Updating the EPA Guidelines for Exposure Assessment

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History of Exposure Guidelines at EPA

- 1986: EPA published it's initial set of 5 risk assessment guidelines in response to NAS "Red Book": *Risk Assessment in the Federal Government*
- 1986: Guidelines for Estimating Exposures
- 1992: Revised Guidelines for Exposure Assessment

What are Agency Exposure Assessment Guidelines?

- Not a textbook
- Not a cookbook
- Rather, statements of science policy regarding principles, general approaches, preferences, and default options that will be applied in Agency risk assessments

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More Specifically…

- General concepts, approaches
- Exposure assessment planning
- Data sources and uses
- Estimating exposure and dose
- Evaluating uncertainty
- Communicating results

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Who Uses the Guidelines?

- EPA risk assessors – Programs and Regions
- EPA risk managers
- Others
  - Contractors and partners (e.g., other governmental organizations)
  - Regulated community
  - Advocacy groups

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Guidance Since 1992

- Agency Risk Assessment Guidance Documents:
  - Probabilistic Risk Assessment
  - Cumulative Risk Assessment Framework
  - Risk Assessment Guidance for Superfund
- Exposure Factors Handbook; Child-Specific Exposure Factors Handbook
- Dermal Exposure Assessment Guidance
- Children's Age Groups

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Why Update the Guidelines?

- Exposure science has advanced
- To reflect specific new Agency guidance documents
- To address new issues & technologies
- To look over the horizon

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Proposed Approach

- Build on the solid foundation of the existing 1992 Guidelines
- Reflect current theory and practice of exposure assessment
- Update resources and references to reflect advances in both knowledge and technology
- Integrate other EPA specific guidance developed since 1992
- More fully integrate the science and art of exposure assessment with biometrics, toxicology, epidemiology, and social sciences

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Major New Issues for the Update

- Aggregate Exposure and Cumulative Risk
- Special Populations and Lifestages
- Uncertainty and Variability and Probabilistic Methods
- Involving Communities and Communicating Results

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Aggregate Exposure and Cumulative Risk Assessment

- Address multiple stressor situations
  - Chemical, physical, biological
  - Pathways, exposure patterns
- Approaches, metrics
  - Environmental exposure data
  - Biometrics (Disaggregating Biomonitoring Data)
- Address vulnerability
  - Intrinsic, extrinsic factors

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Populations and Lifestages

- Selection of exposure factors and assumptions
- Specific activity patterns and exposure data
- Vulnerability and stresses experienced by more highly exposed groups

Example populations:

- Tribal populations
- Lifestages: e.g., children, elderly
- Highly or differentially exposed groups, e.g., pregnant females, subsistence hunting, fishing

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Uncertainty and Variability and Probabilistic Methods

- Describing variability in data sets
  - Characterizing inter- and intra-individual
  - Modeling activities, exposures
- Describing uncertainty in estimates
  - Selecting the appropriate statistic
  - Central tendency and high-end estimates
- Resources
  - EPA Guiding Principles and RAGS
  - External sources

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Community Involvement and Communicating Results

- Planning and scoping
  - Early buy-in; target outcomes
  - Initiate risk communication
- Population- and geo-specific exposure data:
  - Activity and dietary consumption patterns
    - local surveys of exposures (creel surveys)
    - locations of potential exposures
  - Sensitive populations
- Community-based participatory research
- Communicating results of assessment
  - Resources: RAGS, CBPR

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Looking Forward

- Incorporating Biometrics
  - Epidemiology, biomonitoring
  - New technologies:
    - Genomics, proteomics, nanotech, computational toxicology
- Integration with Other Sciences
  - Toxicology, epidemiology, public health, occupational health

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Steps in Updating the Guidelines for Exposure Assessment

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Input from internal stakeholders

- EPA Colloquium – April 2005
- Regional Risk Assessors – May 2005
- SPC Steering Committee Briefing – March 2006

Dialogue with external stakeholders

- Panel (State, Tribal, Academic, Industry) at ISEA Annual Meeting – November 2005
- NGO Comments – December 2005
- Briefed CENR and exposure scientists from other Federal Agencies – Spring 2006

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