

## **CEHC FACT SHEETS: Pesticides**

### **What are pesticides?**

Pesticides are chemicals, most of them synthesized from petroleum and some of natural origin, that are used for preventing, destroying, repelling, or mitigating pests. Pests usually refer to insects, unwanted plants, fungi, rodents, or microorganisms such as bacteria and viruses. Pesticides are a general category including *insecticides*, chemicals designed to kill insects; *fungicides*, chemicals designed to kill molds and fungi; and *herbicides*, chemicals designed to kill unwanted plants and weeds.

Pesticides are used in an extraordinarily wide range of settings in industrialized societies. By controlling agricultural pests, they have contributed to dramatic increases in crop yields and in the quantity and variety of our diet. In the home, they control termites, mice, and other rodents. In gardens and lawns as well as along highways and under power line right-of-ways, pesticides control the growth of unwanted plants.

Certain pesticides have been known to cause significant brain damage, particularly with perinatal exposure, and to correlate with learning disabilities and disruptive behavior in children. Since pesticides can contain other "inert" ingredients, which are often highly toxic themselves, measurement of pesticides and disclosure of all ingredients is crucial. Currently, the EPA does not require such chemicals be identified on pesticide labels. This makes it difficult to follow the effects on brain development in fetuses, infants, and children.

### **How is one exposed to pesticides?**

Exposure to pesticides may be percutaneous (through the skin), by inhalation, or by ingestion. Exposures may occur through food items, in the home, occupationally, and in the community. When looking at potential exposures, it is important to keep in mind that individuals may be exposed to pesticides from multiple sources simultaneously. These multiple pesticides may have an additive or even synergistic effect.

Environmental exposure to pesticides can occur through the consumption of pesticide-contaminated water, ingestion of pesticide residues in food, inhalation of airborne sprat drift, exposure to pesticides applied in the home, school or community, or from exposure to improperly disposed hazardous waste. The heaviest use of pesticides in the home has been found to occur in inner-city neighborhoods for the control of roaches in apartments. Throughout New York State, the heaviest use of pesticides has been recorded in Manhattan and Brooklyn.

Occupational exposure to pesticides occurs among manufacturers and formulators; during transport and storage; among mixers, loaders, and applicators working in fields, greenhouses, parks, and residential buildings; among vector control and structural applicators; and among farm workers entering fields or greenhouse worker handling foliage previously sprayed by pesticides. Crop duster aviation mechanics have also been reported to be at high risk for pesticide poisoning. Other groups occasionally exposed include emergency crews or sewer workers involved in cleanup. In developed countries, a very large

exposed group consists of building maintenance workers who apply insecticides in public and private housing, schools, hospitals, and commercial structures.

Children come into contact with pesticides on a daily basis. Beyond the application of pesticides at school athletic fields, lawns, and parks, one U.S. Environmental Protection Agency survey found that 47 percent of homes with children under 5 years of age had at least one toxic pesticide stored in an unlocked cabinet within a child's reach.

### **How can pesticides affect health?**

Although specifically designed to kill insects, unwanted plants, and fungi, many pesticides are also highly toxic to the environment, to humans, and particularly to children. Because the chemistry of pesticides is highly diverse, they are capable of causing a wide range of adverse health effects. The effect of these chemicals, depending on the specific pesticide or combination of pesticides an individual or population is exposed to, can involve virtually every organ system in the body. Pesticides have been shown to cause a wide range of adverse effects on human health including acute and chronic injury to the nervous system, lung damage, injury to the reproductive organs, dysfunction of the immune and endocrine systems, birth defects, and cancer; these effects can manifest as acutely toxic effects, delayed effects, or chronic effects.

It has been shown that children bear a significantly heavier body burden of many environmental chemicals than adults, and this statistic holds true for pesticides. The Centers for Disease Control and Prevention's Second National Report on Human Exposure to Environmental Chemicals found two-fold higher urine levels of the commonly used pesticide chlorpyrifos in children compared to adults. Chlorpyrifos is one example of a class of pesticides known as organophosphates, which kill insects by disrupting their brains and nervous systems. In a study of the impact of prenatal chlorpyrifos exposure on neurodevelopment in the first three years of life among inner-city children, the proportion of New York City three-year-olds showing delayed development was five times greater in the higher exposure group. As stated previously, the health effect of a particular pesticide is based on its specific chemistry.

### **How can pesticide exposure be prevented?**

While many pesticides are ubiquitous in our environment, there are ways to greatly reduce your families exposure to pesticides. The first of these is to avoid fruits and vegetables that have been treated with pesticides.