

## Water Fluoridation Reduces Cost of Dental Care

*Nationwide, school children miss an estimated 1.6 million days of school per year due to dental conditions. Many studies have verified the safety and efficacy of community water fluoridation in reducing tooth decay. The Texas Department of Health (TDH) addresses children's dental needs through the Texas Health Steps Dental (THSteps Dental) program, which is available to all Texas Medicaid eligible children, 1 through 20 years of age. In fulfillment of a mandate from the 75<sup>th</sup> Legislature, THSteps Dental program assessed the impact of community water fluoridation on dental services provided through the Medicaid THSteps program. The following summary is from the May 2000 TDH report, Water Fluoridation Costs in Texas.*

Community water fluoridation has a 50-year history of effectively and safely preventing dental caries. Most studies of fluoridation have examined the degree of caries reduction in the community. In the early decades, this assessment showed a median 58% reduction. More recent data have shown a range of 30% to 60% reduction, largely due to the use of other fluorides, particularly in toothpaste. Fluoridation provides the greatest benefits for deciduous and permanent teeth.

Studies in New Zealand in the 1960s and in Eastern Europe in the 1970s showed that reported dental treatment costs, a measure of efficiency, were cut by half with fluoridation. The efficiency of water fluoridation to reduce dental costs can be expected to have declined due to the introduction of other sources of fluoride, but this effect is less studied. The Centers for Disease Control and Prevention (CDC) estimates that each \$1 expended on fluoridation results in a savings of \$80 in dental treatment costs, across the whole population. The estimated nondiscounted per capita expenditure for water fluoridation during a lifetime (\$.51/year x 75 years) for the United States was approximately equal to the average, nondiscounted cost of one dental restoration or filling. A 1989 study in Scotland reported a rise of 21% in all dental treatment costs and a doubling of cost of dental restorations (fillings for tooth decay) with cessation of water fluoridation.

Along with its reduction in caries, the only other scientifically established effect of water fluoridation, is that 8% to 15% of children

whose teeth develop with fluoridation show varying degrees of tooth whitening known as dental fluorosis. This whitening is graded as very mild and mild by Dean's Index of dental fluorosis. More severe forms of fluorosis, such as brown staining and hypoplasia (tooth surface defects), are not associated with optimal fluoride levels in water. There is evidence that fluorosis has risen in recent decades in prevalence but not in severity. This increase is attributed to fluorides other than those derived from water fluoridation, including intake of fluoride by young children as a result of swallowing toothpaste.

Texas drinking water overall is consistently fluoridated in keeping with US Public Health Service (USPHS) recommendations. Communities access their water from primary and/or wholesale (secondary) water supplies. Water fluoridation levels obtained from primary and wholesale water supplies indicate that approximately 70% of the population uses fluoridated water. The comparison of communities that have fluoridated drinking water with communities that do not is confounded by the beneficial "halo" effect of the fluoridated water supplies. That is, residents of nonfluoridated communities consume foods processed with water from fluoridated communities. Along with the unquantifiable exposures to fluoride via other sources such as fluoridated toothpaste, this "halo" effect tends to obscure the full benefits of community water fluoridation.

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In addition, the distribution of caries has changed significantly as decay rates have declined. Only one-fourth of children and teens account for over two-thirds of the disease. Higher caries rates are experienced by individuals from low income households, those with lower educational attainment or opportunity, and those from certain racial and ethnic minorities. Children with special health and developmental needs and persons from nonfluoridated communities also experience increased rates of decay.

The median water fluoride level was calculated for each county, weighted by population, and compared with the claims paid to dentists in fiscal year (FY) 1997 for treatment of children from low income families, aged 1 through 20 years, under the Texas Health Steps (EPSDT-Medicaid) Program. Over 80% of the Texas Health Steps (EPSDT-Medicaid) dental costs are related to examination, prevention, and treatment of tooth decay.

Statistical analysis of dental care costs and county water fluoride levels showed that for an initial one part per million rise in water fluoride level

(0.0-1.0 ppm fluoride), the average cost of dental care per child declined \$24 per year. This estimated cost savings in public dental care could be realized if water fluoridation was provided in communities with less than optimal water fluoride levels. Approximately 30% of Texas citizens currently receive drinking water containing less than optimal fluoride levels (Figure 1). Table 1 shows the significant dental cost savings that publicly financed programs in selected Texas cities are likely to realize following implementation of optimal water fluoridation (0.8 ppm). These findings are consistent with national studies which report a reduction in childhood caries in communities with optimal water fluoridation levels.

The wide implementation of community water fluoridation in Texas has resulted in substantial savings in publicly financed dental care under the Texas Health Steps (EPSDT-Medicaid) Program. An overall reduction in the average Texas Health Steps (EPSDT-Medicaid) dental care costs by \$19 yearly could be realized if communities maintain optimal water fluoride levels, and further savings are

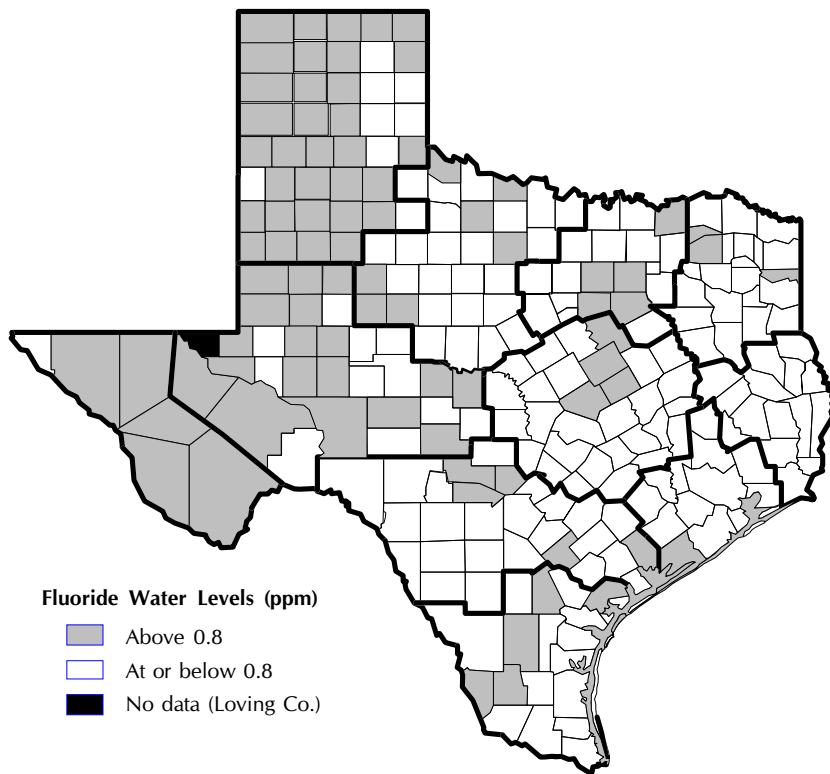
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**Table 1. Public Dental Program Costs**

County (Major city)	Fluoride Level (ppm)	Estimated Start Up Costs*		Estimated Savings/Year	
		Ave/Child	Total	Ave/Child	Total
Taylor (Abilene)	.32	\$1.30	\$172,000	\$15	\$58,000
Tom Green (San Angelo)	.40	\$.70	\$75,000	\$12	\$35,000
Bexar (San Antonio)	.24	\$1.40	\$1,999,000	\$18	\$1,072,000
Bowie (Texarkana)	.14	\$1.90	\$168,000	\$19	\$69,000

\*Estimated yearly maintenance costs would be less than \$.35/person/year.

**Figure 1. Fluoridation Levels in Texas by County, July 1999**



possible through implementation of community water fluoridation in areas where it is lacking but feasible. Failure to implement this public dental preventive measure will continue to result in substantially greater costs of dental care in some Texas communities, including the costs of publicly financed dental care borne by all taxpayers.

**Recommendations**

In its report to the Texas Legislature, TDH recommended that legislation should facilitate, when economically feasible, fluoridation for communities with a less than optimal public water

fluoridation level. In addition the Department recommended that all fluoridated water systems be required to conduct routine monitoring and reporting of fluoride levels.

**Summarized from** the TDH report, *Water Fluoridation Costs in Texas, Texas Health Steps (EPSDT—Medicaid), In Fulfillment of House Concurrent Resolution 145, Texas 75<sup>th</sup> Legislature, May 2000.*

*This report is available online at* <http://www.tdh.state.tx.us/dental/flstudy.htm>



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## **February is National Children's Dental Health Month**

Oral health promotional activities increase public awareness about issues such as baby bottle tooth decay, drinking water fluoridation, access to dental care, and tobacco use. One of the first dental health awareness activities in the nation was a one-day event in Cleveland, Ohio, February 3, 1941. The American Dental Association (ADA) held the first national observance of Children's Dental Health Day on February 8, 1949. The one-day event became a week-long event in 1955. In 1981 the program became a month-long celebration that became what is known today as National Children's Dental Health Month (NCDHM).

The Texas Department of Health (TDH) Division of Oral Health Program will have information on display at the central office in Austin February 4<sup>th</sup> through February 15, 2002. "Don't Let Your Smile Become Extinct!" is this year's theme for the American Dental Association (ADA) campaign promoting Dental Health Month. The ADA planning kit of educational materials and activities is available on-line at either <http://www.ada.org/public/index.asp> or <http://www.tdh.state.tx.us/dental>.

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