

Birth Defects in McFarland

From 1975-1995, childhood cancers have occurred more frequently than expected in McFarland. Extensive assessments by the California Department of Health Services' Environmental Health Investigations Branch uncovered pesticide traces in some areas but found no environmental cause for the cancers.

This study by the California Birth Defects Monitoring Program looks at birth defects—another sentinel health outcome—in McFarland. Residents had not reported specific concerns about birth defects. However, some cancer-causing agents may also induce birth defects; a dramatic increase could signal a hazardous environmental exposure.

MCFARLAND STUDY DESIGN

We reviewed McFarland data following a protocol developed to respond to community concerns (*see page 3*). We examined 1987-1993 data from the Program's birth defects registry, comparing findings from McFarland (zip code 93250) to Kern County and registry-wide data. We evaluated rates of specific conditions, including those which may be linked to pesticides. Finally, we reviewed case information to see if there were patterns suggesting a common underlying cause.

BIRTH DEFECTS NOT INCREASED

We found nothing noteworthy about birth defects rates or occurrence patterns in McFarland.

■ **Was the overall birth defects rate in McFarland higher than expected?**

No. From 1987-1993, there were 23 babies with birth defects among the 1494 live births and fetal deaths to McFarland residents. This rate—15.4 per 1000 births—is lower than the rate in the rest of Kern County (24.6 per 1000 births) and registry-wide (30.6 per 1000 births) for the same years.

SUMMARY

- McFarland's overall birth defects rate—15.4 per 1000 births—was not higher than expected.
- Rates of 7 common defects were not unusual.
- There were no patterns among cases to suggest they had a common underlying cause.
- Studying a small area such as McFarland cannot answer the larger question: Are birth defects caused by environmental conditions? The Program is conducting several statewide studies to assess risks from a variety of exposures, including pesticides.

■ **Were specific conditions elevated?**

Rates of 7 common defects—heart defects, chromosome abnormalities, pyloric stenosis, oral clefts, limb defects, neural tube defects, and intestinal atresias—were normal compared to both county and registry-wide averages.

■ **What about pesticide-related birth defects?**

Birth defects and pesticides have not been well-studied in humans, and there are no definitive conclusions about risk (*see References*).

Possible links to oral clefts, limb defects, and neural tube defects have been raised—rates for these conditions in McFarland were not increased.

■ **Were there similarities among cases?**

One of the hallmarks of a teratogen—an environmental cause of birth defects—is that it will produce a distinctive, characteristic pattern of malformations. We reviewed the 23 cases of birth defects in McFarland to see if there were similarities suggesting a single underlying cause. We found no resemblance between cases.

■ **Are the birth defects in McFarland related to pesticides or other environmental conditions?**

This question cannot be answered simply by reviewing rates or cases. Finding environmental causes of birth defects requires large well-controlled studies of specific exposures. The California Birth Defects Monitoring Program is conducting statewide studies of birth defects, evaluating the influence of pesticides and other environmental concerns. Interviews with mothers—including those in Kern County—document pregnancy exposures and events.

BIRTH DEFECTS, 1987-1993

RATE PER 1000 LIVE BIRTHS & FETAL DEATHS
(WITH 95% CONFIDENCE INTERVAL)

McFarland (93520)	15.4	(9.8-23.0)
Kern County*	24.6	(23.5-25.6)
Registry-wide Average*	30.6	(30.4-30.9)

*Excluding McFarland zip code 93250

Note: Small numbers of births create statistical imprecision. Therefore, we consider both the rate and the confidence interval—the most likely range within which the true rate lies. We judge 2 rates to be similar if the rate from the larger population falls within the confidence interval of the other.

ABOUT THIS STUDY

- Our analysis focuses on the zip code which produced most of the childhood cancer cases, 93250. Some McFarland residents live in zip code 93215, which also contains the town of Delano. Including this zip code in the analysis does not change conclusions—birth defects rates and patterns are still not unusual.
- Our conclusions are based on a relatively small number of births, and have limited statistical power. Variation in demographic composition or medical practices can influence rates, complicating comparison to other areas.

REFERENCES

Childhood cancer in McFarland:

California Department of Health Services, Environmental Health Investigation Branch, “Update on Cancer among Children in McFarland,” May 1996.

Studies of birth defects in agricultural areas where pesticides are used:

Field B, Kerr C. Herbicide use and incidence of neural-tube defects. *Lancet* 1979; I:1341-1342.

Gordon JE, Shy CM. Agricultural chemical use and congenital cleft lip and/or palate. *Archives of Environmental Health* 1981; 36:213-221.

Schwartz DA, LoGerfo JP. Congenital limb reduction defects in the agricultural setting. *American Journal of Public Health* 1988; 78:654-658.

White FMM, Cohen FG, Sherman G, McCurdy R. Chemicals, birth defects and stillbirths in New Brunswick: associations with agricultural activity. *Canadian Medical Association Journal* 1988; 138:117-124.

EVALUATING SMALL AREAS

Although the California Birth Defects Monitoring Program does not routinely analyze data from small areas such as zip codes or census tracts, we have developed this protocol to respond to specific community concerns about the environment.

The protocol looks for hallmarks seen when an environmental agent has been found to cause birth defects—a dramatic increase in a specific condition, a characteristic pattern of defects, and an exposure in common.

The protocol will uncover major birth defects problems, but generally cannot determine if environmental conditions are causing birth defects. For this, sizeable studies with accurate exposure information are needed.

Steps for evaluating small areas include:

- Comparing the area's overall birth defects rate to county and registry-wide rates.
- Examining rates of 7 specific birth defects which are common and likely to be uniformly diagnosed statewide: heart defects, chromosome abnormalities, pyloric stenosis, oral clefts, limb defects, neural tube defects, and intestinal atresias.
- Evaluating rates of other conditions if past scientific studies suggest possible links to the environmental exposure of concern.
- Reviewing cases to look for recurring patterns of defects or other similarities.

The California Birth Defects Monitoring Program— a public health program devoted to finding causes of birth defects— is funded through the California Department of Health Services and jointly operated with the March of Dimes Birth Defects Foundation.