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#376 - How Risk Assessment Poisoned Our Children
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According to the American Academy of Pediatrics, somewhere between 2 and 4 million American children have sufficient lead in their blood to diminish their IQ, reduce their physical stature, damage their hearing, decrease their hand-eye coordination and impair their ability to pay attention in school. This damage is thought to be permanent.[1] Lead is a soft, gray toxic metal that has been mined from the earth and formed into useful items for 5000 years. Its toxicity to miners and workers was well established among ancient Greeks and Romans long before the birth of Christ.

The specific toxicity of lead to children was first described in a medical journal in 1897, and a key source of lead poisoning in children -- paint flaking off a porch railing -- was identified and described in a medical journal in 1904. The U.S. National Research Council recently pointed out that, in 1897, the toxic paint problem was sufficiently well-understood for at least one manufacturer of paint in New York City to advertise, "Aspinall's Enamel is NOT made with lead and is non poisonous."[2,pg.25] In 1920, to prevent the poisoning of its children, Australia passed a law curbing lead in paint. The U.S. delayed 50 years before taking similar action in 1970.

As a result of that delay, a physician writing in the AMERICAN JOURNAL OF PUBLIC HEALTH in 1992 would say flatly, "Lead poisoning is epidemic among American children."[3] The American Academy of Pediatrics in 1993 began its official statement on childhood lead poisoning by quoting the federal Department of Health and Human Services saying lead poisoning is "the most important environmental health problem facing young children."

The Academy then recounted the history of lead regulation, illustrating how millions of American children were poisoned. Reading between the lines of the Academy's sad tale, we can gather that the medical and public health communities buckled under industry pressure and abandoned their own most fundamental principle, DISEASE PREVENTION. The Academy said flatly in 1993, "Childhood lead poisoning is preventable." Then why hasn't it been prevented? It's a fair question.

For the last 30 years, instead of asking how to prevent lead poisoning, the medical community has taken a risk assessment approach, asking, "How much lead is safe for industry to put into children?" In 1960, the medical community answered the question by saying it was safe for a child to have 60 micrograms of lead in each deciliter [10th of a liter] of blood (or 60 mcg/dL). That answer turned out to be wrong, and in 1975 the medical community answered the question by saying 30 mcg/dL was safe. That, too, turned out to be wrong, and in 1985 they set 25 mcg/dL as the safe level. That, too, turned out to be wrong, and in 1991 the medical community said 10 mcg/dL was safe. As we shall see, the National Research Council now believes that even this "safe" level may not be safe.

But first let's review what happens to children with more than 10 mcg/dL lead in their blood. The American Academy of Pediatrics recently reviewed 18 scientific studies showing that lead diminishes a child's mental abilities. "The relationship between lead levels and IQ deficits was found to be remarkably consistent," the Academy said. "A number of studies have found that for every 10 mcg/dL increase in blood lead levels, there was a lowering of mean [average] IQ in children by 4 to 7 points." This may not sound like a major loss, but an average IQ loss of 5 points puts 50% more children into the IQ 80 category, which is borderline for normal intelligence. It also reduces the number of high IQs; for example, one small group that should have contained 5 children with IQs of 125, contained none.[1]

The American Academy of Pediatrics says such losses are permanent and they translate into reduced educational attainment, diminished job prospects, and reduced earning power. Two groups of children in first and second grade --one with 25 mcg/dL and the other with 35 mcg/dL -- were studied into adulthood. The high-lead group was seven times as likely not to graduate from high school and six times as likely to have reading scores two grades below expected, after adjusting for a number of factors, including socioeconomic status and parental IQ. The high- lead children also had higher absenteeism in their final year of school, lower class rank, poorer vocabulary and grammatical reasoning scores, longer reaction times, and poorer hand-eye coordination.

Because the U.S. has banned lead in gasoline, and banned lead solder in tin cans, average [mean] blood lead in U.S. children has diminished from 16 down to about 5 mcg/dL during the last 15 years. However, as the American Academy of Pediatrics says, "there are still many children at high risk of exposure."

Forty-two million families live in housing that contains an estimated 3 million tons of lead in paint, equivalent to about 140 pounds of lead per household, or 63 billion micrograms of lead in each household. As that paint slowly disintegrates into house dust, if a child gets lead onto its hands and into its mouth at the rate of just 150 micrograms per day, the child is poisoned, according to the National Research Council.[2,pg.18]

In addition to paint, house dust also contains lead tracked into homes from soil outside. Between 1920 and 1980, the oil and automobile companies aggressively defended and protected their right to spew toxic lead into every neighborhood in America; they left a legacy of 30 million tons of lead in soils before the nation came to its senses and put a muzzle on these industries.

But the damage was already done, and the poisoning now continues everywhere. A study in the early 1980s showed that, among white children, 7% in higher socioeconomic status areas and 25% in poorer communities had blood lead levels greater than 15 mcg/dL. Among black children in poor communities, this prevalence was 55%.[1]

The lead problem was inevitable, given the decision to allow lead in paint, gasoline, and other products. The National Research Council in its 1993 book on the lead problem, summarized the situation starkly: "Once lead is mined and introduced into the environment, it persists. Over time, lead in various forms becomes available to the body as small particles. Most of the 300 million metric tons of lead ever produced remains in the environment, largely in soil and dust. That explains, in part, why background concentrations of lead in modern North Americans are higher by a factor of 100 to 1000 than they were in pre-Columbia Americans. Today's production evolves into tomorrow's background exposure, and despite reductions in the use of lead for gasoline, overall lead production continues to grow and federal agencies have not addressed the impact of future increases of lead in the environment."[2,pg.18]

In sum, if you mine lead out of the ground, it will eventually spread into the environment. It will get into soil, then into food and water. Eventually it will get into humans (not to mention wildlife), where it will take its toll on health. This is inevitable. The only way to avoid this outcome, is to stop mining lead out of the deep earth. Zero discharge.

The National Research Council says modern humans are estimated to have total body burdens of lead approximately 300-500 times those of our prehistoric ancestors.... [2,pg.xii] According to careful measurements of human bones, pre-Columbian inhabitants of North America had average blood lead levels of 0.016 mcg/dL -- some 625 times lower than the 10 mcg/dL now established as "safe" for our children.[4] On the face of it, it seems unlikely that levels of a potent nerve poison 625 times natural background can be "safe" in children.

The National Research Council admits as much: "There is growing evidence that even very small exposures to lead can produce subtle effects in humans. Therefore, there is the possibility that future guidelines may drop below 10 mcg/dL as the mechanisms of lead

toxicity become better understood."[2,pg.3]

Despite 80 years of research, the toxicity of lead in children is still not fully understood. According to the Council, "Childhood lead poisoning involves injury in at least 3 organ systems: the central nervous system (specifically, the brain), the kidney, and the blood-forming organs. Other systems are also affected, but the nature of their toxic injury has not been as well characterized."[2,pg.32] In other words, we know additional damage (beyond the 3 organ systems) is occurring, but we don't understand it.

Furthermore, the Council says, "[O]nce lead is absorbed from a specific source, it is added to a body burden that contributes to various health effects. Therefore, exposures small enough to have been viewed as of little importance are now taken more seriously. In other words, we must consider the aggregate impact of multiple small lead sources in assessing health risk."[2,pg.99]

As these quotations reveal, the National Research Council is still operating in the old, scientifically bankrupt "risk assessment" mode of thinking -- trying to establish some "safe" level of poison that industry will then be allowed to put into children. For this mode of thinking to protect children, all forms of damage must be understood thoroughly, which they can't be. The effects of all sources of lead exposure must be understood, which they can't be. The cumulative impacts of lead, malnutrition, and many other stresses on a child (PCBs, pesticides, and so forth) must all be factored in to establish cumulative "safe" levels. Science has no way to calculate the cumulative effects of multiple exposures.

This bankrupt, unscientific mode of thinking -- risk assessment -- is guaranteed to allow the poisoning to continue at some level. A truly preventive approach asks not, "How much lead is safe?" but instead asks, "What are the alternatives for each use of lead? How can we avoid lead entirely?" Given the Clinton administration's recent wholesale commitment to risk assessment as the basis for all federal regulations [RHWN #359], we must also ask, are so many of us now brain-damaged by lead and other toxins that we are no longer able, as a society, to frame the right questions?

--Peter Montague

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[1] Committee on Environmental Health, American Academy of Pediatrics, "Lead Poisoning: From Screening to Primary Prevention," PEDIATRICS Vol. 92 (July 1993), pgs. 176-183.

[2] National Research Council, MEASURING LEAD EXPOSURE IN INFANTS, CHILDREN, AND OTHER SENSITIVE POPULATIONS (Washington, D.C.: National Academy Press, 1993).

[3] Philip J. Landrigan, "Commentary: Environmental Disease --A Preventable Epidemic," AMERICAN JOURNAL OF PUBLIC HEALTH Vol. 82 (July 1992), pgs. 941-943.

[4] A. Russell Flegal and Donald R. Smith, "Lead Levels in Preindustrial Humans," NEW ENGLAND JOURNAL OF MEDICINE Vol. 326 (May 7, 1992), pgs. 1293-1294.

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