

THE RELATIONSHIP BETWEEN DRINKING WATER CHLORINATION AND
CAUCASIAN CANCER
MORTALITY IN FOUR RHODE ISLAND COMMUNITIES

by

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ABSTRACT

A non-concurrent prospective ecological study was conducted to investigate the possible relationship between trihalomethane (THM) by-products of water chlorination and human cancer. Chlorine dose was used as a surrogate for THM exposure. The study areas were four Rhode Island communities whose water supplies, historically, displayed distinct prechlorination levels, such that a rough gradient of chlorine exposure could be established among them. Risks were assessed in terms of a simple chlorine/non-chlorine effect and in terms of dose-response trends. Caucasian mortality data were abstracted from the Rhode Island Health Department's Vital Statistics Death File for the years 1968 to 1980. Sex- and site-specific age-adjusted mortality rates were calculated for each town; from these rates relative risks for the six possible two-town comparisons were determined. Relative risks for the chlorine/non-chlorine dichotomies suggested a positive association between chlorination and male cancer mortality, especially for the colon, rectum, kidney and leukemia categories. Female relative risks tended to be less than one, even for the the colon, rectum and stomach sites. Dose-relationships were indicated most strongly for male leukemia, prostate, colon-rectum and total can-

cer mortality. Conversely, total female cancer mortality was found to decrease significantly with increasing exposure in one instance. The female findings are difficult to assess, and seem to point to powerful confounding forces acting upon female cancer mortality. The results of this study must be viewed with some caution in light of the numerous uncontrolled factors; the findings do, however, indicate the need for further, more sophisticated studies of the chlorine/cancer relationship in these communities.