BREATHING RATE DISTRIBUTION FOR USE IN CALIFORNIA'S AIR TOXICS HOT SPOTS PROGRAM RISK.

MA Marty[1], B Blaisdell[1], M Hill[2], R Broadwin[1], S Hurley[1], and P. Jenkins[3]. [1]Office of Environmental Health Hazard Assessment, Cal/EPA, Berkeley, CA; [2] California State Universisty, Hayward, Dept. of Statistics, Hayward, CA; [3]California Air Resources Board, Sacramento, CA. Sponsor: G. Alexeeff.

California's Air Toxics Hot Spots program requires certain facilities to conduct risk assessments of their airborne emissions. Volatile chemicals are evaluated by the inhalation pathway of exposure. Recent efforts by California's Office of Environmental Health Hazard Assessment involve developing distributions for use in stochastic risk assessment. The focus has been on exposure variables such as breathing rates, food consumption rates and so forth. Data from activity patterns studies (Wiley et al., 1991) and inhalation rate (Adams, 1993) were used to develop breathing rate distributions for children and adults. The statistical package SAS was used in the PROC Univariate mode. The empirical distributions were lognormally distributed. The arithmetic mean and standard deviation of the children's breathing rate distribution is 450 $\pm$ 68 L/kg-day; the mean and standard deviation of the adult breathing rate distribution is 235 $\pm$ 67 L/kg-day. The 95th percentiles for children's and adult's breathing rate distributions are 580 and 361 L/kg-day, respectively. Available data for all human exposure variables are cross-sectional rather than longitudinal in nature. Since risk assessments for the Air Toxics program evaluate both short- and long-term exposures, the issue of the accuracy of using short-term data to assess long-term exposures and risk arises. To evaluate the error introduced by the necessity of using one-day activity patterns surveys, we compared the resultant breathing rate distribution to the literature on energy expenditure as a check on its validity. Our breathing rate distribution is reasonable in light of studies evaluating human energy expenditure.