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## Challenges Faced by Minority Children in Obtaining Dental Care

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*Abstract:* Deaths of children due to neglected dental diseases have put the issue of access to care by minorities at the forefront of dental public health discussions. We evaluated the trends in dental service utilization in relation to racial disparities and other factors using Medicaid enrollment and claims data from 1990 to 1997 for Alabama children 19 years of age and younger (N=512,049). Alabama Medicaid children visited the dentist at a low and declining rate. The number of participating providers gradually declined over time and the racial disparities in service utilization were related to the availability of a local provider. Lower service utilization, however, was not a simple function of race, but a complex interaction of race with age and gender. Identification of these complex interactions and removal of barriers to service utilization in race, age, and gender sub-groups will help the U.S. meet the year 2010 oral health objectives.

*Key words:* Medicaid, dental service utilization, health disparities, minority oral health.

A twelve-year old U.S. boy died of a toothache in February 2007. The *Washington Post* wrote that a routine \$80 extraction might have saved his life.<sup>1</sup> The American Dental Association (ADA) called it a wake-up call to the nation.<sup>2</sup> One step towards preventing the next needless death due to neglected oral health is to put oral health service utilization and barriers, particularly among minorities, under the microscope.

Approximately 115 million Americans visit a dentist annually, making about 288 million dental visits, and receiving 335–422 million dental procedures.<sup>3,4</sup> However, those

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who are less educated, poor, African American, or Hispanic have significantly fewer diagnostic and preventive visits and significantly more oral surgical visits.<sup>3</sup>

Identification of factors related to utilization of oral health services has considerable public health significance. If population based data are collected over time, we can identify the trends in service utilization and the factors related to such trends with validity and generalizability. The purpose of this study was to use Alabama Medicaid data from 1990–1997 to evaluate the trends and related factors in oral health service utilization by children.

## Methods

Data were obtained from all Alabama Medicaid claims (1,028,626) submitted between October 1, 1989 and September 30, 1998 (1990–1997 fiscal years). Two primary databases were used in the analysis. The first database (*eligibility database*) contained a listing of Medicaid-eligible subjects. The second database contained information related to procedures performed and the claims submitted (*claims database*). These two databases were merged for the analysis as described elsewhere.<sup>5–7</sup> The University of Alabama at Birmingham Institutional Review Board reviewed and approved the study protocol.

In order to compare our data with the published national estimates and the Healthy People 2010 objectives,<sup>8</sup> we selected claims from Medicaid eligible people who were 19 years of age or younger (N=512,049). Basic descriptive statistics and logistic regression analysis were used in highlighting group differences and trends and identifying the factors associated with oral health service utilization. The dependant variable was the use of dental services as indicated by having or not having a dental claim; the independent variables were age, race, gender, fiscal year, and the availability of a participating provider in the county of residence. Two-sided Type I Error probability  $\leq 5\%$  was chosen as the level of significance.

Individual dental claims were classified as: *diagnostic and preventive* (DP), *restorative* (R), *surgical* (S), or *emergency treatment* (E) using the ADA procedure codes. Some claims were classified under more than one category (e.g., simple extraction, D7110 was classified both under surgical and emergency categories).

## Results

In comparison with their respective counterparts, more females (51.8%), African Americans (56.6%), and children 5 years old or younger (56.5%) were enrolled in the Medicaid program (Table 1). There were 3,724 (.73%) Hispanics of any race and 2,000 (.39%) Asians in the database and these subjects were grouped together under the *other* category with those of *unknown* race/ethnicity. They enrolled in Medicaid around 5.9 years of age (SD=5.0, median=5.0, range=1–19). Only 11% of the children were enrolled for the entire period (1990–1997), 33% for more than five years, and 12% only for one year. Of the total enrollees, 209,231 (41%) used dental services at least once during the study period. There were more males, African Americans, and those who were 5 years old or younger among those who utilized dental services. Hispanics and Asians who utilized dental services were 1,213 (.58%) and 778 (.37%), respectively. The

average age at the first dental claim was 7.3 years (SD=3.7, median=6.0, range=1–19 years).

The number of subjects who utilized services ranged from 37,988 in 1990 to 70,921 in 1995 (Table 2). There were 73,368 (1990) to 147,107 (1995) visits per year with 1.9–2.1 average number of visits per subject per year. Multiple procedures were performed per visit (multiple ADA codes on the claim forms) and the average number of procedures per visit ranged from 3.1–3.8. Solitary diagnostic and preventive (DP) services accounted for about 21–26% of all procedures reported within the fiscal year and this proportion showed only minor variations over time.

The annual proportion of Medicaid eligible children who had at least one dental claim during the year is shown in Figure 1-a. This percentage increased from 1992 to 1995 and declined afterwards. The overall average annual utilization was 21.5% (SD=6.1). This is different from the 41% utilization shown in Table 1 because only the children who were eligible for the given fiscal year were used in the average annual utilization calculation for that year. There were no gender differences in service utilization prior to 1994, but males had a higher utilization from 1995–97 (Figure 1-b). Whites had a consistently higher utilization than African Americans and others (Figure 1-c). Age was also related to service utilization, with the highest utilization seen in the 5–10 year olds (Figure 1-d). Interestingly, the service utilization among 14–19 year olds fell consistently over the years (except between 1996–1997). The differences in service utilization among all racial, gender, and age groups yielded statistical significance at  $p < .0001$  level.

**Table 1.**

**DEMOGRAPHICS OF MEDICAID ELIGIBLE SUBJECTS  
AND THOSE WHO UTILIZED DENTAL SERVICES:  
ALABAMA MEDICAID 1990–1997**

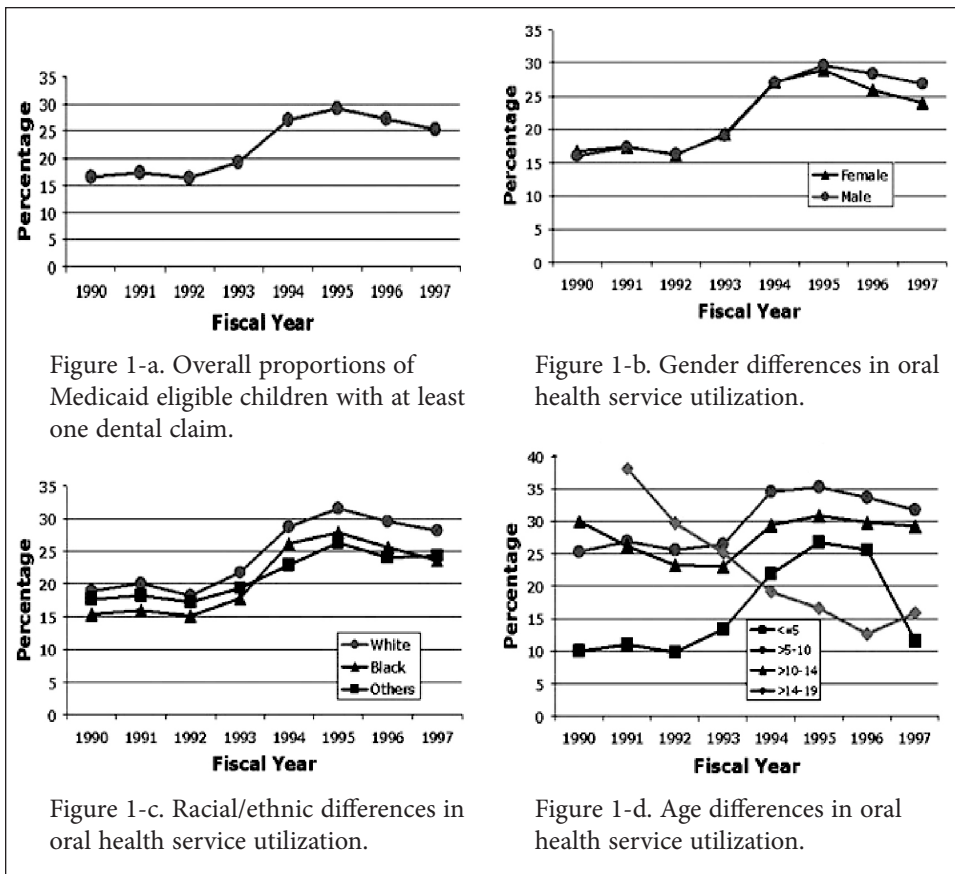
Variable	Eligible (%)	Utilized (%)
Gender		
Female	265,150 (51.8)	103,470 (49.4)
Male	246,899 (48.2)	105,761 (50.6)
Race		
White	211,939 (41.4)	84,479 (40.4)
Black	289,582 (56.6)	120,883 (57.8)
Other	10,528 (2.1)	3,869 (1.9)
Age (yrs)		
≤5	289,419 (56.5)	87,232 (41.7)
>5–10	124,094 (24.2)	79,889 (38.2)
>10–14	57,900 (11.3)	32,655 (15.1)
>14–19	40,636 (7.9)	10,455 (5.0)
<b>Total</b>	<b>512,049</b>	<b>209,231</b>

**Table 2.**

**DENTAL SERVICE UTILIZATION BY FISCAL YEAR: NUMBERS OF SUBJECTS, VISITS AND PROCEDURES AND PERCENTAGE DISTRIBUTION OF DIFFERENT TYPES OF PROCEDURES BY FISCAL YEAR: ALABAMA MEDICAID DATA 1990-1997**

Variable	1990	1991	1992	1993	1994	1995	1996	1997
Subjects (n)	37,988	50,183	51,950	63,127	70,105	70,921	63,337	57,489
Visits (n)	73,368	96,810	96,619	119,192	139,810	147,107	130,097	113,777
Visits/subject mean (SD)	1.9 (1.2)	1.9 (1.2)	1.9 (1.2)	1.9 (1.2)	2.0 (1.3)	2.1 (1.4)	2.1 (1.4)	2.0 (1.3)
Procedure/visit mean (SD)	3.8 (2.4)	3.8 (2.4)	3.8 (2.3)	3.1 (1.8)	3.3 (1.8)	3.2 (1.9)	3.3 (1.9)	3.5 (1.9)
<b>Procedure (%)</b>								
DP	23.8	25.2	25.1	26.3	26.0	23.9	21.4	22.3
R	8.9	8.1	8.3	7.8	8.0	7.9	7.9	8.9
S	.6	.7	.7	.9	.7	.7	.8	.8
E	.3	.4	.4	.3	.4	1.3	1.5	1.6
Other	7.0	7.8	7.7	7.8	8.4	9.3	9.5	4.3
Multiple	59.4	57.8	57.8	56.9	56.5	56.9	58.9	62.1

DP = Diagnostic & Preventive  
R = Restorative  
S = Surgical  
E = Emergency



The average cost of dental services per person per year ranged from \$114.44 to \$199.72 (the average annual cost per dental visit was \$88; SD=\$108 and the average annual cost for all dental visits per person was \$170; SD=\$203). There was a gradual increase in the annual amounts claimed per person from 1993 (\$144.34) to 1996 (\$199.72).

Whites, compared with others (OR=1.32; 95% CI=1.31-1.33), and those who had a participating service provider within the county of residence, compared with those who did not (OR=1.15; 95% CI=1.12-1.20), were more likely to use services (logistic regression analysis main effects model: Table 3). Compared with the 14-19 years old age group, 5-10 year old and 10-14 year old children were twice as likely (OR=2.32; 95% CI=2.29-2.35 and OR=2.07; 95% CI=2.04-2.10, respectively) to have a dental visit, while the youngest group had a small excess in odds (OR=1.03; 95% CI=1.01-1.04). These estimates are adjusted for the annual variations in service use (i.e., fiscal year) and the length of Medicaid eligibility.

The model that included interaction terms indicated that the likelihood of dental service use is not a simple function of race but a complex interaction of race with other factors. For instance, *White males who had a local service provider* were more likely to have a dental visit than *non-White males who did not have a local provider*; this

**Table 3.****EFFECT OF RACE, GENDER, PROVIDER AVAILABILITY,  
AND AGE ON DENTAL SERVICE UTILIZATION:  
ALABAMA MEDICAID 1990–1997**

Comparison	Odds ratio	95% confidence interval
Race		
White vs. Non-White	1.32	1.31–1.33
Gender		
Female vs. male	.99	.985–.998
Provider <sup>a</sup>		
Yes vs. no	1.15	1.12–1.20
Age (years)		
>14–19	1.00	(reference)
≤5	1.03	1.01–1.04
>5–10	2.32	2.29–2.35
>10–14	2.07	2.04–2.10

<sup>a</sup>Availability of a participating provider within the county.

pattern was confined only to 5–10 year olds ( $p < .05$ ) and 10–14 year olds ( $p < .05$ ). A similar pattern was observed when White females with local providers were compared with non-White females without local providers. The absence of a participating local provider within the county of residence of the subject affected the service use of non-Whites more than Whites ( $p = .007$ ).

Importantly, there was a decline in the annual number of providers at the time of the study who submitted a dental claim over time. There were 437 providers who submitted at least one claim in 1990 and this number continuously declined almost annually (except between 1994 and 1995, when there was a slight increase) down to 346 by 1997.

## Discussion

It has been argued that the life of the child who died of a toothache in February 2007 could have been saved if the mother had not lost the family Medicaid and Medicaid dentists were easy to find. Insurance coverage and affordability of care, access to providers, and willingness of providers to accept patients who are participating in insurance programs such as Medicaid are recognized factors that govern service utilization.<sup>9,10</sup> However, since we focused on Medicaid-eligible subjects, lack of insurance does not explain the observed lower utilization in our study. Disparities in access to dental care are known to be significantly associated with poverty, race/ethnicity, and low parental education, even after adjusting for insurance status.<sup>11</sup> Among the other significant

determinants are availability of transportation, availability of service providers within a reasonable distance, and lack of perceived need for care. In Alabama, rural, non-Hispanic African Americans who are less educated, have more children (younger than 6 years or older than 12 years), and report poor perceived oral health are known to underutilize the dental services.<sup>12</sup> Perceived judgmental, disrespectful, and/or discriminatory behavior from staff and providers because of the patients' race and public assistance status may also influence the service utilization.<sup>13</sup> Providers may not treat Medicaid subjects due to broken appointments, low fees, patient non-compliance, unreasonable denial of payments, slow payment, and complicated paperwork.<sup>14</sup> However, we were not able to evaluate the effect of the above factors because our dataset did not include these variables.

Our finding that only about 22% of eligible subjects had at least one dental visit per year is lower than the national average given by 1996 MEPS data (28%) and closer to the percentage of children who obtained dental care without insurance (19%).<sup>15</sup> Our estimate is much lower than the estimates of 52–67% reported from the NHANES III survey.<sup>16</sup> Using the same Alabama Medicaid claims data, Petersen et al. showed that 77% either saw a primary care physician or had a well child visit.<sup>17</sup> In this connection, researchers, dentists, and policymakers should explore why the oral health service utilization of Alabama children is lower than the national average, is similar to that of uninsured children, and is also 3–4 times lower than the medical service utilization by the same Alabama Medicaid children. Answers to these questions may apply to other areas of the country as well.

Edelstein and colleagues, using data from 35 states, have shown that only about 16% of the dentists participate in the state Medicaid program.<sup>9</sup> The Alabama experience was similar during the study period as only 26% of dentists participated, according to Centers for Disease Control/Association of State and Territorial Dental Directors (CDC/ASTDD) Oral Health Synopsis 2000.<sup>18</sup>

A lower proportion of Alabama children had diagnostic and preventive visits compared with children in other states<sup>19</sup> and in national data. Manski et al. showed that over 75% of children below 19 years of age had such a visit, and the relative rate of preventive procedures remained stable while the diagnostic procedures increased between 1987 and 1996.<sup>3</sup> Based on 1996 MEPS data, 39.3% of children had a diagnostic or preventive visit, 4.1% had a surgical visit, and 16.2% had a visit for a restorative/other service.<sup>20</sup> While it is possible that our categorization of services differ from the schemes of other investigators, our estimate for diagnostic and preventive services was lower and declining over the last few years. Due to the limitations of our data, previously mentioned, we were not able to explore the reasons for this observation.

Few studies have examined changing patterns of service utilization over time. Manski et al. showed that the utilization gap between lower- and higher-income people widened during the 20-year study period.<sup>21</sup> Based on analyses of data regarding dental expenditures from the 1987 National Medical Expenditure Survey and the 1996 MEPS, real *per capita* dental expenditures among 2- to 17-year-old children who had a dental visit fell from \$578.05 in 1987 to \$498.57 in 1996.<sup>22</sup> In this study, we observed lower annual amounts claimed for dental services per subject that gradually increased from 1993 (\$144.34) to 1996 (\$199.72), but fell afterwards. Cheng et al. analyzed national

survey data to examine the impact of the 1996 welfare reform policies on health service utilization among current and former welfare recipients and found a reduction in dental service utilization as well as other medical services.<sup>23</sup> These welfare reforms limited the duration of assistance and promoted departure from the program through employment; as a result, many former welfare recipients no longer qualified for Medicaid insurance, which may explain the trend of decreased dental claims and oral health service utilization observed in our study.

Interventions that can alleviate health care needs include: comprehensive approaches to care, attention to enhancing dental service capacity, broadening the scope of the dental skills of locally available providers, expanding the pool of dental providers, creating new interdisciplinary teams in enhanced community-based sites, and developing a more comprehensive oral health policy.<sup>24</sup> *Smile Alabama!*, an initiative focused on improving claims processing, increasing dental reimbursement, provider education and recruitment, and recipient education is a step Alabama Medicaid took in that direction after our study period. According to that program, from 1999–2002, enrollment of targeted Medicaid children increased 32.7% and the number of participating dental providers increased by 127 providers, a 38.7% increase. The number of children receiving dental services increased from 82,600 in 1999 (in 1997, last year of our observation period, there were only 57,419 children who received services) to 130,208 in 2002, a 57.1% total increase, with a 4.8% increase in the annual dental visit rate.<sup>25</sup> Despite the claim that among African American communities the availability of providers or health insurance are not determinants of service utilization, the above experience suggests that access to oral health care services can be improved through a multidimensional and strategically planned dental outreach initiative.

Observed differences in service utilization among racial groups are consistent with the literature.<sup>26</sup> What is interesting, however, is that this disparity is not a simple function of race, but a complex interaction of race with other demographic and provider-related factors. Our multivariable analyses that included two-way and three-way interactions highlighted the patterns of obtaining care in different population subgroups. We can use these patterns to formulate strategies to reach these subgroups. For instance, by making Medicaid-accepting dentists available within predominantly African American neighborhoods (or at least hygienists within school-based programs) and by encouraging older and very young non-White male and female children to obtain care (or encouraging their caregivers to obtain it for them), service utilization by these groups can be enhanced. We cannot explain the dramatic decline in service utilization by 14–19 year olds, or why there was an increase after 1996. It is also uncertain if the 1996 welfare reforms would explain the observed pattern.

In conclusion, less than a quarter of Alabama Medicaid children sought dental care annually. This proportion further declined towards the end of the observation period. Very young and older non-White children residing in communities where there were no participating providers were at higher risk of not obtaining care. Creative and practical approaches beyond just throwing money at the problem may be needed to address the observed disparities and to prevent those rare, but needless, deaths.

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## Notes

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