Growing Up On Chemicals – Our Children’s Toxic Environment

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By Jane Sheppard

The scientific advancements of industry and agriculture have brought about the manufacture of over 75,000 synthetic chemicals, with a marked increase in the use of highly toxic pesticides in recent years. No matter where we live, our children are repeatedly exposed to these toxins. Most parents are not aware of the serious health risks our children face from pesticides and other industrial chemicals. The impact on short and long-term health is just beginning to be uncovered.

Children come in contact with pesticides every day through the food they eat, the water they drink and the air
they breathe. In addition, most children are exposed to pesticides in their homes and schools, as well as on playgrounds, lawns, athletic fields, and public parks. These substances enter their small bodies through the skin, lungs, mouth and eyes. If the body cannot eliminate the toxins, they tend to be stored in body fat and accumulate over time. Infants and small children are especially vulnerable because they absorb substances faster and have more difficulty eliminating them. Their kidneys are immature and cannot excrete foreign compounds as fast as adults. 1 Very little is known about the combined effects of repeated low-level exposures to many different chemicals. But the preliminary evidence and information that is known alerts us that we have a critical, universal problem that is slowly diminishing the health and well-being of our children.

Health Effects of Pesticides

Pesticides are designed to be toxic. Their purpose is to kill insects, weeds, fungus, rodents and other so-called pests. Sadly, they also kill other living things in the vicinity where they are applied. An estimated 67 million birds are killed yearly by pesticides in the U.S. 2 The majority of pesticides have not been fully tested for their ability to cause harm to human health. The Environmental Protection Agency (EPA) admits that reliable toxicity data exists for only about 43 percent of chemicals in use today, and less than seven percent of chemicals used in high volume are thoroughly studied.

_Our Children at Risk: The 5 Worst Environmental Threats to Their Health_, published by the Natural Resources Defense Council (NRDC), identifies the special vulnerability of children to environmental hazards and highlights the evidence pointing to a link between pollution and childhood illnesses. This 1997 report makes recommendations, at both the policy and personal levels, for the protection of the next generation. The chapter on pesticides is a fully documented, in-depth report that discusses the health effects to children from pesticide exposures. The report presents the epidemiological and laboratory studies that contribute to a growing body of evidence linking pesticide exposure to adverse health effects including cancer, birth defects, reproductive harm, neurological and developmental toxicity, immuno toxicity, and disruption of the endocrine system.

The evidence of cancer and other serious health effects from exposure to pesticides is compelling. Well-conducted, peer-reviewed animal studies have shown certain pesticides to cause cancer. Epidemiological studies indicate an association between pesticide exposure and the development of certain cancers in children including leukemia, sarcomas, lymphomas, Wilms' tumors (malignant tumors of the kidney) and brain tumors. 4

In animal tests, most major classes of pesticides have been shown to adversely affect the developing nervous system, impairing both mental and motor development. These tests show that pesticides can cause subtle impairment in behavior when exposure occurs immediately before or after birth. Learning ability, activity level, memory, emotion, sight and hearing can all be affected. 5 Reproductive or developmental disorders such as infertility, spontaneous abortions, and birth defects have been associated with pesticide exposure. 6 A substantial body of evidence suggests that exposure to certain pesticides may compromise the immune system of infants and children, increasing their risk of infectious disease. 7

A collaboration between public health professionals, environmental organizers, and policy advocates resulted in a 124 page report entitled _Generations at Risk: How Environmental Toxicants May Affect Reproductive Health in California_. This report looks at the science involved in determining toxicity of chemicals and states that “toxicological information is often incomplete. Animal testing usually looks at health effects using one chemical at a time. This strategy fails to provide information about interactive effects, which may occur with
exposure to more than one chemical. Moreover, animal tests often fail to examine for subtle, delayed, or difficult-to-diagnose conditions. Epidemiological (human) studies are often limited by inaccurate exposure assessments and incomplete information about health outcomes. Further complicating matters, the federal government is reducing its support for research and information analysis. Corporate funding is filling the void, providing an opportunity for bias in study design and data interpretation. 8

Doris Rapp, M.D., a leading environmental medical specialist and pediatric allergist, has written a fully documented, 600-page book describing the causes, health effects and treatments of environmental illness. *Is This Your Child’s World? How You Can Fix the Schools and Homes That Are Making Your Children Sick* provides help for children who are hyperactive, asthmatic, or suffering from chronic illness or learning problems. Environmental illness is a label for an assortment of medical problems caused by environmental factors, including chemicals. Common symptoms are some combination of nasal congestion, fatigue, headaches, hyperactivity, muscle or joint pain, twitches, blurred vision, burning skin, abdominal discomfort, and inability to think clearly, as well as a variety of learning or behavior difficulties. 9Children today have a variety of perplexing learning and behavior problems that were not occurring a few decades ago. Many are given the label EDS, and are actually children who are environmentally ill. 10

There are no real statistics about the incidence of environmental illness, since chemical sensitivities are usually unsuspected, disbelieved, or misdiagnosed. However, according to Dr. Rapp, physicians practicing environmental medicine conservatively estimate that at least 25 to 50 percent of the current population is affected by environmental illness. 11

**How Children are Exposed**

**Food**

The fruits and vegetables that are so crucial to health are compromised by ongoing pesticide contamination. If you eat conventional food you are eating combinations of pesticides known or suspected to cause brain and nervous system damage, cancer, and disruption of the endocrine and immune systems. The Environmental Working Group (EWG), a non-profit research organization, analyzed government pesticide records and food consumption data and reported that “every day, 610,000 children ages one through five eat a dose of neurotoxic organophosphate insecticides (OPs) that the government deems unsafe. 5

Some 6,000 of these children exceed the government’s safe daily dose of these pesticides by a factor of ten or

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more. More than half of the 610,000 children exposed to an unsafe dose of OP insecticides each day, get that dose by eating an apple, apple sauce or apple juice. Some apples are so toxic that just one bite can deliver an unsafe dose of OPs to a child under five.” Another analysis showed that every day, more than a quarter million American children ages one through five eat a combination of 20 different pesticides. More than one million children ages one through five eat at least 15 pesticides on any given day.13

Pesticide levels in food are regulated by the EPA through a system of standards called food tolerances. This is a legal limit that the concentration of a pesticide in a particular food must not exceed. The EPA only looks at the effects of each pesticide in isolation and fails to recognize the fact that in the real world children are frequently exposed to many pesticide residues at once. These tolerances are also based on the typical diet of adults. Children’s diets are very different from adults, containing much higher quantities of the foods that contain higher pesticide residues. Certain pesticides, especially the fat-soluble organochlorine pesticides may be highly concentrated in breast milk. Processed baby foods also contain pesticides. Lab tests of eight common baby foods made by the three major baby food producers revealed 16 different pesticides.14

The “safe” level of pesticide exposure determined by testing adult animals cannot be assumed to be safe for children. In 1993, the National Academy of Sciences stated in their report, Pesticides in the Diets of Infants and Children, that “exposure to neurotoxic compounds at levels believed to be safe for adults could result in permanent loss of brain function if it occurred during the prenatal and early childhood period of brain development”. Very few of the neurotoxic pesticides used on food have been tested for their effect on the developing brain.15

The Environmental Working Group ranks fruits and vegetables for toxic levels of contamination on their website (http://www.foodnews.org) and in their 1995 report, A Shopper’s Guide to Pesticides in Produce. They analyzed the results of 15,000 samples of food tested for pesticides by the FDA during 1992 and 1993. They then ranked 42 fruits and vegetables according to seven different measures of pesticide contamination. They found that more than half of the health risks from pesticides in these 42 crops are concentrated in the twelve fruits and vegetables consistently contaminated with the most, and the most toxic pesticides. If you are not able to buy all organic food, you can steer clear of these twelve fruits and vegetables, reduce your child’s (and your own) health risks from pesticides in food by half, and still eat a diet rich in fruits and vegetables.16

**Water**

Significant portions of our groundwater and surface water are now contaminated with pesticides, herbicides, fungicides and fertilizers, as well as their metabolites. These contaminants find their way into groundwater, wells, cisterns, and reservoirs, eventually coming out in home faucets. A 1995 study tested tap water for weed killers in cities across the U.S. corn belt and showed that major agricultural weed killers are routinely found in tap water at levels that exceed federal health standards. In addition, they found that federal drinking water monitoring requirements are fundamentally flawed. The authors of this study reported that “federal drinking water standards:

- Do not protect the public from extended periods of exposure above the Maximum Contaminant Level (MCL) or Lifetime Health Advisory (LHA);

- Do not consider the risks of exposure to multiple herbicides simultaneously;
Do not explicitly take into account special risks to children;

Are based on a flawed methodology that does not adequately protect the public from cancer risks.” 17

A recent analysis of California state data by the Environmental Working Group found that the tap water of more than one million Californians is contaminated with a banned pesticide (DBCP) that is one of the most potent carcinogens known. It causes genetic mutations and cancer and has been banned in the U.S. for 20 years. The tap water in 38 water systems in nine counties contains levels of DBCP well above the levels considered safe by the state.18

As with food residues, the legal standards for most waterborne contaminants are set based on the health effects of average adults. Consequently, the health of infants, children, pregnant women and their fetuses may not be protected. Infants and children drink more than 2½ times as much water as adults in proportion to their body weight. An infant living solely on formula drinks an amount of water that corresponds to approximately three gallons of water for a 155-pound man.19

**Air**

In addition to exposure from dust and soil, children living in agricultural areas are exposed to pesticides in the air. Many pesticides are volatile and can evaporate into the air, causing high levels of exposure in neighborhoods close to farms. The Environmental Working Group performed independent air monitoring in eight California counties and found that toxic pesticides routinely drift from farm fields into surrounding neighborhoods and schoolyards.20 In a series of reports detailing the results of air monitoring, the EWG revealed that millions of pounds of methyl bromide (a highly toxic pesticide scheduled to be banned by 2005) are used near schools and daycare centers, with airborne levels exceeding safety standards drifting into suburban neighborhoods. Buffer zones and safety standards established by the state to protect the public from exposure have been found to be inadequate.21

**Homes**

The EPA has ranked indoor air pollution among the top five environmental risks to public health. According to the EPA, indoor air levels of many pollutants may be 2-5 times, and sometimes more than 100 times, higher than outdoor levels. A 1990 EPA study detected 32 different pesticides in air samples taken inside and outside homes. Indoor air had much higher concentrations. They estimated that 85% of the total daily exposure to airborne pesticides come from breathing air inside the home. Most products used in homes contain either organophosphate or carbamate pesticides which are acute nervous system toxins.

The recommended time periods that people may return to an area where a pesticide has been used is too short – usually one to two hours after application. A 1998 study found that chlorpyrifos, a pesticide known to be toxic to the brain and nervous system, remained on toys and other surfaces for at least two weeks after application.22 Pesticides persist in household dust, and small children spend a lot of time on the floor, ingesting soil and dust with their hand-to-mouth activity. According to a study in the American Journal of Public Health, concentrations of the pesticide chlorpyrifos (Dursban-used for treating pets and carpets for fleas) were much higher nearer the floor in the infant breathing zone than in the more ventilated adult zone three to seven hours after application. Residues were also found on the carpet 24 hours after application, and it was estimated that infants would absorb (mostly through their skin) 10-50 times higher than what the EPA considers a safe
exposure for adults.23 Another form of exposure is through pets. Insecticides used in flea collars, shampoos, soaps, sprays, dusts, powders, and dips for pets can expose kids that play with the animals.24

Lice Treatments

Pesticides used to treat head lice are nerve poisons designed to interfere with the nervous system of lice. Unfortunately, they can cause neurological damage to children as well. Lindane, the most hazardous pesticide used for treating lice, can cause headaches, vertigo, paresthesia, convulsions, blood disorders, hormone disruption, liver and kidney damage, and immune dysfunction. Lindane, a possible carcinogen, is absorbed directly through the skin and can persist in human tissue. Children in the U.S. have actually died from the overuse of lindane in treating lice. Nearly 2 million lindane prescriptions are filled each year in the U.S.25

Schools

Potentially dangerous pesticides are routinely applied in schools. The residues remain in dust and surfaces like carpets, books, and plastics. Parents, teachers, or students are not usually warned before applications of pesticides. The most common pesticides used in schools are linked to acute health problems such as headaches, dizziness and muscle cramps as well as long-term problems of cancer and reproductive harm. Very few school districts have pesticide policies or programs in place to protect children and teachers.26

Playgrounds

The organochlorine pesticide pentachlorophenol (PCP), a probable human carcinogen, is a commonly used wood preservative. It is used on playground structures made from wood. Dioxin, a contaminant of PCP, has been found to suppress the immune systems of lab animals. Studies have found that measurable amounts of arsenic and PCP are dislodged from the structures. When kids climb on and touch the wood, they can easily absorb the arsenic and PCP through their skin. Many small children put their hands in their mouths or eat the nearby contaminated dirt or sand, ingesting the preservatives as well. Cases of PCP poisoning have been reported in children who spent a lot of time on playground equipment treated with this chemical.27

Doesn’t Our Government Protect our Children?

The safety standards set for adults are meaningless for any real protection of children, especially with the cumulative, multiple exposures children receive in all aspects of their lives. Understanding this, the National Academy of Sciences issued recommendations in 1993 for better protections of children, which resulted in Congress passing the Food Quality Protection Act (FQPA) in 1996. This new law requires that all pesticide tolerances in food be revised to protect children. It requires a reasonable certainty of no harm from pesticides to children and infants and requires the EPA to consider the cumulative risk of multiple exposure from all sources – food, drinking water, air, indoor use, etc.

However, the testing involved in setting these protections will be enormous and it will take years before the new standards are set, if they happen at all. The deadline set for the EPA to evaluate all pesticide residue limits under the new standard is the year 2006. Babies born now will continue to reap the damage from unsafe levels of pesticides for at least the next five years – the most vulnerable developmental and growth years. Even if the EPA puts a ban on the most dangerous pesticides, they can last in the biosphere for centuries. And, as we are seeing with a ban on methyl bromide, even though it has been deemed unsafe and highly dangerous, the ban
has been delayed for yet another five years due to pressure from the manufacturer and agribusiness. Unfortunately, big business is a major threat to the Food Quality Protection Act. Chemical manufacturers and agribusiness groups have enormous financial stakes at risk and huge resources available to persuade or force the EPA to weaken or evade the new law.

So What’s a Parent To Do?

This information may seem like a lot of doom and gloom and could cause parents to become overwhelmed. Becoming aware of the extent of the problem does seem overwhelming, and the tendency to ignore it could be strong, since it may seem that “there’s nothing we can do about it anyway”. But awareness is power and there is quite a lot a parent can do. You can avoid unnecessary exposures and reduce the overall amount of chemicals your children will take. The more environmentally safe you can make your home and food, the better your children will be able to tolerate unavoidable exposures outside your home. You can make simple changes that do not have to be extensive or expensive. It is much easier than you think to make your home healthier. There are affordable, effective, nontoxic solutions and alternatives to all our household, lawn and garden pest problems, cleaning and personal care needs.

The casual, indiscriminate use of chemicals persists in our environment mostly because of the chemical industry’s deception and desire for short-term economic rewards. However, this indiscriminate use would not be able to continue without the widespread ignorance and denial on the part of consumers. Dangerous chemicals will continue to be released into our environment, poisoning our children until we refuse to tolerate it. Chemical companies are a powerful force affecting the decisions of our government, but we as consumers, have the power to stop this by shopping for products that are environmentally safe.

Organic Farming

Organic farming methods are sustainable, viable and productive. The main reason why most farmers do not farm organically is that they assume it will not be profitable (due to misinformation and heavy marketing from the chemical companies). If enough of us stop buying the food grown with hazardous chemicals, we will send a message to farmers that organic farming is more profitable. Many farmers are already choosing sustainable methods of agriculture, making organic food more available and affordable. They need our consumer support to continue profitably and to be catalysts for other farmers to change their reliance on pesticides.

Take Action

We all have basic rights to a pure food and water supply, clean air, and a planet that supports our health and well-being. When our Mother Earth is depleted and damaged, so are her people. Ultimately, a universal change in attitude and a comprehensive effort by government, business, consumers, parents, and farmers is needed to reduce society’s overall reliance on hazardous pesticides. Until this happens, we must individually take the steps to protect our children. We are no longer uninformed, and we must use this knowledge to help create a different future. We can take action to inform other parents, contact our government officials, and stop buying products that are harmful to our environment and the health of our children. There is much hope for future generations if we all do whatever we can to make a difference.

1 National Research Defense Council (NRDC), Our Children At Risk, The 5 Worst Environmental Threats to Their Health, Chapter 5, p.4

3 National Research Defense Council (NRDC), Our Children At Risk, The 5 Worst Environmental Threats to Their Health, Chapter 5, pp. 2-8.

4 NRDC, ibid.

5 NRDC, ibid.

6 NRDC, ibid.

7 NRDC, ibid.


10 Rapp, ibid, p. 7

11 Rapp, ibid. p. 117

12 Rapp, ibid. p. 16


14 Environmental Working Group, Pesticides in Baby Food.

NRDC, Pesticide Fact Sheets – Highest-Risk Pesticides: A Real Threat to Children's Health, p. 2


18 Environmental Working Group Press Release, Tap Water in Central Valley Tainted with Banned Pesticide, November 15, 1999

19 National Research Defense Council (NRDC), Our Children At Risk, The 5 Worst Environmental Threats to Their Health, Chapter 7, p. 2.

20 Environmental Working Group, What You Don’t Know Could Hurt You


22 NRDC, ibid., Chapter 5

23 NRDC, ibid., Chapter 5, p. 9
24 NRDC, ibid., Chapter 5, p. 9

25 New York Coalition for Alternatives to Pesticides, Safe Control of Head Lice.


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