

US EPA ARCHIVE DOCUMENT

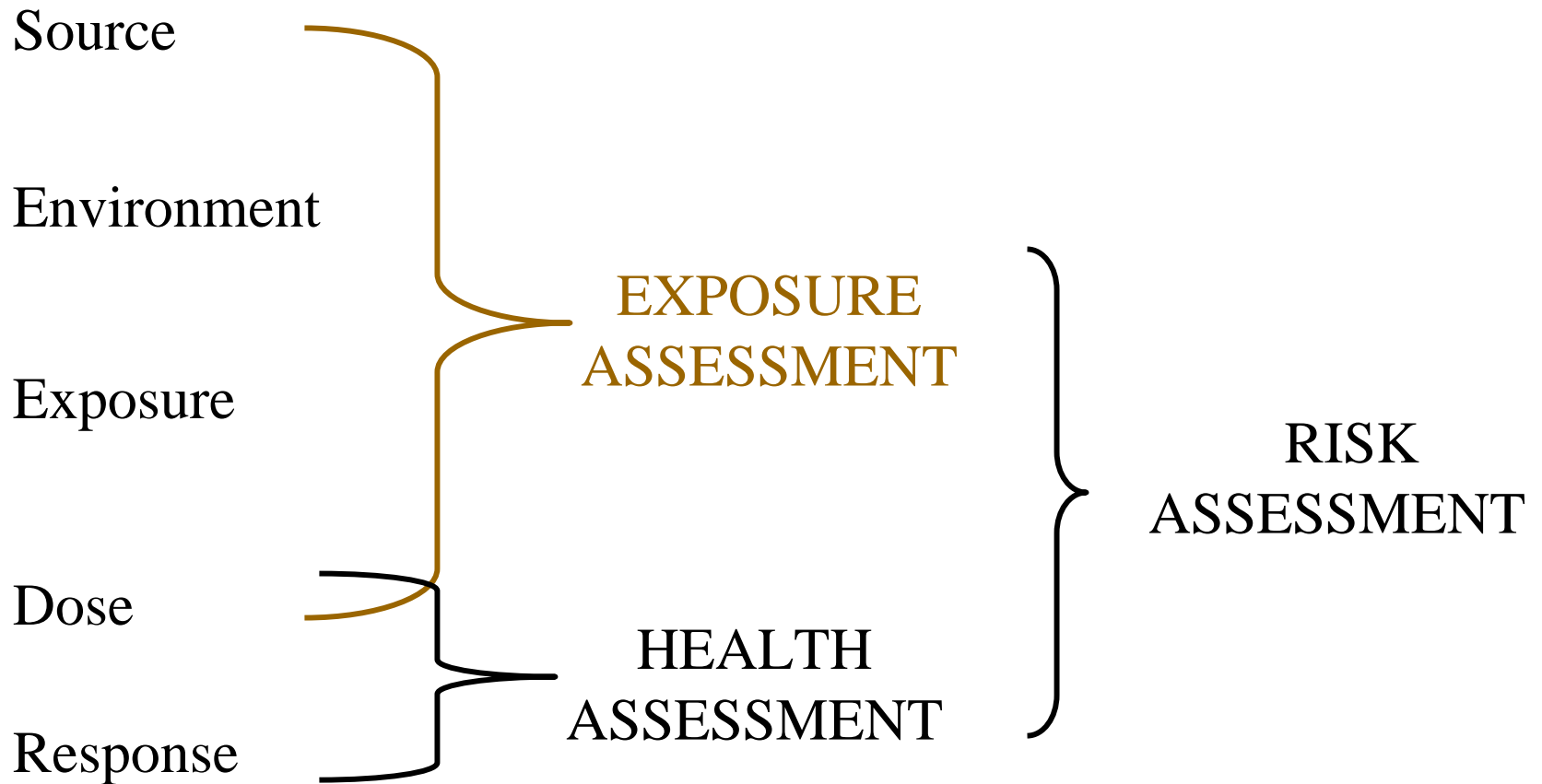
Meeting the Challenges of Particulate Air Pollution: EPA's PM Research Centers

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Risk Assessment and Management Paradigm



Perspective on Exposure

Source

Dose

Environment

Response



EXPOSURE

Disease Causative Factors Are Gene-Environment Interactions

- Environment: What's exposure got to do with it?
 - Socio-economic factors
 - Pollution
 - Infectious disease
 - Personal habits (e.g., smoking, diet)
 - Interrelationships among all of the above

What Contributions Can Exposure Analysis Bring to Public Health?

- Prevention
- Characterization of existing risk
- Risk intervention
- Design of more realistic animal toxicology studies
- Conduct of more quantitative epidemiological studies

Beyond Mass

- Absent other population-level information, PM mass has served as an adequate and efficient surrogate of exposure to outdoor PM.
 - Good start, but not the whole story.
- For effective public health intervention, however, need better understanding
 - Composition for PM characterization
 - 'toxic' components
 - Composition for source attribution
 - Component-relevant exposure assessment
 - Spatial and temporal variability

Susceptible Populations

- Susceptibility typically results from
 - Differences in biological susceptibility
 - Differences in exposures
 - Need a better understanding of behavioral factors that lead to differences in exposures and intake
 - Need to identify critical windows of exposure
 - Relevance to chronic and long-term disease outcomes

Measures of Exposures

- Lessons to be learned from advancements in atmospheric sciences
 - Improved methods to measure and speciate PM and related co-pollutants
 - Beyond filters
 - Continuous or semi-continuous methods
 - Improved precision and accuracy
 - Better source attribution
 - Use of molecular markers