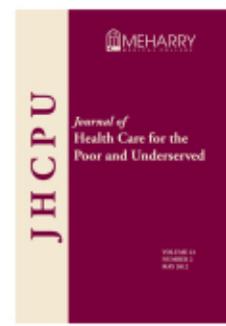# Insurance Coverage among People Living with Combined HIV/AIDS, Chronic Mental Illness, and Substance Abuse Disorders

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Insurance Coverage among People Living with Combined HIV/AIDS, Chronic Mental Illness, and Substance Abuse Disorders

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Abstract: HIV triply-diagnosed adults (those with chronic mental illness and substance abuse disorders) must rely heavily on public insurance to cover high annual medical costs (~$50,000). This study examines the nature and determinants of insurance coverage (including managed care) for this population, along with annual transitions in coverage. Relative to people living with HIV/AIDS in general, fewer triply-diagnosed adults rely on private coverage (3% vs. 30%), but their rate of being uninsured is only slightly lower (16% vs. 20%). More than one third of such adults below poverty are uninsured—a matter of significant policy concern since the annual income of this group is less than 10% of the amount needed to cover their expected medical expenses. Those with the lowest mental health status were disproportionately represented in managed care. While coverage appears relatively stable over time, those with low incomes and moderate mental health status may face barriers in securing Medicaid.

Key words: HIV; substance-related disorders; mental health; insurance, health; managed care programs.

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A recent IOM report states "individuals with both mental illness and HIV represent a large, vulnerable and possibly growing segment of the HIV population,"[1][p.250] further noting that about half of those with mental illness will experience a substance abuse disorder during their lifetimes. Among patients living with HIV/AIDS, those having co-occurring mental illness and substance abuse disorders, hereafter termed *HIV triply-diagnosed*, constitute a minimum of 13%[2] (though they are more likely to be in the 20% range[3]) and have been reported to be as high as 23% in some regions of the country.[4] Within clinics that specialize in treatment of people living with HIV/AIDS (PLWHA), estimates of the prevalence of triple diagnosis range from 8%[5] to 24%[6] to as high as 38%.[7]

Our own work, reported elsewhere,[3] shows that for this population, average monthly expenditures on medical care alone amount to $3,880 (2002 $), implying that it is two to three times as expensive to treat the HIV triply-diagnosed than to treat HIV/AIDS patients without these co-occurring conditions. The average annual amount ($46,560) exceeds by more than 25% the average annual earnings for the typical U.S. worker in 2002 ($36,764), making insurance coverage of central importance in ensuring that triply-diagnosed patients receive needed treatment services. The HIV triply-diagnosed share of total health care expenditures on HIV/AIDS ranges from 20 to 55%, implying that the nation now spends $2.4 to $6.8 billion in public expenditures for triply-diagnosed HIV/AIDS patients alone.[3]

Types of insurance coverage in the U.S. We include three forms of public insurance in this analysis.

Medicaid. Medicaid is jointly funded by the federal government and states, with the federal government establishing a floor on minimum eligibility standards and benefit requirements and states having the discretion to set more generous standards as desired. HIV-positive individuals can qualify for Medicaid in one of three ways. The first is by meeting state income eligibility and family composition requirements (predominantly single-parent families) for low-income cash assistance, formerly known as Aid to Families with Dependent Children (AFDC) and since 1996 known as Temporary Assistance for Needy Families (TANF). Patients who meet the AFDC standards that were in effect as of July 16, 1996 automatically qualify for Medicaid; states are permitted to adopt more liberal standards for TANF, but this does not confer automatic eligibility for Medicaid.[8] In 38 states, beneficiaries who receive Supplemental Security Income (SSI)—a federal cash assistance program for low-income elderly and disabled individuals—also automatically qualify for Medicaid. The federal standard for disability for both SSI and Social Security Disability Income (SSDI) is based on total inability to work and further requires that the disability has lasted or is expected to last for at least one year or to result in death;[9] the remaining states may have different (typically more restrictive) definitions of disability or standards for income or assets to qualify for Medicaid.[10] But in some states, individuals who are categorically eligible for Medicaid—i.e., who meet whatever Medicaid definition of disability is in force, are members of families with dependent children, or are pregnant women—but whose incomes are too high to qualify, are permitted to spend down into Medicaid eligibility by subtracting medical expenses from income. Although prescription drugs are not a federally-mandated Medicaid service, all states have opted to cover such costs to

varying degrees; however, each state imposes its own restrictions with respect to the generosity of their formularies, the degree of provider discretion over substitutions from the formulary, and limits on the number of prescriptions in a month. Thus, while HAART medications often were covered by most Medicaid programs during the period of our study, the foregoing limitations and spend-down requirements (i.e., periods of a year during which the patient rather than Medicaid was responsible for the bill) preclude categorically asserting that all individuals reporting Medicaid coverage had complete coverage for their needed medications (see further discussion in Anderson[11] and Vitiello[12]).

Medicare. In contrast to SSI, which is means-tested, SSDI does not depend on income or assets, but is restricted to medically disabled individuals who have worked and paid FICA taxes. To be considered medically disabled according to Social Security rules, an individual must be unable to engage in any "Substantial Gainful Activity" (SGA) due to any medically determinable physical or mental impairment(s) that can be expected to result in death or that has lasted or can be expected to last for a continuous period of not less than 12 months. In addition to being unable to perform his or her previous work, the person cannot, considering age, education, and work experience, engage in any other kind of SGA that exists in the national economy. There is a five-month waiting period to qualify for SSDI cash benefits, but those who have received SSDI for at least 24 months are automatically eligible for Part A (hospitalization) coverage through Medicare, and also can purchase Part B coverage (physician and other out-patient services). During the period of our study, Medicare did not cover prescription drugs; however, some Medicare beneficiaries purchase private supplemental coverage which may or may not include prescription drug coverage.

Other public coverage. TRICARE is coverage for active military personnel and their families and selected retirees (TRICARE is combined with Medicare for those reaching the age of Medicare eligibility). The Civilian Health and Medical Program of the Department of Veterans Affairs (CHAMPVA) covers dependents of selected military veterans. All FDA-approved drugs are available through the TRICARE formulary. Patients are encouraged to seek medications first through military treatment facilities (MTFs) and in so doing avoid the modest cost-sharing required when medications are obtained elsewhere; the formulary in place at MTFs is closed but providers can prescribe off formulary with prior authorization.[13]

AIDS drug assistance programs. Complicating this picture is that state AIDS Drug Assistance Programs (ADAPs) also are an important source of coverage for HIV medications (including those for opportunistic infections) for low-income patients, especially the uninsured. As with Medicaid, ADAP eligibility varies by state, as do the formulary and resources available to fund ADAP, resulting in waiting lists whose length also varies by state. Some states (e.g., New York) have sufficient resources to expand their ADAP to include free primary care services at selected clinics, hospital outpatient departments, office-based physicians, and lab vendors. The services include ambulatory care for medical evaluation, early intervention, and ongoing treatment. However, in the period of our study (and even today) ADAP had insufficient resources to provide coverage for HIV medications to all HIV-positive individuals lacking such coverage;[14] in 2007 ADAPS reached only one third of those with HIV/AIDS.[15] Patient assistance

programs (PAPs) are set up by drug companies that offer free or low-cost drugs to individuals who are unable to pay for their medication. Eligibility varies program by program. Generally, an individual must have an income under 200% of the federal poverty level, cannot have prescription coverage from any public or private source, and must be a U.S. resident or citizen.

Significance of health coverage for HIV patients. We know from studies of the HIV population in general that public coverage is the predominant source of coverage for those in care for HIV, and that coverage increases as disease progresses.[16] Access to care depends on the nature and source of insurance coverage. For example, relative to the privately insured, those who are uninsured or on Medicaid exhibit inferior patterns of access to care.[17] Similarly, those with HIV covered by health maintenance organizations (HMOs) or public insurance are less likely than those with private non-HMO insurance to get care for HIV symptoms.[18] Furthermore, health insurance coverage affects the likelihood of receiving the most potent form of HIV therapy available: highly active antiretroviral therapy (HAART),[19] with the uninsured and those on Medicaid less likely than others to receive HAART.[20] Health insurance is an important determinant of the intensity and timing of medical care and outcomes among HIV patients hospitalized with Pneumocystis carinii pneumonia (PCP).[21] Having health insurance coverage reduces the probability of six-month mortality among HIV patients by as much as 85%,[16] with private insurance lowering one-year mortality by more than public insurance[10]—effects far larger than the 20% reduction in death risk associated with having private coverage rather than being uninsured.[22] Apart from improvements in health, there is some evidence that provision of health coverage for HIV patients may be self-financing. Specifically, HIV patients with continuous Medicaid coverage (categorically eligible) have lower costs than those with sporadic Medicaid coverage (spend-down).[23] Similarly, more generous public insurance policies (including Medicaid and ADAP) have the potential to improve economic outcomes associated with HIV.[16] Even though their circumstances make the HIV triply-diagnosed arguably far more dependent on health insurance in general, and publicly-financed coverage in particular, relative to their non-triply-diagnosed counterparts with HIV, no one has examined the determinants or dynamics of health insurance coverage (including managed care enrollment) in this population.

HIV triply-diagnosed patients challenge clinicians and health policymakers alike. This population poses sizable challenges to treatment adherence and clinical management of multiple conditions; but these very same characteristics may pose challenges in getting and maintaining critically needed health insurance coverage. To inform clinical and policy debates, we analyzed health insurance data from the HIV/AIDS Treatment Adherence, Health Outcomes and Cost Study (hereafter called the HIV/AIDS Cost Study).

Research questions. Although there is literature spanning decades on the determinants of health insurance coverage in general,[24–28] and a smaller literature on the dynamics of health insurance coverage over time,[29–36] no one previously has examined this issue for HIV triply-diagnosed patients. Given that this population is far sicker and far less likely to be employed than the population in general, we expect that health status will play a far more important role, and employment status a correspondingly

diminished role, in determining who is covered and whether this coverage is public or private. The sheer volume of medical services needed by this population increases the potential savings for managed care plans able to find ways to treat them more efficiently, yet at the same time poses the risk that managed care plans may avoid them due to the losses they will incur. For the same reason, this population may well endure much more extreme transitions in coverage than the general population, finding it more difficult to find new coverage in the event they lose public or private insurance. Our study sheds light on several questions:

1. What are the current patterns of coverage among triply-diagnosed adults?
2. What are the principal determinants of health insurance coverage among patients who are triply-diagnosed? Given the central importance of Medicaid in assisting those with low incomes and/or large medical expenses, are there particular characteristics or behaviors of this population that pose challenges for their ability to secure Medicaid coverage?
3. What are the determinants of managed care coverage among this population?
4. What transitions in health insurance coverage do triply-diagnosed adults experience during a year?

Methods

Data source. *Overview*. The HIV/AIDS Cost Study was conducted under a multi-year cooperative agreement involving eight study sites and was jointly funded by two agencies within the Substance Abuse and Mental Health Services Administration (Center for Mental Health Services, and Center for Substance Abuse Treatment), the Health Resources and Services Administration (HIV/AIDS Bureau) and three agencies within the National Institutes of Health (National Institute of Mental Health, National Institute of Drug Abuse, and National Institute on Alcohol Abuse and Alcoholism). Our final sample included 1,129 adults with HIV/AIDS and co-occurring mental health diagnosis (meeting DSM-IV criteria) and a substance abuse problem (including alcohol and/or other illegal drug use).

This paper reports results from baseline and follow-up interviews conducted at six-month intervals in all eight sites participating in this collaborative cohort study; the baseline interviews occurred during the period 2000 to 2002 (follow-up interviews were conducted every three months, but the baseline insurance questions were repeated only in the six-month and 12-month follow-up periods). The sites were located in Boston, MA; the Bronx, NY; Chicago, IL; Detroit, MI; Durham, NC; Philadelphia, PA; St. Louis, MO; and Seattle, WA. The Durham site included a 15-county catchment area with many rural residents. These sites used somewhat different procedures for locating patients (one site enrolled only individuals not currently in treatment while another enrolled individuals who already were involved in residential or substance abuse treatment). More detailed information on the study sample has been reported elsewhere (The HIV/AIDS Treatment Adherence, Health Outcomes, and Cost Study: conceptual foundations and overview. AIDS Care. 2004;16(Suppl 1):S6–S21).

Data collection. Centrally-trained interviewers conducted baseline and follow-up

interviews in person. Interviews took several hours to complete, and included a battery of validated instruments that obtained information on demographic characteristics, physical and mental health status, HIV transmission risk activities, and medication adherence. The Structured Interview for DSM-IV Axis I Disorders (SCID for DSM-IV), modified for the HIV/AIDS Cost Study, was administered by trained interviewers using the following diagnostic modules: (1) psychotic screen; (2) mood disorders (major depression, bipolar, and dysthymia); (3) anxiety disorders (panic, generalized anxiety disorder, and agoraphobia); (4) adjustment disorders; and (5) antisocial and borderline personality disorders. Patients had to have a diagnosable mental health disorder of sufficient duration to meet psychiatric diagnostic criteria during the preceding 12 months and a substance abuse disorder in the past 12 months, also as determined by the structured psychiatric interview. Viral load is based on chart data where available and patient self-report otherwise. Institutional review boards at each site reviewed informed-consent materials and approved the study. In addition, each site was required to obtain a federal certificate of confidentiality to participate in the study. All patients gave written informed consent to participate in the study.

Variable definitions. *Dependent variables*. Insurance coverage is based on patient self-report from each interview period; patients could designate private insurance, Medicaid, Medicare, VA or CHAMPUS (now called TRICARE), other (patients were asked to specify) and no health insurance. The question permitted multiple responses to reflect overlapping coverage. A follow-up question for those reporting private coverage was as follows: "You said you have private insurance coverage. Is it a managed care plan, such as a health maintenance organization (HMO) or preferred provider organization (PPO)? In managed care plans, you may be restricted to using certain providers, or you might pay less to see health care providers if the provider is a member of the plan's network. You might also have to get pre-approval from the health plan or a referral from your primary care provider in order to get a service you need. With a PPO, you pay a reduced fee to see health care providers that are within the network. Your insurance will still cover visits to health care providers outside of the network, but you have to pay a higher copayment." Similar questions determined whether the individual was covered by a Medicare or Medicaid HMO. The interviewer was asked to assess the reliability of these responses based on whether the information was distorted by patient misrepresentation (1=yes) or inability to understand (1=yes). For the analysis of managed care, we excluded responses where "1" was selected for either reliability response (N=18). These questions were asked at baseline, and at six-month and 12-month follow-ups.

Independent variables. The explanatory variables in the regression models included *demographic characteristics* (age group, gender, race/ethnicity), *socioeconomic characteristics* (education, employment status, income, home ownership), *other characteristics* (marital status, HIV exposure), and *health status* (the SF-36 Physical and Mental Composite Scores [PCS and MCS], and viral load), site fixed effects, and interview year.

The racial/ethnic classification was based on a hierarchy, with Latino ethnicity taking precedence over racial category. Due to small cell size, 21 non-Latinos who were neither Black nor White (primarily 'other race') were aggregated together with the White non-Latinos. The HIV exposure classifications were also based on a hierarchy,

in the order shown in Table 1. Respondents were asked about their current work situation, with 13 specific categories ranging from *employed full-time, regular job* to *unemployed, not looking for work*, to *just hanging out*. Because relatively few individuals have full-time employment, we collapsed these into employed or not employed. Our income measure is based on self-reported money income during the past 30 days from all sources. Respondents were asked specifically about net income from employment/ wages/salary, unemployment/workers compensation, public assistance/AFDC/welfare, child support/alimony, pension/benefits/Social Security, mate/family or friends, and illegal activities. Based on self-reported information on the number of other adults and children living in the household, income categories were created based on the percent of the federal poverty level (e.g., $9,359 for a single individual under age 65, which characterizes 90% of our sample).

We used viral load rather than CD4 count on grounds that it is a better predictor of the risk of HIV disease progression than the CD4 count. The patient's viral load was measured using medical record review (for the time period spanning six months prior to one month following the baseline interview), or if such data were unavailable, self-reported values at baseline; the highest values represent the sickest patients. In our sample, 638 patients had lab data, another 279 provided self-report data, and 221 were missing. To facilitate interpretation of the results, all measures were used as categorical variables (e.g., quartile indicators for PCS and MCS values were used instead of the continuous measures). The lowest quartile (0–25%) corresponds to the sickest patients.

Due to missing data for several variables, primarily HIV exposure and viral load, multiple imputation was used.[37,38] Five datasets with imputed data were created using the Markov Chain Monte Carlo (MCMC) approach. Each dataset was analyzed separately and then the five sets of estimates were combined to produce an overall inference that includes both a within-imputation and an across-imputation component.

Statistical analysis. *Descriptive statistics*. We first show how the distribution of major types of health insurance coverage at baseline varied by patient characteristics for all variables used in the analysis. The types of coverage examined were *none*, *private only*, and *any public* (which together are mutually exclusive and collectively exhaustive), as well as *any Medicaid*, *Dual Eligible (Medicaid and Medicare)*, and *any Medicare* (all of which overlap one another). We calculated descriptive statistics to compare coverage at baseline to coverage at 12 months for those (N=732) reporting on their type of health insurance coverage in both periods. We separately report transitions in coverage over this 12-month period for those (N=648) reporting coverage during baseline and both follow-up periods. Across sites, the sample size ranged from 75 to 243 at baseline and 23 to 190 at 12 months. The overall 12-month follow-up rate was 67%, ranging from 29% to 91% across sites.

Model specification. Four separate logistic regressions were estimated to examine associations of the explanatory variables with insurance coverage at baseline (being insured, public coverage, Medicaid, and Medicare).* Fixed site effects were included in

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* Our sample size was not large enough to permit use of multinomial logistic regression.

the model to account for the clustering of patients within sites, to control for unobservable site-specific heterogeneity that may be correlated with patient-level characteristics, and to control for geographic factors (e.g., Medicaid eligibility) that might have affected the availability of coverage. To facilitate comparisons across coverage types, we report relative risks for health insurance coverage and for managed care coverage at baseline (95% bias-corrected empirical confidence intervals for the relative risks were derived with standard bootstrapping methods with replacement, using 1,000 replicate samples).

Results

Health insurance coverage of HIV triply-diagnosed adults. Nearly one in six (15.9%) of the sample had no health insurance coverage (Table 1); groups with the highest rates of being uninsured included the youngest age group, 18–34 years (21.5%; p=.01), Blacks (19.7%; p<.001), those with incomes below 50% of poverty (35.0%; p<.001), those who did not own or rent their own home (21.4%; p<.001), those who were single (18.9%; p<.002), those exposed to HIV through heterosexual sex (22.8%; p<.02) and those with viral loads above 500 (ranging from 17.1% to 20.7%; p<.001). Private coverage was rare, constituting 2.7% of HIV triply-diagnosed adults; those with the highest rates of private coverage included people with 16 or more years of education (14.3%; p<.001), the employed (12.9%; p<.001), and those who were married (10.1%; p<.002).

The lion's share of our study cohort (81.3%) relied on public health insurance coverage, with roughly three quarters of these obtaining such coverage through Medicaid (60.2%). Those with the highest rates of Medicaid coverage included women (70.9%; p<.001), Latinos (76.6%; p<.001), and those between 50% and 100% of poverty (ranging from 75.8% to 77.3%; p<.001 for both). Nearly one in five (19.9%) was eligible for Medicare, but more than two thirds of these were dual-eligible (13.4% overall). Those most likely to rely on Medicare coverage included those age 35–49 (24.8%; p<.001), males (25.3%; p<.001), Whites and other non-Black, non-Latino races (23.2%; p<.001), those with 16 or more years of education (30.6%; p=.011), and those in the highest income groups (32.8 to 29.9%; p<.001 for both). The proportion who were dual-eligible was highest among those with incomes between 75% and 100% of poverty (25.2%; p<.001).

Determinants of health insurance coverage of HIV triply-diagnosed adults. In our logistic regressions (Table 2), we found that the relative risk for having any health insurance coverage was lower for those who were employed, implying that the probability of insurance coverage was only about three-quarters as high for employed people as for the unemployed (RR=0.78; 95% CI=0.67, 0.89). Other significant findings were in the expected direction: those with the lowest incomes (below 50% of poverty) were least likely to be insured (joint p=.00), while those who were the healthiest (viral loads <500) were most likely to have coverage (joint p=.03).

The likelihood of having public coverage was lowest among those below 50% of poverty relative to other income levels (joint p=.09) and higher among those who owned or rented their homes compared with others (p=.04). Other significant findings were less surprising: public coverage was less likely among those who were employed (RR=0.65; 0.53, 0.74) and more likely among those in worse physical health (PCS scores <75%) than among those in the top quartile (p=.02).

Table 1.

INSURANCE COVERAGE OF HIV TRIPLY-DIAGNOSED ADULTS[a]

Characteristics	Percent of Sample	None (N=180)	Private Only (N=31)	Distribution of health insurance coverage (row percent)			
				Any Public (N=918)	Any Medicaid (N=680)	Medicaid & Medicare (N=151)	Any Medicare (N=225)
Total	100	15.9	2.7	81.3	60.2	13.4	19.9
Demographic characteristics							
Age (years)							
18–34	22	21.5	2.8	75.7	52.8	6.4	9.9
35–49	68	15.4*	2.5	82.2**	60.9*	15.7**	22.3**
≥50	10	7.3**	4.6	88.1**	67.9**	11.9	24.8**
Gender							
Female	42	13.1*	1.9	85.0**	70.9**	7.3**	12.2**
Male	58	18.0	3.4	78.7	51.7	17.6	25.3
Race & ethnicity (28 missing)							
Black	66	19.7*	2.0**	78.3**	58.3	12.5*	18.9*
Latino	12	3.9**	1.3**	94.8*	76.6**	9.1**	15.6**
White & others	19	9.3	5.2	85.6	59.0	16.4	23.2
Socioeconomic characteristics							
Education (years) (7 missing)							
<12	45	16.5	1.0	82.5	67.1	9.7	13.6
12	27	14.6	2.0	83.4	57.1**	13.9	21.3**
13–15	24	15.9	4.8**	79.3	53.1**	18.8**	27.7**
≥16	4	18.4	14.3**	67.4*	36.7**	16.3*	30.6**

(Continued on p. 1015)

Table 1. (*continued*)

Characteristics	Percent of Sample	None (N=180)	Private Only (N=31)	Any Public (N=918)	Any Medicaid (N=680)	Medicaid & Medicare (N=151)	Any Medicare (N=225)
				Distribution of health insurance coverage (row percent)			
Employment status (1 missing)							
Employed	14	25.8**	12.9**	61.3	38.4	13.8	18.9
Not employed	86	14.4	1.1	84.5**	63.2**	13.2	19.9
Income (all sources) (1 missing)							
Income ≤50% FPL	35	35.0	1.5	63.5	39.7	3.8	6.1
Income 50 to 75%	20	9.9**	0.9	89.2**	75.8**	11.2**	17.0**
Income 75 to 100%	21	3.0**	1.3	95.8**	77.3**	25.2**	32.8**
Income >100%	25	5.3**	7.1**	87.5**	60.2**	18.0**	29.9**
Home ownership (2 missing)							
Own	4	8.7*	8.7**	82.6	54.4	15.2	28.3**
Rent	39	8.8**	4.1**	87.1**	68.8**	16.0*	23.4*
Other	57	21.4	1.4	77.2	53.9	11.3	16.7
Other characteristics							
Marital status (5 missing)							
Married	10	8.3	10.1**	81.7	66.1	13.8	22.0
Divorced/separated	33	12.9*	1.4	85.7*	62.5	13.9	22.0
Single	57	18.9**	2.2	78.9	57.1	12.9	18.3
Exposure							
Multiple risks	27	13.1	1.2	85.7	52.4*	9.5	16.7
Heterosexual sex (16 missing)	11	22.8*	1.4	75.9	46.6**	11.0	19.9
Homosexual sex (9 missing)	7	17.1	4.3	78.6	59.3	17.0	21.2
Injection drug use (150 missing)	55	11.1	2.3	86.6	68.2	14.2	21.0

Table 1. (*continued*)

Characteristics	Percent of Sample	None (N=180)	Private Only (N=31)	Any Public (N=918)	Any Medicaid (N=680)	Medicaid & Medicare (N=151)	Any Medicare (N=225)
				Distribution of health insurance coverage (row percent)			
Health status							
PCS score (Omitted: >75%)							
25–75%	25	15.9	5.6	78.5	51.2	10.7	19.4
25–75%	50	15.8	2.5*	81.7	60.6*	13.8	20.0
<25%	25	16.4	0.4**	83.3	66.8**	14.8	19.8
MCS score (Omitted: >75%)	25	11.9	3.8	84.3	64.5	13.8	21.0
25–75%	50	16.9	2.0	81.1	61.6	13.9	18.9
<25%	25	18.2	3.2	78.7	51.4**	11.5	20.1
Viral load (221 missing)							
<500	39	9.6	3.8	86.6	62.6	18.0	23.7
500–9,999	24	19.2**	2.1	78.7**	60.7	12.1**	18.6*
10,000–100,000	24	20.7**	2.7	76.6**	55.9	9.2**	15.3**
≥100,000	13	17.1**	1.3	81.6**	57.9	11.2	20.4

[a]All estimates are based on self-reported coverage at baseline (N=1129); this figure excludes 9 individuals who reported "other coverage" that could not be categorized as either private or public coverage. Any Public includes individuals with VA/CHAMPUS coverage not all of whom are accounted for in the Any Medicaid, Medicaid/Medicare and Any Medicare groups. Statistical significance calculated using a Chi-square test to compare the covariates to the omitted category.
*p<.05
**p<.01

Somewhat unexpectedly, the likelihood of having Medicaid coverage was lowest among those below 50% of poverty relative to other income levels (joint p=.00). Likewise, relative to those with the lowest viral loads (<500), the chances of being on Medicaid were lower for those with viral loads from 10,000–100,000 (RR=0.85; 95% CI=0.71, 1.01). Other significant results were in the expected direction: females were one fifth more likely to have Medicaid coverage (p=.00). The likelihood of Medicaid coverage was similarly elevated among those with intermediate PCS scores (25% to 75%) relative to those in the best physical health (RR=1.19; 95% CI=1.01, 1.48). The likelihood of being on Medicaid declined with years of education (p=.03), and also was lower for those who were employed (RR=0.66, 95% CI=0.52, 0.79).

Relative to the youngest age group (18–34), the chances of being on Medicare were much higher among those ages 35–49 (RR=2.09; 95% CI=1.44, 3.55) and those age 50 or older (RR=2.29; 95% CI=1.28, 4.43). Women were less likely than men to have Medicare (RR=0.66; 95% CI=0.46, 0.92). As with Medicaid, the chances of being on Medicare were substantially higher among those with higher incomes, with a demonstrable income gradient—from 50 to 75% of poverty (RR=2.05; 95% CI=1.34, 3.52), 75 to 100% of poverty (RR=3.10; 95% CI=2.13, 5.31) and those at or above poverty (RR=3.64; 95% CI=2.45, 6.69).

Determinants of managed care coverage of HIV triply-diagnosed adults. Among those with coverage, a total of 25.2% were covered by managed care, with those in Medicaid HMOs accounting for 75.7% of this total. While Medicaid enrollees accounted for the vast majority of those reporting managed care, the managed care penetration rate among those with Medicaid was nearly identical (26.0%) to the overall average. The likelihood of being in managed care was 60% higher among those who were employed than among those who were not (RR=1.60; 95% CI=1.03, 2.53); it also was higher among those who rented rather than owned their own home or lived in other housing arrangements (RR=1.42; 95% CI=1.02, 2.17) (Table 3). It was much lower among those with multiple exposure to HIV than among injection drug users (RR=0.43; 95% CI=0.18, 0.95). It was much higher among those with the lowest mental health status (RR=1.79; 95% CI=1.14, 3.11).

Transitions in health insurance coverage of HIV triply-diagnosed adults. When we examined transitions in coverage between baseline and the 12-month follow-up period, we found a substantial degree of stability in coverage over time. Most remained in the same class of coverage they had at baseline (Table 4). Moreover, when we compare the distribution of coverage between baseline and one year later, the general shift was in the direction of increased coverage, with somewhat fewer individuals being uninsured (9.7% at 12 months vs. 13.3% at baseline) and a slight shift towards more comprehensive coverage (e.g., 37.8% on Medicaid (without Medicare) at 12 months vs. 32.2% at baseline; 17.8% dual eligible at 12 months vs. 14.1% at baseline).

Prevalence of transitions in health insurance coverage among HIV triply-diagnosed adults. Our analysis of transitions showed that less than half (45.5%) of those with private coverage experienced no transitions in coverage over a 12-month period, compared with roughly seven in 10 of those with Medicaid but not Medicare (70.2%) and those with dual coverage (69.2%) (Table 5). Those with Medicare but no Medicaid had a pattern more similar to those with private coverage (52.6%), but since

Table 2.

RELATIVE RISKS OF HEALTH INSURANCE COVERAGE AMONG HIV TRIPLY-DIAGNOSED ADULTS[a]

	Relative Risks of:										
	Being Insured			Public Coverage			Medicaid			Medicare		
		Lower CI	Upper CI		Lower CI	Upper CI		Lower CI	Upper CI		Lower CI	Upper CI
Demographic Characteristics												
Age (years)	(joint p=0.57)			(joint p=0.57)			(joint p=0.45)			(joint p=0.00)[b]		
13–34	1.00			1.00			1.00			1.00		
35–49	1.06	0.94	1.32	1.02	0.91	1.20	1.04	0.89	1.26	2.09[b]	1.44[b]	3.55[b]
≥50	1.09	0.84	1.54	0.96	0.76	1.22	0.93	0.70	1.25	2.29[b]	1.28[b]	4.43[b]
Gender	(joint p=0.06)			(joint p=0.59)			(joint p=0.02)[b]			(joint p= 0.00)[b]		
Female	1.12	0.99	1.31	1.06	0.93	1.22	1.22[b]	1.04[b]	1.48[b]	0.66[b]	0.46[b]	0.92[b]
Male	1.00			1.00			1.00			1.00		
Race & ethnicity	(joint p=0.77)			(joint p=0.31)			(joint p=0.90)			(joint p=0.62)		
Black	0.97	0.87	1.13	1.01	0.89	1.21	1.05	0.89	1.30	0.88	0.61	1.27
Latino	0.87	0.52	1.29	1.01	0.61	1.60	1.16	0.75	1.88	1.12	0.51	2.10
White & others	1.00			1.00			1.00			1.00		
Socioeconomic Characteristics												
Education (years)	(joint p=0.29)			(joint p=0.01)[b]			(joint p=0.03)[b]			(joint p=0.11)		
<12	1.00			1.00			1.00			1.00		
12	1.08	0.95	1.28	1.11	0.97	1.28	0.92	0.79	1.11	1.19	0.85	1.69
13–15	0.95	0.84	1.08	0.95	0.84	1.07	0.85[b]	0.72[b]	0.99[b]	1.45	0.99	2.15
≥16	0.96	0.76	1.22	0.86	0.67	1.07	0.67[b]	0.44[b]	0.89[b]	1.71	0.85	3.29

Table 2. (*continued*)

	Relative Risks of:											
	Being Insured			**Public Coverage**			**Medicaid**			**Medicare**		
		Lower CI	Upper CI		Lower CI	Upper CI		Lower CI	Upper CI		Lower CI	Upper CI
Employment Status	(joint p=0.00)[b]			(joint p=0.00)[b]			(joint p=0.38)			(joint p=0.81)		
Employed	0.78[b]	0.67[b]	0.89[b]	0.65[b]	0.53[b]	0.74[b]	0.66[b]	0.52[b]	0.79[b]	0.95	0.56	1.55
Not employed	1.00			1.00			1.00			1.00		
Income (all sources)	(joint p=0.00)[b]			(joint p=0.09)			(joint p=0.00)[b]			(joint p=0.00)[b]		
Income <50%	1.00			1.00			1.00			1.00		
Income 50 to 75%	1.51[b]	1.33[b]	2.11[b]	1.49[b]	1.33[b]	1.90[b]	2.02[b]	1.77[b]	2.63[b]	2.05[b]	1.34[b]	3.52[b]
Income 75 to 100%	1.82[b]	1.64[b]	2.79[b]	1.78[b]	1.62[b]	2.50[b]	2.32[b]	2.01[b]	3.11[b]	3.10[b]	2.13[b]	5.31[b]
Income >100%	1.68[b]	1.43[b]	2.60[b]	1.47[b]	1.28[b]	1.97[b]	1.74[b]	1.44[b]	2.31[b]	3.64[b]	2.45[b]	6.69[b]
Home ownership	(joint p=0.23)			(joint p=0.04)[b]			(joint p=.03)[b]			(joint p=0.30)		
Own	1.1	0.86	1.55	1.09	0.83	1.50	0.80	0.54	1.10	1.19	0.59	2.22
Rent	1.1	0.98	1.28	1.08	0.97	1.24	1.06	0.91	1.24	1.26	0.92	1.79
Other	1.00			1.00			1.00			1.00		
Other Characteristics												
Marital status	(joint p=0.08)			(joint p=0.09)			(joint p=0.32)			(joint p=0.54)		
Married	1.22	0.94	1.80	0.96	0.76	1.18	0.93	0.69	1.24	1.29	0.74	2.17
Divorced/separated	1.09	0.98	1.29	1.09	0.98	1.26	0.98	0.85	1.14	1.09	0.80	1.47
Single	1.00			1.00			1.00			1.00		
Exposure	(joint p=0.21)			(joint p=0.15)			(joint p=0.30)			(joint p=0.84)		
Multiple risks	0.84	0.64	1.10	0.92	0.73	1.15	0.81	0.61	1.04	0.80	0.44	1.32
Heterosexual sex	0.92	0.79	1.06	0.96	0.83	1.10	0.84	0.67	1.02	1.02	0.64	1.54
Homosexual sex	1.04	0.87	1.27	0.98	0.82	1.16	1.02	0.83	1.23	1.07	0.66	1.66
Injection drug use	1.00			1.00			1.00			1.00		

Table 2. (*continued*)

	Being Insured			Public Coverage			Medicaid			Medicare		
		Lower CI	Upper CI		Lower CI	Upper CI		Lower CI	Upper CI		Lower CI	Upper CI
Health status												
PCS score	(joint p=0.53)			(joint p=0.02)[b]			(joint p=0.09)			(joint p=0.84)		
>75%	1.00			1.00			1.00			1.00		
25–75%	0.93	0.80	1.08	1.06	0.93	1.25	1.19[b]	1.01[b]	1.48[b]	0.89	0.60	1.33
<25%	0.99	0.87	1.13	1.06	0.95	1.23	1.13	0.97	1.36	0.96	0.69	1.39
MCS score	(joint p=0.92)			(joint p=0.09)			(joint p=.09)			(joint p=0.90)		
>75%	1.00			1.00			1.00			1.00		
25–75%	0.98	0.85	1.15	0.99	0.86	1.14	0.87	0.72	1.06	1.08	0.73	1.62
<25%	0.98	0.87	1.15	0.99	0.89	1.13	1.00	0.85	1.20	1.06	0.77	1.52
Viral load	(joint p=0.03)[b]			(joint p=0.54)			(joint p=0.07)			(joint p =0.73)		
<500	1.00			1.00			1.00			1.00		
500–9,999	0.84[b]	0.73[b]	0.94[b]	0.89	0.78	1.01	0.94	0.79	1.11	0.88	0.61	1.24
10,000–100,000	0.89[b]	0.78[b]	0.99[b]	0.94	0.83	1.06	0.85	0.71	1.01	0.82	0.54	1.19
=>100,000	0.93	0.78	1.08	1.04	0.89	1.24	0.90	0.72	1.13	0.89	0.53	1.36

With a top spanning header: **Relative Risks of:**

[a]Model includes site fixed effects not shown. All estimates are based on self-reported coverage at baseline (N=1129); this figure excludes 9 individuals who reported "other coverage" that could not be categorized as either private or public coverage. Because results are for separate logit models, there is overlap for those with multiple types of coverage at baseline.

[b]Statistically significant relationships (p<.05).

CI = confidence interval

individuals typically do not lose Medicare coverage, most of these transitions would have been in the direction of becoming dual eligible.

Discussion

Patterns of coverage. HIV triply-diagnosed adults are in triple jeopardy when it comes to health care coverage. They are far sicker than the average American, making them less likely to be employed, which establishes a substantial barrier to obtaining private health insurance coverage the way most people in the U.S. do (through an employer). But at the same time, their annual costs of care (~$50,000 a year) make it highly improbable they could find coverage in the individual health insurance market, much less afford the premiums. For this reason, we should not be surprised to see that so

Table 3.

MULTIVARIATE RELATIVE RISK OF MANAGED CARE COVERAGE FOR HIV TRIPLY-DIAGNOSED ADULTS[a]

Characteristic	Relative Risk of Managed Care Coverage[b]	Lower CI	Upper CI
Demographic Characteristics			
Age (years)	(joint p = 0.38)		
35–49	0.75	0.51	1.17
≥50	0.99	0.47	2.07
Gender	(joint p = 0.15)		
Female	1.25	0.84	2.02
Race & ethnicity	(joint p = 0.13)		
Black	1.21	0.73	2.13
Latino	0.29	0.04	1.07
Socioeconomic Characteristics			
Education (years)	(joint p = 0.71)		
12	1.16	0.78	1.79
13-15	0.98	0.58	1.54
≥16	1.39	0.55	2.70
Employment Status	(joint p = 0.02)		
Employed	1.60	1.03	2.53
Income (all sources)	(joint p = 0.37)		
Income 50 to 75%	1.09	0.67	1.85
Income 75 to 100%	1.31	0.82	2.19
Income >100%	1.68	0.97	3.06
Home Ownership	(joint p = 0.08)		
Own	0.86	0.32	1.90
Rent	1.42	1.02	2.17

Table 3. *(continued)*

Characteristic	Relative Risk of Managed Care Coverage[b]		
		Lower CI	Upper CI
Other Characteristics			
Marital status		(joint p = 0.37)	
Married	0.89	0.42	1.62
Divorced	1.15	0.73	1.70
Exposure		(joint p = 0.04)	
Multiple risks	0.43	0.15	0.95
Heterosexual sex	0.81	0.43	1.38
Homosexual sex	1.16	0.66	1.90
Health Status			
PCS Score (Omitted: >75%)		(joint p = 0.49)	
25–75%	0.89	0.59	1.35
<25%	0.69	0.42	1.10
MCS Score (Omitted: >75%)		(joint p = 0.06)	
25–75%	1.11	0.72	1.74
<25%	1.79	1.14	3.11
Viral Load		(joint p = 0.86)	
500–9.999	0.92	0.59	1.44
10,000–100,000	0.91	0.59	1.39
≥100,000	0.87	0.44	1.56

[a]Model includes site fixed effects not shown. All estimates are based on self-reported coverage at baseline.
[b]Among those with any coverage.
CI = confidence interval

few of these individuals rely on private coverage and that so many end up with public coverage. Among this group, the fraction with private coverage is only 3%—one-tenth of the private-only coverage rate among HIV/AIDS patients in general.[16] Yet at the same time, their rate of being uninsured (16%) is comparable to that of other HIV/AIDS patients (20%) as is their rate of coverage by Medicare (20% vs. 19%) and the fraction who are dual eligible (13% for both groups). The private coverage gap is largely made up by Medicaid (60% vs. 44%).[16]

Determinants of coverage. When it comes to determinants of coverage, in several respects, coverage for HIV triply-diagnosed adults mirrors what has been found in the general population; for example, the likelihood of having any coverage increases with income[39,40] and declines with health status.[41] Given the heavy reliance of Americans on employer-based coverage in the private insurance market, it may seem surprising that being employed is associated with being less likely to have coverage among the HIV triply-diagnosed. However, relatively few in our sample work, and those who do may find it difficult to find employment with firms offering health insurance coverage (either

Table 4.

BASELINE VS. 12-MONTH HEALTH INSURANCE COVERAGE AMONG HIV TRIPLY-DIAGNOSED ADULTS

Coverage at Baseline[a]	Percent Distribution at Baseline	Coverage at 12 Months				
		Private Only	Medicaid, No Medicare	Medicaid/ Medicare	Medicare, No Medicaid	Uninsured
		Number of Individuals				
Private Only	2.9%	17	1	0	0	3
Medicaid, No Medicare	32.2%	2	200	16	6	12
Medicaid/Medicare/Other Public	14.1%	1	8	89	4	1
Medicare/Other Public, No Medicaid	37.6%	3	29	21	214	8
Uninsured	13.3%	2	39	4	5	47
Percent Distribution at 12 Months	100.0%	3.4%*	37.8%*	17.8%	31.3%*	9.7%*
p Value[b] (change from baseline):		0.58	0.03	0.055	0.011	0.031

[a]Coverage is based on a hierarchy so that categories shown are mutually exclusive and collectively exhaustive. Figures shown include 732 individuals who reported insurance status at baseline and 12 month follow-up interview.

[b]Significance test based on paired-sample test of proportions between baseline and 12 months insurance coverage.

*p<.05

Table 5.

TRANSITIONS IN COVERAGE AMONG HIV TRIPLY-DIAGNOSED ADULTS OVER 12 MONTHS

	Percent[a]		
Coverage at Baseline[b]	**No Transitions**	**Always Insured**	**Ever Uninsured**
Private Only	45.5%	81.8%	18.2%
Medicaid, No Medicare	70.5%	87.2%	12.8%
Medicaid/Medicare/Other Public	69.2%	96.6%	3.4%
Medicare/Other Public, No Medicaid	52.6%	90.0%	10.0%
Uninsured	62.9%	0.0%	100.0%

[a]Figures shown only for individuals (N=648) who reported coverage during baseline and follow-up interviews conducted at 6 and 12 months. No transitions implies that they stayed with the same coverage shown at baseline during both follow-up periods (although it is theoretically possible for some to have switched from one form of coverage to another even if they do not count as having a transition, e.g., switch from individual to employer-based private-coverage, or vice versa; our survey did not explore types of private coverage).
[b]Coverage is based on a hierarchy so that categories shown are mutually exclusive and collectively exhaustive.

because of their education or their compromised health status). Moreover, even in the general population, while workers may be more likely to have coverage than those not in the labor force, the disabled actually have a higher probability of having some sort of coverage than full-time workers;[40] similarly, among young adults (18–24) whose usual activity is not being in school, those with more than eight or more health conditions are more likely to have health insurance than those with 0–4 or 5–8 conditions.[39]

Our observations regarding income and receipt of Medicaid are subject to two interpretations. The first is that many individuals qualify for Medicaid on the basis of SSI and that many others receiving SSDI or other forms of income may qualify for Medicaid by spending down into eligibility (14 states do not have such spend-down provisions, but none of our study sites was located in one of these). With average monthly expenses approaching $4,000, many of these individuals (so long as they meet the categorical test of being disabled or single parents) would qualify for Medicaid. Supplemental Security Income currently guarantees an income of at least 72% of poverty for individuals below age 65. Similarly, those eligible for TANF would be receiving a cash payment that generally would bring them above the 50% of poverty threshold. Thus, anyone with an income below 50% of poverty cannot be getting SSI or TANF, suggesting that either they are not disabled enough to qualify for SSI or are not TANF-eligible (or perhaps face some barrier to getting qualified even though they may be technically eligible). But another interpretation of our findings is that even after controlling for education, those in this lowest-income group may be among the least educated (and hence more

likely to underreport their Medicaid coverage or less informed about the possibility of qualifying for Medicaid) or they may just disqualify for Medicaid for other reasons that also contribute to their low income (e.g., illegal immigrants). We have no good way of determining whether any of these explanations is correct.

An uninsured triply-diagnosed single adult trying to survive on an income below 50% of poverty is in quintuple jeopardy: the 2002 poverty threshold for a single person under 65 (90% of our sample fits this category) is $9,359,[42] meaning that such an individual has less than 10% of the income needed just to cover their expected annual medical expenses. Our sample is admittedly small, but to observe more than a third of this group without any coverage suggests the possibility they may need special help in finding the resources needed to qualify for coverage and/or consideration may need to be given to modifying the definition of disabled to accommodate their circumstances. It is worth noting that many (perhaps all) in this group may qualify for drug assistance through ADAP, which is specifically designed to help those not on medications. Our other work shows that medications account for only about one third of overall health spending,[3] meaning that this group still would have extreme difficulty in paying for their own medical care.

Determinants of managed care coverage. We explored the determinants of managed care enrollment because we wondered whether the sickest patients might face barriers to getting into managed care (see Hill et al.[43] for a discussion of the extensive risk selection experienced by SSI recipients in the TennCare Medicaid managed care program). However, neither our physical health status measure nor viral load measure indicated this was a problem—although the relative risk for those in the worst physical health (RR=0.61) nearly approached significance at the 10% level, so we may just have a problem of power. In contrast, we unexpectedly found that those in the lowest quartile of our mental health status measure were much more likely than those in the highest to be in managed care. We considered the possibility that this result reflected that Medicaid programs had forced such individuals into managed care (since nationally nearly three-fifths of Medicaid recipients were enrolled in managed care at the time of our study[44]). However, this was inconsistent with our results showing that those in the worst mental health were no more likely than those in the best mental health to be Medicaid recipients. Another possibility is that Medicaid programs are disproportionately singling out those with poor mental health for mandatory enrollment in managed care, but this prospect seems unlikely given the generally cautious approach states have taken to mandating managed care enrollment for their SSI populations.[45]

One further explanation is that even if they had fee-for-service Medicaid coverage, those with the greatest mental health needs were more likely to be subject to (or recall) various restrictions on mental health services use (e.g., pre-authorization) imposed by Medicaid managed behavioral health organization (MMBH0). Given that nearly all states 46 states were implementing Medicaid managed mental or behavioral health care in some form when our study began, we cannot rule out this possibility. But it also is possible our findings reflect the proclivity, for whatever reason, of those in this group to select managed care rather than an alternative.

Skeptics of managed care might view this as evidence that one would have to be mentally ill to pick managed care (see GAO[46] and Gold and Mittler[47] for some of the

concerns raised about Medicaid managed care for vulnerable populations in general; Laws, Gabriel, and McFarland[48] for the difficulties of integrating substance abuse treatment in Oregon's Medicaid managed care experiment; and Hill et al.[49] for how SSI beneficiaries have fared under the TennCare managed care program). However, managed care proponents could counter that such choices may be quite sensible, as such individuals might be particularly well served by the medical home that a good managed care plan might provide them (a relatively recent synthesis of the literature suggests that Medicaid managed care provides cost savings, improved access, and higher satisfaction, even for SSI populations[50]). At the same time, HIV triply-diagnosed adults may be uniquely vulnerable to lacking the wherewithal to protect themselves, were they to enroll in a plan that relied on patients to be pro-active about seeking needed care or negotiating some of the barriers (e.g., pre-authorization requirements) that managed care plans sometimes place in the way of getting timely services. Given that mental health services generally tend to have far more such restrictions and potential barriers than other types of medical care, this possibility cannot be ignored. Our data are not sufficient to state that such individuals are underserved, but our observation that the most vulnerable of an already vulnerable group are the ones getting into managed care suggests that states must be particularly vigilant about ensuring that such patients get the care they need from their plans. There is ample literature suggesting ways in which states might go about ensuring adequate access for their special needs populations in Medicaid managed care.[51,52]

Transitions in coverage. The good news in our study is the relative stability of coverage over time, with a greater overall average tendency to secure coverage rather than lose it over a year's period. Similarly, although we were concerned about the possibility that this group might be particularly vulnerable to floating in and out of Medicaid coverage due to spend-down requirements, we found that Medicaid appears to be a very stable source of coverage, with roughly nine in 10 who began with such coverage remaining covered for the entire period. It was not the purpose of any of these interventions to secure better insurance coverage for this population. However, given that half of our sample was involved in a treatment intervention following baseline, at least some of this improvement and stability in coverage may have been related to these interventions rather than something that would have occurred naturally.

Limitations. For purposes of studying triply-diagnosed patients, the HIV Cost Study has one serious disadvantage but also several advantages over earlier studies of HIV-infected patients, the most important of these being the HIV Costs and Services Utilization Study (as it is the largest nationally representative sample of HIV-positive patients in care). The intent of the HCSUS study design was to recruit a nationally representative sample; in contrast, the participants in the HIV Cost Study represent a convenience sample of patients in particular facilities within a small number of cities and rural areas. Thus, our findings may be less generalizable. On the other hand, even if our descriptive estimates of coverage are not generalizable, the associations between patient characteristics and coverage are more likely to be representative. As we have detailed elsewhere,[3,53] in many ways, the HIV Cost Study sample can be viewed as complementary to the HCSUS subsample of triply-diagnosed patients, focusing more heavily on a disadvantaged Medicaid-eligible population of particular relevance to

state and national policymakers and including individuals likely to be missed by the HCSUS sampling frame.

Another limitation is that we rely on patient self-reports of insurance coverage; in the Current Population Survey, it is well known that Medicaid coverage tends to be underreported by 15% to 50% when compared with administrative data.[54,55] Since no one specifically has examined the reliability of self-reporting of insurance coverage among the HIV triply-diagnosed, we assume their underreporting might be similar if not worse.

Conclusions. Because the average expenditures of HIV triply-diagnosed adults on medical care alone exceed by more than one quarter the average annual earnings for the typical U.S. worker, it is not surprising that this population relies so heavily on public coverage. In our sample, fully two-thirds were covered by Medicaid or Medicare, and another 16% had no coverage (other work shows that more than half of care for the typical full-year uninsured patient is uncompensated, and that public funding finances 85% of so-called uncompensated care[56]); only 5% had private health insurance. Given the growing number of uninsured, coupled with budgetary pressures facing both federal[57] and state policymakers,[58] addressing these issues may be a challenge, especially if national health reform efforts fail. The prescription drug benefit available under Medicare Part D has added to these fiscal pressures, yet ironically this benefit may pose particular problems for triply-diagnosed dual-eligibles to the extent that they find themselves facing so-called doughnut holes in their coverage, or more limited formularies than they previously had under Medicaid. One purpose of the HIV/AIDS Cost Study was to determine whether better integrated care for the HIV triply-diagnosed can reduce expenditures or cost-effectively improve health outcomes. But integrated care is of little meaning to patients who do not have coverage that would pay for it. An estimated 42% to 59% of those living with HIV/AIDS are not in regular care,[59] so maximizing use of existing resources is critical. Our findings illuminate the patterns and predictors of health insurance coverage among triply-diagnosed adults, which is important to understand for all the reasons just described.

Acknowledgments

Notes

1. Institute of Medicine. Public financing and delivery of HIV/AIDS care: securing the legacy of Ryan White. Washington, DC: National Academies Press, 2004.

2. Galvan FH, Burnam MA, Bing EG. Co-occurring psychiatric symptoms and drug dependence or heavy drinking among HIV-positive people. J Psychoactive Drugs. 2003 May;35 Suppl 1:153–60.

3. Conover CJ, Weaver M, Ang A, et al. Costs of care for people living with combined HIV/AIDS, chronic mental illness, and substance abuse disorders. AIDS Care. 2009 Dec;21(12):1547–59.

4. Whetten K, Reif SS, Napravnik S, et al. Substance abuse and symptoms of mental illness among HIV-positive persons in the Southeast. South Med J. 2005 Jan;98(1):9–14.

5. Pence BW, Miller WC, Whetten K, et al. Prevalence of DSM-IV-defined mood, anxiety, and substance use disorders at an HIV clinic in Southeastern United States. J Acquir Immune Defic Syndr. 2006 Jul;42(3):298–306.

6. Lyketsos CG, Hanson A, Fishman M, et al. Screening for psychiatric morbidity in a medical outpatient clinic for HIV infection: the need for a psychiatric presence. Int J Psychiatry Med. 1994;24(2):103–13.

7. Tegger MK, Crane HM, Tapia KA, et al. The effect of mental illness, substance use, and treatment for depression on the initiation of highly active antiretroviral therapy among HIV-infected individuals. AIDS Patient Care STDS. 2008 Mar;22(3):233–43.

8. Herz EJ. Coverage of the TANF population under Medicaid and SCHIP. Washington, DC: Congressional Research Service, 2005 January 27.

9. Social Security Administration. What we mean by disability. Baltimore, MD: Social Security Administration, 2007. Available at: http://www.ssa.gov/dibplan/dqualify4.htm.

10. Bhattacharya J, Goldman D, Sood N. The link between public and private insurance and HIV-related mortality. J Health Econ. 2003 Nov;22(6):1105–22.

11. Andersen R, Bozzette S, Shapiro M, et al. Access of vulnerable groups to antiretroviral therapy among persons in care for HIV disease in the United States. HCSUS Consortium. HIV Cost and Services Utilization Study. Health Serv Res. 2000 Jun;35(2):389–416.

12. Vitiello B, Burnam MA, Bing EG, et al. Use of psychotropic medications among HIV-infected patients in the United States. Am J Psychiatry. 2003 Mar;160(3):547–54.

13. The Lewin Group. Access and utilization of new antidepressant and antipsychotic medications. Fairfax, VA: The Lewin Group, 2000. Available at: http://aspe.hhs.gov/health/reports/psychmedaccess/.

14. Smith SR, Buchanan RJ. The AIDS drug assistance programs and coverage of HIV-related medications. Ann Pharmacother. 2001 Feb;35(2):155–66.

15. Carbaugh AL, Kates J, Crutsinger-Perry B, et al. 2009 National ADAP Monitoring Project annual report. Washington, DC: The Henry J. Kaiser Family Foundation and the National Alliance of State and Territorial AIDS Directors, 2009.

16. Goldman DP, Bhattacharya J, Leibowitz AA, et al. The impact of state policy on the costs of HIV infection. Med Care Res Rev. 2001 Mar;58(1):31–53.

17. Shapiro MF, Morton SC, McCaffrey DF, et al. Variations in the care of HIV-infected adults in the United States: results from the HIV Cost and Services Utilization Study. JAMA. 1999 Jun 23–30;281(24):2305–15.

18. Kilbourne AM, Andersen RM, Asch S, et al. Response to symptoms among a U.S. national probability sample of adults infected with human immunodeficiency virus. Med Care Res Rev. 2002 Mar;59(1):36–58.

19. Cunningham WE, Markson LE, Andersen RM, et al. Prevalence and predictors of

highly active antiretroviral therapy use in patients with HIV infection in the United States. HCSUS Consortium. HIV Cost and Services Utilization. J Acquir Immune Defic Syndr. 2000 Oct 1;25(2):115–23.

20. Keruly JC, Conviser R, Moore RD. Association of medical insurance and other factors with receipt of antiretroviral therapy. Am J Public Health. 2002 May;92(5):852–7.

21. Horner RD, Bennett CL, Achenbach C, et al. Predictors of resource utilization for hospitalized patients with Pneumocystis carinii pneumonia (PCP): a summary of effects from the multi-city study of quality of PCP care. J Acquir Immune Defic Syndr Hum Retrovirol. 1996 Aug 1;12(4):379–85.

22. Institute of Medicine. Care without coverage: too little, too late. Washington, DC: National Academies Press, 2002.

23. Whetten K, Zhu CW. Do United States–based Medicaid spend-down programmes make public sense for persons with HIV/AIDS? AIDS Care. 2004 Aug;16(6):781–5.

24. Phelps CE. Demand for health insurance: a theoretical and empirical investigation. Santa Monica, CA: RAND Corporation, 1973.

25. Broyles RW, Rosko MD. The demand for health insurance and health care: a review of the empirical literature. Med Care Rev. 1988 Fall;45(2):291–338.

26. Gruber J. Health insurance and the labor market. Cambridge, MA: National Bureau of Economic Research, 1998.

27. Gruber J, Washington E. Subsidies to employee health insurance premiums and the health insurance market. J Health Econ. 2005 Mar;24(2):253–76. Epub 2004 Dec 19.

28. Institute of Medicine. Coverage matters: insurance and health care. Washington, DC: National Academies Press, 2001.

29. Walden DC, Wilensky GR, Kasper JD. Changes in health insurance status: full-year and part-year coverage. Rockville, MD: U.S. Department of Health and Human Services, National Center for Health Services Research and Health Care Technology Assessment, 1985.

30. Monheit AC, Schur CL. The dynamics of health insurance loss: a tale of two cohorts. Inquiry. 1988 Fall;25(3):315–27.

31. Short PF, Cantor JC, Monheit AC. The dynamics of Medicaid enrollment. Inquiry. 1988 Winter;25(4):504–16.

32. Swartz K, McBride TD. Spells without health insurance: distributions of durations and their link to point-in-time estimates of the uninsured. Inquiry. 1990 Fall;27(3): 281–8.

33. Swartz K, Marcotte J, McBride TD. Spells without health insurance: the distribution of durations when left-censored spells are included. Inquiry. 1993 Spring;30(1):77–83.

34. U.S. Department of Commerce, Bureau of the Census. Health insurance coverage 1986–88. Washington, DC: U.S. Government Printing Office, 1990.

35. U.S. Department of Commerce, Bureau of the Census. Health insurance coverage: 1987–1990. Washington, DC: Government Printing Office, 1992.

36. Jensen GA. The dynamics of health insurance among the near elderly. Med Care. 1992 Jul;30:598–614.

37. Rubin D. Multiple imputation for nonresponse in surveys. Hoboken, NJ: John Wiley and Sons, Inc., 1987.

38. Schafer J. Analysis of incomplete multivariate data. New York, NY: Chapman & Hall/CRC, 1997.

39. Markowitz MA, Gold M, Rice T. Determinants of health insurance status among young adults. Medical Care. 1991 Jan;29(1):6–19.

40. Sloan FA, Conover CJ. Effects of state reforms on health insurance coverage of adults. Inquiry. 1998 Fall;35(3):280–93.

41. Monheit AC, Hagan MM, Berk ML, et al. The employed uninsured and the role of public policy. Inquiry. 1985 Winter;22(4):348–64.

42. U.S. Census Bureau. Poverty thresholds 2002. Washington, DC: U.S. Census Bureau, 2003. Available at: http://www.census.gov/hhes/www/poverty/threshld/thresh02.html.

43. Hill SC, Thornton C, Trenholm C, et al. Risk selection among SSI enrollees in Tenn-Care. Inquiry. 2002 Summer;39(2):152–67.

44. Centers for Medicare and Medicaid Services. Medicaid managed care enrollment as of June 30, 2005. Washington, DC: Centers for Medicare and Medicaid Services, 2005.

45. Tobias C, Maisels L, Andrew J. How health plans identify and serve Medicaid special needs clients. Boston, MA: Boston University School of Public Health, Health and Disability Working Group, 2000 Jun.

46. U.S. General Accounting Office. Medicaid managed care: challenge of holding plans accountable requires greater state effort. Washington, DC: U.S. General Accounting Office, 1997.

47. Gold M, Mittler J. Medicaid's complex goals: challenges for managed care and behavioral health. Health Care Financ Rev. 2000 Winter;22(2):85–101.

48. Laws KE, Gabriel RM, McFarland BH. Integration and its discontents: substance abuse treatment in the Oregon Health Plan. Health Aff (Millwood). 2002 Jul–Aug;21(4):284–9.

49. Hill SS, Wooldridge J, Ciemnecki A, et al. SSI enrollees in TennCare: room for improvement. Perspectives on Medicaid managed care. Princeton, NJ: Mathematica Policy Research, Inc., 2001.

50. Lewin Group. Medicaid managed care cost savings—a synthesis of fourteen studies. Fairfax, VA: Lewin Group, 2004.

51. Families USA. A guide to monitoring Medicaid managed care. Washington, DC: Families USA, 2000.

52. Felt-Lisk S, Mitler J, Cassidy A. Ensuring special needs populations' access to providers in managed care networks: a technical assistance and self-assessment tool for state Medicaid agencies. Washington, DC: Center for Health Care Strategies, Inc., 2001.

53. Weaver MR, Conover CJ, Proescholdbell RJ, et al. Cost effectiveness analysis of integrated care for people with HIV, chronic mental illness and substance abuse disorders. J Ment Health Policy Econ. 2009 Mar;12(1):33–46.

54. Zelder M, Esmail N, Irvine C. Medically uninsured Americans: evidence of magnitude and implications. Toronto, Canada: Fraser Institute, 2002.

55. State Health Access Data Assistance Center. Do national surveys overestimate the number of uninsured? Findings from the Medicaid undercount experiment in Minnesota. Minneapolis, MN: State Health Access Data Assistance Center, 2004.

56. Hadley J, Holahan J. The cost of care for the uninsured: what do we spend, who pays, and what would full coverage add to medical spending? Washington, DC: The Henry J. Kaiser Family Foundation, 2004 May 10.

57. Congressional Budget Office. The budget and economic outlook: fiscal years 2009–2019. Washington, DC: The Congress of the United States, Congressional Budget Office, 2009.

58. National Governors Association, National Association of State Budget Officers. The fiscal survey of states. Washington, DC: National Governors Association, 2008. Available at: http://www.nga.org/Files/pdf/FSS0812.PDF.

59. Kates J. Financing HIV/AIDS care: a quilt with many holes. Washington, DC: The Henry J. Kaiser Family Foundation, 2004.