EDITORIAL

# Colon and Stomach Cancer Mortality among Automotive Wood Model Makers

Do woodworkers, in particular those who work as wood model makers in the automotive industry, have an increased risk of colon or stomach cancer? Several previous occupational cohort studies have shown such workers to have significantly elevated proportionate mortality ratios,[1] standardized incidence ratios,[2] and standardized mortality ratios (SMR),[3] for colon cancer. Those findings apparently prompted the study by Roscoe *et al* reported in this issue of the journal. As in earlier studies, the present report includes an examination of site-specific cancer mortality in an occupational cohort, in this case white men employed in wood model making at three automotive plants in the Detroit area between 1940 and 1980, and provides standardized ratios that compare observed deaths in the cohort with expected deaths based on rates in the general population. The SMR reported here for colon cancer was only slightly elevated and not statistically significant (SMR = 1.2; 95% confidence interval [CI]: 0.8-1.9). Curiously, the information provided on cohort exposure assessment states that 42% of the job titles in the cohort were categorized as "unexposed," which suggests that many workers with minimal wood dust exposure were included. The authors have gone a step farther, however, by conducting a nested case-control study within the cohort. This approach allowed them to collect more detailed job history data than is generally feasible for large-scale occupational cohorts, thereby making possible analyses of risk by weighted wood exposure and duration of employment.

Inasmuch as the earlier literature does not suggest any increased risk for stomach cancer, the additional focus in this report on that site is no doubt based on an examination of the site-specific cancer mortality ratios within this particular cohort, rather than on any a priori hypotheses. Although the SMR reported here was of only borderline statistical significance, it was among the highest for all sites examined (SMR = 1.6; 95% CI: 0.9-2.6). Recognizing that, relative to the US population as a whole, the wood model makers cohort may include a disproportionate share of workers from areas of the world where stomach cancer rates are known to be higher than in the United States, the authors also calculated SMRs based on a comparison of observed stomach cancer deaths in the cohort with the number expected based on surrounding Wayne County rates alone. (Parenthetically, stomach cancer incidence rates among white persons in Detroit for the years 1978 to 1981 were 17% higher than for white persons from all SEER areas combined[4].) Although still not quite statistically significant, an elevated risk remained, which suggests that ethnicity is not entirely responsible for the observed findings. The authors went on to perform a nested case-control study for stomach as well as colon cancer.

Contrary to the findings of the cohort mortality studies, the findings of the nested case-control studies reported here provide no support for the notion that occupational exposure to wood model making increases risk of either colon or stomach cancer. Odds ratios for six different measures of exposure (cumulative exposure, cumulative exposure lagged by 10 years, cumulative exposure after 1955, cumulative duration, cumulative duration lagged by 10 years, and cumulative duration after 1955) were all below 1.0, in most cases markedly below 1.0. For most of the analyses, the authors made the assumption that exposures in the various job title categories were constant over the four decades from 1940 to 1984. However, they noted there was a change in the mid-1950s in the making of die models from the use of traditional hardwoods to cativa wood impregnated with epoxy resin; it was for this reason that odds ratios were calculated specifically for the variable "cumulative exposure after 1955."

Several questions arise in the interpretation of these findings. Most importantly, what was the statistical power of the analyses, given that there were only 20 colon cancer deaths and 17 stomach cancer deaths? The number of matched controls per case was 14 or 15, which certainly helped to increase power, and the results were consistent across the various measures of exposure. Still, the confidence intervals were very wide, suggesting that the power of the analyses to detect differences of the magnitude predicted by previous cohort studies probably was low. Related to this is the fact that many potentially confounding variables were initially tested for inclusion in a multivariate model and then dropped because their inclusion did not "appreciably change" the wood-exposure variable coefficients. Again, one wonders whether these variables failed to show up as significant confounders simply because of small numbers. In particular, the authors examined employment in wood model making before employment during the actual study period and found no effect. However, information on previous employment was available for only 12 of the 20 colon cancer cases and 11 of the 17 stomach cancer cases; among the colon cancer controls, the percentage with missing data was even higher than among the cases. If cases and controls with missing data differed in terms of prior occupational exposure to wood, then the ex-

posure analyses reported here could be seriously compromised, a limitation the authors acknowledged. The fact that controls were matched to cases on age and on year of birth does serve to reduce this concern.

This report, based on an occupational cohort mortality study of 2294 white men employed in automotive wood model plants and case-control studies nested in the cohort, suggests that workers exposed to wood dust in those jobs are not at increased risk to colon and stomach cancer. The authors are to be commended for the detailed (and blinded) exposure histories that were collected on each study subject for the period of employment in the plants studied. Of course, more definitive answers await studies based on larger numbers of cancer cases and more complete lifetime occupational exposure data. It is encouraging to note that the overall cancer, heart disease, and total mortality rates reported for this cohort were as expected or lower than expected based on comparisons with rates for the entire US white male population.

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### Good and Evil: Magically Infectious

A young woman contemplates slipping into a sweater previously worn by her ex-boyfriend, but she finds the garment repulsive. "It's the fact that he could somehow transmit—uh, somehow the object would pick up some negativeness," she explains to a research psychologist. "I'm not saying it would smell or have dandruff on it, but it would be creepy because he's a creepy person."

A man in the same study rejects a thoroughly laundered sweater once worn by a hepatitis victim. "I'd feel it was contaminated in some way, not only that I could get hepatitis from it, but that it was somehow contaminated, it's just not clean," he tells an experimenter. "I don't really think you could get [hepatitis] that way."

Do these cases represent rare lapses into superstition or "magical thinking" on the part of otherwise rational folks? Just the opposite, asserts psychologist Carol Nemeroff of Arizona State University in Tempe. Her research indicates that many adults routinely subscribe to some form of what Nemeroff calls "the magical law of contagion," a traditional belief noted in many non-Western cultures by anthropologists. From isolated new Guinea tribes to crowded New York streets, contagion beliefs hinge on the conviction that all sorts of sources—including friends, enemies, food, blood and hair—contain some sort of contagious entity or "essence" that transfers physical psychological or moral qualities to others through direct or indirect contact.

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