

Perceived Unmet Need for Oral Treatment Among a National Population of HIV-Positive Medical Patients: Social and Clinical Correlates

ABSTRACT

Objectives. This study examines social, behavioral, and clinical correlates of perceived unmet need for oral health care for people with HIV infection.

Methods. Baseline in-person interviews with 2864 individuals were conducted with the HIV Cost and Services Utilization Study cohort, a nationally representative probability sample of HIV-infected persons in medical care. Bivariate and logistic regression analyses were conducted, with unmet need in the last 6 months as the dependent variable and demographic, social, behavioral, and disease characteristics as independent variables.

Results. We estimate that 19.3% of HIV-infected medical patients ($n = 44550$) had a perceived unmet need for dental care in the last 6 months. The odds of having unmet dental needs were highest for those on Medicaid in states without dental benefits (odds ratio [OR] = 2.21), for others with no dental insurance (OR = 2.26), for those with incomes under \$5000 (OR = 2.20), and for those with less than a high school education (OR = 1.83). Low CD4 count was not significant.

Conclusions. Perceived unmet need was related more to social and economic factors than to stage of infection. An expansion of dental benefits for those on Medicaid might reduce unmet need for dental care. (*Am J Public Health*. 2000;90:1059–1063)

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The HIV epidemic is challenging not only for the persons directly and indirectly affected but for the health care system itself. Understanding the extent to which perceived unmet need for dental care exists in the context of the HIV epidemic is basic to our ability to develop appropriate health services responses.

In previous studies of unmet need, Marx et al. found that 41% of a mostly male HIV-infected population in San Francisco had an unmet need for oral health care in the preceding 4 months.¹ One of the most commonly reported unmet health services needs in the AIDS Cost and Services Utilization Survey (ACSUS) was for dental services.² In the 3 ACSUS interviews that included questions on dental care, the unmet need for dental care in the preceding 3 months was 8.8%, 7.5%, and 5.2%, respectively.³ Among HIV-infected women in the San Francisco Bay area, 43% reported that in the previous year they had felt they needed dental care but had failed to get it.⁴ In Santa Clara County, Calif, a study comparing measures of service requirements with service availability found that dental care was among those services with the highest levels of unmet need.⁵

In order to understand the social, behavioral, and clinical correlates of perceived unmet need for oral health care for people with HIV infection, we assessed unmet need as reported in the baseline interviews of those enrolled in the HIV Cost and Services Utilization Study (HCSUS). The goal of this study was to obtain national estimates of cost and utilization of health and supportive services for patients receiving medical care for HIV/AIDS. Only representative national data can help interpret local studies and answer questions for the nation as a whole.

Methods

The HCSUS cohort is a nationally representative probability sample of HIV-infected adults receiving medical care in the contiguous United States. For practical reasons, the reference population was limited to persons at least 18 years old with known HIV infection who made at least 1 visit for regular or ongoing medical care to a nonmilitary, nonprison medical provider other than an emergency department during a specified "population definition period." This period was January 5 to February 29, 1996, in all but 1 metropolitan area, where the start was delayed until March. Full details of the design are available elsewhere.^{6,7}

There were 2864 subjects who completed "long form" (complete) interviews. All interviews were conducted with computer-assisted personal interviewing instruments designed for this study.⁸ Initial inter-

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TABLE 1—Population Estimates^a of Percentage and Number of HIV-Infected Medical Patients With Perceived Unmet Need for Dental Care, by Demographic Characteristics

Variable	Persons With Unmet Need			
	%	n	SE	P
Age, y				
18–34 (reference)	19.9	15 732	0.030	
35–49	19.4	24 410	0.022	NS
≥50	16.7	4 408	0.047	NS
Sex				
Male (reference)	18.2	32 681	0.021	
Female	22.7	11 868	0.052	NS
Ethnicity				
White (reference)	16.0	18 251	0.023	
African American	23.6	17 911	0.035	.001
Hispanic	20.0	6 843	0.032	NS
Other	20.7	1 543	0.066	NS
Education				
Bachelor degree or higher (reference)	9.3	4 126	0.016	
AA or some college	17.7	11 600	0.018	.001
High school graduate	18.7	11 851	0.022	.0001
Not a high school graduate	29.4	16 976	0.057	.0001
Location				
Northeast (reference)	13.0	7 422	0.012	
Midwest	17.3	4 450	0.043	NS
South	28.1	23 306	0.045	.0001
West	14.3	9 373	0.021	NS

Note. NS = not significant; AA = associate in arts.
^aBased on a sample of 2864 subjects.

views lasted 120 minutes, including time to obtain informed consents and contact information. Ninety-one percent of the long-form interviews were conducted in person, and the remainder were carried out over the telephone. We approached anonymously selected subjects for interview only after providers or their agents obtained permission. All consent forms and informational materials had institutional review board approval.

As part of this interview, all respondents (n = 2864) were asked, “In the last 6 months, was there a time when you needed dental treatment but could not get it?” This single item was the measure of perceived unmet need in the analyses reported here. The questionnaire also included questions on (1) demographic characteristics, such as age, sex, ethnicity, and education; (2) enabling characteristics, which are specific attributes of an individual that either enhance or inhibit the ability to gain access to dental care, such as having a usual source of dental care, dental insurance, and income^{9,10}; (3) behavioral characteristics such as smoking and risk exposure; and (4) disease characteristics such as lowest CD4 count and the occurrence in the preceding 6 months of 2 oral symptoms that can be associated with HIV: pain in the mouth, lips, or gums and white patches in the mouth. Unmet need in the last 6 months was the dependent variable, and demographic, enabling, behavioral, and dis-

ease characteristics were the independent variables.

We categorized dental insurance into 4 groups. Two groups had dental insurance. Respondents in 1 group reported having private dental insurance, whereas those in the other group did not have private insurance but were covered by Medicaid and lived in a state that provided dental benefits to adults in the program at the time of the study. Respondents in the remaining 2 groups were without dental insurance; those in 1 group were not covered by Medicaid, while those in the other group were covered by Medicaid but lived in a state that did not provide dental benefits for adults.

The analysis in this report concerns long-form interview data only. We used weighted sample means to estimate population prevalence parameters. To adjust the standard errors and statistical tests for the differential weighting and complex sample design, we used the linearization methods¹¹ available in the SUDAAN¹² and Stata¹³ software packages. We conducted bivariate comparisons and logistic regression with SAS¹⁴ and Stata programs. We set the significance level at *P* = .05.

Results

We estimate that 44 550 (19.3%) of the approximately 230 000 HIV-infected med-

ical patients in the United States had a perceived unmet need for dental care within the last 6 months. Table 1 presents population estimates and bivariate findings for 5 demographic characteristics. The bivariate comparisons are made between each subgroup and the reference group, which we assumed to be the privileged subgroup.

When compared with 18- to 34-year-olds, the older age groups were not statistically different with respect to unmet need (aged 35–49, *P* > .69; aged 50 and older, *P* > .25). There was also no difference (*P* > .19) between males and females. African Americans were significantly more likely to have unmet need than Whites (23.6% vs 16.0%, *P* < .001). Of respondents with a bachelor’s degree or higher, only 9.3% reported unmet dental need. All other educational groups had significantly more unmet need than those with the highest level of education (*P* < .001). Respondents from the Northeast had the least unmet need of any region (13.0%), followed by those in the West (14.3%) and Midwest (17.3%). The South, with 28.1% reporting unmet need, was the only region significantly different from the Northeast, which was the reference group (*P* < .0001). The South also had significantly more unmet need than the West (odds ratio [OR] = 2.35).

Table 2 presents enabling, behavioral, and clinical variables. Income, employment, insurance, and having a usual source of care are all enabling resources. There is progressively more unmet need as respondents’ income decreases; 29.1% of those with annual incomes of less than \$5000 had an unmet need, compared with 23.9% of those with incomes of \$5000 to \$9999, 18.6% of those with incomes of \$10 000 to \$25 000, and only 8.8% of those with incomes over \$25 000, the reference group (*P* < .0001). Employed persons were less likely to have unmet dental need than those not employed (*P* < .0001).

There was a strong relationship (*P* < .0001) between the availability of dental insurance and perceived unmet need. Those with no dental insurance and not covered by Medicaid were almost 3 times as likely to have a perceived unmet need as those with private insurance. Those covered by Medicaid but living in states without adult dental benefits were 4 times more likely to have unmet dental need than those with private insurance. Almost one third of those in the former group reported an unmet need for dental care, which was the highest of any group. A comparison of states with and without dental Medicaid benefits showed that respondents without dental coverage had significantly greater unmet need (OR = 2.25).

TABLE 2—Population Estimates of Percentage and Number of HIV-Infected Medical Patients With Perceived Unmet Need for Dental Care, by Enabling, Behavioral, and Clinical Characteristics

Variable	Persons With Unmet Need			P
	%	n	SE	
Income				
>\$25 000 (reference)	8.8	5800	0.015	
\$10 000–\$25 000	18.6	11 232	0.023	.0001
\$5 000–\$9 999	23.9	14 254	0.041	.0001
<\$5 000	29.1	13 265	0.038	.0001
Employed				
Yes (reference)	13.5	11 632	0.020	
No	22.7	32 922	0.033	.0001
Dental insurance				
Private insurance (reference)	7.5	3933	0.010	
Medicaid: dental insurance	16.9	11 286	0.022	.0001
No dental insurance	22.3	14 399	0.030	.0001
Medicaid: no dental insurance	31.5	13 947	0.058	.0001
Usual source of dental care				
Yes (reference)	15.9	15 553	0.028	
No	21.7	29 000	0.025	.0001
Exposure				
Males with males (reference)	15.2	17 061	0.020	
Intravenous drug users	21.6	12 057	0.032	.009
Heterosexuals	25.3	10 773	0.058	.009
Other	22.7	4 655	0.023	.007
Smoking				
Never (reference)	17.9	11 030	0.036	
Past	12.8	6 644	0.023	.021
Current	22.8	26 879	0.026	NS
Pain in mouth last 6 mo				
No (reference)	15.8	27 678	0.026	
Yes	29.9	16 695	0.038	.0001
White patches in mouth last 6 mo				
No (reference)	17.7	29 574	0.027	
Yes	23.5	14 799	0.027	.0001
Lowest CD4 count				
≥500 (reference)	18.4	4 033	0.029	
200–499	21.8	18 859	0.034	NS
50–199	16.1	10 990	0.024	NS
<50	19.5	10 670	0.034	NS

Note. NS = not significant.

Individuals who identified a usual source of dental care were significantly ($P < .0001$) less likely to report an unmet dental need than those without (15.9% vs 21.7%). Of those with a usual source of care, 60% identified private dentist offices, 18% public clinics, 13% AIDS clinics, and 2.4% dental schools as their usual source of care. There were no significant differences in perceived unmet dental need by type of usual source of care.

The behavioral characteristics examined in this analysis are risk exposure and smoking history. Compared with males who had sex with males, all other exposure groups had significantly more perceived unmet need ($P < .01$), although these relationships were not supported by the multivariate analysis. Those who had quit smoking had less unmet need than those who had never smoked ($P < .05$).

The 3 clinical characteristics examined were (1) lowest reported CD4 count, (2)

having a history of white patches in the mouth in the last 6 months, and (3) having pain in the mouth, lips, or gums during the same period. With regard to CD4 counts, there was no significant difference between the reference group ($CD4 \geq 500$) and any of the other 3 groups. Both symptoms, however, showed a significant difference; 29.9% of persons reporting oral pain had an unmet need compared with 15.8% of those without oral pain ($P < .0001$), and almost 24% of respondents who had white patches in the last 6 months had an unmet need compared with about 18% of those without this symptom ($P < .0001$).

Table 3 presents a logistic model predicting unmet need and gives probabilities, odds ratios, and confidence intervals for all variables used in the regression. This regression analysis enabled us to examine the simultaneous effects of the demographic, enabling, behavioral, and clinical variables. We

did not include symptoms or region in this analysis. The 2 symptoms were not included because the causal relationship with unmet need was unclear. Multicollinearity was a consideration with the regional variable, which contains a host of factors, including different Medicaid coverage for oral health care. There was also multicollinearity with respect to gender and exposure, with females likely to be heterosexual, whereas males having sex with males is defined by gender. The regression was run with and without gender, and the results were virtually identical. Therefore, the regression reported in Table 3 includes sex as an independent variable, because it completes the demographic profile.

The logistic regression shows significant differences in the following categories: age, education, income, employment, dental insurance, usual source of dental care, and smoking history. The 50-and-older age group had significantly less unmet need than the reference group ($P < .05$). The only significant difference found in education was that those with less than a high school education were almost twice as likely to have an unmet need for dental care as those with a bachelor's degree or higher ($OR = 1.83$). Every income category was significant. Those with an income under \$10 000 were more than twice as likely to have an unmet dental need as those with an income over \$25 000.

Those without any dental insurance—both those with no private insurance and those in the Medicaid program with no dental coverage—were more than twice as likely to have an unmet need for dental care as those with private insurance. In states where the Medicaid program included dental benefits, there was no significant difference between those in the Medicaid program and those with private dental insurance. Those who were employed and those with a usual source of dental care were less likely to have an unmet need. Individuals who had smoked but had quit were less likely to have an unmet need than those who had never smoked.

Discussion

This is the first study of unmet dental need in a nationally representative probability sample of HIV-infected adults receiving medical care in the contiguous United States. Our research estimates that within this group there were approximately 44 550 people who expressed an unmet need for dental treatment in the last 6 months. For some individuals, associated with this unmet need is either pain or infection, which may add to problems in the quality of life and

TABLE 3—Odds Ratios From Logistic Regression Model of Perceived Unmet Need for Dental Care

Variable	Category	Odds Ratio (95% CI)
Age, y	18–34	(Reference)
	35–49	1.14 (0.95, 1.37)
	≥50	0.69 (0.49, 0.98)*
Sex	Male	(Reference)
	Female	0.81 (0.55, 1.19)
Ethnicity	White	(Reference)
	African American	0.93 (0.67, 1.28)
	Hispanic	0.96 (0.67, 1.36)
	Other	1.36 (0.52, 3.53)
Education	Bachelor degree or higher	(Reference)
	AA or some college	1.42 (0.88, 2.28)
	High school graduate	1.26 (0.80, 1.96)
	Not a high school graduate	1.83 (1.08, 3.10)*
Income	>\$25 000	(Reference)
	\$10 000–\$25 000	1.62 (1.07, 2.44)*
	\$5 000–\$9 999	2.07 (1.45, 2.96)***
	<\$5 000	2.20 (1.53, 3.18)***
Employed	Yes	(Reference)
	No	1.42 (1.09, 1.85)*
Dental insurance	Private insurance	(Reference)
	Medicaid: dental insurance	1.07 (0.72, 1.60)
	No dental insurance	2.26 (1.54, 3.33)***
	Medicaid: no dental insurance	2.21 (1.25, 3.94)***
Usual source of dental care	Yes	(Reference)
	No	1.93 (1.38, 2.72)***
Exposure	Males with males	(Reference)
	Intravenous drug users	1.13 (0.87, 1.47)
	Heterosexuals	1.37 (0.99, 1.90)
	Other	1.24 (0.71, 2.16)
Smoking	Never	(Reference)
	Past	0.74 (0.56, 0.99)*
	Current	1.20 (0.71, 1.56)
Lowest CD4 count	≥500	(Reference)
	200–499	1.25 (0.75, 2.07)
	50–199	0.82 (0.48, 1.38)
	<50	1.12 (0.62, 2.01)

Note. CI = confidence interval; AA = associate in arts.
P* < .05; *P* < .01; ****P* < .001.

may have an impact on the course of the disease. For example, there were an estimated 16 700 people with an unmet dental need who had pain in the mouth, lips, or gums in the preceding 6 months.

The HCSUS reference population is all persons who received medical care during the first 2 months of 1996. Use of weights allowed us to make direct inference to this population, and our estimates of unmet need in this population are unbiased. If we expand the population of interest to include all persons who received medical care in 1996, we hypothesize that over the course of that year, more than our estimated 44 550 persons would have expressed a perceived unmet need for dental care, since a patient who made a visit during 1996 outside of the 2-month interval would not have a chance of being sampled. There is a cumulative effect of having a larger time frame, so we believe the estimate is an underrepresentation for a 1-year period. Also, this group would include

infrequent users of medical care who may well be infrequent users of dental care.

The unmet need for dental care is substantially greater among those with HIV than in the general population. Mueller et al.¹⁵ and Berk et al.,¹⁶ in a national study of access to care, asked the question “During the past 12 months, was there a time when you wanted dental care but could not get it?” They found that 8.5% of respondents reported not getting desired care, which was the largest percentage of positive responses for any health service. It is not possible to directly compare the general population and the HIV population, since the time frames of the studies are not the same. The 19.3% of those who had an unmet need for dental care in the HCSUS study was for a 6-month period, whereas the 8.5% found in the general population study was for a 12-month period.

The unmet need for dental care in this study is more than twice that found in the ACSUS, which had a maximum of 9%.³ It

should be noted, however, that the time period used in the ACSUS was the previous 3 months, whereas the time period in the HCSUS was 6 months. In the ACSUS, people were asked about unmet dental need at 3 points during an 18-month period, and 15.5% indicated an unmet need at some point, a figure closer to that found in this study.

Although we anticipated that respondents would experience an increase in unmet oral health need as the disease progressed, both the ACSUS and the HCSUS found no relationship between stage of disease as measured by CD4 count and perceived unmet dental need. To check on this lack of relationship, we used both lowest CD4 count and the Centers for Disease Control and Prevention (CDC) definition of stage of disease and found no relationship by either measure. One explanation for this unexpected finding might be that as individuals become ill with more debilitating diseases, they become eligible for more benefits, which may include dental benefits, thereby increasing their access to dental care and decreasing unmet need. Another possibility is that these more debilitating diseases lessen an individual’s perception of oral health needs. Finally, as the disease progresses, individuals may be more likely to take all possible aggressive steps to mitigate any health problems that can occur and thus do more to prevent or resolve oral disease.

The dental insurance findings suggest that an extension of dental Medicaid coverage might result in a reduction of perceived unmet need, warranting additional study. The multivariate analysis showed no significant difference between those with private insurance and those with Medicaid dental insurance. Only the 2 groups without any dental insurance had significantly greater unmet need than those with private insurance; for both groups, unmet need was more than twice as likely. Among those covered by Medicaid, those in states without a dental benefit were almost twice as likely to perceive an unmet need for dental care (31.5% vs 16.9%). The relative lack of Medicaid coverage for dental care in the South compared with other regions may partly account for the regional differences that were found in the bivariate analysis.

We know that there is a significant relationship between smoking and oral health,^{17–19} so the finding that people who had never smoked had higher rates of unmet needs than those who had quit smoking was of interest. One possible explanation is that giving up smoking is a proxy for other health practices that may affect unmet dental need. Perhaps those who have decided to stop smoking have

taken more affirmative steps in preventive health behavior in more than one area that could affect their health and unmet need.

Conclusion

This is the first study to estimate unmet dental need at a national level. The high prevalence of unmet need for oral health care among persons receiving medical care demands attention from the health policy community. Of note was the finding that this unmet need was related more to social and economic factors than to disease factors such as stage of infection. Among the social and economic factors, the availability of dental benefits under Medicaid had a substantial effect on the number of people who perceived an unmet need. In those states where Medicaid does not include adult dental benefits, HIV-infected medical patients covered by Medicaid had the highest level of unmet need of any group studied. In light of these findings, the formulation of public policy requires further examination of the relationship between Medicaid dental benefits and perceived unmet need for dental care. □

Contributors

M. Marcus wrote the first draft, conceived the oral health component of the HCSUS survey, and designed the analysis. J.R. Freed cowrote the paper, edited the drafts, helped design the oral health component of the survey, and assisted in the analysis design. I. D. Coulter participated in the writing of the paper and helped design the oral health component of the survey. C. Der-Martirosian conducted the analyses and wrote portions of the paper. W. Cunningham assisted in the study design and provided the medical perspective of the paper. R. Andersen provided the overall conceptualization of the analytic approach and assisted in the oral health com-

ponent of the study. I. Garcia, D.A. Schneider, and W.R. Bozzette and provided the dental health policy perspective of the paper. S. A. Bozzette and M. Shapiro conceptualized and designed the HCSUS study, developed the overall instruments, and provided input to the initial versions of the paper.

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