

Pesticide Exposure in Women of Reproductive Age: A U.S.-Mexico Border Study Community Fact Sheet October 2003



What is this study about?

The Centers for Disease Control and Prevention (CDC) and the California Department of Health Services (CDHS) studied women living in Imperial County in October 2001. This was a first step towards learning more about the pesticide levels in women in farming communities in the United States (U.S.).

Why did we do this study?

CDC has done a National Report which looked at exposure of the U.S. population to environmental chemicals. That report found that most people in the U.S. have some pesticides in their bodies. CDC has recently improved the methods used to measure pesticides. The samples collected in Imperial County were some of the first samples in the U.S. to be tested with these new, improved methods. These samples will help us begin to understand whether women who live in Imperial County are different in their pesticide exposure than women in the general U.S. population.

How was the study done?

A pesticide is any substance used to kill or repel pests, such as insects, weeds, bacteria, mold, or viruses. We studied 100 women aged 18 to 45 years who live in the Imperial County and who did not work with pesticides. These women were recruited from women who visited health clinics for non-pesticide reasons over a two-week period in October 2001. The women answered questions about the pesticides they used. Each woman provided a urine sample, and we tested the urine for pesticides. We also tested the urine for the broken-down parts of pesticides called “metabolites.” The urine samples were analyzed for 5 pesticides and 29 pesticide metabolites, 34 in total. We did not study whether the pesticides affected the health of the women.

What did the study find?

Each woman tested had at least five pesticides or pesticide metabolites in her urine. All of the levels we found were lower than those known to cause health problems.

In general, pesticide levels in women in Imperial County, a farming community, are higher than levels found in women in the general U.S. population. We compared the results from the women in our study to the results from women in the CDC National Report. We put the results in groups according to whether they were higher, the same, or lower than the National Report average. Twelve pesticides were higher among Imperial County women than among women in the National Report, whereas only four were lower:

Higher than the National Average (12 pesticides or pesticide metabolites)

- Disinfectants: 2,5-dichlorophenol; 2-naphthol (a metabolite of naphthalene); and orthophenyphenol
- Insect Repellant: DEET
- Antifungal Wood-treatment Chemicals: the pesticide, pentachlorophenol, and metabolites 2,4,5-trichlorophenol and 2,4,6-trichlorophenol
- Weed Killer: 2,4-dichlorophenol
- General-use Pesticides (used for many different pests): diethylthiophosphate (a metabolite of organophosphates); 1-naphthol (a metabolite of carbaryl); 3,5,6-trichloropyridinol (a metabolite of chlorpyrifos); and 4-nitrophenol (a metabolite of parathion/methyl parathion)

Same as the National Average (Eight pesticides or pesticide metabolites)

- Weed Killers: 2,4,5-T; 2,4-D; and atrazine mercapturate (a metabolite of atrazine)
- General-use Pesticides (used for many different pests): diethylphosphate, dimethylphosphate, diethyldithiophosphate (metabolites of organophosphate); carbofuranphenol (a metabolite of carbofuran); and 2-isopropoxyphenol (a metabolite of propoxur)

Lower than the National Average (Four pesticides or pesticide metabolites)

- General-use Pesticides (used for many different pests): dimethyldithiophosphate, dimethylthiophosphate (metabolites of organophosphates); IMPY (a metabolite of diazinon), and MDA (a metabolite of malathion)

Ten pesticide metabolites could not be put into a group because they were not tested in the National Report.

What does this mean for me?

If you live in Imperial County, you may have higher levels of some pesticides in your body than do people in the general U.S. population. All of the levels found in women in our study were lower than levels known to cause health problems. However, researchers are still studying whether low levels can cause health problems such as asthma, neurological problems (such as difficulty learning), and cancer. These studies are taking place in other communities in the U.S.

Where did these pesticides come from?

At this time, we do not know whether the higher levels among Imperial County women were because of pesticide use on farms, at home, or in the workplace. Exposure may have occurred in many ways, including eating produce, breathing pesticides in air that drifts from fields, or from pesticides sprayed or used at home or at work. Two pesticides, chlorpyrifos and carbaryl, were used on farms in Imperial County fields at the time of the study and were found most frequently among Imperial County women. However, chlorpyrifos is also used for pest control in homes by exterminators and found in store-bought products such as Dursban. The U.S. Environmental Protection Agency (EPA) required pesticide manufacturers to stop using chlorpyrifos in home

products in 2000, but products with chlorpyrifos made before 2000 continue to be sold. Carbaryl is also used in common household products. It is also known by the brand name Sevin. Another pesticide measured, orthophenylphenol, is used to keep fruits and vegetables fresh in storage; it is also used as a household disinfectant.

Pentachlorophenol and its metabolites were also found at higher levels in the women of Imperial County. Pentachlorophenol is used to treat wood to prevent it from rotting and is found in outdoor wood products such as telephone poles.

Other metabolites found at higher levels in women of Imperial County than in women in the National Report are typically used in homes and offices and are not commonly used in agriculture. For example, 1-naphthol and 2-naphthol are metabolites of naphthalene. Naphthalene is found in mothballs and tobacco smoke. Other metabolites of pesticide products found at higher levels among women in Imperial County include household products such as insect repellants, bathroom deodorizers, and pesticides used on lawns or in the home and workplace.

What are the health problems pesticides can cause?

Pesticides may cause health problems, depending on the type and amount that entered the body. People exposed to large amounts of pesticides may develop health problems within a few hours or days. Signs of pesticide poisoning often are similar to those of many illnesses, and include nausea, vomiting, diarrhea, and eye or throat irritation. Other signs of poisoning may include pinpoint pupils and rashes. Some health problems may not occur immediately and may take years to appear. These health effects can include birth defects or damage to the genetic and immune systems. These health problems have been mostly among people who have had much higher levels than the women in our study.

Just because you were exposed to pesticides does not mean you will have health problems. Most diseases are influenced by a number of different factors including diet, lifestyle, exposure to environmental pollutants, and your genes. If you are concerned about possible pesticide illness, you should talk to your doctor.

How can I protect my health?

In general, you should reduce or avoid exposure to pesticides. Pesticides are used in many settings to repel pests such as insects, weeds, bacteria, mold, or viruses. Pesticides are commonly used on fruits and vegetables, in buildings, and on parks and roadsides. They also may be used in homes, gardens, and swimming pools, and on the body to repel mosquitoes or other insects. Pesticide products that you buy in a store are labeled with the pesticide (or active ingredient) to inform you about what chemicals you are using.

To reduce exposure in the home, CDHS recommends the following precautions:

- Always wash fruits and vegetables before eating them
- If you use pesticides in your home or garden, carefully follow the directions on pesticide containers

- Wash skin or clothing promptly if contact with a pesticide occurs

Adults and children in the same home can be exposed to pesticides from both agricultural and home use. Pesticide exposure in children is of special concern because children are often exposed to greater amounts of pesticides and other contaminants than adults. Children's activities, such as playing in the dirt or putting their fingers in their mouths, may increase their chance of exposure. Be aware of all the ways you or your children can come in contact with pesticides. If you or your family are concerned about exposure to pesticides, you should talk to your healthcare provider.

Your county agricultural commissioner also can provide you with information about pesticide use in your area and will investigate complaints of pesticide misuse. The EPA has produced a report entitled, "A Citizen's Guide to Pest Control and Pesticide Safety." If you would like a copy of this report, call The National Service Center for Environmental Publications at 1-800-490-9198 or visit the web at: http://www.epa.gov/pesticides/factsheets/health_fs.htm.

What will CDC and CDHS do next?

Over the next few months, we will be examining the results of the Imperial County study to try and learn more about what pesticides were being used in the area, and how much individual pesticide use may have contributed to exposures. We will also compare levels to women in other farming communities such as Salinas, California, where some of the same tests are being made. A report summarizing the results will be available in the summer of 2004.

How do I get more information about this study?

Please contact:

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How do I get more information about the National Report?

In 2003, CDC released the *Second National Report on Human Exposure to Environmental Chemicals*. The report presents exposure data for 1999 and 2000 for 116 chemicals. The results from the Imperial County study are compared with the results from this National Report. Information about this National Report can be found on the Internet at <http://www.cdc.gov/exposurereport/> (for information in Spanish <http://www.cdc.gov/exposurereport/spanishcontent.htm>).