

**DOW CONFIDENTIAL**

## A B S T R A C T

DETERMINANTS OF LUNG CANCER  
AMONG CHEMICAL WORKERS

by

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Prior study of a sample of employees from Dow Chemical U.S.A., Texas Division had suggested lung cancer rates were excessive. This dissertation describes the results of two epidemiologic studies which were conducted to determine if the excess persisted upon study of all employees, and if the risk of lung cancer was associated with one or more exposures at the facility.

A historical cohort mortality study was conducted of the 19,608 males with one or more years of employment accumulated between 1940 and 1981. Vital status was ascertained through 1980 for 97.3 percent of the subjects and death certificates were obtained for 96.4 percent of the 3,444 decedents. Lung cancer occurred significantly more often than expected based on rates for the U.S. (SMR = 125) and Texas (SMR = 118), but occurred as often as expected based on rates for the five local counties (SMR = 99). Mortality from 56 other causes of death was also assessed. The influence of a number of employment characteristics, including educational level and job category, was explored using the Mantel-Haenszel method as adapted for a cohort study.

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A nested case-control study was done of the 308 lung cancer deaths. Two control groups, one of which was a decedent series, were individually matched to the cases one-for-one. Interviews were conducted with subjects or their next-of-kin to collect information on smoking and other potential confounders. Those data were combined with employee work history records and industrial hygiene data to form the basis of the analysis. Conditional logistic regression and stratification techniques were employed to examine for effect modification and to control confounding. Not surprisingly, cigarette smoking was the most important determinant of lung cancer risk. Being of lower social class and consuming foods rich in Vitamin A less often were weaker determinants. Statistically significant, positive and negative associations were found for assignment to several work areas within the facility and with presumptive exposure to several chemical and physical agents encountered in those work areas. The lack of strength and consistency of the associations precluded incriminating any particular workplace exposure as having been causally-related to lung cancer.

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