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ON THE USE OF ENVIRONMENTAL TOBACCO SMOKE COMPONENT RATIOS

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INTRODUCTION

Environmental tobacco smoke (ETS) is present in the indoor air of places where people smoke. Considerable attention is currently focused on ETS because of reports (1, 2) concluding that long term exposure to ETS is associated with disease. However, these conclusions come from epidemiological studies lacking validated measures of ETS exposure. In response to this deficiency, researchers throughout the world are analyzing indoor air to assess ETS exposure in field settings. Currently, efforts are hampered by the lack of an ideal indicator (2) of ETS. Nicotine and respirable suspended particles (RSP) have found the greatest use as surrogate indicators of ETS exposure; nevertheless, until fairly recently, few investigations involved measurements of both indicators. Against this background, some have attempted to evaluate or predict concentrations of nicotine or RSP by assuming that defined ratios of the two substances exist. Using nicotine and RSP data from field surveys, we show here that the relationship between the two is too weak for purposes of either evaluation or prediction.

MATERIALS AND METHODS

Data are from surveys performed in three public, environmental categories: offices (3, 4), restaurants (3, 5), and passenger cabins of commercial aircraft (6). For the surveys, RSP and nicotine samples were collected concurrently with portable air sampling systems (4). Sampling and analytical procedures have been described previously (7, 8). Statistical interpretation proceeded from data for each of the three individual environmental categories. Correlations were evaluated between raw and log transformed RSP and nicotine concentration values; Pearson's correlation coefficients were computed. The Kolmogorov-Smirnov test (9) was used to assess whether RSP to nicotine ratios were better approximated

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