



# Exposure and Health effects of PBDE exposure in pregnant women and children in a California agricultural community

---

Asa Bradman

School of Public Health

University of California, Berkeley



# Investigators

## *Health Studies*

- **Brenda Eskenazi, PI**
- **Ira Tager**
- **Kim Harley**
- **Laura Fenster, CDPH**
- **Caroline Johnson**
- **Michael Lipsett, CDPH**
- **Janet Macher, CDPH**
- **Don Smith, UCSC**
- **Andreas Sjodin, CDC**
- **Jonathan Cheverier**

## *Exposure Studies*

- **Asa Bradman**
- **Tom McKone**
- **Dana Barr CDC**
- **Rosemary Castorina**
- **Martha Harnly, CDPH**
- **Manish Arora, U. Sydney**
- **Marcia Nishioka, Batelle**

## *Mechanism Studies*

- **Nina Holland**
- **John Casida**

## *Biostatistical Core*

- **Nick Jewell**
- **Alan Hubbard**
- **Amy Marks**

## *Intervention and Community Outreach*

- **Abbey Alkon, UCSF**
- **Lisa Goldman**
- **Alicia Salvatore**
- **Celina Trujillo**

## *Clinica de Salud*

- **Max Cuevas**
- **John Silva**

## *Natividad Medical Center*

**Marc Tunzi**



# Background

---

- Three commercial products available:
  - Penta
  - Octa
  - Deca
- US production of penta and octa ended in 2004.
- Deca use continues.
- Exposure continues as household products degrade.

**97% of U.S. population has detectable levels of PBDEs**

# Young children may have higher PBDE Exposures

---

- Exploring environment
- Hand-to-mouth behavior
- Playing near the ground
- Children eat, drink, and breathe more

# Children are More Susceptible to Adverse Health Effects

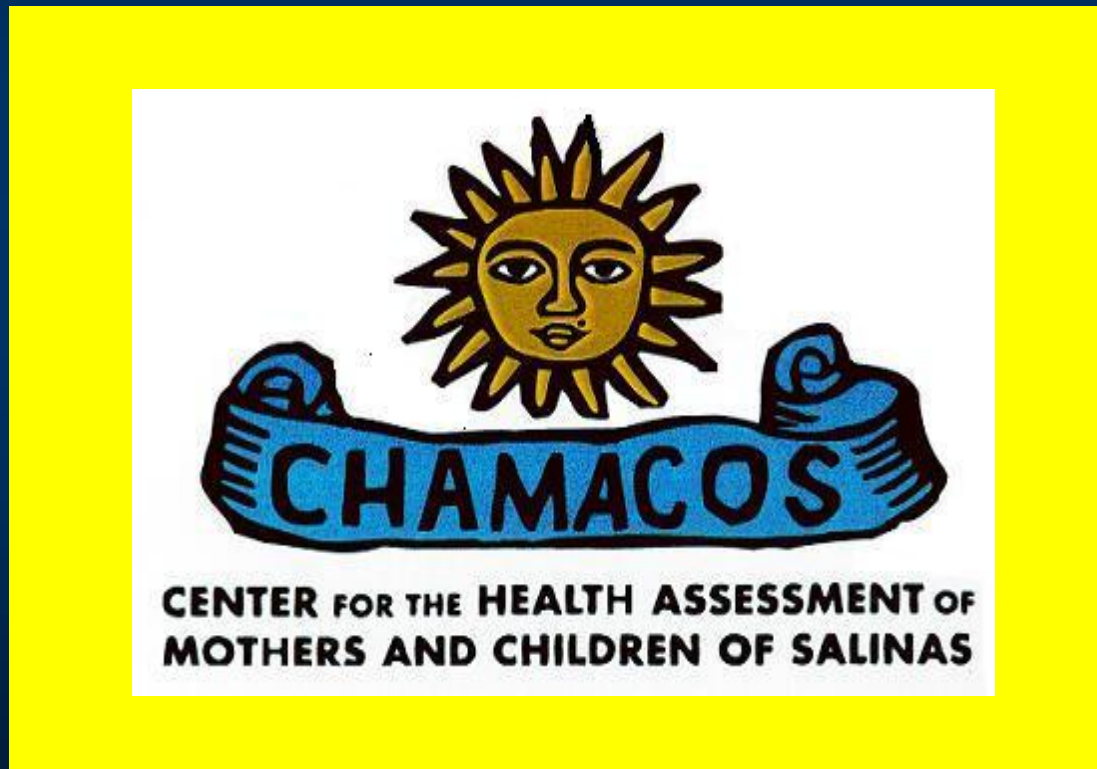
---

- Developing organs are more sensitive
- Children are smaller
- Children may be less able to detoxify chemicals

# Center for the Health Assessment of Mothers and Children of Salinas

---

1998 - present







# Methods

- We enrolled 600 pregnant women from community clinics
- Andreas Sjodin at CDC analyzed 10 PBDE congeners in serum from:
  - Mothers during pregnancy
  - Children at age 7 years
- Used GC-IDHRMS.
- Results expressed on a serum lipid basis (ng/g lipids).



# Research Questions

---

- What are children's exposures in utero/childhood?
- What are the associations of PBDE with:
  - Maternal\* and neonatal thyroid function
  - Fertility\*
  - Fetal growth and length of gestation\*
  - Neurobehavioral development\*
  - Growth and metabolic syndrome
  - Timing of puberty

# *Preliminary Findings*

---

- Children may have higher exposure to PBDEs
- Children in California have the highest exposure
- PBDE exposure may be (needs replication) related to:
  - Infertility - see *Harley et al. 2010, Env. Health Persp*
  - Hyperthyroidism in pregnant women
  - Lower birthweight for gestation
  - Poorer attention and hyperactivity in children

*There are very few studies examining  
PBDEs in human populations.*

# *Papers in Progress*

---

- Maternal exposure to PBDEs.
- Child Exposures to PBDEs.
- Association of PBDE exposure and maternal thyroid.
- Association of PBDE exposure and child neurodevelopment.
- Association of PBDE exposure and birth outcomes.

Watch our website at [www.chamacos.org](http://www.chamacos.org)

# Next 5 years...

---

- Double the cohort
  - 300 boys
  - 300 girls
- Follow Cohort from age 9-13 years
- Measure exposure to PBDEs
  - *In utero*
  - Early childhood
  - Peripubertal
- Assess neurobehavior, pubertal development and growth (obesity) and their inter-relationship
- Measure hormone levels in 12 yo boys.

*Thanks to our funders:*



*And a special thanks to the mothers and children  
of Salinas*