



Organophosphate Pesticide Use in the Salinas Valley

<u>OP Pesticide</u>	<u>Lbs Applied in 2001</u>
Diazinon	133,537
Malathion*	96,520
Acephate	71,725
Oxydemeton-methyl	57,859
Chlorpyrifos*	54,945
Dimethoate	34,224
Bensulide	32,669
Naled	17,045
Methidathion	14,220
Disulfoton	10,216

Total OP Pesticide Use: 530,000 Pounds

***Potential endocrine disrupter**



Our Study Population

601 pregnant women who were living in Salinas Valley:

- **Less than 20 weeks gestation**
- **Medi-Cal eligible**
- **18 years or older**
- **Receiving prenatal care at Clinica de Salud and Natividad**
- **Planning to deliver at Natividad Medical Center**

CHAMACOS Specimen Collection

	13 Wks	26 Wks	Delivery	6M	12M	24M	42M	60M	84M
• Maternal Urine	✓	✓	✓	✓					
• Paternal Urine			✓						
• Maternal Blood		✓	✓						
• Cord Blood			✓						
• Breast Milk			✓	✓					
• Child Urine				✓	✓	✓	✓	✓	
• Child Blood					✓	✓		✓	
• Child Saliva							✓	✓	✓



Characteristics of CHAMACOS Mothers (N=601)

- **92%** Spanish-speaking
- **85%** born in Mexico; **54%** ≤ 5 years in U.S.
- **96%** living within **200%** of poverty
- **44%** **6th** grade education or less
- **44%** worked in agriculture during pregnancy
- **84%** other agricultural workers in home



Pesticide Exposure Assessed in 4 Major Ways:

- 1. Biomarker measurements (urine, blood, breastmilk)**
- 2. Environmental samples (dust)**
- 3. Pesticide Use Report (PUR)**
- 4. Detailed questionnaires and home walkthroughs**



Biomarkers of Exposure in CHAMACOS cohort

Urine

- OP DAPs metabolites
- Specific metabolites
- Potential endocrine disruptors

Blood

- Organochlorines (11)
- AChE
- PCBs
- PBDEs (subset)
- Lead
- OP's in blood

In development or under consideration:

- Non-persistent pesticides in breast milk
- PBDE (population-wide)
- Perchlorate



Potential Endocrine Disrupting Pesticides (non OPs) Measurable *in Urine*

	Lbs Applied 2000		Lbs Applied 2000
Maneb	322,335	Mancozeb	13,768
Iprodione	54,524	Cypermethrin	2,096
Permethrin	25,137	Endosulfan	1,609
Carbaryl	20,217	Lindane	780
Vinclozolin	19,332	2,4-D	558
		Atrazine	10



Endocrine Disrupting Chemicals Measurable *in Serum*

pp-DDE*

op- and *pp*-DDT*

Dieldrin*

Hexachlorobenzene

β and γ -HCH*

(Hexachlorocyclohexane)

Heptachlor epoxide*

Mirex*

trans-Nonachlor*

Oxychlorodane*

PCBs (29 compounds)

PBDEs (subset)

* Organochlorine pesticides



Maternal Urinary Dialkyl Phosphate (OP) *Metabolite Levels (nmol/L)*

Total Dialkyl Metabolites

	N	Geo. Mean
Maternal Enrollment	584	112
Maternal 26-Weeks	497	113
Maternal Postpartum	492	228
<i>NHANES (women 18-40)</i>	<i>271</i>	<i>82</i>

DAPS for pregnant women significantly higher than the reference NHANES

Maternal and Child Urinary OP Metabolite Levels (nmol/L)

*Unpublished results
presented:*

*Not for online
publication*