



Fact Sheet on Water Chlorination

On July 1, 1992, the Journal of the American Public Health Association published an article by Robert Morris and coworkers reporting a weak but positive association between the consumption of chlorinated drinking water and the incidence of bladder and rectal cancer. The authors performed a statistical evaluation called a meta-analysis from epidemiology studies published between 1966 and 1991. Their results are similar to what has previously been reported by Cantor et al. in 1987.

Although a positive association was reported, this study does not demonstrate a causal association between chlorinated drinking water and cancer. The studies used in this analysis have also been reviewed by the International Agency for Research on Cancer (IARC). IARC considered these studies to be inadequate for determining the carcinogenicity of chlorinated drinking water in humans. EPA currently supports the IARC conclusions. In addition, EPA continues to support the disinfection of drinking water for the purpose of reducing the risk of waterborne disease. The known risk of waterborne disease in humans that occurs if water is not disinfected is much greater than the theoretical risk of developing cancer from the consumption of chlorinated drinking water.

The risk of cancer from chlorinated drinking water is often associated with organic by-products produced when chlorine is added to water containing organic material. EPA established a regulation of 0.1 milligram per liter (mg/L) in 1979 to control one group of by-products, the trihalomethanes, which includes chemicals such as chloroform. EPA is currently revising that regulation to reflect current scientific developments. In addition, EPA is developing new regulations for other by-products and the disinfectants themselves. The regulations are scheduled for proposal in June, 1993 and are to be finalized in June, 1995.

Water Chlorination - Background

- Chlorine is added to water to kill bacteria, viruses and other microorganisms that cause disease.
- Chlorination first began in the early 1900s. As a result, diseases such as cholera and typhoid have been nearly eliminated.
- In 1974, chloroform was found to occur in water following chlorination. Additional byproducts have since been identified as byproducts of the reaction between chlorine and organic material found in water.
- Chloroform, a trihalomethane (THMs), is an animal carcinogen. Some of the other by-products have also been shown to cause cancer or other adverse health effects in animals.
- EPA established a regulation in 1979 that limited the amount of THMs to 0.1 mg/L for water supplies serving 10,000 people or more.
- In the 1980s, several epidemiology studies reported an increased risk of bladder, colon and rectal cancer in individuals drinking chlorinated drinking water, however studies evaluating the carcinogenicity of chlorine in animals are negative.
- The International Agency for Research on Cancer (IARC) reviewed the available epidemiology data in June 1990 and concluded that they were inadequate to determine the carcinogenicity of chlorinated drinking water.