



Know your environment.  
Protect your health.

## **EWG Comments on the EPA's Proposed Interim Registration Review Decision for Glyphosate**

**August 21, 2019**

**To: Office of Pesticide Programs  
Environmental Protection Agency  
1200 Pennsylvania Avenue, N.W.  
Washington, D.C. 20004**

**Submitted electronically to docket EPA-HQ-OPP-2009-0361-2340**

Environmental Working Group (EWG), a nonprofit research and advocacy organization with headquarters in Washington, D.C., objects to the Environmental Protection Agency's proposed decision on glyphosate, the most heavily used pesticide in the U.S. The EPA's decision to allow continued, extensive use of glyphosate disregards the cancer risks and children's health risks posed by glyphosate and should be re-evaluated with emphasis on the latest research on glyphosate toxicity.

Exposure to glyphosate can come from foods sprayed with the herbicide; from water and air, because of the widespread presence of glyphosate in the environment; and from the residential and occupational application of glyphosate-based herbicides.<sup>1</sup> These exposures have grown dramatically in the past two decades. As demonstrated by a biomonitoring study between 2014 and 2016 of older adults in Southern California, at least 70 percent of study participants had detectable traces of glyphosate in their bodies, compared to 12 percent of participants tested between 1993 and 1996.<sup>2</sup> Increased exposure has paralleled the explosive growth in the volume of glyphosate sprayed annually, with less than 25 million pounds applied in 1992 and over 250 million pounds sprayed in 2016, according to the data from the U.S. Geological Survey.<sup>3</sup>

EWG is especially concerned about the risks that glyphosate exposure poses to children's health. The EPA's dietary risk assessments indicate that children one to two years old are likely to have the highest exposure levels, comparable to EPA estimates of exposure in occupational settings – and yet real life data on infants' and children's

---

<sup>1</sup> Gillezeau C, van Gerwen M, Shaffer RM, Rana I, Zhang L, Sheppard L, Taioli E. 2019. The evidence of human exposure to glyphosate: a review. *Environmental Health* 18:2 doi: 10.1186/s12940-018-0435-5

<sup>2</sup> Mills PJ, Kania-Korwel I, Fagan J, McEvoy LK, Laughlin GA, Barrett-Connor E. 2017. Excretion of the Herbicide Glyphosate in Older Adults Between 1993 and 2016. *JAMA*. 318(16): 1610-1611.

<sup>3</sup> U.S. Geological Survey. 2018. Estimated Annual Agricultural Pesticide Use. Available at <https://water.usgs.gov/nawqa/pnsp/usage/maps/>



exposure to glyphosate are missing.<sup>4</sup> In the recently published “Toxicological Profile for Glyphosate”, the Agency for Toxic Substances and Disease Registry recommends improving the biomonitoring of glyphosate in humans as well as the “monitoring of children’s exposure to glyphosate.” A recent study of 12 parent-child pairs in California found that for 9 of the 12 pairs, children had greater glyphosate exposure than adults, as measured by urinary glyphosate levels.<sup>5</sup>

Epidemiological evidence has linked glyphosate exposure to an elevated risk of cancer, neurodevelopmental changes, and impact on the reproductive system. Of the eight epidemiological studies assessing the use of glyphosate-based herbicides by agricultural workers, five find an elevated risk of non-Hodgkin lymphoma in association with glyphosate exposure. Importantly, the increased risk identified in two individual studies was greatest with longer exposure dose, such as the number of application days, which suggests a dose-response relationship.<sup>6,7</sup> Four separate meta-analyses, published between 2014 and 2019, have identified a statistically significant 30 to 50 percent increase in the risk of non-Hodgkin lymphoma due to occupational glyphosate exposure.<sup>8,9,10,11</sup> Notably, a new study, published in July 2019, reported that glyphosate exposure can promote multiple myeloma progression in an experimental animal model.<sup>12</sup> Statistically significant associations between glyphosate exposure and multiple myeloma have also been observed in agricultural workers.<sup>9</sup>

The latest scientific publications suggest that glyphosate exposure during pregnancy can affect the development of the fetus and the health of newborn infants and young children. A study from the University of California, Los Angeles, found that prenatal glyphosate exposure, assessed on the basis of the California Pesticide Use Reporting

---

<sup>4</sup> FIFRA Scientific Advisory Panel Meeting Minutes and Final Report No. 2017-0, EPA’s Evaluation of the Carcinogenic Potential of Glyphosate, Dec. 13-16, 2016.

<sup>5</sup> Center for Environmental Health. 2019. Study Finds 90% of Families Have Toxic Weed Killer in Bodies. Significantly Higher Levels Found in Children. <https://www.ceh.org/wp-content/uploads/Glyphosate-Factsheet.pdf>

<sup>6</sup> Eriksson M, Hardell L, Carlberg M, et al. 2008. Pesticide exposure as risk factor for non-Hodgkin lymphoma including histopathological subgroup analysis. *Int J Cancer* 123(7):1657-1663. 10.1002/ijc.23589.

<sup>7</sup> McDuffie HH, Pahwa P, McLaughlin JR, et al. 2001. Non-Hodgkin’s lymphoma and specific pesticide exposures in men: Cross-Canada study of pesticides and health. *Cancer Epidemiol Biomarkers Prev* 10(11):1155-1163.

<sup>8</sup> Zhang L, Rana I, Shaffer RM, Taiolo E, Sheppard L. 2019. Exposure to glyphosate-based herbicides and risk for non-Hodgkin Lymphoma: a meta-analysis and supporting evidence. *Mutation Research/Reviews in Mutation Research*, in press. Available at <https://www.sciencedirect.com/science/article/pii/S1383574218300887>

<sup>9</sup> Schinasi L, Leon ME. 2014. Non-Hodgkin lymphoma and occupational exposure to agricultural pesticide chemical groups and active ingredients: A systematic review and meta-analysis. *Int J Environ Res Public Health* 11(4):4449-4527.

<sup>10</sup> Chang ET, Delzell E. 2016. Systematic review and meta-analysis of glyphosate exposure and risk of lymphohematopoietic cancers. *J Environ Sci Health Part B* 51(6):402-434.

<sup>11</sup> IARC. 2017. Glyphosate. Some organophosphate insecticides and herbicides. In: IARC monographs on the evaluation of carcinogenic risks to humans. Volume 112. International Agency for Research on Cancer. <http://monographs.iarc.fr/ENG/Monographs/vol112/mono112.pdf>. June 4, 2018.

<sup>12</sup> Wang L, Deng Q, Hu H, Liu M, Gong Z, Zhang S, Xu-Monette ZY, Lu Z, Young KH, Ma X, Li Y. 2019. Glyphosate induces benign monoclonal gammopathy and promotes multiple myeloma progression in mice. *J Hematol Oncol*. 12(1):70. doi: 10.1186/s13045-019-0767-9.



data, was associated with a 33 percent increase in risk for autism spectrum disorder combined with intellectual disability.<sup>13</sup> Prenatal exposure to glyphosate, measured by urinary glyphosate concentrations, was associated with shorter gestational length in an Indiana birth cohort.<sup>14</sup> In addition, research in animal models found significant harm to the male reproductive system after low-dose prenatal glyphosate exposure.<sup>15,16</sup>

In light of this research, the EPA's decision to allow continued, extensive use of glyphosate is particularly troubling, because the EPA's assessment of glyphosate risk to human health is based solely on a toxicity study conducted in animals and disregards human epidemiological data. Further, the study that the EPA chose for the derivation of a chronic dietary endpoint for glyphosate was a prenatal, short-term developmental toxicity study in rabbits completed in 1996, more than 20 years ago. This study (EPA study ID 44320616) does not adequately characterize risks to children's health and the potential impacts of lifelong exposure to glyphosate from diet and other sources. Therefore, due to outstanding data gaps and concerns about health harm from glyphosate raised by epidemiological studies, a full tenfold children's health safety factor should be included in the glyphosate assessment, as specified under the Food Quality Protection Act.

In conclusion, given the extensive use of glyphosate nationwide, the documented increase in human exposure to glyphosate over time, and the risk of health harm from glyphosate, including cancer and the effects on fetal development, we must conclude that the EPA's proposed decision to allow glyphosate spraying to continue unabated is not in the interest of public health. For that reason, Environmental Working Group urges the EPA to:

- (1) Re-evaluate its decision about glyphosate reregistration, with particular emphasis on the latest studies of glyphosate toxicity.
- (2) Recognize the cancer risks posed by glyphosate, as demonstrated by epidemiological studies and toxicological data.
- (3) Use a full tenfold children's health safety factor.

---

<sup>13</sup> Von Ehrenstein OS, Ling C, Cui X, Cockburn M, Park AS, Yu F, Wu J, Ritz B. 2019. Prenatal and infant exposure to ambient pesticides and autism spectrum disorder in children: Population based case-control study. *BMJ* 364: 1962. doi: 10.1136/bmj.1962

<sup>14</sup> Parvez S, Gerona RR, Proctor C, Friesen M, Ashby JL, Reiter JL, Lui Z, Winchester PD. 2018. *Environmental Health* 17:23 doi: 10.1186/s12940-018-0367-0.

<sup>15</sup> Manservigi F, Lesseur C, Panzacchi S, Mandrioli D, Falcioni L, Bua L, Manservigi M, Spinaci M, Gaeleati G, Mantovani A, Lorenzetti D, Miglio R, Andrade AM, Kristensen DM, Perry MJ, Swan SH, Chen J, Belpoggi F. 2019. The Ramazzini Institute 13-week pilot study glyphosate-based herbicides administered at human-equivalent dose to Sprague Dawley rats: effects on development and endocrine system. *Environ Health*. 18(1):15.

<sup>16</sup> Pham TUH, Derian L, Kervarrec C, Kernanec P, Jegou B, Smagulova F, Gely-Pernot A. 2019. Perinatal Exposure to Glyphosate and a Glyphosate-Based Herbicide Affect Spermatogenesis in Mice. *Toxicological Sciences*. 169(1): 260-271.



Know your environment.  
Protect your health.

(4) Take measures to limit Americans' exposure to glyphosate from dietary sources, especially due to preharvest spraying of glyphosate on products such as oats, wheat, legumes, and related crops.

It is essential to take these steps so that children may be adequately protected from glyphosate exposures in the diet and other sources of exposure to this herbicide.

Submitted on behalf of the Environmental Working Group,

Alexis Temkin, Ph.D., Toxicologist

Olga V. Naidenko, Ph.D., Vice President,  
Science Investigations