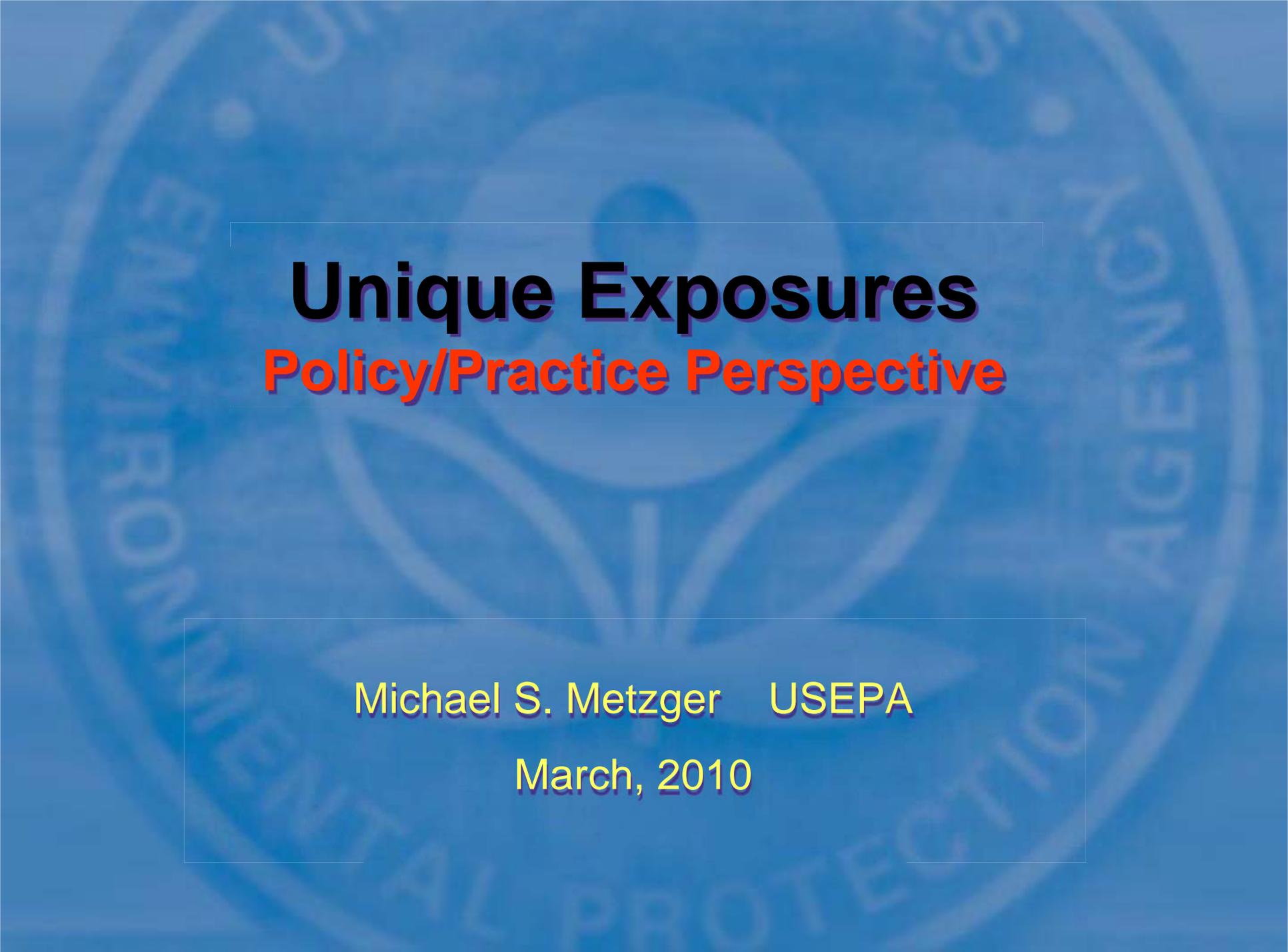


US EPA ARCHIVE DOCUMENT



Unique Exposures

Policy/Practice Perspective

Michael S. Metzger USEPA

March, 2010

Roadmap

- **Unique Exposures: Relevance**
- **OPP Environmental Justice Training**
- **Future directions and Issues to Consider**

Unique Exposures: Relevance

Background: OPP/HED Function

- Perform human health risk assessment for pesticides – dietary, residential, occupational, aggregate, cumulative
- 120 scientists, various disciplines
- Hundreds of risk assessments per year
- Full package of toxicity, residue chemistry, and ORE data
- Workload:
 - *New active ingredients, new uses, old chemical review (65%)*
 - *Policy development, methods development, litigation support (25%)*
 - *Epi and incident review, outreach, international harmonization (10%)*

Unique Exposures: Relevance

Food Quality Protection Act (FQPA) Risk Assessments

- Food: Acute through chronic durations
- Drinking Water: Ground and Surface sources
- Residential: Any non-dietary non-occupational uses (home, golf courses, playgrounds)
- Aggregate: Food + residential + drinking water
- Cumulative: Aggregate across chemicals with common mode of toxicity



Unique Exposures: Relevance

Examples of unique pesticide exposures: Lindane

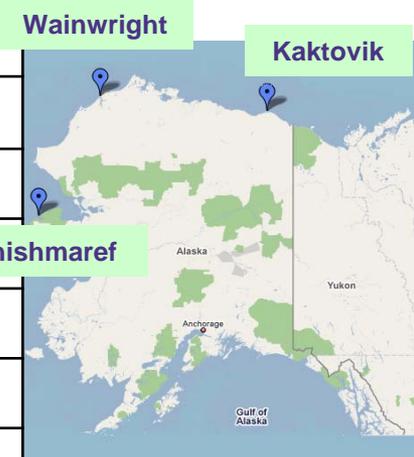
- Lindane is an organochlorine pesticide used as a seed treatment
- Found in tissues and fat of people living in the arctic due to a “unique” subsistence (or chosen) diet
- Limited consumption and residue information for contaminated fish and game



Unique Exposures: Relevance

Examples of unique pesticide exposures: Lindane

Traditional Food	Community 1 – Kaktovik Harvest (lbs/yr)	Community 2- Shishmaref Harvest (lbs/yr)	Community 3 - Wainwright Harvest (lbs/yr)
Polar Bear	1,330	11,573	5,952
Seal	6,104	224,977	17,140
Whale	108,160	----	102,132
Walrus	----	10,061	118,370
Caribou	19,136	46,542	83,187
Moose	----	36,656	----
Salmon	105	52,011	----
Arctic Grayling	158	----	2,405
Whitefish	----	6,503	7,102
Smelt	----	4,621	6,490



Unique Exposures: Relevance

Examples of unique pesticide exposures: Lindane

Traditional Food	Total HCH residues (ng/g)
Polar Bear	10
Seal	215
Whale	391
Walrus	20
Caribou	1
Moose	9
Salmon	26
Arctic Grayling	3
Whitefish	20
Smelt	348

Residue data from literature

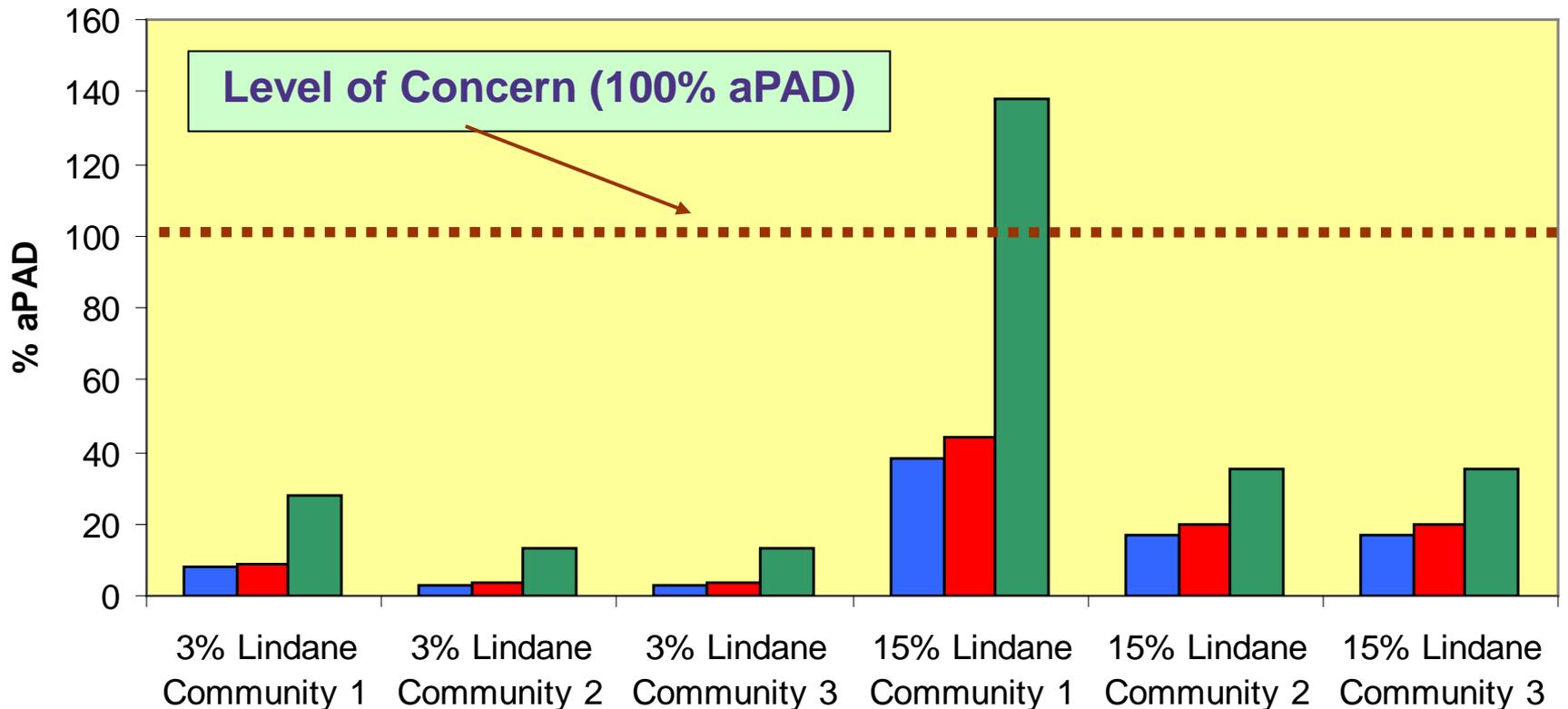


Unique Exposures: Relevance

Examples of unique pesticide exposures: Lindane

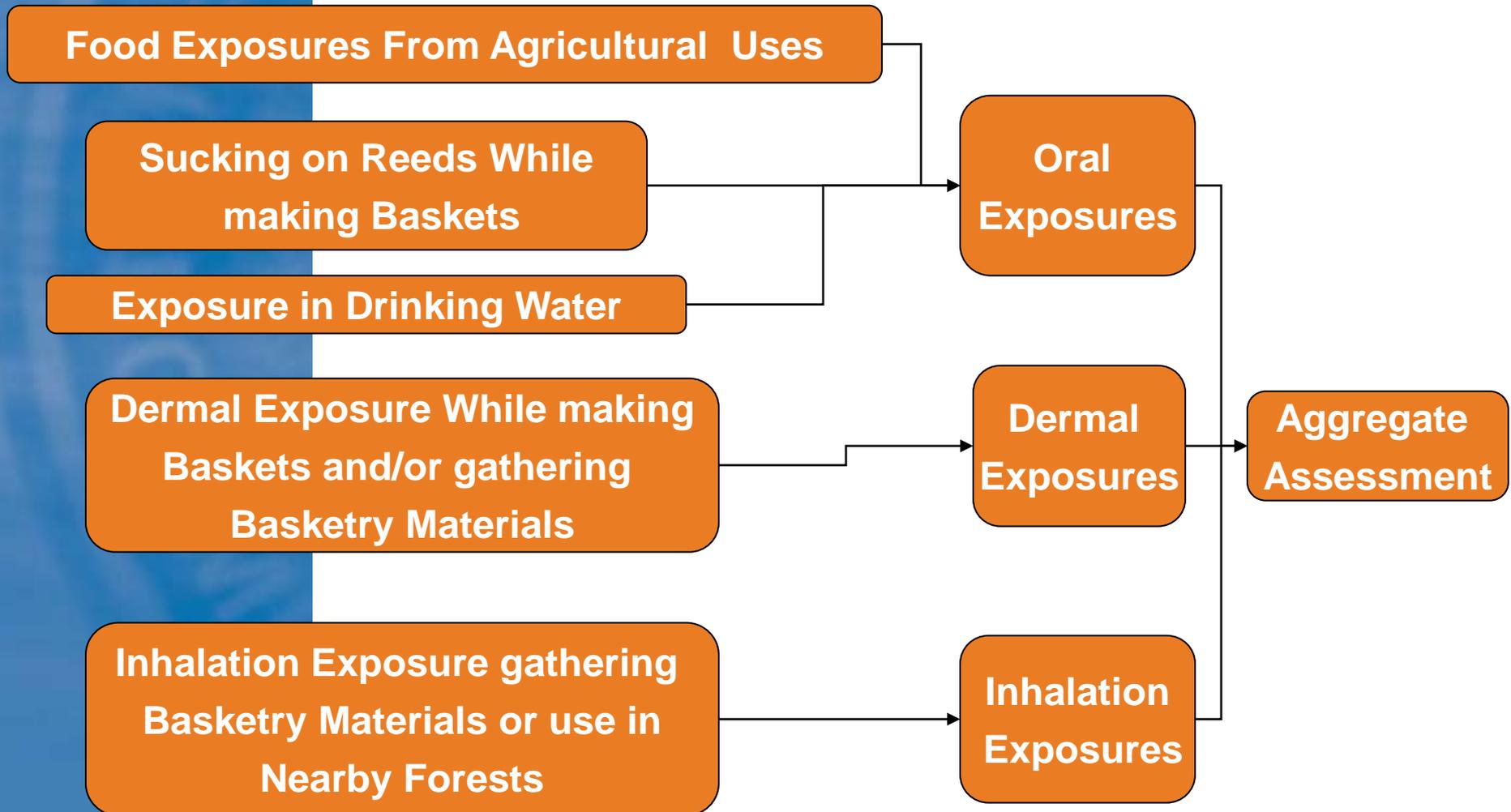
Lindane Subsistence Dietary Assessment

■ Males ■ Females ■ Children



Unique Exposures: Relevance

Examples of unique pesticide exposures: Basket weaving



Unique Exposures: Relevance

Examples of unique pesticide exposures: Urban poor

Insecticide use in inner-city housing: Child exposures

- **Residential Standard Operating Procedures (SOPs):** A set of algorithms and methods designed to capture the high end of residential exposure



Residential SOP for indoor post-application exposure assumes:

- Use of maximum application rate, frequency of application, and other high-end inputs to child exposure (e.g., air concentration, surface residues, floor-to-hand and hand-to-mouth residue transfer)
- Aggregates dermal, inhalation, and incidental oral exposure (assuming same toxicity occurs from each route)
- Aggregates residential, food, and drinking water exposures
- Cumulates aggregate risks from multiple chemicals with same toxicity

Unique Exposures: Relevance

Examples of unique pesticide exposures: Urban poor
Insecticide use in inner-city housing



Does not account for:

- Misuse (e.g., over-application) or not reading label directions
- Pica or other unusual exposure pathways
- Potential for other co-occurring high-end or unique exposures (e.g., consumption of fish from a local, polluted river)
- Interplay of non-chemical stressors (e.g., diet, overall health)
- Others?

OPP Environmental Justice Training

- **Hazard:**
 - **Susceptible populations**, esp. children, pregnant women, potential for genetic polymorphisms which could put certain populations at increased risk (e.g., PON1 and chlorpyrifos exposure)
- **Dietary:**
 - **Vulnerable populations**, esp. children, pregnant women, subsistence fishers and hunters, groups who consume unusual foods
 - Bioaccumulating pesticides/metabolites
 - Drinking water sources
 - Atypical use patterns
- **Residential:**
 - Monitoring methods apply to all people regardless of ethnicity, socio-economic status & other EJ factors
 - Revised Residential SOPs to FIFRA SAP recently; SAP recommendations for inclusion of different exposures (e.g., re-suspended dust)

OPP Environmental Justice Training

- **Worker:**
 - **Vulnerable populations**, esp. children, pregnant women
 - Consistency with epi, incident, and monitoring data
 - Consideration of spray drift, volatilization, or other off-site transport
 - Consideration of unusual use patterns
 - Proposed revised methods for workers which would include potential for additional SF (similar to FQPA SF), aggregate and cumulative worker assessments, consideration of youth workers (“professional” to 10 y/o, on family farms possibly younger), child day care in farm fields, farm family take-home exposure – currently out for public comment



EJ: Future Directions and Issues to Consider

- Unique exposures are important considerations in risk assessment, including pesticide risk assessment
- How will information about unique, high-end exposure be used in the **risk management** process
- Help for risk assessors in identifying unique exposures, potential for susceptibility
 - *OPP's "EJ Tool Box"*
- Prioritization of research
- Legal Mandates



Thank You

Questions?