

Use of Mental Health and Substance Abuse Treatment Services Among Adults With HIV in the United States

M. Audrey Burnam, PhD; Eric G. Bing, MD, PhD, MPH; Sally C. Morton, PhD; Cathy Sherbourne, PhD; John A. Fleishman, PhD; Andrew S. London, PhD; Benedetto Vitiello, MD; Michael Stein, MD; Samuel A. Bozzette, MD, PhD; Martin F. Shapiro, MD, PhD

Background: The need for mental health and substance abuse services is great among those with human immunodeficiency virus (HIV), but little information is available on services used by this population or on individual factors associated with access to care.

Methods: Data are from the HIV Cost and Services Utilization Study, a national probability survey of 2864 HIV-infected adults receiving medical care in the United States in 1996. We estimated 6-month use of services for mental health and substance abuse problems and examined socioeconomic, HIV illness, and regional factors associated with use.

Results: We estimated that 61.4% of 231 400 adults under care for HIV used mental health or substance abuse services: 1.8% had hospitalizations, 3.4% received residential substance abuse treatment, 26.0% made individual mental health specialty visits, 15.2% had group mental health treatment, 40.3% discussed emotional prob-

lems with medical providers, 29.6% took psychotherapeutic medications, 5.6% received outpatient substance abuse treatment, and 12.4% participated in substance abuse self-help groups. Socioeconomic factors commonly associated with poorer access to health services predicted lower likelihood of using mental health outpatient care, but greater likelihood of receiving substance abuse treatment services. Those with less severe HIV illness were less likely to access services. Persons living in the Northeast were more likely to receive services.

Conclusions: The magnitude of mental health and substance abuse care provided to those with known HIV infection is substantial, and challenges to providers should be recognized. Inequalities in access to care are evident, but differ among general medical, specialty mental health, and substance abuse treatment sectors.

Arch Gen Psychiatry. 2001;58:729-736

From RAND, Santa Monica, Calif (Drs Burnam, Morton, Sherbourne, Bozzette, and Shapiro); Center for AIDS Research, Education and Services and Collaborative Alcohol Research Center, Charles R. Drew University of Medicine and Science, Los Angeles, Calif (Dr Bing); Agency for Healthcare Research and Quality, Rockville, Md (Dr Fleishman); Department of Sociology, Kent State University, Kent, Ohio (Dr London); National Institute of Mental Health, National Institutes of Health, Bethesda, Md (Dr Vitiello); Brown University Medical School and Rhode Island Hospital, Providence (Dr Stein), Veterans Administration Medical Center, La Jolla, Calif (Dr Bozzette); and the Division of General Internal Medicine, Department of Medicine, University of California, Los Angeles (Dr Shapiro).

SEVERAL STUDIES suggest that adults infected with human immunodeficiency virus (HIV) are more likely than those in the general community to experience depression and anxiety and to have a history of substance abuse (E.G.B., M.A.B., Douglas Longshore, PhD, et al, unpublished data, 2001).¹⁻³ Excess prevalence of psychiatric disorder among persons with HIV may reflect high rates of preexisting affective and substance abuse disorder in demographic groups at the highest risk for HIV.³⁻⁷ There is also evidence, however, that anxiety, depression, and emotional distress may for some be a response to the initial crisis of learning that they are seropositive or to subsequent symptoms and disability associated with HIV-related illness.^{3,5} Regardless of its origins, the presence of significant emotional distress, psychiatric disorder, or substance abuse among persons with HIV may impede the use of medical services and adherence to HIV medication regimens^{8,9}

and increase the physical and emotional burden of care provided by formal and informal caregivers.

See also page 721

Although appropriate treatments have the potential to ameliorate many mental health and substance abuse problems, little is known about the extent to which individuals with HIV receive alcohol, drug, and mental health (ADM) services. Use of ADM services has been studied in the general population,^{10,11} but only limited information on convenience samples is available from individuals with HIV.¹² There are several reasons to investigate the use of ADM services among those with HIV. First, the sheer magnitude of the HIV epidemic argues for a consideration of access to behavioral health services for this special patient population. Second, as with other groups of patients with chronic and life-threatening diseases, medical treatments are a priority for those with HIV. The complexity of delivering and

SUBJECTS AND METHODS

STUDY DESIGN AND SAMPLE

Data are from the HIV Cost and Services Utilization Study, a longitudinal study of a nationally representative sample of HIV-infected adults receiving medical care in the contiguous United States in 1996. The study used a multistage design in which geographic areas, medical providers, and patients were sampled.^{17,18} At the first stage, 28 metropolitan statistical areas and 24 clusters of rural counties were sampled, with probabilities based on the number of reported acquired immunodeficiency syndrome cases during 1995. In the second stage, 58 urban and 28 rural "known providers" were sampled from lists of all providers known by local informants to provide HIV care. An additional 87 urban and 23 rural "other providers" were selected from among providers who reported caring for patients with HIV in a screening survey of approximately 4000 physicians randomly selected from the Physician Masterfile of the American Medical Association, Chicago, Ill. At the third stage, 4042 patients were sampled from anonymous lists of all eligible patients who visited participating providers during the population definition period (January 5, 1996, to February 29, 1996, in all but 1 metropolitan statistical area, where it occurred about 2 months later). Third-stage sampling rates were set to be as uniform as possible within subgroups; this overall sampling rate was then doubled for women and increased again for those in staff model health maintenance organizations (in which clinical providers are employed directly by the health maintenance organization).

The study enrolled 57 of 58 urban known providers and replaced the 1 nonparticipating institution with a similar institution in the same city. The study also enrolled 61 (70%) of 87 urban other providers, 22 (79%) of 28 rural known providers, and 19 (83%) of 23 rural other providers. Nonresponse for these latter 3 provider groups was adjusted for by weighting. Among selected patients, 2864

(71%) completed the full interview at baseline. This baseline sample provides a 68% coverage rate of the population that would have been directly represented if there were no refusals at any stage. Analytic weights adjusted for the study sample design and for nonresponse, using data from short forms, proxy forms, or basic nonresponse information that was collected on those who failed to complete the full interviews.

BASELINE SURVEY AND MEASURES

Surveys were conducted by trained interviewers using structured and computer-assisted instruments during 15 months beginning in January 1996. Most (91%) were conducted in person, either at home or in private space made available to the study at clinics, libraries, and HIV organizations. The remainder were conducted by telephone.

The survey included questions about use of mental health and substance abuse services in the past 6 months. Questions about each hospitalization in the past 6 months allowed identification of hospitalizations that occurred for ADM treatment. Items on other types of ADM care included visits to a medical provider that included discussion of personal or emotional problems, visits to a mental health provider on an individual or a family basis for emotional or personal problems, visits to support or psychotherapy groups, nights spent in a halfway house or residential or recovery program for alcohol- or other drug-related problems, days treated in an outpatient program or visits with a professional in an outpatient setting for drug- or alcohol-related problems, and attendance at 12-step or self-help groups for drug- or alcohol-related problems. Finally, a question about medications asked whether respondents had regularly taken any drugs for depression, anxiety, or emotional problems.

The survey included several brief screening measures for mental disorders and measures of substance abuse. Screeners for major depression, dysthymia, generalized anxiety disorder, and panic disorder in the past year were from

managing medical care may overshadow consideration of behavioral health needs, even when behavioral services could improve quality of life.¹³ Third, the stigma associated with HIV infection raises particular concerns about access to ADM services for these individuals.

In this study, we report use of mental health and substance abuse treatment services in the first national probability survey of adults receiving ongoing medical care for HIV infection. We examine the relationship of use patterns to symptom-based measures of need for such services and investigate whether some individuals are more likely to receive mental health care than others, independent of need. Consistent with the model developed by Andersen and colleagues,¹⁴⁻¹⁶ we examine different factors that may either predispose (demographics and severity of HIV) or enable (insurance coverage, educational level, presence of household partner, and region of country) access to services. If these factors affect access to care independent of need, they point to inequities that are potentially amenable to policy and health care system change.

RESULTS

POPULATION DESCRIPTION

From the HIV Cost and Services Utilization Study sample of 2864 persons, we estimated the number of adults with HIV who were under regular medical care in the contiguous United States in early 1996 to be 231 400 (95% confidence interval, 162 800-300 000), excluding persons in prison or the active military. Of these, 23% were women, and most were in their early adult years (34% were aged 18-34 years and 54% were aged 35-49 years). There were nearly equal numbers of whites (49%) and other ethnicities (51%), with African Americans (33%) and Hispanics (15%) heavily represented among those under care for HIV. Only 1 in 10 was asymptomatic, while 38% reported that they were diagnosed as having acquired immunodeficiency syndrome.

More than half of this population screened positive for a mental disorder or drug dependence in the past year:

the World Health Organization Composite International Diagnostic Interview Short-Form.¹⁹ The form was developed and tested using data from a general population survey; agreement rates of 90% to 100% were found between short-form diagnoses and those derived from the full Composite International Diagnostic Interview, an in-depth structured diagnostic interview.¹⁹ For the present analysis, a dichotomous summary measure indicated whether respondents scored positive on any of the 4 depression or anxiety disorder screeners or negative on all of them.

Drug use questions included past-year use of 8 classes of drugs and a measure of dependence on any of these drugs in the past year, based on a screener developed by Rost et al.²⁰ A summary indicator based on these was used to classify respondents' illicit drug use in the past year as: no drug use, marijuana use only but no drug dependence, use of other illicit drug but no drug dependence, or drug dependence. Questions on quantity and frequency of alcohol consumption in the past 4 weeks were used to classify drinking patterns as no drinking, nonheavy drinking (never drank ≥ 5 drinks in a day), heavy drinking (drank ≥ 5 drinks on 1-4 days), or frequent heavy drinking (drank ≥ 5 drinks on ≥ 5 days).

Emotional well-being was measured using a 7-item scale assessing mental health symptoms and feelings of well-being in the past week.²¹ Five of these items are identical to the commonly used Mental Health Index-5 scale included in the Medical Outcomes Study 36-Item Short-Form Health Survey.²²

Sociodemographic variables were gender, age, ethnicity, education, household composition, sexual orientation, employment status, income, and type of health insurance coverage. Geographic variables included the region of the country and the size of the metropolitan area from which the HIV providers were selected.

Human immunodeficiency virus severity measures included stage of HIV infection and respondents' lowest CD4⁺ lymphocyte count (both by self-report). Two additional indexes summarized HIV-related symptom experience in the

past 6 months. All respondents were asked about 13 HIV clinical symptoms: new or persistent headaches; fevers, sweats, or chills; pain in the mouth, lips, or gums; white patches in the mouth; painful rashes or sores on the skin; nausea or loss of appetite; trouble with the eyes; sinus infection, pain, or discharge; numbness or tingling in the hands or feet; Kaposi sarcoma lesions; persistent cough or difficulty breathing; diarrhea or watery stools; and weight loss. Women were also asked about abnormal vaginal discharge. For each symptom experienced, respondents rated the extent to which the symptoms bothered them (extremely, quite a bit, moderately, very little, or not at all). This information was used to create 2 analytic variables: a proportion that represented the number of symptoms each respondent experienced divided by the total number of possible symptoms, and the mean bothersome level of symptoms, ranging from 0 (no symptoms or not bothered at all) to 5 (extremely bothered).

ANALYSES

Analyses adjusted SEs and statistical tests for the differential weighting and the clustered sample design using linearization methods²³ and used imputation for key demographic variables to adjust for item-level missing data.²⁴

First, we examined patterns of mental health and substance abuse service use for the HIV Cost and Services Utilization Study population and conducted cross-tabular analyses relating use of specific types of services to measures of need for services. Next, we conducted multiple logistic regression analyses to predict the probability of using specific types of services. In these models, all 4 of the indicators of need for services (past-year mood or anxiety disorder, past-year drug use or dependence, alcohol use, and the emotional well-being scale) were included as control variables, and each of the other sociodemographic, geographic, and HIV severity variables was individually entered in separate models.

10% were positive for a mental disorder and drug dependence, 38% were positive for a mental disorder only, and 3% were positive for drug dependence only. Among those who screened positive for drug dependence, most used marijuana (64%) and cocaine (62%) in the past year, with less frequent use of nonprescribed analgesics (42%), nonprescribed sedatives (38%), nonprescribed amphetamines (28%), heroin or other opiates (24%), inhalants (14%), and hallucinogens (6%).

USE OF SERVICES

The percentage of the population with any ADM hospitalization in the past 6 months was 1.8%, and 3.4% of the population were in nonhospital residential treatment for substance abuse problems (**Table 1**). Among those who had hospitalizations, mean length of stay was almost 2 weeks, while residential treatment stays were nearly twice as long. For the population as a whole, hospital days during a 6-month period were estimated to be nearly 60000, and the estimate of days of residen-

tial treatment for substance abuse was more than 200000.

Adults with HIV were similarly likely to discuss mental health problems with general medical providers (40.3%) and mental health specialists (26% sought individual or family treatment, and 15.2% went to group therapy), but those seeing mental health specialists generally made more visits (Table 1). Thus, the total number of mental health visits to specialty providers during 6 months was much greater than the number of mental health-related general medical visits. Nearly 30% of the population reported that they had "regularly taken" a medication for depression, anxiety, or emotional problems in the past 6 months (Table 1).

Outpatient substance abuse treatment was common (5.6% reported at least 1 visit in the past 6 months), and the mean intensity of this treatment was high (2.2 visits per week) (Table 1). More than 12% of the population reported participating in drug or alcohol self-help groups, and intensity of participation was generally similar to that in outpatient substance abuse treatment.

Table 1. Use of Services for Mental Health and Substance Abuse in Past 6 Months in an Estimated National Population of 231 400 Adults With Human Immunodeficiency Virus*

Service	Receiving Care	Total Amount of Care (Mean Amount per User)
Hospitalization	4200 (1.8)	57 300 (13.6) days
Residential substance abuse treatment	7800 (3.4)	206 500 (26.5) days
Outpatient specialty mental health care		
Individual or family	60 100 (26.0)	616 800 (10.3) visits
Group	35 200 (15.2)	510 300 (14.5) visits
Discussed emotional or personal problems with medical provider	93 300 (40.3)	485 700 (5.2) visits
Took medications for depression, anxiety, or emotional problems	68 400 (29.6)	NA
Outpatient substance abuse treatment	12 900 (5.6)	753 300 (58.4) days
Self-help substance abuse treatment (12-step)	28 600 (12.4)	1 619 100 (56.6) meetings

*Data are given as number (percentage) unless otherwise indicated. NA indicates not applicable.

Table 2. Use of Services in Past 6 Months by Mental Health Disorder and Substance Abuse Measures*

Measure	Hospitalization	Outpatient Therapy			Medication Use	Substance Abuse Treatment		
		Individual or Family	Group	Discussion With Medical Provider		Residential	Outpatient	Self-help
Past-year mood or anxiety disorder								
No	0.7	13.9	9.6	27.4	15.3	2.2	3.2	9.6
Yes	3.1	39.2	21.4	54.4	45.3	4.7	8.2	15.5
P(χ^2 test) significant	<.001	<.001	<.001	<.001	<.001	.004	<.001	<.001
Past-year drug use or dependence								
None	0.9	21.2	14.3	35.6	22.9	0.9	3.5	11.9
Use marijuana	1.4	20.3	13.2	37.5	24.7	0.7	1.8	4.5
Use other drug	1.7	29.2	14.2	42.0	33.9	2.0	4.3	7.6
Dependence	6.4	43.7	23.0	58.3	52.6	19.0	20.2	32.0
P(χ^2 test) significant	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001
Alcohol use								
None	2.2	27.8	17.5	38.7	29.7	4.7	7.2	19.0
Nonheavy	1.2	23.2	13.2	39.6	28.1	1.3	2.5	4.6
Heavy	2.8	27.7	15.8	48.6	34.1	3.4	6.2	10.0
Frequently heavy	1.5	23.7	8.9	40.6	27.2	5.1	8.9	11.2
P(χ^2 test) significant	.10	.30	.01	.02	.31	<.001	<.001	<.001
Emotional well-being†								
0-20	2.3	40.7	21.4	50.8	55.1	5.1	13.0	17.0
21-40	3.9	40.2	19.8	62.1	54.9	4.3	7.4	13.9
41-60	2.5	30.6	17.7	46.7	35.5	4.2	8.0	13.8
61-80	1.5	26.4	15.9	39.5	25.3	3.6	4.8	13.8
81-100	0.6	11.7	8.9	23.2	12.3	1.7	2.1	7.9
P(χ^2 test) significant	.002	<.001	<.001	<.001	<.001	.03	<.001	<.001

*Data are given as percentage of 2864 users.

†Scale of 0 to 100 (0, lowest; 100, highest).

The estimated number of adults with HIV using any of the ADM services described was 142 100, or 61.4% of the adult population in care for HIV.

Those who screened positive for a mental disorder in the past year were much more likely to have used each category of ADM services, as were those who screened positive for drug dependence and those who had lower scores on the emotional well-being scale (**Table 2**). Alcohol consumption was strongly associated with use of substance abuse treatment services, but only modestly or not at all related to use of other mental health services. Those who had consumed no alcoholic drinks in the past 4 weeks, as well as frequent heavy drinkers, were more likely to have used substance abuse services in the past 6 months (Table 2). The association of abstinence

with higher use of substance abuse services likely reflects efforts of former heavy drinkers or drug users to maintain sobriety.

PREDICTORS OF SERVICE USE

After controlling for indicators of need for services, ADM hospitalizations were associated with few sociodemographic variables, except that persons who reported their employment status as disabled and those covered by Medicare were more likely to have had such a hospitalization, while those with college degrees were less likely (**Table 3**). Human immunodeficiency virus severity measures were unrelated to the probability of an ADM hospitalization.

Table 3. Multivariate Predictors of Use of Any Mental Health Service in Past 6 Months*

Sociodemographic Predictors (Unweighted No. per Group)	Discussion With Medical Provider							
	Hospitalization	Individual or Family Therapy	Group Therapy	Medication Use	Residential Treatment for Substance Abuse	Outpatient Treatment for Substance Abuse	Self-help (12-Step) for Substance Abuse	
Sex								
Male (2017)	0.8 (0.5-1.3)	1.0 (0.8-1.1)	0.9 (0.7-1.1)	0.9 (0.7-1.1)	1.2 (0.9-1.5)	0.7 (0.4-1.3)	0.5† (0.4-0.7)	1.0 (0.7-1.3)
Female (847)‡	...	...	...	...	...	...	...	...
Age, y								
18-34 (987)‡	...	...	...	...	...	...	...	...
35-49 (1591)	1.5 (0.9-2.4)	1.0 (0.8-1.2)	0.7§ (0.5-1.0)	1.0 (0.8-1.2)	1.4§ (1.1-1.7)	1.0 (0.6-1.6)	1.2 (0.8-1.8)	1.3 (1.0-1.8)
≥50 (286)	1.3 (0.5-3.5)	0.9 (0.6-1.2)	0.8 (0.5-1.2)	1.0 (0.8-1.4)	1.0 (0.7-1.5)	0.6 (0.1-2.1)	0.7 (0.2-2.4)	0.6 (0.3-1.3)
Ethnicity								
White (1399)‡	...	...	...	...	...	...	...	...
African American (959)	2.0 (0.9-4.4)	0.7§ (0.5-0.9)	1.1 (0.7-1.6)	0.9 (0.7-1.1)	0.5† (0.4-0.7)	2.8† (1.9-4.3)	3.1† (2.0-4.8)	1.7§ (1.1-2.8)
Hispanic (415)	0.8 (0.3-2.3)	1.0 (0.7-1.4)	0.9 (0.6-1.5)	0.7† (0.5-0.8)	0.7§ (0.6-1.0)	1.5 (0.7-3.3)	1.8 (0.9-3.5)	1.2 (0.7-2.2)
Other (91)	2.2 (0.5-9.8)	1.6 (0.8-3.0)	0.8 (0.4-1.7)	1.2 (0.7-2.1)	0.9 (0.5-1.6)	2.1 (0.5-8.9)	2.1 (0.7-6.1)	1.3 (0.6-2.7)
Education								
<High school (723)	1.8 (0.6-5.8)	0.5§ (0.4-0.8)	0.8 (0.4-1.5)	0.6§ (0.5-0.8)	0.7§ (0.5-0.9)	4.8§ (1.2-18.5)	4.8† (1.9-12.0)	1.5 (0.9-2.6)
High school degree (805)	3.0§ (1.0-8.7)	0.6§ (0.4-0.9)	1.3 (0.9-1.9)	0.8 (0.7-1.1)	0.7§ (0.5-0.9)	3.2 (0.9-11.7)	4.0† (2.0-8.2)	1.7§ (1.2-2.5)
Some college (810)	2.6 (1.0-7.1)	0.8 (0.6-1.0)	1.0 (0.7-1.5)	1.0 (0.7-1.3)	0.8 (0.6-1.0)	3.0 (0.7-12.4)	2.6 (0.9-7.6)	1.6§ (1.1-2.2)
≥Bachelor's degree (526)‡	...	...	...	...	...	...	...	...
Household composition								
Spouse (303)‡	...	...	...	...	...	...	...	...
Partner (705)	0.3 (0.1-1.9)	1.1 (0.8-1.5)	1.3 (0.6-2.5)	1.2 (0.8-1.6)	1.3 (1.0-1.9)	0.6 (0.2-1.9)	1.1 (0.6-2.0)	1.1 (0.7-1.6)
Others (965)	1.1 (0.3-3.3)	1.0 (0.7-1.4)	1.7 (0.8-3.4)	1.0 (0.7-1.3)	1.3 (1.0-1.7)	1.1 (0.4-2.6)	0.8 (0.5-1.3)	1.1 (0.7-1.6)
Alone (891)	1.0 (0.4-3.0)	1.3 (0.8-2.1)	1.3 (0.6-2.9)	1.0 (0.7-1.4)	1.5§ (1.0-2.2)	0.8 (0.3-1.8)	0.8 (0.6-1.2)	1.3 (0.8-2.1)
Sexual orientation								
Heterosexual (1222)‡	...	...	...	...	...	...	...	...
Gay or other (1287)	0.5 (0.2-1.3)	1.3 (1.1-1.7)	1.2 (0.9-1.7)	1.4§ (1.1-1.8)	1.6§ (1.2-2.1)	0.4§ (0.2-0.7)	0.3† (0.2-0.5)	0.6§ (0.4-1.1)
Bisexual (150)	0.6 (0.2-2.2)	1.2 (0.7-1.9)	1.0 (0.6-1.7)	1.4 (0.9-2.1)	1.5 (0.9-2.5)	0.9 (0.5-1.6)	0.7 (0.4-1.2)	0.9 (0.5-1.5)
Celibate (205)	0.5 (0.2-1.4)	1.3 (0.9-1.9)	0.8 (0.5-1.3)	1.1 (0.7-1.9)	1.9§ (1.2-3.0)	0.5 (0.2-1.7)	0.8 (0.5-1.4)	0.6 (0.3-1.1)
Employment								
Full- or part-time (1015)‡	...	...	...	...	...	...	...	...
Unemployed (216)	3.6 (0.6-20.4)	1.3 (0.8-2.1)	1.3 (0.9-1.9)	1.2 (0.8-1.8)	0.6§ (0.3-1.0)	1.6 (0.7-3.4)	4.2† (2.4-7.3)	1.3 (0.8-2.2)
Disabled (1375)	3.7§ (1.1-12.3)	1.5§ (1.1-2.0)	1.4§ (1.1-1.9)	1.1 (0.9-1.4)	2.0† (1.6-2.5)	2.7§ (1.3-5.3)	2.9† (1.8-4.7)	1.0 (0.7-1.3)
Not working (258)	2.0 (0.5-7.3)	1.1 (0.7-1.6)	0.9 (0.5-1.5)	0.8 (0.6-1.3)	0.9 (0.6-1.5)	1.9 (0.7-4.8)	2.8§ (1.4-5.3)	1.1 (0.7-1.8)
Income, \$								
0-5000 (609)	1.7 (0.6-5.1)	0.7§ (0.5-0.9)	1.3 (0.8-1.9)	0.6† (0.5-0.8)	0.8 (0.5-1.2)	2.5 (1.1-6.0)	3.6† (1.8-7.5)	1.6§ (1.0-2.7)
5001-10 000 (740)	1.9 (0.7-5.0)	0.9 (0.7-1.1)	1.5 (1.0-2.3)	0.8 (0.6-1.1)	1.1 (0.8-1.5)	2.2 (0.9-5.7)	2.9§ (1.4-5.9)	1.4 (0.9-2.1)
10 001-25 000 (736)	0.6 (0.2-2.6)	0.8 (0.6-1.1)	1.1 (0.7-1.8)	0.9 (0.7-1.1)	0.9 (0.7-1.2)	1.2 (0.5-3.3)	1.8 (0.8-3.8)	1.1 (0.7-1.8)
≥25 001 (779)‡	...	...	...	...	...	...	...	...
Insurance								
None (597)‡	...	...	...	...	...	...	...	...
Medicaid (858)	2.0 (0.8-4.9)	1.0 (0.8-1.4)	1.3 (0.9-1.8)	1.0 (0.7-1.4)	1.3 (1.0-1.8)	1.3 (0.6-2.7)	2.2† (1.5-3.4)	1.2 (0.8-1.9)
Private (865)	1.1 (0.3-4.1)	1.2 (0.8-1.8)	0.9 (0.6-1.5)	1.4 (0.9-1.5)	1.2 (0.8-1.8)	0.5 (0.2-1.0)	0.3§ (0.1-0.9)	0.9 (0.6-1.4)
Medicare (544)	3.0§ (1.2-7.4)	1.4 (1.0-2.0)	1.4 (0.9-2.1)	1.0 (0.7-1.4)	1.9† (1.4-2.5)	0.8 (0.4-1.9)	1.4 (0.8-2.5)	0.9 (0.5-1.5)
Geographic region								
Northeast (707)‡	...	...	...	...	...	...	...	...
Midwest (332)	0.5 (0.1-2.7)	0.7§ (0.5-1.0)	1.0 (0.7-1.3)	1.0 (0.7-1.5)	1.1 (0.7-1.8)	0.5§ (0.3-0.8)	0.3† (0.2-0.4)	0.4† (0.2-0.7)
South (916)	0.8 (0.3-2.2)	0.6† (0.4-0.8)	0.6§ (0.3-1.0)	0.5§ (0.4-0.8)	0.9 (0.7-1.4)	0.8 (0.5-1.4)	0.2† (0.2-0.3)	0.3† (0.2-0.6)
West (909)	0.4 (0.1-1.0)	1.1 (0.8-1.5)	0.8 (0.6-1.1)	1.4§ (1.0-1.9)	1.4 (1.0-1.9)	0.4† (0.2-0.7)	0.2† (0.1-0.4)	0.5§ (0.3-0.8)
Metropolitan size								
≤1 500 000 (826)‡	...	...	...	...	...	...	...	...
1 500 001-2 500 000 (523)	0.7 (0.3-1.8)	1.5 (0.9-2.6)	1.2 (0.6-2.3)	1.5 (0.9-2.6)	1.1 (0.7-1.8)	1.0 (0.4-2.4)	2.0 (0.9-4.1)	1.7 (0.9-3.1)
2 500 001-4 500 000 (562)	0.8 (0.2-2.5)	1.0 (0.7-1.7)	1.4 (0.7-2.7)	1.1 (0.7-1.8)	0.6 (0.4-1.0)	1.3 (0.5-3.0)	1.4 (0.7-2.8)	1.8 (0.9-3.5)
≥4 500 001 (953)	1.0 (0.4-2.4)	1.7§ (1.2-2.4)	1.4 (0.8-2.4)	1.4 (0.9-2.2)	0.8 (0.6-1.2)	1.3 (0.6-2.6)	3.0† (1.8-4.9)	2.7§ (1.5-4.8)
HIV clinical severity								
Clinical stage HIV								
Asymptomatic (243)‡	...	...	...	...	...	...	...	...
Symptomatic (1495)	0.8 (0.3-2.0)	1.7§ (1.1-2.7)	1.2 (0.7-2.3)	1.4§ (1.0-1.9)	1.4 (0.7-2.7)	0.7 (0.4-1.2)	0.8 (0.4-1.6)	1.1 (0.8-1.6)
AIDS (1126)	1.1 (0.5-2.5)	1.8§ (1.1-3.0)	1.5 (0.8-2.8)	1.5§ (1.1-2.2)	2.0 (1.0-4.0)	0.7 (0.4-1.2)	0.6 (0.3-1.1)	0.9 (0.5-1.4)
HIV symptoms, %								
None (228) ‡	...	...	...	...	...	...	...	...
1-25 (865)	0.5 (0.2-1.3)	2.4† (1.5-3.8)	0.8 (0.4-1.9)	1.5§ (1.1-2.1)	1.7§ (1.0-2.9)	1.4 (0.4-4.9)	1.4 (0.7-2.5)	1.1 (0.6-2.0)
26-50 (958)	0.7 (0.3-1.9)	2.4† (1.5-3.7)	1.0 (0.5-2.0)	1.8§ (1.3-2.6)	2.1§ (1.2-3.8)	1.0 (0.4-2.7)	0.9 (0.4-2.1)	0.8 (0.4-1.3)
51-75 (613)	0.5 (0.2-1.3)	3.0† (1.8-4.8)	1.4 (0.6-2.9)	1.8† (1.3-2.6)	2.4§ (1.3-4.1)	1.4 (0.4-4.1)	1.3 (0.6-2.5)	1.1 (0.6-2.2)
76-100 (200)	0.6 (0.2-2.2)	3.2§ (1.8-5.6)	1.6 (0.7-3.8)	2.3§ (1.3-4.2)	3.8† (1.8-7.9)	0.3 (0.1-1.3)	1.6 (0.6-4.1)	0.6 (0.3-1.2)

(continued)

Table 3. Multivariate Predictors of Use of Any Mental Health Service in Past 6 Months* (cont)

Sociodemographic Predictors (Unweighted No. per Group)	Hospitalization	Individual or Family Therapy	Group Therapy	Discussion With Medical Provider	Medication Use	Residential Treatment for Substance Abuse	Outpatient Treatment for Substance Abuse	Self-help (12-Step) for Substance Abuse
Symptom burden								
None or very little (574)‡	...	...	...	...	...	...	...	...
Moderate (1077)	1.1 (0.6-2.2)	1.9† (1.3-2.8)	1.1 (0.7-1.7)	1.6† (1.3-2.1)	1.8§ (1.2-2.5)	0.9 (0.5-1.6)	0.6 (0.4-1.1)	0.8 (0.6-1.0)
Quite a bit or extreme (1213)	0.8 (0.3-1.7)	1.8§ (1.1-2.8)	1.2 (0.8-1.9)	1.7† (1.4-2.2)	1.9§ (1.2-3.1)	0.9 (0.6-1.3)	0.7 (0.5-1.0)	0.7 (0.5-1.0)
CD4+ lymphocyte count, ×10 ⁹ /L								
≥.5 (253)	0.6 (0.2-1.7)	1.2 (0.7-2.0)	0.8 (0.4-1.4)	0.9 (0.6-1.4)	0.8 (0.5-1.2)	1.3 (0.5-3.2)	2.9† (1.5-5.3)	2.8† (1.8-4.3)
0.200-0.499 (1096)	0.7 (0.4-1.4)	0.9 (0.7-1.2)	0.9 (0.7-1.1)	1.0 (0.8-1.4)	0.7§ (0.6-0.9)	1.4 (0.7-2.5)	1.9§ (1.2-3.2)	2.2† (1.6-3.0)
0.050-0.199 (854)	0.7 (0.3-1.5)	1.1 (0.8-1.4)	0.9 (0.6-1.2)	1.0 (0.8-1.3)	0.8§ (0.6-1.0)	1.7 (0.9-3.2)	1.6§ (1.0-2.5)	2.4† (1.7-3.3)
0-0.049 (661)‡	...	...	...	...	...	...	...	...

*Data are given as odds ratio (confidence interval). HIV indicates human immunodeficiency virus; AIDS, acquired immunodeficiency syndrome.

†Odds ratio significantly different from 1.0 at $P < .001$.

‡Reference category.

§Odds ratio significantly different from 1.0 at $P < .05$.

After controlling for need for ADM services, use of individual or family outpatient mental health visits was less likely among African American individuals, those with lower educational level or income, and those reporting heterosexual relationships; higher probability of use was found among the disabled, those with more HIV symptoms, and persons with greater HIV symptom burden (Table 3). Individual outpatient mental health visits were also more common among those living in the Northeast and West and in large metropolitan areas. Group therapy was less likely to be reported by persons aged 35 to 49 years, the disabled, and residents of the South, but was more likely among persons with low income.

Discussions of emotional problems with general medical providers, after adjusting for need for services, were reported less often by Hispanics, those with lower educational level or income, and residents of the South, and reported more often by those in homosexual relationships and by those with more HIV symptoms or greater HIV symptom burden (Table 3).

Models adjusting for need for ADM services show that the probability of psychotherapeutic medication use was lower among minority groups, those with lower educational level, the unemployed, and those in heterosexual relationships. Medication use was higher for persons aged 35 to 49 years, those living alone, the disabled, those with Medicare insurance, and those with more HIV symptoms, greater HIV symptom burden, or low CD4+ lymphocyte counts (Table 3).

Residential treatment for substance abuse, after adjusting for need for care, was more common among African American individuals, those with less education, and the disabled, and was less common among persons in homosexual relationships and residents of the Midwest and West (Table 3). For outpatient substance abuse treatment, higher probability of use was found among women, African American individuals, those with less education or income, those with Medicaid insurance, those not currently working, residents of large metropolitan areas and of the Northeast, and those with higher CD4+ lymphocyte counts.

Use of substance abuse self-help groups was more likely, after adjusting for need for services, among African American persons, those with lower educational level, those residing in the Northeast or in a large metropolitan area, and those with higher CD4+ lymphocyte counts (Table 3).

COMMENT

These results should be considered in the context of several study limitations. The generalizability of our results is limited in 2 respects: persons with HIV who had no regular source of general medical care were not represented in the HIV Cost and Services Utilization Study, and our baseline data predate the introduction of the more effective highly active antiretroviral therapy treatments for HIV. If these limits in generalizability bias our findings, we suspect that it is in the direction of finding somewhat higher rates of service use in our study than a perfect population estimate would give today.

A further limitation is that the study's assessment of need for ADM services was necessarily brief. Measures focused on the most common and treatable mental health and substance abuse problems. Because a full clinical ascertainment of psychiatric diagnoses was not possible, short symptom-oriented screeners were used instead. Finally, the retrospective time frame for assessing need for ADM services varied across measures (past year for diagnostic screeners, past month for alcohol use, and past week for emotional distress) and differed from the time frame used in questions about service use (past 6 months). Although limited, the mental health and substance abuse measures provide us with an operational definition of *need* that is intentionally broad, including significant emotional distress and heavy substance abuse, even if these fail to reach thresholds for syndromal disorder or are not perceived as need for ADM services.

Those in care for HIV were frequent users of mental health services in general medical and in specialty mental health and substance abuse sectors, with more than 60% reporting some use of these services in the past 6

months. In contrast, in the 1990 National Comorbidity Survey,²⁵ use of any outpatient care for mental health problems in a general population during the past year was 13.3%. The magnitude of specialty ADM care provided to those with HIV (>3.5 million formal outpatient visits with specialty mental health or substance abuse providers) suggests that the epidemic may be consuming substantial mental health and substance abuse treatment resources. A thumbnail calculation, using national statistics on annual admissions for specialty ADM care²⁶ as the denominator and our estimates in this article as the numerator, suggests that those with HIV account for a little less than 1% of inpatient and residential admissions and around 2% of ambulatory admissions, which are nontrivial percentages. This raises important questions about how well specialty providers are prepared for and are appropriately treating these patients with complex medical and mental health needs. It is not clear, for example, the extent to which specialty ADM providers are aware of their patients' HIV status and consider the special issues facing persons with HIV. Nor do we know whether ADM care is routinely coordinated with general medical care for this population, or whether counseling to help these patients deal with barriers to and difficulties in complying with complicated HIV medication regimens is commonly provided by ADM specialists.

Although substantially more ADM care is provided by specialty providers, our findings suggest that general medical providers also provide extensive ADM-related care to this population: about 40% of the population discussed emotional or personal problems with their general medical providers and generally did so just a little less than once a month. Previous research has suggested that general medical providers are less likely to deliver appropriate levels of care to patients with depression^{27,28} than are mental health specialists, but some patients may find it more comfortable to talk with their physicians about such issues. Physicians treating many patients with HIV may have a particularly high burden of responsibility for providing ADM care, and thus it is important to evaluate needs that these providers may have for improving the quality of this care (eg, through training or better linkages with specialty providers).

Ethnicity, educational level, and income were differentially associated with the probability of receiving ADM care, with divergent patterns for substance abuse relative to mental health care. Sociodemographic factors commonly associated with poorer access to health services (minority group member, low educational level, and low income) predicted less use of mental health outpatient care. In light of the disproportionate incidence of HIV among disadvantaged ethnic minorities in the United States, such inequality in access to mental health care is particularly important to document and attempt to ameliorate. Patterns of access differed for substance abuse treatment services. In fact, African Americans were more likely to get formal substance abuse treatments, and lower educational level and income were associated with greater likelihood of getting outpatient or self-help services for substance abuse problems. The large public substance abuse treatment sector and the 12-step self-help movement have perhaps done a better job of reaching vul-

nerable and disadvantaged populations among those with HIV than have the traditional mental health and medical sectors. Even so, overall penetration of specialty substance abuse services in the HIV-infected population is relatively low.

Divergent patterns for mental health vs substance abuse care were also found in the relationship of HIV clinical severity to use of services. Individuals with more severe HIV-related symptoms were more likely to receive mental health outpatient care from specialty mental health and general medical providers and to take psychotherapeutic medications. Human immunodeficiency virus-related illness may stimulate emotional help-seeking on the part of patients with HIV, or providers may be more sensitized to inquire about emotional distress in those who are sicker. In contrast, substance abuse outpatient visits and self-help meetings were less likely among those with lower CD4⁺ lymphocyte counts. Those who are sicker may be less inclined to take on the challenge of directly addressing their substance abuse problems.

Type of insurance coverage had little impact on probability of using ADM services. This is puzzling and may reflect the relative availability of care in the public sector for the uninsured and those covered by Medicaid, as well as the crudeness of our insurance measures, which do not allow us to determine benefit levels for mental health and substance abuse services among those with private insurance.

Those living in the Northeast were generally more likely than those in other regions of the country (especially the South) to be using specialty outpatient services for mental health and substance abuse, to be discussing emotional or personal problems with their medical providers, and to be participating in substance abuse self-help groups. This may reflect greater availability of services in the Northeast or less stigma associated with using such services. Because injection drug use has been a more important route of transmission of HIV in the Northeast, substance abuse service provision to the HIV-infected population in this region may be more well developed than in other parts of the country.

As a whole, our findings suggest important variations in access to specific types of care as a function of socioeconomic, HIV clinical severity, and regional factors. Inequalities in access to mental health services urge increased attention to improving outreach and services for lower socioeconomic status and minority HIV-infected populations and for those in regions that are relatively underserved, such as the South. Inequalities in access to substance abuse care can be understood in the context of a distinctive public substance abuse treatment system that is more responsive to disadvantaged populations, that provides better access to HIV populations in the Northeast relative to other parts of the country, but that may not attract or easily accommodate higher socioeconomic status populations or those whose HIV infection is more advanced.

Accepted for publication November 27, 2000.

The HIV Cost and Services Utilization Study is being conducted under cooperative agreement U-01HS08578 (Drs Shapiro and Bozzette) between RAND, Santa Monica, Calif,

and the Agency for Health Care Policy and Research, Rockville, Md. Additional funding was provided by the Health Resources and Services Administration, Washington, DC, and the National Institute for Mental Health, the National Institute on Drug Abuse, and the National Institutes of Health Office of Research on Minority Health through the National Institute for Dental Research, Bethesda, Md. Additional support was provided by the Robert Wood Johnson Foundation, Princeton, NJ; Merck and Company, Whitehouse Station, NJ; GlaxoSmith Kline, Inc, Research Triangle Park, NC; the National Institute on Aging, Bethesda; and the Office of the Assistant Secretary for Planning and Evaluation in the US Department of Health and Human Services, Washington. Dr Bing received support for this study from the National Institute for Mental Health as a UCLA Faculty Scholar in Mental Health Services Research (MH00990), the California Statewide AIDS Research Program, and from the National Institutes of Health Office of Research on Minority Health through the National Institute on Alcohol Abuse and Alcoholism, Rockville (AA11899).

Corresponding author and reprints: M. Audrey Burnam, PhD, RAND, 1700 Main St, PO Box 2138, Santa Monica, CA 90407-2138 (e-mail: aburnam@rand.org).

REFERENCES

- Brown GR, Rundell JR, McManis SE, Kendall SN, Zachary R, Temoshok L. Prevalence of psychiatric disorders in early stages of HIV infection. *Psychosom Med*. 1992;54:588-601.
- Atkinson JH, Grant I, Kennedy CJ, Richman DD, Spector SA, McCutchan JA. Prevalence of psychiatric disorders among men infected with human immunodeficiency virus: a controlled study. *Arch Gen Psychiatry*. 1988;45:859-864.
- Perkins DO, Stern RA, Golden RN, Murphy C, Naftolowitz D, Evans DL. Mood disorders in HIV infection: prevalence and risk factors in a nonepicenter of the AIDS epidemic. *Am J Psychiatry*. 1994;151:233-236.
- Williams JB, Rabkin JG, Remien RH, Gorman JM, Ehrhardt AA. Multidisciplinary baseline assessment of homosexual men with and without human immunodeficiency virus infection. *Arch Gen Psychiatry*. 1991;48:124-130.
- Atkinson JH, Grant I. Natural history of neuropsychiatric manifestations of HIV disease. *Psychiatr Clin North Am*. 1994;17:17-33.
- Perry S, Jacobsberg L, Card CAL, Ashman T, Frances A, Fishman B. Severity of psychiatric symptoms after HIV testing. *Am J Psychiatry*. 1993;150:775-779.
- Rosenberger PH, Bornstein RA, Nasrallah HA, Para MF, Whitaker CC, Fass RJ, Rice RR. Psychopathology in human immunodeficiency virus infection: lifetime and current assessment. *Compr Psychiatry*. 1993;34:150-158.
- Turner BJ, Markson LE, Mausekopf J, Houchens R, Fanning TR. Health care delivery, zidovudine use, and survival of women and men with AIDS. *J Acquir Immune Defic Syndr*. 1994;7:1250-1262.
- Fairfield KM, Libman H, Davis RB, Eisenberg DM, Phillips RS. Delays in protease inhibitor use in clinical practice. *J Gen Intern Med*. 1999;14:395-401.
- Hough RL, Lansverk JA, Karno M, Burnam MA, Timbers DM, Escobar JI, Regier DA. Utilization of health and mental health services by Los Angeles Mexican Americans and non-Hispanic whites. *Arch Gen Psychiatry*. 1987;44:702-709.
- Kessler RC, McGonagle KA, Zhao S, Nelson CB, Hughes M, Eshleman S, Wittchen H-U, Kendler KS. Lifetime and 12-month prevalence of DSM-III-R psychiatric disorders in the United States: results from the National Comorbidity Survey. *Arch Gen Psychiatry*. 1994;51:8-19.
- Stein MD, Hanna L. Use of mental health services by HIV-infected women. *J Womens Health*. 1997;6:569-574.
- Sherbourne CD, Hays RD, Fleishman JA, Vitiello B, Magruder KM, Bing EG, McCaffrey D, Burnam A, Longshore D, Eggan F, Bozzette SA, Shapiro MF. Associations of psychiatric conditions with health-related quality of life in persons with HIV infection. *Am J Psychiatry*. 2000;157:248-254.
- Aday LA, Andersen R, Fleming GV. *Health Care in the U.S.: Equitable for Whom?* Beverly Hills, Calif: Sage Publications; 1980.
- Andersen R, Kravits J, Anderson OW. *Equity in Health Services: Empirical Analyses in Social Policy*. Cambridge, Mass: Ballinger Publishing Co; 1975.
- Aday L, Fleming GV, Andersen R. *Access to Medical Care in the United States*. Chicago, Ill: Pluribus Press; 1984. Center for Health Administration Studies Research Series, No. 32.
- Shapiro MF, Beck ML, Berry SH, Emmons CA, Athey LA, Hsia DC, Leibowitz AA, Maida CA, Marcus M, Perlman JF, Schur CL, Schuster MA, Senterfitt JW, Bozzette SA. National probability samples in studies of low-prevalence diseases, I: perspectives and lessons from the HIV Cost and Services Utilization Study. *Health Serv Res*. 1999;34:951-968.
- Frankel MR, Shapiro MF, Duan N, Morton SC, Berry SH, Brown JA, Burnam MA, Cohn SE, Goldman DP, McCaffrey DF, Smith SM, St. Clair PA, Tebow JF, Bozzette SA. National probability samples in studies of low-prevalence diseases, II: designing and implementing the HIV Cost and Services Utilization Study sample. *Health Serv Res*. 1999;34:969-993.
- Kessler RC, Andrews G, Mroczek D, Ustun B, Wittchen H-U. The World Health Organization Composite International Diagnostic Interview Short-Form (CIDI-SF). *Int J Methods Psychiatr Res*. 1998;7:171-185.
- Rost K, Burnam MA, Smith GR. Development of screeners for depressive disorders and substance disorder history. *Med Care*. 1993;31:189-199.
- Hays RD, Cunningham WE, Sherbourne CD, Wilson IB, Wu AW, Cleary PD, McCaffrey DF, Fleishman JA, Crystal SC, Collins R, Eggan F, Shapiro MF, Bozzette SA. Health-related quality of life in patients with human immunodeficiency virus infection in the United States: results from the HIV Cost and Services Utilization Study. *Am J Med*. 2000;108:714-722.
- Ware JE, Sherbourne CD. The MOS 36-Item Short-Form Health Survey (SF-36), I: conceptual framework and item selection. *Med Care*. 1992;30:473-483.
- Kish L, Frankel MR. Inference from complex samples. *J R Stat Soc B*. 1974;36:1-37.
- Duan N, McCaffrey DF, Frankel MR, St. Clair PA, Beckman R, Keesey JW, Chien C, Goldman DP, Smith SM, Morton SC. *HCSUS Baseline Methods Technical Report: Weighting, Imputation, and Variance Estimation*. Santa Monica, Calif: RAND; May 1998. Report MR-1060-AHCP.
- Kessler RC, Frank RG, Edlund M, Katz SJ, Lin E, Leaf P. Differences in the use of psychiatric outpatient services between the United States and Ontario. *N Engl J Med*. 1997;336:551-557.
- Rouse BA, ed. *Substance Abuse and Mental Health Statistics Sourcebook*. Washington, DC: Superintendent of Documents, US Government Printing Office; 1995. Department of Health and Human Services Publication No. (SMA) 95-3064.
- Katon W, Von Korff M, Lin E, Bush T, Ormel J. Adequacy of duration of antidepressant treatment in primary care. *Med Care*. 1992;30:67-76.
- Wells KB, Katon W, Rogers B, Camp P. Use of minor tranquilizers and antidepressant medications by depressed outpatients: results from the Medical Outcomes Study. *Am J Psychiatry*. 1994;151:694-700.