

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE  
PUBLIC HEALTH SERVICE

Refer To: PS, CPB-10  
September, 1969

RELATIONSHIP OF AIR POLLUTION TO COMMUNITY WATER FLUORIDATION

Fluoride concentrations in ambient air (atmosphere) pose no problem for communities with water fluoridation.

Ambient fluoride concentrations are routinely measured at all of the National Air Sampling Network Stations. The data collected do not support claims of hazards from inhaled fluoride to people living in communities with fluoridated water supplies.

The following statement has been prepared by the National Air Pollution Control Administration:

Assuming that the maximum fluoride concentration of approximately 2.0 micrograms per cubic meter, reported by the National Air Sampling Network was present continuously in the atmosphere of a city having 1.0 ppm fluoride in its water supply, intake of this atmospheric fluoride concentration could increase the total fluoride intake by only five percent. This figure was derived as follows: if an individual breathes 0.8 liters per breath at a rate of 20 breaths per minute for 24 hours per day and lives in an atmospheric fluoride concentration of 2.0 micrograms per cubic meter, he would absorb 46 micrograms of fluoride in one day. This assumes that 100 percent of inhaled fluoride was absorbed into the blood stream.

Simultaneously he would ingest 1000 micrograms of fluoride if he consumed one liter of water containing 1.0 ppm fluoride. Of the total intake of 1046 micrograms fluoride from these two sources, 46 micrograms (approximately 5 percent) would be contributed by inhalation. This small contribution would result only under conditions of continuous and very high atmospheric fluoride exposure and under the unrealistic assumption of complete absorption of all inhaled fluoride.

Data reported by Edward J. Largent (A.M.A. Archives of Industrial Health 21: 318-323, 1969) and F. J. McClure and C. A. Kinser (Public Health Reports 59: 1575, 1944) give evidence for achievement of a metabolic balance in the human between total intake and total output of fluoride. This balance was achieved even in the presence of high levels of daily fluoride intake ranging from 3500 micrograms to 8000 micrograms. In the same article by Largent evidence is presented to show that when other sources of fluoride were controlled inhalation of high concentrations of particulate or gaseous fluoride resulted in a ready fluoride excretion closely related to the concentrations of fluoride in the inhaled air. This evidence supports the contention that fluoride concentrations in ambient air are unlikely to add to the total body concentration of fluoride in communities having fluoridated water.

Community Programs Branch  
Division of Dental Health  
National Institutes of Health  
Bethesda, Maryland 20014