

Rachel's Environment & Health News

#712 - Children In Harm's Way

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A new report by a group of physicians says that millions of children in the U.S. exhibit learning disabilities, reduced IQ and destructive, aggressive behavior because of exposures to toxic chemicals.[1] "Neurodevelopmental disabilities are widespread, and chemical exposures are important and preventable contributors to these conditions," the report says (pg. 117).

Titled IN HARM'S WAY, the report was written by physicians Ted Schettler and Jill Stein and two of their colleagues and was published by Greater Boston Physicians for Social Responsibility in partnership with the Clean Water Fund. IN HARM'S WAY links toxic exposures during early childhood, or even before birth, to lifelong disabilities including attention disorders, reduced IQ and poorly-controlled aggression.

IN HARM'S WAY reviews scientific and medical information on a range of toxins to which most or all American children are exposed, and draws links to the rising number of children diagnosed each year with abnormal brain development or function. The report is a call to action for everyone interested in children's welfare and the future of our society. To avert brain damage in growing numbers of children, we have to reclaim our government from corporate special interests, the report concludes.

Developmental disabilities such as autism, attention deficit hyperactivity disorder (ADHD), dyslexia and uncontrollable aggression currently affect an estimated 12 million children under age 18 in the U.S. -- almost one child in five. Furthermore, the incidence of some of these disabilities appears to have increased dramatically in recent decades. For example, nationwide, the number of children classified with learning disabilities and placed in special education programs increased 191% between 1977 and 1994. The number of children taking the drug Ritalin to combat attention deficit hyperactivity disorder (ADHD) has approximately doubled every 4 to 7 years since 1971. Experts estimate that autism rates have risen from around 4 per 10,000 in the early 1980s to between 12 and 20 per 10,000 in the 1990s. According to a recent article in US NEWS AND WORLD REPORT, the number of children in New York classified with learning disabilities rose 55 percent between 1983 and 1996. [2]

Some argue that reported disabilities are increasing because of improved diagnosis and rising expectations as children are required to learn more complicated skills at younger ages. But many parents, teachers, and physicians who work with children think these explanations are only partially correct because "they can not imagine that such disabilities escaped notice in the past," the report says. (pg. 11)

Experts may argue about the exact number of children suffering from individual disorders, but the undisputed reality is that huge numbers of children currently suffer with serious developmental disabilities and they are exposed to many toxic chemicals that are known to produce such disabilities. "We believe we can no longer ignore the mounting evidence that chemical exposures contribute to the epidemic of developmental disabilities," the report says. (pg. 9)

IN HARM'S WAY walks us through a sampling of neurotoxic substances to which many or all American children are exposed --metals (lead, mercury, manganese); nicotine; pesticides; persistent organochlorine compounds (e.g., dioxin and PCBs); solvents, including alcohol; fluoride; and food additives -- and reviews existing human and animal data on developmental effects of these chemicals. These effects can vary dramatically depending on the exact timing of exposures. Tiny exposures that would have no noticeable effect at most stages of development can produce devastating permanent damage if they occur during a "window of vulnerability" when certain organs are developing rapidly. (pg. 9)

Here is a sampling of the toxins that can misdirect the development

of a child's brain.

-- Lead exposure in infants and children is associated with attention deficit, aggression, and reduced IQ. Blood lead levels below those labeled "safe" by U.S. Environmental Protection Agency (EPA) are associated with learning problems, and no threshold has been identified below which adverse effects do not occur. Young monkeys exposed to lead show symptoms including heightened distractability and inappropriate responses to stimuli. One million American children currently live with blood lead levels above the threshold recognized by EPA as affecting behavior and cognition. Millions more would be added to this list if EPA's threshold were updated to take account of the most current science on the effects of lead in children.

-- At low doses, mercury exposure can produce impairments in language ability, attention, and memory; at high doses it can cause mental retardation, vision problems, and problems walking. Mercury enters the environment through waste incinerators and coal-burning power plants. It bioaccumulates in fish in its most toxic form, methylmercury (see REHW #597). The EPA estimates that 1.16 million women of childbearing age "eat sufficient amounts of mercury-contaminated fish to pose a risk of harm to their future children." (pg. 64)

-- Many pesticides kill insects by exerting a toxic effect on cells in the nervous system. Not surprisingly, such pesticides can disrupt the development and functioning of the human nervous system by the same mechanisms. Animal studies show that neurotoxic pesticides can produce permanent changes in brain structure and functioning when exposures occur on a single critical day of development. For example, some effects occurred in newborn mice if exposures occurred on day 10 of development, but not if exposures occurred on day 3 or 19. (pg. 82) Short-lived "pulse" exposures may have devastating developmental effects and yet can be difficult or impossible to identify after the fact (see REHW # 648).

-- One pesticide exposure study examined children in two Mexican communities. The two communities were very similar in ethnic composition and culture, but one community practiced chemical-intensive agriculture while the other used few farm chemicals. Children in the community with chemical-intensive agriculture scored substantially lower on measures of memory, physical stamina and coordination, and had trouble with ordinary children's activities such as drawing a simple picture of a person. (pgs. 82-83) Children in the pesticide-exposed group also displayed more aggressive behavior than their unexposed counterparts (see REHW #648).

-- Dioxins and polychlorinated biphenyls (PCBs) are organochlorine compounds that bioaccumulate in fatty tissue and are found at significant levels in human breast milk. Both animal and human studies show strong links between these pollutants and developmental disorders. Monkeys exposed before birth to dioxin in the range of human breast milk contamination levels were impaired in their ability to reverse a learned behavior in response to new stimuli. Young monkeys exposed to PCBs at levels typically found in human breast milk showed retarded learning as well as abnormally repetitive behavior. Studies of human children have found lowered IQs associated with PCB exposure in the womb, and a study of babies whose mothers ate PCB-contaminated fish from Lake Ontario found impaired development including abnormal reflexes and startle responses. (pgs. 76-79) These are just a few of the studies covered in IN HARM'S WAY.

Government officials set "safe" exposure levels based on individual chemicals. But in the real world children are exposed to many chemicals simultaneously. Such multiple exposures can be far more damaging than exposure to single chemicals. For example, one study found that certain combinations of pesticides produce changes in thyroid levels that are not observed when the chemicals are tested individually, and thus the combination may produce unexpected

developmental effects (see REHW #648). Proper thyroid levels are essential for brain development. Other studies reveal that exposure to a combination of mercury and PCBs, two pollutants that accumulate in fish, can produce even greater effects on neurological development than either pollutant alone. (pg. 67)

Under our current regulatory system, industrial chemicals need not be tested for toxicity before they are marketed. (pg. 108) EPA estimates that somewhere between 2400 and 4000 industrial chemicals now on the market are neurotoxic. (pg. 107) However, this number is "highly speculative" (pg. 107) because most chemicals in commercial use have not been tested for neurotoxicity. EPA's Toxics Release Inventory (TRI) -- which covers just 625 out of 80,000 industrial chemicals -- reported that nearly a billion pounds of known neurotoxins were released directly into air and water in 1997. (pg. 103) Pesticides must be tested before marketing, but not for toxicity to the nervous system. Of 890 pesticide "active ingredients" EPA believes 140 are neurotoxins. Some 20 million U.S. children under age 5 eat an average of 8 different pesticides on their food each day. (pg. 106)

The authors of IN HARM'S WAY point out that there is no reason to delay protecting our children; we don't need more scientific information before taking precautionary action. "We should not need to identify with certainty exactly how much and through what mechanism a neurotoxic pesticide impairs brain development before coming to the conclusion that public health is not protected when the urine of virtually every child in this country contains residues of these chemicals. ... We do not need to exhaustively understand the mechanism by which methylmercury interferes with normal fetal brain development before concluding that it is not acceptable for freshwater and many ocean fish to be sufficiently contaminated with mercury to threaten developing brains. We know how to reduce the environmental releases of mercury so that fish are once again safe to eat regularly. We can modify manufacturing practices so that lead use in products goes steadily down instead of up. We can eliminate or modify outmoded technologies that produce the dioxin that contaminates fetuses and breast milk. We know how to do these things." (pgs. 121-122)

In order to do these things, we have to take back control of our regulatory system. As things stand now, corporations that benefit financially by exposing children to toxic substances are accepted -- even by most environmentalists -- as valid "stakeholders" in the process that determines "safe" levels of exposure. As a result, we have failed to protect our children from industrial poisons. As the authors of IN HARM'S WAY put it, "The role of special interests in the regulation of environmental chemicals is an important matter for public debate, as it has direct relevance to the neurological development of children now and in the future." (pg. 121) In sum, our current regulatory system is like a trial in which the criminal defendant gets to serve on the jury. If we want to have children who can play, think and learn normally, we will have to change corporations and our government so that protecting brain development comes ahead of protecting profits.

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[1] Ted Schettler, Jill Stein, Fay Reich, Maria Valenti, and David Wallinga, IN HARM'S WAY: TOXIC THREATS TO CHILD DEVELOPMENT (Cambridge, Mass.: Greater Boston Physicians for Social Responsibility [GBPSR], May 2000). Available on the web at <http://www.igc.org/psr/> or as a paper copy from GBPSR in Cambridge, Mass.; telephone 617-497-7440.

[2] Sheila Kaplan and Jim Morris, "Kids At Risk," US NEWS AND WORLD REPORT Vol. 128, No. 4 (June 19, 2000), pgs. 47-53.