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Issue Summary

“Neurodevelopmental Disorders and Prenatal Residential Proximity to Agricultural Pesticides: The CHARGE Study”

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Study Summary

This study was conducted by researchers from the University of California, Davis and supported through grants from the National Institute of Environmental Health Sciences (NIEHS). The goal of the study was to “evaluate whether residential proximity to agricultural pesticides during pregnancy is associated with autism spectrum disorders (ASD) or developmental delay (DD) in the Childhood Autism Risks from Genetics and Environment (CHARGE) Study.” Study authors examined pesticide use information made available by the California Department of Pesticide Regulations and linked data to residential addresses of 970 participants from the CHARGE study.

The study concludes that “Children of mothers who live near agricultural areas, or who are otherwise exposed to organophosphate, pyrethroid, or carbamate pesticides during gestation may be at increased risk for neurodevelopmental disorders.”

CLA Statement

The University of California, Davis study that attempts to link proximity to pesticide applications with neurodevelopmental disorders instigates unnecessary fears. It incorrectly assumes that proximity equates to exposure, and that a single exposure is sufficient to cause harm. Both assumptions are incorrect. Pesticides are strictly regulated by federal and state bodies. These products are applied responsibly, according to federally mandated label instructions; as such, expectant mothers should not be concerned about exposure to these products.

Protecting the well-being of expectant mothers, infants and elderly individuals is a top priority for the U.S. Environmental Protection Agency (EPA). The registration process for pesticides is conducted with these populations fully in mind. The Agency conducts a risk assessment where toxicology data for a particular product are compared with estimates of exposure based on many studies evaluating chemical behavior in air, water and soil. EPA takes a precautionary approach in their evaluation of the potential for exposure associated with the legal use of pesticide products in concordance with label recommendations. They do this to ensure there is a large margin of safety for approved use so they can be confident that people are protected from harm.

The crop protection industry is constantly seeking ways of reducing environmental impacts of pesticide products and reducing potential product drift. Advanced tools such as GPS technology, electrostatic sprayers and specialized spray nozzles allow applicators to use products with greater precision and care. EPA also establishes buffer zones to help disperse airborne pesticide residues and mitigate exposure that can occur as a result of pesticide drift.

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Supplemental Information

- The study authors assume that a single legal application of any pesticide can drift more than 1 km, resulting in exposure to a pregnant resident and autism or developmental delay among children. This assumption is unsupported and unfounded.
- The study does not show decreasing risk with increasing distance from the application.
- This study draws false connections between proximity and exposure to pesticides and autism. It does not positively contribute to a stronger understanding of the etiology behind autism and developmental disorders, which is a matter of great concern for parents and their children.
- All pesticides are regulated by EPA using an extensive battery of acute, chronic and sub-chronic toxicity and exposure testing. These tests examine the dose and route of exposure and are conducted across a range of species, including offspring. "Uncertainty factors" are also used which address uncertainty by extrapolating the data from animals to humans, the variability of the human population and the vulnerability of children. These "uncertainty factors" **reduce the dose to which pesticides are regulated by 100- to 1000-fold below the dose at which there is no observable adverse effect.**
- It is essential to understand the varying levels at which chemicals are found in the environment (i.e. exposure point concentration) and the level at which adverse health effects occur in humans by these chemicals (i.e. toxicity) before an assessment of risk can be made.
- Among the pyrethroid class of pesticides, manufacturers have conducted hundreds of studies for each of the pyrethroids and pyrethrins to ensure that pyrethroids can be used with reasonable certainty of no harm to humans and no unreasonable effects to the environment.

Resources

Burns CJ, McIntosh LJ, Mink PJ, Jurek AM, Li AA. 2013. Pesticide Exposure and Neurodevelopmental Outcomes: Review of the Epidemiologic and Animal Studies.

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U.S. Environmental Protection Agency. 2013. OCSPH Harmonized Test Guidelines.

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U.S. Environmental Protection Agency. 2014. Pesticide Registration Data Requirements.

<http://www2.epa.gov/pesticide-registration/data-requirements>.