

EPIDEMIOLOGICAL STUDY
OF
VINYL CHLORIDE WORKERS

~~Final Report~~

April 15, 1974

Prepared for
The Manufacturing Chemists Association
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DRAFT
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EPIDEMIOLOGICAL STUDY OF VINYL CHLORIDE WORKERS

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I. SUMMARY

A historical prospective study of 8384 workers with occupational exposure to vinyl chloride revealed a generally favorable mortality experience compared with the U. S. male population. Overall mortality was about 76 percent of what would be expected in a comparable U. S. male population.

However, there was a measurable excess of digestive cancers, especially liver, respiratory cancers, and other unspecified cancers in which brain cancer predominated. An excess of buccal cancer was found, but was apparently unrelated to any measure of exposure obtained.

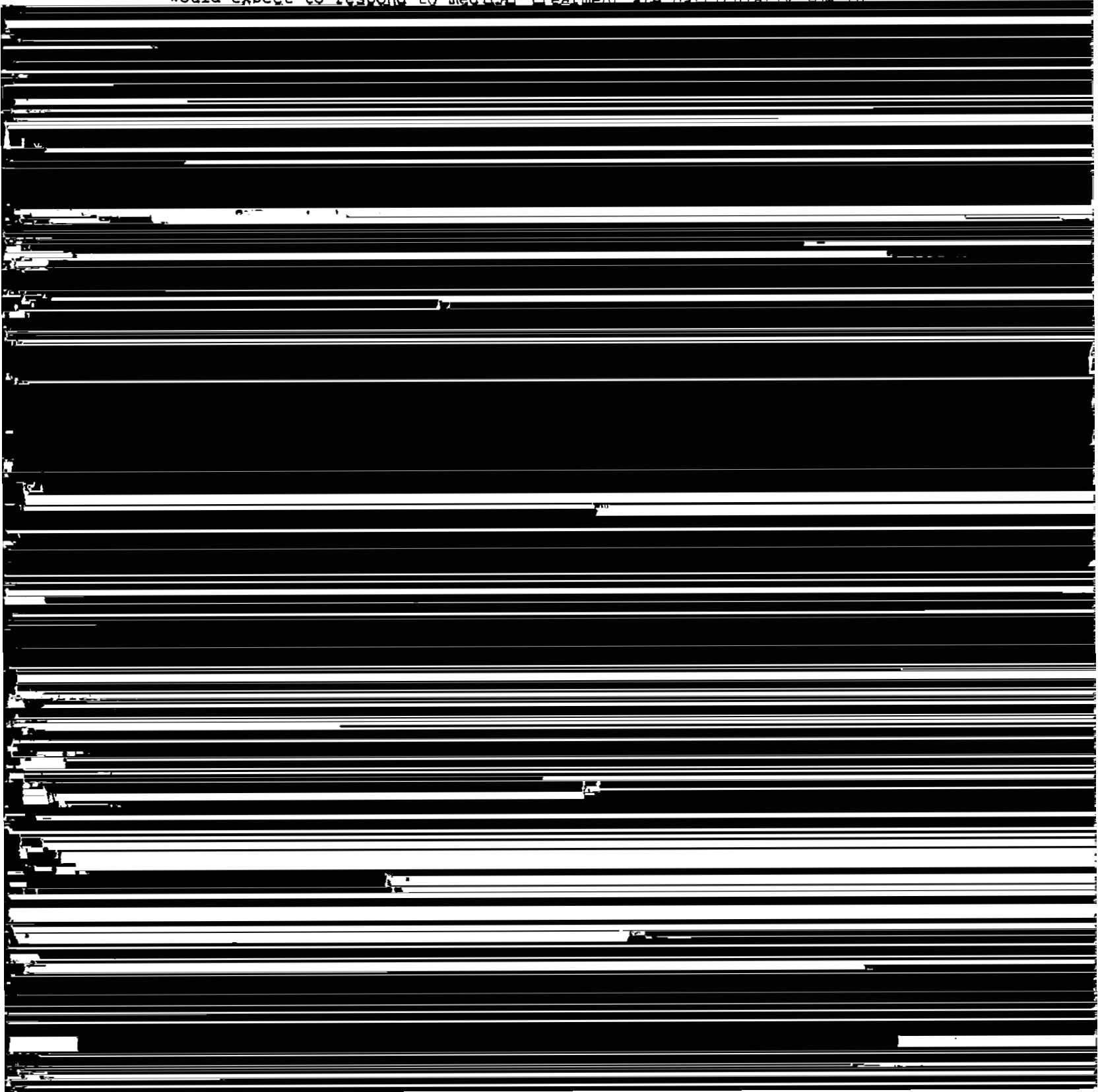
The study was begun before the relationship of angiosarcoma to vinyl chloride exposure was known to TCA, Inc. Among the liver cancers found through the study, however, two were certified as due to angiosarcoma.

Although the report is a final one for the purposes of the present contract, it is incomplete in two major areas.

1. The follow-up rate of 85 percent is relatively low, and the workers not found represent a relatively older group whose exposures terminated some time ago, providing a latent period within which malignancies or other chronic conditions might have developed.
2. A group of about 1500 workers whose exposures occurred up to 35 years ago was discovered as the study ended, and are not included. This group, by virtue of its age and the possible severity of the earlier exposure, could represent a source of mortality which might change the picture with respect to chronic conditions and affect the relative mortality.

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The favorable mortality is due in part to the initial selection of the work force, and possibly in part to the fact that employed populations are more likely to have access to adequate medical care. Table 7 shows that the SMR's from causes such as pneumonia, ulcers, etc. which one would expect to respond to medical treatment are particularly low in



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The SMR from "other and unspecified malignancies" is 155. Table 11 shows the relevant circumstances of the 17 deaths included in this category. Of the 12 deaths for which a primary site could be identified, the majority were due to brain cancers. From ~~Table 5~~ ^{Table 5} it is possible to calculate that about 22 percent of "other and unspecified malignancies" would ordinarily be brain cancer. In the present study it is about 40 percent, so that brain cancer is present in excess.

Table 12 shows the deaths from cancer of the buccal cavity and pharynx with an SMR of 189. Although most of these men were over 50 at the time of death, their exposures tended to be relatively short compared with the cases in Tables 10 and 11.

The overall picture indicates an excess risk from cancer of the buccal cavity and pharynx, liver cancer, specifically angiosarcomas, and brain cancer, and a slight excess risk from lung cancer, ~~but~~ though none of these is statistically significant.

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Table 8 shows the relationship of risk of death to estimated exposure, as measured by the time weighted average. One would expect that causes which were in fact related to level of exposure would be higher in the group with higher time weighted averages ^{Score}

The overall SMR is higher in the high exposure group. This appears to be due to a moderate increase in the cardiovascular diseases and a rather substantial increase in malignancies. In particular, the SMR's for digestive cancer are 59 in the low exposure group versus 141 in the high; respiratory cancer goes from 86 to 146, and lymphosarcoma goes from 30 to 210. On the other hand, malignancies of other and unspecified sites show no substantial change with exposure level, while buccal cancer is

See also with study subject