

EPIDEMIOLOGICAL STUDY
OF VINYL CHLORIDE WORKERS
FINAL REPORT

Prepared for

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CONTENTS

	<u>Page</u>
I. INTRODUCTION	1
II. PLANTS INCLUDED IN STUDY	3
III. STUDY POPULATION	4
A. Identification	4
B. Follow-up	5
C. Description	7
IV. EXPOSURE LEVELS	8
V. CALCULATIONS OF MORTALITY	10
VI. STANDARDIZED MORTALITY RATIOS	13
A. For the Total Population	13
B. For the Population Grouped by Maximum Estimated Exposure Level	13
C. Consideration of Duration, Time of Exposure, and Maximum Exposure	14
D. Integrated Doses	16
E. Analysis of Long-term PVC Production Workers	17
VII. SELECTED GROUPS OF DEATHS	18
VIII. DISCUSSION	21
IX. SUMMARY & CONCLUSIONS	23

IX. SUMMARY & CONCLUSIONS

This is the final report of a study of the mortality of workers exposed to vinyl chloride and its polymers, which augments studies reported in 1974 and 1975. The current report increases the total population of workers studied from 8,384 to 10,173, with the number whose vital status was determined increasing from 7,128 (85 percent) to 9,677 (95.1 percent). The number of deaths has more than doubled; there are now 669 certified and available for analysis, compared with 328 in the original study. The follow-up period concluded December 31, 1972, for both the original study and the augmented final study.

The successive additions to the population and improved follow-up have been accompanied by a rise in the overall-cause Standardized Mortality Ratio (SMR) from 75 in 1974 to 89 in the current analysis. The major change has been in the SMR for cardiovascular and renal disease, which was originally 80 and is now 95. There has been a concurrent downward shift in the SMR for "all malignancies," which is now 104 compared with 110 in the previous report.

In the current study the SMR's for malignancies of various sites are also lower than in the 1974 and 1975 reports. The SMR for gastrointestinal tract tumors dropped from 94 to 75 in successive reports (these included 5 deaths from hepatic angiosarcoma); that for respiratory tract cancer (uncorrected for smoking) dropped from 112 to 107; and that for cancer of other and unspecified sites from 155 to 147. There is, nevertheless, still some support for the hypothesis that vinyl chloride may increase the incidence of cancer slightly in sites other than the liver. The principal evidence for this is the observation that the incidence of lung cancer and miscellaneous cancers appears to be higher in individuals with higher maximum exposures

and those with longer exposure periods.

Brain tumors were found to be in excess, 12 observed vs. 5.9 expected (significant at the 0.05 level) but the incidence was not related to either duration of exposure or to intensity of exposure to VCM.

This population should be studied again within the next 5 years. Since the time of observation after first exposures will be longer, and more deaths will be available for analysis, it is possible that some of the questions about cancer in sites other than the liver may be resolved.

Table 1
Distribution of Vinyl Chloride Plants Studied
by Product and Numbers of Workers

<u>Product or Products</u>	<u>Number of Plants</u>	<u>Number of Workers</u>	<u>Number Traced</u>
Polyvinyl chloride only	18	6,848	6,468
Vinyl chloride monomer only	11	1,214	1,177
PVC and VCM	3	935	910
Copolymers, resins, with or without PVC and VCM	5	1,176	1,122
TOTALS	37	10,173	9,677

Table 2

Distribution of Vinyl Chloride Plants and Vinyl Chloride Workers
by Census Regions and Geographic Divisions

Region	Geographic Division	Percent of U.S. male Population (1970)	Number of Plants in Study	Number of Workers in Study	Number Traced
All regions		100.0	37	10,173	9,677
Northeast		23.8	8	1,619	1,550
	New England	5.8	2	467	453
	Middle Atlantic	18.0	6	1,152	1,097
North Central		27.9	6	1,872	1,817
	East North Central	19.8	6	1,872	1,817
	West North Central	8.0	-	--	--
South		30.9	22	6,589	6,218
	South Atlantic	15.1	5	1,735	1,620
	East South Central	6.3	4	2,868	2,655
	West South Central	9.5	13	1,986	1,943
West		17.4	1	93	92
	Mountain	4.1	-	--	--
	Pacific	13.2	1	93	92

Table 3

Follow-up

