Determining Dental Utilization Rates for Children: An Analysis of Data from the Iowa Medicaid and SCHIP Programs

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Abstract

Objective: *Accessing dental care is a significant problem for children in Medicaid and SCHIP. Evaluating the extent of the access problem is affected by the differential dental utilization rates as calculated by unique approaches used by national organizations. The problem is related to the intermittent enrollment in Medicaid and SCHIP for many children during the year. The objective of this study is to evaluate the effect of four different approaches for calculating dental utilization rates for children in Medicaid and SCHIP programs.* ***Methods:*** *All Iowa Medicaid and S-SCHIP dental claims and enrollment files for CY 2001 were used to characterize the populations, calculate dental utilization rates and evaluate the types of services received by dental utilizers. Dental utilization rates were calculated four ways using the following different rate denominators: 1) any child enrolled during the year (Center for Medicare and Medicaid Services method), 2) children enrolled for 11-12 months (National Committee for Quality Assurance method), 3) a full-time equivalents (FTE) method, 4) only newly enrolled children.* ***Results:*** *The methodology employed greatly affected the dental utilization rates. Rates varied from 18% for newly enrolled children in Medicaid to 58% for S-SCHIP-enrolled children using the FTE method. Methods that included children who were more likely to be in for more months during the year, such as the NCQA approach, produced the highest rates.* ***Conclusions:*** *The method used to determine the dental utilization rates for Medicaid and SCHIP enrollees should be clearly stated when these rates are being presented. This will allow the reader to be able to make a careful and appropriate interpretation of the results.*

Key Words: Medicaid, SCHIP, dental, utilization

Introduction

Public dental benefits programs such as Medicaid and the State Child Health Insurance Program (SCHIP) play an increasingly important role in providing access to dental care for low-income children. Between 1990 and 2003, the number of children enrolled in Medicaid (including Medicaid expansion programs created as a result of the SCHIP legislation) increased from 11 million to 25 million (1). An additional 3.2 million children were enrolled in separate SCHIP (S-SCHIP) programs (2).

Although Medicaid is the largest payer for dental services for children in poverty, long-standing concerns about access to dental care for children enrolled in Medicaid persist (3, 4). The SCHIP program, being more recently implemented, is less well studied regarding the effectiveness in providing access to dental care. SCHIP programs cover a higher income population than Medicaid with different plans or delivery systems for states with separate SCHIP programs, thus creating a potential contrast with traditional Medicaid dental programs.

One of the most frequently cited analyses of children's dental utilization in Medicaid is the 1996 report by the US Department of Health and Human Services' Office of the Inspector General (OIG) (1). The OIG report found that in 1993, less than 20 % of Medicaid-enrolled children throughout the US received a preventive dental service. More recent data from the Centers for Medicare and Medicaid Services (CMS) show that 27% of children enrolled in Medicaid had a dental visit during 2001 (5). Reports based on data collected by the National Committee on Quality Assurance (NCQA), in contrast, found that 37% of children in Medicaid had a dental visit during 2002 (6).

Some of the differences in these rates (especially between the CMS and NCQA figures) undoubtedly stem from differences in the methodologies used to calculate utilization rates; in particular, which criteria were used to determine whether to include or exclude enrolled children in the analyses based on the length and continuity of their enrollment in the year of record. Other plausible factors underlying the differences are the proportion of Medicaid enrollees included in the respective databases and the enrollment characteristics of these children. Several approaches for calculating utilization rates from administrative data for Medicaid and SCHIP enrollees are described below.

Centers for Medicare and Medicaid Services (CMS) Form 416 methodology. All states are required to submit utilization data for services covered by the Medicaid Early and Periodic Screening Diagnosis and Treatment (EPSDT) benefit, including dental services, annually to CMS. The CMS-416 rates are calculated using all children enrolled at any point during the year of record as the denomi-

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nator. The strength of this approach is that it considers all children enrolled in the program during the year of record, and thus can be compared to other national measures (e.g., self-reported utilization rates obtained from surveys) that usually include children regardless of length or type of coverage.

Health plan Employer Data and Information Set (HEDIS) methodology. HEDIS is a set of measures developed by NCQA for evaluating quality in health plans. With this approach, the annual utilization rate includes only those who have been enrolled for 11-12 months in the year of record. Thus the HEDIS approach provides a comparison of utilization for individuals with a similar enrollment period or "opportunity" to schedule and receive services.

Full-Time Equivalent (FTE) methodology. Similar to calculations of FTEs in the workplace, this approach includes all children enrolled at any point in the year, but adjusts the denominator of the rates by summing the total number of months for all children and dividing by 12 months. This measure includes all children enrolled in the program at any point during the year and then adjusts globally for partial-year enrollment (7).

New Enrollee methodology. In this study, an approach is investigated that that calculates utilization rates for only those children who were "newly enrolled" in the program (i.e., who had not been in the same program during the previous 12 months). This rate can be important when high enrollee turnover and/or access to care is of particular concern, and there is interest in assessing the ease with which children can enter the dental care system after obtaining coverage. This method was used both for all children and for those enrolled for 11-12 months during the year (as in the HEDIS approach).

Dental utilization rates for both the Iowa Medicaid and S-SCHIP programs were included in this paper for several reasons: 1) few studies to date have included data from SCHIP programs in evaluations of dental utilization, 2) from a practical, statistical perspective, this presentation shows how data comparing programs can be affected by different methodologies; 3) there are important policy questions about differences in these two populations that might result in differences in dental utilization which these analyses can help address.

Without a clear understanding of the implications of using the different methodological approaches to calculating dental utilization rates it is very difficult to appropriately evaluate access to dental care for enrollees in these programs. The establishment of targets or benchmarks is impossible and policymakers receive conflicting information about the ability of enrollees to receive appropriate care without understanding why the utilization rates vary significantly.

Research questions. The primary research questions in this study were: 1) What, if any, are the effects of using various methods for calculating dental utilization from administrative data on reported dental utilization rates for children in Medicaid and S-SCHIP? 2) How do dental utilization rates for Medicaid-enrolled children compare to the respective rates for children enrolled in S-SCHIP when the various rate calculation methodological approaches are used?

TABLE 1
Demographics of children in Medicaid and S-SCHIP, CY2001

Characteristic	Medicaid	S-SCHIP
# Enrolled at any point in year	141,154	18,961
% Enrolled for 11-12 months	54.3	27.9
% of full-time equivalent enrollees	75.3	59.9
% of enrollees new to program	14.2	51.3
% of enrollees new to program and enrolled 11-12 months	1.0	5.4
Gender (% female)	50	50
Age (enrolled any point)		
% age 1-3	25.2	16.4
% age 4-7	19.2	18.5
% age 7-12	32.8	37.6
% age 13-18	22.8	27.5
% of enrollees at <50% of Federal Poverty Level	47%	Not available–all are between 133 and 200% FPL

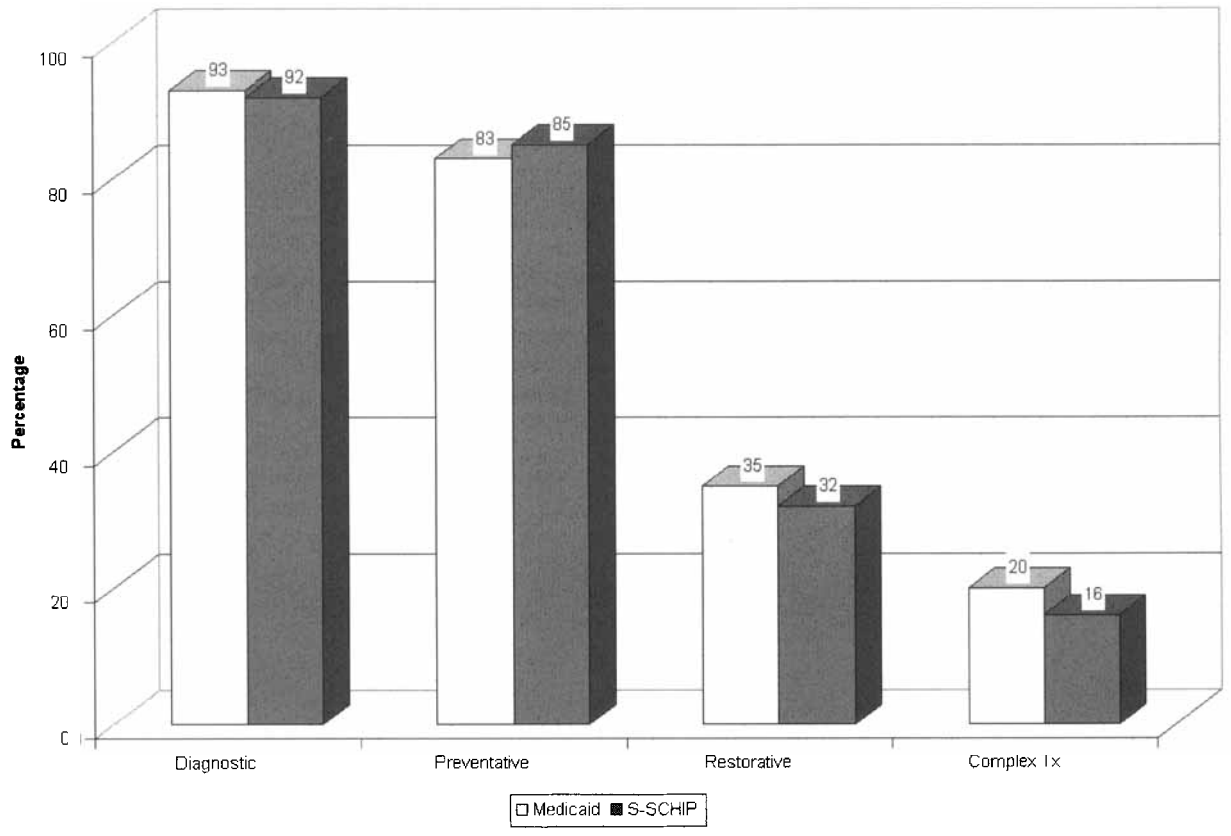
Methods

Overview of Iowa's Medicaid and S-SCHIP Dental Programs. Iowa implemented a "combination" SCHIP program in 1997 so that all children over age one in families with incomes up to 133% of the federal poverty level (FPL) are eligible for the Medicaid program, while children in families with incomes between 133% and 200% of the FPL are eligible for the separate SCHIP (S-SCHIP) program. In Iowa, S-SCHIP is called *hawk-i* – Healthy and Well Kids in Iowa.

Iowa's dental Medicaid program is a traditional fee-for-service program operated by the Iowa Department of Human Services (IDHS). Recent internal analyses by IDHS indicated that reimbursement rates for this program are about 66% of the average of dentists' submitted charges to the program (8). This level of reimbursement generally translates to rates that range from the 5th to 10th percentile of fees charged by dentists in the region (9).

Dental and medical services are provided to S-SCHIP enrollees by two private HMOs and one indemnity plan on a county-by-county basis. Though the dental benefit packages for children are generally equivalent, the provider panels differ. For example, one of the HMOs is a relatively small closed panel, while the other HMO includes any dentist willing to participate. The indemnity plan has a large network that includes about 80% of all dentists in the state. Reimbursement levels to providers vary by plan (i.e., one pays at rates slightly

FIGURE 1
Type of services received by percent of those with a visit by program



better than Medicaid, the second pays at about the 90th percentile of dentists' charges, while the third pays full charges).

Data sources. Iowa Medicaid and S-SCHIP enrollment and administrative (claims) data for all children ages 1 to 18 for calendar year (CY) 2001 were used. All children in this age range at the end of 2001 were identified in the eligibility files, and select demographic and enrollment period data were compiled. All claims for dental services provided for children enrolled in Iowa's Medicaid and S-SCHIP programs during 2001 were also obtained from the respective claims files. The enrollment and claims data were then matched for each enrolled child.

Calculation of dental utilization rates. Dental utilization rates for the four different approaches were calculated by dividing the following numerators by the given denominators:

1) The CMS 416 Methodology
2) The HEDIS Methodology
3) The Full-Time Equivalent Methodology
4) The New Enrollee Methodology

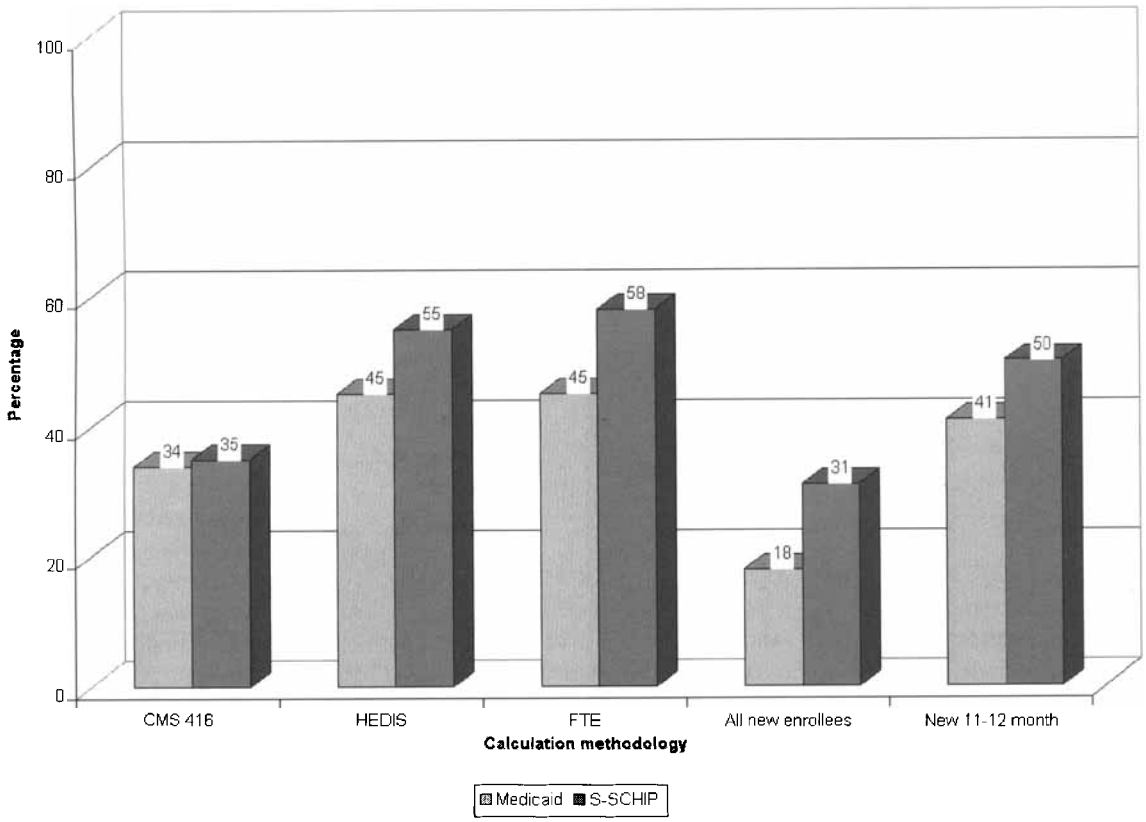
Types of services received were also categorized into diagnostic, preventive, restorative and complex restorative categories using Current Dental Terminology (CDT) codes for dental procedures. CDT codes were developed by the American Dental Association for reporting dental services to third party payers. The data were managed in SPSS for the Macintosh, version 11.0 (10).

Results

Descriptive statistics for the populations of Iowa children in Medicaid and S-SCHIP are shown in Table 1. There were about 7 times as many Iowa children enrolled in Medicaid as in S-SCHIP in 2001. Children enrolled in Medicaid were more likely to have been in the program longer than S-SCHIP enrollees. The Medicaid-enrolled population also was younger than the S-SCHIP enrollees, with almost 10% more children under age 3 enrolled in Medicaid. The proportion of enrolled children who were included in each of the different rate calculations varied considerably. All children, by definition, were included in the CMS approach; however, varying proportions of children met the criteria for the other methodologies.

Among children with a dental visit during the year (Figure 1), almost all children in both programs (93%) received a diagnostic procedure, and the vast majority (84%) received a preventive procedure. About one in three children received routine restorative care, and approximately one in six received a complex restorative procedure. Children in Medicaid were slightly more likely to receive complex treatment.

FIGURE 2
Comparison of four methods for percent with receipt of any dental visit



ported dental utilization rates. These are the utilization rates that would result if the HEDIS criteria were more inclusive, going beyond just those who have been enrolled for 11-12 months. For example, if the HEDIS criteria were changed to include all children enrolled for at least 6 months (i.e., enrolled in the program for 6-12 months during the year), the reported dental utilization rates would be 40% for Medicaid and 47% for S-SCHIP. Narrowing the inclusion criterion to include all children enrolled for at least 8 months during the year of record would yield reported utilization rates of 42% and 50% for Medicaid and SCHIP, respectively. The figure thus shows the effect of inclusion criteria that reflect the range of enrollment periods between the current CMS-416 criteria (of being enrolled for any length of time during the year of record) and the HEDIS criteria (of being enrolled for at least 11 or 12 months during the year of record).

Discussion

It is clear from these findings that reported dental utilization rates for children in public programs could be greatly affected by the methodology used to determine the rates. The CMS methodology, which includes all children enrolled for any length of time during the year, produced lower dental utilization rates than the HEDIS or FTE approaches, as well as the

FIGURE 3a
Percentages of children enrolled in Iowa Medicaid and SCHIP programs for varying numbers of months during 2001 with at least one dental visit

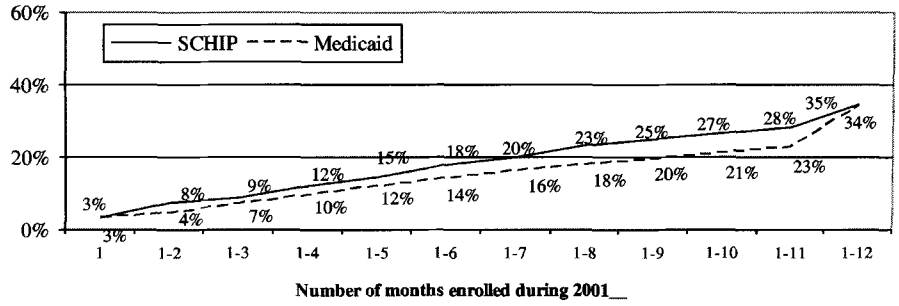


FIGURE 3b
At least one dental visit by length of enrollment (CY 2001)

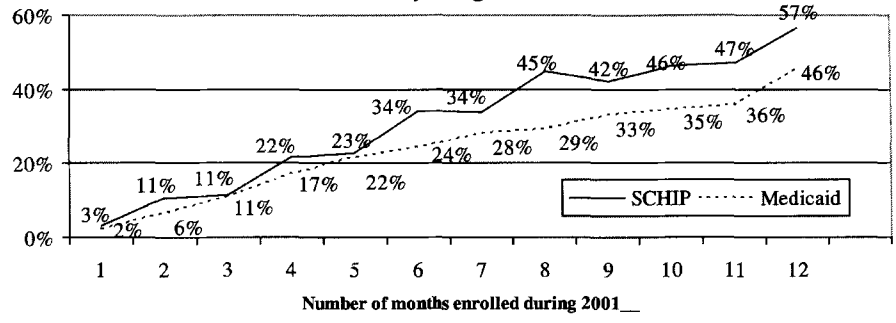


FIGURE 3c
At least one dental visit by length of cumulative months enrolled (CY 2001)

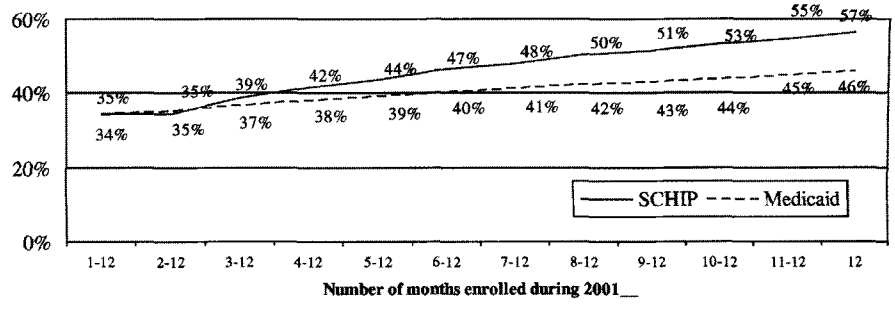


TABLE 2
Any dental visit by age and method

Methodology	Age 1-3 N	Age 1-3 %	Age 4-6 N	Age 4-6 %	Age 7-12 N	Age 7-12 %	Age 13-18 N	Age 13-18 %	Total N	Total %
1) CMS 416 method										
Medicaid	4,128	12	11,570	43	20,389	44	11,850	37	47,937	34
S-SCHIP	374	12	1,298	37	3,005	42	1,864	36	8,213	35
2) HEDIS method										
Medicaid	2,972	16	8,331	56	14,735	56	8,183	49	34,221	45
S-SCHIP	151	24	550	59	1,333	64	849	51	2,883	55
3) FTE method										
Medicaid	4,128	16	11,570	56	20,389	58	11,850	50	47,937	45
S-SCHIP	374	22	1,298	63	3,005	69	1,864	57	6,541	58
4) New enrollee method										
Medicaid	282	7	777	21	1,441	22	1,139	20	3,639	18
S-SCHIP	186	10	612	34	1,379	39	823	34	3,000	31
5) New enrollee—11-12 months method										
Medicaid	40	16	128	51	226	47	197	44	591	41
S-SCHIP	30	17	108	55	227	63	148	51	513	50

most similar rates for Medicaid and S-SCHIP enrollees. Including only 'new' enrollees in the rates (i.e., not enrolled in previous 12 months) had the lowest overall utilization rates, especially for Medicaid enrolled children.

The HEDIS and FTE approaches produced higher rates overall, and resulted in a significant differential whereby rates for children in S-SCHIP were much higher than for those in Medicaid. The FTE approach produced the highest rates, in part due to the potential for having more than one visit counted in the numerator. For example, two children each enrolled in Medicaid for six months during the year are considered one FTE (the equivalent of one person-year). If each then had a dental visit, they would both be counted in the numerator of the rate calculation (i.e., a score of two). In contrast, a child can only be counted once in the numerator for each of the other methodologies.

Longer enrollment intervals were associated with higher utilization rates. This observation is not surprising since the longer a person is enrolled in the program, the more opportunity he or she will have to identify the need for dental care, locate a participating provider, schedule an appointment and obtain services.

This is one of the first studies to report on the utilization of dental services for children in Medicaid and S-SCHIP. Children in Iowa's S-SCHIP program had rates similar to those in Medicaid when averaged across all children, but had higher rates as the length of enrollment in the program increased. The higher S-SCHIP dental utilization rates with longer enrollment intervals may be due to a number of reasons. First, children in S-SCHIP have a higher socioeconomic status, and thus their parents may have a greater awareness of the need for dental care. Dentist participation in S-SCHIP may also be higher than in Medicaid, although no data from Iowa are available yet.

The utilization rates derived from the various approaches used in this study are lower than commonly reported national annual dental utilization rates based on survey data—which typically are about 75-80% for the general population (11). Even the dental utilization rate for publicly insured children in the NHIS was much higher (68%). Interestingly, significant variation in dental utilization rates derived from survey data has also been found (12). The rates in this study, however, were generally in the range of rates derived from administrative data for public dental programs for children. Differences in the rates from survey and administrative data could occur for a number of reasons, including: (a) social response bias, with people responding more positively in a survey; (b) enrollees receiving dental services during periods when not enrolled in Medicaid (which would be missed by administrative data); or (c) providers not submitting all claims for services provided to Medicaid/S-SCHIP enrollees because they feel that low reimbursement levels are not worth the hassle of filing claims.

Ideally, dental utilization rates for children in Medicaid and S-SCHIP would be calculated using an enrollment period of sufficient length to allow enrollees a reasonable opportunity to identify the need for the service, attempt to access the service, schedule an appointment, and ultimately, receive services during one or more visits. Typically, one would expect this process to occur within 6-8 months. This raises the question of which methodology is most appropriate for evaluating utilization in state Medicaid and SCHIP programs, or in commercial health plans.

It is the belief of the authors that an approach that allows for a more consistent comparison between two entities (i.e., states or plans) by controlling for the length of enrollment (in a manner analogous to HEDIS, although not necessarily using the HEDIS 11-12 months of enrollment criteria) may provide a better indicator of access to dental care than currently used methods. An alternative approach to both the CMS and HEDIS methods would be to include all children enrolled for some interval that is somewhere between the two "extremes" of 1 month (CMS) and 11-12 months (HEDIS). Perhaps, for example, those enrolled for at least 8 months could be included when calculating dental utilization rates. As an aside, the same might be advisable for other types of services, such as well-child visits, where there is an expectation that children will have regular, periodic visits within a given year. This would allow for a reasonable time period in which children could be expected to receive services, yet would include more enrolled children in the analysis than the current HEDIS approach. Determination of this type of rate should be relatively easy for states or health plans using administrative data.

Adopting a "standard" that would apply to children covered by either public or private benefit programs would have obvious benefits in terms of comparing utilization rates across programs. Thus, this standardization could be of value to both CMS and HEDIS, especially as CMS incorporates more HEDIS outcomes measures in the evaluation of Medicaid and SCHIP programs (13). For additional analyses where access is of particular concern and there are fewer long-term enrollees, an additional evaluation of dental utilization for enrollees who have been in for less than a year could yield helpful information regarding access to care when compared to the other rates.

Finally, it should be noted that all studies using administrative data have limitations, in large part because the data were designed and submitted for reimbursement purposes rather than for research. The results reported here also are derived from data on a single state. The design and administration of Medicaid and S-SCHIP programs, as well as the characteristics of enrollees, vary significantly across states, and thus the utilization rates observed in this study should not be construed as typical of utilization rates for programs in other states.

Analyses using different methodological approaches for calculating dental utilization rates produced con-

siderable differences in rates for children in Iowa's Medicaid and S-SCHIP programs. Utilization of dental services generally was higher for children in S-SCHIP, especially when length of enrollment was considered. As an alternative to the current CMS-416 approach that includes all children enrolled for any length of time in a year of record, policymakers might want to consider analyses that include children who have been enrolled for a minimum time interval wherein utilization would be expected to occur (e.g., 6-8 months). Additional analyses of utilization for children who are newly enrolled in a program could also provide valuable information about initial access to dental care.

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References

1. Centers for Medicare & Medicaid Services. 2002 Data Compendium. Available at: http://www.cms.hhs.gov/researchers/pubs/datacompendium/2002/. Accessed September 15, 2004.
2. Centers for Medicine & Medicaid Services. SCHIP Enrollment Reports. Available at: http://www.cms.hhs.gov/schip/enrollment. Accessed September 15, 2004.
3. Office of the Inspector General (OIG), U.S. Department of Health and Human Services. Children's dental services under Medicaid: access and utilization. San Francisco, CA: Office of Evaluation and Inspection; OE1-09-93-00240; April, 1996.
4. U.S. General Accounting Office (GAO). Dental disease is a chronic problem in low-income populations. Washington, DC: United States General Accounting Office, GAO/HEHS-00-72; April, 2002.
5. American Dental Association. State Innovations to Improve Access to Oral Health Care for Low Income Children: A Compendium. Chicago: American Dental Association; 2003. Available at: http://www.prnewswire.com/mnr/ada/11207/#. Accessed February 28, 2005.
6. National Committee for Quality Assurance (NCQA). *Medicaid HEDIS® 2002 Audit Means, Percentiles & Ratios: Annual Dental Visits.* Available at: http://www.ncqa.org/Programs/HEDIS/02medicaid.htm#Annual%20Dental%20Visits. Accessed November 5, 2004.
7. Damiano PC, Kanellis M, Momany ET and Willard JC. *A Report on the Iowa Title 19 Dental Program.* A Report to the Iowa Department of Human Services. University of Iowa, Public Policy Center, Iowa City, April 1996. Available online at: http://ppc.uiowa.edu/XIX/index.html. Last accessed August 29, 2005.
8. Internal evaluation of dentist participation and fees conducted by the Iowa Department of Human Services, May 2004.
9. American Dental Association. Medicaid reimbursement for the West North Central region – using marketplace principles to increase access to dental services. Chicago, IL: American Dental Association; March 2004.
10. American Dental Association. Current Dental Terminology Third Edition (CDT-3). Chicago, IL. 1999.
11. Dey AN, Schiller JS, Tai DA. Summary Health Statistics for US Children: National Health Interview Survey, 2002. National Center for Health Statistics. Vital Health Stat 10(221). 2004. Tabl2 18, pg 47.
12. Macek MD, Manski RJ, Vargas CM, Moeller JF. Comparing oral health care utilization estimates in the United States across three nationally representative surveys. Health Services Research. 37(2):499-521, 2002 Apr.
13. Department of Health and Human Services, Centers for Medicare & Medicaid Services; CMS–250–254 and CMS–1964. Agency Information Collection Activities: Submission for OMB Review; Comment Request. Federal Register / Vol. 69, No. 73 / Thursday, April 15, 2004/Notices.