

# Scared to Death: Understanding the Difference Between a Chemical Risk vs. Hazard - Pesticide Facts

*NKOLO Isaac says:*

When is a chemical dangerous?

This is not a question we consciously ask ourselves much, but in fact, we interrogate the world and our safety unconsciously dozens of times each day about it. Is our child's plastic sippy cup made with dangerous chemicals? Does the cleaner we are using on our car give off dangerous fumes? What about the spray to kill dandelions?

How do people assess hazard and risk? How safe is safe?

Media perceptions and government regulations are often shaped by a fervor fed by misconceptions about the widespread dangers of common chemicals. Consider the word "pesticide." Sounds scary. After all, synthetic and natural pesticides kill unwanted pests such as insects, weeds, fungi and rodents.

But advocacy groups, many hostile to conventional agriculture, mostly refer to pesticides pejoratively, assuming anything that can kill another organism can also do a lot of damage to humans. This is almost never true. In fact, it is not possible for some pesticides to harm humans. For example, natural *Bt* toxins, which are sprayed widely by organic farmers to kill certain insects and are bioengineered into insect-resistant seeds are biologically impossible to harm humans. But that doesn't stop the hysteria. Pesticides are regularly blamed for all sorts of problems—from environmental pollution to hormonal disruption to cancer.

One prime example? Glyphosate.

This is the controversial case of the herbicide found in Monsanto's Roundup<sup>®</sup> and generic formulations. A jury in San Francisco [decided](#) in August 2018 that exposure to Roundup<sup>®</sup> was responsible for a California groundskeeper's cancer. The ruling came despite hundreds of studies that found the popular weed killer to be [safe as used](#). The verdict turned on a June 2015 evaluation by the International Agency for Research on Cancer (IARC) that glyphosate was "probably carcinogenic to humans." It was not a finding of "risk" but of "hazard"—and did not take into account exposure. IARC put glyphosate in the same category as coffee and salted fish. It was deemed less possibly carcinogenic than alcohol, which is very hazardous and can lead to cancer—if you are exposed to (consume) extraordinary amounts of it.

## **Chemophobia May Lead to Real Risks**

The fact is that almost all chemicals we encounter on a regular basis have undergone reviews of one kind or another and are safe as used. Yet people still believe that somehow one government agency or another "missed something" or that it's in cahoots with "big business" and has fudged the safety data.

An illusion also has developed that chemicals can be divided into categories of "safe" versus "unsafe." But any substance, even food

and vitamins, can be harmful if we consume too much of it. Safety is relative, depending on the frequency, duration and magnitude of exposure.

To put into context how askew this debate has gone, let's look at the supposed risk that pesticides cause pediatric cancer. No issue could be more emotionally charged.

A [study](#) published in August 2018 in *The Lancet Oncology* examined the incidence of pediatric cancer from 1991 to 2010. It was a gigantic study that included 1.3 billion person-years. (One "person-year" is an epidemiological term that refers to one person being studied for a period of one year.) The study found cancer rates have stabilized over the past decade after minimal increases of 1 percent in the two previous decades. As for the impact of pesticides, in an accompanying [commentary](#), Belgian cancer epidemiologist Philippe Autier wrote:

*In 2014, the quantities of pesticide sales per capita were about three times greater in Spain, Italy, and France than in Sweden or the UK. If increasing cancer incidence trends were due to pesticides, dissimilarities in incidence trends for leukemia and lymphoma would be expected between European regions, which was not the case.*

Put another way, if pesticides cause pediatric cancer, then countries that use more pesticides should have more cases of pediatric cancer. But they don't. Therefore, pesticides probably don't cause pediatric cancer.

The bottom line is that more research is necessary to uncover the causes of childhood cancer. But eliminating unlikely candidates, such as pesticides, is an important step in unraveling the mystery.

The public obsession with the alleged dangers of chemicals in common usage is unhealthy. Serious health challenges need to be forcefully confronted, but the resources devoted to challenging and removing relatively innocuous chemicals in exchange for substitutes—usually substances that have often not been scrutinized as much as the chemicals they would replace and thus confer an illusion of safety—divert us from addressing known health risks. This chemophobia can result in the opposite of what was intended: a decrease rather than an increase in public health.

*Jon Entine is a freelance journalist, author of "[Scared to Death: How Chemophobia Threatens Public Health](#)" and other books, and founder and executive director of the [Genetic Literacy Project](#).*