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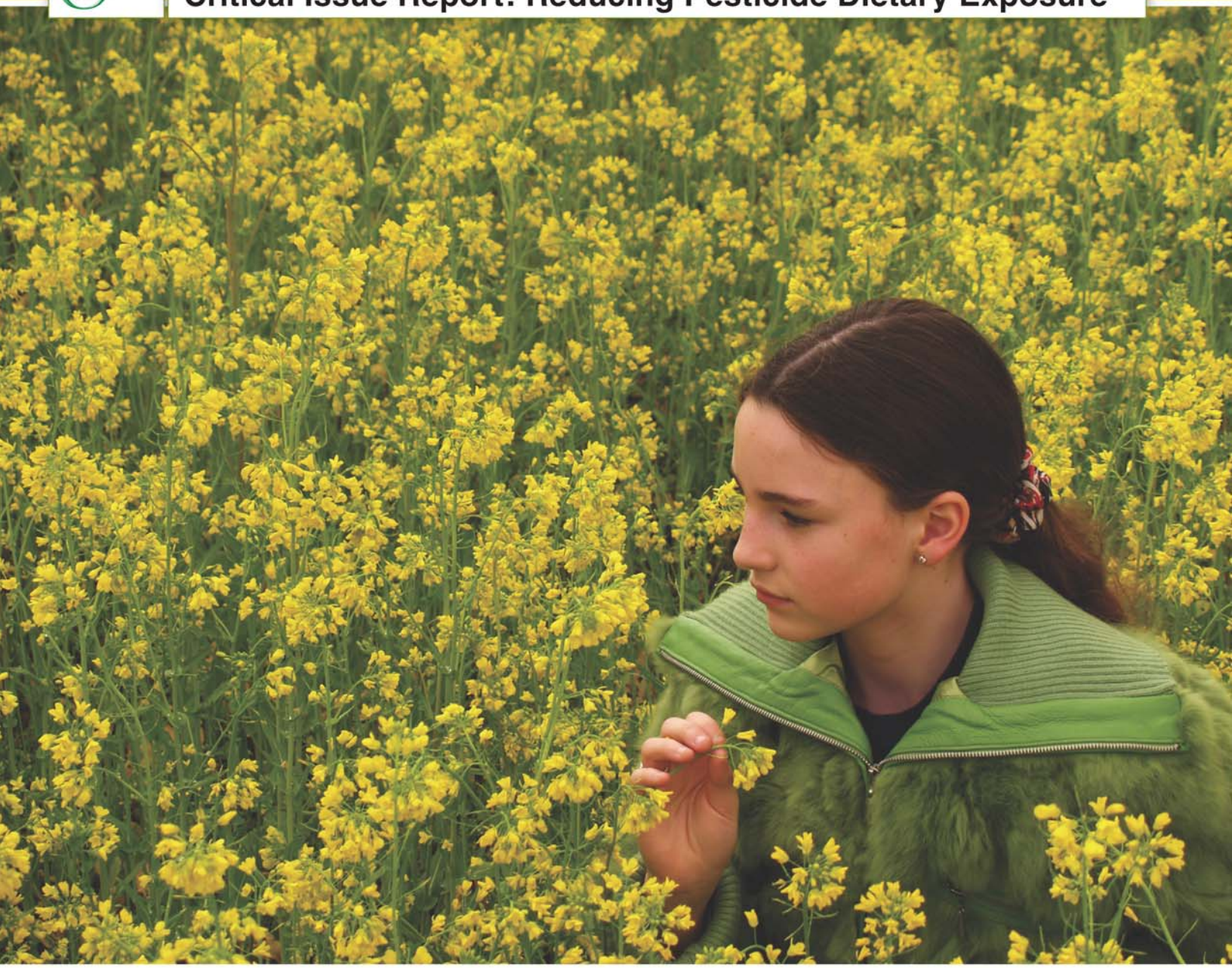
Critical Issue Report: Reducing Pesticide Dietary Exposure



# Successes and Lost Opportunities to Reduce Children's Exposure to Pesticides Since the Mid-1990s

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# INTRODUCTION AND SUMMARY

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This "Critical Issues" report synthesizes papers written by the four scientists who made presentations at the 2006 American Association for the Advancement of Science (AAAS) annual meeting symposium entitled "Opportunities and Initiatives to Minimize Children's Exposures to Pesticides". The symposium occurred February 16th in St. Louis, Missouri.

Dr. Alan Greene, a pediatrician, served as co-symposium organizer with Dr. Charles Benbrook, and presented the session's introductory talk. Dr. Greene is chief medical officer of A.D.A.M., a leading publisher of interactive health information. His award-winning website, www.DrGreene.com, is devoted to health information. He is an attending physician at Stanford University's Lucile Packard Children's Hospital.

Dr. Chensheng (Alex) Lu, Ph.D., is an assistant professor of environmental and occupational health, Emory University, Atlanta GA. Dr. Lu described the findings of a key dietary intervention study that highlights the impact of diets composed of predominantly organic foods on exposures to a class of high-risk insecticides.

Dr. Charles Benbrook is the Organic Center's Chief Scientist. He has worked on pest management, pesticide risk, and regulatory issues since 1981. He spent 17 years in Washington, D.C., working for the Executive Office of the President, the U.S. Congress, and the National Academy of Sciences/National Research Council. He was the Executive Director of the NAS/NRC Board on Agriculture during the period when two critical studies on pesticide risk-regulatory issues were carried out. In his AAAS paper, Dr. Benbrook reviews private sector efforts to reduce risks and identifies some clear winners and losers.

Dr. Philip J. Landrigan, a pediatrician, is the director for the Center for Children's Health and the Environment at the Mount Sinai School of Medicine in New York. From 1995 to 1997, he served on the Presidential Advisory Committee on Gulf War Veteran's Illnesses. Dr. Landrigan chaired the NAS committee that wrote *Pesticides in the Diets of Infants and Children,* a report that was instrumental in securing passage of the Food Quality Protection Act of 1996. In a paper co-authored by Dr. Benbrook, Dr. Landrigan assesses the impacts of the Food Quality Protection Act after 10 years of implementation, and provides an overall assessment of progress made and challenges ahead in reducing children's exposures to pesticides.

Significant progress has been made in the past decade in improving the databases and analytical methods available to establish benchmarks for children's exposures to pesticides and resultant risks. We also have much-improved capability to track trends in exposures and risks.

Risks associated with organophosphate (OP) insecticides were a major focus in the AAAS symposium and are featured in this "Critical Issues" report. This class of insecticides is the most widely used in food production worldwide, poses the most worrisome developmental risks stemming from pesticide use, and has been the dominant focus of the U.S. Environmental Protection Agency (EPA) for more than a decade.

We describe and contrast the effectiveness of four major approaches to reducing pesticide risks:

- Discovery and use of reduced-risk and biologically-based pesticides;
- Adoption of biointensive pest management systems, including organic production methods;
- Marketplace incentives and ecolabels, including organic production; and
- Regulation.

## New Chemistry

Several important classes of new pesticides have been developed and adopted over the last decade that are less toxic and persistent, and less likely to find their way into food, drinking water, and the environment. These new chemistries have displaced many uses of higher-risk pesticides and helped achieve significant risk reduction.

## Shift to Biointensive Integrated Pest Management

From the 1960s through the 1990s, farmers have relied largely upon pesticides to keep pest populations below economic thresholds. The focus of most pest management specialists was chemical control of populations that threatened farm yields, crop quality, and profits.

Concern over the impacts of DDT on wildlife populationsin the 1960s and 1970s, and early experiences with the emergence of pesticide-resistant pest populations, raised questions about the sustainability of pest management systems largely reliant on chemical control. These questions led to early research on Integrated Pest Management (IPM) and biological control.

IPM systems exist along a continuum from largely pesticide-based to fully dependent upon prevention and biological interventions. Successful biointensive IPM requires a shift in the focus of farmers and pest managers to prevention through the management of biological systems, and away from treatments using chemicals (Benbrook et al., 1996). While a significant share of American farmers utilize one or a few core elements of IPM, pesticides remain by far the dominant pest management tool in American agriculture.

A small but growing percentage of farmers are using organic production systems that prohibit the use of toxic synthetic pesticides, and place heavy emphasis on cultural, mechanical and biological control tactics. Organic farmers are allowed to augment their biointensive IPM systems with use of a few dozen, low-risk pesticides that are derived, for the most part, from microbes and natural materials.

## Food Marketplace Incentives and Ecolabels

Food companies and grower groups have promoted adoption of IPM and reduced-risk pest management systems through a variety of marketplace initiatives. Most programs include some sort of ecolabel that certifies that food was grown in ways reducing the environmental impacts of farming systems.

Ecolabels making pesticide-related claims typically are based on:

- Presence of “No Detectable [Pesticide] Residues,” or NDR (also sometimes called “pesticide free”);
- Use of Integrated Pest Management (IPM grown); and/or
- Produced in accord with the principles of organic farming (certified organic).

## Regulation

Through the 1970s and until the late 1990s, the EPA based its pesticide risk assessments on exposures to healthy adults. The Food Quality Protection Act (FQPA), passed in 1996, directed the EPA to conduct a reassessment of all food uses of pesticides, taking into account the heightened susceptibility of infants and children, the elderly, and other vulnerable population groups.

The summary of the AAAS symposium that follows was issued during the meeting as a joint statement signed by the four presenters. It highlights our key findings and conclusions regarding the effectiveness of efforts in the last decade to reduce children’s exposures to pesticides.

## Joint Statement on Pesticides, Infants and Children
## Issued February 19, 2006, at the AAAS Annual Meeting

We believe that the scientific case supporting the need to significantly reduce prenatal and childhood exposures to pesticides has greatly strengthened over the last decade, since passage of the Food Quality Protection Act (FQPA) in 1996. Evidence of the developmental neurotoxicity of several commonly used pesticides is particularly compelling. The FQPA provided the Environmental Protection Agency (EPA) important new tools, ten years, and a mandate to address these sorts of risks and assure that there is a "reasonable certainty of no harm" from government-approved pesticide uses, with special focus on pregnant women, infants and children.

The EPA has acted decisively to eliminate most residential uses of the organophosphate (OP) insecticides. There is encouraging evidence that actions taken to date on residential pesticide uses are producing public health benefits. Equally decisive steps to reduce dietary exposures to high-risk OP pesticides have been regrettably few and far between. Human biomonitoring data shows that only modest progress has been made in reducing OP exposures since passage of the FQPA.

Strong data point to a dramatic shift of pesticide dietary risks from fresh fruits and vegetables grown in the U.S. to those imported from abroad. As a nation, we have more work to do, and contentious decisions ahead if we are to markedly reduce pesticide dietary risks.

How can we best approach this task? In the last decade, significant public and private resources have been invested with the goal of reducing pesticide risks through:

- The discovery and registration of safer pesticides;
- Adoption of Integrated Pest Management systems;
- Ecolabel programs, including "certified organic;" and
- Regulation.

We conclude that discovery of reduced risk pesticides has significantly facilitated the transition by many farmers away from high-risk pesticides. This transition has clearly helped reduce risks in some key children's foods. EPA policies put in place to expedite registration of reduced risk products should be strengthened.

Adoption of Integrated Pest Management (IPM) has had limited impacts on pesticide use and risks. Most IPM systems are focused on using pesticides efficiently and lack even a secondary focus on dietary risk reduction.

Ecolabel programs have had modest impacts on pesticide risks because they collectively impact so few acres, and many programs do not require farmers to markedly change pest management systems. Organic farming is the clear exception, and offers one proven way to quickly and dramatically reduce children's exposures. Studies led by Dr. Chensheng Lu of Emory University have shown that a predominantly organic diet essentially eliminates evidence of exposure to certain widely used organophosphate insecticides.

Regulation, and the FQPA in particular, has advanced knowledge of pesticide risks and addressed residential risks reasonably well, but has done little to reduce pesticide dietary risks. The FQPA is a fundamentally sound law, but it has not delivered fully on its promise to reduce children's pesticide risks because of the EPA's hesitancy to fully use the law's strong new provisions.

In the absence of more decisive action by EPA, significant near-term reductions in pesticide dietary risks are attainable, but only if farmers are provided support and incentives to change pest management systems, and only if consumers demand change.

We conclude that enhanced efforts by the government and food industry to increase both the supply and demand for organic food will deliver the most significant near-term public health gains, especially if the focus is on expanding consumption of fresh and processed organic fruits and vegetables, while reducing consumption of foods high in added sugar and added fat content. Building such requirements into the school lunch and WIC programs are obvious ways to start.