

What Are the Potential Health Effects of Pesticides?

At a Glance

- Toxicity is the ability of a chemical to cause harm to health. The amount needed to cause harm depends on the chemical.
- With most pesticides, the longer you are exposed the greater the chance of harm.
- People can be exposed by breathing a pesticide, getting it into the mouth (by eating or drinking, for example), or by contact with the skin or eyes.
- Some people are more at risk than others, depending on their age, gender, individual sensitivity, or other factors.

Although pesticides are intended to harm only the target pest, if not used correctly, they can also harm people or the environment.

The presence of a pesticide in the environment is not necessarily a problem, but it may be a source of exposure. As with all toxic substances, whether the exposure causes harm depends on the dose, how someone is exposed, how sensitive an individual may be to that toxin, and the toxicity of the pesticide involved.

What do you mean, "Risk = Toxicity + Exposure"?

Toxicity is the capacity of a chemical to cause harm to health. The amount needed to cause harm depends on the chemical. Like other chemicals, some pesticides are more toxic than others. A small quantity of a highly toxic pesticide



With most (but not all) pesticides, the more a person is exposed to a particular substance, the greater the chance of harm. Two aspirin may get rid of your headache, but a bottle will make you sick.



Humans can be exposed to pesticides by breathing it, getting it into their mouth, or absorbing it through the skin.

can cause great harm, but almost any substance can cause harm in large enough doses. That's why, when we consider risk, we consider both the toxicity and your exposure to it (how, how much, how long).

With most (but not all) pesticides, the more a person is exposed to a particular substance, the greater the chance of harm. Two aspirin may get rid of your headache but an entire bottle will make you sick. And for some people, aspirin may be harmful even at low doses. The degree of harm depends on the chemical, the situation, and the person. The same is true of pesticides. Very small amounts of even the most toxic materials may do no or immeasurably small harm. Less toxic materials in large amounts can cause great harm.

How are people exposed to pesticides?

People can be exposed to pesticides in three ways:

- Breathing (inhalation exposure).
- Getting it into the mouth or digestive tract (oral exposure).
- Contact with the skin or eyes (dermal exposure).

Pesticides can enter the body by any one or all three of these routes. Inhalation exposure can happen if you breathe air containing pesticide as a vapor, as an aerosol, or on small particles like dust. Oral exposure happens when you eat food or drink water containing pesticides. Dermal exposure happens when your skin is exposed to pesticides. This can cause irritation or burns. In more serious cases, your skin can absorb the pesticide into the body, causing other health effects.

Some pesticides evaporate more easily than others so they are more likely to be inhaled. Some break down quickly on surfaces; others last longer. A pesticide applied as a liquid spray may drift more easily than dry granules. A pesticide sealed in a trap is less likely to be eaten accidentally by a child or a pet. A dry pesticide plowed into the soil can be dangerous to groundwater, but is not as likely to drift through the air. All these factors affect the potential risk of human exposure and are considered when DPR makes rules for pesticide use.

Does how long you are exposed make a difference?

Generally, the longer or more often a person is exposed to a given amount of a pesticide, the greater the chance of harm. We at DPR consider both how long and how often someone might be exposed when we develop rules for pesticide use. For example, we know that fumigant pesticides slowly escape into the air during the hours or days after an application. (Fumigants are gaseous pesticides injected into the soil or released into buildings.) When we evaluate controls on fumigant use, we work to make sure people near an application, including workers and nearby residents, are protected over both short and long periods.

Are some people more at risk than others?

Pesticides affect different people differently. Children may be more sensitive to some pesticides than adults. Compared to adults, they breathe in more air and eat more food relative to their body size, increasing their exposure. When they play on floors or lawns or put objects in their mouths, they increase their chance of exposure to pesticides used in yards or lawns. Also, their developing bodies may not break down some chemicals as effectively as adults.

People of any age with asthma or other chronic diseases may be more likely than healthy individuals to get sick after pesticide exposure. Some individuals are also more sensitive to the odor or other irritant effects of certain pesticides.

But no matter what their individual sensitivities, people in the greatest danger of pesticide illness are those whose exposure is highest, such as workers who mix or apply pesticides. People who use pesticides in their homes may also be overexposed and become ill, especially if they do not carefully follow the directions on the product label. People living near agricultural fields are more likely than urban residents to be exposed to farm chemicals (although their exposure may not necessarily be high enough to cause harmful effects).



Because they are smaller, children get a larger dose from a given exposure to pesticides. Regulators take this into consideration when they develop restrictions on pesticide use.