

Are toxic industrial chemicals causing an epidemic of behavioral and developmental illnesses in U.S. children?

Chemicals that damage or destroy brain cells may be causing a "silent pandemic" of behavioral and developmental disorders, according to a report by Philippe Grandjean and Philip Landrigan.

Grandjean and Landrigan used the Hazardous Substances Data Bank and other data sources to identify 202 industrial chemicals known to be neurotoxic to adults and currently in use. Of these, about half are used very often.

The researchers note that overall, more than 1,000 industrial chemicals show evidence of neurotoxicity in animal tests. "The few substances proven to be toxic to human neurodevelopment," they say, "should therefore be viewed as the tip of a very large iceberg."

The researchers also analyzed how scientists and government officials have responded to the threat of neurotoxins in the past, using lead, methylmercury, arsenic, polychlorinated biphenyls (PCBs), and toluene as examples. These toxins' devastating effects on children, they found, were recognized and addressed only after adult toxicities became obvious, episodes of gross poisoning among children occurred, and epidemiological studies finally revealed that the toxins caused neurobehavioral deficits in children at concentrations too small to harm adults. Programs to reduce children's exposure to these toxins, the researchers say, "were initiated only after substantial delays."

According to the Centers for Disease Control and Prevention (CDC), one in six children is diagnosed with a developmental disability. Most of these disabilities, Grandjean and Landrigan note, involve the nervous system. They also cite a report of an expert committee of the U.S. National Research Council, which concluded that 3% of developmental disabilities stem directly from environmental exposure to toxins and another 25% arise from interactions between genetic susceptibility and environmental factors. Yet, they note, "Of the thousands of chemicals used in commerce, fewer than half have been subjected to even token laboratory testing for toxicity."

Grandjean and Landrigan call for accelerated testing of industrial chemicals, and expansion of this testing to evaluate neurobehavioral functions. In addition, they say, large-scale epidemiological studies are needed to evaluate the effects of early toxic exposure on the brain.

"The brains of our children are our most precious economic resource," says Grandjean, "and we haven't recognized how vulnerable they are. We must make protection of the young brain a paramount goal of public health protection. You have only one chance to develop a brain."

"Developmental neurotoxicity of industrial chemicals," Philippe Grandjean and Philip Landrigan, *The Lancet*, November 8, 2006 (epub ahead of print publication). Address: Philippe Grandjean, Department of Environmental Health, Harvard School of Public Health, Landmark Center 3E-110, 401 Park Drive, Boston, MA 02215, pgrand@hsph.harvard.edu.

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"A silent pandemic: Industrial chemicals are impairing the brain development of children worldwide," news release, Harvard School of Public Health, November 7, 2006.