

Neural Tube Defects in Kern County: Buttonwillow Area Cluster Investigation

In May 1993, the California Birth Defects Monitoring Program received reports of community concerns regarding neural tube defects—3 affected babies were born over 8 months in 1992-1993 in the Kern County towns of Buttonwillow and Wasco. The community suspected the nearby Laidlaw hazardous waste site was related to these cases; in particular, they were worried about xylene and toluene, 2 solvents found at the facility. Subsequent information focused the investigation on Buttonwillow, where all 3 mothers were thought to live in early pregnancy, and brought forth concerns about hazardous waste-laden trucks passing through town.

■ **The California Birth Defects Monitoring Program conducted a complete inquiry following our standard cluster investigation protocol.** Data collection staff verified index cases by reviewing medical records. We looked for additional neural tube defect cases born to Buttonwillow women during the study period (January 1987-June 1993) by reviewing medical records and other information sources. A trained interviewer gathered extensive pregnancy history and other information from mothers of index cases in face-to-face interviews. Representatives of Kern County and California State agencies

provided environmental information about the Laidlaw hazardous waste facility, agricultural practices in the Buttonwillow area, and other potential exposures.

■ **There were 2 neural tube defect cases born in 1992.** One of the 3 index cases was dropped from the study because the mother did not live in Buttonwillow during her pregnancy. We identified no additional cases of neural tube defects in January 1987-June 1993 births to Buttonwillow residents.

With 60 births per year in Buttonwillow, we statistically expect 0-1 cases of neural tube defects in any given year. Two cases occurring in 1992 is 25 times higher than expected (based on the prevalence of neural tube defects in Kern County of 1.3/1000 live births and fetal deaths.)

■ **We found no environmental exposures that explained the excess.** There were some common characteristics between the mothers of the 2 cases, but no etiologic agents were identified.

■ **There was no evidence linking the cases to the presence of the Laidlaw facility, or to trucking of hazardous waste to the site.** In particular, we identified no route for significant

exposure of the 2 case mothers to hazardous waste during early pregnancy. They both lived more than 3 miles away making exposures to chemicals at the site unlikely.

■ **Overall birth defects data from 1987-1991 suggest no longterm birth defects problem in Buttonwillow.** The observed rate for all types of birth defects was about 3%, the same as the rest of California.

■ **The excess of neural tube defects seen in 1992 could be due to chance, or could be the result of an undetected environmental exposure.** There were no cases of children with neural tube defects born in any other year during the study period. This suggests that if an environmental exposure was linked to the 1992 excess, it is not part of a longstanding pattern.

Environmentally-caused clusters result from changes in exposures: as when new agents are introduced; unusual exposures occur due to accidents or other events; or existing exposure levels increase. A cluster investigation may detect these changes, but cannot identify the effects of pervasive or longstanding exposures—for this, larger studies are necessary. The California Birth Defects Monitoring Program is exploring a number of possible risk factors for neural tube defects in case-control interview studies. These studies are evaluating solvents and other exposures of concern to the Buttonwillow community, and may be able to provide answers not possible through a cluster investigation in a small population.

BIRTH DEFECTS IN BUTTONWILLOW, 1987-1993

	Neural Tube Defects	Any Birth Defects
1987	0	2
1988	0	2
1989	0	1
1990	0	0
1991	0	3
1992	2	*
Jan-June 1993	0	*

**Registry data not yet available.*

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.