

## U.S. DEPARTMENT OF HEALTH, EDUCATION AND WELFARE

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ADULT DENTAL HEALTH BENEFITS FROM FLUORIDATION  
DOCUMENTED IN NEW AMERICAN AND BRITISH REPORTS

Attached are abstracts and excerpts from five recent reports on adult benefits from fluorides. These are an addendum to the annotated bibliography distributed with CPB-15 in May 1970.

In two reports, the U.S. Navy presents their conclusions that the increased number of caries-free recruits entering the Navy in recent years is related to the availability of fluoridated water in the areas where they lived during the years of tooth development.

The three other reports concern an investigation of adult dental health in a naturally fluoridated area of Great Britain which shows that residents up to age 65 have significantly less tooth decay, fewer missing teeth, and a lesser need for partial dentures than persons the same age living in a nonfluoridated area. The author calls attention to the fact that these favorable results were achieved even though there were "three times as many dentists, per head of population, in York (nonfluoridated) than in Hartlepool (fluoridated)." He concludes that "the beneficial effect of fluoride drinking water has been shown to persist throughout life."

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Enclosure  
Annotated Bibliography on Adult Benefits  
from Fluorides - Addendum 1

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ANNOTATED BIBLIOGRAPHY ON ADULT BENEFITS FROM FLUORIDE  
(Addendum 1, February 1972)

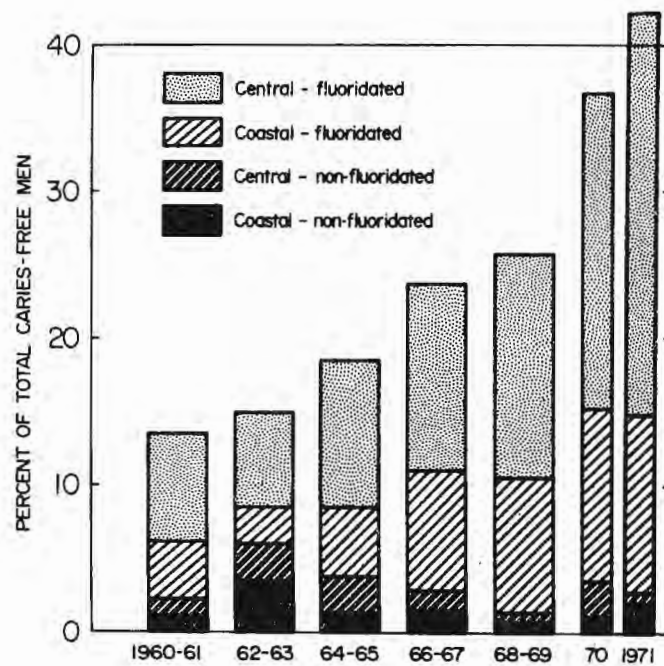
Keene, H. J., et al: "Prevalence, incidence and geographic distribution of caries-free naval recruits," Naval Dental Research Institute, Naval Training Center, Great Lakes, Illinois, Research Progress Report NDRI PR 69-08, June 27, 1969. (Excerpts)

For a number of years the Naval Dental Research Institute at Great Lakes has been conducting a longitudinal study on caries-free naval recruits to learn more about the factors which may be operating in their resistance to dental caries. Preliminary findings relating to the epidemiology, microbiology, biochemistry, and clinical aspects of this interesting group have been reported. . . . A 9-year survey on over 500,000 recruits at the Great Lakes Naval Training Center indicates a prevalence of caries-free men of about 0.2% or 2 men per 1000. . . . Marked variations occurred in the prevalence of caries-free men within the various geographic regions of the United States. These differences were partly related to regional variations in the availability of natural fluoride in public water supplies.

Keene, H. J., Shklair, I. L., and Hoerman, K. C.: "Caries immunity in naval recruits and ancient Hawaiians," Naval Dental Research Institute, Great Lakes, Illinois; paper given at the 138th meeting of the American Association for the Advancement of Science, Philadelphia, Pennsylvania, December 1971. (Excerpts)

During the 12-year period from 1960 to 1971, in which 657,893 recruits came to Great Lakes for basic training, a total of 1716 men were found to be caries-free, for an overall prevalence of 0.261%, or 2.6 men per 1000. . . . In the 1960-5 group of caries-free men . . . the combined New England and Middle Atlantic states . . . accounted for close to 50% of the recruit population, but only 10.4% of the caries-free group. The West South-Central, West North-Central, Mountain, and Pacific states, on the other hand, provided Great Lakes with a relatively small number of recruits (7.1%), but these four regions accounted for 27.5% of the caries-free group. . . . The prevalence of caries-free men . . . was found to correlate . . . with the availability of natural fluoride in the public water supplies of 44 states. Where the availability of natural fluoride was low . . . the prevalence of caries-free men was also low. . . . The increased prevalence of caries-free recruits at Great Lakes in recent years (9.1 per 1000 in 1971) as well as the leveling off of regional differences seems most certain to be related to the gradual increase in population served with artificially fluoridated water in this country since the late 1940's.

Distribution of caries-free recruits from four groups of cities



The first thing that strikes us in this chart is the gradual increase in prevalence of caries-free men from large cities in general during this 12-year period. In 1960-61, less than 15% . . . came from these cities, as compared to approximately 40% by 1970-71. . . . Of the 1970-71 total recruit population, about 10% came from Central fluoridated cities and about 5.3% from Coastal fluoridated cities. . . . It is clear . . . that the effect is entirely the result of gains made by the Central and Coastal cities which started fluoridation in the early 1950's. The nonfluoridated cities have barely changed throughout this period, averaging less than 4% of all caries-free recruits.

Murray, J. J.: "Adult dental health in fluoride and non-fluoride areas. Part 1. Mean DMF values by age," British Dental Journal 131:391-5, November 2, 1971. (Author abstract)

The dental condition of 2,135 adults, aged 15 to 65 years, continuously resident in Hartlepool, a natural fluoride area, was compared with that of 2,639 adults from York, a low fluoride area. Mean DMF values for the general and dentate populations were consistently lower in Hartlepool than in York. Hartlepool DMF values were 40 to 50 per cent lower than those observed in York up to the 30 to 34-year age group. At ages beyond 34 years the percentage difference between the two communities diminished with age because of the increasing proportion of missing teeth in the DMF. In spite of this, observed DMF values in Hartlepool were lower than those observed in York for all ages up to and including the 60 to 65-year age group, demonstrating that continuous residence in a high fluoride area has lifelong beneficial effects.

Murray, J. J.: "Adult dental health in fluoride and non-fluoride areas. Part 2. Caries experience in each tooth type," British Dental Journal 131:437-42, November 16, 1971. (Author abstract and excerpt)

The caries experience of each tooth type in adults aged 15 to 65 years living in Hartlepool (1.5 to 2.0 ppm F) and York (0.15 to 0.28 ppm F) was determined. The mean number of carious teeth in 60 to 65-year-old continuous residents in Hartlepool was approximately equal to the mean number of carious teeth in 20-year-old adults from York. At 60 to 65 years in Hartlepool, approximately 45 per cent of teeth were carious; in York, at the same age, approximately 60 per cent of teeth were carious, therefore maximum caries experience in Hartlepool was 25 per cent lower than in York. Fluoride in drinking water reduced the prevalence of dental caries in all tooth types, but the preventive action was most marked in those teeth with the lowest caries experience (mandibular incisors) and least marked in those teeth with the highest caries experience (first molars). Approximal caries in maxillary incisors was 66 per cent lower in Hartlepool than in York . . . It is concluded that continuous residence in a fluoride area has substantial beneficial effects in that it reduces the prevalence of caries in the community. The caries inhibitory property of fluoride in drinking water was observed throughout life.

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NOTE. -- Underscore supplied.

Murray, J. J.: "Adult dental health in fluoride and non-fluoride areas. Part 3. Tooth mortality by age," British Dental Journal 131:487-92, December 7, 1971. (Author abstract)

The mortality of teeth by age in Hartlepool, a natural fluoride area, and York, a low fluoride area, was determined. Throughout the whole age range, the mortality of each tooth type was lower in Hartlepool than in York. Tooth mortality in Hartlepool dentate people lagged approximately 10 years behind tooth mortality in York dentate people. The effect of the lower tooth mortality in Hartlepool was that the need for partial dentures was lower in Hartlepool than it was in York. The results of this study have shown that, even in an area with one of the lowest dentist/population ratios in the country, the presence of 1-5 to 2-0 ppm fluoride in drinking water resulted in a lower caries experience, a lower tooth mortality and a smaller need for partial dentures compared with a non-fluoride area with one of the most favourable dentist/population ratios in the country. These benefits were observed for all ages up to 65 years.

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