Pesticide Exposure and Potential Health Effects in Young Children Along the U.S. - Mexico Border: Pesticide Exposure in Children Living in Agricultural Areas, Yuma County, Arizona

Start Date: February 1999 **Completion Date: October 2003**

Project Purpose:

To assess pesticide exposure in children living in the U.S.-Mexico border area. The objective of the study was to determine whether children living or attending school near pesticide-treated fields had greater exposure to pesticides than children living or attending schools further away from such fields.

Project Description:

An exposure assessment of pesticides in children was conducted with 152 children aged 4-9 years living or attending school in Yuma County during October 1999 through February 2000. Siblings of these children, aged 2-11 years, also participated in this study, an additional 92 children. Study measures collected were 1) urine samples tested for six organophosphate metabolites; 2) household and school dust samples tested for 43 pesticides-organochlorines, organophosphates, pyrethroids, and carbamates; 3) height and weight of participating child; and 4) distance from both the house and from the local school to the closest agricultural field. The data were collected by promotoras from a local non-governmental agency in Yuma County. They recruited participants by sending informational flyers home with children in kindergartens and first grades; attending parent meetings at the participating schools; approaching parents at Women, Infants, and Children clinics; and knocking on doors of families with children near the homes of other participants.

Organophosphate metabolites were detected in all the urine samples and compared to the US population. In general, the geometric means were higher in the Yuma study when compared to the US population. The data reported in the National Report are for people that live in the eastern and western suburban and urban regions of the US. People living in this border region are primarily in an agricultural region. This difference may account for the higher levels in this population, however, the levels of pesticides and other substances detected in urine do not necessarily indicate a health risk. Comparison of this study population to a similar population from a different study located in Yuma County showed no statistical difference between these two groups.

No significant difference was observed in the distance from the household to agricultural fields. Levels of only one of the six pesticide metabolites were higher among children living further from agricultural fields (>250 feet) than those living closer (<250 feet). Occupation of parents and other adults living in the home that worked in agriculture and the use of pesticides inside the home were associated with levels of organophosphate metabolites in urine.

Pesticides also were detected in the dust samples. The three pesticides most detected were chlorpyrifos, carbaryl, and diazinon. These pesticides found in the home and schools demonstrated an association with biomarkers in urine.

Final Outcomes:

- February 2001: Reporting of results to study participants and to participating schools
- November 2001: Presentation of results at parent meetings at participating schools
- October 2002: Report to state agency on methodology and findings of the study
- November 2003: Abbreviated version of report for local and community agencies on methodology and findings from the study
- 2004-2005: Results of this study pending publication in a peer-reviewed journal

Presentations or Publications:

October 1999: Presentation by Rebecca Hart McElroy of CDC/NCEH of study objectives and methodology to Binational Environment Council in Yuma, Arizona

May 2000: Study methodology presented at the U.S.-Mexico Border Health Association 58th Annual Meeting in Hermosillo, Mexico

August 2000: Study methodology presented at the International Society of Environmental Epidemiology in Buffalo, New York by Rebecca Hart McElroy of CDC/NCEH

October 2000: Study methodology presented at the International Society for Environmental Assessment by Gary Robertson and Steven Hern, EPA/Las Vegas

November 2001: Presentation of results to local environmental and public health community at the 10th interagency coordinating conference and annual meeting of the Arizona Interagency Farm worker Coalition in Yuma County

April 2002: Pesticide Exposure in Children Living in Agricultural Areas Along the US–Mexico Border, Yuma County, Arizona. Final Report.

Publication pending: Pesticide Exposure in Children Living in Agricultural Areas Along the US-Mexico Border, Yuma County, Arizona

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