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## Dental insurance, dental care utilization, and perceived unmet dental needs in women living with HIV: Results from the Women's Interagency HIV Study

Carrigan Leigh Parish, DMD, PhD<sup>1</sup>, Daniel J. Feaster<sup>2</sup>, Margaret R. Pereyra<sup>3</sup>, Maria Alcaide<sup>4,5</sup>, Mardge Cohen<sup>6</sup>, Susanna Levin<sup>7</sup>, Deborah Gustafson<sup>8</sup>, Daniel Merenstein<sup>9</sup>, Bradley Aouizerat<sup>10</sup>, Jessica Donohue<sup>11</sup>, Jennifer Webster-Cyriaque<sup>12</sup>, Gina Wingood<sup>13</sup>, Mirjam Kempf<sup>14</sup>, Lisa R. Metsch<sup>15</sup>

<sup>1</sup> Department of Sociomedical Sciences, Mailman School of Public Health, Columbia University, New York, NY, USA

<sup>2</sup> Public Health Sciences, University of Miami School of Medicine, Miami, FL, USA

<sup>3</sup> Sociomedical Sciences, Columbia University, New York, NY, USA

<sup>4</sup> Medicine, University of Miami School of Medicine, Miami, FL, USA

<sup>5</sup> CORE Center, Cook County Health and Hospitals System, Chicago, IL, USA

<sup>6</sup> Stroger Hospital Cook County Bureau of Health Services Department of Medicine, Chicago, IL, USA

<sup>7</sup> Montefiore Hospital and Medical Center, Bronx, NY, USA

<sup>8</sup> Neurology, State University of New York Downstate Medical Center, Brooklyn, NY, USA

<sup>9</sup> Family Medicine, Georgetown University School of Medicine, Washington, District of Columbia, USA

<sup>10</sup> Oral and Maxillofacial Surgery, New York University College of Dentistry, New York, NY, USA

<sup>11</sup> WIHS Data Management and Analysis Center, Johns Hopkins University Bloomberg School of Public Health, Baltimore, Maryland, USA

<sup>12</sup> Dental Ecology, University of North Carolina at Chapel Hill School of Dentistry, Chapel Hill, North Carolina, USA

<sup>13</sup> Sociomedical Sciences, Columbia University Mailman School of Public Health, New York, NY, USA

<sup>14</sup> Health Behavior, School of Nursing, Birmingham, Alabama, USA

<sup>15</sup> School of General Studies, Columbia University, New York, NY, USA

### Abstract

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**Correspondence** Carrigan Leigh Parish, Sociomedical Sciences, Columbia University, New York, NY 10027. Tel.: 786-703-9826; Fax: 786-703-9828; cp2695@columbia.edu.

**Objectives:** Dental care is the most commonly cited unmet health-care service due to cost. Previous research has highlighted the unmet dental needs of people living with HIV (PLWH). Understanding associations among dental insurance availability, dental care utilization, and the presence of unmet dental needs among PLWH is a public health priority.

**Methods:** Oral health surveys were collected cross-sectionally (April–October 2016) among 1,442 women living with HIV (WLWH) in the Women’s Interagency HIV Study. Logistic regression models were used to analyze the association between having versus not having dental insurance by type (Ryan White, private, Medicaid/Medicare) and two primary outcomes: a) typical frequency of dental visits (at least annually, less than annually) and b) reporting an unmet dental need in the past 6 months.

**Results:** All dental insurance types were associated with higher odds of receiving annual dental care and, for those with either Medicare/Medicaid or private insurance, lower odds of having an unmet dental need. When WLWH were asked to describe their oral health, poor self-reported condition was associated with both an unmet dental need (odds ratio [OR]: 4.52, 95 percent Confidence Interval [CI] [3.29–6.20]) and lower odds of annual dental care utilization (OR: 0.44, 95 percent CI [0.34–0.57]). Self-reported depressive symptom burden was also linked to having an unmet dental need (OR: 2.10, 95 percent CI [1.46–3.01]).

**Conclusions:** Dental insurance coverage increases dental care utilization and is associated with better oral health among WLWH. In the era of health-care reform, dental insurance coverage may be instrumental for enhancing treatment outcomes.

## Keywords

oral health; access to dental care; dental insurance; HIV

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## Introduction

People living with HIV (PLWH) are more likely to experience oral health disease and infection, especially those that are more severe and difficult to treat, than persons without HIV, which can also worsen overall general health.<sup>1,2</sup> Prior to the initiation of antiretroviral therapy (ART), oral lesions are detected in over half of PLWH and can serve as early signs of HIV-infection and disease progression.<sup>3</sup> Additionally, PLWH who are receiving ART to manage their HIV infection are more likely to experience diminished salivary flow, which can affect chewing, swallowing, and the ability to take medications, as well as increase the risk of candida infections, dental caries, and difficulty in wearing dental prosthetics.<sup>4–7</sup> By inhibiting daily activities of living and social and physical functioning, these dental complications can have a detrimental effect on one’s oral health-related quality of life (OHRQOL) and general well-being.<sup>8–10</sup>

For over two decades, research findings have highlighted the unmet dental needs of PLWH.<sup>11,12</sup> The HIV Cost and Services Utilization Study demonstrated that unmet dental needs were twice as common among PLWH compared with their unmet medical needs, especially among those without dental insurance.<sup>13,14</sup> Of the 2,469 PLWH participating in the Health Resources and Service Administration’s (HRSA) Special Projects of National Significance Innovations in Oral Healthcare Initiative<sup>15</sup> who had not received dental care in

the previous year, nearly half reported an unmet dental need since their HIV diagnosis, and 63 percent perceived their oral health as “fair” or “poor.”<sup>16,17</sup> Similarly, a 2014 randomized controlled trial linking PLWH to dental care found that, at baseline, 62.6 percent of participants reported experiencing at least one dental problem “fairly often” or “very often.”<sup>18</sup> Even so, 35.1 percent had not seen a dentist in the prior 2–5 years, 28.3 percent had not seen a dentist in more than 5 years, and 2.2 percent had never seen a dentist. Likewise, a 2011 study found that oral health problems were highly prevalent among PLWH, with 63 percent of participants reporting an oral health problem one in the preceding month.<sup>19</sup>

Despite the efforts of national health-care reform through the Affordable Care Act (ACA), cost is the most significant barrier preventing people in the United States from obtaining needed oral health care, and dental care is the most commonly cited type of health-care service that is unmet on account of finances.<sup>20</sup> The income- and dental insurance-inequality gap has not improved – and in many US states has worsened – as Medicaid dental benefits are becoming more limited.<sup>21,22</sup> While some states provide limited adult dental benefits in their post-ACA expanded Medicaid programs, many do not provide coverage beyond emergency treatment. As a result, individuals without dental insurance constitute a population at high risk of having persistent unmet dental needs and relying on hospital-based emergency settings for treatment.<sup>23</sup> Given that PLWH without private insurance are highly dependent on US federal programs such as the Ryan White HIV/AIDS program for health-care coverage,<sup>24</sup> it is critical to the understanding of how dental care utilization and the presence of unmet dental needs are affected by the cost of dental care and provision of dental insurance. Therefore, the objective of this analysis is to assess the relationship between having dental insurance, the utilization of routine dental services, and the presence of unmet dental needs among women living with HIV (WLWH).

## Methods

The Women’s Interagency HIV Cohort Study (WIHS) is the largest national prospective cohort study of WLWH and at risk of HIV infection. Originating in 1993 with six sites in the United States (hereby referred to as “original WIHS sites”), the WIHS expanded in 2001–2002 to capture newer therapy initiators and later in 2011–2012 in response to mortality-related attrition; in 2013, four Southern sites (hereby referred to as “newer Southern WIHS sites”) were added to improve cohort representativeness, given the increased incidence and burden of HIV infection in the Southern United States compared with other geographic areas.<sup>25</sup> A longitudinal WIHS oral health substudy was conducted to describe the status of the oral cavity and oral health overall, including the finding that less than one-tenth of WLWH in WIHS had dental insurance.<sup>26,27</sup> A subset of WIHS women in Chicago and San Francisco participated in a phone survey to identify barriers to dental care utilization, with more than 70 percent of those women reporting the presence of an oral symptom in the past year, and more than half perceiving their oral health as fair or poor.<sup>28</sup> Since oral health data had not been collected in WIHS since the end of the oral substudy in the early 2000s, an oral health survey was administered in 2016 to provide more recent data of the cohort’s oral health quality of life, dental care utilization, unmet needs, and insurance coverage.

WIHS participants are followed biannually. Visits consist of a physical examination and interviewer-administered questionnaire, including ascertainment of medical history and psychosocial factors. An oral health questionnaire was added to the April–October 2016 follow-up visit at all sites (original WIHS sites: Bronx, NY, Brooklyn, NY, Chicago, IL, San Francisco, CA, Washington, D.C.; newer Southern sites: Atlanta, GA, Birmingham, AL/Jackson, MS, Chapel Hill, NC, Miami, FL) after Institutional Review Board approval. A total of 2,156 women completed the oral health questionnaire (out of 2,416 active WIHS participants), of which 1,526 were WLWH. The present analyses included women with HIV who answered all questionnaire items related to the predictor and the outcomes of interest ( $N = 1,442$ , 95 percent).

Primary outcome variables were: a) typical frequency of dental care utilization and b) report of a recent unmet dental need. Typical frequency of dental care utilization was assessed by the question: “How often do you usually go to the dentist to have your teeth and/or mouth checked?” Participants responded using 4-point ordinal categories: “*More than once/year*” (1), “*Once/year*” (2), “*Once/two years*” (3), or “*Less than once/two years*” (4). In the analysis, the variable was dichotomized to “*At least once a year*” (1, 2) and “*Less than once per year*” (3, 4). This was done given evidence that at least yearly dental examinations provide a health benefit and the use of this frequency measure by the American Dental Association’s Health Policy Institute.<sup>29,30</sup> Report of a recent unmet dental need was assessed by the question: “During the past 6 months, has there been a time when you had a problem with your mouth or teeth, but you didn’t see a dentist for the problems?” Participants gave a binary “Yes”/“No” response.

The primary independent variable of interest was dental insurance status, assessed by the question: “Do you have dental insurance?” Participants gave a binary “Yes”/“No” response. Participants with dental insurance were asked which type (i.e., private, Medicaid/Medicare, or a form of Ryan White insurance).

Additional covariates consisted of individual and contextual determinants of health service utilization, consisting of demographic variables, health-care-related perceptions and behaviors, clinical measures, and risk behaviors. Demographic variables consisted of age, education (less than high school, high school graduate, more than high school), current employment (yes/no), race (non-Hispanic White, Hispanic, African-American, other), and marital status (yes/no). Site location (original WIHS site versus new Southern WIHS site) was also included, given the disproportionate impact of HIV in the Southern United States, compared with the rest of the United States, concerning HIV-related stigma, poverty, morbidity, and mortality.<sup>31</sup> Health-care-related perceptions and behaviors consisted of: self-perceived oral health condition (5-point Likert Scale options: “Excellent,” “Very good,” “Good,” “Fair,” “Poor;” dichotomized to “Fair/Poor” or “Good/Very good/Excellent”), overall health-care empowerment measured by the sum of the eight items in the Health Care Empowerment Inventory,<sup>32</sup> and utilization of routine HIV medical care in the prior 6 months (yes/no). Clinical measures consisted of clinical recommendation for depressive symptom assessment (indicated by a score of  $\geq 16$  on the Center for Epidemiologic Studies - Depression scale\* (CES-D)<sup>33</sup>), clinical recommendation for anxiety symptom assessment (based on scores  $\geq 10$  on the Generalized Anxiety Disorder (GAD-7) Anxiety Assessment<sup>34</sup>),

HIV viral control (i.e., HIV RNA < 200 copies/ml), and CD4 depletion at the visit (CD4 count < 200 cells/ml). Risk behaviors included any substance use (i.e., crack, cocaine, heroin, methamphetamine, illicit methadone, amphetamines, narcotics, hallucinogens, injected drugs, noninjected recreational drugs, nonmedical use of prescription drugs, marijuana/hash) in the prior 6 months, smoking status (current, former, or nonsmoker), and alcohol use (abstainer, 1–7 drinks per week, more than 7 drinks per week).

## Data analysis

Characteristics of WLWH who completed the oral health questionnaire were summarized using proportions for categorical variables and means and standard deviations for continuous variables. Multivariable logistic regression was then used to assess the relationship between the independent variables, including dental insurance status, and the two outcomes of interest while controlling for confounders, including sociodemographic, health-care-related, clinical, and risk behavior variables. Interaction effects were explored but excluded from the models due to the lack of statistical significance. The analysis was completed using SAS® Version 9.4.

## Results

Cohort characteristics are described in Table 1. Over one-fifth of participants reported no dental insurance, almost half had Medicaid/Medicare, and the remainder had either private insurance (17.1 percent) or were covered by Ryan White programs (12.9 percent). Almost three-quarters of the women were African American, with an overall mean age of 49.4 years. Most women had received HIV medical care in the prior 6 months (87.5 percent). Almost 38 percent of women perceived their oral health as “fair” or “poor.”

Multivariable logistic regression analysis subsequently showed that women with dental insurance, compared with those without, had significantly greater odds of utilizing dental services at least annually [Medicaid/Medicare: OR = 2.35, 95 percent CI (1.70–3.24); Private: OR = 3.31, 95 percent CI: (2.07–5.30); Ryan White: OR = 2.84; 95 percent CI: (1.80–4.47)] (Table 2). Those who had recently received HIV care had 55 percent higher odds [95 percent CI (1.06–2.28)] of visiting the dentist at least once annually than those who had not recently engaged in HIV care. In addition, WLWH who self-reported “poor/fair” oral health conditions were 56 percent less likely to report at least annual visits to the dentist [OR = 0.44, 95 percent CI (0.34–0.57)]. Self-reported generalized anxiety symptoms based on the GAD was the only clinical measure showing a significant association with dental care utilization [OR = 1.53, 95 percent CI (1.05–2.24)].

Multivariable logistic regression analysis also showed that, compared with no insurance, Medicaid/Medicare and private insurances were both associated with lower odds of reporting an unmet dental need [OR = 0.55, 95 percent CI (0.38–0.80); OR = 0.55, 95 percent CI (0.32–0.96), respectively], though there was no significant association with

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\*The CES-D is a brief, self-report measure consisting of 20 items assessing symptoms of depression in the prior week. The 20 items comprise six scales: depressed mood, feelings of guilt/worthlessness, feelings of helplessness/hopelessness, psychomotor retardation, appetite loss, and sleep disturbance. The reliability of the scale to assess depressive symptoms has been demonstrated across race, age, and gender.

Ryan White program coverage (Table 3). Level of education achieved was associated with reporting an unmet dental need (for those with less than high school or a high school degree compared with more than high school) [OR = 0.48, 95 percent CI (0.33–0.71), OR = 0.64, 95 percent CI (0.44–0.93), respectively]. Participants with perceived poor oral health had over fourfold higher odds of reporting an unmet dental need [95 percent CI (3.29–6.20)] compared with those with better perceived oral health. Greater overall health-care empowerment was associated with reduced odds of an unmet dental need [OR = 0.96, 95 percent CI (0.93–0.99)]. A clinically relevant depressive symptom burden was the only clinical measure associated with having an unmet dental need [OR = 2.10, 95 percent CI (1.46–3.01)].

## Discussion

Our findings provide insights into the current self-perceived oral health status and dental needs of WLWH in the WIHS, the largest research cohort study of HIV-positive women in the United States. Although use of dental services, treatment of dental needs, and the availability of dental insurance have improved over the past few decades in light of widespread availability of effective ART and the implementation of the ACA, substantial deficits remain. A survivor effect is possible given that the most vulnerable WLWH died during the early years of the study, including many of the original oral substudy participants.<sup>35</sup> The overall picture, however, suggests that oral health conditions have improved over time for WLWH. It is encouraging that almost 80 percent of the WLWH in the current cohort reported having dental insurance, compared with only 9 percent of WLWH in the early WIHS oral health substudy.<sup>26</sup> While over one-fourth of the women in this current analysis did not report annual dental visits (29 percent), it is still lower than the 43 percent of WLWH from the San Francisco, CA, WIHS site who reported less than annual dental service utilization between 1995 and 1996.<sup>12</sup> In addition, while more than one-third of women reported fair or poor oral health in this current analysis, this percentage is an improvement to the more than half of women at the San Francisco and Chicago WIHS sites who reported fair or poor oral health in the WIHS oral health substudy.<sup>28</sup>

Self-reported oral health conditions were significantly associated with unmet dental needs and dental care utilization, highlighting the importance of the relationship between the regular dental care and the absence of dental disease and impairment. This is consistent with prior research documenting the association between routine dental visits and achieving better self-reported oral health, and underscores that proper oral health, including the elimination of dental needs, and regular dental visits are interconnected.<sup>36,37</sup> Continued efforts must be made to ensure that WLWH have the ability to access affordable and available dental treatment as a means of achieving and maintaining adequate oral health, high OHRQOL, and positive wellbeing.

Notably, the two primary outcomes – dental care utilization and reporting an unmet dental need – were not associated with similar exposures. Dental care utilization was associated with several health-care-seeking behaviors, such as recent HIV medical care being an important factor in women's utilization of annual dental services. It is unknown whether this relationship is related to physicians' referrals to dentists and their emphasis on the



importance of dental health<sup>38</sup> versus a patient's own inherent care-seeking behaviors. Still, HIV care providers play a critical role in advocating the importance of dental care with their patients and facilitating uptake of dental treatment.<sup>39</sup> Furthermore, integrated HIV medical-dental health-care delivery systems that provide referrals to on-site dental services can facilitate dental utilization.<sup>40</sup> It is also critical to the reinforcement of the individual-level factors that influence WLWH to seek regular preventive health-care services. Generalized anxiety was also associated with annual dental care utilization. While *dental* anxiety specifically has been associated with less frequent dental utilization,<sup>41</sup> this substudy only assessed generalized anxiety, which has been linked to hypochondria<sup>42</sup> and higher health-care service utilization.<sup>43</sup>

Factors in the realm of thought-processes, like education, were related to women's perception of having an unmet dental need, similar to how depressive symptoms have been linked to negative attitudes regarding one's oral health.<sup>44</sup> Prior analysis of Short Form-8 Health Survey data collected from PLWH enrolled in the aforementioned HRSA Oral Health Care Initiative demonstrated that improved self-reported mental health status was associated with lower reports of dental-related problems and pain, reminiscent of the relationship between poor oral health and depressive symptoms.<sup>45</sup> Similarly, health-care empowerment is related to how patients are cognitively and behaviorally motivated to make and execute their own health-care decisions.<sup>46</sup> Therefore, while the reported measure of dental care utilization and the more subjective measure of having an unmet dental need are assuredly related, it is important that both be considered in assessing one's oral health status and receipt of adequate and appropriate oral health care.

Overall, almost 80 percent of WLWH in the current WIHS cohort had dental insurance, and having dental insurance had the most significant effect on both outcomes; all forms of dental insurance were associated with higher odds of annual dental care and, for those with Medicare/Medicaid and private insurance, lower odds of having an unmet dental need. Such findings support the necessity of affordable care as a powerful driver of dental service utilization and oral health outcomes. This is consistent with other studies documenting that the substantial cost of dental care for the uninsured can serve as a major deterrent toward seeking dental services.<sup>22,47</sup> National Health Interview Survey data has shown that 42 percent of US adults have an untreated dental problem attributed to out-of-pocket expenses, which can impact the frequency of dental care utilization even for those with dental coverage.<sup>48</sup> This growing body of evidence on the economic factors driving health-care-seeking behaviors underscores the importance of dental insurance in minimizing the cost of dental treatment, increasing the uptake of dental treatment, and ultimately improving oral health conditions.

The major strengths of surveying WLWH in WIHS include the cohort's large sample size and geographic representativeness. Limitations of this study include collection of data via self-report, which may be susceptible to information bias, specifically recall and/or social desirability biases. Given the cross-sectional methodology, inferences cannot be made about the directionality of any significant associations. Additionally, a measure of dental anxiety specifically, such as the Corah Dental Anxiety Scale,<sup>49</sup> may have been a more informative behavioral covariate than the use of the GAD. Finally, since WIHS maintains a longstanding,

highly retentive cohort, there is a potential for participation bias related to evaluating women who comply with research participation and benefit from regular medical assessments, as well as a Hawthorne effect, which may limit generalizability to all HIV-positive women in the United States.

The ACA helped increase the availability of affordable care for millions of people in the United States who did not have insurance coverage, particularly for PLWH. As a result of crucial legislation that loosened Medicaid eligibility criteria and increased state-level Medicaid expansion options,<sup>50</sup> the percentage of PLWH who secured Medicaid coverage increased from 42 percent in 2012 to 48 percent in 2014.<sup>51</sup> Despite this changing Medicaid landscape, the Ryan White Program remains a critical source of health-care coverage for PLWH, especially in providing insurance in nonexpansion states, in states that do not cover dental services through its Medicaid program, and financing non-covered essential health-care services.<sup>51,52</sup> Universal accessible and attainable health care may contribute to greater improvements in the health of PLWH. Therefore, research continues to be important in documenting the role that insurance coverage plays in enabling affordable access to health care and in enhancing treatment outcomes.

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**Table 1.**

Overall demographic characteristics, healthcare behaviors, clinical measures, and risk behaviors of participants (N= 1442)

Participant Characteristic	N or mean (% or SD) [range]
<b>Dental Insurance</b>	
Private	247 (17.1%)
Ryan White	186 (12.9%)
Medicaid/Medicare	706 (48.8%)
None	307 (21.2%)
<b>Sociodemographics</b>	
Age (years), mean	49.4 (9.2) [26 – 81]
Race/Ethnicity	
White	154 (10.7%)
Hispanic	191 (13.3%)
Black	1056 (73.2%)
Other	41 (2.8%)
Education	
Less than high school	476 (33.0%)
High school graduate	458 (31.8%)
> High school graduate	508 (35.2%)
Married (N=1418)	274 (19.0%)
Employed	522 (36.2%)
New Southern WIHS site	554 (38.4%)
<b>Healthcare Behaviors and Perceptions</b>	
HIV care in last 6 months (N=1439)	1262 (87.5%)
Self-perceived fair or poor oral health	546 (37.9%)
Health care empowerment, mean (N=1420)	34.3 (4.5) [8 – 40]
<b>Clinical Measures</b>	
CES-D 16 (N=1437)	442 (30.7%)
GAD 10 (N=1438)	262 (18.2%)
Viral Load below 200 copies/ml (N=1417)	1218 (84.5%)
CD4 count below 200 cells/ml (N=1423)	89 (6.2%)
<b>Risk Behaviors</b>	
Alcohol Use (N=1441)	
Abstinent	838 (58.1%)
0–7 drinks/week	452 (31.4%)
> 7 drinks/week	151 (10.5%)
Smoking Status	
Never	484 (33.6%)
Current	562 (39.0%)

Participant Characteristic	N or mean (% or SD) [range]
Former	396 (27.5%)
Any recent substance use (N=1440)	317 (22.0%)

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**Table 2.**

Multivariate logistic regression modeling the probability of at least annual dental care utilization (OR and 95% CI, p-value)

	At Least Annual Dental Care Utilization		
	OR	95% CI	p-value
<b>Participant Characteristic</b>			
<b>Dental Insurance</b>			<.001
Medicaid/Medicare vs. None	<b>2.35</b>	<b>1.70 – 3.24</b>	
Private vs. None	<b>3.31</b>	<b>2.07 – 5.30</b>	
Ryan White vs. None	<b>2.84</b>	<b>1.80 – 4.47</b>	
<b>Sociodemographics</b>			
Age	0.99	0.97 – 1.00	0.128
Race/Ethnicity			0.145
White vs. Black	0.87	0.57 – 1.32	
Hispanic vs. Black	0.77	0.53 – 1.11	
Other vs. Black	2.07	0.87 – 4.94	
Education			0.252
Less than high school vs. > High school graduate	0.83	0.60 – 1.14	
High school graduate vs. > High school graduate	1.07	0.78 – 1.47	
Married vs. not married	1.41	1.00 – 1.99	0.051
Employed vs. not employed	0.88	0.65 – 1.21	0.442
Original WIHS site vs. new Southern WIHS site	1.03	0.76 – 1.39	0.849
<b>Healthcare Behaviors and Perceptions</b>			
HIV care vs. No HIV care in last 6 months	<b>1.55</b>	<b>1.06 – 2.28</b>	0.026
Self-perceived fair/poor vs. good/excellent oral health	<b>0.44</b>	<b>0.34 – 0.57</b>	<.001
Health care empowerment	1.01	0.98 – 1.04	0.696
<b>Clinical Measures</b>			
CES-D 16vs. CESD<16	0.73	0.53 – 1.00	0.047
GAD 10 vs. GAD<10	<b>1.53</b>	<b>1.05 – 2.24</b>	0.027
Viral Load below vs. above 200 copies/ml	1.08	0.73 – 1.60	0.691
CD4 below vs. above 200 cells/ml	1.13	0.65 – 1.95	0.665
<b>Risk Behaviors</b>			
Alcohol Use			<b>0.518</b>
0–7 drinks/week vs. Abstinent	0.79	0.51 – 1.22	
> 7 drinks/week vs. Abstinent	0.90	0.67 – 1.21	
Smoking Status			0.251
Current vs. Never	0.86	0.61 – 1.21	
Former vs. Never	0.76	0.55 – 1.05	
Any vs. none recent substance use	0.89	0.64 – 1.23	0.470



**Table 3.**

Multivariate logistic regression modeling the probability of reporting an unmet dental need (OR and 95% CI, p-value)

	Reported Presence of an Unmet Dental Need		
	OR	95% CI	p-value
<b>Participant Characteristic</b>			
<b>Dental Insurance</b>			0.014
Medicaid/Medicare vs. None	<b>0.55</b>	<b>0.38 – 0.80</b>	
Private vs. None	<b>0.55</b>	<b>0.32 – 0.96</b>	
Ryan White vs. None	0.70	0.42 – 1.16	
<b>Sociodemographics</b>			
Age	0.98	0.96 – 1.00	0.025
Race/Ethnicity			0.602
White vs. Black	1.21	0.75 – 1.93	
Hispanic vs. Black	0.78	0.48 – 1.28	
Other vs. Black	0.93	0.39 – 2.18	
Education			0.001
Less than high school vs. > High school graduate	<b>0.48</b>	<b>0.33 – 0.71</b>	
High school graduate vs. > High school graduate	<b>0.64</b>	<b>0.44 – 0.93</b>	
Married vs. not married	0.85	0.57 – 1.27	0.426
Employed vs. not employed	0.90	0.62 – 1.31	0.582
Original WIHS site vs. new Southern WIHS site	1.17	0.82 – 1.68	0.390
<b>Healthcare Behaviors and Perceptions</b>			
HIV care vs. No HIV care in last 6 months	1.05	0.65 – 1.69	0.849
Self-perceived fair/poor vs. good/excellent oral health	<b>4.52</b>	<b>3.29 – 6.20</b>	<.001
Health care empowerment	<b>0.96</b>	<b>0.93 – 0.99</b>	0.016
<b>Clinical Measures</b>			
CES-D 16vs. CESD<16	<b>2.10</b>	<b>1.46 – 3.01</b>	<.001
GAD 10 vs. GAD<10	0.97	0.64 – 1.46	0.875
Viral Load below vs. above 200 copies/ml	1.00	0.63 – 1.56	0.985
CD4 below vs. above 200 cells/ml	0.97	0.52 – 1.81	0.923
<b>Risk Behaviors</b>			
Alcohol Use			0.874
0–7 drinks/week vs. Abstinent	0.92	0.54 – 1.55	
> 7 drinks/week vs. Abstinent	1.05	0.75 – 1.49	
Smoking Status			0.626
Current vs. Never	1.13	0.75 – 1.70	
Former vs. Never	1.21	0.82 – 1.79	
Any vs. none recent substance use	1.24	0.85 – 1.80	0.264