

Supplemental Material

Smoking Adjustment Methods

In 2003 a questionnaire was mailed to a sample of active and retired workers to assess job-related variation in smoking habits in the unionized trucking industry (Jain et al. 2006). Job-specific smoking adjustment factors were calculated by dividing the weighted risk for workers employed in each job by the weighted risk for workers not employed in that job (Axelson 1980; Larkin et al. 2000; Schlesselman 1978). A generalized form of Axelson's formula appears below for three levels of smoking. The terms in the numerator and the denominator are calculated by multiplying the proportions of current, former, and never smokers by the literature-based relative risk of lung cancer associated with current, former smoker, and never smokers. The numerator is calculated for each specific trucking industry job-related exposure group, while the denominator is calculated based on the proportions current, former, and never smokers in a reference group, i.e., trucking industry smoking rates not including workers in the job in the numerator. Thus, the ratio of the numerator to the denominator defines the smoking adjustment factor for each job:

$$S = \frac{\sum_{i=3}^k (RR_i) \hat{P}_{ci, \text{exposed}} + \left[1 - \sum_{i=3}^k \hat{P}_{ci, \text{exposed}} \right]}{\sum_{i=3}^k (RR_i) \hat{P}_{ci, \text{unexposed}} + \left[1 - \sum_{i=3}^k \hat{P}_{ci, \text{unexposed}} \right]} = \frac{x_{\text{exposed}}}{x_{\text{unexposed}}}$$

Adjusting the relative risk for lung cancer for confounding by smoking effects calls for

$$RR_{\text{adjusted}} = \frac{RR_{\text{observed}}}{S}$$

Deviance of S from one represents the positive or negative effects of smoking on the relative risk. Specifically when S is greater than one, the confounding effect is positive and the observed relative risk will be reduced. When S is less than one, the confounding effect is negative and the observed relative risk will be increased.

The age standardized smoking rates obtained for each job category and standardized smoking rates in the cohort excluding workers in the job category are presented in Table 1. The lung cancer relative risk risks used to calculate the smoking adjustment factors [current smoker RR=20.3; former smoker RR=10.6] were obtained from the American Cancer Society Prevention Study II for men (Thun et al. 1997; US Department of Health and Human Services 1990), and for never smokers, RR=1. Former smoker RR was obtained by using the average of relative risks reported for men who had quit smoking from 6 to 15 years.

Supplemental Material, Table 1. Age standardized smoking rates obtained for each job category and standardized smoking rates in the cohort excluding workers in the job category (N=3,362 respondents)

Job Category	N	Smoking Status		
		Current	Former	Never
Longhaul Driver	1,130	17.4%	52.0%	30.6%
Pick-Up and Delivery Driver	362	8.3%	54.7%	37.0%
Combination Worker	940	13.9%	45.7%	40.3%
Hostler	137	16.1%	45.3%	38.7%
Dockworker	570	19.1%	36.0%	44.9%
Mechanic	91	14.3%	38.5%	47.3%
Clerk	132	9.1%	39.4%	51.5%
Mail survey smoking rates, excluding workers in each job category		Current	Former	Never
Excluding:				
Longhaul Driver	2,232	14.2%	44.0%	41.8%
Pick-Up and Delivery Driver	3,000	16.1%	45.7%	38.2%
Combination Worker	2,422	15.8%	47.1%	37.2%
Hostler	3,225	15.2%	46.8%	38.0%
Dockworker	2,792	14.5%	48.9%	36.6%
Mechanic	3,271	15.3%	46.9%	37.8%
Clerk	3,230	15.5%	47.0%	37.5%

References

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