

Risk and Technology Review (RTR)

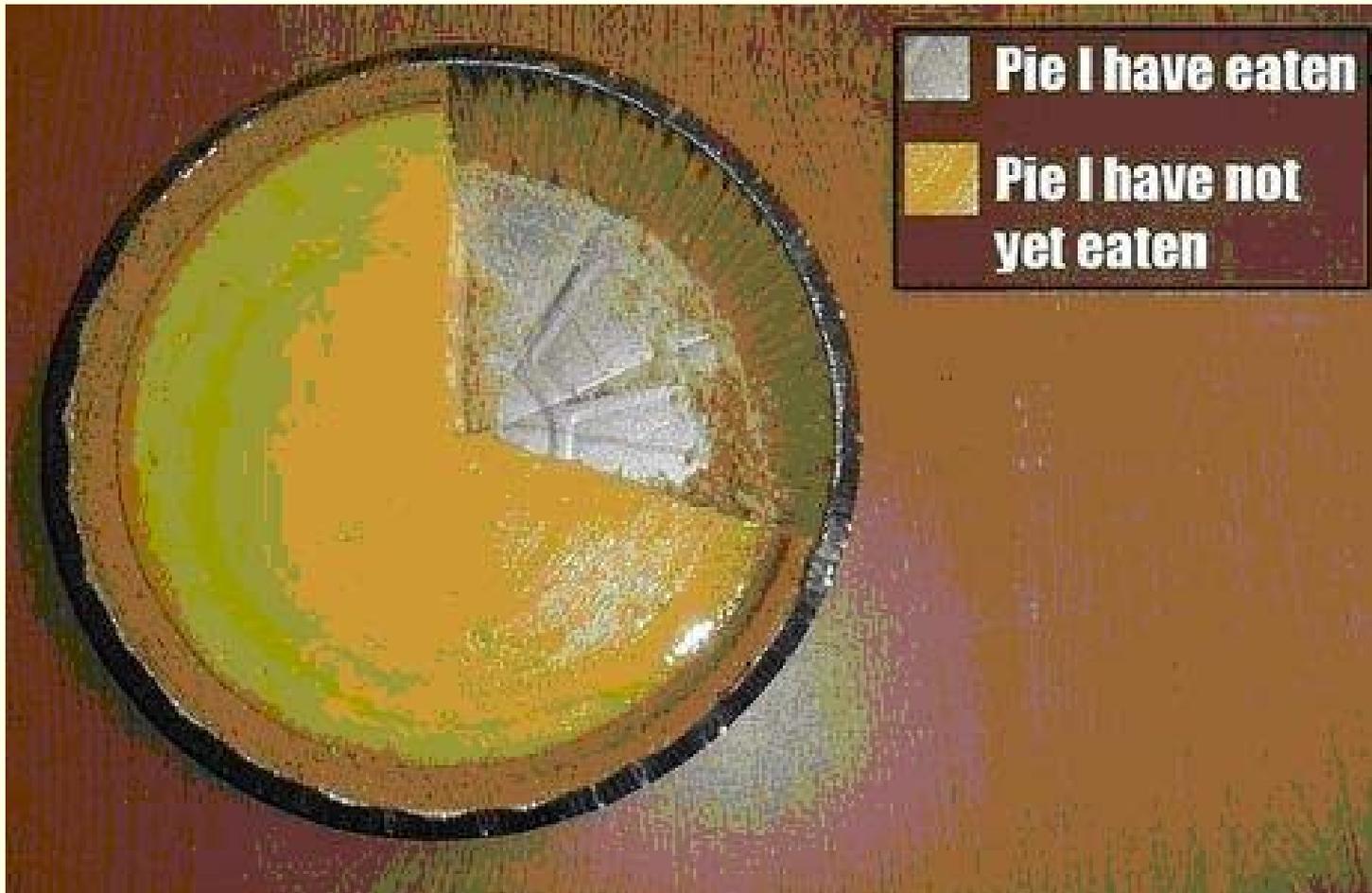
Risk Assessment Methodologies
EPA Science Advisory Board
28 July 2009

This Talk

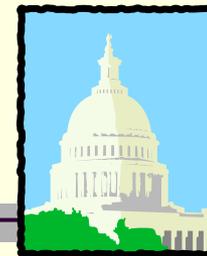
- Dave Guinnup
 - Introduction
 - Quick review of regulatory context
 - Our models vs NRC recommendations
- Roy Smith
 - Flow charts for each type of assessment
 - Chronic inhalation
 - Acute inhalation
 - Multipathway health
 - Ecological

RTR Pie Chart

(Can also be applied to other EPA Programs)



Congressional Mandate



- Residual Risk CAA 112(f)
 - Assess risks that remain after implementation of MACT standards within 8 years of promulgation
 - Set additional standards if MACT does not protect public health with an “ample margin of safety”
 - Set additional standards if necessary to prevent adverse environmental effects
- Technology Review CAA 112(d)(6)
 - Review standards every 8 years
 - Revise as necessary
- Since the first technology review coincides with residual risk review, we combine them into one “RTR” rulemaking

Goals for Additional Standards

- Step 1: Limit cancer MIR* to no higher than about 100 in a million
- Step 2: Protect the greatest number of persons possible to approximately 1 in a million lifetime cancer risk or lower

*MIR = cancer risk for person exposed to maximum HAP concentration(s) near a facility for 70 years

Status of Regulatory Program

- EPA has issued MACT standards for 174 categories
- We have finalized residual risk standards for 16 source categories, proposed 10 more, and have received comments from an advance notice of proposed rulemaking (ANPRM) on an additional 12 categories
- 17 additional categories are to be included in an ANPRM slated for this summer

NRC Recommendations

- Life cycle evaluation
 - AERMOD (within HEM3)
 - Created to improve on ISC, which was itself subject to continuing evaluation
 - AERMOD receiving same kind of evaluation
 - http://www.epa.gov/scram001/dispersion_prefrec.htm
 - TRIM
 - Evaluated extensively from 2002-2005 prior to release
 - User feedback solicited for improvements
 - http://www.epa.gov/ttn/fera/trim_fate.html
- Both models are recent, with life cycles are just beginning, so SAB comments have the potential to shape their development

NRC Recommendations

- Peer review
 - AERMOD (within HEM3)
 - Reviewed by joint committee of EPA and the American Meteorological Society
 - Used in most RR rulemakings, each of which was peer- and publicly-reviewed
 - TRIM
 - Developed with substantial SAB input and support
 - Not yet widely-used because the RTR program focused first on low-risk inhalation-only assessments
 - Usage will increase as multipathway assessments begin

NRC Recommendations

- Documenting origin and history
 - Each of the web pages on slide 7 contain links to technical support documents with algorithms, concepts, and descriptions of development
 - The history of these model *types* predates EPA, however

NRC Recommendations

- Use of probabilistic methods
 - Applied *ex post facto* to model long-term migration behavior (Appendix N)
 - Otherwise not currently feasible
 - Input distributions not available for emissions, release parameters, meteorological variables, or dose-response values
 - Run times would likely be tens of trials per hour or less (vs. 5000 per minute in Appx N analysis)
 - Regulatory decision context spans two orders of magnitude, suggesting deterministic estimates are adequate



And finally, thanks...

...for your interest and efforts in helping EPA develop the highest-quality RTR assessments possible.

We're looking forward to discussing our methods, and hearing your thoughts.