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Knowledge of the Purpose of Community Water Fluoridation -- United States, 1990

Expansion of water-fluoridation programs in the United States has been based on the clear documentation of the caries-preventive benefits of fluoride (1), as well as resources made available since the 1970s through the Fluoridation and Preventive Services Block grants administered by CDC. An estimated 135 million persons in the United States -- approximately 61% of the population served by public water supplies -- have access to drinking water with clinically important levels of fluoride (0.7 ppm or higher) for the prevention of dental caries (2). Efforts to expand the implementation of community water fluoridation require dissemination and understanding of information about health benefits and purported health risks. This report summarizes results from the 1990 National Health Interview Survey (NHIS) regarding public knowledge of the purpose and value of fluoridation of community drinking water.

Data for the NHIS were collected by CDC's National Center for Health Statistics through personal interviews with a representative sample of the civilian, noninstitutionalized, U.S. population aged greater than or equal to 18 years. The NHIS is conducted throughout the year and has two parts: a basic health and demographic questionnaire (core) that is constant, and several specific health-topic questions directed to adults in sample households. The 1990 NHIS included 41,104 respondents. Respondents were asked: "As you understand it, what is the purpose of adding fluoride to the public drinking water?" Interviewers coded responses as one of the following: "prevent tooth decay, protect teeth, or related response"; "purify the water or related response"; "other"; or "don't know." Analysis reflects adjustment for unequal probabilities of selection and for clustering introduced during sampling.

Almost two thirds (62%) of respondents correctly identified the purpose of fluoridation. Correct knowledge of the purpose of fluoridation was highest for persons aged 35-54 years (68%-70%), than for persons aged 18-24 years (49%) and aged greater than or equal to 75 years (40%) (Table 1).

Persons with more than a high school education were more than twice as likely than those with less than a high school education (76% versus 36%) to correctly identify the purpose of fluoridation. Among persons with a high school education, 61% answered correctly. Among

persons with less than a high school education, 30% believed the purpose of fluoridation was to purify water, compared with 36% who knew it was for preventing tooth decay.

Persons who were edentulous (i.e., had lost all of their natural teeth) were less likely to know the correct purpose of fluoridation than were persons who still had their natural teeth (44% versus 64%). In addition, persons who visited the dentist 1-3 times during the preceding 12 months (66%-69%) were more likely to know the correct purpose of fluoridation than those who had not visited the dentist (50%). Reported by: Disease Prevention and Health Promotion Br, Epidemiology and Oral Disease Prevention Program, National Institute of Dental Research; Musculoskeletal Disease Br, Extramural Program, National Institute of Arthritis and Musculoskeletal and Skin Diseases, National Institutes of Health. Div of Oral Health and Office of the Director, National Center for Prevention Svcs, CDC.

Editorial Note

Editorial Note: Dramatic declines in dental caries in the United States during the past half century that have been attributed largely to water fluoridation and other fluoride therapies reflect the public importance of fluoride exposure to human health (1). At the same time, continuing concerns have been raised about possible adverse health effects of fluoride.

Because more than one third of the U.S. adult population cannot correctly identify the purpose of fluoridation, these persons may be less likely to make an informed decision when presented with conflicting information about the benefits and risks of fluoridation during local efforts to fluoridate. The findings of the NHIS suggest that misunderstanding of or resistance to fluoridation may be associated with the age and educational composition of a community. For example, because older populations have higher rates of edentulousness and are less likely to visit dentists, opportunities for reinforcement of the benefits of fluoridation are reduced (3).

Efforts to fluoridate water may be subjected to greater levels of scrutiny than other public health interventions because fluoridation is a purposeful process to benefit individuals that must be instituted at the community level. For example, issues involving the relation between fluoridation and bone health and osteoporosis are representative of the range of concerns raised about potentially serious health effects of fluoridation. In the United States, approximately 250,000 hip fractures occur each year; osteoporosis is an important underlying risk factor for this problem (4). However, based on reports from public health agencies, the importance of results from some recent studies examining the relation of fluoride in drinking water to bone health and bone fracture susceptibility (5-10) appears to have been overinterpreted.

To address concerns about the possible relation of bone health to fluoride exposure, the National Institutes of Health (NIH) convened a conference of experts to evaluate current public health practices regarding fluoride (11). The conference participants concluded that there was not an "adequate basis for making firm conclusions relating fluoride levels in drinking water to hip fracture and bone health" (11), and there were no recommended changes in the Public Health Service policy regarding fluoride.

Since the NIH conference, two additional studies have been reported regarding the relation of fluoride exposure to bone health (9,10,12). An ecologic study involving three communities in Utah reported weak statistical evidence of increased risk for hip fracture in the exposed community (9); however, this study was constrained by a variety of methodologic limitations (10). The second

study, conducted in Rochester, Minnesota, used a historical baseline incidence of hip fracture in a highly stable population; in this study, there was no increased risk for hip fracture following institution of fluoridation (12). The findings of these additional studies do not alter the conclusions and recommendations of the NIH conference.

The findings of the NHIS indicate a continuing modest level of knowledge of the purpose of fluoridation in the United States -- especially among young adults, the oldest adults, and the least educated. These findings, coupled with conflicting information and possible misinterpretation about safety, may hinder efforts to expand fluoridation. Accordingly, health-care providers, public health agencies, and schools should intensify efforts to educate the public, especially children and young adults, about the benefits of fluoridation and maintaining oral health.

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