

# THE ASSOCIATION OF ACCESS TO MEDICAL CARE WITH REGULAR SOURCE OF CARE AND SOCIODEMOGRAPHIC CHARACTERISTICS IN PATIENTS WITH HIV AND TUBERCULOSIS

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**Purpose:** To examine satisfaction with access to health care in two populations, one with HIV and one with TB, and examine the effect of having a regular doctor and sociodemographic characteristics.

**Design:** Cross-Sectional survey.

**Patients:** A sample of HIV inpatients hospitalized at seven Los Angeles sites (N = 217) and TB outpatients chosen randomly from the Los Angeles County TB Registry Census (N = 313).

**Analysis:** We performed bivariate and multivariate regression analyses of satisfaction with access to care on gender, race/ethnicity, age, education, income, insurance, and having a regular doctor.

**Main Outcome Measures:** A six-item scale of satisfaction with access to care (range 0–100; Cronbach's alpha 0.87).

**Results:** The mean satisfaction with access score for the HIV sample was significantly lower than the TB sample (53.5 vs. 61.2,  $p < 0.001$ ). The HIV sample multivariate analysis (including all the variables) showed that increasing age ( $p < 0.02$ ) and having a regular doctor ( $p < 0.002$ ) were associated with better access, and that low income ( $p < 0.005$ ) was associated with poor access. In the TB sample analysis, only increasing age was associated with better satisfaction with access to care ( $p < 0.01$ ).

**Conclusion:** HIV patients receiving care in the private sector reported less satisfaction with access to care compared to TB patients receiving care in the public health sector. The traditional factors of socio-economic status and having a regular doctor were associated with satisfaction with access-to-care in the HIV sample but not the TB sample. Our findings suggest that certain characteristics of the TB public health programs may explain these differences and suggests that, perhaps, the existence of a similar public health program for vulnerable low-income populations with HIV would improve their satisfaction with access, as well. (*J Natl Med Assoc.* 2002;94:581–590.)

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**Key words:** HIV ♦ TB ♦ access to care

There is great policy concern regarding poor and minority populations that are vulnerable to the adverse consequences of lack of access to medical care. Two increasingly common conditions about which this concern is frequently raised are human immunodeficiency virus (HIV) infection and tuberculosis (TB). These two conditions disproportionately affect African Americans and Hispanics in California, as well as in the nation.<sup>1-4</sup> African Americans and Hispanics are much more likely than whites to be poor, uninsured, and more likely to use public sources of care that lack adequate resources.<sup>5,6</sup> Despite certain similarities, there may be important differences in the populations affected by these two infections. Little is known about these differences because the two groups have never been compared directly.

While HIV and TB infections are two distinct infections, they do interact in an important way. A recent study shows that the Acquired Immunodeficiency Syndrome (AIDS), caused by HIV, significantly amplifies TB outbreaks, often doubling the number and frequency of resulting TB cases. Strong TB public health treatment programs can curb HIV's effect.<sup>7</sup> These findings are particularly important for groups at risk for both HIV and TB, such as African Americans and Hispanics.

Since HIV and TB infections are contagious and a public health hazard, it would be important to understand the levels of satisfaction with access-to-care reported by poor groups with these conditions. Previous studies have shown that even persons receiving some care frequently report problems accessing care.<sup>8</sup> These problems may include inconvenient location of the doctor's office; long waiting times to get an appointment; inconvenience of doctor's office hours; lengthy waiting time in the doctor's waiting room; difficulties getting in touch with doctor; and the inability to find one good doctor.<sup>9</sup> Studies also indicate that worsening self-reported access to care for those with HIV may

lead to higher utilization of costly services, such as increased utilization of emergency rooms<sup>10</sup> and hospitalizations<sup>10,11</sup>.

In order to guide future efforts to improve access to care and outcomes for poor minority groups with serious infections such as HIV and TB, more data are needed on the factors associated with satisfaction with access to care, so that appropriate health care models may be developed.

In this study, we examine several dimensions of access to medical care using data pooled from two separate studies: a sample of HIV in-patients and TB out-patients. Both of these samples include a substantial number of African Americans and Hispanics. Given that access to medical care is important for both the effective treatment of persons with HIV and TB and the prevention of future infections, it is important to empirically evaluate access to care in these two populations. We, thus, hypothesized that patients who had a regular source of care and insurance would have more access to care than other groups.

**METHODS****Design and Data Sources**

The study sample consisted of 530 individuals, 217 with HIV and 313 with TB infection. The HIV sample consisted of a sample of patients hospitalized at seven Los Angeles area hospitals from May 1992 to April 1993. Two of the sites were public hospitals; two of the sites were Veteran's Administration (VA) hospitals; two were private community hospitals; and one was a University-based hospital that does not have an indigent medical service. These sites were selected purposefully because they represent a broad range of common health service systems and they serve large numbers of HIV-infected patients who vary in terms of socio-demographic characteristics and extent of insurance coverage.

For the HIV sample, a total of 395 patients were approached and 217 (70%) agreed to participate. Ten patients were eliminated from

this analysis because they were co-infected with TB and HIV, for a final sample size of 207. Patients were interviewed at the time and site of hospitalization and a review of medical records was conducted. Additional information on this study sample has been previously reported.<sup>11</sup>

The TB sample consisted of patients chosen randomly from the census of persons reported to the Los Angeles County Tuberculosis Registry. A total of 365 patients were contacted by telephone and of these 313 (85.8%) agreed to participate in a telephone interview. We found that 37 of these patients were co-infected with HIV and these cases were excluded, bringing the final sample size to 276. Data were collected between April and September 1993. Additional information on this study sample has been previously reported.<sup>12</sup>

The HIV sample was followed from 1993 to 1999 but the TB sample was not followed past 1993.

### Independent Variables

The independent variables in the study include: gender, race/ethnicity, age, education, income, insurance status and regular doctor. Previous research suggests that overall access-to-care is a function of these variables.<sup>13</sup> Race/ethnicity was defined as non-Hispanic white, non-Hispanic black, Hispanic, or other. Insurance status was classified as insured for any private (including prepaid) or public (Medicaid or Veterans Administration) insurance, or uninsured. Regular source of care was defined as having a doctor who provides medical care on a regular basis. For those in the tuberculosis sample, the reference period for having a regular doctor was the period of time prior to seeking help for the symptoms that were later diagnosed as TB. For those in the HIV sample, the reference period was prior to the current hospitalization.

### Access to Care Measures

Established measures of access-to-care were adapted for use in each of the samples.<sup>9</sup> A subset of six items on access-to-care common to

both samples were used in this study. In both samples, the items asked respondents to rate how convenient their doctors' offices were to their homes; how long they had to wait to get an appointment; how convenient doctors' office hours were; how long they had to wait in the waiting room; how easy it was to reach their doctors; and the ability to find one good doctor for treatment.

For each of these items, respondents rated their access as excellent(5), very good(4), good(3), fair(2), or poor(1). The time-frame for the access items in the HIV sample was "prior to your first hospitalization." For the TB sample, the time frame was "for the previous few months." An overall access scale was constructed by averaging the ratings for these six items. For ease of interpretation, the scores for each item and the overall scale, respectively, were transformed linearly to range from 0–100, where 100 indicates the highest possible satisfaction with access score. Cronbach's alpha for the scale was 0.87, indicating good internal consistency reliability<sup>14</sup>.

### Analysis Plan

Socio-demographic characteristics and having a regular doctor were compared between the two samples using Chi-squares. We compared unadjusted means for each access item and the overall access scale using t-tests. Separate linear regressions were run within each disease sample. First, we conducted bivariate regressions of the access scale on each of the independent variables in the HIV and TB samples. Then we conducted a multivariate regression analysis by regressing the access-to-care scale on all of the independent variables in the HIV sample. In both the bivariate and multivariate regression analyses, and for all categorical independent variables (race/ethnicity, high school graduate, income, health insurance, regular doctor), dummy variables were constructed and analyzed in comparison to a reference (hold-out) group. The categorical variables were coded as follows: gender (female = 0, male = 1); race/ethnicity (white =

Table 1. HIV and TB Sample Demographics

Demographics	HIV Sample N = 207*	TB Sample N = 272*	p-Value**
Female	5.5%	41.7%	0.006
Race/ethnicity			
White	58.1%	9.3%	0.0001
Black	19.8%	10.8%	
Hispanic	19.8%	50.0%	
Other	2.3%	26.5%	
Average age (years)	37.6	45.1	0.0001
Education			
High school graduate or more	64.0%	48.9%	0.001
Less than high school	36.0%	51.1%	
Income			
\$25,000–100,000	40.1%	10.1%	0.0001
\$10,000–25,000	20.3%	19.4%	
\$5,000–10,000	16.4%	15.2%	
Less than \$5,000	18.8%	35.1%	
Income missing	15.0%	22.1%	
Insurance status			
Uninsured	28.0%	50.3%	0.0001
Private	40.0%	13.8%	
Medi-Cal	20.0%	19.6%	
Medicare	2.4%	10.9%	
Other/missing	9.6%	5.5%	
Regular doctor	72.4%	25.7%	0.0001

\*The HIV sample consisted of only those with HIV (the 8 cases that had HIV and TB are excluded from this analysis). The TB sample consisted of only those with TB (the 37 cases that had TB and HIV are excluded from this analysis).  
\*\*p-values cited are for differences in the entire variable category.

0, black = 1, Hispanic = 2, Asian = 3); high school graduate (yes = 0, no = 1); income (\$25,000 = 0, \$10,000–\$25,000 = 1, \$10,000 = 2); health insurance (no = 0, yes = 1); regular doctor (no = 0, yes = 1).

## RESULTS

The two samples differed significantly on each of the independent variables considered (see Table 1). The TB sample contained significantly more women, and was, on average, significantly older, less educated, and had lower income. Sample differences in the percentage insured and having a regular doctor were striking: a much lower percentage of the HIV sample was uninsured compared to the TB sample (28.0% vs. 50.3%), more of the HIV sample had private insurance (40.0% vs. 13.8%), and

close to three-quarters of the HIV sample had a regular doctor (72.4%, compared to 25.7%).

Given that insurance status and having a regular doctor are generally associated with access to medical care, one would expect that the HIV sample would be observed to report greater satisfaction with access to care than the TB sample. However, the opposite was generally found (see Table 2). For five of the six items on satisfaction with access to care, the mean score was significantly lower for the HIV sample compared to the TB sample. In particular, the convenience of the location of the doctor's office was rated significantly lower by patients with HIV than those with TB. Consistent with these findings, the overall access scale mean for the six items was 53.5 for the HIV sample and 61.2 for the TB sample ( $p < 0.001$ ).

**Table 2. Comparison of Means for Satisfaction with Access Items Across HIV and TB Samples**

Satisfaction With Access Items*	HIV Sample Mean (SD) N = 217	TB Sample Mean (SD) N = 276	p-Value**
How would you rate how convenient your doctor's office is to your home?	46.7 (33.0)	64.9 (28.0)	0.0001
How would you rate how long you have to wait to get an appointment?	56.7 (35.7)	63.1 (29.1)	0.037
How would you rate how convenient your doctor's office hours are?	55.6 (29.6)	64.6 (25.1)	0.0001
How would you rate how long you have to wait in the doctor's waiting room?	42.0 (34.3)	53.9 (30.3)	0.0001
How would you rate how easy it is to get in touch with your doctor?	55.6 (33.9)	62.1 (28.1)	0.027
How would you rate your ability to find one good doctor to treat you?	57.4 (35.1)	58.3 (28.4)	0.766
Overall satisfaction with access scale***	53.3 (26.2)	61.2 (21.1)	0.001

\*Range 0–100. Higher scores indicate greater satisfaction with access to care. Established measures of access to care were adapted for use in each of the samples (Penchansky et al., 1981).  
\*\*T-test p-values.  
\*\*\*Average of all satisfaction with access items.

In order to determine the associations of the independent variables with the satisfaction with access-to-care scale, the overall access scale was regressed on the socio-demographic factors within the separate HIV and TB samples. Bivariate and multivariate regression analyses were conducted (see Table 3). The bivariate analysis of the HIV sample found positive associations with satisfaction with access-to-care for increasing age, education, insurance, and regular doctor, but negative associations were found for Hispanic individuals and those with low income. The bivariate analysis of the TB sample found positive association with satisfaction with access-to-care for increasing age only. The multivariate analysis (including all variables) of the HIV sample found positive associations with satisfaction with access-to-care for increasing age and having a regular doctor, and a negative association for lower income. The multivariate analysis (including all variables) of the TB sample had similar findings as the bivariate analysis.

In a subanalysis of the subsample that was co-infected with HIV and TB ( $n = 37$ ), a bivariate analysis revealed that having a regular

doctor (B coefficient 19.4,  $p < 0.04$ ) and having insurance (B Coefficient 22.8,  $p < 0.01$ ) had a positive association with satisfaction with access to care. In the multivariate analysis (including all variables), having insurance (B coefficient 31.6,  $p < 0.003$ ) emerged as the only significant factor and had a positive association with satisfaction with access to care.

## DISCUSSION

In our study of two distinct populations in Los Angeles, we found that HIV patients reported lower satisfaction with access to medical care than those with TB. The traditional factors reported in the literature, such as having a regular doctor and socio-economic status, were found to be associated with satisfaction with access to care in the HIV sample, but not the TB sample. Our findings suggest that certain characteristics of the TB public health care programs provide more satisfaction with access to care than the private system of health care for those with HIV.

Characteristics of TB public health programs, which TB patients rated significantly higher than HIV patients, included conve-

Table 3. HIV and TB Sample Beta Coefficients for Regression of Access Scale on Demographic Characteristics

Demographic* Characteristic	Bivariate				Multivariate			
	HIV N = 207		TB N = 276		HIV N = 207		Beta**	Beta
Beta	Coeff.	p-Value	Coeff.	p-Value	Coeff.	p-Value		
Female	6.9	0.38	1.88	0.50	0.63	0.93		
Race/ethnicity								
White								
Black	-2.24	0.65	-1.33	0.77	2.57	0.60		
Hispanic	-10.56	0.02	0.24	0.93	1.12	0.23		
Asian	***	***	-2.00	0.54	***	***		
Age (18–89 years)	2.5	0.01	0.20	0.01	0.49	0.02		
High school grad								
Yes								
No	-9.91	0.01	1.93	0.49	-5.96	0.14		
Income								
>\$25,000								
\$10,000–25,000	3.65	0.37	-6.39	0.08	-3.40	0.45		
<\$10,000	-16.4	0.001	1.25	0.65	-13.09	0.005		
Health insurance								
No								
Yes	17.0	0.001	4.41	0.11	8.1	0.15		
Regular doctor								
No								
Yes	17.5	0.001	2.00	0.54	3.1	0.002		

\*Dummy variables were created for all categorical variables and compared to the reference group (coded 0): gender (Female = 0, Male = 1), race/ethnicity (White = 0, Black = 1, Hispanic = 2, Asian = 3), high school graduate (Yes = 0, No = 1), income (\$25K = 0, \$10K–\$25K = 1, <\$10K = 2), health insurance (No = 0, Yes = 1), regular doctor (No = 0, Yes = 1).

\*\*Unstandardized beta coefficients.

\*\*\*Too few observations for statistical analysis.

nience of a doctor's office location and being able to get in touch with a doctor. Having a clinic conveniently located may be especially important for those who are low income and who may not be able to take time off from work to go to a clinic that is far away from home. A recent study indicates that populations in medically underserved areas served by a Federally Qualified Health Center have significantly lower preventable hospitalization rates for general medical conditions<sup>15</sup>. Thus, providing low-income patient's access to a clinic near their home may be cost-effective. In addition, since TB patients reported more satisfaction on their ability to get in touch with a doctor, this suggests that the provision of a regular doctor (which TB clinics provide) facilitates such com-

munication between patient and physician. Public health programs for TB may provide a lesson for the control of the HIV epidemic in vulnerable populations.

In the HIV sample, the multivariate analysis revealed that being young and low-income was associated with poor satisfaction with access to care. This is significant because the HIV epidemic is shifting toward younger and lower income groups<sup>3</sup> who may need special outreach programs to encourage them to seek health care and which facilitate their access to care. In the TB sample, lower income was only marginally associated with satisfaction with access to care. Therefore, our findings in the HIV sample are consistent with previous research studies showing the importance of socio-eco-

conomic status in accessing health care<sup>16-19</sup>, but our findings in the TB sample are not.

Associations between having a regular doctor and medical utilization are described in the literature<sup>20,21</sup>. Studies focusing on HIV show an association between having a regular doctor and increased likelihood of HIV testing<sup>22</sup>, and that a patient's knowledge of having HIV, alone, leads to positive changes in sexual risk behavior and decreases in substance use<sup>23</sup>. In addition, studies indicate that worse self-reported access to care for those with HIV may lead to lower use of anti-retroviral therapy<sup>24</sup>, worse health outcomes<sup>25</sup>, and higher utilization of costly services such as increased use of emergency rooms<sup>10</sup> and hospitalizations.<sup>10,11</sup> Studies indicate there may be overall cost savings for early treatment of HIV when taking a societal perspective, and also indicate that early treatment would prevent opportunistic infections and thereby prevent costly hospitalizations<sup>26</sup>. More than a decade ago, the concept of early intervention and the targeting of AIDS prevention and treatment towards HIV infected persons was proposed<sup>27</sup>.

As these epidemics grow, it is imperative that we further evaluate "patient-perceived" barriers to accessing care. A study that evaluated patient-perceived barriers to accessing care among a general sample of uninsured persons found that cost, length of time before one can get an appointment, lack of comfort with providers, and having to miss work for appointments, as major barriers.<sup>18</sup> Some studies point to language problems as significant barriers to health care utilization for Hispanics and those with limited English proficiency.<sup>28</sup> There are many other barriers to accessing care, especially for those infected with HIV, that need to be explored in future research. These barriers may include, but are not limited to multiple dimensions of the health care system, including the lack of health care infrastructure in poor communities (lack of clinics in close proximity and lack of physicians in under-served areas), as well as patients' social, cultural, and economic barriers. Additionally, there is the

stigma of having HIV, which may discourage some patients from accessing care.

While both HIV and TB infections are contagious, the modes of transmission are different. TB infection can be transmitted to anyone, simply by being in close proximity to someone with pulmonary TB. HIV is typically transmitted through unprotected sex or sharing of infected needles among intravenous drug addicts. While the HIV epidemic has been shifting towards ethnic minorities, women, and adolescents, HIV is still perceived as an epidemic that largely affects gay/bisexual men. There is a stigma associated in the way that HIV is acquired. Such a stigma may hinder those infected from seeking care, or if they seek care, they may face bias on the part of health care providers. It is possible that in our study, HIV patients reported less satisfaction with access to care because of the stigma associated with HIV.

There are several limitations to our study that need to be mentioned. First, the HIV and TB samples had different socio-demographic characteristics. The TB sample had more women and more lower income persons compared to those with HIV. The TB sample was largely a homogenous sample of low-income patients receiving health care in a structured public health care system. This lack of variability in the TB sample may not have allowed us to detect the effect of income on satisfaction with access to care. Therefore, the two samples may be limited for direct comparisons in this cross-sectional study.

Secondly, previous research indicates that severity of illness is a strong predictor of the use of health care services,<sup>13</sup> but in our study samples there were no comparable measures of severity of illness available.

Third, our study was limited because we compared different populations: hospitalized HIV patients and non-hospitalized TB patients. This difference in acuity level may have an effect on satisfaction with access to care. In future studies, it would be important to compare satisfaction with access to care among HIV patients who have not been hospitalized.

Fourth, the time frame used to assess satisfaction with access to care in the HIV sample does not allow for an estimate of average time. Although for 73.0% of our HIV patients, the current hospitalization had been the first one. Therefore, for the majority of the patients, the time frame was recent.

Fifth, satisfaction with access to care may not perfectly capture actual access to care. However, previous studies using similar measures have demonstrated adequate reliability and validity<sup>25</sup>. Finally, while data for both HIV and TB samples were collected in 1993, the HIV sample was followed through 1999, but the TB sample was not. Therefore, we are unable to compare satisfaction with access to care in the two groups over time.

In summary, HIV patients report less satisfaction with access to care compared to TB patients. The traditional factors reported in the literature to affect access to care, such as socioeconomic status and having a regular doctor were found to be important for the HIV sample, which received care in the private sector, but not for the TB sample, which received care in the public health sector. While Ryan White Care Act funding has enabled many Americans living with HIV to have access to care, we still lack a comprehensive public health program to control the HIV epidemic. Such a program would provide outreach for the difficult to reach populations, like the young and low-income groups. Such programs are especially needed in the HIV endemic areas of our nation.

Facilitating access to care is essential for individuals, as well as societal benefits from early HIV treatment and for secondary prevention of HIV. Further research is needed that identifies the specific barriers to accessing care in vulnerable populations. Our findings suggest that the extensive public health system for TB patients may explain their higher satisfaction with access to care compared to HIV patients receiving care in the private sector. Perhaps the existence of a similar, extensive out-patient public health system for vulnerable low-income popu-

lations with HIV would improve their access, as well.

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