
Glyphosate: Get the Facts

NEPPSC

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Disclaimer

I am not affiliated with Monsanto, Bayer or any entity with interests in glyphosate or its commercial formulations.

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glyphosate



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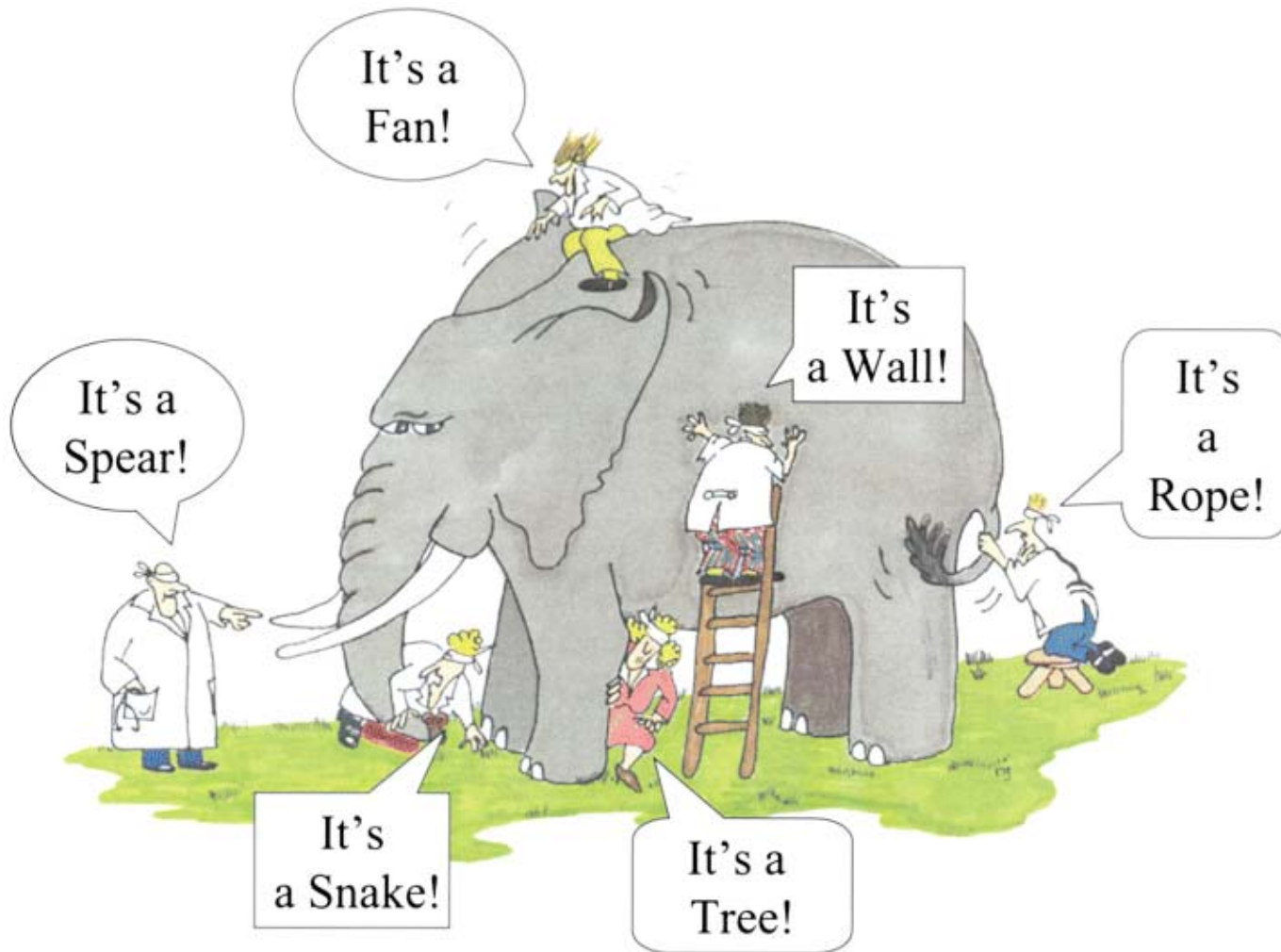
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The Evidence (as of 2016)

- 23 epidemiological studies



- 15 animal carcinogenicity studies

- Over 90 genotoxicity studies





Evaluations

The Environmental Protection Agency (EPA)/ Office of Pesticide Programs (OPP)

European Food Safety Authority (EFSA)

The World Health Organization (WHO)/ Joint Meeting on Pesticide Residues (JMPR)

WHO/ The International Agency for Research on Cancer (IARC)

Glyphosate Issue Paper: Evaluation of Carcinogenic Potential

EPA's Office of Pesticide Programs
September 12, 2016



Overall Conclusion

“not likely to be carcinogenic to humans’ at doses relevant to human health risk assessment.”

https://www.epa.gov/sites/production/files/2016-09/documents/glyphosate_issue_paper_evaluation_of_carcinogenic_potential.pdf

Evidence in Humans

“In epidemiological studies, there was **no evidence of an association** between glyphosate exposure and numerous cancer outcomes; however, due to conflicting results and various limitations identified in studies investigating NHL, a conclusion regarding the association between glyphosate exposure and risk of NHL cannot be determined based on the available data.”

Evidence in Animal Studies

“Increases in tumor incidence were **not considered treatment-related** in any of the animal carcinogenicity studies.”

Mutagenesis (DNA damage)

“The overall weight of evidence indicates that there is **no convincing evidence** that glyphosate induces mutations *in vivo* via the oral route.”

CONCLUSION ON PESTICIDE PEER REVIEW

Conclusion on the peer review of the pesticide risk assessment of the active substance glyphosate¹

European Food Safety Authority (EFSA)²

European Food Safety Authority (EFSA), Parma, Italy

“...all the Member State experts but one agreed that neither the epidemiological data (i.e. on humans) nor the evidence from animal studies demonstrated causality between exposure to glyphosate and the development of cancer in humans.”

“Regarding carcinogenicity, it is unlikely that this substance is carcinogenic.”



Food and Agriculture Organization
of the United Nations



World Health
Organization

JOINT FAO/WHO MEETING ON PESTICIDE RESIDUES

Geneva, 9–13 May 2016

SUMMARY REPORT

Issued 16 May 2016

In view of the **absence of carcinogenic potential in rodents** at human-relevant doses and the **absence of genotoxicity** by the oral route in mammals, and considering the **epidemiological** evidence from occupational exposures, the Meeting concluded that glyphosate is **unlikely to pose a carcinogenic risk to humans** from exposure through the diet.

<https://www.who.int/foodsafety/jmprsummary2016.pdf>

International Agency for Research on Cancer



World Health
Organization

20 March 2015

IARC Monographs Volume 112: evaluation of five organophosphate insecticides and herbicides

Evidence in humans

“There is limited evidence in humans for the carcinogenicity of glyphosate. A positive association has been observed for non-Hodgkin lymphoma.”

Evidence in experimental animals

“There is sufficient evidence in experimental animals for the carcinogenicity of glyphosate.”

Supporting evidence

Genotoxicity and oxidative stress

Overall evaluation

“Glyphosate is probably carcinogenic to humans (Group 2A).”

<https://monographs.iarc.fr/wp-content/uploads/2018/06/mono112-10.pdf>

Why are IARC's conclusions different?

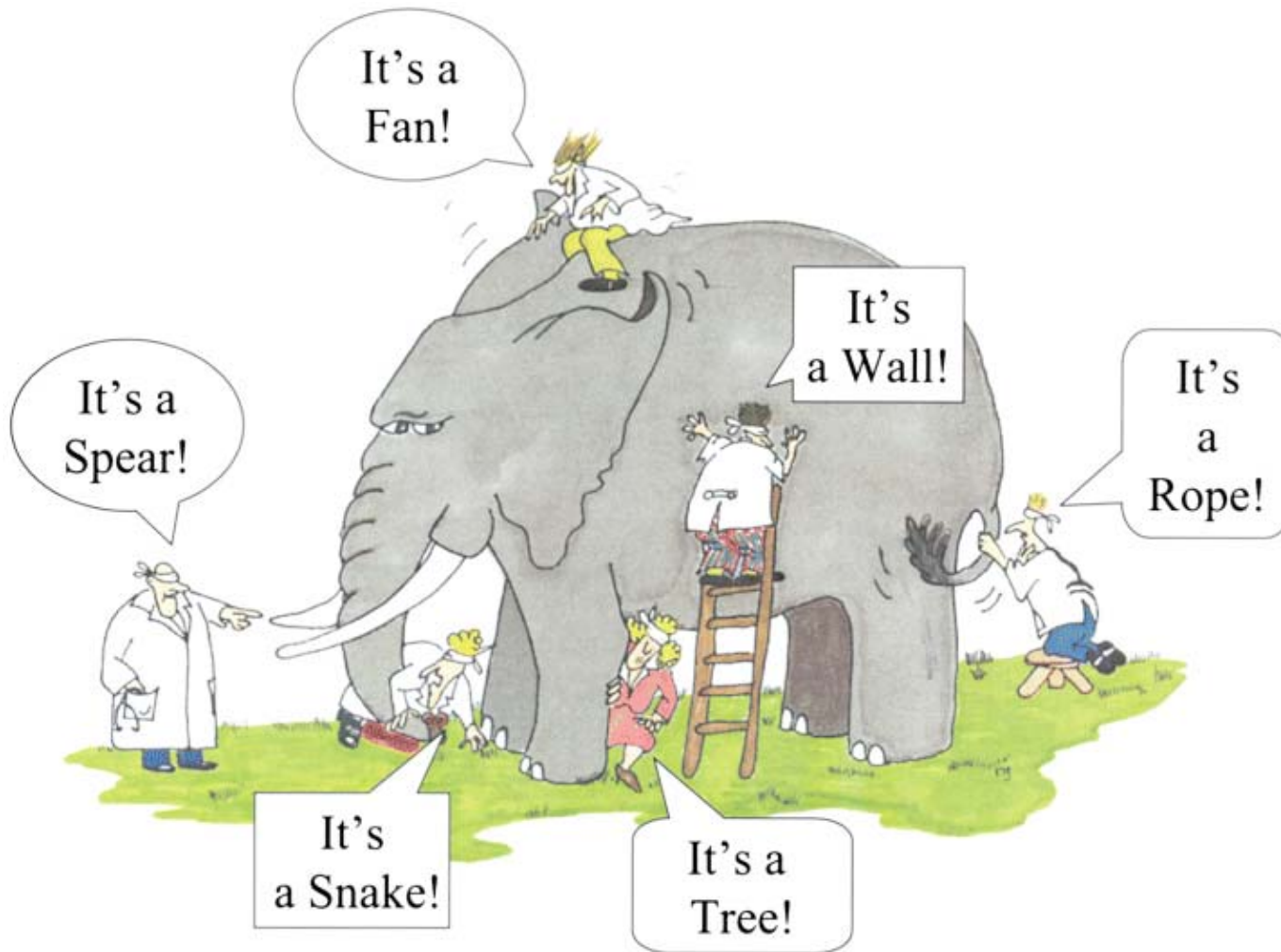
	IARC	EPA/EFSA
Process	Working Groups	FQPA, PRIA, Registration Review, comments, transparency, full time science teams, ...
Breadth of studies	Publicly available	All, including those submitted by registrant and those not published
Quality evaluation of studies and weighting	Some	Systematic
Dose levels	Not considered	Relevant to the interpretation of data
Statistics	Trend	Pairwise
Other??		

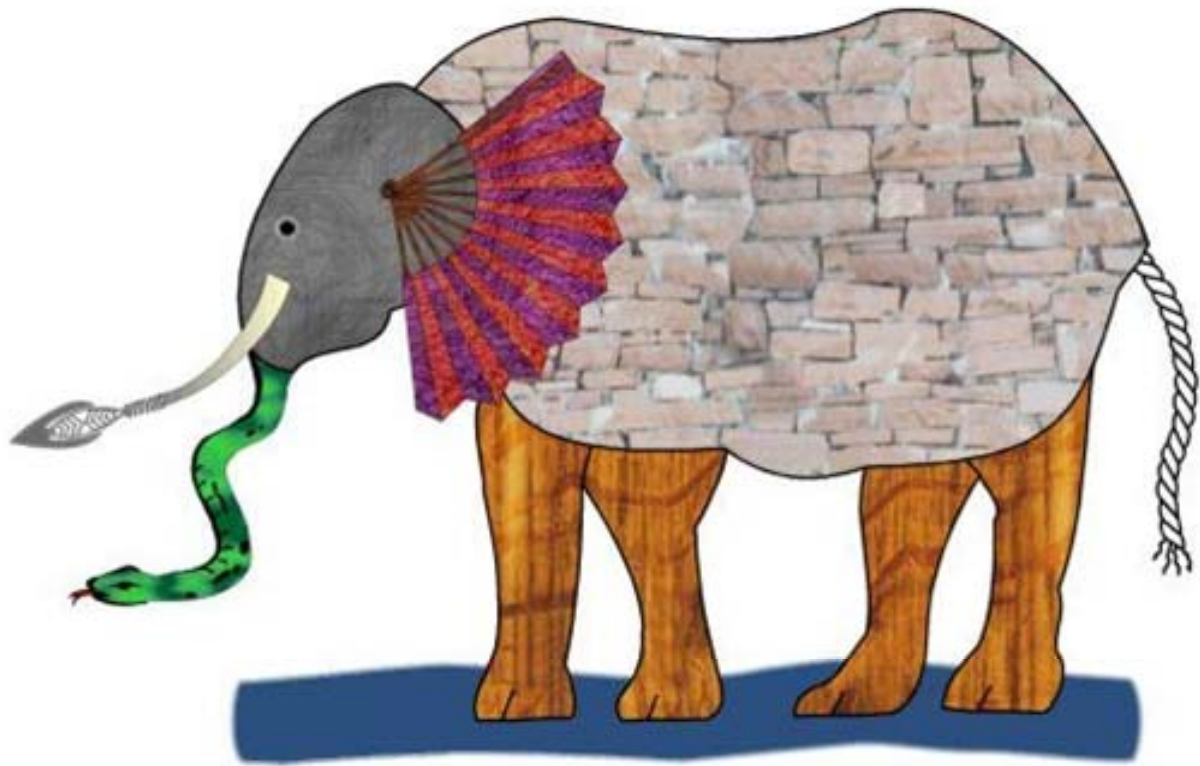
Why are IARC's conclusions different?

	2015 IARC	2016 SAP Issue Paper
Epidemiological Studies	28 individual studies 1 reanalysis 1 meta-analysis	58 individual studies 1 reanalysis 2 meta-analyses
Animal Carcinogenicity Studies	6 rat studies 2 mouse studies Only publicly available data	9 acceptable rat 6 acceptable mouse 5 unacceptable Access to all acceptable studies
Genotoxicity Studies	Technical, formulation, and metabolites	Technical only (107 assays) Access to all except 17

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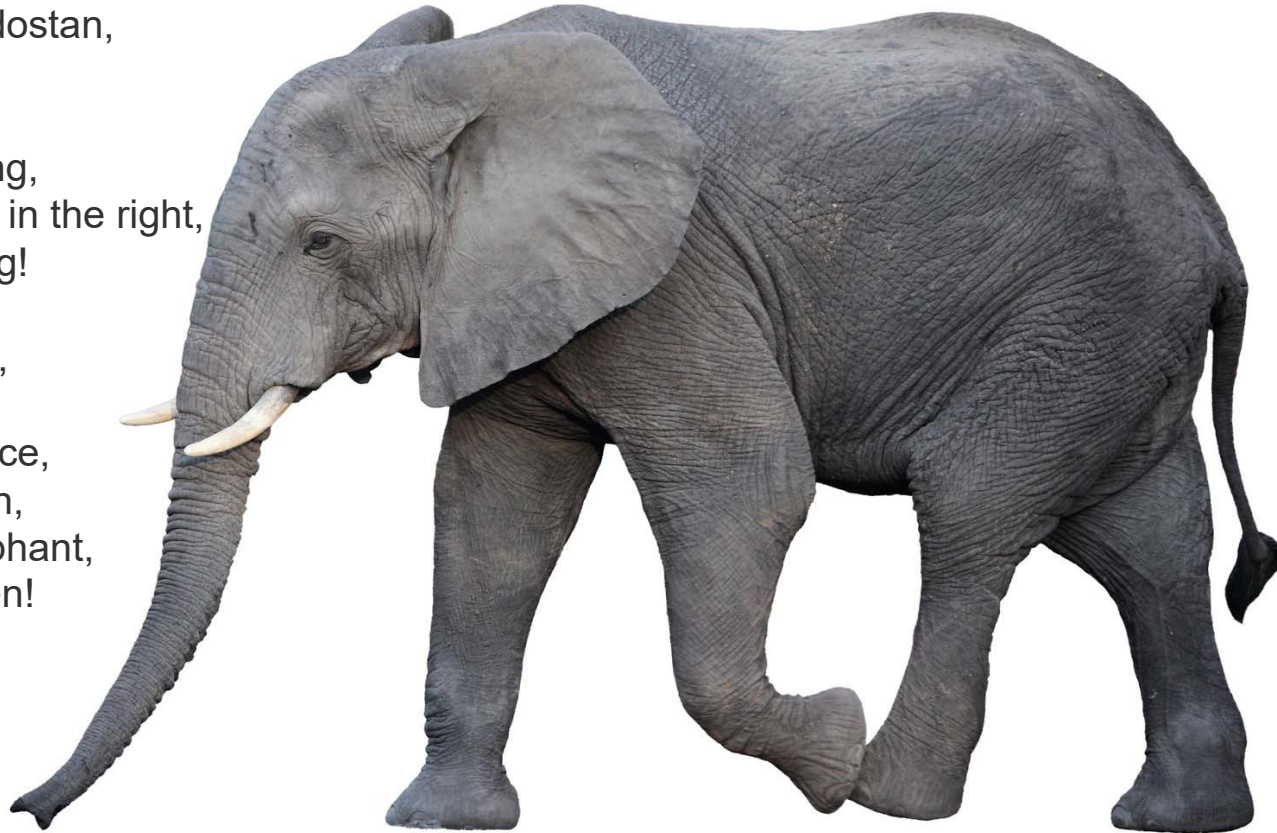


“The Blind Man and The Elephant”

And so these men of Indostan,
disputed loud and long,
each in his own opinion,
exceeding stiff and strong,
Though each was partly in the right,
and all were in the wrong!

So, oft in theologic wars,
the disputants, I ween,
tread on in utter ignorance,
of what each other mean,
and prate about the elephant,
not one of them has seen!

-John Godfrey Saxe



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