

Prevalence of Total Tooth Loss, Dental Caries, and Periodontal Disease in Mexican-American Adults: Results from the Southwestern HHANES

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The Southwestern portion of the Hispanic Health and Nutrition Examination Survey (HHANES) was conducted by the National Center for Health Statistics (NCHS) in 1982 and 1983. The survey population was Mexican-Americans residing in five Southwestern states. This report presents data on the prevalence of total tooth loss, dental caries, and periodontal diseases in 3860 Mexican-American adults aged from 18 to 74. Results show that 4.3% of this group was edentulous. Among the dentate, Mexican-Americans had lower overall DMF scores but higher numbers of untreated decayed teeth than did residents of the same region seen in the NHANES I survey in 1971-1974. Caries of the smooth surfaces in both posterior and anterior teeth was more pronounced in the older than in the younger age groups. Mexican-Americans had more gingivitis but fewer periodontal pockets than did the general population in the Western states during NHANES I. The caries pattern in the Mexican-Americans suggests that caries among adults may remain a problem in the future, with the possibility of increased involvement with the aging, although modest, of smooth tooth surfaces.

J Dent Res 66(6):1183-1188, June, 1987

Introduction.

In 1982, the National Center for Health Statistics (NCHS) conducted its first survey of Hispanic Americans. The survey, known as the Hispanic Health and Nutrition Examination Survey (HHANES) (National Center for Health Statistics, 1985), was carried out in three regions of the country: (a) the five Southwestern states of Arizona, California, Colorado, New Mexico, and Texas; (b) Dade County and Miami, Florida; and (c) the New York City area, including parts of New Jersey and Connecticut. The three components of HHANES were designed to target persons of Mexican, Cuban, and Puerto Rican origins, respectively, the largest groups of Hispanics in the United States.

Existing information on the oral health of Hispanic Americans is sparse. The only previous NCHS survey to include specifically individuals of Hispanic descent was the Ten-State Nutrition Survey (TSNS) of 1968-70 (Centers for Disease Control, 1973). In the TSNS, 8.3% of Hispanic adults were reported to be edentulous, compared with 26.6% of non-Hispanic whites. Sample design problems in the TSNS, however, suggest that the figure for Hispanics may be an underestimate, and for non-Hispanic whites, an overestimate. This percent of edentulous non-Hispanic whites was about 100% higher than that reported from other NCHS surveys around this time (National Center for Health Statistics, 1974). Hispanic adults in the TSNS had lower DMFT levels than did either non-Hispanic whites or blacks (Centers for Disease Control, 1973).

A 1984 survey of Mexican-American adults residing in

Lordsburg and Deming, New Mexico (Eklund *et al.*, 1987), indicated that they had a lower prevalence of dental caries than did non-Hispanic adults examined during the first National Health and Nutrition Examination Survey (NHANES I) of 1971-74. This same New Mexico study showed that while about 40% of the adults had at least one periodontal pocket of 4-5 mm, deeper pockets were present in only 12.4% (Ismail *et al.*, 1986). Calculus was present in virtually all those examined, and the presence of plaque, also highly prevalent, was the most important risk factor associated with deep pocketing. No significant differences were found in the prevalence of periodontal pocketing between Mexican-Americans and non-Hispanic adults who were life-long residents of the two cities. Another recent analysis of data from New Mexico adults, collected in 1958, showed that Hispanics had a significantly higher prevalence of advanced loss of attachment than did non-Hispanics (Ismail *et al.*, 1987c).

This report describes the prevalence of total tooth loss, dental caries, and periodontal disease in 3680 adults, aged 18 years or older, who reported that they were of Mexican-American origin and who resided during 1982-83 in one of the five Southwestern states.

Materials and methods.

Data sources. — A detailed description of the HHANES sample, study design, and oral conditions measured during the survey has been presented elsewhere (National Center for Health Statistics, 1985) and so is described only briefly here. The HHANES sample design is a four-stage clustered sample. The four stages were: (1) primary sampling units (PSUs), made up of counties or small groups of contiguous counties; (2) segments (clusters of households); (3) households; and (4) eligible persons. Data collection was carried out from 1982 through 1983 in the Southwestern states, and was completed in the Miami and New York City areas in 1984.

Oral conditions measured. — In HHANES, each participant received a medical and dental examination and provided a 24-hour dietary-recall interview, conducted by trained interviewers. Other demographic and health-related behaviors were also recorded. Questions of relevance to dentistry included reasons for and frequency of dental visits, preventive health behaviors, coverage by dental insurance, and an evaluation of perceived oral health.

Dental caries was recorded according to criteria described by the National Institute of Dental Research (NIDR) (National Institute of Dental Research, 1981a), periodontal disease using the Periodontal Index (PI) (Russell, 1956), oral hygiene status using the Debris Index (DI) and the Calculus Index (CI) (Greene and Vermillion, 1968), and malocclusion status and history of orthodontic treatment as defined by NIDR (National Institute of Dental Research, 1981b). The examiners also evaluated the denture status of partially and completely edentulous examinees, and estimated the need for restorative care by using the

Received for publication October 3, 1986

Accepted for publication December 12, 1986

This investigation was supported by USPHS Research Grant DE-07130 from the National Institute of Dental Research, National Institutes of Health, Bethesda, MD 20892.

NIDR Dental Restorative Treatment Need Index (National Institute of Dental Research, 1981b). The dental examiners were all trained by NIDR staff.

Statistical analysis. — Analytical procedures for data from national surveys like HHANES have been discussed elsewhere (Ismail *et al.*, 1987a; Ismail *et al.*, 1983). Following the same approach as that used in an earlier report (Ismail *et al.*, 1987a), we computed means and percentages using sample weights in order to permit the estimates to be generalized to the population from which the sample was drawn. Weighted means and percentages were computed by the PSRATIO program of the Organized Sets of Integrated Routines in Statistics (OSIRIS) supported by the Institute of Survey Research, University of Michigan. To account for the clustering effect introduced by the sample design, we multiplied standard errors, computed assuming a simple random sample, by their design effects. The design effect represents the estimated increase in the variance of the mean or percentage under study which results from examination of individuals in clusters, rather than independently, as when a simple random sample is drawn (Kish, 1965). Design effects were computed for the purpose of this analysis for the DMFT, DMFS, PI, CI, and DI scores. Each of these variables was stratified by age, income, and gender, and an average design effect was computed to adjust the standard errors of each of the variables. Testing for statistically significant differences between means or percentages was based upon comparison of 95% confidence intervals.

Some results were stratified by the Poverty Income Ratio, computed by dividing the total household income by the total income determined necessary (from Federal guidelines) to maintain a family on a nutritionally adequate diet. A Poverty Income Ratio of less than one is referred to in this report as being "below the poverty status".

Comparisons were carried out between the Mexican-Americans in the five Southwestern states and residents of the Western states (Washington, Oregon, California, Nevada, New Mexico, Arizona, Texas, Oklahoma, Kansas, Nebraska, North Dakota, South Dakota, Idaho, Utah, Colorado, Montana, and Wyoming) who were examined during HHANES I in 1971-74. The mean numbers of decayed, missing, and filled teeth, and mean CI and DI scores of dentate Americans in Western states in 1971-74, in addition to the proportion of edentulous adults, were computed specifically for the purpose of this report because they are not available in published NCHS monographs.

Results.

Total tooth loss. — The percentage of Mexican-American adults who were fully edentulous is presented in Table 1. No adult aged 18-24 was edentulous, and total tooth loss increased with age in both males and females. Females had a higher prevalence of total tooth loss than did males.

Table 2 presents the percentages of edentulous adults by poverty status and age. Those above the poverty status had a lower prevalence rate of total tooth loss than did those below, but none of the differences was statistically significant. Table 2 also shows the percentage of edentulous adults residing in the Western states who were examined during NHANES I (1971-74). Overall, Hispanics had a lower prevalence of total tooth loss than did residents of the Western states in 1971-74 (Table 2).

Dental caries. — The mean numbers of sound, decayed, missing, and filled permanent teeth, and DMFT scores by age, are presented in Table 3. The numbers of sound teeth decreased in older age groups, whereas the numbers of missing teeth

increased. In those 65 years or older, missing teeth constituted 59.7% of all DMF teeth. The number of filled teeth also increased with age until age 44, when it declined. There were no differences in mean decayed teeth among the different age groups. When compared with the general population of the Western states seen in NHANES I, Hispanics from 18 to 74 years of age had lower DMF scores but higher numbers of decayed teeth (Table 3).

Table 4 shows that there was no difference in mean DMFT scores between those below and above the poverty status, but those below the poverty status had a significantly higher mean number of decayed and missing teeth, and a lower mean number of filled teeth. The intra-oral distribution of dental caries, by age, is presented in Table 5. DFS scores for smooth surfaces of posterior and anterior teeth of older adults are higher than those in younger adults (Table 5).

Oral hygiene status. — In the younger age groups, Mexican-Americans from 18 through 34 years of age, and below the poverty status, had significantly higher CI scores than did those above (Table 6). Mexican-Americans below the poverty status also had higher CI scores than did residents of the Western states examined in NHANES I (Table 6), but the difference was only statistically significant in those aged 65 or older. Above the poverty status, Mexican-Americans had significantly higher CI scores at all ages than did the residents of the Western states examined in NHANES I. The same comparison shows that Mexican-Americans above the poverty status had significantly higher DI scores than did residents of the Western states in 1971-74.

Periodontal disease. — A significantly higher percentage of Mexican-Americans had gingivitis than did the residents of the Western states examined in NHANES I, and fewer of them were found to have no gingivitis or periodontitis (Table 7). Data collected on periodontitis do not permit examination of loss of attachment and are restricted to pocketing. The percentage of Mexican-Americans with periodontal pockets was significantly higher in older than younger age groups (Table 7). There was a tendency for a higher prevalence of pocketing in persons below the poverty status. The Mexican-Americans showed a lower prevalence of pocketing than did residents of the Western states examined in NHANES I.

Discussion.

The prevalence of total tooth loss in Mexican-Americans was significantly lower than that of residents of the Western states in 1971-1974, and is even lower than the national average of 8.7% found in mostly non-Hispanic Americans who participated in the 1983 National Health Interview Survey (Ismail *et al.*, 1987b). This low rate of total tooth loss in Mexican-Americans in the five Southwestern states might be an underestimate, an artifact of the sampling design. The Southwestern HHANES was carried out mostly in large urban communities in five Southwestern states, resulting in a sampling bias which may have excluded individuals in rural areas who may have higher levels of total tooth loss.

Valuable information on periodontal disease in Mexican-Americans has come from two recent studies (Ismail *et al.*, 1986 and 1987c), but similar analysis for the periodontal data from this study cannot be carried out because of the limitations of the PI index. The PI was developed 30 years ago as an index for epidemiological studies, and was extensively validated against clinical diagnoses at that time. The clinical perceptions of periodontal disease at the time of the PI's development, however, are now considered highly questionable (Polson and Goodson, 1985), especially the concept of

TABLE 1
PERCENT DISTRIBUTION* OF EDENTULOUS MEXICAN-AMERICANS AGED 18 TO 74 YEARS BY GENDER
(SOUTHWESTERN HHANES, 1982-83)

| Age Group | Male | | | Female | | | Total | |
|-----------|-------|--------------------|--------|--------|--------------------|--------|-------|--------------------|
| | n | Percent Edentulous | S.E. † | n | Percent Edentulous | S.E. † | n | Percent Edentulous |
| 18-24 | 348 | 0.0 | 0.000 | 455 | 0.0 | 0.000 | 803 | 0.0 |
| 25-34 | 439 | 0.0 | 0.000 | 550 | 0.2 | 0.002 | 989 | 0.1 |
| 35-44 | 262 | 1.1 | 0.007 | 350 | 1.8 | 0.008 | 612 | 1.5 |
| 45-54 | 283 | 5.1 | 0.016 | 355 | 8.3 | 0.018 | 638 | 6.7 |
| 55-64 | 208 | 14.5 | 0.039 | 230 | 16.9 | 0.039 | 438 | 15.7 |
| 65-74 | 88 | 30.8 | 0.055 | 112 | 41.9 | 0.052 | 200 | 37.0 |
| All ages | 1,628 | 3.5 | 0.006 | 2,052 | 5.2 | 0.006 | 3,680 | 4.3 |

*Percentages of edentulous adults were computed using weighted sample sizes.

†Standard errors were computed assuming that a multi-stage clustered sample was selected and not a simple random sample.

TABLE 2
PERCENT DISTRIBUTION, BY POVERTY STATUS*, OF EDENTULOUS MEXICAN-AMERICAN ADULTS EXAMINED DURING
SOUTHWESTERN HHANES, 1982-83, AND PARTICIPATION FROM ALL RACES RESIDING IN THE WESTERN STATES DURING
NHANES I, 1971-74

| Age Group | Poverty Status | | | | | | | | | |
|-----------|---------------------|-------|-------------------|-------|------|---------------------|-------|-------------------|-------|-------|
| | Below | | | | | Above | | | | |
| | NHANES I 1971-74 | | HHANES 1982-83 | | | NHANES I 1971-74 | | HHANES 1982-83 | | |
| % | S.E. | % | S.E. | % | S.E. | % | S.E. | % | S.E. | |
| 18-24 | 0.7 | 0.006 | 0.0 | 0.000 | 0.5 | 0.001 | 0.0† | 0.000 | 0.0 | 0.000 |
| 25-34 | 3.1 | 0.013 | 0.5 | 0.005 | 2.2 | 0.007 | 0.0† | 0.000 | 0.0 | 0.000 |
| 35-44 | 6.1 | 0.031 | 1.4 | 0.010 | 7.2 | 0.013 | 1.3 | 0.002 | 1.3 | 0.002 |
| 45-54 | 21.5 | 0.091 | 6.4 | 0.025 | 12.0 | 0.016 | 5.9† | 0.004 | 5.9† | 0.004 |
| 55-64 | 47.5 | 0.120 | 19.3 | 0.057 | 30.8 | 0.040 | 14.9† | 0.021 | 14.9† | 0.021 |
| 65-74 | 59.1 | 0.053 | 36.9† | 0.055 | 43.1 | 0.019 | 38.8 | 0.050 | 38.8 | 0.050 |
| All ages | 17.9 | 0.028 | 5.9† | 0.009 | 12.2 | 0.005 | 3.5† | 0.004 | 3.5† | 0.004 |

*See text.

†P<0.05, HHANES versus NHANES I.

TABLE 3
MEAN NUMBERS OF SOUND, DECAYED, MISSING, AND FILLED PERMANENT TEETH, AND DMFT SCORES IN DENTATE MEXICAN-AMERICANS, SOUTHWESTERN HHANES, 1982-83, AND DENTATE RESIDENTS OF WESTERN STATES, NHANES I, 1971-74

| Age Group in Years | n | Mean Number | | | | | Standard Error | | | | |
|-----------------------|-------|-------------|------|------|-----|------|----------------|------|------|------|------|
| | | S* | D | M | F | DMFT | S | D | M | F | DMFT |
| HHANES | | | | | | | | | | | |
| 1982-83 | | | | | | | | | | | |
| 18-24 | 803 | 23.3 | 1.5 | 0.6 | 3.9 | 6.0 | 0.25 | 0.11 | 0.06 | 0.20 | 0.23 |
| 25-34 | 988 | 22.0 | 1.4 | 1.4 | 5.0 | 7.8 | 0.28 | 0.10 | 0.09 | 0.23 | 0.25 |
| 35-44 | 602 | 19.3 | 1.3 | 2.9 | 5.9 | 10.1 | 0.41 | 0.12 | 0.19 | 0.30 | 0.37 |
| 45-54 | 593 | 17.8 | 1.4 | 4.4 | 4.9 | 10.6 | 0.38 | 0.11 | 0.23 | 0.26 | 0.35 |
| 55-64 | 368 | 16.2 | 1.5 | 6.4 | 3.8 | 11.7 | 0.50 | 0.17 | 0.38 | 0.29 | 0.50 |
| 65-74 | 126 | 13.8 | 1.7 | 6.6 | 2.7 | 11.0 | 0.83 | 0.33 | 0.64 | 0.46 | 0.86 |
| All ages | 3,480 | 20.6 | 1.4 | 2.4 | 4.7 | 8.5 | 0.15 | 0.05 | 0.08 | 0.11 | 0.14 |
| NHANES I | | | | | | | | | | | |
| 1971-74 | | | | | | | | | | | |
| 18-24 | 629 | 20.0 | 1.7† | 1.1 | 6.6 | 9.4 | 0.32 | 0.07 | 0.12 | 0.22 | 0.34 |
| 25-34 | 697 | 16.5 | 1.5† | 3.2 | 8.8 | 13.5 | 0.14 | 0.15 | 0.20 | 0.20 | 0.10 |
| 35-44 | 596 | 14.0 | 0.9 | 8.0 | 8.9 | 17.8 | 0.33 | 0.06 | 0.39 | 0.36 | 0.33 |
| 45-54 | 365 | 12.2 | 1.1† | 10.4 | 8.3 | 19.8 | 0.32 | 0.10 | 0.35 | 0.31 | 0.32 |
| 55-64 | 246 | 11.2 | 0.7 | 11.1 | 9.0 | 20.8 | 0.47 | 0.12 | 0.31 | 0.45 | 0.47 |
| 65-74 | 503 | 10.3 | 0.5 | 13.9 | 7.3 | 21.7 | 0.31 | 0.04 | 0.47 | 0.29 | 0.31 |
| All ages | 3,036 | 15.1 | 1.2 | 6.4 | 8.1 | 15.7 | 0.12 | 0.04 | 0.17 | 0.16 | 0.16 |

*S = sound, D = decayed, M = missing, F = filled.

†Not significantly different from HHANES estimates. Other comparisons were all significant at P < 0.05.

not scoring gingivitis when pocketing was present — assuming that whenever periodontitis is present, gingivitis is also present. Within the limits of the PI index, however, the periodontal status of this Mexican-American population is not unexpected: poorer oral hygiene and more gingivitis.

The caries pattern in Mexican-Americans was quite different from that of the general population of the Western states seen in NHANES I: Overall DMF scores were much lower, but numbers of decayed teeth were higher. This pattern suggests a low level of dental care, a likelihood supported by findings

TABLE 4
MEAN DMFT SCORES AND STANDARD ERRORS OF DECAYED, MISSING, AND FILLED TEETH IN DENTATE MEXICAN-AMERICAN ADULTS EXAMINED DURING SOUTHWESTERN HHANES, 1982-83, BY POVERTY STATUS

| | Age Group in Years | Poverty Status | | | | | | | |
|--------------------|-----------------------|----------------|------|------|--------------|-------|------|------|--------------|
| | | Below | | | Mean DMFT | Above | | | Mean DMFT |
| | | D | M | F | | D | M | F | |
| Means | 18-24 | 1.9 | 0.7 | 3.2 | 5.8 | 1.2 | 0.5 | 4.3 | 6.0 |
| | 25-34 | 1.9 | 1.9 | 3.8 | 7.6 | 1.2 | 1.3 | 5.5 | 8.0 |
| | 35-44 | 2.4 | 3.8 | 3.8 | 10.0 | 1.0 | 2.7 | 6.6 | 10.3 |
| | 45-54 | 2.0 | 5.0 | 3.0 | 10.0 | 1.1 | 4.1 | 5.7 | 10.9 |
| | 55-64 | 1.7 | 6.8 | 2.8 | 11.3 | 1.5 | 6.2 | 4.3 | 12.0 |
| | 65-74 | 2.5 | 6.4 | 1.7 | 10.6 | 1.0 | 6.0 | 3.8 | 10.8 |
| Standard Errors | 18-24 | 0.22 | 0.11 | 0.35 | 0.42 | 0.12 | 0.08 | 0.27 | 0.30 |
| | 25-34 | 0.23 | 0.24 | 0.42 | 0.55 | 0.09 | 0.17 | 0.30 | 0.35 |
| | 35-44 | 0.40 | 0.45 | 0.48 | 0.78 | 0.11 | 0.22 | 0.38 | 0.34 |
| | 45-54 | 0.28 | 0.55 | 0.49 | 0.76 | 0.12 | 0.28 | 0.33 | 0.43 |
| | 55-64 | 0.34 | 0.78 | 0.50 | 1.04 | 0.21 | 0.48 | 0.39 | 0.63 |
| | 65-74 | 0.66 | 0.84 | 0.43 | 1.23 | 0.31 | 0.96 | 0.86 | 1.31 |

TABLE 5
MEAN NUMBERS OF DECAYED AND FILLED TOOTH SURFACES (DFS) AND STANDARD ERRORS BY TYPE OF TEETH AND TOOTH SURFACES AFFECTED IN DENTATE MEXICAN-AMERICAN ADULTS (SOUTHWESTERN HHANES, 1982-83*)

| | Age Group (in Years) | Mean Number of DFS Scores | | | | |
|--------------------|-------------------------|---------------------------|-----------------------|----------------------|-----------------------|----------------------|
| | | Posterior Teeth | | | Anterior Teeth | |
| | | Occlusal | Buccal and Lingual | Mesial and Distal | Buccal and Lingual | Mesial and Distal |
| Means | 18-24 | 4.6 | 2.4 | 1.9 | 0.4 | 0.6 |
| | 25-34 | 5.4 | 2.7 | 3.0 | 0.7 | 1.0 |
| | 35-44 | 5.8 | 3.3 | 4.4 | 1.1 | 1.5 |
| | 45-54 | 4.7 | 3.3 | 4.4 | 1.4 | 1.7 |
| | 55-64 | 3.6 | 2.9 | 3.7 | 1.8 | 1.9 |
| | 65-74 | 2.5 | 2.9 | 3.1 | 1.7 | 1.8 |
| Standard Errors | 18-24 | 0.18 | 0.11 | 0.14 | 0.04 | 0.07 |
| | 25-34 | 0.19 | 0.11 | 0.14 | 0.04 | 0.08 |
| | 35-44 | 0.24 | 0.21 | 0.29 | 0.10 | 0.13 |
| | 45-54 | 0.21 | 0.21 | 0.27 | 0.12 | 0.13 |
| | 55-64 | 0.23 | 0.24 | 0.28 | 0.17 | 0.18 |
| | 65-74 | 0.30 | 0.44 | 0.45 | 0.29 | 0.30 |

that Mexican-Americans visit a dentist less frequently than do other Hispanics (Trevino and Moss, 1984), and seek fewer preventive services and more extractions and dentures (Garcia and Juarez, 1978). They also had more sound, unfilled teeth that are potentially vulnerable to decay at all ages than did the NHANES I population.

Caries is usually perceived as a disease of childhood, but the distribution of caries by tooth type and surfaces affected suggests that the availability of non-cariogenic tooth surfaces may lead to continuing caries attack in older age groups if the challenge is present. Results of a survey of older persons in Iowa also showed that caries in older persons was more prevalent than had been previously believed (Beck *et al.*, 1985). Data from Southwestern HHANES, presented in Table 5, show that while the pits and fissures of posterior teeth in younger persons, rather than of approximal or smooth surfaces, are the most affected by dental caries, the caries attack on smooth tooth surfaces of posterior teeth increased with age. Even the loss of posterior teeth, which is significantly higher than loss of anterior teeth in this Mexican-American group (2.1 missing posterior teeth compared with 0.3 missing anteriors), did not affect the pattern of an increased number of smooth tooth surfaces affected in older age groups. The increase in decayed and filled surfaces in anterior teeth among older age groups,

however, was more linear than that observed in posterior teeth, perhaps because of the smaller number of missing anterior teeth.

The pattern of caries in this Mexican-American group may indicate what can be increasingly expected in the general population in years to come, because it is a group which does not suffer greatly from childhood dental caries (Ismail *et al.*, 1987a), and which therefore has many teeth among its adults "available" for decay. The apparent continuation of the caries attack in the older age groups (which still has to be interpreted cautiously in view of the cross-sectional nature of the data) shows that it may continue through life if the challenge is present. With more adults retaining teeth into later life, the data from Southwestern HHANES, like that from the Iowa study, might serve as a statement that continuing treatment needs for caries in today's "caries-free" young people could continue throughout their lives, and that the caries decline in children does not mean that caries has necessarily been prevented permanently (Burt, 1985).

The long-term outcome of the decline of caries in American children, therefore, may be an increase in primary caries in older age groups. If this happens, caries will move from being primarily a disease of childhood to one of adults. These data from Southwestern HHANES, together with the information

TABLE 6
MEAN CI AND DI* SCORES FOR MEXICAN-AMERICANS IN THE SOUTHWESTERN HHANES 1982-83 AND PARTICIPANTS FROM WESTERN STATES IN NHANES I, 1971-74, BY AGE AND POVERTY STATUS

| Age Group | Poverty Status | | | | | | | |
|-----------|---------------------|------|-------------------|------|---------------------|------|-------------------|------|
| | Below | | | | Above | | | |
| | NHANES I 1971-74 | | HHANES 1982-83 | | NHANES I 1971-74 | | HHANES 1982-83 | |
| Mean | SE | Mean | SE | Mean | SE | Mean | SE | |
| CI | | | | | | | | |
| 18-24 | 0.5 | 0.07 | 0.6 | 0.05 | 0.3 | 0.02 | 0.4† | 0.03 |
| 25-34 | 0.6 | 0.07 | 0.8 | 0.06 | 0.3 | 0.02 | 0.5† | 0.03 |
| 35-44 | 1.1 | 0.20 | 0.9 | 0.08 | 0.3 | 0.04 | 0.7† | 0.05 |
| 45-54 | 0.9 | 0.27 | 1.2 | 0.10 | 0.5 | 0.04 | 1.0† | 0.05 |
| 55-64 | 1.1 | 0.24 | 1.6 | 0.12 | 0.5 | 0.06 | 1.2† | 0.08 |
| 65-74 | 1.1 | 0.17 | 1.8† | 0.15 | 0.5 | 0.05 | 1.5† | 0.16 |
| DI | | | | | | | | |
| 18-24 | 0.8 | 0.07 | 0.8 | 0.05 | 0.5 | 0.04 | 0.7† | 0.03 |
| 25-34 | 0.7 | 0.05 | 0.8 | 0.05 | 0.4 | 0.02 | 0.7† | 0.02 |
| 35-44 | 0.9 | 0.18 | 0.8 | 0.07 | 0.5 | 0.03 | 0.7† | 0.03 |
| 45-54 | 0.7 | 0.15 | 0.9 | 0.08 | 0.5 | 0.03 | 0.8† | 0.04 |
| 55-64 | 1.3 | 0.16 | 1.1 | 0.10 | 0.5 | 0.05 | 0.9† | 0.06 |
| 65-74 | 1.0 | 0.06 | 1.8 | 0.18 | 0.6 | 0.03 | 1.0† | 0.13 |

*CI = Calculus Index, DI = Debris Index. See text for details.

†p<0.05 NHANES I versus HHANES.

TABLE 7
PERCENT DISTRIBUTION OF DENTATE MEXICAN-AMERICANS IN THE SOUTHWESTERN HHANES, 1982-83, AND PARTICIPANTS FROM WESTERN STATES IN NHANES I, 1971-74, BY AGE, POVERTY STATUS, AND PERIODONTAL DISEASE STATUS

| Age Group | Percent of Individuals | | | | | |
|-----------------------------|------------------------|-------------------|---------------------|-------------------|---------------------|-------------------|
| | No Disease | | Gingivitis Only | | Pockets* | |
| | NHANES I 1971-74 | HHANES 1982-83 | NHANES I 1971-74 | HHANES 1982-83 | NHANES I 1971-74 | HHANES 1982-83 |
| Below poverty status | | | | | | |
| 18-24 | 41.3 | 9.7* | 47.1 | 86.7* | 11.6 | 3.6 |
| 25-34 | 35.0 | 5.3* | 43.4 | 86.0* | 21.6 | 8.7* |
| 35-44 | 26.8 | 2.7* | 29.0 | 74.3* | 44.2 | 23.0* |
| 45-54 | 15.9 | 4.0* | 41.8 | 58.5* | 42.3 | 37.4 |
| 55-64 | 18.5 | 1.0* | 15.8 | 50.4* | 65.7 | 48.6 |
| 65-74 | 28.1 | 2.0* | 7.9 | 46.4* | 64.0 | 51.6 |
| Above poverty status | | | | | | |
| 18-24 | 63.8 | 12.1* | 32.7 | 87.0* | 3.4 | 0.9 |
| 25-34 | 61.9 | 11.2* | 28.4 | 83.0* | 9.7 | 5.8 |
| 35-44 | 58.1 | 15.0* | 21.5 | 73.0* | 20.4 | 12.1 |
| 45-54 | 49.8 | 7.6* | 19.0 | 68.7* | 31.2 | 23.7 |
| 55-64 | 43.1 | 6.9* | 20.8 | 56.6* | 36.1 | 36.5 |
| 65-74 | 42.3 | 4.4* | 12.7 | 47.4* | 45.0 | 48.2 |

*p<0.05, NHANES I versus HHANES.

from the Iowa study, suggest that this long-term shift may have begun.

Acknowledgments.

The authors thank Ms. Mary Dudley and Mr. Gerald G. Wheeler of the National Center for Health Statistics for their help and cooperation in providing HHANES data. Original data for this article were supplied by the National Center for Health Statistics. Results of analysis and conclusions reached are solely those of the authors and not necessarily those of the National Center for Health Statistics.

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