

Rachel's Environment & Health News

#633 - Carcinogens Everywhere

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U.S. EPA [Environmental Protection Agency] published a report in 1998 saying that 100% of the outdoor air in the continental U.S. is contaminated with eight cancer-causing industrial chemicals at levels that exceed EPA's "benchmark" safety standards.[1] Alaska and Hawaii were excluded from the analysis for lack of available data.~

Using 1990 data on toxic industrial emissions, EPA applied well-known mathematical models to estimate year-round average outdoor air concentrations for 148 industrial poisons in each of the nation's 60,803 census tracts.

For each of the 148 toxicants, EPA established a "benchmark" level that the agency considers safe. Eight of the 148 industrial poisons exceed EPA's benchmark safety levels all of the time in all 60,803 census tracts. All eight are carcinogens, that is, they are known to cause cancer: bis(2-ethylhexyl) phthalate; benzene; carbon tetrachloride; chloroform; ethylene dibromide; ethylene dichloride; formaldehyde; and methyl chloride.

In its report, EPA said that outdoor air concentrations provide a reasonable estimate of toxic concentrations "that occur both outdoors and indoors, given the high rates of penetration into indoor environments for various HAPs [hazardous air pollutants]." In other words, EPA believes that being inside your home or workplace does not protect you from constant exposure to these eight carcinogens.

EPA said its mathematical models probably underestimate the true levels to which the population is exposed. Where actual measurements of toxic contaminants were available, EPA found that the measured levels exceeded the levels estimated by their mathematical models.

In its report, EPA also acknowledged that it may have underestimated the health effects because the eight chemicals, combined, may have additive or multiplier effects since people experience all of them simultaneously. However, the agency also acknowledged that it has no way to take such combined effects into account.

The agency also acknowledged that many of the chemicals may have health effects for which the agency has established no "benchmark" standards. For example, benzene and 1,3-butadiene have both been associated with reproductive and developmental effects, but EPA currently has set no benchmark safety levels for such effects, and so those effects were ignored in this study.

And finally, most (if not all) individuals are exposed to far more than just eight industrial poisons. These eight merely provide a toxic background to which other toxicants are added, depending upon a person's (or a community's) individual situation: automobile and truck exhaust, second-hand cigarette smoke, prescription drugs, emissions from power plants, smelters, incinerators, and so on.

Several of the eight chemicals exceed EPA "benchmark" safety levels by a wide margin. For example, the average day-in-and-day-out concentration of carbon tetrachloride exceeds EPA's benchmark level by a factor of 13, and bis(2-ethylhexyl) phthalate exceeds EPA's benchmark by a factor of 6.4.

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LEAD IN CHILDREN: OLD STORY, NEW DATA

In 1998, the federal Centers for Disease Control and Prevention (CDCP) in Atlanta issued a report saying that only 4.4% of American children between the ages of 1 and 5 have the toxic metal lead in their blood at "levels of health concern," which CDCP defines as concentrations of 10 micrograms of lead per deciliter of blood (10 ug/dL) or higher.[2] A microgram is a millionth of a gram and there are 28 grams in an ounce; a deciliter is a tenth of a

liter and a liter is about a quart. The reporting period was 1991-1994.

Although 4.4% sounds like a small percentage, it represents 890,000 individual children whose intellectual capacity is being permanently diminished by exposure to excessive amounts of lead.

CDCP established 10 ug/dL as the "unsafe" level of lead in blood in 1991.[3] The limit was set at 10 ug/dL not because 10 is a magic number that protects children but because it was the lowest level that could be detected with an inexpensive test, and because, CDCP said, setting the standard lower would burden the country's health-care system.

When it set the official safety level at 10, CDCP acknowledged that something besides pure concern for public health went into the decision. "The recommendations [of 10 ug/dL]... are based mainly on the scientific data showing adverse effects of lead in young children at increasingly lower blood lead levels. They are tempered, however, by practical considerations, for example, of the numbers of children who would require followup and the resources required to prevent this disease," wrote Vernon Houck on behalf of CDCP.[3,pg.iii] In other words, when it set 10 as the "safe" standard, CDCP acknowledged that it was reluctant to set the standard lower because too many children would then qualify for medical help, and too much money would have to be spent removing lead from the environment.

Numerous studies have now shown that there is no "safe" dose of lead in children's blood. Five years ago the National Research Council (NRC) said, "There is growing evidence that even very small exposures to lead can produce subtle effects in humans. Therefore, there is the possibility that future [safety] guidelines may drop below 10 ug/dL as the mechanisms of lead toxicity become better understood." [4,pg.3] The NRC offered evidence that lead at 5 ug/dL (half the official "safe" level) can cause attention deficit in children and in monkeys; reduced birthweight in children; and hearing loss in children.[4,pgs.69,254-256]

In 1993 the NRC summarized a series of recent studies, then said, "Those studies support the general conclusion that there is growing evidence that there is no effective threshold for some of the adverse effects of lead." [4,pg.67] In other words, in 1993 there was good evidence that there is no safe level of lead.

According to careful measurements of human bones, pre-Columbian inhabitants of North America had average blood lead levels of 0.016 ug/dL -- 625 times as low as the 10 ug/dL now established as "safe" for children. On the face of it, it seems unlikely that levels of a potent nerve poison 625 times as high as natural background --or even 300 times as high as natural background -- can be "safe" for children.[5]

The CDCP's 1998 study reported that the average (geometric mean) concentration of lead in all 20 million American children between the ages of 1 and 5 was 2.7 ug/dL, or 43 times as high as natural background.

The main effect of lead in blood is to reduce a child's IQ. Five years ago, the American Academy of Pediatrics 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 ug/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.[6]

In recent years, many studies have shown that lead not only

diminishes intellectual capacity, but it also causes loss of hearing, reduces hand-eye coordination, impairs the ability to pay attention, and creates a propensity toward violence. Children who have been poisoned by lead are less able to handle stress and are more prone to violent outbursts. (See REHW #529, #551.)

The source of the lead poisoning children today is chiefly paint containing lead. In the U.S., approximately 83% of privately owned housing units and 86% of public housing units built before 1980 contain some lead-based paints.

Public health authorities have acknowledged openly since 1952 that black children are being preferentially poisoned by lead in paint. (See REHW #294.) The City of Baltimore began a lead-toxicity screening program in 1931. With 20 years of data in hand, the head of the Baltimore health department wrote in 1952, that the rate of poisoning among children was "7.5 times as high among the Negro population as it was among the white population.... The high rates among Negro children are a problem of considerable public health significance since 30 percent of Baltimore's pre-school population is Negro. The racial difference in incidence is believed to be due to environmental factors probably resulting chiefly from economic disadvantage." [7]

Today, 47 years later, the situation has changed little. According to CDCP's 1998 study, today the highest concentrations of lead are occurring in non-Hispanic black children. Among non-Hispanic black children ages 1 to 5 living in housing built before 1946, 21.9% have blood lead levels at or above 10 ug/dL, and among those living in housing built between 1946 and 1973, 13.7% had blood lead levels at or above 10 ug/dL, CDCP's 1998 study says.

A recent study of children visiting a pediatric clinic in Philadelphia's inner city reported that 68% of the children there have lead levels that exceed the "safe" 10 ug/dL. [8]

In sum, roughly a million black children who live in the inner cities are being continuously poisoned by exposure to lead.

In 1991, the Centers for Disease Control published a study showing that the nation's taxpayers would save \$60 billion in health-care and special-education costs by spending \$32 billion to eradicate lead from inner city homes. [9] Congress has never been willing to adopt this cost-effective prevention strategy, evidently preferring to produce generation after generation of black inner city children with diminished intellectual capacity and a propensity toward violence.

Children, can you spell R-A-C-I-S-M?

--Peter Montague (National Writers Union, UAW Local 1981/AFL-CIO)

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[1] Tracey J. Woodruff and others, "Public Health Implications of 1990 Air Toxics Concentrations across the United States," ENVIRONMENTAL HEALTH PERSPECTIVES Vol. 106, No. 5 (May 1998), pgs. 245-251.

[2] James L. Pirkle and others, "Exposure of the U.S. Population to Lead, 1991-1994," ENVIRONMENTAL HEALTH PERSPECTIVES Vol. 106, No. 11 (November 1998), pgs. 745-750.

[3] William L. Roper and others, PREVENTING LEAD POISONING IN YOUNG CHILDREN (Atlanta, Ga.: Centers for Disease Control, October, 1991).

[4] National Research Council (Bruce A. Fowler and others,

editors), MEASURING LEAD EXPOSURE IN INFANTS, CHILDREN, AND OTHER SENSITIVE POPULATIONS (Washington, D.C.: National Academy Press, 1993).

[5] 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.

[6] Committee on Environmental Health, American Academy of Pediatrics, "Lead Poisoning: From Screening to Primary Prevention," PEDIATRICS Vol. 92 (July 1993), pgs. 176-183. And see: John F. Rosen, "Health Effects of Lead at Low Exposure Levels," AMERICAN JOURNAL OF DISEASES OF CHILDREN Vol. 146 (November 1992), pgs. 1278-1281. And see: John F. Rosen, "Effects of Low Levels of Lead Exposure," SCIENCE Vol. 256 (April 17, 1992), pg. 294. And: Herbert L. Needleman and others, "Deficits in Psychologic and Classroom Performance of Children with Elevated Dentine Lead Levels," NEW ENGLAND JOURNAL OF MEDICINE Vol. 300, No. 13 (March 29, 1979), pgs. 689-695. And see: Joel Schwartz, "Low-Level Lead Exposure and Children's IQ: A Meta-analysis and Search for a Threshold," ENVIRONMENTAL RESEARCH Vol. 65 (1994), pgs. 42-55. And see: Herbert L. Needleman and Constantine A. Gastonis, "Low-Level Exposure and the IQ of Children," JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION Vol. 263, No. 5 (February 2, 1990), pgs. 673-678.

[7] Huntington Williams and others, "Lead Poisoning in Young Children," PUBLIC HEALTH REPORTS Vol. 67 (March, 1952), pgs. 230-236.

[8] Shoshana T. Melman and others, "Prevalence of Elevated Blood Lead Levels in an Inner-city Pediatric Clinic Population," ENVIRONMENTAL HEALTH PERSPECTIVES Vol. 106, No. 10 (October 1998), pgs. 655-657.

[9] This study was described in Marianne C. Fahs, "White House Should Stay With Lead Cleanup [letter to the editor]," NEW YORK TIMES September 18, 1991, pg. A18.

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