associated with elevated BLLs and the cost of medication and counseling for 1 year per child to be $724.28 (inflated to reflect 2019 cost). Please see **Table 3: Potential Health Care Costs Associated with ADHD** in Appendix.

[xviii] According to Gould's (2009) estimates, parents will lose $152.55 (inflated to 2019 cost) per year for every child that has medical treatment due to lead poisoning. This cost was applied to children who received immediate medical attention and ADHD medication and counseling. Please see **Table 4: Potential Parental Work Loss** in Appendix.

[xix] Schwartz (1994) estimates that 20% of children with BLL of 25 µg/dL or above require special education for an average of 3 years.
Schwartz (1994) "Societal Benefits of Reducing Lead Exposure." Environmental Research 66: 105-124. Please see **Table 5: Potential Costs of Special Education Related to Lead Exposure** in Appendix.

[xx] These estimates applied the standards established in Lanphear et al (2005) and Gould (2009) to estimate lead-associated IQ loss and lifetime earnings loss for Children 0-5 year olds in 2017. Lanphear BP, Hornung R, Khoury J et al (2005). Low-level environmental lead exposure and children's intellection function: An international pooled analysis. Environmental Health Perspectives 113(7): 849-9 Please see **Table 6: Potential Reduction in Lifetime Earnings** in Appendix.

[xxi] Numbers in this summary are based off the calculations used in Tracy Swinburn's Economic Impacts of Lead Exposure and Remediation in Michigan (2014). Swinburn, Tracy. (June 2014). Economic Impacts of Lead Exposure and Remediation in Michigan. University of Michigan Risk Science Center and the Michigan Network for Children's Environmental Health. Tax rates were calculated based on the state income tax rate for an individual who makes $60,000 a year. Loughead, Katherine, March 2019, State Individual Income Tax Rates and Brackets for 2019. https://taxfoundation.org/state-individual-income-tax-rates-brackets-2019/

[xxii] HUD estimates the cost of a risk assessment for a single-family housing unit is $700. HUD estimates the cost of a risk assessment for a multi-family housing unit is $450. These cost estimates were applied to the total number of housing units that have children under 6 and potential lead-based paint hazards that was calculated in footnote 10. Office of Lead Hazard Control and Healthy Homes, U.S. Dep't of Housing and Urban Development, Economic Analysis of the Proposed Rule on Lead-based Paint: Requirements for Notification, Evaluation and Reduction of Lead-Based Paint Hazards in Federally Owned Residential Property and Housing Receiving Federal Assistance; Response to Elevated Blood Lead Levels 18 tbl.3 (Aug. 10, 2016). Please see **Table 8: Potential Costs of Risk Assessment** in appendix.

[xxiii] Number of Children Tested and Confirmed BLL's ≥ 10 µg/dL by State, Year, and BLL Group, Children < 72 Months Old, (2015), Center for Disease Control and Prevention. https://www.cdc.gov/nceh/lead/data/Website_StateConfirmedByYear_1997_2014_01112016.htm

[xxiv] Kemper (1998) "Cost Effectiveness Analysis of Lead Poisoning Screening Strategies Following the 1997 Guidelines of the Center for Disease Control and Prevention." Archives of Pediatric Adolescent Medicine. 152:1202-08.

[xxv] Elise Gould, Childhood Lead Poisoning: Conservative Estimates of the Social and Economic Benefits of Lead Hazard Control, 117 Envtl. Health Persp. 1162–67 (2009). Cost inflated to represent 2019 costs.

[xxvi] Kemper (1998) "Cost Effectiveness Analysis of Lead Poisoning Screening Strategies Following the 1997 Guidelines of the Center for Disease Control and Prevention." Archives of Pediatric Adolescent Medicine. 152:1202-08.

[xxvii] The number of children in our cohort is taken from the CDC and divided by 6 to create a cohort of children aged 1-2. Number of Children Tested and Confirmed BLL's > 10 µg/dL by State, Year, and BLL Group, Children < 72 Months Old (2015), From https://www.cdc.gov/nceh/lead/data/Website_StateConfirmedByYear_1997_2014_01112016.htm.

[xxviii] According to the CDC (2016), 9.4% of children aged 3-17 in the US have been diagnosed with ADHD. From https://www.cdc.gov/ncbddd/adhd/data.html

[xxix] Gould (2009) estimates 21.1% of ADHD cases in children aged 4-15 are associated with elevated BLLs. Elise Gould, Childhood Lead Poisoning: Conservative Estimates of the Social and Economic Benefits of Lead Hazard Control, 117 Envtl. Health Persp. 1162–67 (2009). Cost inflated to represent 2019 costs.

[xxx] Gould (2009) estimates the cost of medication and counseling for ADHD for 1 year per child diagnosed to be $724.28 (inflated to reflect 2019 cost). Elise Gould, Childhood Lead Poisoning: Conservative Estimates of the Social and Economic Benefits of Lead Hazard Control, 117 Envtl. Health Persp. 1162–67 (2009). Cost inflated to represent 2019 costs.

[xxxi] According to the CDC (2016), 9.4% of children aged 3-17 in the US have been diagnosed with ADHD. From https://www.cdc.gov/ncbddd/adhd/data.html

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[xxxiii] Gould (2009) estimates the cost the cost of parental work loss is estimated to be $152.55 per year per child lead-poisoned. This number was applied to the estimated number of children receiving medical treatment in Table 2 and Table 3. Cost inflated to represent 2019 costs.

[xxxiv] Schwartz (1994) estimates that 20% of children with BLL of 25 µg/dL or above require special education for an average of 3 years.
Schwartz (1994) "Societal Benefits of Reducing Lead Exposure." Environmental Research 66: 105-124.

[xxxv] These numbers come from assumptions made in **Table 1: Potential Blood Lead Levels**.

[xxxvi] The associated decline in IQ points for the groups applies the standard from Gould (2009), with the conservative assumption that all children in the 5-9 µg/dL group tested at 5 µg/dL, and so on. The loss of lifetime earnings is calculated using the standard in Gould (2009), inflated to 2019 costs, assuming each IQ point lost equates to $22,924.33.

[xxxvii] Swinburn, Tracy. (June 2014). Economic Impacts of Lead Exposure and Remediation in Michigan. University of Michigan Risk Science Center and the Michigan Network for Children's Environmental Health.

[xxxviii] Gould (2009) estimates the cost the cost of parental work loss is estimated to be $152.55 per year per child lead-poisoned. This number was applied to the estimated number of children receiving medical treatment in Table 2 and Table 3. Cost inflated to represent 2019 costs.

[xxxix] Numbers in this summary are based off the calculations used in Tracy Swinburn's Economic Impacts of Lead Exposure and Remediation in Michigan (2014). Swinburn, Tracy. (June 2014). Economic Impacts of Lead Exposure and Remediation in Michigan. University of Michigan Risk Science Center and the Michigan Network for Children's Environmental Health.

[xl] Loughead, Katherine, March 2019, State Individual Income Tax Rates and Brackets for 2019. https://taxfoundation.org/state-individual-income-tax-rates-brackets-2019/