Letters to the Editor

To the Editor:

I am concerned about the strong recommendation for changes in public policy related to fluoride concentrations in public water supplies in the article "Dental Caries and Dental Fluorosis at Varying Water Fluoride Concentrations" (J Public Health Dent 1997;57(3):136-43). One reason for my concern is the authors' assumption that the children were exposed to the same fluoride level both at home and at school. By assuming that the fluoride concentration of the children's (some of whom were as old as 17 years of age) school water supply coincides with their drinking water source at home during the first five or six years of life, the authors use a surrogate measure for systemic fluoride ingestion. This surrogate measure as indicated in their discussion introduces an "imprecision." Moreover, despite the imprecision, fluorosis does not appear to be a serious problem when only 5.7 percent of the children exhibited fluorosis higher than the very mild level.

One conclusion stated in the abstract suggests that "a suitable tradeoff between caries and fluorosis appears to occur around 0.7 ppm F." Statements made throughout the "Results" section are weak to support this conclusion. For example, referring to Figure 1, the authors state that "dfs declined sharply from 0 ppm F ... to 0.6 ppm F," and that "a gradual decline in DMFS occurred from 0 ppm F to 0.7 ppm F, and plateaued to 1.2 ppm." The figure shows fluctuations for both the dfs and DMFS scores at different ppm F concentrations that are ignored. Furthermore, the lowest dfs and DMFS scores are at concentrations above 1 ppm F. In Figure 2, the mean severity score and fluorosis prevalence are lower at an F concentration of 1.1 ppm F than at 0.7 ppm F; however, this relationship is not mentioned in the discussion. Table 5 shows a mean severity score of 0.43 in areas with 0.3 to <0.7 ppm F, and of 0.58 in areas with 0.7 to 1.2 ppm F. These values are considered of borderline public health significance according to Dean, and were not significantly different from each other.

Most importantly, a cross-sectional study is not a suitable choice for establishing a causal relationship between exposure to fluoride concentrations in the water and dental fluorosis or for suggesting a possible change in public policy. In my opinion, a longitudinal study plus information on all sources of systemic fluoride must be included to suggest a "reconsideration" of policies concerning recommended fluoride concentrations of water.

—María Teresa Canto, MS, DDS, MPH, Silver Spring, MD.

In response to the letter by Dr. Canto:

We feel we were being appropriately conservative in simply recommending that a reconsideration of our water fluoridation policies would be timely, based on our findings and the research of others regarding changing patterns of dental caries and fluorosis. All public policy (including fluoride policy) needs to be reevaluated constantly based on the best current scientific understanding.

For the reasons we stated in the paper, the use of the school water sample for fluoride estimation was superior to imputing fluoride exposure from the residential histories and CDC Fluoridation Census data. While some random error was likely, we do not see how bias would have been introduced by taking school water fluoride levels as a proxy for lifetime exposure to fluoride from water. The fluoride level at school is just as likely to be higher than at the home as it is to be lower, and for the vast majority is likely to be the same.

In Figure 1 there is some fluctuation, particularly for the DMFS curve. The important observation, however, is that there is no apparent decrease in caries between 0.7 and 1.2 ppm F for either curve. While the lowest caries levels are above 1 ppm, this is a range that few would recommend for caries prevention.

There is clearly a great deal of fluctuation in the fluorosis curves in Figure 2. What is important here is the general trend toward increasing fluorosis with increasing water fluoride levels. This pattern is to be expected and has been shown in many other epidemiologic and laboratory studies.

We make no subjective interpretation of what level of fluorosis constitutes a serious public health problem. This is a very important and serious issue that will long be studied and debated. What is much more important than the issue of fluorosis severity is the question of how much fluoride is enough for sufficient caries reduction; it is prudent to use the lowest level that will achieve our public health goals. From these data, 0.7 ppm F is as effective as 1.0 ppm. If we can get less fluorosis at the lower fluoride level, so much the better.

We make no claims of establishing any causal relationships from these cross-sectional data. We do feel it is appropriate for results from studies such as these, when considered as a whole, to be used for policy formulation, especially when they are the only data available. Recall that our present fluoridation policies are based on cross-sectional data from over 60 years ago. While longitudinal studies have certain inherent benefits and would be very valuable, such studies are unlikely to be conducted in the near future. We should not allow the lack of such data to be an excuse for not examining the extensive cross-sectional data we now have available and using this information for guiding our policy decisions.

—Keith E. Heller, DDS, DrPH; Stephen A. Eklund, DDS, MHSA; Brian A. Burt, BDS, MPH, PhD; University of Michigan School of Public Health, Ann Arbor, MI.