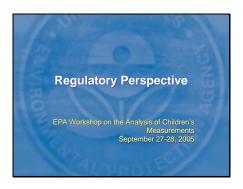
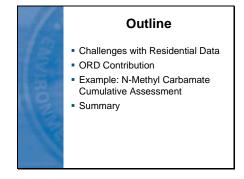
## Presentation entitled "Regulatory Perspective" by Mr. Jeff Evans





#### **Residential Data**

- OPP can call-in data to assess residential exposure
  - · Need to provide guidance Study design
- OPP can interpret findings from **ORD** studies
  - Usually available in published literature
  - Summary reports

#### **OPP Residential Data** Requirements

- Some OPP data requirements are easily interpreted
  - Consumer applicator exposure data
  - Air concentration data
- Some exposure pathways are easily modeled
  - · Ingestion of contaminated soil

# **OPP Residential Data** Requirements

- Some are more difficult
  - · Post application dermal exposure data
    - Relationship between residue on surfaces and dermal contact for various activities
    - Contact data rely on a few choreographed routines

      - Jazzercise (Cal-EPA)
         Routines described in Vaccaro 1997

## **OPP Residential Data** Requirements

- Some are extremely difficult
  - Non-Dietary Ingestion
    - Hand to mouth behavior
    - Object to mouth behavior
    - Contaminated food
- No clear study guidelines
  - Hand press data (Clothier)
  - Toy measurements

# Areas Where Additional ORD Input Is Needed

- Non-dietary ingestion:
  - Correlation between surface area and frequency of hand to mouth events
  - · Quiet versus active play
  - Wet hand transfer efficiency
    - Clothier
  - Saliva extraction of residues from hands during the mouthing event

#### Areas Where ORD Input Is Needed

- Post application dermal exposure
  - Indoor broadcast and crack and crevice treatments
  - Treated pet
- Interpreting the data appears to be complicated by:
  - Small sample sizes
  - a wide variety of surface residue collection methods

#### Other ORD Research

- House dust and track-in
- Compared to our dermal and nondietary assessments, they don't have a big impact.
- Difficult to model or develop guidelines for

## Analysis of Workshop Studies Can Help

- Dermal contact values for post application assessments (broadcast and C+C)
  - Daycare, CPPAES, JAX, Hore.
- Hand loadings for H-t-M pathway
   CTEPP, CPPAES, DIYC, SHEDS.
- Characterization of dust, track-in, object to mouth
  - CTEPP

#### Example of Challenges with Assessing Children's Oral Nondietary Exposure

 N-Methyl Carbamate Cumulative Assessment

#### **Hand-to-Mouth Algorithm**

- Non-dietary ingestion via hand-tomouth behavior has been discussed at several SAPs
- Most recently N-methyl Carbamate
  - Case study (February)
  - Preliminary (August)
  - Consult the experts

#### **Hand-to-Mouth Contact Factors- Previous Assumptions**

- Based on discussions at August 1999 SAP
  - · 20 cm2 surface area of hand mouthed
  - Palmer surface area of 3 fingers (4 year old) 20 hand-to-mouth events per hour
  - 90th percentile from videography data collected and analyzed by Reed et. al., 1999
- Considered removal by saliva (e.g., Geno)
- Assumed complete replenishment of hands between events

## What We Used in the Case Study

- Hand-to-mouth Frequency
  - Triangular Distribution (Reed, 1999)
    - Range from 0 to 26 events per hour Mean 9.5
- Surface area of the hand (fingers)
  - Uniform Distribution
    - □ 0 20 cm² per event

#### We Considered Additional Data

- Available Micro-Activity Data and their Available Micro-Activity Data and their Applicability to Aggregate Exposure Modeling Valerie Zatratian's SRA Presentation, Dec. 2003 Analyzed hand-to-mouth data based on six studies Including Reed Relied on observational data using video tape

- All hand contacts were recorded as hand-to-mouth events, regardless of the fraction of hand mouthed
   One study (Letkie) was used to estimate the percent area of hand mouthed

#### Available Micro-Activity Data and their Applicability to Aggregate Exposure Modeling

(Zartarian et al., December 2003)

No. Subjects	Description	Videotape time	Median frequency/Other Information
52 children in Laredo,TX	13 infants; 12, one year olds; 18 two year olds; 9 preschool) living in the vicinity of Rio Bravo, Texas	Four hour videotaped observations	indoors 13.5/hour and 4.9/hour outdoors
72 urban Washington State children	ages 11 to 60 months	No video-tape (parental and trained observers). Observations for more than one day were available for 78% of the children*.	Mean – 16 hand to mouth contacts per hour
19 children	ages 3 to 6 years living in Minnesota	Four hour videotaped observations	Median 3.5 hand to mouth contacts/hour, 3-4 years Median 2.5 contacts/hour, 5-6
30 urban children living in Newark, NJ	A total of 20 day care (3-6 yrs) and 10 at home (2-5 years)		Mean hand to mouth frequency 9.5 contacts per hour
4 Latino children in agricultural area in California		Single day videos (6, 7, 8, 10 waking hours)	Mean = 9.5 eventshr.
Video observations of suburban children ages 1 to 6 years of age.		33-34 hours of children "in view"	These data were used to enumerate area of hand mouthed; Median: 2.3 hand to mouth contacts/hour; mean: 7.3 contacts/hour.
	32 children in Landon, TX  72 urbain Washington State children  19 children  30 urbain children living in  Homant, 143  24 urbain children living in  Homant, 143  24 urbain children living in  Homant, 143  24 urbain children living in  Homant, 143  25 urbain children  26 urbain children  26 urbain children  26 urbain children  26 urbain children  27 urbain children  28 urbain children  28 urbain children  28 urbain children  29 urbain children  20 urbain childre	13 Oddown In Laredo, TX  13 Oddown In Laredo, TX  13 Oddown In Laredo, TX  14 Oddown In Laredo, TX  15 Union Washington State  25 Union Washington State  25 Union Washington State  25 Union Children  25 Union Children  25 Union Children  26 Union Children  26 Union Children  26 Union Children  27 Union Children  27 Union Children  28 Union Children  29 Union Children  20	13 dedam in Larodo, T.K.  14 dedam in Larodo, T.K.  15 desam in Visual registration  16 desam in Visual registration  17 uniform Visual registration  18 desam in Visual registration  18

## What We Used in the **Preliminary Assessment**

- Increased the potential area of the hand that can be mouthed (Letkie)
  - Begin with surface area of 200 cm<sup>2</sup>
  - · Multiply times percent area mouthed

    - Beta distribution
       Mean: 0.13 (std 0.06)
       99th %-ile: 0.3
- Increased hand to mouth frequency
  - Weibull:
    - Mean: 12.5 events/hr (std 16.4)

    - 99th %-ile: 84.8

#### **Uncertainties In Modeling Hand-to-Mouth Exposure**

- Assumes residue replenishment between each hand to mouth event
- Fixed values for exposure duration
  - Surface area Frequency
- Fixed upper percentiles for long durations has the potential to create unrealistic exposure estimates
- Age differences

# **Summary**

- To better assess children's exposures to pesticides, OPP had identified the following areas of importance:
  Dermal contact values for post application assessments (broadcast and C+C)
  Hand loadings for H-t-M pathway
  Interpretation of biomonitoring data
  Characterization of dust, track-in, object to mouth (relative source contribution)

## **Final Thoughts**

- Continued efforts to improve assessment of children's exposure to pesticides
  - Increased OPP collaboration with ORD
    - ORD research
       STAR grants