

Dental Needs in Children of Mexican-American Migrant Workers

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INTRODUCTION

The unique health needs of Mexican-American migrant farm workers has long been a source of concern for various state and federal agencies. While there exists in the literature a number of articles describing treatment programs sponsored by dental schools¹⁻⁴ and health departments,^{5,6} as well as reports describing the oral health status of Black adult⁷⁻⁹ and Puerto Rican adult migrant workers,¹⁰ there is limited information concerning the specific oral health needs of the children of Mexican-American migrant workers.

Two reports on the nutritional status of Mexican-American migrant farm children provide limited information regarding the number of decayed teeth in these children. Chase et al¹¹ report a mean of four carious teeth per child in a sample of 300 Mexican-American migrant children aged 1-7 years in which 39% were observed to have one or more carious lesions. Larson et al,¹² in a study of 137 1-7-year-old children of migrant workers, found one or more carious teeth in 47% of their population. Both of these studies limited their dental findings to a gross prevalence statement. Larson et al describe their detection of dental caries as limited to "obvious, unfilled dental caries," while Chase et al provide no description of their dental caries criteria or methodology.

In a related study on the nutritional status of Mexican-American children in a California border town, Acosta et al¹³ provide a more detailed description of the dental caries status of their study group. However, the study population in this nutritional status survey was not children of migrant workers, but rather

the pre-school children of Mexican-American residents of that town. A dental examination team found a mean def (decayed, extracted and filled teeth) of 3.52 in 145 Mexican-American pre-school children, with nearly 90% of those over age three identified as needing dental care. While providing a clearer picture of the oral health status of Mexican-American pre-schoolers, these findings cannot be interpreted in terms of migrant families.

A specific study of the oral health needs of an urban Latino population (156 volunteers) by Cisneros et al¹⁴ reported a mean dmf (decayed, missing and filled teeth) of 3.57 for 11 children two to five-years old and a mean DMF (dmf + DMF) of 5.32 for the 62 children 6-12-years-old. A significant finding of this study indicated that the dental caries need (D/D+F) of all subjects aged 2-84 years residing in Minnesota less than one year was three times greater than that of subjects residing in Minnesota for more than four years. This latter finding suggested that there were significant differences in the oral health status of Mexican-Americans who were established residents of a community versus those who were recently migrated.

Annually, the Red River Valley of the North in Minnesota receives an influx of migrant workers who are employed in weeding and thinning the vast sugar beet crop of this region. The demand for migrant labor in the sugar beet fields usually extends for a six-to-eight-week period from early June through July. This particular crop is viewed by migrants as both favorable to work as well as reasonably lucrative. Consequently, many of the same migrant families travel each year from South Texas directly to the Red River Valley.

The Minnesota Migrant Education and Child Development Program provides a well-organized network of instructional and support services to migrant children from birth through 17 years of age. In 1978, the Department of Education contracted with Migrant Health Services, Inc. (a private, non-profit organization designed to serve the health needs of migrant families in both Minnesota and North Dakota) to provide dental screenings and referrals for all children of migrant workers enrolled in the summer school programs. While the Dental Division of the State Health Department provided dental screenings for 13 of the programs, the authors of this paper provided a comprehensive dental examination for five geographic program areas in order to more completely assess the oral health status and needs of these children of migrant workers.

This study presents the findings of a dental health survey designed to: (1) identify the level of dental caries need that exists in the children of migrant workers in the Red River Valley of the North in Minnesota, and (2) to recommend effective and feasible treatment and preventive measures.

MATERIALS AND METHODS

In the summer of 1978, examinations were performed at five different schools in the Red River Valley, by three calibrated dentists, using #23 explorers, mouth mirrors and portable headlamps.

The data on all subjects included: (1) a combined dmft-DMF score for teeth and for surfaces; (2) a DMF score for permanent teeth and for permanent surfaces; and (3) an estimate of the restorative treatment needs of each subject.

The DMF index can be reported as either a count of the decayed (D), missing (M) and filled (F) teeth (DMFT) or decayed, missing and filled surfaces (DMFS). Capital letters are used to designate permanent teeth or surfaces, whereas lower case designation (dmft or dmfs) indicate deciduous (ie, baby) teeth or surfaces.

The majority of analyses in this study use DMF scores for teeth as it currently provides the best basis for comparisons with previous studies. The DMF scores for surfaces (DMFS) are reported should future studies of a more detailed nature seek a basis for comparison. A separate analysis of the DMFS findings for occlusal surfaces of permanent first molars is reported for purposes of suggesting preventive and treatment regimens in this population.

While the examiners were calibrated for collecting the DMF index data, the estimate for restorative treatment needs represents the individual clinical judgments of the examiners.

TABLE 1
Distribution of Subjects by Age Group

AGE GROUP	SAMPLE DISTRIBUTION	
	# of subjects	% of subjects
3 - 5 years	161	27.8
6 - 8 years	219	38.0
9 - 11 years	162	28.0
12 - 13 years	36	6.2
TOTAL	578	100.0

RESULTS

All 578 children aged 3-13 years enrolled at five school sites in the Red River Valley received dental examinations. There were slightly more females (51.9%) than males, and the subjects had a mean age of 7.3 years. Table 1 shows the distribution of subjects by age group.

The findings by age group of the combined deciduous and permanent decay indices and the permanent decay indices are shown in Table 2. Both the combined dmft-

TABLE 2
Combined Deciduous-Permanent Decay Indices and Permanent Decay Indices by Age Group

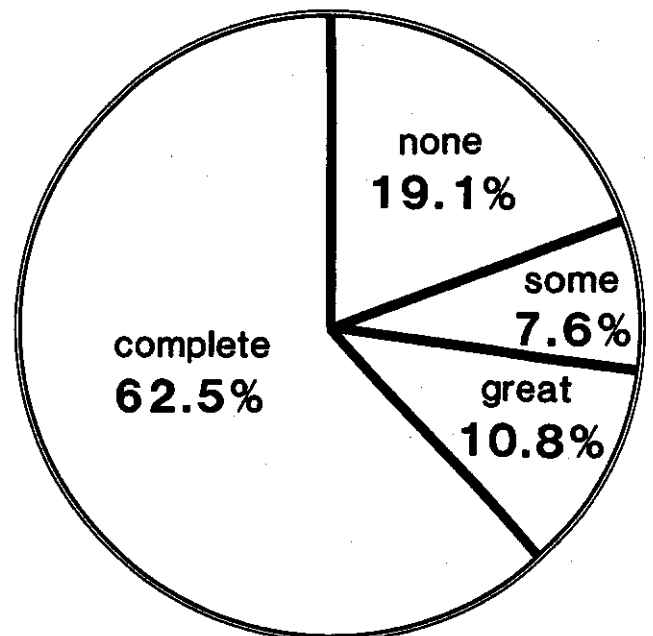
Age Groups	Deciduous and Permanent Dentition		Permanent Dentition Only	
	dmft-DMFT	dmfs-DMFS	DMFT	DMFS
3 - 5	3.8±3.9	6.6±5.6	—*	—*
6 - 8	6.9±2.4	14.0±11.9	2.2±1.5	2.9±2.3
9 - 11	6.5±3.3	12.0±8.2	3.7±2.6	5.0±3.6
12-13	5.6±3.1	8.4±5.0	5.2±2.9	6.6±4.0
all ages 3-13	5.8±4.1	11.1±10.2	3.1±2.8	4.0±3.3

*mean calculated only for 6-13 year olds as 3-5 year olds exhibited no permanent teeth

DMFT and dmfs-DMFS scores exhibit a peak in the 6-8-year-old age group, whereas the DFMT and DMFS scores increase steadily with age.

Figure 1 illustrates the distribution of subjects by need for dental treatment. All children were categorized into one of four treatment need categories based on their D/D+F ratio for permanent teeth. The D/D+F ratio indicates the percent of decayed and filled teeth which are decayed (ie, untreated). The category of No Need consisted of subjects whose D/D+F ratio equalled zero; the Some Need category reflected subjects whose D/D+F ratio fell between 1% and 50%

Figure 1
The Distribution of 6-13-Year-Old Subjects by Need for Dental Treatment Categories



(ie, at most one-half of their decayed teeth were currently untreated). Similarly the category of Great Need reflected that more than one-half but less than all of the decayed teeth were untreated ($D/D + F = 51\% - 99\%$), while the category of Complete Need contained those subjects for whom all decayed teeth were untreated ($D/D + F = 100\%$). As can be seen in Figure 1, over 62% of the children between ages six and thirteen were in the category of Complete Need, with only 19% in the No Need category.

Further evidence of the extent of need for dental treatment is provided in Figure 2 which shows the percent of decayed teeth by age group. For each of the age groups, the percent of DMF teeth that were decayed remained stable at approximately 75%. This indicates that regardless of age, three out of four teeth which required treatment were unfilled.

Figure 3 indicates the extent of decay on the occlusal (chewing) surfaces of all four permanent first molars by age group. The data on the occlusal surfaces of first molars (ie, the six-year molars) is of particular interest because these are the first permanent teeth which are highly susceptible to decay, to erupt in the mouth. Since the time of eruption is approximately six years of age, data is also given on the percent of these teeth that were actually erupted (ie, present) as well as the decay findings on these teeth. While 94% of the first molars are unerupted in the 3-5-year-old age group, only 12% remain unerupted in the 6-8-year-old age group. Decay or fillings are found on 51% of the occlusal surfaces of first molars for 6-8-year-old children, indicating the

Figure 2
Mean DMF Scores and % of Decayed Teeth
by Age Group

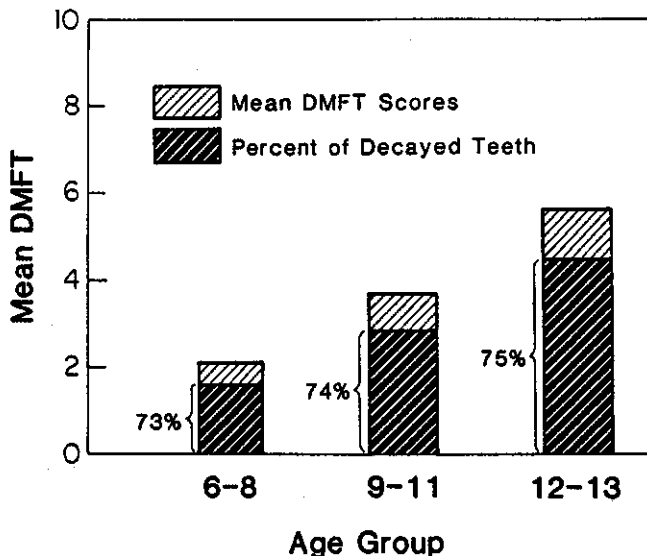


Figure 3
The DMFS Status of Occlusal Surfaces
of all Four Permanent First Molars by Age Group

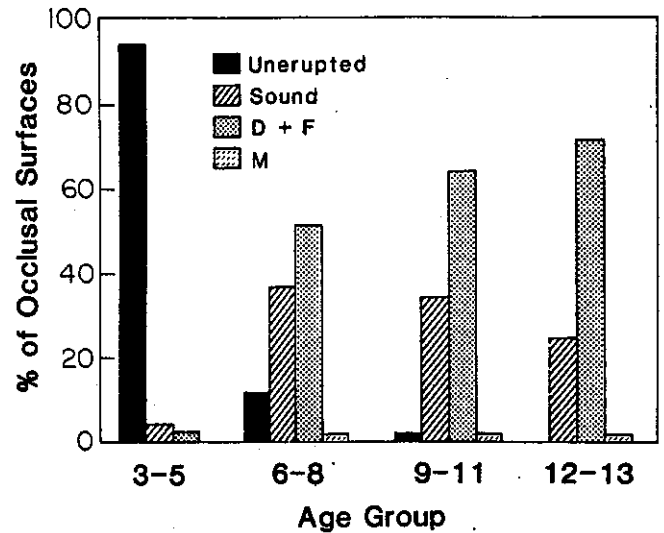
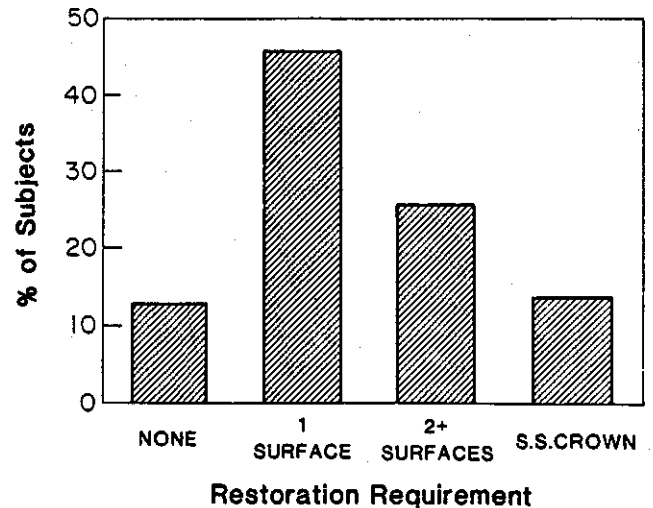


Figure 4
Restoration Requirements of all
3-13-Year-Old Children



susceptibility of these teeth to the decay process. The prevalence of decay or fillings increases to 73% in the 12-13-year-old age group.

An analysis of the restorative treatment requirement of all subjects is presented in Figure 4. Over 86% of the subjects needed fillings with 46% of all children requiring simple (one surface) restorations, 26% more complex (two or more surfaces) restorations, and another 14% requiring extensive (stainless steel crown) restorations.

DISCUSSION

The data in Table 1 reveals that the population of children examined was evenly distributed between the 305, 6-8 and 9-11-year-old age groups. However, the 12-13-year-old age group comprised only 6% of the children examined. This observed underrepresentation of children 12-13 years old reflects the fact that many children were already working in the fields during the summer months by this age and, hence, were not enrolled in school programs. While the representativeness of these 36 12-13-year-old children cannot be assumed for all characteristics, their dental findings do support theoretical predictions for this age group. It must be appreciated that while the direction of the findings for this group supported our theoretical assumptions (ie, increased DMF score), the exact magnitude of the findings (ie, the actual numerical DMF scores) are based on a less solid foundation than for the other age groups because of this uncertainty regarding their representativeness.

When comparing the DMFT scores of this population with those reported by Acosta et al and by Cisneros et al, definite similarities can be observed in the 3-5-year-old age group as well as in the 6-12-year age group despite differences in population selections. Acosta et al¹³ reported a def of 3.52 for 5-5.9-year-old children, and Cisneros et al¹⁴ reported a dmft of 3.57 for 3-5-year-old children, while our data reveal a dmft of 3.8 for the 3-5-year age group. While Cisneros reported a mean combined dmft-DMFT of 5.32 for children 6-12 years old, a similar age group (6-13 years old) of migrants in our study exhibit a combined mean dmft-DMFT of 6.6.

The greatest statement of dental need is evidenced in Figure 1 — 62.5% of children aged 6-13 have 3.2 decayed teeth and no fillings. Another 11% in the Great Need category have received treatment on less than one-half of their decayed permanent teeth and likewise exhibit an average of three decayed teeth. These two categories, Complete Need and Great Need, indicate that nearly 75% of the 6-13-year-old age group have three or more permanent teeth which remain decayed and untreated.

Additional evidence of this need is shown in Figure 2 in which it can be seen that decayed teeth account for approximately 75% of the DMF score for all 6-13-year-old children. This indicates that older children are no more likely to have received dental services than the younger children despite the increasing DMF score by age group.

In terms of actual preventive and restorative services required by this 3-13-year-old population, several considerations stand out. As evidenced by Figure 3, 51% of these surfaces are either decayed or filled shortly after eruption and this rises to 73% by age 13. Since perma-

nent first molars are generally the first teeth of the permanent dentition at risk of decay and remain at risk the longest, our data suggest that preventive intervention with topical fluorides and sealants must occur immediately after eruption if the rapid onset of decay which was observed is to be prevented. Although the use of sealants to prevent occlusal decay has been proven effective in numerous controlled studies,^{15,16} the nonutilization of dental services by this population presents a serious obstacle to this approach. Another limitation is the biological fact that teeth erupt continually throughout any 12-month period; and by the time these children reach a summer school program, a great many of their permanent first molars would have already experienced decay. Nonetheless, sealing the remaining undecayed permanent first molars in the 6-8-year-old children in a summer school program would prove beneficial to those whose first molars erupted shortly before or during the summer months, and is recommended.

With the unmet dental caries need (D/D+F) remaining constant at 75% (Figure 2), any dental health program instituted during the summer school period should emphasize provision of restorative services. Most of the treatment required could be provided by the least costly of dental services, since our data shows that over half of these services would consist of simple one surface fillings (Figure 4).

While an emphasis on restorative as opposed to preventive services in a dental health program for children runs counter to the usual public health approach, this choice seems most appropriate for children of migrant workers given the realities of their access to care. The periodic availability of these children to a summer school program dental service limits the effectiveness of both topical fluoride and occlusal sealant treatments. Given the inevitable consequence of untreated dental decay (ie, loss of teeth), any dental service in a summer school program should emphasize the provision of restorative services with sealants being provided on available occlusal surfaces. Ideally, one can conceive of a future time when dental services between summer programs and winter home residences will be coordinated to the extent that comprehensive and continual preventive services will be a feasible alternative.

Although it was not within the purview of this study to identify specific factors relative to program design and implementation, it is felt that the epidemiologic data does provide sound information for program planners. Decisions regarding realistic treatment alternatives (eg, referral to community practitioners vs. establishing school or public health clinics) must consider the availability and accessibility of local manpower and financial resources. However, projections based on the

treatment needs data in this report combined with the assessments of local resources should aid program planners to devise feasible approaches to the oral health problems of these children.

CONCLUSIONS

A survey of 578 3-13-year-old children of Mexican-American migrant farmworkers was conducted to: (1) identify the level of dental caries need; and (2) to determine the most effective and feasible intervention mechanisms regarding treatment and prevention.

The 6-12-year-old children exhibited a mean of 3.2 decayed, missing and filled teeth (DMF). All children 3-13 years old had a combined mean of 5.8 decayed, missing and filled teeth (dmf-DMF). The unmet dental caries need (D/D + F) remained constant at 75% for all age groups, indicating that three out of four decayed teeth in this population are untreated. By age 13, 73% of the occlusal surfaces of the four permanent first molars are either decayed or filled.

The primary emphasis of a dental service in a summer school program for this population should be the provision of restorative treatment because of the following factors: (1) the periodic availability of these children; (2) the biologic eruption patterns of teeth; (3) the limitations of preventive techniques regarding frequency of application. ■

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