

Results of the 1999 Iowa Oral Health Survey

By

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INTRODUCTION

Despite the many gains in decreasing the amount of overall dental decay in children, there continues to be disparities in dental caries experience so that 80 percent of tooth decay is found in 25 percent of the children in the United States.¹ It is well documented that children from low-income families have much higher rates of tooth decay than do other children.² There are striking disparities in dental disease by income. Poor children suffer twice as much dental caries as their more affluent peers, and their disease is more likely to be untreated.³

¹ Kaste, LM, et al. 1996. Coronal caries in the primary and permanent dentition of children and adolescents 1-17 years of age: United States, 1988-1991. *Journal of Dental Research* 75 (Special Issue):631-641.

² Vargas CM, et al. 1998. Sociodemographic distribution of pediatric dental caries: NHANES III, 1988-1994. *Journal of the American Dental Association* 129(9):1229-1238.

³ U.S. Department of Health and Human Services. *Oral Health in America: A Report of the Surgeon General*. Rockville, MD: U.S. Department of Health and Human Services, National

Despite the fact that most dental infection is preventable and treatable,⁴ dental caries is still the single most common chronic disease of childhood, occurring five to eight times as frequently as asthma, the second most common chronic disease in children.⁵

Because dental caries is both a common disease and is largely preventable, it is important to monitor its occurrence in children to most effectively target community preventive efforts. That is, it is important to understand the pattern of dental caries as a disease in children so that the limited public resources can be used most effectively so that they have the greatest effect in preventing the disease. The Dental Health Bureau of the Iowa Department of Public Health

Institute of Dental and Craniofacial Research, National Institutes of Health, 2000.

^{4,5} *Issue Brief: Putting Teeth in Children's Oral Health Policy and Programs: The State of Children's Oral Health and the Role of State Title V Programs*, December, 1999. Association of Maternal and Child Health Programs.

recognizes the need for consistent and regular measures of oral health in order to determine the need for state programs and to design such programs to produce the most benefit.

METHODS

Planning

A statewide oral health survey of Iowa children was conducted in 1994, and the 1999 survey was modeled after this earlier effort. Planning for the 1999 Iowa Oral Health Survey began in the spring of 1999 and included personnel from the Dental Health Bureau of the Iowa Department of Public Health, the University of Iowa College of Dentistry and the U.S. Centers for Disease Control and Prevention. The goal of the survey was to collect data on children's oral health from a statewide sample for the purpose of planning preventive programs and oral health initiatives. Input was received from the Oral Health Division of the CDC to support the design of the survey.

Study Design

A random sample was based on the Iowa Department of Public Health's distribution of the 26 Title V child health agencies. One school in each agency's service area was

chosen at random via computer. Due to limited manpower, half of those schools were then chosen for the survey sample, based on geographic location and rural or urban location, according to state population distribution. The student sample to be evaluated included grades two through four. These grades were selected to assess mixed dentitions and newly erupted first permanent molars.

Study Methods

Examiners included 12 dentists from the University of Iowa College of Dentistry and 6 dental hygienists from the Iowa Department of Public Health and local child health agencies. Parent volunteers at each school, Title V maternal and child health agency personnel, and dental students also participated in the survey, acting as data recorders for the examiners.

The examiners participated in a half day training and calibration conducted by Dr. John Warren, University of Iowa College of Dentistry. The training was based on protocol developed by the Centers for Disease Control and Prevention.

Consent forms were distributed to the parents of the 2,760 students in second, third, and fourth grades in the 13 selected schools. Of those, 1,934 (70.6 percent) were returned and 1,713 (62.1 percent) children were screened. The consent form contained questions about recency and payment source of last dental visit and parents' ability to access dental care for their children. The consent form also asked

whether the family was eligible for the free and reduced lunch program, a measure of socioeconomic status (SES).

Dental screenings were conducted using portable dental chairs and portable lights. The instruments used for the exams were disposable mirrors and #23 (shepherd's hook) explorers. CDC infection control protocols for field dental examinations were followed. Data were collected on site and later entered into an SPSS data file for statistical analysis.⁶

RESULTS

Description of the Sample

A total of 1,713 children, ranging from 6 to 11 years old, were examined. Since just one 6 year old and three 11 year olds participated, they were included in the 7 year old and 10 year old age groups, respectively, for analysis. Of those, 90.5 percent were white; 50.4 percent were male and 49.6 percent were female.

Table 1 provides information gathered from consent forms. Of the surveyed children, 27 percent participated in the free and reduced lunch program, which is close to the statewide level of 26.2 percent.

Overall, 85.2 percent of children were reported to have visited a dentist within the past year, with 72 percent of those eligible for free and reduced lunch (low SES) seeing a dentist within the past year

and 91 percent of those who were not on the free and reduced lunch program (high SES).

Nearly 45 percent of the children did not have private dental insurance at their last dental visit. Of those children, one third had dental coverage through Medicaid. HAWK-I (Iowa's CHIP) provided some coverage for low-income children (1 percent).

Parents signing consent forms were asked to rate their ability to get their children the dental care they needed. Fifty-six percent of the families that did not qualify for the free and reduced lunch program answered that they would rate that ability as excellent. However, only 22.1 percent of the families that do qualify for the free and reduced lunch program answered with the same response. Not surprisingly, then, 19.6 percent of families that qualify for the lunch program rated their ability to get their children dental care as being "not good," while only 2.5 percent of families not on the lunch program answered with the same rating.

Dental Caries-Primary Dentition

Data on dental caries in the primary dentition for children aged 7 to 10 are presented in Table 3. Gender is not a significant factor of caries status in the primary dentition as measured by decayed, filled teeth (dft) and decayed, filled surfaces (dfs). The information seen in Table 3 presents data that is based on socio-economic status. Children from low-income families have higher mean dft

⁶ SPSS Base 7.5 for Windows user's guide 7.5. Chicago, SPSS, Inc., 1997.

and dfs scores than children from high SES families.

Dental Caries-Permanent Dentition

Data on dental caries in the permanent dentition are presented in Table 4. As with the primary dentition, mean decayed, filled teeth (DFT) and decayed, filled surfaces (DFS) for permanent teeth are higher in the low SES group children than that of higher income children.

Table 5 illustrates the distribution of decay in permanent tooth surfaces. Most decay occurred in the occlusal, buccal, or lingual pits and fissures. There was almost a 10 percent increase in the amount of untreated buccal and lingual decay found in this survey as compared to the 1994 survey.

Table 6 shows the percent of children with caries-free permanent dentitions. The number of children of higher SES with caries-free permanent dentitions was 10 percent greater than their lower SES counterparts.

Table 7 shows untreated decay status. Low-income children had higher untreated decay in their permanent dentitions. With the exception of the 9 year old category, children of a low SES had twice the percentage of untreated decay as the high SES in the same age group.

Sealant Prevalence

Table 8 presents percentages of children with an occlusal sealant on one or more permanent molar. There was a substantial difference between the low and high SES groups, with an

overall 12.5 percent disparity between the two groups, with the low SES group having less sealant prevalence than the high SES group.

Treatment Urgency

Each child participating was evaluated on the level of dental treatment needed. Treatment urgency was placed in the following categories: No treatment indicated, schedule an appointment, or urgent treatment needed/schedule immediately. Any child who was recommended to have sealants was placed in the "schedule an appointment" category. Of the children in the survey sample, 33.7 percent needed no further treatment, 61.9 percent were recommended to schedule an appointment, and 4.4 percent were seen to have urgent treatment needs.

DISCUSSION

There were no significant differences in consent form information between participants and non-participants, so those examined were likely representative of the sample. The sample may not be representative of all grade 2-4 children in the state, but the fact that all geographic regions were included lends credence to the results.

Survey results show that overall caries prevalence has declined since 1994 for the same age children by measuring DFS and DFT in the primary or permanent dentition. Although, overall decay rates seem to have declined in the United States, national studies and our state survey demonstrate that dental caries continues to be

a problem for a small minority of children.

Consistent with previous studies, survey results reveal that dental caries was concentrated in certain segments of the population. Children from the low SES group consistently had higher mean DFS, DFT and untreated caries. In this survey, of low SES children, just over 20 percent had untreated decay, while nearly 11 percent of higher SES children had untreated decay in permanent teeth. Also, approximately 30 percent of the surveyed children had more than one carious tooth.

In addition, there is less evidence of the use of sealants, an important preventive treatment, in lower income families. Thus, lower SES children continue to be at a disadvantage not only for restorative care, but also for preventive dental services, suggesting the need for continued public dental programs in the state.

Based on survey results, the dental sealant rate for Iowa school-aged children is still lower than optimal. An objective in the Oral Health Chapter in *Healthy Iowans 2010* is to have at least 70% of third graders with at least one permanent molar sealed by the year 2010. *Healthy People 2010* also supports the increased utilization of sealants.

With the higher rate of pit and fissure decay on occlusal, buccal, and lingual surfaces of teeth as children get older, school-based sealant programs are essential. Given higher rates of decay in low-income families, targeting sealant

programs in areas with a large number of underserved and low-income families would be likely to produce the most benefit.

In addition, because such families are less likely to get needed dental care, it may be especially important to target preventive programs that reach these children in school settings.

Iowa is not alone in having oral health disparities between children from low-income families and other children. The Surgeon General's recent report on oral health documents the disparities relating to oral health throughout the U.S.⁷ However, while Iowa may be similar to the rest of the United States in having disparities in oral health, Iowa has a unique population with its own set of problems and challenges. Thus, it is our goal in Iowa to address these disparities as they relate to oral health and address those needs for all segments of our population.

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⁷ U.S. Department of Health and Human Services. *Oral Health in America: A Report of the Surgeon General*. Rockville, MD: U.S. Department of Health and Human Services, National Institute of Dental and Craniofacial Research, National Institutes of Health, 2000.

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⁶ SPSS Base 7.5 for Windows user's guide 7.5. Chicago, SPSS, Inc., 1997.

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Health and Human Services, National Institute of Dental and Craniofacial Research, National Institutes of Health, 2000.

1999 Iowa Oral Health Survey Tables

| Table 1 Consent Form Summary | |
|----------------------------------|-------------------------|
| Consent forms distributed | 2760 |
| Consent forms returned | 1934 |
| Number of children surveyed | 1713 |
| Ages | 6-11 |
| Grades | 2 nd (33.0%) |
| | 3 rd (33.9%) |
| | 4 th (33.1%) |
| Race: | |
| White | 90.5% |
| Black | 2.8% |
| Asian | 3.2% |
| Other | 3.5% |
| Gender: | |
| Male | 50.4% |
| Female | 49.6% |
| Insurance: | |
| No dental insurance | 29.4% |
| Medicaid | 13.0% |
| HAWK-I | 0.8% |
| Private dental insurance | 55.2% |
| Don't know | 1.6% |
| Dental visit < 1 year | 85.2% |
| Free/Reduced Lunch qualification | 27.0% |

| Table 2 Age Distribution of Children Surveyed | | |
|--|---------------------------|--------------|
| <u>Age</u> | <u>Number of Children</u> | <u>%</u> |
| 7 | 423 | 24.6 |
| 8 | 566 | 33.1 |
| 9 | 566 | 33.1 |
| 10 | 158 | 9.2 |
| Total | 1,713 | 100.0 |

Table 3
Mean dft and dfs of Primary Dentition by Socio-Economic Status

| <u>Age</u> | <u>dft</u> | | | <u>dfs</u> | | |
|--------------|----------------|-----------------|--------------|----------------|-----------------|--------------|
| | <u>Low SES</u> | <u>High SES</u> | <u>Total</u> | <u>Low SES</u> | <u>High SES</u> | <u>Total</u> |
| 7 | 1.9 | 1.4 | 1.5 | 3.3 | 1.9 | 2.4 |
| 8 | 2.4 | 1.3 | 1.7 | 4.0 | 2.1 | 2.8 |
| 9 | 1.8 | 1.5 | 1.6 | 3.0 | 2.3 | 2.7 |
| 10 | 1.9 | 1.4 | 1.6 | 3.8 | 2.2 | 2.8 |
| Total | 2.1 | 1.4 | 1.6 | 3.5 | 2.1 | 2.7 |

Table 4
Mean DFT and DFS of Permanent Dentition by Socio-Economic Status

| <u>Age</u> | <u>DFT</u> | | | <u>DFS</u> | | |
|--------------|----------------|-----------------|--------------|----------------|-----------------|--------------|
| | <u>Low SES</u> | <u>High SES</u> | <u>Total</u> | <u>Low SES</u> | <u>High SES</u> | <u>Total</u> |
| 7 | 0.3 | 0.2 | 0.2 | 0.4 | 0.2 | 0.3 |
| 8 | 0.6 | 0.3 | 0.4 | 0.7 | 0.4 | 0.5 |
| 9 | 0.5 | 0.4 | 0.4 | 0.7 | 0.5 | 0.6 |
| 10 | 0.9 | 0.5 | 0.6 | 1.4 | 0.6 | 0.9 |
| Total | 0.5 | 0.3 | 0.4 | 0.7 | 0.4 | 0.5 |

Table 5
Distribution of DFS and Untreated Decay in the Permanent Dentition by Surface

| <u>Surface</u> | <u>DFS</u> | <u>Untreated Decay</u> |
|----------------|------------|------------------------|
| Occlusal | 58.0% | 62.0% |
| Mesial/Distal | 6.8% | 5.2% |
| Buccal/Lingual | 35.2% | 32.8% |

Table 6
Caries-Free Distribution in the Permanent Dentition
By Age and Socio-Economic Status

| <u>Age</u> | <u>Low SES</u> | <u>High SES</u> | <u>Total</u> |
|--------------|----------------|-----------------|--------------|
| 7 | 79.0% | 86.8% | 84.4% |
| 8 | 69.4% | 82.2% | 78.2% |
| 9 | 74.5% | 77.7% | 76.9% |
| 10 | 50.0% | 73.9% | 67.1% |
| Total | 71.3% | 81.2% | 78.3% |

Table 7
Untreated Decay Distribution in the Permanent Dentition by
Age and Socio-Economic Status

| <u>Age</u> | <u>Low SES</u> | <u>High SES</u> | <u>Total</u> |
|--------------|----------------|-----------------|--------------|
| 7 | 17.1% | 8.6% | 11.3% |
| 8 | 22.9% | 9.8% | 14.3% |
| 9 | 18.2% | 13.2% | 14.8% |
| 10 | 32.7% | 14.1% | 20.3% |
| Total | 20.2% | 10.9% | 13.8% |

Table 8
Distribution With a Sealant on One or More Permanent Molar

| <u>Age</u> | <u>Low SES</u> | <u>High SES</u> |
|--------------|----------------|-----------------|
| 7 | 13.3% | 26.4% |
| 8 | 22.2% | 34.2% |
| 9 | 31.5% | 43.6% |
| 10 | 27.5% | 49.5% |
| Total | 24.0% | 36.5% |