



Kids Deserve Better

The latest science is clear: our food system's continued reliance on pesticides is harming rural children

Children in agricultural areas are exposed to pesticides from water and drift above and beyond the exposures all kids share from residues on food and applications in schools, parks, homes and gardens.

Each year, more than 680 million pounds of pesticides are applied to agricultural fields across the country, a figure that climbs to more than a billion when common non-agricultural pesticide uses are included.

This is far too much. Compelling research shows that, even at low levels of exposure, many of these chemicals are harmful to human health. Children's developing minds and bodies are particularly vulnerable.

Yet farmers around the world are modeling alternative, less chemical-intensive approaches to farming that are viable and would strengthen the resilience of agricultural production.

Put simply, there is no need for our food and farming system to put children's health at risk from chemical exposure.

Summary of PAN's new report

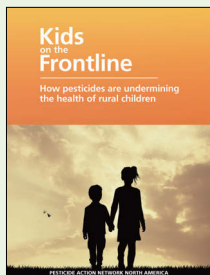
Kids on the Frontline highlights the latest evidence of children's pesticide health risks, especially those faced by rural children.

Scientists have understood for decades that children are particularly vulnerable to the harms of pesticide exposure. Quickly growing bodies take in more of everything; they eat, breathe and drink more, pound for pound, than adults. Physiological systems undergo rapid changes from the womb through adolescence. Interference from even very low levels of pesticides and industrial chemicals can derail the process in ways that lead to significant, potentially lifelong health harms.

Government health trend data and recent academic research indicates:

- **Overall, childhood health problems continue to climb.** Cancer incidence continues to rise, as do rates of autism spectrum disorder, attention deficit hyperactivity disorder and other developmental disabilities, and some birth defects.
- **Fast-rising childhood cancers have strong links to pesticides.**
- **More science links pesticides and neurodevelopmental harms.**
- **Rural children's "double dose" of pesticide exposure is cause for concern.** Children in agricultural areas are exposed to more

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PAN's new report, released May 10, builds on our 2012 analysis, *A Generation in Jeopardy*, summarizing the state of science linking pesticide exposure and children's health. *Kids on the Frontline* focuses on the particular health risks pesticides pose to rural children.

We highlight recent studies in agricultural areas, with specific data on California, Hawai'i, Iowa and Minnesota.



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pesticides than most children. Economic and social stressors can exacerbate the health harms of agricultural chemicals.

Policies to protect kids

The best way to protect children from pesticide harms is to dramatically reduce the volume of use nationwide. We believe this shift is both achievable and long overdue.

The burden cannot rest with individual families; policy changes are required. Our campaign platform below reflects both the growing urgency of the pesticide problem and the current momentum toward building a healthier national system of food and farming. Though exposure to residential pesticides can also be harmful, these recommendations focus on protecting children from agricultural pesticides.

1. Set an ambitious national use-reduction goal for agricultural pesticides. Once this goal is in place, policymakers at all levels should act quickly to implement strong policies and programs to reach the goal, including, among other measures, publicly accessible reporting systems to track progress. Since national reform is unlikely soon, PAN is concentrating on states where policy change is possible.

2. Protect children first. Our national use-reduction campaign prioritizes pesticides most harmful to children. At the state level, we're working for protective pesticide-free buffer zones around schools, daycare centers and other sensitive sites in rural agricultural areas across the country.

3. Invest in healthy, innovative farming. Farmers need significant and meaningful support, incentives and recognition to step off the pesticide treadmill. National and state programs must prioritize investment in healthy, sustainable and resilient agricultural production.

What's standing in our way?

Our current system of industrial agriculture and pest control relies on chemical inputs sold by a handful of multinational corporations. These corporations wield tremendous control over how we grow our food, from setting research agendas in public institutions to production and sale of farm inputs including seeds, fertilizers and pesticides.

Not surprisingly, these same corporations are investing millions of dollars every year to influence voters and policymakers at the local, state and federal levels, and to protect the market for pesticides, seeds and other agrichemicals. As public concern about the health impacts of pesticide products grows, the pesticide industry invests more heavily in public relations campaigns to influence the national conversation about food and farming.

The result is a system of food and farming that serves the interests of these corporations well. It does not, however, adequately protect public health or serve the common good. Farmers, farmworkers and their families are regularly exposed to hazardous chemicals. The health of children in rural communities is compromised by repeated exposure to pesticides where they live, learn and play.

Children in agricultural communities are on the frontline of exposure to pesticides that don't respect boundaries. Pesticides linked to cancer and neurological harm travel through air, water and dust and end up in homes and schools, and eventually in children's bodies.

— PAN lead author, Dr. Emily Marquez



Emily certifying a Midwestern volunteer to use PAN's pesticide Drift Catcher.

We can and must fix this broken system. With your help, PAN is building support for farming practices that sustain our agricultural economy and produce abundant, healthy food that is accessible to all. In the coming year, from school boards to state capitols, from local food policy councils to the halls of Congress, PAN and our supporters will be pressing for child-healthy food and farming. If you're in California or Iowa, you can make a difference right now in our local campaigns (see below). For opportunities to be active at the national level, be sure to sign up for PAN Action Alerts, today! 🌱

Take Action!

California: Tell the Department of Pesticide Regulation to protect schoolchildren in agricultural communities from drifting pesticides with one-mile buffer zones at www.panna.org/HealthySchools.

Iowa: Urge the head of the Iowa Department of Agriculture and Land Stewardship to improve pesticide reporting systems and protect farmers and rural families from drift at www.panna.org/IowaDrift.

More online: Visit our Action Center at www.panna.org/action to see the latest alerts and sign up to receive them in your inbox. You can download or print the full *Kids on the Frontline* report (English or Spanish) and factsheets for California, Iowa and Minnesota at www.panna.org/kof.

Pioneering Research to Protect Kids

Dr. Paloma Beamer and her students are learning that pesticides in the air from nearby farms are entering homes

Many years ago, Paloma Beamer and Emily Marquez were students in the same calculus class at the University of California, Berkeley. Then, early this year, they connected at a meeting of the International Society for Children's Health and the Environment. They discovered a common interest in how exposure to pesticides impacts children's health—Emily as a staff scientist at PAN, and Paloma as an associate professor at the University of Arizona's Community, Environment and Policy Department in the College of Public Health.

Paloma, trained as an environmental engineer, is an expert in "micro-activity patterns." She uses field studies, computer modeling, GIS and lab techniques in her research to help children avoid exposure to harmful toxins. She's already received several awards for her efforts, and was selected as one of Tucson's "40 under 40." Like Emily, Paloma is passionate about protecting communities from exposure to environmental contaminants.

As a graduate student at Stanford, Paloma contributed to UC Berkeley's long-term study of how California's rural communities, particularly farmworkers, are impacted by exposure

to hazardous pesticides. She supported this research (known as CHAMACOS) by documenting the numbers and types of surfaces farmworker children touched with their hands and mouths in the course of a day.

Adding pesticide concentration data from dust in the homes, she developed and validated a multi-route, multi-pesticide exposure and dose model, simulating 115,000 exposure scenarios. Paloma was able to demonstrate that over 95 percent of these scenarios may pose health risks to children, primarily from hand-to-mouth ingestion of the neurotoxic insecticide chlorpyrifos.

Thanks to more than a decade of campaigning by PAN, our partners and allies, U.S. EPA is *finally* poised to ban chlorpyrifos from agricultural use.

Paloma and her students at the University of Arizona are continuing this research in the U.S.–Mexico border region. Because of the large number and quantity of pesticides used near Yuma, Arizona, they have developed a hazard-ranking scheme to prioritize the most widely used pesticides with the greatest potential for exposure and adverse health effects. Paloma worked with Anastasia Sugeng, a recently graduated doctoral student, to simulate how pesticides enter the home from outdoors.

So far, they have discovered that more pesticides enter the home via air infiltration rather than from shoes or clothes as previously thought. This is even more evidence that families living near farms are disproportionately impacted by drifting pesticides. And it's clear that new ways to reduce airborne pesticides need to be developed.

In PAN's recently released report, *Kids on the Frontline*, Emily wrote, "The health impacts from pesticides used in our current system of food and farming has profound consequences for individuals, families, society—and future generations." We're grateful for the dedicated work of researchers like Emily's former classmate, Paloma, making it possible for PAN to bring credible science to bear in our campaigns for healthy children. —



The ultimate goal of my work is to develop more effective interventions and policies for prevention of avoidable cases of diseases such as asthma.

— Dr. Paloma Beamer



Dr. Beamer (with her son) samples for pesticides in the outdoor air near farmworker homes in Yuma, Arizona.

OUR MISSION

30+ YEARS **Pesticide Action Network North America** **90 COUNTRIES**

works to replace the use of hazardous pesticides with ecologically sound and socially just alternatives. As one of five PAN Regional Centers worldwide, we link local and international consumer, labor, health, environment and agriculture groups into an international citizens' action network. This network challenges the global proliferation of pesticides, defends basic rights to health and environmental quality, and works to ensure the transition to a just and viable society.

Another Record for Honey Bee Losses

A second year of high summer bee die offs in 2015 contributed to a troubling 2015–2016 annual loss of 44.1%

The fact that bees are dying in a season when they should be thriving underscores the severity of the problem. There's no question the pollinators we rely on for one in three bites of food are still struggling. And, while several factors are at play, exposure to harmful pesticides is something policymakers can—and must—act on quickly.

Beekeepers are also struggling, spending more time and money to maintain their hives while staggering colony losses continue. This past year's losses were second only to 2012–2013, which topped 45%. They've been losing at least 29% of hives each year since 2006—more than double what is considered normal.

This can't go on. If we're going to break this disturbing trend in pollinator losses, federal policymakers need to step up and take meaningful action.

The trouble with neonics

PAN is focusing specifically on eliminating neonicotinoid pesticides, a class closely linked to bee die-off. Not only can neonics kill bees outright, but at non-lethal doses they can disrupt bees' ability to navigate and can weaken their immune systems, undermining their resistance to common diseases and pests. Multiple studies show that bees exposed to neonicotinoids have more parasite and pathogen problems.

But still, these pesticides are used widely in agriculture. In fact, they are routinely applied to seeds for common crops—including corn, soy and cotton—before planting. Since they're "systemic" pesticides, neonics are pulled up from the seed to all parts of the plant, contaminating the pollen and nectar that bees collect. And, as researchers take a closer look at the common practice of coating seeds with these and other bee-harming pesticides, it's clear that pollinators are being harmed by a practice that, according to the latest evidence, doesn't even help farmers increase yield or profit. With your support, PAN and our allies are campaigning to eliminate neonic seed coatings. —

Take Action: We need to get neonics off the shelf and EPA is moving too slowly. Urge your Representative to support the "Saving America's Pollinators Act" (Conyers/Blumenauer) today at www.panna.org/SAPA.



This spring, PAN Organizing Director Paul Towers worked with Bee Love Sacramento to pass a new city policy that would preclude purchasing of any plants or seeds pre-treated with bee-harming neonics.

Sustain PAN's Work—Give Monthly

When you join PAN's Sustainers Circle, you become part of a vital group that donates each month to fund grassroots science, collaboration with frontline communities and policy change.

We rely on consistent support from Sustainers to work towards a healthy, fair and resilient system of food and farming.

Pledge \$10 a month or more and we'll thank you with a gift of your choice, such as these letterpress honey bee note cards.



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