



## Why do regulators conclude glyphosate safe while IARC, alone, claims it could cause cancer?

Andrew Porterfield | July 24, 2015 | Genetic Literacy Project



When IARC, which examines potential cancer hazards (but not risks) of a wide range of substances and activities for WHO, issued its report on the relationship between cancer and five pesticides—including glyphosate, perhaps better known as Roundup—headlines went screaming.

In March, the World Health Organization’s International Agency for Research on Cancer ([IARC](#)), issued a statement (also published in *The Lancet*) that re-[classified glyphosate](#) as “probably carcinogenic to humans”. Why? Because of:

*Limited evidence of carcinogenicity in humans for non-Hodgkin lymphoma. The evidence in humans is from studies of exposures, mostly agricultural, in the USA, Canada, and Sweden*

*published since 2001. In addition, there is convincing evidence that glyphosate also can cause cancer in laboratory animals.*

Anti-GMO groups jumped on the report, led by anti-GMO crusader, NaturalNews.com, acting as point in a global [campaign](#) to ban glyphosate:

*In response to a recent International Agency for Research on Cancer report, which found that the Monsanto herbicide glyphosate “probably” causes cancer in humans, a cohort of international doctors is now petitioning the European Union Parliament, the EU Commission, and several other health and food safety authorities to take action by banning the use of this prolific chemical.*

The website for Moms Against Monsanto declared that “Top Medical Journal, WHO Confirm: Monsanto’s Flagship Product [Probably Causes Cancer](#).” Not to be outdone, Common Dreams declared “Glyphosate, Favored Chemical of Monsanto & Dow, [Declared ‘Probable’ Source of Cancer for Humans](#).” Anti-GMO NGOs have been relentlessly flogging this report since. Even more scientifically oriented publications couldn’t resist overstepping in characterizing the review.

*Scientific American* declared “Widely used herbicide [linked to cancer](#).” The science magazine had earlier published a post quoting a study by Gilles-Éric Séralini in an article entitled “Weed-Whacking Herbicide [Proves Deadly](#) to Human Cells.”

Some countries even took the IARC report to heart enough to suspend uses of glyphosate.

## **Comparing apples and Roundup**

Does glyphosate pose a genuine danger to humans? The mainstream press has tried to separate the scare from the science, but it’s been a challenge because of the confusion of what IARC was evaluating and scientists in general assess the potential hazards and risks of chemicals. IARC does not evaluate actual human risks—a fact widely misunderstood by the public in general. Regulatory agencies do that. Rather, IARC looks at what is called “hazards”.

Note the focus of the IARC review. Quoting [Nature’s summary](#):

*The IARC review notes there is limited evidence for a link to cancer in humans. Although several studies have shown that people who work with the herbicide seem to be at increased risk of a cancer type called non-Hodgkin lymphoma, the report notes that a separate huge US study, the Agricultural Health Study, found no link to non-Hodgkin lymphomas. That study followed thousands of farmers and looked at whether they had increased risk of cancer.*

*But other evidence, including from animal studies, led the IARC to its ‘probably carcinogenic’ classification. Glyphosate has been linked to tumours in mice and rats — and there is also what the IARC classifies as ‘mechanistic evidence’, such as DNA damage to human cells from exposure to glyphosate.*

Like glyphosate, almost anything can present a hazard, from the sun to chemicals to everyday foods like coffee depending upon exposure. IARC did not find any food risks related to glyphosate. British based Sense About Science just [issued an explainer](#) on the glyphosate controversy to help dispel the fog of confusion about what this review actually means. What is IARC, it asks?

*The IARC is an agency of the World Health Organization (WHO) which aims to identify causes of cancer. It brings together groups of scientists to review scientific evidence in order to recognise chemicals, physical and biological agents, and lifestyle factors that can cause cancer in humans.*

*The IARC do not carry out a risk assessment but rather assess the **potential** of an agent to be carcinogenic. It does not take into consideration how much of or how commonly a risk it poses in the real world.*

*We’ve translated the IARC’s carcinogen list into something you can read [here](#). **Warning:** You might be shocked...*



**\* Classified as probable or possible carcinogens by the IARC.**



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What's been overlooked is that the classification that IARC assigned glyphosate—a “2A, Probably carcinogenic to humans”—is the same classification the organization gave to grapefruit juice, fruits (including apples), and working the [night shift](#). At least glyphosate didn't rate a “1, carcinogenic to humans,” so it's not as dangerous as baby oil or sunlight.

When IARC comes to a determination of what may cause cancer, it combs through existing literature (which does raise the risk of cherry-picking studies that satisfy your point of view). But it's [assessing the hazard](#) of a chemical. A hazard assessment simply states that a certain chemical, environmental element or behavior is somehow related to cancer. [It'll then](#) note whether something “is,” “is probable” or “is possible”, or “isn't,” so far as we know.

What a hazard evaluation does not tell you is how likely you are to get cancer. That's the domain of a risk assessment, which will use the same words—“is,” “probable” and “possible”—but in a different way. Here's a very informative video explainer by Andrew Maynard, director of the [Risk Innovation Lab](#) at Arizona State University, that covers how IARC makes its hazard assessments:

### **Risks versus hazards**

While a hazard just shows you that “somebody out there linked this to cancer,” a risk measures how likely you are going to come into contact with this hazard. So, in the case of apples and

pears, IARC looked at the existence of amygdalin, or formaldehyde, both of which are considered class 1 carcinogens and occur naturally in apples. [But apples contain 22 parts per million](#) of formaldehyde, far below amounts necessary to cause cancer. In short, [dose matters](#).

Likewise, a report trumpeted by Moms Across America, for example, claimed [the existence](#) of glyphosate in mother's milk, but it was not actually a study and has been challenged by many scientists, most recently by [researchers at Washington State University](#).

Most foods do contain certain chemicals that are associated with toxicity. But each chemical has a dosage curve showing how much ingestion is needed to cause harm, and most foods contain very low doses of these toxins. As the US Centers for Disease Control and Prevention [states](#),

*Just because we can detect levels of an environmental chemical in a person's blood or urine does not necessarily mean that the chemical will cause effects of disease.*

This explains why IARC, a WHO subsidiary, can issue reports on cancer hazards, while the World Health Organization itself declares that the IARC study does not indicate a need for more regulation of glyphosate. In fact, several other government agencies, including the [German government](#) and (so far) US Environmental Protection Agency, have issued statements on the doses of glyphosate that cause harm and the low cancer risk of the popular and targeted weed-killer:

- The German Federal Institute for Risk Assessment re-examined data on glyphosate and [declared that](#) “the available data do not show carcinogenic or mutagenic properties of glyphosate nor that glyphosate is toxic to fertility, reproduction or embryonal/fetal development in laboratory animals.” The institute did find toxicity that originated from surfactants and other co-formulants used in the making of some glyphosate products.
- The EPA and other US agencies have [considered](#) glyphosate's cancer risk to be low (the EPA declared glyphosate as [noncarcinogenic in 1991](#)), but the EPA is currently reviewing the chemical for weed resistance as well as other properties.

[Sense About Science](#) and other groups maintain that even as a hazard evaluation, IARC badly botched its job.

**[Scientists](#) have criticised the IARC glyphosate assessment for numerous reasons:**

- *The selection of literature for reviewing was unbalanced and data has been 'cherry picked'*
- *No new scientific evidence was included in this evaluation*

- *This classification is based mostly on animal studies and the report states that there is limited evidence of carcinogenicity in humans*
- *It contradicts the conclusions of several national regulatory agencies around the world that have reviewed the large body of glyphosate research and deemed it a safe herbicide*

***...The dose makes the poison***

*It's important to remember that any chemical, whether natural or synthetic can hurt us if we consume too much of it. The dose is the crucial factor.*

When done well, IARC and similar organizations doing hazard studies merely review literature (or sometimes conduct their own research) to search for a chemical that might or might not pose some kind of hazard. Then, it's up to regulatory agencies to compare what's known about toxic exposure levels of the hazard with actual exposure to humans or animals. It's this assessment of exposure that really tells us whether something's likely to cause cancer.

So what does science tell us about glyphosate? It's not carcinogenic and is safe as used. If you question that based on the IARC hazard study, perhaps you should consider advocating bans of grapefruits, apples or night shift work.

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This is a list of lifestyle choices, occupations and everyday items that contain chemicals which, according to the IARC, have carcinogenic potential. They are grouped as follows:

**Group 1: Carcinogenic to humans**

Epidemiological studies show convincing evidence that the factor causes cancer in humans.

## **Group 2A: Probably carcinogenic**

There is limited evidence of carcinogenicity in humans and sufficient evidence of carcinogenicity in experimental animals. Other explanations for the observations (technically termed chance, bias, or confounding) could not be ruled out.

## **Group 2B: Possibly carcinogenic to humans**

This category is used when there is limited evidence of carcinogenicity in humans and less than sufficient evidence of carcinogenicity in experimental animals.

## **Agents Classified by the IARC Monographs, Volumes 1–112**

| Agent | Chemicals from agent | Year found in this group classified |
|-------|----------------------|-------------------------------------|
|-------|----------------------|-------------------------------------|

|                     |   |      |
|---------------------|---|------|
| Alcoholic beverages | 1 | 2012 |
|---------------------|---|------|

|                             |   |      |
|-----------------------------|---|------|
| Hormone replacement therapy | 1 | 2012 |
|-----------------------------|---|------|

|                     |   |      |
|---------------------|---|------|
| Oral contraceptives | 1 | 2012 |
|---------------------|---|------|

|                                       |   |      |
|---------------------------------------|---|------|
| Nail varnish; wart/ verruca treatment | 1 | 2012 |
|---------------------------------------|---|------|

|          |   |      |
|----------|---|------|
| Baby oil | 1 | 2012 |
|----------|---|------|

|           |   |      |
|-----------|---|------|
| Plutonium | 1 | 2012 |
|-----------|---|------|

|                       |   |         |
|-----------------------|---|---------|
| Outdoor air pollution | 1 | in prep |
|-----------------------|---|---------|

|         |   |      |
|---------|---|------|
| Painter | 1 | 2012 |
|---------|---|------|

|                     |   |      |
|---------------------|---|------|
| Chinese salted fish | 1 | 2012 |
|---------------------|---|------|

|          |   |      |
|----------|---|------|
| Sunlight | 1 | 2012 |
|----------|---|------|

Fried, roasted and baked food 2A 1994

Emissions from frying food 2A 2010

Art glass 2A 1993

Tea bag manufacturing 2A 1999

**Glyphosate 2A in prep**

Hairdresser/ barber 2A 2010

Cooked meat and fish 2A 1993

Grapefruit juice 2A 1987

Bacon, sausages, burgers, vegetables 2A 2010

Night shifts 2A 2010

Dry cleaning liquid; paint remover 2A 2014

Grilled food 2B 1987

Hangovers; coffee; bread; fruit 2B 1999

Aloe vera 2B 1987

Bracken fern 2B 1987

Food preservative 2B 1987

Thyme; spearmint; sage; cinnamon; star anise; sunflower seeds 2B 1993

Carpentry and joinery 2B 1987

Food thickener for salad dressings, alcohol, ice cream etc 2B 1987

Fruits, vegetables; perfumes 2B 1999

Coconut oil 2B 2013

Coffee 2B 1991

Soap; shampoo; cosmetics 2B 2013

Firefighter 2B 2010

Cereal fungus toxin 2B 2002

Crop fungus 2B 1993

Athlete's foot treatment 2B 2001

Pickled vegetables 2B 1993