

Dental Decay in Southern Illinois Migrant and Seasonal Farmworkers: An Analysis of Clinical Data

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ABSTRACT: *Context:* Migrant and seasonal farmworkers are a population at risk for oral health problems. Data on the oral health conditions of migrant and seasonal farmworkers' permanent teeth are particularly lacking. *Purpose:* To document the relative rates of treated and untreated dental decay in a sample of southern Illinois migrant and seasonal farmworkers who had sought care at a farmworker health center dental clinic. *Methods:* Existing migrant health dental clinic records from 1995-2002 were reviewed. Final sample size was 650. Data for decayed, missing, and filled tooth surfaces were recorded using both anatomical recording and treatment notes. *Findings:* Sixty-nine percent of migrant farmworkers had at least 1 decayed (untreated) tooth surface, and more than half had 3 or more decayed surfaces. *Conclusions:* Results indicate that untreated dental decay is significant among migrant and seasonal farmworkers who seek care at this dental clinic. Recommendations include addressing barriers to care, improved monitoring of dental health conditions, and further research to better document the treatment needs of this population.

Since the implementation of community water fluoridation in 1945, the prevalence of dental decay in the United States has decreased.¹ Although this trend is encouraging, the overall reduction in dental caries (decay) has not been experienced universally, and certain populations continue to be at high risk for untreated dental disease. Migrant and seasonal farmworkers (MSFWs) are one such group, suffering disproportionately from dental disease when compared with the general population.²⁻¹⁵ (Note: although the term *migrant and seasonal farmworkers* will be used throughout this paper, this includes not only the migrant farmworker, but other family members as well.) The elimination of such disparities in health care has been identified as one of the principal public health goals for this decade.¹⁶ In his landmark 2000 report

on oral health, former US Surgeon General David Satcher referred to oral diseases affecting vulnerable populations as a "silent epidemic."¹⁷

A number of factors contribute to this health care problem, chief of which are issues of access. Access to oral health services can be a problem for MSFWs for a number of reasons including availability, cost, time, transportation, and language,^{3,6,10,12} combined with the everyday concerns about housing, food, and clothing. In addition, oral health problems—like many other chronic diseases—are often asymptomatic in their early stages. So although access may be a problem, dental care is often complicated by the fact that MSFWs often do not seek dental care until dental problems become acute.¹⁰

The farmworker health center in rural southern Illinois has been serving the health needs of MSFWs for more than 25 years. The health center provides medical and dental care for the population throughout southern Illinois. A range of medical services is offered during the growing season including—on a more limited basis—dental services. The dental clinic is typically open 1 day and evening per week during the growing season. However, hours of operation are always dependent upon the availability of dental staff, and the clinic has never been operational enough hours per week to meet the demand for services. Preventive and restorative care

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is offered, as well as simple extractions, but more complicated procedures are referred to area practitioners.

Despite the fact that dedicated systems of health care for MSFWs exist in most states,^{6,11,12,18} data on their oral health status is scarce. A number of recent studies have reported on the oral health of MSFW children,^{5,11,12,19} but data on the conditions of permanent teeth are largely lacking. The most recent published report we were able to identify on dental decay in MSFW adults was more than 15 years old.⁶ The purpose of this study was to document the frequency and severity of untreated dental decay in the permanent teeth of southern Illinois MSFWs who had sought care at a local farmworker health center dental clinic. Results of this study may be used to better plan for and to promote oral health services for this at-risk population.

Methods

In the spring of 2002, we obtained permission from the regional migrant health center to access its dental records for a dental caries study. A protocol was established that would assure confidentiality of the data, and permission to conduct the study was granted by an institutional review board. All available dental records from the farmworker health center dental clinic were examined, and a total of 790 records were documented. Because the center has been providing dental services to MSFWs for more than 20 years, we expected to find a greater number of patient records. Noting the date of last visit as recorded in the patient files, and the few records indicating a date older than 10 years, we were convinced that additional records must exist. However, despite many communications with clinic staff, the records department, and administrative staff, we were unable to locate any additional patient records on-site or in storage at another location. Of the records we did have, 98% indicated treatment dates for fewer than 8 years, and we made the decision to limit our data to only those records from this time period—1995-2002. We are reasonably confident that this set of records is complete for the specified time period.

Our interest was in reporting the conditions of adult teeth only; we therefore limited our data analysis to MSFW patients 6 years of age or older. When the records were entered, we discovered that our sample included very few observations ($n = 12$) beyond age 64, and we therefore made the decision to restrict our data analysis to only those 64 years of age or younger. These age restrictions reduced our initial sample of 790 to 650. Variables recorded included age, gender, and number of decayed, missing, and filled tooth surfaces. Information

on tooth surface conditions was recorded from both anatomical charting and treatment notes.

The Decayed, Missing, and Filled Permanent Tooth Surfaces index (DMFS) is the protocol dental professionals use to record tooth surface conditions in epidemiological studies,^{1,20-22} and oral exams are conducted to collect data. Clinical data, accessed from patient records, though not the best indicator of current dental conditions, is nonetheless valuable in this case, for little information on the oral health conditions for this population is available in any form at present. Because little else was available for documenting decay conditions, the DMFS was deemed the most appropriate instrument for this study as well.

A tooth surface may be classified as decayed (D), missing (M), or filled (F), and decision rules exist for certain conditions and exceptions. The index score, DMFS, is simply a summation of all D, M, and F surfaces. This value represents the patient's total decay history. For this study, we deviated from the standard DMFS recording procedures in some ways and established decision rules specific to the study. These changes were made to adjust for specific treatment issues characteristic of this population—specifically, the low utilization of dental services. Our desire was to produce a more accurate picture of conditions than may be allowed from standard use of the index, given the limitations of using clinical data.

Modifications to the DMFS index are not without precedent, however. Researchers have previously modified the established recording procedures in other studies to suit the specific needs of their research.²³ In the 1986 NIDR National Survey of Oral Health in US Employed Adults and Seniors,²³ when a surface was both carious and restored, both conditions were noted. Generally, caries takes precedence over restored and the surface is recorded as D. Also, in most studies there is no distinction made between teeth missing due to caries or to periodontal disease, but the NIDR National Dental Caries Prevalence Survey 1979-80²³ did distinguish between the 2 conditions.

In this study, if a tooth was indicated for extraction due to decay, but was not noted as having received treatment, and specific decayed surfaces were not charted on the record, the total number of surfaces for that tooth was recorded as D. Although there was no visual inspection, we thought it conceivable that all surfaces would be affected if a tooth was decayed so severely as to make it nonrestorable. Surfaces that had been filled with a temporary filling, without notation of permanent restoration, were recorded as D. This is in contrast to standard DMFS protocol that designates scoring surfaces containing temporary fillings as F,²¹ which presumes that a temporary filling will eventually

Distribution Statistics for Decayed, Missing, and Filled Tooth Surfaces (DMFS), Southern Illinois Migrant and Seasonal Farmworkers, 1994-2001 (n = 650)

	Mean	Median	Mode	Range
Decayed surfaces	4.91	3	0	33
Missing surfaces	4.75	0	0	111
Filled surfaces	3.37	0	0	55
Total DMFS	13.04	8	0	116

be replaced by a permanent one. However, aware of the low utilization of dental services by this population, we decided to record those rare findings as D. Finally, a small number of patient records in this study had incipient caries recorded on the dental chart, and it was decided to add them into the decay component. However, if it had been less than 6 months since the patient had been to the clinic, the few lesions charted as incipient on the record were not counted as D because they were not indicated for restoration before the next preventive appointment. Diagnosing carious lesions can be very subjective and without calibration of examiners (as in a survey), we deemed it appropriate for our study to include them in the D component.

Data collection was very labor intensive due to charting inconsistencies among the various practitioners providing care over the years. Both dental charting and treatment notes had to be examined for an accurate DMFS score.

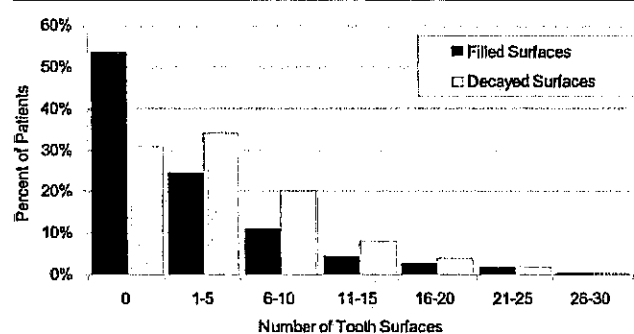
Descriptive statistics were calculated using SAS (SAS Institute version 8.0, Cary, NC).

Results

The gender composition of the sample was fairly equal (53% male, 47% female). Patient ages were normally distributed with a mean of 26 years (SD = 12.6). As with many types of data, decayed, missing, and filled tooth surface variables were all nonnormally distributed with means close to 0 and skewed to the right. The modal scores for each of the 3 surface variable conditions, as well as the median scores for missing and filled surfaces, were 0. The median score for decayed surfaces, however, was 3 (see the Table). Sixty-nine percent of the patients had at least 1 decayed surface, and more than half had 3 or more decayed surfaces (Figure 1).

We divided our sample into age groups to assess the impact of age on untreated decay. The greatest number

Figure 1. Number of Filled and Decayed Tooth Surfaces, Southern Illinois Migrant Farmworkers, 1995-2002 (n = 650).



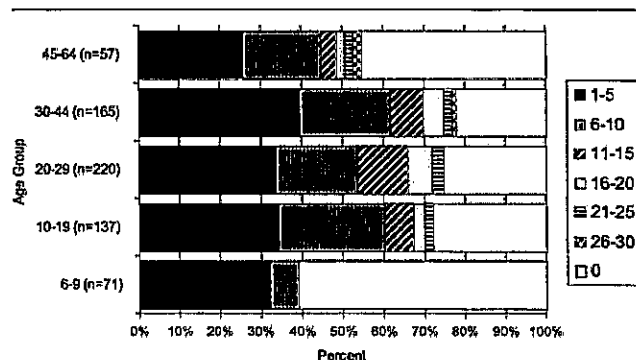
Note: Number of decayed and filled tooth surfaces over 30 represented less than 1% of the total number and are not shown in the above chart.

of decayed surfaces—more than 25 in some cases—was found in the oldest of our patients (Figure 2). For MSFWs between 10 and 44 years of age, roughly 40% had 6 or more decayed tooth surfaces. The decay rate drops in the 45-64 year age group, but this is most likely attributable to an increase in the number of extractions more commonly found in this age group. With fewer teeth remaining, there is less opportunity for decay.

Discussion

We recognize that the patient record data we collected cannot be considered representative of

Figure 2. Percentage Decayed Tooth Surfaces by Age Group, Southern Illinois Migrant Farmworkers, 1995-2002.



national or even of local conditions. Patients who present for services may be qualitatively and quantitatively different from the population. In addition, the study design and modifications to the DMFS scoring protocol also limit comparisons with other groups. Nonetheless, because little information on the oral health conditions of adult MSFWs currently exists in any form, such data may represent a useful contribution to the literature. In this study, the prevalence of untreated decay among MSFWs appears to be great. The percentage of MSFWs with untreated decay was 69%, and more than half of the sample had 3 or more decayed surfaces.

The consequences of delayed or neglected dental health care, as seen in this MSFW sample, can result in more serious conditions and more drastic treatment measures than would be necessary if dental health care was available and utilized at recommended rates. Lukes and Miller¹⁰ found that 51% of MSFWs seeking health care at the farmworker health center had not sought dental care in the previous year. The primary reason was the absence of pain or discomfort. Consequently, conditions that could be resolved through the utilization of primary or secondary levels of intervention must instead be treated with the goal of limiting disability. Untreated decay may result in painful abscesses that require extraction of affected teeth. The immediate results of such treatment are missed days at work and reduced income, but there may be long-term and systemic effects of untreated oral disease as well. Studies have demonstrated associations between oral diseases and conditions such as diabetes, low birth weight, premature delivery, heart disease, respiratory disease, and HIV infection.^{16,17,24-27} Migrant and seasonal farmworkers suffer higher rates of many chronic diseases—including oral disease. Oral-systemic associations may therefore be even more significant for this population.

The reasons for not receiving dental care are complex and include social, economic, and cultural factors, as well as practical matters of access and availability. Socioeconomic status (SES) is a well-documented predictor of health and health care access, and low SES is associated with an increased frequency of untreated dental caries in the US.^{17,22,28} Low-income children and adults have higher levels of dental disease and lower levels of dental care than more affluent people.¹ Migrant and seasonal farmworkers are, for the most part, of low socioeconomic status, with 50% falling below the poverty line and a similar number having no more than an 8th grade education.¹² Given the demanding working conditions and long work hours they face, clinic hours and transportation also can be barriers to care. In a recent study at the same

farmworker health center, limited clinic hours were cited as the chief access barrier.¹⁰ Nearly 2 decades ago, another study of the same clinic identified many of these same factors as barriers to care.²⁹

Because MSFWs most often seek dental care for acute problems, education for primary prevention could increase the utilization of preventive services and could reduce the need for more serious interventions later. One means of providing this education could be through the increased use of the *promotora de salud*, translated as "promoter of health." A *promotora* is most often a member of the migrant farmworker community trained to provide a number of health-related services, including patient education.³¹⁻³³ Prevention education from a trusted resource may serve to increase the use of preventive services and thereby reduce the rates of dental disease among the population.

Recommendations

Our review of the literature indicates that there is little national dental health data for this population. Our primary recommendation, therefore, concerns the need for more comprehensive studies on migrant and seasonal farmworker oral health. Further research is needed to develop a clear understanding of the population, the problems, and the most effective solutions.

Given the range and significance of many of the health problems migrant farmworkers face, many public health providers may be forced to question the relative value of providing education and treatment for dental health. Given limited resources, what can public health agencies do to provide improved oral health care for this population? Migrant farmworker health centers not already offering dental services may consider forming partnerships with local dental programs to increase services and to provide oral health education, thereby improving access. Attention to the identified barriers to care for this population should be addressed when planning or promoting a migrant farmworker oral health program.

Conclusion

Our results indicate that there may certainly be cause for concern about the oral disease burden experienced by migrant and seasonal farmworkers. Dental disease is often neglected, given the substantial general disease burden and limited resources available to this population. This is true of both MSFWs and the agencies that serve them. Limited resources and other access barriers make regular dental care a largely unmet need for this population.

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