

# School Pesticide Monitor

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Beyond Pesticides / National Coalition Against the Misuse of Pesticides  
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## Persistent Pesticides Linked to ADHD, Obesity, and Diabetes

Three new studies link pesticides and other persistent pollutants to major health problems, including ADHD, obesity, and diabetes. It is estimated that around two million children in the United States have ADHD. Obesity has become an increasingly prevalent epidemic over the last few decades. According to the Centers for Disease Control and Prevention, diabetes is the sixth leading cause of death in the U.S., and the annual direct and indirect costs of diabetes are estimated at \$132 billion.

A recent study (Dec 2006) published in *Pediatrics*, the journal of the American Academy of Pediatrics, has linked the organophosphate insecticide chlorpyrifos, currently used on corn, soy, wheat, and many fruits and vegetables, with delays in learning rates, reduced physical coordination, and behavioral problems in children, especially attention deficit hyperactivity disorder.

This new study, by researchers at Columbia University, looked at infants born between 1998 and 2002, before and right after the residential chlorpyrifos phaseout was put in place. Blood samples show that 64 percent of the children had chlorpyrifos in their blood. Those exposed to higher levels of the chemical were found to have higher rates of psychomotor and cognitive delays. Additionally, the children that were exposed to higher levels of chlorpyrifos were also more likely to get lower scores on age-specific tests.

Perhaps most striking is the relationship between chlorpyrifos and behavioral disorders. According to the report, the difference between the chil-

dren not exposed and those that had come in contact with chlorpyrifos reached "statistical significance" for both attention problems and ADHD. ADHD is a condition that causes inattention, impulsivity, and hyperactivity.

Chlorpyrifos inhibits the enzyme cholinesterase and causes degenerative lesions of sensory, motor, or reflex

their endocrine-disrupting effects, which have been increasingly implicated as contributing to weight gain and obesity. Previous studies have documented other negative environmental and health effects, including masculinization in some fish and liver damage in some mammals.

In assessing how organotins affect weight gain, scientists studied their effects on mice and frogs. Several organotins were found to disrupt the normal function of receptors related to fat cell differentiation. Exposure in neonatal mice led to significant disruption of signaling pathways and aberrant fat cell formation at several sites, including the liver and testis, and also led to greater accumulation of fat in several sites after the mice were born. Further, although the birth weight of mouse pups exposed in utero tended to be normal, at age ten weeks the fat content was 20% higher than normal.

Though obesity prevention is traditionally understood as the result of healthy diet and exercise habits, this study of organotins indicates that prevention of obesity may also require avoiding exposure to environmental contaminants over the course of a lifetime, even prior to conception. Human exposure to organotins typically occurs through consumption of contaminated foods and contact with treated materials.

Finally, adding to a growing body of literature linking persistent pesticides to diabetes, a study published in the journal *Environmental Health Perspectives* has found an increased rate of hospitalization for diabetes in those who live close to hazardous waste sites contain-



nerve, and is also toxic to bees, birds, mammals, and aquatic life.

A second study, published in the September 2006 *Molecular Endocrinology*, has linked a class of environmental contaminants, organotins, with excess weight gain and fat cell aberrations, complicating the debate over what factors are contributing to an international obesity epidemic. Organotins are ingredients in many household products, including pesticides, wood preservatives, textiles, and plastics, and are persistent compounds found in low concentrations in most humans and animals.

U.S. and Japanese scientists studied organotins primarily because of

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## Pre-School Parents Win Right-to-Know

A new state law, Assembly Bill 2865 (AB 2865-Torrico), went into effect in California on January 1, 2007. The law requires private child day care facilities to comply with new pesticide use record keeping and notification requirements.

Assemblyman Alberto Torrico (D-CA) introduced AB 2865 as an extension of the *Healthy Schools Act of 2000*. The act requires day care facilities to notify parents about pesticide applications and to post notices in areas treated with pesticides. In addition, licensed pest control companies are required to submit detailed reports of their pesticide applications at private child day care facilities. The bill also provides day care providers with information and trainings on least-toxic Integrated Pest Management (IPM) techniques to help them create a safer environment in which to care for our most vulnerable population. These requirements do not apply to family child care homes.

Among working families, 83% of children ages zero to five spend thirty-five hours per week on average in day care. The unique behaviors and activities of small children place them at greater risk for heavier exposure to contaminants, including pesticides, compared with adults in the same environment. After learning that the vast majority of California's children spend significant time in day care and of the impacts of pesticides on young children, California school activists and legislators decided to expand the *Healthy Schools Act* to protect children in day care. Robina Suwol, executive director of California Safe Schools said that AB 2865 will provide better protection for California's most vulnerable population.

Studies show that children's exposure to pesticides during critical stages of development may have permanent, irreversible effects. Studies have found that children exposed to a pesticide or herbicide in their first year of life were

more than twice as likely to suffer from persistent asthma before the age of five. Another study finds that the risk of childhood leukemia increases more than six times in children who live in homes where garden pesticides are used at least once per month. Numerous other studies show linkages of pesticides to a wide range of other adverse health effects, including altered social skills, learning disabilities, hyperactivity, nervous system disorders, immune deficiency, and several types of cancer.

The California Department of Pesticide Regulation has prepared a downloadable informational handout to assist day care facilities with the process. For a free downloadable copy of "How IPM Can Help Child Day Care Facilities," visit their website at [http://www.schoolipm.info/daycare/ab2865\\_faq.pdf](http://www.schoolipm.info/daycare/ab2865_faq.pdf). You can also visit California Safe Schools at <http://www.calisafe.org/ab2865.html>

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ing persistent organic pollutants (POPs). While established risk factors for diabetes, such as obesity, genetics and a sedentary lifestyle, have been emphasized in prevention efforts, increasing evidence is showing exposure to environmental contaminants is also an important risk factor for diabetes.

The study analyzes hospitalization rates by zip code throughout New York

state, excluding New York City. The results show an increase in hospitalization for diabetes in areas with hazardous waste sites - the highest rates occurring in areas containing POPs.

POPs are synthetic, toxic chemicals that persist in the environment, bioaccumulate in food chains and are common contaminants in fish, dairy products and other foods. POPs include

dioxins, furans, PCBs and chlorinated pesticides.

**TAKE ACTION:** Protect yourself and your family by eating organic foods, especially organic produce, when possible. Lobby to get organic foods introduced in your school. For more information on organic school lunches, see the Jan/Feb 2006 edition of the *School Pesticide Monitor*.