Dental Services, Costs, and Factors Associated with Hospitalization for Medicaid-eligible Children, Louisiana 1996–97

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Abstract

Objective: *This study compared types and costs of dental services rendered to children who had received care in a hospital operating room (H) with children who had not (NH).* ***Methods:*** *The study population consisted of all children aged 1–5 years who received a dental service reimbursed by the Louisiana Medicaid EPSDT program from October 1996 through September 1997. Claim files were provided by the Louisiana Bureau of Health Services Financing. A treatment intensity index [TII=3*(# extractions) + 2*(# pulpotomies + # crowns) + # simple restorations] was calculated for H children (n=2,142) and NH children (n=38,423). Using logistic regression, a dichotomous hospitalization variable (H vs NH) was regressed against treatment intensity and selected personal and parish (county) characteristics for each of the five age groups. Total and average reimbursement per child were calculated for both groups of children, by age.* ***Results:*** *The mean treatment intensity scores for H and NH children were 24.02 (SD=11.82) and 2.16 (SD=4.78), respectively. For all age groups, children with treatment intensity scores greater than 8 were at least 132 times more likely to be hospitalized than were children with scores less than or equal to 8. The mean cost for care provided to H children was $1,508 compared with $104 for NH. Total costs for dental care rendered to H children (5% of the study population) were $3,229,851 (45% of total dental costs for the study population).* ***Conclusion:*** *Reducing severe caries through early interventions could provide substantial cost savings. [J Public Health Dent 2000;60(1):21-27]*

Key Words: Medicaid, childhood caries, hospitalization, cost.

Several studies have shown that children from low-income families are at greater risk for severe caries in their primary dentition than those from other families (1-6). However, research documenting the total cost from this condition is limited (7). Cost estimates for individual patients based on a review of dental records in an academic setting in 1992 ranged from $170 to $2,212 per patient and treatment cost increased greatly if care was provided in a hospital operating room under general anesthesia (7). In one study, for example, hospitalization increased the cost to as much as $6,000 per patient (8).

Medicaid claims data can provide critical information about treatment services delivered and total resources spent for dental care provided to children from low-income families. To date, only the state of Iowa has reported on the portion of its Medicaid dental reimbursements spent on very young children (9). Using 1994 data, that study found that 29 percent of all dental reimbursements for children under age 6 years were spent on care rendered in hospital operating rooms. Excluding oral exams, the most common services were stainless steel crowns, amalgam and composite restorations, pulpotomies, and extractions, indicating that the majority of dental care was associated with dental caries.

The purpose of this research was to compare the types and costs of dental services provided through the Louisiana Medicaid Early, Periodic, Screening, Diagnosis, and Treatment (EPSDT) Program to very young children who had received care in a hospital operating room to children who had not. Of particular interest was the association between hospitalization and the types and numbers of procedures performed as a marker of the severity of dental caries. A strong association would suggest that earlier introduction of preventive strategies may reduce treatment needs that require hospitalization.

Methods

This investigation used a computer file, provided by the Bureau of Louisiana Health Services Financing, to analyze claims submitted to Medicaid EPSDT for dental services rendered from October 1996 through September 1997. The data set included type of procedure by tooth and surface, reimbursement amount, date of visit, recipient's birth date, parish (county) of residence, and physical or mental disability status. Identification numbers for both providers and patients were encrypted. The state Medicaid dental director provided data on the number of general and pediatric dentists practicing in each parish. Estimates of the 1996 population and per capita income for each parish were obtained from the

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Bureau of Census (10). This information was merged with the dental claims data. Analysis was confined to children whose age was older than 11 months and younger than 72 months when they received a dental service reimbursed by Medicaid EPSDT.

A dental procedure was defined as any service listed in the "Louisiana Medicaid Program Dental Service Procedure Codes and Explanation of Benefits." This document was provided by the Louisiana Bureau of Health Services Financing. The children were divided into two groups: hospitalized (H) if they had received procedure number 9420 (code for "hospital call" in the "Louisiana Medicaid Program Dental Service Procedure Codes and Explanation of Benefits") at least once during the study year, and nonhospitalized (NH) if otherwise. Thus, any services (e.g., topical fluoride application) rendered in a dental office visit before or after a child's hospitalization were categorized as received by an H child. This approach was taken to obtain an overall treatment profile for children requiring hospitalization for dental care as evaluated by the provider and approved by the Medical Dental Program.

Five variables were calculated for H and NH children: (1) the proportion who had received at least one of the following procedures—simple restoration (one- to three-surface amalgam or composite filling), crown (stainless steel or polycarbonate), pulpotomy, and extraction; (2) the mean number of simple restorations, crowns, pulpotomies, extractions, as well as the mean sum of simple restorations, crowns, and extractions; (3) the proportions of children who had received a simple restoration, crown, or extraction on at least one maxillary incisor, on at least one first primary molar, and on at least one second primary molar; (4) the proportions of children who had received a simple restoration, crown, or extraction on all maxillary incisors, on all first molars, and on all second molars; and (5) a treatment intensity index (TII), which provided a weighted sum of the types of dental services performed. For this index, an arbitrary decision was made to weight an extraction as 3, pulpotomies and crowns as 2, and simple restorations as 1. For example, the TII for a child who had two extractions and one simple restoration would be 7. O'Sullivan and Curzon (11) constructed similar indices for assessing the work units required to provide a given procedure, as did Reisine and Miller (12) in determining the severity of procedures performed during an office visit. In this study, the TII was a proxy for severity of oral disease and likely reflected both clinical status and variation in dentists' decision making.

The 10 procedures most frequently received by H children were compared to those received by NH children. In addition, total and average Medicaid dental reimbursements per child were calculated for both groups. All statistics were calculated by child's age in years at time of the last dental visit, where age 1=12–23 months, age 2=24–35 months, age 3=36–47 months, age 4=48–59 months, and age 5=60–71 months.

Logistic regression was used to determine the factors associated with a child's being hospitalized. Separate regressions were run for each age group because the number of dental services provided and the dentist's ability to effectively manage behavior may differ by year of age for young children. In addition, the study population size was sufficiently large to stratify by age without a significant loss in statistical power.

In separate models for all children and for children who received at least one restoration, a dichotomous hospitalization variable was regressed against the child's TII, sex, disability status, use of a pediatric dentist, and characteristics of the parish of residence that could affect access to Medicaid dental providers (dentist-to-population ratio, population, and income per capita). Previous studies of medical care have found that Medicaid populations' access to care increases as physician-to-population ratio increases and as per capita income decreases (13,14). The latter effect is attributed to decreased demand for medical care in the non-Medicaid market resulting from lower income, which increases the supply of physicians available to the Medicaid population.

The backward selection option in the SAS logistic procedure was used to select the best model (15). The procedure enters the full model and then removes the explanatory variable with the lowest chi-square value (highest *P*-value) if it exceeds the acceptance criterion of $P<.1$. This step is repeated until *P*-values of all remaining variables meet the acceptance criterion.

Results

The study population consisted of 40,565 children who had 64,385 dental visits at which 233,635 dental procedures were performed. Approximately 5 percent of these children (n=2,142) received care in a hospital operating room (Table 1). Sixty-three percent of children in group H were 3 years of age or younger, compared to

TABLE 1
Selected Characteristics of Hospitalized* and Nonhospitalized† Medicaid-eligible Children, Louisiana, 1996–97

	Hospitalized (n=2,142)		Nonhospitalized (n=38,423)	
Characteristic	*n*	%	*n*	%
Age (years)				
1	109	5	2,067	5
2	500	23	5,100	13
3	743	35	9,499	25
4	525	25	10,996	29
5	265	12	10,761	28
Male	1,137	53	19,578	51
Disabled	96	4	1,450	4
Provider is pediatric dentist	1,316	61	12,217	32

*Received dental care in hospital operating room at least once from 1996–97.
†Did not receive dental care in hospital operating room from 1996–97.

43 percent of children in group NH (chi-square=424 for the entire age distribution; $P<.001$). Children in the H group were more likely to receive care from a pediatric dentist than their NH counterparts (Table 1). In addition, children in group H had more visits and procedures performed, higher TII scores, and lived in less populated parishes with lower per capita income and slightly lower dentist-to-population ratios (Table 2).

Higher percentages of group H children received at least one simple restoration, crown, pulpotomy, or extraction than NH children in every age group (Table 3). For example, group H children were 7 to 13 times more likely to receive a crown as their NH counterparts. Also, the mean number of each procedure and the mean number of all procedures were larger in the H group than in the NH group (Table 4).

Almost 70 percent of group H children received treatment, i.e., a simple restoration, crown, or extraction on a maxillary incisor versus 9 percent of group NH (Table 5). Just over 50 percent of group H received treatment on all four maxillary incisors versus 2.7 percent of group NH. In addition much higher percentages of group H

TABLE 2
Selected Characteristics for Hospitalized* and Nonhospitalized† Medicaid-eligible Children, Louisiana 1996–97

	Hospitalized (n=2,142)		Nonhospitalized (n=38,423)	
Characteristic	Mean	SD	Mean	SD
Age (years)	3.2	1.0	3.6	1.2
Visits	2.4	1.0	1.5	1.0
Procedures	18.5	6.3	5.1	4.0
Treatment intensity index	24.0	11.8	2.2	4.8
Parish population	127,260	127,697	223,896	185,830
Parish per capita income	$15,369	$2,413	$16,661	$2,770
Dentist per 1,000 population	0.4	0.2	0.5	0.2

*Received dental care in hospital operating room at least once from 1996–97.
†Did not receive dental care in hospital operating room from 1996–97.

TABLE 3
Percentage of Hospitalized* (H) and Nonhospitalized† (NH) Medicaid-eligible Children Who Had Specified Procedures on at Least One Tooth, by Age, Louisiana, 1996–97

	Simple Restoration		Crown		Pulpotomy		Extraction	
Age (Years)	H	NH	H	NH	H	NH	H	NH
1	32.1	3.5	98.2	7.3	71.6	5.3	13.8	2.3
2	56.4	12.1	95.8	12.8	70.0	9.7	26.2	3.5
3	66.0	21.3	94.6	11.4	68.5	8.8	24.2	3.6
4	55.2	27.5	96.2	11.3	73.1	8.6	45.9	6.4
5	54.3	30.5	97.0	13.1	79.2	11.0	62.3	15.1
All	57.9	23.5	95.8	11.8	71.5	9.3	34.2	7.5

*Received dental care in hospital operating room at least once from 1996–97.
†Did not receive dental care in hospital operating room from 1996–97.

TABLE 4
Mean Number of Specified Procedures Performed on Hospitalized* (H) and Nonhospitalized† (NH) Medicaid-eligible Children, by Age, Louisiana, 1996–97

Age	Simple Restoration		Crown		Pulpotomy		Extraction		Sum‡	
(Years)	H (SD)	NH (SD)	H (SD)	NH (SD)	N (SD)	NH (SD)	H (SD)	NH (SD)	H (SD)	NH (SD)
1	1.1 (1.8)	0.1 (0.5)	5.3 (2.6)	0.2 (1.0)	2.7 (2.3)	0.2 (0.7)	0.6 (1.6)	0.1 (0.4)	6.9 (3.1)	0.4 (1.3)
2	2.0 (2.4)	0.3 (1.1)	6.3 (3.6)	0.4 (1.3)	2.9 (2.8)	0.3 (1.0)	0.9 (1.6)	0.1 (0.5)	9.2 (3.7)	0.8 (2.0)
3	2.9 (2.9)	0.6 (1.6)	6.9 (4.2)	0.3 (1.2)	2.9 (3.0)	0.2 (0.9)	0.7 (1.6)	0.1 (.05)	10.5 (3.8)	1.0 (2.3)
4	1.7 (2.1)	0.8 (1.6)	6.5 (3.2)	0.3 (1.1)	2.8 (2.8)	0.2 (0.8)	1.5 (2.1)	0.1 (0.6)	9.7 (3.5)	1.2 (2.2)
5	1.6 (1.9)	0.8 (1.6)	5.9 (2.9)	0.3 (1.0)	2.8 (2.5)	0.2 (0.7)	2.1 (2.3)	0.3 (0.8)	9.6 (3.4)	1.4 (2.3)
All	2.1 (2.5)	0.7 (1.5)	6.4 (3.7)	0.3 (1.1)	2.8 (2.8)	0.2 (0.8)	1.1 (1.9)	0.2 (0.6)	9.7 (3.7)	1.1 (2.2)

*Received dental care in hospital operating room at least once from 1996–97.
†Did not receive dental care in hospital operating room from 1996–97.
‡Pulpotomy precedures excluded.

TABLE 5
Percentage of Children Receiving Procedures on Selected Teeth among Hospitalized* (H) and Nonhospitalized† (NH) Medicaid-eligible Children, by Age, Louisiana, 1996–97

Age (Years)	At Least 1 Max. Incisor Treated		All Max. Incisors Treated		At Least 1 1st Molar Treated		All 1st Molars Treated		At Least 1 2nd Molar Treated		All 2nd Molars Treated	
	H	NH	H	NH	H	NH	H	NH	H	NH	H	NH
1	94.5	10.6	80.7	4.8	69.7	2.2	43.1	0.6	6.4	0.5	0.9	0.2
2	93.2	16.9	79.4	7.2	87.2	8.2	63.2	1.6	45.8	5.2	23.6	1.0
3	76.6	12.4	52.6	3.6	90.2	12.7	59.8	1.8	90.3	17.4	67.0	3.7
4	45.9	5.4	29.0	1.2	94.1	19.4	59.2	2.2	96.6	26.9	77.7	5.3
5	41.5	5.6	20.4	0.9	96.6	24.7	64.9	2.2	98.5	31.4	73.2	4.7
All	69.5	9.0	50.5	2.7	90.2	16.8	60.2	1.9	78.2	21.5	56.9	3.9

*Received dental care in hospital operating room at least once from 1996–97.
†Did not receive dental care in hospital operating room from 1996–97.

children received treatment on at least one first molar (90.2% vs 16.8%), at least one second molar (78.2% vs 21.5%), all first molars (60.2% vs 1.9%), and all second molars (56.9% vs 3.9%).

The four most common procedures received by H children, which were caries related, accounted for 64 percent of all procedures (Table 6). In contrast, the four most frequently performed procedures performed on NH children were all preventive or diagnostic and accounted for 56 percent of all procedures.

Total Medicaid dental reimbursement for children aged 1 through 5 years was $5,814,754 (Table 7), with 32 percent going to care received by children in group H. The state Medicaid dental director estimated that Louisiana Medicaid, on average, incurred additional hospitalization costs of $650 per child, which included payments for the operating room, for general anesthesia, and for other frequently performed procedures such as chest x-rays, blood laboratory and chemical screens, and admission physicals. Including the $650 estimate for each of the 2,142 hospitalized children would increase total costs to $7,207,054, of which 45 percent would be attributable to care for H children.

The results of the logistic regression for factors associated with hospitalization are shown in Table 8 (received any dental procedure) and Table 9 (received at least one restorative procedure). Factors most commonly having a positive association with hospitalization were a high TII (>8), living in parishes with populations greater than 100,000 (for children aged 4 years

TABLE 6
Number and Percent of 10 Most Frequently Received Procedures by Hospitalized* and Nonhospitalized† Medicaid-eligible Children, Louisiana, 1996–97

Hospitalized Children		Nonhospitalized Children	
Procedure	Number (%)	Procedure	Number (%)
Stainless steel crown	13,466 (36)	Examination	34,122 (17)
Pulpotomy	6,064 (16)	Prophylaxis	31,722 (16)
Simple extraction	2,382 (6)	Fluoride application	29,147 (15)
1-surface amalgam	2,234 (6)	Bitewing x-ray	15,808 (8)
Prophylaxis	1,863 (5)	Stainless steel crown	12,105 (6)
Examination	1,681 (4)	1-surface amalgam	10,482 (5)
Fluoride application	1,620 (4)	2-surface amalgam	9,650 (5)
Additional x-ray	1,482 (4)	Nitrous oxide	8,996 (5)
Prior authorization x-ray	1,206 (3)	Pulpotomy	7,848 (4)
2-surface amalgam	1,202 (3)	Simple extraction	5,830 (3)

*Received dental care in hospital operating room at least once from 1996–97.
†Did not receive dental care in hospital operating room from 1996–97.

TABLE 7
Total and Average Medicaid Dental Reimbursement (in $) for Dental Care Provided to Hospitalized* (H) and Nonhospitalized † (NH) Children, Louisiana, 1996–97

Age (Years)	H Children Reimbursements ($)		NH Children Reimbursements ($)	
	Average Cost (SD)	Total Cost	Average Cost (SD)	Total Cost
1	712 (241)	77,576	60 (108)	124,867
2	827 (302)	413,360	94 (155)	481,389
3	896 (341)	665,564	99 (150)	943,441
4	865 (294)	453,941	105 (139)	1,149,852
5	857 (260)	227,110	119 (136)	1,277,654
All	858 (310)	1,837,551	104 (142)	3,977,203

*Received dental care in hospital operating room at least once from 1996–97.
†Did not receive dental care in hospital operating room from 1996–97.

TABLE 8
Logistic Regression* Odds Ratios for Factors Associated with Hospitalization Among Medicaid-eligible Children Who Received Any Dental Procedure from Louisiana Medicaid from October 1996 to September 1997, by Age

	Age (Years)				
Explanatory Variable	1 (*n*=2,176)	2 (*n*=5,600)	3 (*n*=10,242)	4 (*n*=11,521)	5 (*n*=11,026)
Treatment intensity index (TII>8)	132 (71, 245)†	171 (118, 249)	164 (122, 219)	177 (124, 252)	238 (125, 451)
Population>100,000	3.3 (1.5, 7.0)	2.0 (1.4, 3.0)	1.8 (1.3, 2.4)	1.6 (1.2, 2.3)	
Mid-low income ($13,755–$16,690)				0.67 (0.5, 0.91)	
Mid-high income ($16,691–$19,288)	0.2 (0.1, 0.3)	0.2 (0.1, 0.3)	0.21 (0.15, 0.3)	0.14 (0.09, 0.22)	0.34 (0.24, 0.48)
High income ($>19,288)	0.02 (0.01, 0.09)	0.03 (0.02, 0.06)	0.07 (0.04, 0.11)	0.09 (0.05, 0.16)	0.23 (0.14, 0.39)
Pediatric specialty			2.7 (2.2, 3.4)	2.3 (1.9, 3.0)	2.7 (2.0, 3.5)
Disability				2.2 (1.3, 3.7)	3.4 (1.9, 5.90)
Hosmer and Lemeshow goodness-of-fit statistic (*P*-value)	0.62 (0.96)	3.61 (0.61)	14.9 (0.04)	6.5 (0.37)	0.98 (0.81)

*Full model regressed hospitalization against treatment intensity, parish population, income, sex, dentists per 1,000 population ratio, disability status, and whether provider was a pediatric dentist.
†95% confidence interval.

TABLE 9
Logistic Regression* Odds Ratios for Factors Associated with Hospitalization Among Medicaid-eligible Children Who Received a Restorative Dental Procedure from Louisiana Medicaid from October 1996 to September 1997, by Age

	Age (Years)				
Explanatory Variable	1 (n=355)	2 (*n*=1,645)	3 (*n*=3,455)	4 (*n*=4,439)	5 (*n*=5,050)
Treatment intensity index (TII>8)	11 (6, 21)†	26 (18, 39)	43 (32, 58)	63 (43, 91)	106 (54, 208)
Population>100,000	4.8 (2, 11.6)	1.9 (1.3, 2.9)	1.8 (1.3, 2.4)	1.6 (1.2, 2.3)	
Mid-low income ($13,755–$16,690)	0.5 (0.2, 1.0)			0.66 (0.49, 0.90)	
Mid-high income ($16,691–$19,288)	0.08 (0.03, 0.25)	0.2 (0.1, 0.3)	0.21 (0.15, 0.29)	0.14 (0.09, 0.22)	0.34 (0.24, 0.48)
High income ($>19,288)	0.01 (0.0, 0.05)	0.03 (0.03, 0.06)	0.07 (0.04, 0.11)	0.09 (0.05, 0.16)	0.23 (0.14, 0.39)
Pediatric specialty			2.5 (2.0, 3.2)	2.4 (1.9, 3.0)	2.7 (2.0, 3.6)
Disability				2.3 (1.3, 4.0)	3.4 (2.0, 6.0)
Hosmer and Lemeshow goodness-of-fit statistic (*P*-value)	1.6 (0.98)	3.9 (0.69)	10.0 (0.19)	7.4 (0.49)	10.0 (0.12)

*Full model regressed hospitalization against treatment intensity, parish population, income, sex, dentists per 1,000 population ratio, disability status, and whether provider was a pediatric dentist.
†95% confidence interval.

and younger), having a pediatric dentist (for children aged 3 years and older), and having a disability (for children aged 4 years and older). Living in parishes with annual per capita incomes greater than $16,690 was a protective factor for all age groups. The same variables tested significant in both the full and parsimonious models and few changes were observed in the parameter estimates.

Discussion

This study confirms that intensity of treatment for dental caries is strongly associated with hospitalization. The mean treatment intensity score for H was approximately 11 times that of NH (Table 2). In fact, children hospitalized at least once were about eight times more likely than those not hospitalized to receive a crown or pulpotomy and greater than four times more likely to receive an extraction (Table 3). The mean number of crowns, pulpotomies, and extractions for H children were respectively, 20 times, 14 times,

and six times greater than the mean number of these procedures among NH children (Table 4).

Documenting the association between hospitalization and treatment intensity was necessary to determine the cost savings from averted disease. If factors other than treatment intensity were more strongly associated with hospitalization, much of the cost for H children—namely, the additional $650 resulting from delivery of care in a hospital—would not be eliminated by reducing caries severity. In this study, over 90 percent of all the H children had TII scores greater than 8 (data not shown); this would be the equivalent of three extractions, four crowns, or nine simple restorations.

Not surprisingly, the cost of dental treatment for children who had received care in a hospital operating room was far greater than for those who had not. Indeed, these children consumed a disproportionate share of Louisiana Medicaid dental resources; mean reimbursement per H child was eight times that of NH ($858 vs $104). When the estimated additional $650 from providing care in a hospital were added, the average cost was 15:1 ($1,508 vs $104). Thus, more than 30 percent of Louisiana's Medicaid dental reimbursements and approximately 45 percent of the state's total Medicaid costs for dental care (dental reimbursements and hospital reimbursements) were spent on just 2,142 children, or 5 percent of Medicaid children who received dental care and only 3 percent of Medicaid eligible children in this age group in Louisiana (16).

The costs reported in this study are quite conservative. For example, the estimated $650 reimbursement for operating room use and general anesthesia is much lower than the $1,000 to $2,600 reported in other studies (3,7). In addition, this study used Medicaid reimbursements, not billings; the latter would be higher and has been examined in at least one other study (9). In Louisiana, the reimbursement-to-billing ratio is 0.75. Using this ratio, dental billings would equal $7.75 million and total costs would increase to $9.15 million.

Medicaid dental claims data have several limitations. First, they do not contain diagnostic codes; thus, information on the child's oral health status is unknown. In this study, the TII index served as a proxy for severity of caries and probably captured not only the objective nature and extent of carious conditions, but also subjective variation in dentists' clinical decisions (17). Such variation may reflect differences in dentists' knowledge and beliefs about diagnostic criteria, disease processes, risk factors, alternative treatment options, and patient preferences, among other factors (17). Second, financing mechanisms can affect types of treatment. However, variation attributable to different financing mechanisms should be minimized in this study because the fee-for-service plan was uniform for all eligible children. Also, the Louisiana Bureau of Health Services Financing will reimburse operating room care only when prior authorization has been obtained. The dentist's statement of treatment need is compared to the final billing statement submitted to Medicaid. Finally, this study did not examine actual hospital or general anesthesia claims, but used an estimate of these charges provided by the Louisiana Bureau of Health Services Financing.

These findings may not be applicable to other states. Louisiana ranks below the median US per capita income and employment levels. These values in Louisiana were $16,612 and 92 percent, respectively, in 1996 (10). Approximately 36 percent of all Louisiana children between ages 1 and 5 years were eligible for Medicaid (16). An earlier study that examined 325 Louisiana schoolchildren who utilized school-based health care clinics found that the proportion of children aged 6 to 8 years with untreated caries in their primary or permanent dentition ranged from 61 percent to 73 percent (18). This high proportion of untreated disease in primary teeth, however, has been observed in Medicaid-eligible and low-income populations in other states (19-21).

These possible limitations notwithstanding, this study documented several important associations. For example, the high levels of treatment in children aged 3 years and younger suggest that a substantial portion of very young Medicaid children have severe dental decay. Of the 1-year-olds who visited the dentist, 8 percent (n=188 children) underwent treatment on all four maxillary incisors. In addition, more than 13.6 percent of the 2-year-olds (n=763 children) had all four maxillary incisors treated, as did 7.1 percent of 3-year-olds (n=731 children). In all, some 1,352 children aged 1 to 3 years were hospitalized for dental care.

We do not know why hospitalization was associated with residency in parishes with larger populations. Perhaps more densely populated parishes have more hospitals per square mile and hence shorter hospital traveling distances than sparsely populated parishes. Dentists with shorter hospital traveling distances may be more likely to hospitalize a marginally severe case than one who must travel a greater distance to the hospital. The finding that pediatric dentists are more likely to hospitalize may be associated with their training, their greater likelihood of having hospital privileges, and thus, the higher probability of receiving referrals for patients requiring hospitalization. The finding that pediatric specialty was not associated with hospitalization for children aged 1 and 2 years was surprising. This finding may be explained partially by the fact that approximately one-half of these children in the nonhospitalized group received care from a pediatric dentist, whereas less than one-third of the older nonhospitalized children did.

We found that higher parish per capita income levels appear to protect against hospitalization. High-income parishes may attract dentists with more technologically advanced equipment and more highly trained support staff. If this is the case, dentists located in high-income parishes may be better prepared and able to treat severe caries in an office setting.

Findings of intense and costly treatment among very young Medicaid-eligible children support early introduction of preventive strategies. Strategies addressed in existing guidance include consistent dissemination of established messages to parents and other care givers about appropriate feeding practices, daily tooth cleaning, use of fluorides and other chemotherapeutic agents, and, among infants judged to be at increased risk of caries, a dental visit by age 1 (22-24). A systematic review found limited scientific support for the effectiveness of most strategies. These strategies continue to be recommended, however, because many have been found effective in other age groups (25). Findings

of a recent survey of attitudes and practices of Louisiana dentists toward the Medicaid program indicated that more than 40 percent of dentists responded that a child's first dental visit should be at age 3 years or older (26). For many young Medicaid-eligible children included in the present study, however, opportunities for prevention, early detection, and more simple restorative options will be missed by age 3.

As part of a comprehensive plan to address caries in young children, the Office of the Louisiana State Dental Director has recommended that educational campaigns be directed at "at-risk" parishes and parents (i.e., those who have had children hospitalized for caries treatment), primary care and pediatric physicians, and general and pediatric dentists. Messages would stress the importance of oral screening, early application of preventive strategies, early referral of at-risk children to a dentist, and promotion of healthy oral care and dietary practices.

In summary, of the total costs incurred by Medicaid for dental care rendered to children aged 1–5 years, 45 percent are spent on less than 3 percent of the eligible children. Findings indicate that this small group of children receive multiple caries-related procedures, including simple restorations, crowns, pulpotomies, and extractions. The mean sum of simple restorations, crowns, and extractions received by this group is almost 10 times greater than the mean sum received in other dental settings. Reducing the treatment needs of this group through earlier intervention could reduce costs incurred by the Medicaid Program.

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