

N E E T F

National Strategies for Health Care Providers: Pesticides Initiative Fact Sheet **HEALTH EFFECTS OF PESTICIDES**

A pesticide is any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating any pest. Pests can be insects, mice and other animals, unwanted plants (weeds), fungi, or microorganisms like bacteria and viruses. Though often misunderstood to refer only to insecticides, the term pesticide also applies to herbicides, fungicides, and various other substances used to control pests. Under United States law, a pesticide is also any substance or mixture of substances intended for use as a plant regulator, defoliant, or desiccant.

Many household products are pesticides, including: cockroach sprays and baits; insect repellents for personal use; rat and other rodent poisons; flea and tick sprays, powders, and pet collars; kitchen, laundry, and bath disinfectants and sanitizers; products that kill mold and mildew; some lawn and garden products, such as weed killers; and some swimming pool chemicals.

Pesticide exposure can occur in a number of settings outside agriculture, including urban and suburban environments, homes, and schools. Exposures can lead to acute and/or chronic health effects through indoor and outdoor exposures, prenatal and postnatal exposures in children, as well as from dietary intake. Chronic health effects represent a range of adult and childhood illnesses, such as cancer and asthma, as well as reproductive and central nervous system effects.

Agricultural Exposures

- Agriculture accounts for 76 percent of the conventional pesticides used each year in the United States.
- Pesticide handlers and agricultural workers appear to be at greatest risk for acute pesticide poisoning. Based on U.S. states with required reporting of pesticide-related health concerns, the U.S. Environmental Protection Agency (EPA) estimates there are approximately 250-500 physician-diagnosed cases of acute pesticide poisoning per 100,000 agricultural workers (including pesticide handlers).
- Migrant and seasonal farmworkers are especially at high risk since they often work and live in areas where pesticide exposures can be significant.

Non-Agricultural Exposures

- Control of a growing number of exotic and public health pests has increased the potential for pesticide exposure to the public. In recent years, spraying of insecticides over residential neighborhoods, for example, involved millions of people, in New York City for control of West Nile Virus-carrying mosquitoes and in several Florida counties for control of the Mediterranean fruit fly (Medfly).
- An estimated 84 percent of American households use pesticides, according to a 1990 EPA survey. Homeowners annually use 5-10 pounds of pesticide per acre on their lawns and gardens, many times the amount applied by farmers to corn and soybean fields. They also use pesticides in the form of disinfectants, including pine oil cleaners, bathroom cleaning products, and cleaning materials for swimming pools. In addition, structural pest control operators and workers in nurseries, greenhouses, and landscaping are also at risk for work-related exposures.

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- Data collected from Poison Control Centers found that in 1996, more than 40,000 adults were sufficiently exposed to various types of pesticides to warrant a call to their local Poison Control Center. It is estimated that as many as 60 percent of these individuals developed symptoms of pesticide poisoning. These figures are thought to represent less than 30 percent of the incident cases of acute pesticide-related illness in the United States.

Children's Pesticides Exposure

- Children may be more susceptible than adults to environmental health risks because of their physiology and behavior. They eat and drink more and breathe more air in proportion to their body weight than adults. They also play close to the ground and put objects in their mouths. Their bodily systems are still developing, and they may be less able than adults to metabolize and excrete pollutants.
- In the agricultural setting, children may be exposed to pesticides in a number of ways: through prenatal exposure, from being in the fields where their parents work, contact with pesticide residues on parents' clothing, living next to areas being treated, and working in the fields themselves.
- In non-agricultural settings, children may be exposed to pesticides in their houses, yards, day cares and schools. In 1996, Poison Control Centers were notified about approximately 80,000 children (age 0-19) who were exposed to common household pesticides in the United States, an estimated one-quarter of whom developed symptoms of pesticide poisoning. In 1992-98, there were an estimated 24,000 emergency department visits annually resulting from pesticide exposure, of which 61 percent of the cases involved children younger than age 5.

Chronic Health Effects of Pesticides Exposures

- *Cancer:* Over 60 active ingredients for pesticides have been classified as probable human carcinogens by EPA or the International Agency for Research on Cancer. Although most of these pesticides are no longer on the market or have had their uses severely restricted, persons previously exposed may be at increased risk. A review by the National Cancer Institute (NCI) lists 15 pesticides for which there is evidence of cancer in human epidemiologic studies.
- *Central nervous system effects:* Many insecticides and fumigants are designed specifically to target the nervous system of the pest they are intended to control. There is increasing human evidence in the form of case reports and epidemiologic studies that suggests that humans may experience chronic neurologic or neurobehavioral effects following high levels of exposure to certain types of pesticides. Several reports have also found chronic neurological sequelae (reduced neurobehavioral function) after acute organophosphate poisoning.
- *Reproductive effects:* Many pesticides have been identified as developmental or reproductive toxicants based on animal studies. An epidemiologic study published in *Occupational Medicine: State of the Art Reviews* in 1997 concluded, "there is increasing evidence for reproductive and developmental effects of both maternal and paternal pesticide exposures. Areas of particular concern include infertility and time to pregnancy, spontaneous abortion, neural tube defects, and limb reduction defects."
- *Asthma:* An Institute of Medicine report concluded that although there is evidence suggesting that high level exposures to some pesticides may elicit persistent asthma, there is not enough evidence to say whether an association exists between pesticide exposures at the levels typically encountered in nonoccupational or residential settings and the development or exacerbation of asthma.

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