



Prevention



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Pesticides: strengths and limitations of current research

Cancer is a complex disease and it can have a long latency period. This means that the time between the first exposure to a cancer-causing substance and the onset of cancer can take years. This long latency and the fact that there are many [risk factors](#) can make identifying the causes of cancer difficult. Some of these factors cannot be changed – age, sex or genes – while others can. Some risk factors that can be changed include exposure to natural or synthetic substances in the environment such as pesticides.

Pesticides, like many [other environmental exposures](#), can be difficult to study. The three major ways to study environmental contaminants, such as pesticides, are:

- [toxicology studies](#) (studies that look at what is toxic in substances)
- [animal studies](#) (studies that test the effects of toxic substances in laboratory animals)
- [epidemiology studies](#) (studies that look at links between risk factors and disease in people)

Toxicology, animal and epidemiology studies together improve our understanding of the link between pesticides and cancer. However, it is still difficult to fully understand the relationship between pesticides and cancer because of certain limitations of current research.

Toxicology studies

- Strengths
 - Chemical properties and toxic limits of substances can be found.
 - Potential health effects associated with exposure to a substance can be identified.
 - Metabolism of substances in the body can be studied.
- Limitations
 - Only single substances are tested. The interactions between different pesticides or with other chemicals in the environment are not studied – this makes it difficult to understand if these interactions affect cancer development.
 - Harmful levels of pesticides are often unknown – this could affect research on setting maximum residue limits for pesticides (the amount you can take in without causing a risk to your health).
 - Measures on the levels of pesticides in the environment may be incomplete or unavailable.

Animal studies

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- ▶ [Pesticides](#)
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- Strengths
 - Environmental conditions can be controlled.
 - Potential effects of a substance can be studied in animals before considering it in humans.
 - The length of time from exposure to the development of health effects is short.
- Limitations
 - Results can be difficult to apply to humans. For example, people are exposed to more than one substance and at lower doses than animals in studies. Unlike study animals, people have characteristics that vary from person to person.
 - The effects on animals may not be the same in people.
 - It is often not possible to test the effect of exposure during important developmental periods such as pre-natal (before birth) and newborn periods when the effects of toxins may be at their highest.

Epidemiology studies

- Strengths
 - These studies look at disease or health effects in people, including how, when and where they happen under real world conditions.
 - Health effects can be observed after exposures have occurred naturally in a person's environment.
 - Groups of people, rather than individuals, can be studied over time.
- Limitations
 - Some types of epidemiological studies need a large number of people and a long time to complete
 - Information about specific exposures may be limited because people need to remember exposures from the past.
 - Researchers may have limited information or control over other factors that can affect a person's health or exposure, such as exposure to other chemicals, lifestyle and health.

Current pesticide research doesn't give us all of the information we need.

- There is only a small amount of research about Canadians' exposure – information is often from other countries that may have different exposure patterns and pesticide use.
- It is not possible to do research on pesticide exposures that put people at risk. This makes it hard to study the link between pesticides and cancer.
- Changes over time in how pesticides are made and the use of multiple pesticides can make it difficult to understand the health risks of current products.

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