Comparison Between EPA Assumptions for Lung Cancer Risk Assessment and
16 Cities Study ETS Exposure Data

Presentation to National Toxicology Program
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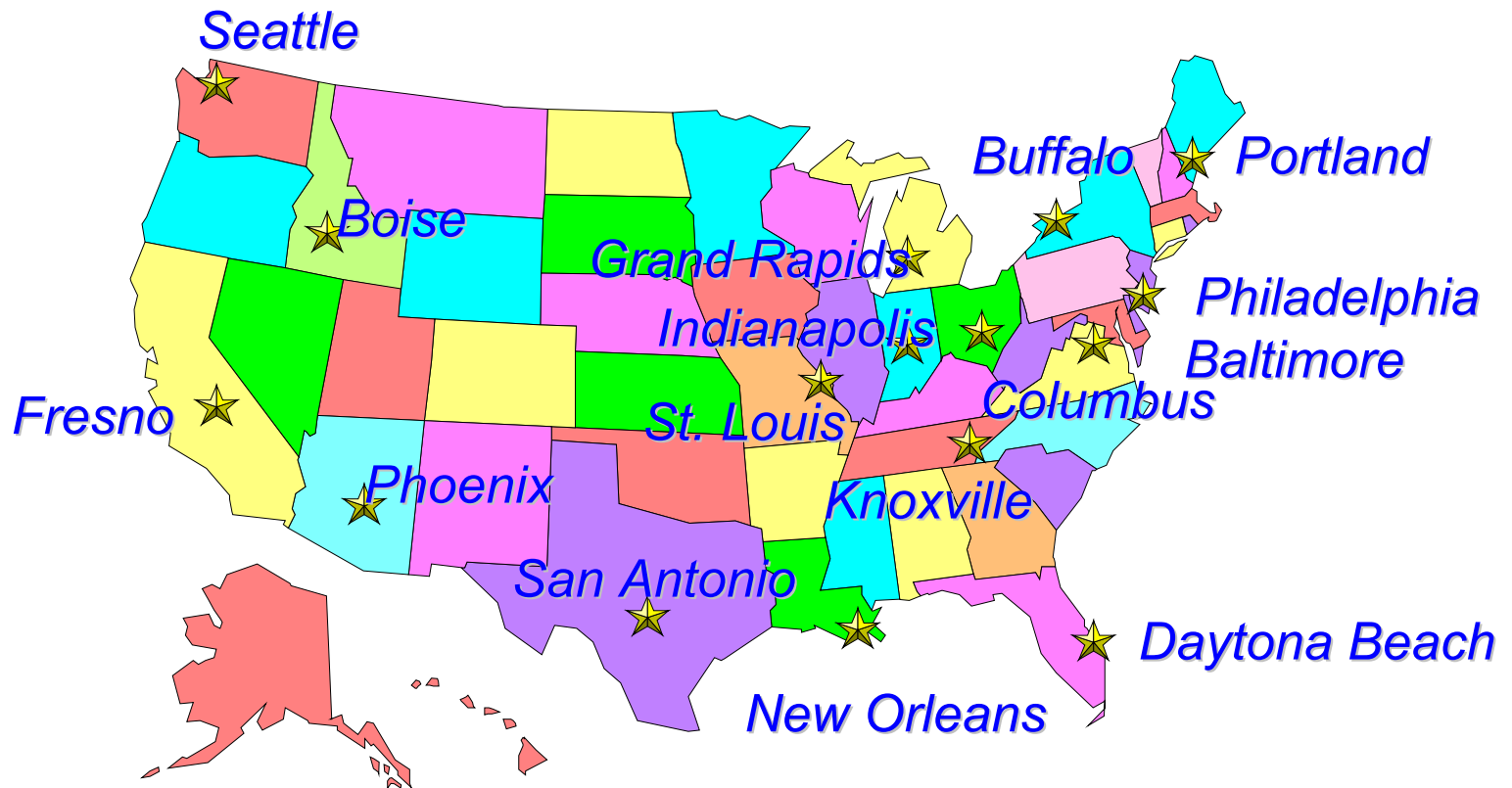*Chemical and Analytical Sciences Division*

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Purpose

◆ Contrast definitive data from large personal exposure study of ETS with EPA assumptions.

◆ Describe implications of using definitive data.

16 Urban Areas Distributed Geographically

Seattle

Boise

Buffalo

Portland

Grand Rapids

Philadelphia

Indianapolis

Baltimore

Fresno

Columbus

St. Louis

Phoenix

Knoxville

San Antonio

Daytona Beach

New Orleans

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Sample Collection in the Workplace

Sampling Head
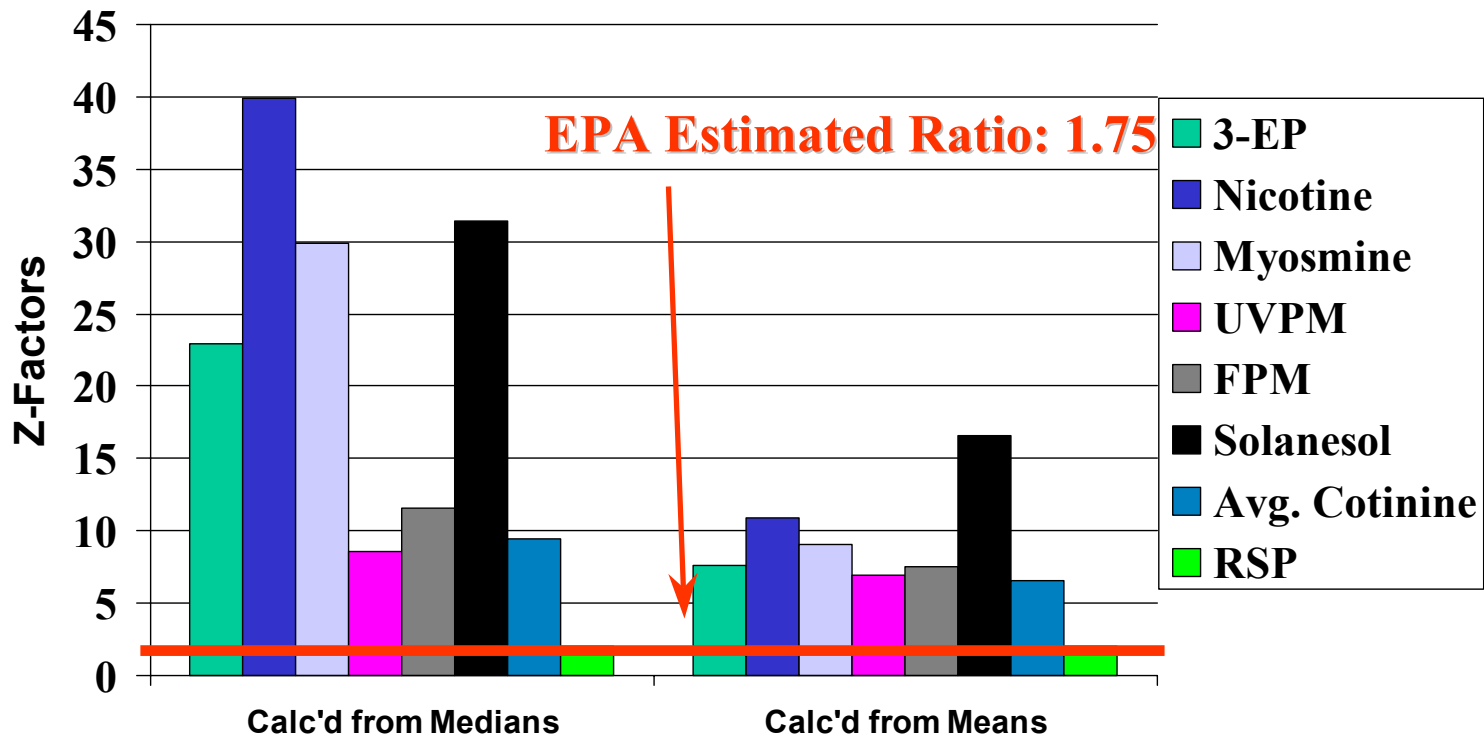
Sampling Pump

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ETS Components Measured
ORNL 16 Cities Exposure Study

◆ ETS Particle Phase

  ◆ *Respirable suspended particulate matter (RSP)*

  ◆ *UV-absorbing particulate matter (UVPM)*

  ◆ *Fluorescing particulate matter (FPM)*

  ◆ *Solanesol*

  ◆ *Scopoletin*

◆ ETS Vapor Phase

  ◆ *3-ethenyl pyridine*

  ◆ *Nicotine*

  ◆ *Myosmine*

◆ Saliva

 ◆ *Cotinine*

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Ratios of 24-hr Exposures of Never Smoking Women:
Married to Smokers vs. Married to Non-Smokers
Comparison of EPA Estimate with 16 Cities Data

EPA Estimated Ratio: 1.75

Legend:
- 3-EP
- Nicotine
- Myosmine
- UVPM
- FPM
- Solanesol
- Avg. Cotinine
- RSP

Y-axis: Z-Factors (0 to 45)

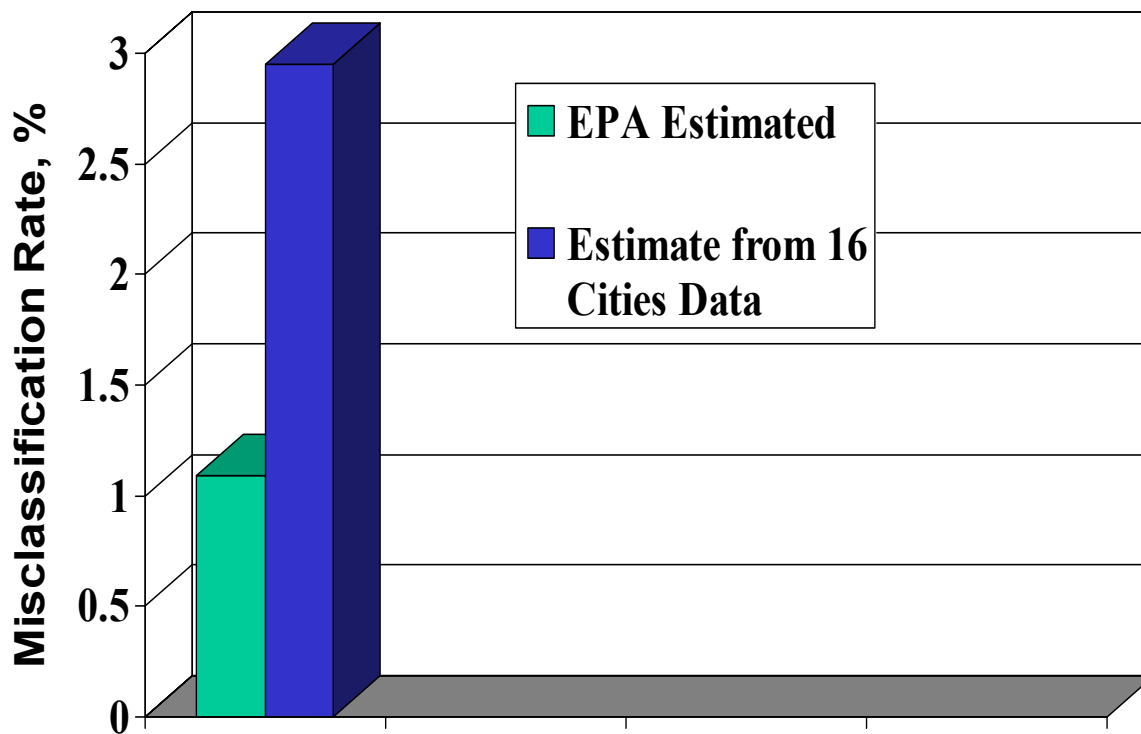X-axis: Calc'd from Medians, Calc'd from Means

Impact of Differences in Z-Factor:
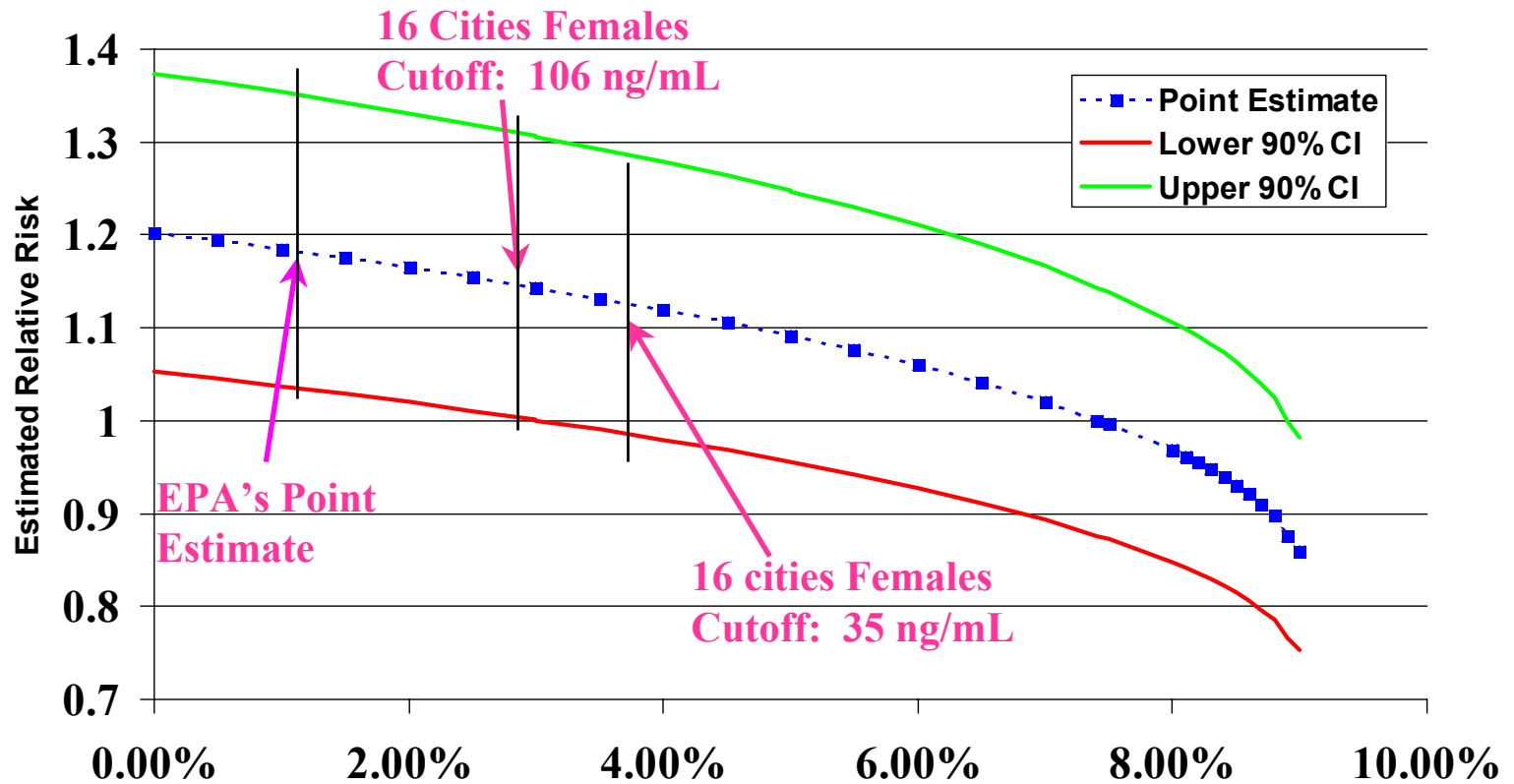# EPA Estimate vs. ORNL 16 Cities Data

Z = Exposure ratio of women exposed from smoking spouse compared with women not exposed from spouse
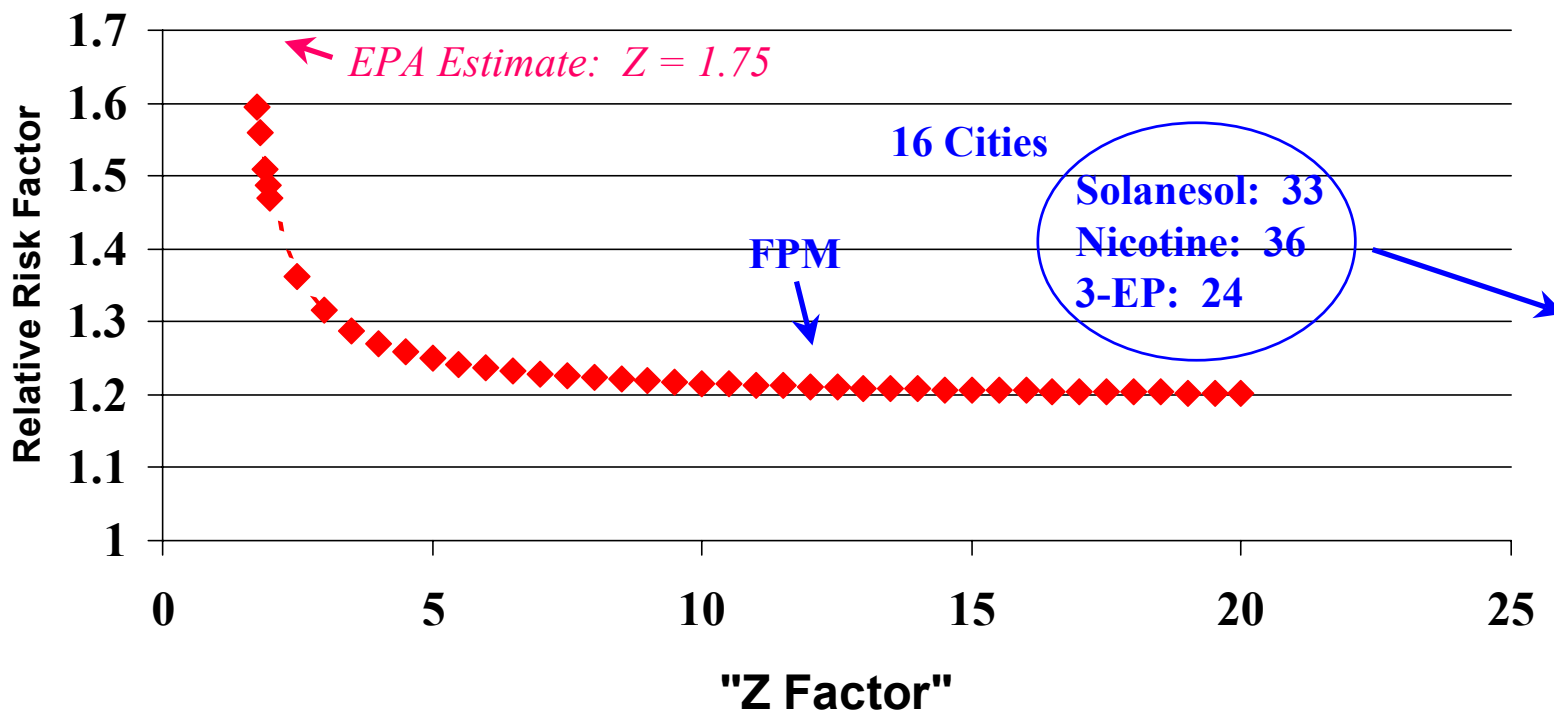
Never Smoking Female Misclassification Rates: EPA Estimate vs. Data from 16 Cities Study

How "Never-Smoker" Misclassification Rates Impact EPA's Relative Risk Estimation

Conclusions

◆ Assumptions critical in EPA lung cancer risk assessment are not supported by 16 Cities data.

◆ Use of definitive data, rather than EPA estimates, would act to lower estimated Relative Risk.

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