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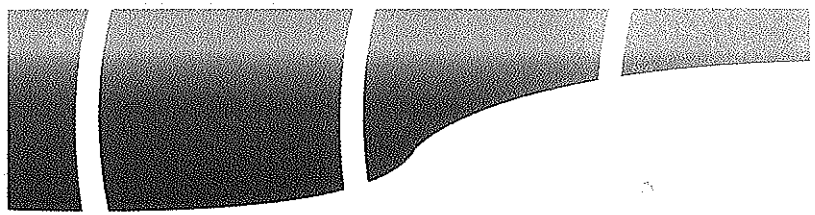

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Wyndham Palm Springs

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T19.1 Parnell G., Dillon-Merrill R.L.; United States Military Academy, Georgetown University; Gregory.parnell@usma.edu. INTEGRATING RISK AND DECISION ANALYSIS FOR COUNTER-TERRORISM DECISION-MAKING

We examine the types of risk analysis and resource allocation decision-making required for counter-terrorism in Homeland Security. We examine the key Homeland Security trade-offs between mission (services), risk reduction, and stakeholder/customer impacts. We propose a resource allocation framework to assess these trade-offs using risk analysis and multiple objective decision analysis concepts.

M13.3 Patterson J., Briggs D.; Toxicology Excellence for Risk Assessment; patterson@tera.org. PEER CONSULTATION IN RISK ASSESSMENT.

Peer consultation is a process that is used in the field of risk assessment to solicit input and advice from technical experts and sometimes from stakeholders. The output of a peer consultation is generally opinions of individual panel members, not necessarily consensus, or agreement, from the panel as a whole. Toxicology Excellence for Risk Assessment (TERA) is conducting a variety of peer consultations to explore additional ways to gain expert review for risk assessment documents. TERA has organized peer consultations to solicit expert opinion from panels on topics such as physiologically based pharmacokinetic modeling of trichloroethylene, dermal exposure guidance, and to facilitate data gathering and initial analysis of data in an interactive process for evaluators to seek, gather, and clarify data from subject matter experts. TERA has also been organizing and conducting peer consultations for Voluntary Children's Chemical Evaluation Program (VCCEP) chemical assessments which is a pilot program to evaluate risks to children and identify data needs. The VCCEP pilot peer consultations have offered an opportunity to develop procedures and practices in a number of areas, including conflict of interest and bias determinations, selection of balanced panels and how to involve stakeholders, preparation of meeting reports, and how to present discussion results. This work has been funded in part by the U.S. EPA (cooperative agreement X-82916801); however, the views expressed in this poster are those of the authors and do not represent the views of the funding agency.

T6.3 Paustenbach D.J., Richter R.O., Finley B.L., Williams P.R.D., Sheehan P.J.; ChemRisk, Exponent; pwilliams@chemrisk.com. EVALUATING ASBESTOS EXPOSURES ASSOCIATED WITH VEHICLE BRAKE CLEANING AND MACHINING ACTIVITIES USING SHORT-TERM AND TWA MEASUREMENTS.

Numerous sampling surveys have been conducted to assess airborne asbestos concentrations at vehicle brake repair facilities. Specifically, these surveys have collected both short-term (<15 minute) and longer-term (brake-job or 8-hour TWA) samples for mechanics during various brake cleaning and machining activities. In this analysis, we compare the asbestos air concentrations from approximately 300 short-term and 180 TWA personal measurements during such activities from about 1970 to 1990. Evaluations based on the short-term data yield asbestos air concentrations ranging from 0.0129.4 f/cc (mean of 3.2 f/cc) while performing compressed air cleaning on car and light truck brakes (i.e., the most common cleaning method used prior to the 1980s). For heavy trucks, short-term asbestos air concentrations ranged from 0.205.9 f/cc (mean of 1.5 f/cc) while machine grinding new linings on these vehicles with exhaust systems. Evaluations based on the longer-term data yielded significantly lower concentrations of airborne asbestos. Specifically, with the exception of a single outlier, asbestos TWA concentrations for automobile and light truck mechanics ranged from <0.004 to 0.28 f/cc (mean of 0.07 f/cc) and TWA concentrations for heavy truck and bus mechanics ranged from 0.003 to 0.53 f/cc (mean of 0.29 f/cc). Relatively few of the short-term samples had asbestos concentrations that may have exceeded the historical OSHA ceiling limit of 10 f/cc, and 8-hour TWA asbestos concentrations were constantly below OSHA PELs during the past three decades. Although it would be informative to use the short-term air measurements to estimate or validate TWA asbestos exposures under different scenarios, a number of shortcomings associated with these data make it difficult to quantify the relationship between (or relative contribution of) the short and longer-term data. These include inadequate task descriptions, an absence of data on sampling and activity durations, a lack of short-term data for machining of automobile brakes, and the relatively large degree of variability in the short-term data for all activities.

T16.3 Pekar Z., Hubbell B., Conner L., Richmond H.; US Environmental Protection Agency; pekar.zachary@epa.gov. CHALLENGES IN APPLYING POPULATION-LEVEL RISK ASSESSMENT IN SUPPORT OF COST-BENEFIT ANALYSIS FOR NATIONAL-SCALE ENVIRONMENTAL REGULATIONS.

Cost-benefit analysis as conducted by the US EPA in support of national-scale environmental regulations involving criteria air pollutants, uses population-level risk assessment methods to estimate reductions in health effects incidence. Specifically, population-level risk assessment is used to translate predicted decreases in ambient air concentrations for a specific pollutant(s) under a particular regulatory strategy into reductions in mortality and morbidity incidence for specific demographic groups, which are then monetized using willingness-to-pay and cost-of-illness measures. The application of population-level risk assessment in this context raises particular theoretical and methodological issues related to the emphasis placed in cost-benefit analysis on generating accurate or representative estimates of health impacts. This can be contrasted with traditional site-specific environmental risk assessment, which often focuses on a protective characterization of upper-bound or high-end risk and places less emphasis on a representative assessment of population-level impacts. In this presentation, we first describe the particular challenges and issues associated with conducting population-level risk assessment in support of cost-benefit analysis for national-scale regulations. Specific topics include: (a) derivation of concentration-response functions from epidemiology studies, (b) predicting demographics and background disease incidence for future points in time when regulations will be fully in effect and (c) selection of optimal spatial scales for GIS-based modeling of risk. We then discuss a number of research initiatives that the EPA's Office of Air and Radiation is currently undertaking to enhance population-level risk assessment methods as applied in cost-benefit analysis including the use of expert elicitation to characterize uncertainty in key modeling elements and development of a comprehensive uncertainty/variability analysis framework.

M13.4 Penberthy W., Hernandez O.; US Environmental Protection Agency; penberthy.ward@epa.gov. FUTURE CHALLENGES FACING THE VCCEP.

The VCCEP pilot program is underway. Some challenges have been met, but still others remain. The remaining challenges include utilization of peer consultation report by EPA and others; communication about the findings under the pilot and the value of the pilot; application of VCCEP model for decision making beyond the pilot program.

T12.3 Pennell M.L. (Runner-up, DRSG Student Award), Dunson D.B.; University of North Carolina, Chapel Hill, National Institute of Environmental Health Sciences; pennell@niehs.nih.gov. A DYNAMIC FRAILTY MODEL FOR TUMOR MULTIPLICITY DATA.

Phototcocarcinogenicity studies using animal models provide an important means of examining the carcinogenic interactions between drugs and chemicals and ultraviolet light. Since tumors are detectable without animal sacrifice, these experiments generate a rich set of longitudinal data for studying the effects of treatment on both latency (time to tumor appearance) and multiplicity (total number of tumors). Although methods currently exist for modeling these two phenomena, there is a need for flexible biologically-based models which allow for a wide variety of longitudinal trends in frailty and treatment effects. With this in mind, we propose an innovative dynamic frailty model for tumor multiplicity data using Bayesian methodology. At each time point, an animals hazard for developing a tumor is equal to the product of an estimate from historical data, a deviation from the historical data for the current study, an animal- and time-specific frailty, and a dose effect. The latter three terms are parameterized based on multiplicative changes in time, providing a simple method of introducing autocorrelation and smoothing the data. In addition, we use non-parametric priors to allow the distribution of the frailty terms to be more data driven. Computation of model parameters can be obtained easily using Markov Chain Monte Carlo Methods. Our model performed well when used in preliminary analyses of a recent photococarcinogenicity study by the NTP Center for Phototoxicology. Even under high levels of smoothing, our hazard function was able to capture oscillating trends in tumor incidence within the data. In addition, we were able to identify peaks in treatment effect