"Children's exposure to pesticides should be limited AS MUCH AS POSSIBLE."

– American Academy of Pediatrics[1]

GOOD NEIGHBOR

EVIDENCE OF HARM

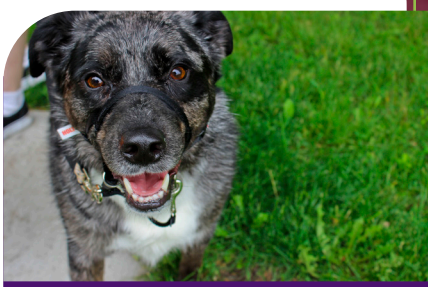
Children are exposed to pesticides through their food, water, and the pesticides applied in their own backyards, school grounds, and the public parks they play in. Children's unique vulnerabilities, including frequent hand-to-mouth behavior, physical size, and developmental stage, can lead to significantly greater, and more detrimental, exposure compared to adults. There are situations where pesticides may be needed in certain landscapes (invasive species control, removing poison ivy, etc.), **but, given the body of evidence, their use on common turf for cosmetic purposes is unjustifiable.**

A technical report, *Pesticide Exposure in Children*[1] by the American Academy of Pediatrics, offers a review of numerous studies linking prenatal and childhood cancers, chronic illnesses, neurodevelopmental delays, and behavioral disorders to pesticide exposure.

Many other findings in the public health literature point to similar conclusions:

- In 2007, a comprehensive literature review by the Ontario College of Family Physicians concluded, "Studies looking at pesticide use and cancer have shown a positive relationship between exposure to pesticides and the development of some cancers, particularly in children." This report advises "...decreasing pesticide use for cosmetic (non-commercial) purposes where children might be exposed, and on the job."[2]
- A 2010 meta-analysis of 15 studies on residential pesticide use and childhood leukemia found an association with exposure during pregnancy.[3] Links between pesticides and non-Hodgkin lymphoma, brain, and kidney cancers also exist. [2]
- Many pesticides exhibit neurotoxic effects in children. A 2013 systematic review found a positive correlation between pesticide exposure and negative neurobehavioral outcomes in 26 out of 27 evaluated studies.[4]
- A paper published in 2018 outlining urgent pesticide policy reforms describes compelling evidence that very low levels of pre- and neo-natal exposure put children at risk of neurodevelopmental harms.[5]
- Neurodevelopmental effects include impacts on neonatal reflexes, psychomotor and mental development, ADHD,[6] and autism. [7,8]
- Some pesticides have active ingredients that have been shown to be endocrine disruptors. Many "other" ingredients—ingredients that remain undisclosed—have also been shown to be endocrine disruptors. [9,10]
- Lawn pesticides often make their way inside homes. In 2001, a study looking at indoor residue of 2,4-D (a common lawn herbicide) was detected in indoor air and on all surfaces throughout all study homes. [11]

For more information, see Pesticide Action Network North America's comprehensive reviews: A Generation in Jeopardy,[12] and Kids on the Frontline: How Pesticides are Undermining the Health of Rural Children.[13]



Pets' health is affected, too

Dogs are highly susceptible to environmental toxins and can act as "canaries in the coal mine" for human health hazards.[16,17] Research shows that exposure to herbicide-treated turf is associated with significantly higher bladder cancer risk in dogs.[18] A 2013 study found elevated levels of 2,4-D and MCPP (common lawn herbicides) in the urine of dogs in both treated and untreated lawns.[18] This suggests that both intentional application *and* pesticide drift from neighbor applications contribute to pet exposure. Furthermore, track-in by an active dog is one of the most significant factors for pesticide intrusion (transport) indoors.[11]

We invite school officials, park managers, and grounds staff to:

- **Act** on what we already know from studies in public health sciences outlined here.
- **Eliminate** pesticide use for cosmetic purposes on general turf areas. Diverse lawns will not hurt anyone, but herbicides can.
- **Be a Good Neighbor.** You can demonstrate to your community that creating healthy lawns without herbicides is practical, saves money, protects children, provides pollinator habitat, and protects Iowa's streams.

Lawn pesticides pollute local streams

The warnings on containers of common lawn weed killers often say: "This product is toxic to fish and aquatic organisms." Yet some of the herbicides applied to turf do end up in local streams. Monitoring studies have shown that pesticides used on lawns are detected in urban streams, and often in higher concentrations than in streams draining from agricultural regions.[14]

After the province Ontario, Canada banned cosmetic lawn pesticides, a study found that weed killer concentrations in urban streams were significantly reduced.[15]

Pollinators and biodiversity

Bees are a keystone pollinator species. However, urban bee populations may be undermined due to pesticide exposure. Pesticides, including both insecticides and herbicides, aim to diminish biodiversity — the lifeline of pollinators. It is critical that we safeguard their habitat by maintaining urban biodiversity and providing spaces in which plants essential to pollinators' health can grow and flourish. When lawns are managed without pesticides, naturally occurring flowers and plants can serve as a natural wildlife habitat for urban bee species.[19]

SOURCES

1. Roberts, James R., and Catherine J. Karr. "Pesticide exposure in children." Pediatrics 130.6 (2012): e1765-e1788.
2. Bassil, K. L., et al. "Cancer health effects of pesticides: systematic review." Canadian Family Physician 53.10 (2007): 1704-1711.
3. Turner, Michelle C., Donald T. Wigle, and Daniel Krewski. "Residential pesticides and childhood leukemia: a systematic review and meta-analysis." Ciencia & Saude Coletiva 16.3 (2011): 1915-1931.
4. Munoz-Quezada, M., et al. "Neurodevelopmental effects in children associated with exposure to organophosphate pesticides: A systematic review." Neurotoxicology 39 (2013): 158-168
5. Hertz-Picciotto, I., Sass, J.B., Engel, S., Bennett, D.H., Bradman, A., Eskenazi, B., Laphear, B., Whyatt, R. "Organophosphate Exposures During Pregnancy and Child Neurodevelopment: Recommendations for Essential Policy Reforms." Plos Medicine. 2018
6. Liu, Jianghong and Schelar, Erin. "Pesticide Exposure and Child Neurodevelopment: Summary and Implications." Workplace Health and Safety 60.5 (2012): 235-242.
7. Kalkbrenner, A., Schmidt, R., and Penlesky, A. "Environmental Chemical Exposure and Autism Spectrum Disorders: A Review of the Epidemiological Evidence." Curr Probl Pediatr Adolesc Health Care 44.10 (2014): 277-318.
8. Roberts, J.R., Dawley E.H., Reigart, J.R. "Children's Low-Level Pesticide Exposure and Associations with Autism and ADHD: a Review." Pediatric Research. 85 (2019): 234-241.
9. Gasnier, C., et al. "Glyphosate-Based Herbicides are Toxic and Endocrine Disruptors in Human Cell Lines." Toxicology 262.3 (2009): 184-191.
10. Defarge, N., et al. "Co-Formulants in Glyphosate-Based Herbicides Disrupt Aromatase Activity in Human Cells Below Toxic Levels." International Journal of Environmental Research and Public Health 13.3 (2016): 264.
11. Nishioka, M., et al. "Distributions of 2,4-D in Air and on Surfaces inside Residences after Lawn Applications: Comparing Exposure Estimates from Various Media for Young Children." Environmental Health Perspectives,109.11 (2001): 1185-1191.
12. Pesticide Action Network North America. "A Generation in Jeopardy." 2013.
13. Pesticide Action Network North America. "Kids on the Frontline." 2016.
14. Hoffman, Ryan S., Paul D. Capel, and Steven J. Larson. "Comparison of pesticides in eight US urban streams." Environmental Toxicology and Chemistry 19.9 (2000): 2249-2258.
15. Todd, Aaron and J. Struger. "Changes in Acid Herbicide Concentrations in Urban Streams after a Cosmetic Pesticides Ban." Challenges, 2014, 5, 138-151.
16. Reif, J. "Animals Sentinels for Environmental and Public Health." Public Health Reports, 126.1 (2011): 50-57.
17. Takashima-Uebeloer, B., et al. "Household Chemical Exposures and the Risk of Canine Malignant Lymphoma, a Model for Human Non-Hodgkin's Lymphoma." Environmental Res, 112 (2012): 171-176.
18. Knapp, D., et al. "Detection of Herbicides in the Urine of Pet Dogs Following Home Lawn Chemical Application." Science of the Total Environment, 456 (2013): 34-41.
19. Lerman, S.B., Milam, J. "Bee Fauna and Floral Abundance Within Lawn-Dominated Suburban Yards in Springfield, MA." Annals of the Entomological Society of America. 109.5 (2016): 713-723.