# National Learning and Developmental Disabilities Advocacy Groups Analyze Body Burden Studies

**For decades, scientists have studied the pollutants that linger in our air, water, food, and soil.**

**Now government scientists are studying pollution in people, too.**

**The findings are unsettling…..**

## The Studies.

In January 2003, the government agency Centers for Disease Control and Prevention (CDC) released the results of a 1999-2000 study that tested blood, urine, and hair samples of 2,500 Americans for levels of 116 chemicals. Titled the National Health and Nutrition Examination Survey (NHANES), the study reveals important information about the average American's "body burden," the mixture of industrial chemicals carried in our bodies as a consequence of lifelong exposure to chemicals contained in thousands of common consumer products, food, water, packaging, pesticides, and industrial emissions.

Concurrent with NHANES, three national research groups from the Mount Sinai School of Medicine, Environmental Working Group and Commonweal, jointly conducted a study testing the body fluids of nine volunteers for an even more extensive chemical assortment of 210 pollutants. The three groups' goal was to create a more personalized study where results could be linked to real faces, ordinary lives, and true stories.

## The Implications: Why Every Human Should Care.

> **"We are unwilling participants in a huge chemical experiment ..., but because these chemicals enter us from industrial and agricultural sources, they are not subject to testing that would ensure our safety."**
>
> - Michael Lerner, president of Commonweal, a health and environmental research institute.

## Toxics in Our Environment Result in Toxics in Our Bodies.

There are approximately 80,000 synthetic chemicals in the chemical inventory and about 10,000-15,000 are regularly used in the global marketplace. **Few have been tested for any health effects on humans. None have been tested based upon the unique vulnerabilities of children's developing systems.**[1] Yet most of us across the age span, womb to tomb, are exposed to these persistent chemicals on a daily basis. They come from pollution in our air, water and soil and are found in a range of household products like detergent, insulation, fabric treatments, cosmetics, paints, upholstery, carpeting, computers, cleaners and pesticides. They accumulate in fat, blood and organs. Some are passed through the mother's body in breast milk and others cross the placental barrier and enter fetal circulation via contaminated umbilical cord blood. We are only beginning to discover what these toxic exposures might mean for our long-term health, but the fact that we even have these chemicals in our bodies, without our consent, is becoming a major concern for health-care providers, researchers, health-affected groups, advocacy organizations and parents.

## Children are at greater risk.

Doctors and scientists have long known children and fetuses to be far more susceptible to the effects of toxicants than adults. Pound for pound, children eat, drink, and breathe more for their size than adults do, and their speedily developing systems are fragile. Children also live closer to the ground. When they play on the floor, they may breathe in chemicals trapped in carpets. They also frequently put things, including dirt and plastic toys, into their mouths, which increases the chance of contact with toxic chemicals. Moreover, infants are born with chemical body burdens that reflect the burden of the mother, transferred to the fetus through the placenta, and to the infant through breast milk. Though it is still very important to breast-feed for many good reasons, the simple fact that breast milk can no longer be considered the purest of human foods is in its essence a human rights issue.

# The Results.

## Mixed findings: reasons for optimism ⊕, reasons for concern ◎.

By comparison with the results of the first Centers for Disease Control (CDC) Biomonitoring Report on human exposure to environmental chemicals, measuring exposures to 27 chemicals in the years 1991-1994, the second Report, spanning 1999-2000 and measuring 116 chemicals, including the earlier 27, reveals improvement in a few areas, as well as cause for continued concern. Both studies are part of an ongoing health survey process that began decades ago.

Of the 116 chemicals tested in the most recent CDC Report, many are known or suspected neurotoxicants. These include:

- **METALS.** Lead, mercury and cadmium.
- **DIOXINS, FURANS, POLYCHLORINATED BIPHENYLS (PCBs).** Pollutants, by-products of various industrial processes.

[1] U.S. EPA, Office of Prevention, "Pesticides and Toxic Substances," 1998.

- **ORGANOPHOSPHATE PESTICIDES.** At least 60 million pounds used each year in the U.S.
- **ORGANOCHLORINE PESTICIDES.** DDT, chlorpyrifos, and others. Many banned in the U.S.

Specific examples of these neurotoxicants in this study suggest reasons for optimism ⊕ and reasons for concern ◎:

- **LEAD** ⊕ The number of children aged 1-5 years with elevated blood lead levels (BLLs) has decreased from 4.4% to 2.2%. ◎ However, exposure of children to lead in homes containing lead-based paint and lead-contaminated dust remains a serious public health concern. Higher prevalence of elevated BLLs in U.S. children occurs in urban settings, among lower socioeconomic groups, immigrants, and refugees.
- **DIOXINS, FURANS, POLYCHLORINATED BIPHENYLS (PCBs).** ⊕ Although this group of chemicals is known to persist for years in the environment and in the human body, the Second Report found that most people had serum levels of these chemicals below the detection limits of the analytical method used. ◎ Although this finding is encouraging, scientists believe that this finding is the result of the small volume of the tested serum samples. Future Reports will expand serum-sample volumes to enable CDC to get better estimates of actual levels of dioxin and dioxin-like chemicals in the U.S. population.
- **DICHLORODIPHENYLTRICHOLOROETHANE (DDT).** ◎ A DDT metabolite called DDE is 3 times higher in Mexican Americans than in non-Hispanic whites or non-Hispanic blacks. DDE levels are clearly measurable in people aged 12-19 years, even though this age group was born after banning DDT in the United States in 1973. ⊕ Compared with levels found in several smaller studies of DDT exposure in the U.S. before 1990, DDT/DDE levels presented in the Second Report are clearly lower. ◎ Because DDT and DDE persist in the environment, these levels likely represent both past and ongoing exposure.

## Bringing the Results to Life.

Davis Baltz' body contains 106 of the synthetic chemical analyzed.[2] Lexi Rome's, 86. Charlotte Brody and Bill Moyers were just below, at 85 and 84, respectively. Lucy Waletzky had the lowest levels of the nine, at 78 traceable chemicals in her body.

None of the nine volunteers works with chemicals on the job. All lead healthy lives. All are knowledgeable concerning the known and suspected hazards of many synthetic chemicals, and so avoid them wherever possible. **Yet the subjects' bodies contained an average of 91 compounds—most of which did not exist 60-70 years ago.**

Andrea Martin, one of the study's test subjects, was found to have 95 toxins in her body, 59 of which are known carcinogens. A survivor of two bouts of breast cancer who currently fights brain cancer, Andrea recalls her childhood in Memphis, where she would chase the spray of the insecticide trucks that roamed the town. Later, she developed a passion for water skiing—on lakes clouded by chemical pollutants. She does not know whether these pollutants, acting alone or in combination over the decades since her youth, can be named as the cause of the cancers she later developed. **But now she has just cause for suspicion.**

[2] Some of the following is extracted from the EWG site, http://www.ewg.org/reports/bodyburden/findings.php.

Although chemical patent laws require little to no health testing, nearly two-thirds of the compounds studied jointly by the three research groups have been partially tested for harmful health impacts and some have consequently been banned in the U.S.[3]

In total, the nine subjects carried:

- 76 chemicals linked to cancer in humans or animals (average of 53 per participant),
- 94 chemicals that are toxic to the brain and nervous system (average of 62 per participant),
- 86 chemicals that interfere with the hormone system (average of 58 per participant),
- 79 chemicals associated with birth defects or abnormal development (average of 55 per participant),
- 77 chemicals toxic to the reproductive system (average of 55 per participant), and
- 77 chemicals toxic to the immune system (average of 53 per participant).

## Brain Cancers and Learning and Developmental Disabilities are Reaching Epidemic Proportions: What might be the Relationship to Chemical Body Burdens?

Decades of studies have drawn links between fetal and childhood exposure to certain toxicants and impacts on healthy development**. Early exposure to neurotoxicants such as lead, mercury, pesticides and PCBs can result in neurobehavioral problems that persist into adulthood.** Given these studies indicate that people carry a chemical body burden of a number of neurotoxicants, could this be related to increase in certain brain cancers and learning and developmental disorders? And given there is no legal requirement to test most chemicals for health effects at any stage of production, marketing, and use, should we not eliminate known and suspected neurotoxicants from the environment in order to reduce exposures and any health problems they may cause?

A few facts to consider:

- Incidence of **childhood brain and nervous system cancers jumped 1.8% per year, or 40%** from 1973 to 1994 (Gurney, Smith, Bunin, "Cancer Incidence and Survival Among Children and Adolescents," National Cancer Institute, 1999).
- Autism spectrum disorder is estimated to affect 450,000 children under the age of 18 **and it appears to be 10 times more prevalent today than it was in the 1980s** (Journal of the American Medical Association, January 2003).
- An estimated **12 million children (17%) in the U.S. suffer from one or more learning, developmental, or behavioral disability** and that number appears to be steadily increasing (Boyle, Decouffle, Yeargin-Allsopp, Journal of Pediatrics, 93(3):399-403, 1994).

Under the Toxic Substances Control Act (TSCA), chemical companies can put new compounds on the market without conducting any studies of their effects on people or the environment. Some companies conduct rudimentary screening studies prior to production, but fewer than half of all applications to the EPA for new chemical production include any toxicity data whatsoever. Eight of 10 new chemicals win approval in less than three weeks, at an average determination rate of seven a day. (EPA 1997a, GAO 1994).[4]

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[3] Note: Chemical bans are extremely uncommon. When a group of chemicals is banned they are likely congeners, nearly identical members of the same chemical family.

[4] Note: Pesticides are regulated under FIFRA, which does have some premarket testing requirements. However, these requirements are not rigorous enough for some endpoints like developmental neurotoxicity.

For chemicals that are already on the market, the EPA can request health impact data only when it can substantiate that the chemical is causing harm, which it generally cannot do without the toxicity data it is seeking to request. In practice, this means that studies are required only after independent scientists have accumulated a body of evidence demonstrating potential harm, a process that typically takes decades.

## What Can Be Done?

Only the chemical producers currently have the right to know whether their products are dangerous and likely to contaminate people. As a first step toward a public understanding of the extent of the problem, **chemical producers must provide a comprehensive analysis of health impacts before marketing, with full public disclosure—revealing problems before people are widely exposed.** Further, they must bear the burden of repairing, by extensive clean-up initiatives, some of the harm done to our communities, and investing in the creation of safer alternatives to those chemicals found to be harmful.

**On personal level and an institutional levels,** we all need to protect ourselves, our families, our communities and future generations by avoiding products treated with or containing harmful pollutants and choosing healthier alternatives. Some suggestions include:

- Preventing exposures by washing foods and eliminating excessive animal fats from our diets, since so many of these chemicals bioaccumulate up the food chain in fat tissue;
- Reducing and eliminating "fast" or processed foods from institutional meal programs and using whole foods instead.
- Demanding our right to know what chemicals are in our environment and in the products we use and the risks they may pose to current and future generations—not only in the marketplace but in public institutions, such as schools, day cares and hospitals.
- Educating policymakers at local, state and national levels to ensure that policies, legislation and regulations are implemented that eliminate toxic transgressors everywhere children live, work, study and play.

**Remember: We all have our fundamental right to live and raise children in a world free from chemical trespass—a world that does not threaten our health or theirs simply because we eat, breathe, and drink water in the normal course of our daily lives.**

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For more information on these studies, visit the Centers for Disease Control and Prevention's Exposure Report at **www.cdc.gov/exposurereport** and the Environmental Working Group's Body Burden Report at **www.ewg.org/reports/bodyburden.** See also the web sites for the Collaborative on Health and the Environment, **www.cheforhealth.org**, Physicians for Social Responsibility, **www.psr.org**, the National Environmental Trust**, www.net.org,** and the Institute for Children's Environmental Health, **www.iceh.org.**

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This summary was compiled by the Institute for Children's Environmental Health, which is coordinating the Learning and Developmental Disabilities Initiative (LDDI) as part of the national Collaborative on Health and the Environment (CHE). For a list of learning and developmental disabilities organizations and others involved in LDDI, please see **www.cheforhealth.org**. This summary is available online in pdf format at **www.iceh.org.** Some of the above was excerpted from reports issued by the Environmental Working Group, readable at **www.ewg.org.**