LEAGUE OF WOMEN VOTERS OF DELAWARE

State Funding is Needed to Reduce Childhood Lead Poisoning
Testimony Presented to the Joint Finance Committee
February 26, 2020

Good Morning. My name is Sandy Spence and I am speaking on behalf of the League of Women Voters of Delaware in favor of state funding to address childhood lead poisoning. I was appointed by the Governor as a public member of the Childhood Lead Poisoning Advisory Committee established last year by HB 89.

For the past few years I have focused on criminal justice issues for the League, but I do have a background that qualified me for service on this Committee. From 1992-2000, I served as Executive Director of the Society of Glass & Ceramic Decorators where I was responsible for keeping members informed of state and federal laws relating to the use of lead and cadmium in the decoration of glass & ceramic ware. Since 2008, I have been a consultant to the Society, monitoring legislation and regulatory actions around the world focused on lead and cadmium issues and writing a monthly newsletter column on my findings.

Over my 12 years as a lobbyist for the League, I have been surprised that I never heard anything about childhood lead poisoning issues in Delaware until last year. That's when the issue began to get much needed attention when the General Assembly passed the nation's first law banning lead paint on outdoor structures, the Advisory Committee was restructured and reactivated, and a bill (HB 166) was introduced to require testing of all Delaware children for lead poisoning at age 2 in addition to the state's Childhood Lead Poisoning Prevention Act that requires testing for those at or around 12 months of age and proof of screening prior to child care or school enrollment.

HB 89 gives the Advisory Committee a big job. Meetings began in October to focus on that work. I had hoped to support initial recommendations that we planned to present today. However, I was not able to secure a copy of that statement in advance, so I am not able to do that. Instead, I will focus on one of the issues that supports to need for funding without being specific. [At the hearing, I was able to learn that the Advisory Committee recommended that the JFC provide $50,000 to purchase 20 machines that can provide immediate findings of lead poisoning within a medical office. I indicated that I supported that but would suggest adding a zero to the end of the amount based on need in Delaware. I also mentioned that I understood that the state provides no funding for childhood lead poisoning programs. (All our funding is from the feds.)]

Through my work on criminal justice issues, I had become convinced that childhood lead poisoning is a likely contributor to what has been called the "school to prison pipeline." Only recently have I found significant scholarly research to support what some call the "lead-crime hypothesis." Three important studies have been reported by the Brookings Institution. They are summarized in an attached article and one of them is discussed in more detail in the attached article from Mother Jones.

Here are results of some of the studies:

- Leaded gasoline explained as much as 90 percent of the rise and fall of violent crime over the past half century by showing a significant rise in crime as auto sales boomed. Then, prohibition of lead in gasoline led to a decline in crime 20 years later as young children exposed to the lead in gasoline grew to adulthood.
- "Even moderately high levels of lead exposure are associated with aggressivity, impulsivity, ADHD, and lower IQ. And right there, you've practically defined the profile of a violent young offender."
- Exposing populations to lead in their drinking water causes much higher homicide rates 20 years later, relative to similar places where kids avoided such exposure.
- 250 individuals, 19 to 24 years of age, were recruited at birth between 1979 and 1984…. Adjusted total arrest rates 20 years later were greater for each 5 μg/dl increase in blood lead concentration as originally measured.

As one report concluded: “We can either get rid of the remaining lead, or we can wait 20 years and then lock up all the kids who’ve turned into criminals.” Surely, investing in effective actions to cut childhood lead poisoning will yield long-term benefits to both our state budget for the social services and corrections as well as improved safety for our communities.

BROOKINGS [https://www.brookings.edu/]

New evidence that lead exposure increases crime (by Jennifer L. Doleac Thursday, June 1, 2017)

….The “lead-crime hypothesis” is that (1) lead exposure at young ages leaves children with problems like learning disabilities, ADHD, and impulse control problems; and (2) those problems cause them to commit crime as adults — particularly violent crime. For many years, the major source of lead in the environment was leaded gasoline: car exhaust left lead behind to settle into dust on the roads and nearby land. When lead was removed from gasoline, lead levels in the environment fell, and kids avoided the lead exposure that caused these developmental problems. About 20 years later, when those kids became young adults, crime rates fell. This, proponents say, is what explains the mysterious and persistent decline in crime beginning in the early 1990s.

It’s an intriguing idea — particularly since we don’t have a better explanation for the big changes in crime rates during this period. Several studies have found correlations between lead exposure and crime, at varying levels of geography (from neighborhoods to nations). But correlation, as we all know by now, does not imply causation.

The main challenge in measuring the effect of lead on crime is that lead exposure is highly correlated with a variety of indicators related to poverty: poor schools, poor nutrition, poor health care, exposure to other environmental toxins, and so on. Those other factors could independently affect crime. The challenge for economists has been to separate the effect of lead exposure from the effects of all those other things that are correlated with lead exposure. A true experiment — where some kids are randomized to grow up with high lead exposure and others not — is out of the question. So economists have gone hunting for natural experiments — events or policies that divide otherwise-similar kids into comparable treatment and control groups.

And they’ve found them. Three recent papers consider the effects of lead exposure on juvenile delinquency and crime rates, using three very different empirical approaches and social contexts. All have plausible (but very different) control groups, and all point to the same conclusion: lead exposure leads to big increases in criminal behavior.

One of these papers considers the aggregate effects of lead exposure on city-level crime, using U.S. data from the early twentieth century. The authors, James Feigenbaum and Christopher Muller, noted that one of the primary ways individuals were exposed to lead during this period was by drinking water pumped through lead pipes. But not all cities had lead pipes. If a city was far from the nearest lead refinery, it would likely have pipes made from another material. Comparing places with and without lead pipes might allow us to estimate the effect of lead exposure on crime, but we’d worry that places near lead refineries are systematically different in some way that could confound our estimates: perhaps they’re subject to more pollution, or are wealthier. To address this, the authors exploit another interesting fact: lead only seeps into water when the water is acidic. This sets up a nice natural experiment that sorts otherwise-similar cities into the treatment and control groups we need. Those with lead pipes and acidic water are the treatment group (their populations were exposed to lead in the drinking water). Cities with lead pipes but non-acidic water, and cities with acidic water but non-lead pipes, are the control groups. These control groups account for the independent effects of lead pipes or acidic water — and whatever characteristics those features are correlated with.

Using this experiment, the authors measure the effect of lead exposure on homicide rates lagged by 20 years (to give the kids exposed to lead time to grow up). They find that exposing populations to lead in their drinking water causes much higher homicide rates 20 years later, relative to similar places where kids avoided such exposure.

This evidence on city-level violent crime is more compelling than previous correlational studies, but perhaps it would be even better to compare similar kids who live in the same community. This would allow us to control for more factors that might independently drive criminal behavior.

The next paper does just this, using data from more recent years. Anna Aizer and Janet Currie link data on preschool blood lead levels with data on school suspensions and incarceration, for children born in Rhode Island between 1990 and 2004. They note that kids who happened to live closer to busy roads within a neighborhood are more likely to have high blood lead levels, because the soil near those roads was still contaminated due to the use of leaded gasoline decades ago. This was especially true for kids born in the early 1990s, as environmental lead levels have fallen over time. They use those kids as the treatment group (high lead exposure) and similar kids who lived on other roads, as well as kids who lived on the same roads in later years, as the control group. These kids look similar in most other ways — they attend the same schools, their parents have similar incomes, and so on — so we would expect them to have similar outcomes. But Aizer and Currie find that being exposed to higher levels of lead increases kids' likelihood of suspension from school as well as (for boys) the probability of being incarcerated as juveniles. The magnitude of their estimates suggest that the reduction in lead exposure due to the switch to unleaded gasoline may indeed explain a substantial portion of the decline in crime in the 1990s and 2000s.

The third paper comes at the lead-crime hypothesis from a different direction, and asks whether government programs that aim to reduce lead exposure can protect kids from lead's negative effects. Stephen Billings and Kevin Schnepel measure the effect of CDC-recommended interventions for kids with elevated blood lead levels. Kids who test above a certain lead level twice in a row are provided intensive services — including lead abatement in their home and nutritional counseling to mitigate the effects of lead exposure. The reason two tests are required is that blood lead tests are extremely imprecise. There are therefore a lot of kids who test over the threshold once but not the second time, for reasons other than their actual lead exposure. Billings and Schnepel use the noise in these test results as random variation that divides kids into treatment and control groups: kids who tested over the threshold twice get these services, while kids who tested over the threshold once and then just below the threshold the second time do not. The intuition is that these kids have similar blood lead levels, but due to random noise in the test, some are treated and others are not. By comparing what happens to those two groups of kids, Billings and Schnepel are able to measure the effects of CDC-recommended interventions on kids' outcomes.

They use data on kids born between 1990 and 1997 in Charlotte-Mecklenburg County, North Carolina. The data include results of blood lead level tests as well as school records and adult arrests. They find that, relative to the control group, kids who receive the intervention exhibit substantially less antisocial behavior, including suspensions, absences, school crimes, and violent crime arrests. These results are striking for two reasons: (1) The kids' blood lead levels — low by historical standards — are high enough to affect their behavior and put them at risk for suspensions and arrests. (2) The CDC-recommended interventions have a big impact and can substantially mitigate those risks. The authors conclude: "It is likely that increasing the frequency and intensity of intervention for lead-exposed children will yield a profound return considering the potential long-term effects of lead on health and human capital."

These new studies give us compelling evidence that ongoing lead exposure in communities across the country will have long-term costs to society. But they also provide evidence that we can do something to help kids who have been exposed to high lead levels, and that the benefits of such interventions far outweigh the costs. (Billings and Schnepel estimate that for every $1 invested in the intervention they studied, society yields a return of nearly $1.80.) If President Trump is serious about reducing crime rates, this research suggests he should dramatically expand these programs. It would be a smart investment in public safety.

Association of Prenatal and Childhood Blood Lead Concentrations with Criminal Arrests in Early Adulthood [Researchers: John Paul Wright, Kim N Dietrich, M. Douglas Ris, Richard W Hornung, Stephanie D Wessel, Bruce P Lanphear, Mona Ho, Mary N Rae

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Background…. The objective of this study was to determine if prenatal and childhood blood lead concentrations are associated with arrests for criminal offenses.

Methods and Findings. Pregnant women were recruited from four prenatal clinics in Cincinnati, Ohio if they resided in areas of the city with a high concentration of older, lead-contaminated housing. We studied 250 individuals, 19 to 24 y of age, out of 376 children who were recruited at birth between 1979 and 1984…. Total arrests and arrests for offenses involving violence were collected from official Hamilton County, Ohio criminal justice records. Main outcomes were the covariate-adjusted rate ratios (RR) for total arrests and arrests for violent crimes associated with each 5 μg/dl (0.24 μmol/l) increase in blood lead concentration. Adjusted total arrest rates were greater for each 5 μg/dl (0.24 μmol/l) increase in blood lead concentration: RR = 1.40 (95% confidence interval [CI] 1.07–1.85) for prenatal blood lead, 1.07 (95% CI 0.88–1.29) for average childhood blood lead, and 1.27 (95% CI 1.03–1.57) for 6-year blood lead. Adjusted arrest rates for violent crimes were also greater for each 5 μg/dl increase in blood lead: RR = 1.34 (95% CI 0.88–2.03) for prenatal blood lead, 1.30 (95% CI 1.03–1.64) for average childhood blood lead, and 1.48 (95% CI 1.15–1.89) for 6-year blood lead.

Conclusions. Prenatal and postnatal blood lead concentrations are associated with higher rates of total arrests and/or arrests for offenses involving violence. This is the first prospective study to demonstrate an association between developmental exposure to lead and adult criminal behavior.

Mother Jones

Lead: America's Real Criminal Element

The hidden villain behind violent crime, lower IQs, and even the ADHD epidemic.

KEVIN DRUMJANUARY/FEBRUARY 2013 ISSUE

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More prisons might help control crime, more cops might help, and better policing might help. But the evidence is thin for any of these as the main cause. What are we missing?

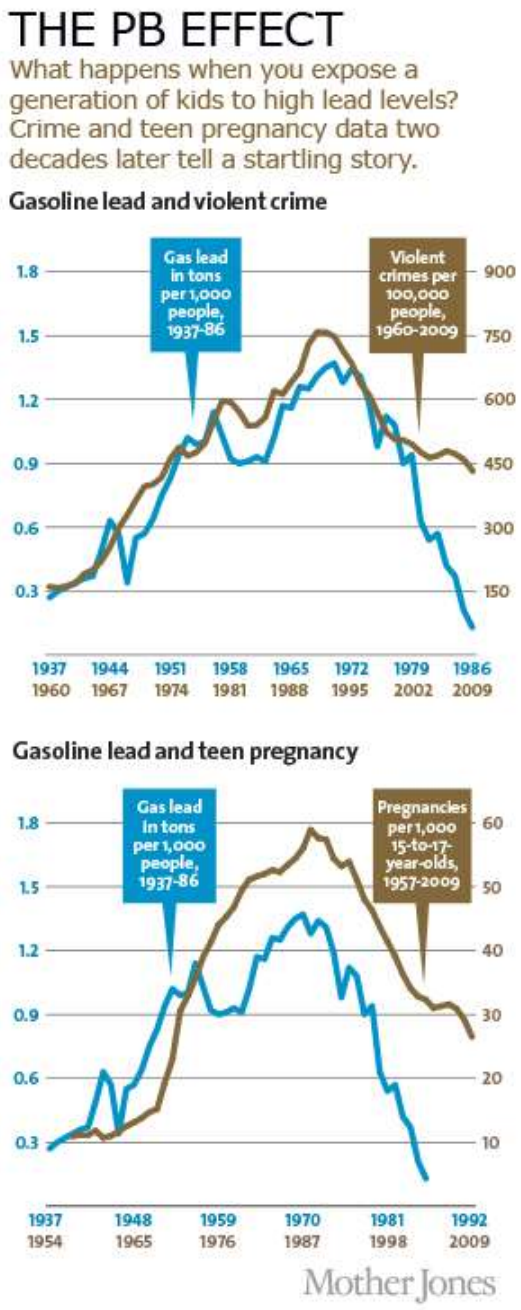
Well, here's one possibility: $Pb(CH_2CH_3)_4$.

In 1994, Rick Nevin was a consultant working for the US Department of Housing and Urban Development on the costs and benefits of removing lead paint from old houses. This has been a topic of intense study because of the growing body of research linking lead exposure in small children with a whole raft of complications later in life, including lower IQ, hyperactivity, behavioral problems, and learning disabilities.

But as Nevin was working on that assignment, his client suggested they might be missing something. A recent study had suggested a link between childhood lead exposure and juvenile delinquency later on. Maybe reducing lead exposure had an effect on violent crime too?

That tip took Nevin in a different direction. The biggest source of lead in the postwar era, it turns out, wasn't paint. It was leaded gasoline. And if you chart the rise and fall of atmospheric lead caused by the rise and fall of leaded gasoline consumption, you get a pretty simple upside-down U: Lead emissions from tailpipes rose steadily from the early '40s through the early '70s, nearly quadrupling over that period. Then, as unleaded gasoline began to replace leaded gasoline, emissions plummeted.

Intriguingly, violent crime rates followed the same upside-down U pattern. The only thing different was the time period: Crime rates rose dramatically in the '60s through the '80s, and then began dropping steadily starting in the early '90s. The two curves looked eerily identical but were offset by about 20 years.



Top: Rick Nevin, USGS, DOJ; Bottom: Rick Nevin, Guttmacher Institute, CDC

So Nevin dove in further, digging up detailed data on lead emissions and crime rates to see if the similarity of the curves was as good as it seemed. It turned out to be even better: In a 2000 paper (PDF) he concluded that if you add a

lag time of 23 years, lead emissions from automobiles explain 90 percent of the variation in violent crime in America. Toddlers who ingested high levels of lead in the ’40s and ’50s really were more likely to become violent criminals in the ’60s, ’70s, and ’80s.

And with that we have our molecule: tetraethyl lead, the gasoline additive invented by General Motors in the 1920s to prevent knocking and pinging in high-performance engines. As auto sales boomed after World War II, and drivers in powerful new cars increasingly asked service station attendants to “fill ‘er up with ethyl,” they were unwittingly creating a crime wave two decades later.

It was an exciting conjecture, and it prompted an immediate wave of…nothing. Nevin’s paper was almost completely ignored, and in one sense it’s easy to see why—Nevin is an economist, not a criminologist, and his paper was published in Environmental Research, not a journal with a big readership in the criminology community. What’s more, a single correlation between two curves isn’t all that impressive, econometrically speaking….You need to do something more to establish causality.

As it turns out, however, a few hundred miles north someone was doing just that. In the late ’90s, Jessica Wolpaw Reyes was a graduate student at Harvard casting around for a dissertation topic that eventually became a study she published in 2007 as a public health policy professor at Amherst. “I learned about lead because I was pregnant and living in old housing in Harvard Square.”….She started thinking about lead and crime. Although the association seemed plausible, she wanted to find out whether increased lead exposure caused increases in crime. But how?

In states where consumption of leaded gasoline declined slowly, crime declined slowly. Where it declined quickly, crime declined quickly.

The answer, it turned out, involved “several months of cold calling” to find lead emissions data at the state level. During the ’70s and ’80s, the introduction of the catalytic converter, combined with increasingly stringent Environmental Protection Agency rules, steadily reduced the amount of leaded gasoline used in America, but Reyes discovered that this reduction wasn’t uniform. In fact, use of leaded gasoline varied widely among states, and this gave Reyes the opening she needed. If childhood lead exposure really did produce criminal behavior in adults, you’d expect that in states where consumption of leaded gasoline declined slowly, crime would decline slowly too. Conversely, in states where it declined quickly, crime would decline quickly. And that’s exactly what she found.

Meanwhile, Nevin had kept busy as well, and in 2007 he published a new paper looking at crime trends around the world (PDF). This way, he could make sure the close match he’d found between the lead curve and the crime curve wasn’t just a coincidence. Sure, maybe the real culprit in the United States was something else happening at the exact same time, but what are the odds of that same something happening at several different times in several different countries?

Nevin collected lead data and crime data for Australia and found a close match. Ditto for Canada. And Great Britain and Finland and France and Italy and New Zealand and West Germany. Every time, the two curves fit each other astonishingly well. When I spoke to Nevin about this, I asked him if he had ever found a country that didn’t fit the theory. “No,” he replied. “Not one.”

Just this year, Tulane University researcher Howard Mielke published a paper with demographer Sammy Zahran on the correlation of lead and crime at the city level. They studied six US cities that had both good crime data and good lead data going back to the ’50s, and they found a good fit in every single one. In fact, Mielke has even studied lead concentrations at the neighborhood level in New Orleans and shared his maps with the local police. “When they overlay them with crime maps,” he told me, “they realize they match up.”

Put all this together and you have an astonishing body of evidence. We now have studies at the international level, the national level, the state level, the city level, and even the individual level. Groups of children have been followed from the womb to adulthood, and higher childhood blood lead levels are consistently associated with higher adult arrest rates for violent crimes. All of these studies tell the same story: Gasoline lead is responsible for a good share of the rise and fall of violent crime over the past half century.

When differences of atmospheric lead density between big and small cities largely went away, so did the difference in murder rates.

Like many good theories, the gasoline lead hypothesis helps explain some things we might not have realized even needed explaining. For example, murder rates have always been higher in big cities than in towns and small cities. We're so used to this that it seems unsurprising, but Nevin points out that it might actually have a surprising explanation—because big cities have lots of cars in a small area, they also had high densities of atmospheric lead during the postwar era. But as lead levels in gasoline decreased, the differences between big and small cities largely went away. And guess what? The difference in murder rates went away too. Today, homicide rates are similar in cities of all sizes. It may be that violent crime isn't an inevitable consequence of being a big city after all.

The gasoline lead story has another virtue too: It's the only hypothesis that persuasively explains both the rise of crime in the '60s and '70s and its fall beginning in the '90s. Two other theories—the baby boom demographic bulge and the drug explosion of the '60s—at least have the potential to explain both, but neither one fully fits the known data. Only gasoline lead, with its dramatic rise and fall following World War II, can explain the equally dramatic rise and fall in violent crime.

If econometric studies were all there were to the story of lead, you'd be justified in remaining skeptical no matter how good the statistics look. Even when researchers do their best—controlling for economic growth, welfare payments, race, income, education level, and everything else they can think of—it's always possible that something they haven't thought of is still lurking in the background. But there's another reason to take the lead hypothesis seriously, and it might be the most compelling one of all: Neurological research is demonstrating that lead's effects are even more appalling, more permanent, and appear at far lower levels than we ever thought. For starters, it turns out that childhood lead exposure at nearly any level can seriously and permanently reduce IQ. Blood lead levels are measured in micrograms per deciliter, and levels once believed safe—65 μg/dL, then 25, then 15, then 10—are now known to cause serious damage. The EPA now says flatly that there is "no demonstrated safe concentration of lead in blood," and it turns out that even levels under 10 μg/dL can reduce IQ by as much as seven points. An estimated 2.5 percent of children nationwide have lead levels above 5 μg/dL.

But we now know that lead's effects go far beyond just IQ. Not only does lead promote apoptosis, or cell death, in the brain, but the element is also chemically similar to calcium. When it settles in cerebral tissue, it prevents calcium ions from doing their job, something that causes physical damage to the developing brain that persists into adulthood.

Only in the last few years have we begun to understand exactly what effects this has. A team of researchers at the University of Cincinnati has been following a group of 300 children for more than 30 years and recently performed a series of MRI scans that highlighted the neurological differences between subjects who had high and low exposure to lead during early childhood.

High childhood exposure damages a part of the brain linked to aggression control. The impact is greater among boys.

One set of scans found that lead exposure is linked to production of the brain's white matter—primarily a substance called myelin, which forms an insulating sheath around the connections between neurons. Lead exposure degrades both the formation and structure of myelin, and when this happens, says Kim Dietrich, one of the leaders of the imaging studies, "neurons are not communicating effectively." Put simply, the network connections within the brain become both slower and less coordinated.

A second study found that high exposure to lead during childhood was linked to a permanent loss of gray matter in the prefrontal cortex—a part of the brain associated with aggression control as well as what psychologists call "executive functions": emotional regulation, impulse control, attention, verbal reasoning, and mental flexibility. One way to understand this, says Kim Cecil, another member of the Cincinnati team, is that lead affects precisely the areas of the brain "that make us most human."

So lead is a double whammy: It impairs specific parts of the brain responsible for executive functions and it impairs the communication channels between these parts of the brain. For children like the ones in the Cincinnati study, who were mostly inner-city kids with plenty of strikes against them already, lead exposure was, in Cecil's words, an "additional kick in the gut." And one more thing: Although both sexes are affected by lead, the neurological impact turns out to be greater among boys than girls.

Other recent studies link even minuscule blood lead levels with attention deficit/hyperactivity disorder. Even at concentrations well below those usually considered safe—levels still common today—lead increases the odds of kids developing ADHD.

In other words, as Reyes summarized the evidence in her paper, even moderately high levels of lead exposure are associated with aggressivity, impulsivity, ADHD, and lower IQ. And right there, you've practically defined the profile of a violent young offender.

Needless to say, not every child exposed to lead is destined for a life of crime. Everyone over the age of 40 was probably exposed to too much lead during childhood, and most of us suffered nothing more than a few points of IQ loss. But there were plenty of kids already on the margin, and millions of those kids were pushed over the edge from being merely slow or disruptive to becoming part of a nationwide epidemic of violent crime. Once you understand that, it all becomes blindingly obvious. Of course massive lead exposure among children of the postwar era led to larger numbers of violent criminals in the '60s and beyond. And of course when that lead was removed in the '70s and '80s, the children of that generation lost those artificially heightened violent tendencies.

Police chiefs want to think what they do on a daily basis matters. And it does. But maybe not as much as they think.

But if all of this solves one mystery, it shines a high-powered klieg light on another: Why has the lead/crime connection been almost completely ignored in the criminology community? In the two big books I mentioned earlier, one has no mention of lead at all and the other has a grand total of two passing references. Nevin calls it "exasperating" that crime researchers haven't seriously engaged with lead, and Reyes told me that although the public health community was interested in her paper, criminologists have largely been AWOL. When I asked Sammy Zahran about the reaction to his paper with Howard Mielke on correlations between lead and crime at the city level, he just sighed. "I don't think criminologists have even read it," he said. All of this jibes with my own reporting. Before he died last year, James Q. Wilson—father of the broken-windows theory, and the dean of the criminology community—had begun to accept that lead probably played a meaningful role in the crime drop of the '90s. But he was apparently an outlier. None of the criminology experts I contacted showed any interest in the lead hypothesis at all.

Why not? Mark Kleiman, a public policy professor at the University of California-Los Angeles who has studied promising methods of controlling crime, suggests that because criminologists are basically sociologists, they look for sociological explanations, not medical ones. My own sense is that interest groups probably play a crucial role: Political conservatives want to blame the social upheaval of the '60s for the rise in crime that followed. Police unions have reasons for crediting its decline to an increase in the number of cops. Prison guards like the idea that increased incarceration is the answer. Drug warriors want the story to be about drug policy. If the actual answer turns out to be lead poisoning, they all lose a big pillar of support for their pet issue. And while lead abatement could be big business for contractors and builders, for some reason their trade groups have never taken it seriously.

More generally, we all have a deep stake in affirming the power of deliberate human action. When Reyes once presented her results to a conference of police chiefs, it was, unsurprisingly, a tough sell. "They want to think that what they do on a daily basis matters," she says. "And it does." But it may not matter as much as they think.

So is this all just an interesting history lesson? After all, leaded gasoline has been banned since 1996, so even if it had a major impact on violent crime during the 20th century, there's nothing more to be done on that front. Right?

Wrong. As it turns out, tetraethyl lead is like a zombie that refuses to die. Our cars may be lead-free today, but they spent more than 50 years spewing lead from their tailpipes, and all that lead had to go somewhere. And it did: It settled permanently into the soil that we walk on, grow our food in, and let our kids play around.

That's especially true in the inner cores of big cities, which had the highest density of automobile traffic. Mielke has been studying lead in soil for years, focusing most of his attention on his hometown of New Orleans, and he's measured 10 separate census tracts there with lead levels over 1,000 parts per million.

To get a sense of what this means, you have to look at how soil levels of lead typically correlate with blood levels, which are what really matter. Mielke has studied this in New Orleans, and it turns out that the numbers go up very fast even at low levels. Children who live in neighborhoods with a soil level of 100 ppm have average blood lead concentrations of 3.8 μg/dL—a level that's only barely tolerable. At 500 ppm, blood levels go up to 5.9 μg/dL, and at 1,000 ppm they go up to 7.5 μg/dL. These levels are high enough to do serious damage.

Mielke's partner, Sammy Zahran, walked me through a lengthy—and hair-raising—presentation about the effect that all that old gasoline lead continues to have in New Orleans. The very first slide describes the basic problem: Lead in

soil doesn't stay in the soil. Every summer, like clockwork, as the weather dries up, all that lead gets kicked back into the atmosphere in a process called resuspension. The zombie lead is back to haunt us.

Mark Laidlaw, a doctoral student who has worked with Mielke, explains how this works: People and pets track lead dust from soil into houses, where it's ingested by small children via hand-to-mouth contact. Ditto for lead dust generated by old paint inside houses. This dust cocktail is where most lead exposure today comes from.

Paint hasn't played a big role in our story so far, but that's only because it didn't play a big role in the rise of crime in the postwar era and its subsequent fall. Unlike gasoline lead, lead paint was a fairly uniform problem during this period, producing higher overall lead levels, especially in inner cities, but not changing radically over time. (It's a different story with the first part of the 20th century, when use of lead paint did rise and then fall somewhat dramatically. Sure enough, murder rates rose and fell in tandem.)

And just like gasoline lead, a lot of that lead in old housing is still around. Lead paint chips flaking off of walls are one obvious source of lead exposure, but an even bigger one, says Rick Nevin, are old windows. Their friction surfaces generate lots of dust as they're opened and closed. (Other sources—lead pipes and solder, leaded fuel used in private aviation, and lead smelters—account for far less.)

We know that the cost of all this lead is staggering, not just in lower IQs, delayed development, and other health problems, but in increased rates of violent crime as well. So why has it been so hard to get it taken seriously?

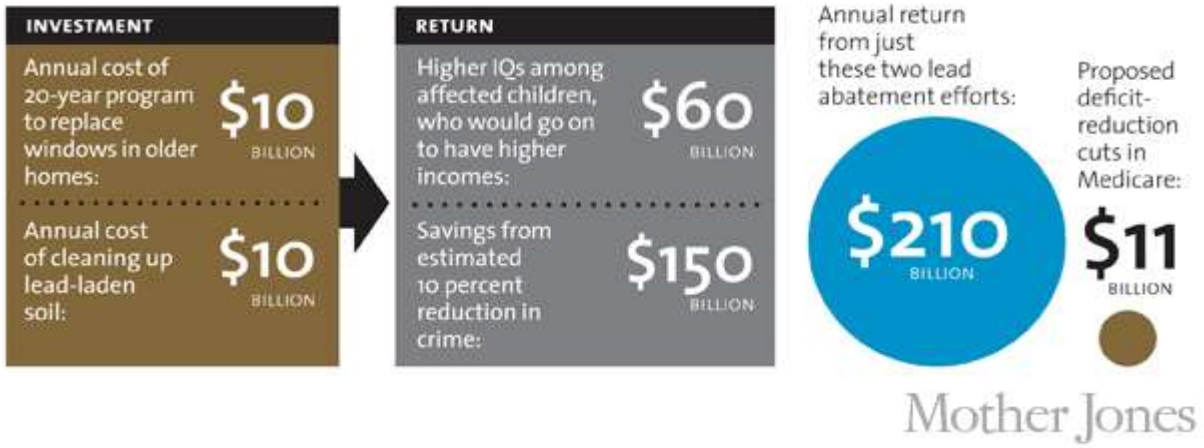
There are several reasons. One of them was put bluntly by Herbert Needleman, one of the pioneers of research into the effect of lead on behavior. "Number one," he said without hesitation, "it's a black problem." But it turns out that this is an outdated idea. Although it's true that lead poisoning affects low-income neighborhoods disproportionately, it affects plenty of middle-class and rich neighborhoods as well. "It's not just a poor-inner-city-kid problem anymore," Nevin says. "I know people who have moved into gentrified neighborhoods and immediately renovate everything. And they create huge hazards for their kids."

Another reason that lead doesn't get the attention it deserves is that too many people think the problem was solved years ago. They don't realize how much lead is still hanging around, and they don't understand just how much it costs us.

It's difficult to put firm numbers to the costs and benefits of lead abatement. But for a rough idea, let's start with the two biggest costs. Nevin estimates that there are perhaps 16 million pre-1960 houses with lead-painted windows, and replacing them all would cost something like $10 billion per year over 20 years. Soil cleanup in the hardest-hit urban neighborhoods is tougher to get a handle on, with estimates ranging from $2 to $36 per square foot. A nationwide program might cost another $10 billion per year.

So in round numbers that's about $20 billion per year for two decades. But the benefits would be huge. Let's just take a look at the two biggest ones. By Mielke and Zahran's estimates, if we adopted the soil standard of a country like Norway (roughly 100 ppm or less), it would bring about $30 billion in annual returns from the cognitive benefits alone (higher IQs, and the resulting higher lifetime earnings). Cleaning up old windows might double this. And violent crime reduction would be an even bigger benefit. Estimates here are even more difficult, but Mark Kleiman suggests that a 10 percent drop in crime—a goal that seems reasonable if we get serious about cleaning up the last of our lead problem—could produce benefits as high as $150 billion per year.

Put this all together and the benefits of lead cleanup could be in the neighborhood of $200 billion per year. In other words, an annual investment of $20 billion for 20 years could produce returns of 10-to-1 every single year for decades to come. Those are returns that Wall Street hedge funds can only dream of.



There's a flip side to this too. At the same time that we should reassess the low level of attention we pay to the remaining hazards from lead, we should probably also reassess the high level of attention we're giving to other policies. Chief among these is the prison-building boom that started in the mid-'70s. As crime scholar William Spelman wrote a few years ago, states have "doubled their prison populations, then doubled them again, increasing their costs by more than $20 billion per year"—money that could have been usefully spent on a lot of other things. And while some scholars conclude that the prison boom had an effect on crime, recent research suggests that rising incarceration rates suffer from diminishing returns:

So this is the choice before us: We can either attack crime at its root by getting rid of the remaining lead in our environment, or we can continue our current policy of waiting 20 years and then locking up all the lead-poisoned kids who have turned into criminals. There's always an excuse not to spend more money on a policy as tedious-sounding as lead abatement—budgets are tight, and research on a problem as complex as crime will never be definitive—but the association between lead and crime has, in recent years, become pretty overwhelming. Not only would solving our lead problem do more than any prison to reduce our crime problem, it would produce smarter, better-adjusted kids in the bargain. It's just common sense. Cleaning up the rest of the lead that remains in our environment could turn out to be the cheapest, most effective crime prevention tool we have. And we could start doing it tomorrow.