

Leading researchers call for a ban on widely used insecticides

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Public health experts have found there is sufficient evidence that prenatal exposure to widely used insecticides known as organophosphates puts children at risk for neurodevelopmental disorders.

In a scientific review and call to action published in *PLOS Medicine*, the researchers call for immediate government intervention to phase out all organophosphates.

"There is compelling evidence that [exposure](#) of pregnant women to very low levels of organophosphate pesticides is associated with lower IQs and difficulties with learning, memory or attention in their children," said lead author Irva Hertz-Picciotto, professor of [public health](#) sciences, director of the UC Davis Environmental Health Sciences Center and researcher with the UC Davis MIND Institute.

"Although a single organophosphate—chlorpyrifos—has been in the national spotlight, our review implicates the entire class of these compounds," Hertz-Picciotto added.

Originally developed as nerve gases and weapons of war, organophosphates today are used to control insects at farms, golf courses, shopping malls and schools. They kill pests by blocking nerve signaling.

People can come into contact with these chemicals through the food they

eat, the water they drink and the air they breathe. As a result, organophosphate pesticides are detected in the vast majority of U.S. residents, according to Hertz-Picciotto.

Elevated risks even with low-level exposures

While existing limits on organophosphates have reduced exposures, the review authors said this isn't enough. Based on more than 30 epidemiologic studies and scores of experimental studies in animals and cell cultures, they believe the evidence is clear: Exposure to organophosphates before birth, even at levels currently considered safe, is associated with poorer cognitive, behavioral and social development.

"It should be no surprise that studies confirm that these chemicals alter brain development, since they were originally designed to adversely affect the central nervous system," Hertz-Picciotto said.

Despite growing evidence of harm and recommendations from scientific advisors to and scientists within the U.S. Environmental Protection Agency, many organophosphates remain in use. This may be in part because low-level, ongoing exposures typically don't cause visible, short-term clinical symptoms, leading to the incorrect assumption that these exposures are inconsequential, according to Hertz-Picciotto.

"Acute poisoning is tragic, of course, however the studies we reviewed suggest that the effects of chronic, low-level exposures on brain functioning persist through childhood and into adolescence and may be lifelong, which also is tragic," Hertz-Picciotto explained.

Recommendations to protect children

In addition to conducting the [scientific review](#), the authors offered

recommendations for substantially reducing organophosphate exposures, including:

- Removing organophosphates from agricultural and non-agricultural uses and products
- Proactively monitoring sources of drinking water for organophosphate levels
- Establishing a system for reporting pesticide use and illnesses

Until a ban can occur, the reviewers recommend:

- Greater medical and nursing education on organophosphates to improve treatment for and patient education on avoiding exposures
- Training for agricultural workers in their languages on proper handling and application of [organophosphate](#) pesticides
- Increased use of less-toxic alternatives and a transition toward sustainable pest-control measures

More information: Irva Hertz-Picciotto et al, Organophosphate exposures during pregnancy and child neurodevelopment: Recommendations for essential policy reforms, *PLOS Medicine* (2018). [DOI: 10.1371/journal.pmed.1002671](https://doi.org/10.1371/journal.pmed.1002671)

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