Chemical Trespass

Pesticides in Our Bodies and Corporate Accountability

Executive Summary

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Pesticide Action Network North America
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Pesticide Action Network

Pesticide Action Network (PAN) advocates adoption of ecologically-sound pest management methods in place of pesticide use. For 20 years, our international network of over 600 citizens groups in more than 90 countries has created a global pesticide reform movement with regional coordinating centers in Africa, Asia, Europe, Latin America and North America. PAN North America's (PANNA) primary approach is to link the collective strengths and expertise of groups in Canada, Mexico and the U.S. with counterpart citizen movements in other countries, and to carry out joint projects to further our collective goals of sustainable agriculture, environmental protection, workers' rights, improved food security, and guaranteed human rights for all.

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Pesticide Action Network NORTH AMERICA

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Executive Summary

The human body is not designed to cope with synthetic pesticides. Yet we all carry a cocktail of chemicals designed to kill insects, weeds and other agricultural and household pests.

Some of these pesticides are coursing through our systems at levels that can barely be detected with the most sophisticated monitoring equipment. Others occur in concentrations reflecting exposure levels known to be unsafe.

Many of the pesticides we carry in our bodies can cause cancer, disrupt our hormone systems, decrease fertility, cause birth defects or weaken our immune systems. These are just some of the known detrimental effects of particular pesticides at very low levels of exposure. Almost nothing is known about the long-term impacts of multiple chemicals in the body over long periods.

For decades, pesticide manufacturers have argued that applying pesticides in our homes and introducing them into our environment is necessary and safe. When used correctly, they argue, pesticides harm pests, not people. But the claim that pesticides are necessary is rapidly eroding in light of the growing success of sustainable and organic agricultural production and alternative controls for household pests. And the safety argument is directly challenged by the data analyzed in this report documenting the presence of pesticides in the bodies of men, women and children throughout the U.S.

Government data reveal pesticide body burden

The U.S. Centers for Disease Control and Prevention (CDC) released its *Second National Report on Human Exposure to Environmental Chemicals* in January 2003. The report reflects the results of testing 9,282 people for the presence in their bodies of 116 chemicals, including 34 pesticides.

This report takes a closer look at what the CDC data tell us about the pesticides we all carry, or our "pesticide body burden." Analysis of these data tell us which groups of people carry the most of which pesticides, and whether the levels we're exposed to are considered "safe" by U.S. authorities. We also review what is known (and what is not known) about the long-term health effects of daily exposure to this mix of synthetic chemicals, who is responsible for the pesticides in our bodies and what can and must

> No one ever asked us whether we wanted pesticides in our bodies.

Maggie Hallahan

Women and Mexican Americans have the highest body burden levels of several organochlorine pesticides measured by CDC.

be done to prevent and eliminate pesticide body burdens. Key findings of our analysis are outlined below.

Many in the U.S. are exposed to pesticides at harmful levels

Body burden data provide direct evidence of an individual's exposure to pesticides. In many cases, pesticide exposure levels indicated by CDC's body burden data were well above officially permitted thresholds established by government health and environmental agencies. Of the 13 pesticides in the evaluated set[1] for which such "acceptable" exposure levels have been established, two—chlorpyrifos and methyl parathion—exceeded the thresholds dramatically. Chronic exposure to chlorpyrifos, an insecticide more commonly known by its commercial name Dursban, was furthest above the government safety threshold, with average[2] levels for the different age groups three to 4.6 times what agencies consider "acceptable" for chronic exposure of vulnerable populations (see Figure A). This means that women, children and elderly people in the sample population—reflecting many millions of people in the U.S.—exceed the officially established "acceptable" dose for chronic exposure.

Children carry heaviest body burden of many harmful pesticides

CDC data show that the most vulnerable members of the population—our children—are exposed to the highest levels of the organophosphorus family of pesticides, which damage the nervous system. As CDC noted in the 2003 release of these data, young children carry particularly high body burdens—nearly twice that of adults—of a breakdown product (or "metabolite") specific to the insecticide chlorpyrifos (see Figure B).

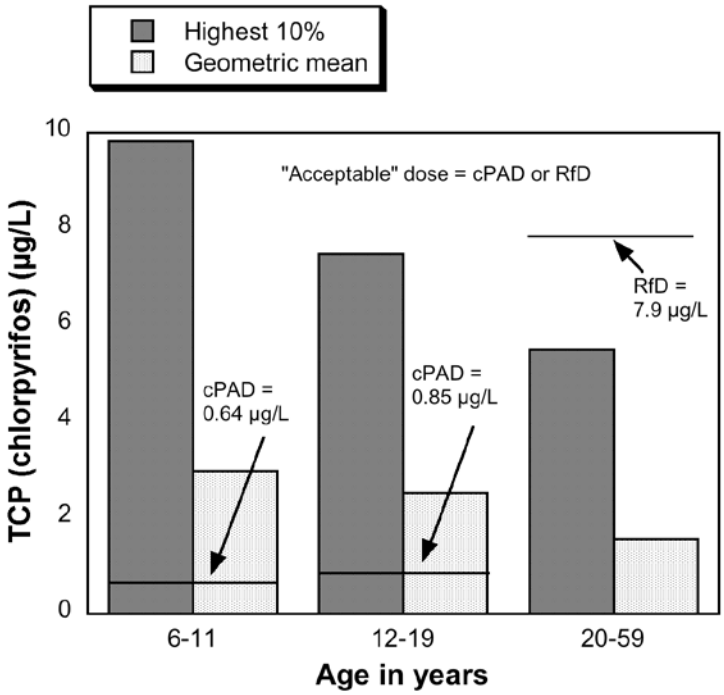


Figure A. Chlorpyrifos Exposure Above "Acceptable" Levels for Many. We compared levels between CDC's three age categories of the chlorpyrifos metabolite (3,5,6-Trichloro-2-pyridinol or TCP) measured in urine. The cPAD refers to the chronic Population Adjusted Dose, the officially "acceptable" dose for children,[3] and RfD refers to the Reference Dose, the officially "acceptable" dose for healthy adults (excluding pregnant or nursing women). See Section 2 and Appendix B of the full report for more details.

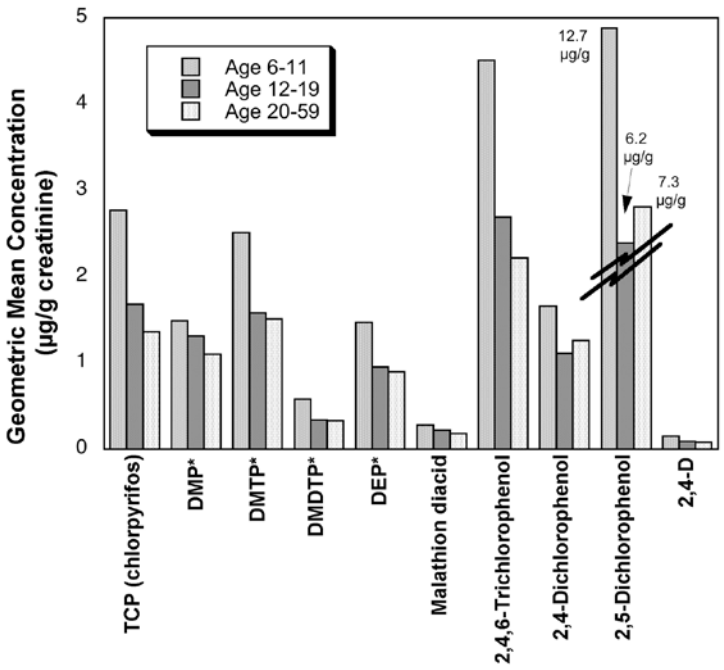


Figure B. Children Have Higher Levels of Many Pesticide Metabolites. For ten pesticides or metabolites measured in urine, children age 6–11 have significantly higher levels than youth (12–19), adults or both. Breakdown products common to many organophosphorus insecticides are indicated with an asterisk.

Mexican Americans carry higher body burden of many agricultural pesticides

A comparison of pesticide exposure levels among ethnic groups showed Mexican Americans had significantly higher concentrations of five of 17 pesticide metabolites measured in urine (see Figure C). Mexican Americans also had significantly higher body burdens than other ethnic groups of the waste and breakdown products of the insecticides lindane and DDT (*beta*-HCH and *p,p*-DDE, respectively).

Most people in the U.S. carry many pesticides in their bodies

CDC found pesticides and their breakdown products in all of the people they tested. All but five of the 23 pesticides and pesticide metabolites evaluated in this report were found in at least half of the study subjects (see Figure D). Among those tested for pesticide residues in both blood and urine, the average person had 13 pesticides in his or her body. Two chemicals found in nearly all the test subjects were TCP, a metabolite of the insecticide chlorpyrifos (found in 93% of those tested), and *p,p*-DDE, a breakdown product of DDT (found in 99% of those tested). Based on these data—which present results from testing for only a fraction of the pesticides that individuals are actually exposed to—it is clear that most people in the U.S. carry a significant body burden of pesticides and pesticide metabolites.

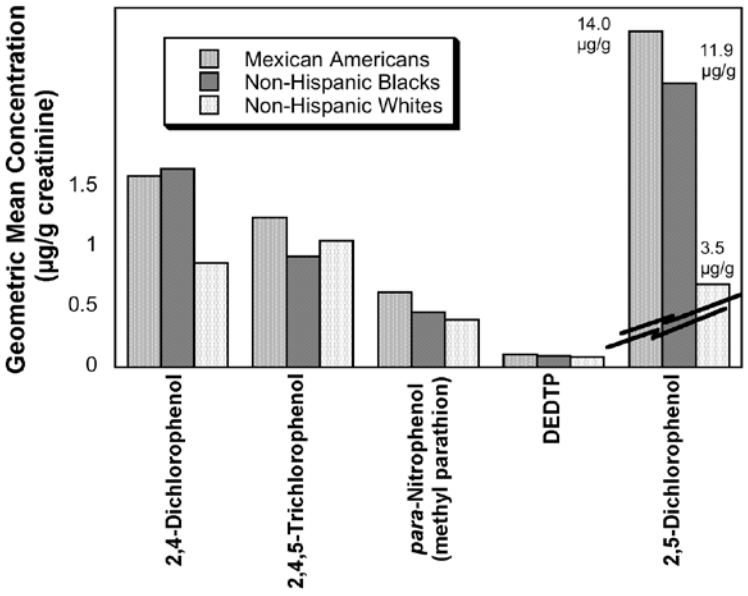


Figure C. Pesticide Levels Higher Among Mexican Americans. Five of the 17 pesticide metabolites measured in urine are significantly higher among Mexican Americans than among blacks, whites or both.

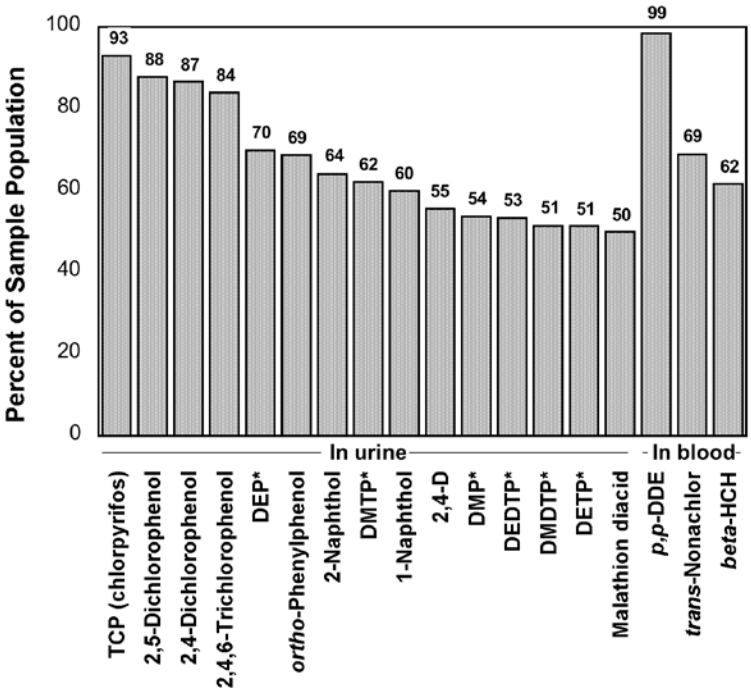


Figure D. Eighteen Pesticides Found in at Least Half of People Sampled. Fifteen of the pesticides or metabolites found in urine and three of the six found in blood were present in at least 50% of the study subjects. (Metabolites common to many organophosphorus insecticides are indicated with an asterisk.)

Future generations are at risk

Adult women—including women of childbearing age—had the highest measured body burden levels of three of the six organochlorine pesticides evaluated (see Figure E). This is cause for serious concern, as many of these pesticides are known to have multiple harmful effects when crossing the placenta during fetal development. Potential negative impacts of fetal exposure include reduced infant birth weight, reproductive problems including low sperm counts and other fertility problems later in life and disruption of neurological development during infancy, potentially leading to learning disabilities and other neurobehavioral problems. Elevated levels of *p,p*-DDE in mothers, for example, have been associated with both lower infant birth weight and reduced lactation, shortening the length of time mothers are able to breastfeed.

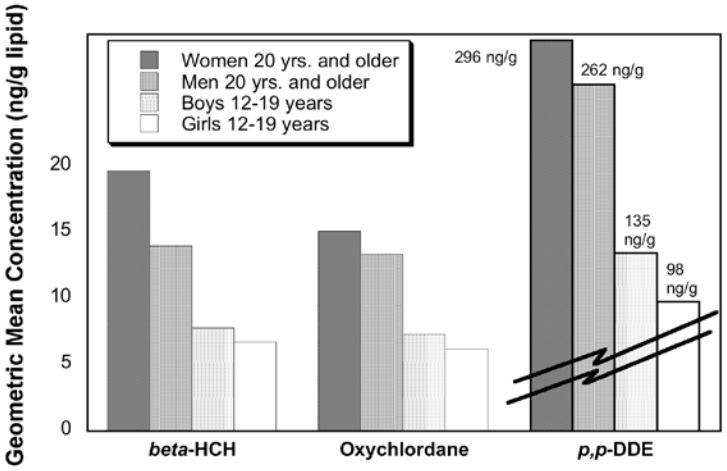


Figure E. Women Have Highest Levels of Some Organochlorine Pesticides. Women 20 years of age and older have significantly higher levels than men or children of three of the six persistent organochlorine pesticides measured by CDC.

Pesticide companies must be held accountable

Where did these harmful pesticides in our bodies come from? Who is responsible for this chemical trespass?

Primary responsibility must rest with pesticide manufacturers. Over the last 50 years, agrochemical companies have largely defined the range of pest control technologies available to farmers and non-agricultural users alike. They also use their political influence to promote and protect their interests by limiting health and safety regulations. Pesticide manufacturers have the greatest capacity to prevent pesticide body burdens, and the general public expects manufacturers to be responsible for the impacts of their products.

In an effort to begin quantifying the responsibilities of individual manufacturers for pesticide body burdens, PANNA has developed a Pesticide Trespass Index (PTI). The PTI is a quantitative measure (a number between 0 and 1) of the fraction of chemical trespass attributable to a specific manufacturer for a pesticide, or group of pesticides, found in a population.

A test case using the pesticide chlorpyrifos as an example illustrates how the PTI works. Dow AgroSciences, a wholly-owned subsidiary of Dow Chemical Corporation, is the primary manufacturer of chlorpyrifos. Using conservative market share estimates, Dow's PTI for chlorpyrifos can be calculated to be 0.8. This suggests that at least 80% of the population's chlorpyrifos body burden is the responsibility of Dow Chemical Corporation.

It would be difficult to make a case that anyone could be more responsible for the chlorpyrifos in our bodies than Dow Chemical Company. Dow developed and was the first to commercialize the pesticide for a wide range of agricultural, residential and non-residential uses, and remains the predominant producer of technical grade chlorpyrifos to this day. The company continues to produce and promote the pesticide in the U.S. and internationally, despite strong evidence of significant public health impacts.

Real changes are needed to reduce pesticide body burdens

The fact that we all carry a mixture of toxic pesticides in our bodies reflects a dramatic failure of government efforts to protect public health and safety. Rather than focusing on preventing harm, current pesticide policies are designed to weigh health and environmental concerns against the powerful economic interests of pesticide manufacturers, users and their allies.

Systemic changes are needed to reduce our pesticide body burden, safeguard public health and safety, hold pesticide manufacturers accountable and prevent further harm. The following are PANNA's recommendations for urgently needed actions to accomplish these goals:

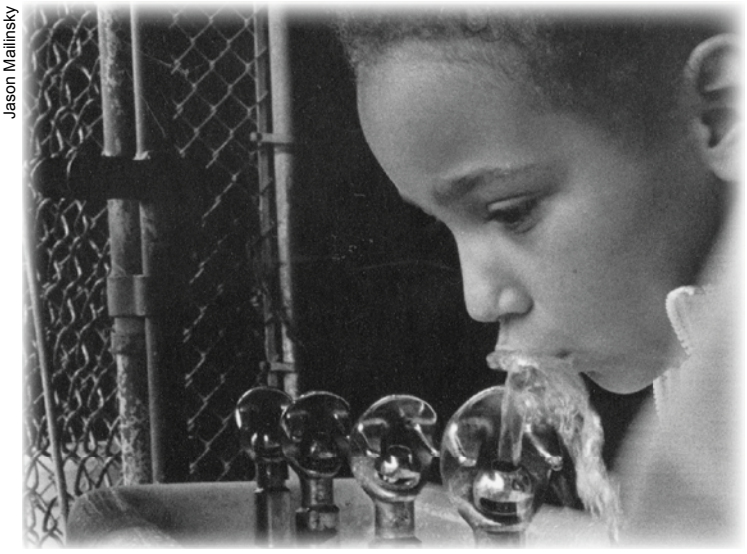
U.S. EPA should:

- Ban pesticides that are known to build up in people's bodies (a process known as bioaccumulation), including those with bioaccumulative breakdown products. This includes an immediate ban of the remaining uses of lindane, an action currently being considered under the North American Regional Action Plan of the Commission on Environmental Cooperation.
- Ban pesticides that are widely used, known to be hazardous and pervasive in the environment and our bodies. This includes an immediate ban of agricultural uses of the pesticide chlorpyrifos.

The chemical trespass of our children reveals a failure to protect public health.

- Require pesticide manufacturers to report detailed information to U.S. EPA on the production, sales and use of their products. EPA should make this information available to the public in a timely, unfiltered, accessible and affordable manner. The costs of this reporting should be paid by industry, not the public.
- Require that pesticides undergo an alternatives assessment process, including a credible demonstration by pesticide manufacturers that safer alternatives are not available for controlling the target pest as a condition of registration. EPA should also require that manufacturers bear the burden of proof for demonstrating that a pesticide *does not* harm human health—meaning a pesticide is guilty until proven innocent, not the other way around.

Jason Mailinsky



Children carry the highest levels of many pesticides and are more vulnerable to the health risks they pose.

- Initiate an aggressive transition to a precautionary approach to pest management and pesticide regulation, designed to prevent public exposure to pesticides and eliminate pesticide body burdens, with a particular focus on vulnerable populations. This transition must include collaboration with the U.S. Department of Agriculture to support and promote sustainable agricultural production, including substantial increases in funding for research, extension and training services for farmers in organic and sustainable production methods.

U.S. Congress should:

- Ratify the Stockholm Convention on Persistent Organic Pollutants (POPs), an international treaty which targets 12 bioaccumulating chemicals for global elimination. The ratification must include strong implementing legislation that allows for a streamlined U.S. phaseout of chemicals identified as POPs under the Convention in the future and supports full U.S. participation in treaty implementation.
- Ensure ongoing funding of chemical body burden data collection and analysis by CDC, including establishment of appropriate biomonitoring fees on pesticide manufacturers earmarked to support and expand CDC's ongoing pesticide body burden monitoring.
- Conduct a thorough, independent and unbiased investigation into corporate responsibility and liability for pesticide body burdens, and establish financial mechanisms that shift the health and environmental costs of pesticides to the corporations that produce them.

CDC should:

- Expand pesticide body burden monitoring to include targeted monitoring in areas of intensive pesticide use.
- Expand the list of pesticides and other chemicals tested for in its biennial studies, and make the full data sets from these studies more readily accessible to the public, including more detailed demographic and occupational data.
- Aggressively pursue its stated mission to "promote health and quality of life by preventing and controlling disease, injury and disability" by working to prevent the accumulation of pesticide body burdens through strong actions to eliminate hazardous pesticide exposures.

Pesticide manufacturers should:

- Develop and publicize valid analytical methods for identifying and measuring their pesticides and metabolites in people's bodies.
- Support and cooperate with EPA's efforts to phase out bioaccumulative and pervasive pesticides found in people's bodies.
- Begin implementing a real process of transition from pesticide manufacture to development of ecologically sustainable pest management technologies.

Widespread understanding of our pesticide body burden and the resulting public demand for change will play a key role in finally bringing a precautionary approach to pest management and eliminating reliance on dangerous chemicals that end up in our bodies and the bodies of our children.

No one ever asked us whether we wanted pesticides in our bodies. They are there without our consent. We have relied on public health and safety regulatory systems to protect us from these highly hazardous chemicals, and CDC's pesticide body burden data show us that these systems have failed. The time has come to take dramatic steps toward a healthier system of agriculture and pest management.

Notes

1 Of the 34 pesticides CDC tested for, 23 were found at levels significant enough to allow statistical analysis, and this report focuses on evaluation of these 23 chemicals.

2 "Average" refers to geometric mean of the sample in each age group.

3 The cPAD applies to children, pregnant or nursing women and other vulnerable populations, such as the ill and the elderly.

This document contains the Executive Summary (in English and Spanish) of *Chemical Trespass: Pesticides in Our Bodies and Corporate Accountability,* published by Pesticide Action Network North America (PANNA) in May 2004. Greater detail and complete references can be found in the full report (English only) available at www.panna.org or by calling PANNA.