

Pesticides & Birth Defects

Expectant mothers should be mindful of the range of activities that may expose them to pesticides. Although public concern about birth defects and pesticides has focused mainly on agriculture and occupational exposures, women frequently encounter pesticides in their own homes or gardens as well.

Yet data about pesticides and human pregnancy is sparse. Past investigations have been hampered by small study size or incomplete exposure information. This research by the California Birth Defects Monitoring Program provides a framework for clarifying these issues. Over 2,000 women were questioned about a wide range of potential pesticide exposures and other pregnancy factors. Those interviewed included mothers whose babies had oral clefts, neural tube defects, conotruncal heart defects or limb defects as well as mothers whose babies did not have birth defects.

3 IN 4 PREGNANT WOMEN EXPOSED

Pesticide exposure is very common. More than 3/4 of women whose babies did not have birth defects reported at least one source of contact with pesticides while pregnant; 15% were exposed to 3 or more sources.

Household exposure was frequent. About half of homes were treated for pests, using substances

applied by the mother, a professional, or others.

18% of women reported working in gardens where weed killers or insecticides were used. Pets lived in 42% of households; most had flea collars or other treatments to manage fleas.

Nearly 25% of women reported living within 1/4 mile of agricultural crops, including orchards and commercial flower fields.

Occupational exposure was relatively rare—only 5% of mothers had jobs involving contact with pesticides. Half of these women worked in agriculture, others had jobs such as florist or animal handler.

REPORTED PESTICIDE EXPOSURES

Mother used at work	5%
Father used at work	8%
Household gardening	18%
Home pest treatment	51%
Insect fogger	7%
Pet flea collar	16%
Other pet flea treatment	16%
Insect repellent	7%
Lived within 1/4 mile of crops	23%
No pesticide exposure	22%
Exposure to 1 pesticide source	39%
Exposure to 2 sources	25%
Exposure to 3 or more sources	15%

NO GREATER RISK SEEN FOR MANY EXPOSURES

Scientifically, it is almost impossible to prove an exposure is safe. However, we observed no increased risk for the birth defects studied among mothers with the pesticide exposures we had expected to be the most intense:

- **Occupation.**
- **Self-applied home pest control.**

SOME ELEVATIONS OBSERVED

Although the significance of these findings is still not clear, we did identify several promising leads warranting further study. We observed elevated risks—at least 1.5 times greater among exposed women—for these birth defects and exposures:

- **Household gardening** and certain types of oral clefts, neural tube defects, heart defects, and limb defects.
- **Living within 1/4 mile of agricultural crops** and neural tube defects.

UNDERSTANDING EXPOSURES IS CRITICAL

Our study has many strengths: its size, accurate classification of birth defects, exploration of multiple exposure sources. Yet studying human risks from pesticides has inherent challenges.

- Identifying the exact nature of exposures (pesticide type, dose) is extremely important—and extremely difficult.
- Untangling the role of multiple exposures plus possible interactions with other pregnancy risk factors, such as smoking, is complex.

- Women's recall of exposures may be biased by their own search for answers.
- When considering numerous types of pesticide exposure—as in this study—some will show elevated risks simply by chance alone.

DATA SOURCES

All cases were identified through ongoing surveillance by the California Birth Defects Monitoring Program's population-based registry.

- **Births included:** 550,000 live births and fetal deaths in California from 1987-1989; metropolitan Los Angeles and San Francisco were excluded.
- **Cases:** 662 oral clefts (classified by type and associated birth defects), 265 neural tube defects, 207 conotruncal heart defects, 165 limb defects.
- **Comparison group:** 734 randomly selected live births without birth defects.
- **Interviews:** With infants' mothers, by telephone in English or Spanish; 82% response rate.
- **Exposures:** Based on mothers' reports; we did not verify distance of homes to agricultural areas. An industrial hygienist reviewed occupational descriptions to assess pesticide exposure.

*REFERENCE: Shaw GM, Wasserman CR, O'Malley CD, Nelson V, Jackson RJ. Maternal pesticide exposure from multiple sources and selected congenital anomalies. **Epidemiology** 1999;10(1):60-66.*

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