



---

# Housing Need, Housing Assistance, and Connection to HIV Medical Care

---

Angela A. Aidala  
Gunjeong Lee  
Anne Siegler

Columbia University  
Mailman School of Public Health

In collaboration with the Medical and Health Research Association of New York, the NYC Department of Health and Mental Hygiene, and the HIV Health & Human Services

---

HRSA Contract H89 HA00015-16  
© 2007 The Trustees of Columbia University  
February 15, 2007

---

**C.H.A.I.N. REPORT**

## **ACKNOWLEDGMENTS**

A Technical Review Team (TRT) provides oversight for the CHAIN Project. In addition to Peter Messeri, PhD and Angela Aidala, PhD of Columbia University's Mailman School of Public Health, TRT members include Mary Ann Chiasson, DrPH, MHRA (chair); Judy Sackoff, PhD, NYCDOHMH; Jan Park, Office of AIDS Policy and Community Planning; Clarissa Silva, Office of Evaluation and Quality Assurance, JoAnn Hilger, NYCDOHMH; Julie Lehane, PhD, Westchester County DOH; and Justine Dang, MHRA.

This research was supported by grant number H89 HA 0015-15 from the US Health Resources and Services Administration (HRSA), HIV/AIDS Bureau with the support of the HIV Health and Human Services Planning Council, through the New York City Department of Health and Mental Hygiene and the Medical and Health Research Association of New York City, Inc. Its contents are solely the responsibility of the researchers and do not necessarily represent the official views of the U.S. Health Resources and Services Administration, the City of New York, or the Medical and Health Research Association of New York

## **Introduction**

The newly enacted Ryan White HIV/AIDS Treatment Modernization Act of 2006 includes a provision which requires that 75 percent of CARE Act funds be used for specifically defined “core medical services.” Housing assistance is excluded from core service funding which limits funds available to address housing needs. Further, an amendment has been proposed which would limit (retroactively) the amount of time a client can receive housing assistance through the CARE Act to a cumulative lifetime total of 24 months. In addition to these constraints on use of Ryan White funds, the primary source of funding specifically designated to support housing for HIV positive persons, the Housing Opportunities for Persons With AIDS (HOPWA) program, has not increased in recent years.

There is great concern among provider and consumer communities that changes in the availability of funds for assistance with housing needs will have a negative impact on people living with HIV/AIDS and create (or fail to remove) significant barriers to HIV treatment and care. Most persons living with HIV/AIDS face considerable challenges to maintaining regular employment that would provide income sufficient to cover housing costs in jurisdictions such as New York where affordable housing is increasingly scarce. The Fair Market Rent (FMR) is an amount determined by the U.S. Dept. of Housing and Urban Development (HUD) to be the cost of modest rental units in specific market areas. The FMR for the New York metro area is currently \$949 for a one-bedroom apartment. As a comparison, monthly Supplemental Security Income (SSI) payments for an individual in New York are \$690.

The overall goal of the present report is to investigate the relationship between housing and access to and maintenance in HIV medical care. Specific research questions are: 1.) What is the prevalence of housing instability and need for housing assistance among PLWH in New York City and have rates changed over time? 2.) What is the relationship between housing status and utilization of medical services? 3.) Does housing status predict receipt of medical care that meets good clinical care standards, controlling for receipt of supportive services such as case management, substance abuse or mental health treatment? 4) Does receipt of housing assistance have an effect on entry into care and continuity of care among persons who are outside or marginally connected to HIV medical care.

## **Key Findings**

- The need for housing assistance among persons living with HIV/AIDS has not diminished over time. At every interview period from 1994 to 2004, roughly 30-40% of all CHAIN Participants reported housing problems or need for housing assistance. This included persons who were homeless or unstably housed in a temporary situation, as well as those unable to pay rent, facing eviction for any reason, living in overcrowded or inadequate housing (e.g. no heat), experiencing domestic violence or other threats to safety. Housing needs are fluid - as some PLWH get their housing needs met, others lose their housing or develop housing problems.
- There is a strong and consistent relationship between housing status and connection to HIV medical care. Housing instability, including living in a temporary or transitional housing program as well as literal homelessness, is associated with delayed entry into medical care, not receiving care that meets good clinical practice standards, dropping out of care, and inconsistent use of antiretroviral medications, even when indicated by established clinical markers.

- For the most recent CHAIN cohort interviewed in 2002-2003, housing status variables are the strongest predictors of receiving HIV medical care that meets good clinical practice guidelines controlling for demographic characteristics, individual and neighborhood economic resources, risk exposure group, health and mental health status. The association between housing status and receipt of appropriate medical care is unaffected by the concurrent receipt of case management, mental health, drug treatment, or other supportive services.
- Longitudinal analysis pooling data from all CHAIN cohorts interviewed from 1994 through 2003 shows that there is a strong and consistent relationship between unstable housing/housing problems increase risk for dropping out of HIV medical care and remaining outside or marginal to care. Receipt of housing assistance is a significant predictor of entry into care, and entry and maintenance in care that meets good clinical practice standards.
- Findings provide strong evidence that housing needs are a significant barrier to consistent, appropriate HIV medical care, and that receipt of housing assistance has a direct impact on improved medical care outcomes for persons living with HIV/AIDS.

## Methods

### Sample

This report is based primarily on information provided by interviews conducted in 2002-2004 with a probability sample of persons living with HIV in New York City – the CHAIN “New Cohort”. The CHAIN study has followed a recruitment procedure designed to yield a broadly representative sample of people living with HIV in New York City since the first phase of the project in 1994. The most recent cohort was sampled and recruited following the same protocol used for the original CHAIN sample. A two-step process was used. A wide selection of service providers were randomly chosen, and with the assistance of agency staff, individual clients were randomly selected from agency rosters or through a sequential recruitment procedure. Recruitment for the 2002 cohort was conducted at 34 randomly selected medical and social service agencies known to serve HIV positive adults. Baseline interviews were completed with 684 agency-recruited individuals and a small sample (n=23) of HIV-positive individuals unconnected to medical care, contacted through outreach activities. For comparisons over time, we include data from earlier cohorts. An additional 648 HIV-positive individuals recruited from agency sites were part of the original 1994 cohort, along with 52 PLWH unconnected to services. A refresher cohort of 268 was recruited in 1998-99 using the 1994 agency sample frame and 24 PLWH unconnected to care.

Table 1 compares the 2002 CHAIN cohort of 693 individuals with contemporaneous New York City HIV/AIDS surveillance data and a duplicated count of Ryan White CARE Act-funded encounters. The gender and ethnic composition of the NYC cohort is similar to the AIDS and HIV epidemiology data with the exception of the substantial underrepresentation of white males and greater proportion of African American and Latino males. The ethnic imbalance is much less pronounced for females. The CHAIN sample more closely mirrors the CARE Act encounter data. One possible explanation is that white HIV positive adults at this stage of the epidemic are more likely to be receiving care at private physician offices (not in the CHAIN sampling frame) and less likely to need social services. Minority PLWH are more likely to seek care at outpatient clinics, neighborhood health care centers and social service agencies where CHAIN members were recruited. Details about

**Table 1. Sample Representativeness, NYC HIV/AIDS Cases and CHAIN Cohort**

	NYC Persons Living with AIDS, as of 6/30/03 <sup>1</sup>		NYC Persons Living with HIV, as of 6/30/03 <sup>1</sup>		Ryan White CARE Act Encounters, 3/2001 - 2/2002 <sup>2</sup>		CHAIN 2002 Cohort 6/2002-6/2004	
	Female	Male	Female	Male	Female	Male	Female	Male <sup>3</sup>
<b>Total N</b>	<b>15,753</b> (28%)	<b>39,765</b> (72%)	<b>10,104</b> (35%)	<b>18,995</b> (65%)	<b>10,765</b> (39%)	<b>16,962</b> (61%)	<b>278</b> (40%)	<b>415</b> (60%)
<b>White</b>	11%	25%	8%	30%	9%	8%	6%	10%
<b>Black</b>	56%	40%	58%	36%	53%	53%	62%	47%
<b>Latino</b>	33%	32%	31%	30%	37%	37%	31%	41%
<b>Other</b>	1%	2%	3%	4%	2%	2%	<1% (1)	2%

<sup>1</sup> Source: Personal correspondence, HIV Epidemiology Program, Department of Health and Mental Hygiene, the City of New York

<sup>2</sup>Source: HIV CARE Services. Data represent a duplicated count of first time encounters with Ryan White CARE Services In FY11, March 2001 - February 2002.

<sup>3</sup> Seven transgender in transition persons are included in male category.

sample recruitment and representativeness of the earlier samples has been discussed elsewhere (Abramson 2003).

All CHAIN interviews are conducted in person by interviewers recruited from communities throughout New York City and trained specifically for the study. Interview topics include sociodemographic characteristics, the full range of experiences with access to and use of medical and social services, and quality of life. At each round of interviews participants are asked about their current living situation, their recent history of housing instability, and whether or not they have had any housing problems or need for assistance with housing issues. Information is also obtained about rental assistance, housing placement or other housing services received.

### Measures

Homelessness/ Unstable Housing. We ask respondents about their current living arrangements and recent history (any time during the six months prior to interview) of unstable or inadequate housing. Persons who describe themselves as homeless, or sleeping on the street, in a shelter, a limited-stay SRO or welfare hotel with no services, or in an abandoned building, a public or private place not intended for sleeping (e.g. subway station) are coded as “homeless.” Residence in a temporary or transitional housing program; in jail, halfway house or drug treatment housing; or in a hospice, currently or during the past six months was coded as ‘temporary or transitional housing.’ Persons temporarily doubled up with others, in someone else’s home are coded ‘doubled-up.’ Finally, individuals are coded ‘own place/ stable housing’ if they are in a house or apartment that they or a family member own or rent, with no time limit or restrictions on residency other than what would be found in a conventional lease or ownership agreement.

Need for Housing Assistance. CHAIN study participants are also asked about their need for services in a wide range of service areas. We examine self perceived need for housing services by answers to the question: “In the last six months, have you had a problem or needed assistance in the area of

housing?” Self-reported housing problems is a broader category than current housing status since individuals can be currently stably housed but in an intolerable situation due to domestic violence or lack of basic services such as heat and hot water, or they could be facing housing loss for any number of reasons including the inability to pay rent, facing eviction or being discharged from a housing program with no resources to secure housing .

Medical Care. A number of different measures of access to medical care, quality of care, continuity of care, access to treatment and adherence to treatment regimens have been used in different analyses of relationships between housing and health care in the CHAIN sample. The specific indicators and measures used will be discussed below, in conjunction with the specific analysis undertaken.

## **Findings**

### Prevalence of Housing Instability and Need for Housing Assistance

Almost one-third (30%) of CHAIN participants were homeless or unstably housed currently or at some point during the six months prior to baseline interview in 2002-03 (Table 2). Ten percent (10%) were literally homeless, sleeping in the street, a shelter for homeless persons, a limited stay SRO, an abandoned building or other place not meant for sleeping. Another 12% were previously homeless but currently in some type of temporary or transitional housing program. This category also includes persons in residential drug treatment or ex-offender halfway houses, as well as those temporarily in a nursing home or other medical facility with no other place to live. About one-quarter of the sample changed addresses within the last six months; one in eight (13%) moved 2 or more times during this period. Housing problems or need for housing assistance was reported by 35% of all CHAIN Participants. Problems include being homeless, not having a regular place to live; not being able to pay rent; being asked to leave a ‘doubled up’ situation, facing eviction or being discharged from a housing program with no resources to secure housing; inadequacy of housing (e.g. no heat, severe overcrowding); domestic violence or other dangerous situation; needing to change housing due to a medical condition (e.g. needing wheelchair access). More than half of the most recent CHAIN cohort were homeless or unstably housed during the year that they became aware of their HIV status; many have extensive histories of struggling with housing needs.

### Over-time Comparison of Housing Status Indicators

Table 3 shows rates of homelessness/ housing instability and self-reported housing problems at each of the CHAIN cohort enrollment time periods. The percentage of literally homeless PLWH among agency recruited persons in the original cohort (1994-95) was higher than at subsequent study periods - 19% compared to 10% among 2002 cohort. However these cross-sectional data show a similar percentage either homeless or unstably housed between the 1998-99 and 2002-04 recruitment periods (28% and 30% respectively). Although numbers are small, rates of homelessness among PLWH unconnected to care have been especially high at each period; currently 72% are homeless or unstably housed, with 60% literally homeless. This is consistent with findings from our ethnographic work locating HIV positive persons outside of care; almost all were experiencing housing difficulties.

**Table 2. Housing Status and Housing Problems: CHAIN New Cohort, 2002**

	n	%
<i>Total Sample</i>	693	100%
<b>Housing Status at Baseline Interview</b>		
Stable, own place	487	70%
Temporarily doubled up with others	54	8
Temporary/ transitional housing <sup>1</sup>	85	12
Homeless <sup>2</sup>	67	10
<b>Housing Transience</b>		
Changed address past 6 months	168	24%
<b>Housing Problems<sup>3</sup></b>		
Self-reported housing problems or need for housing assistance past 6 months:  <i>Homeless or unstably housed, can't pay rent, facing eviction, being discharged from program with no resources to secure housing, no heat/ plumbing, domestic violence or other dangerous situation, need accessible unit, etc.</i>	243	35%
<b>History of Homelessness/Unstable Housing</b>		
During the year prior to HIV diagnosis spent at least one night:  <i>On the streets, in a homeless shelter, SRO or welfare hotel, drug treatment, jail or other temporary housing, or doubled up with others, in somebody else's home.</i>	356	52%

1. Residence in a temporary or transitional housing program; in jail, halfway house or drug treatment housing; or in a hospice, currently or during the past six months.

2. Sleeping in the street; a shelter for homeless persons; a limited stay SRO with no services; in an abandoned building, a public or private place (e.g. subway station) not intended for sleeping currently or during the six months prior to interview.

3. Percent answering "YES" in response to the question: "In the last six months, have you had a problem or needed assistance in the area of housing?" and examples of housing problems described.

**Table 3. Housing Status and Housing Problems: CHAIN Cohorts 1994, 1998, 2002**

	Original Cohort 1994-95	Refresher Cohort 1998-99	New Cohort 2002-04
<b>AGENCY RECRUITED SAMPLE</b> n=	(700)	(268)	(693)
<b>Housing Status at Baseline Interview</b>			
Stable, own place	65%	72%	70 %
Unstable housing <sup>1</sup>	16	19	20
Homeless <sup>2</sup>	19	9	10
<b>Reported Need for Housing Assistance<sup>3</sup></b>			
Self-reported housing problems or need for housing assistance past 6 months: <i>Homeless or unstably housed, can't pay rent, facing eviction, being discharged from program with no resources to secure housing, no heat/ plumbing, domestic violence or other dangerous situation, need accessible unit, etc.</i>	38%	28%	35%
<b>UNCONNECTED SAMPLE</b> n=	(50)	(24)	(23)
<b>Housing Status at Baseline Interview</b>			
Stable, own place	36%	22%	28%
Unstable housing <sup>1</sup>	6	7	12
Homeless <sup>2</sup>	58	71	60
<b>Reported Need for Housing Assistance<sup>3</sup></b>			
Self-reported housing problems or need for housing assistance past 6 months: <i>Homeless or unstably housed, can't pay rent, facing eviction, being discharged from program with no resources to secure housing, no heat/ plumbing, domestic violence or other dangerous situation, need accessible unit, etc.</i>	54%	50%	74%

1. Residence in a temporary or transitional housing program; in jail, halfway house or drug treatment housing; in a hospice, or temporarily doubled up with others, in someone else's home, currently or during the past six months.

2. Sleeping in the street; a shelter for homeless persons; a limited stay SRO with no services; in an abandoned building, a public or private place (e.g. subway station) not intended for sleeping currently or during the six months prior to interview.

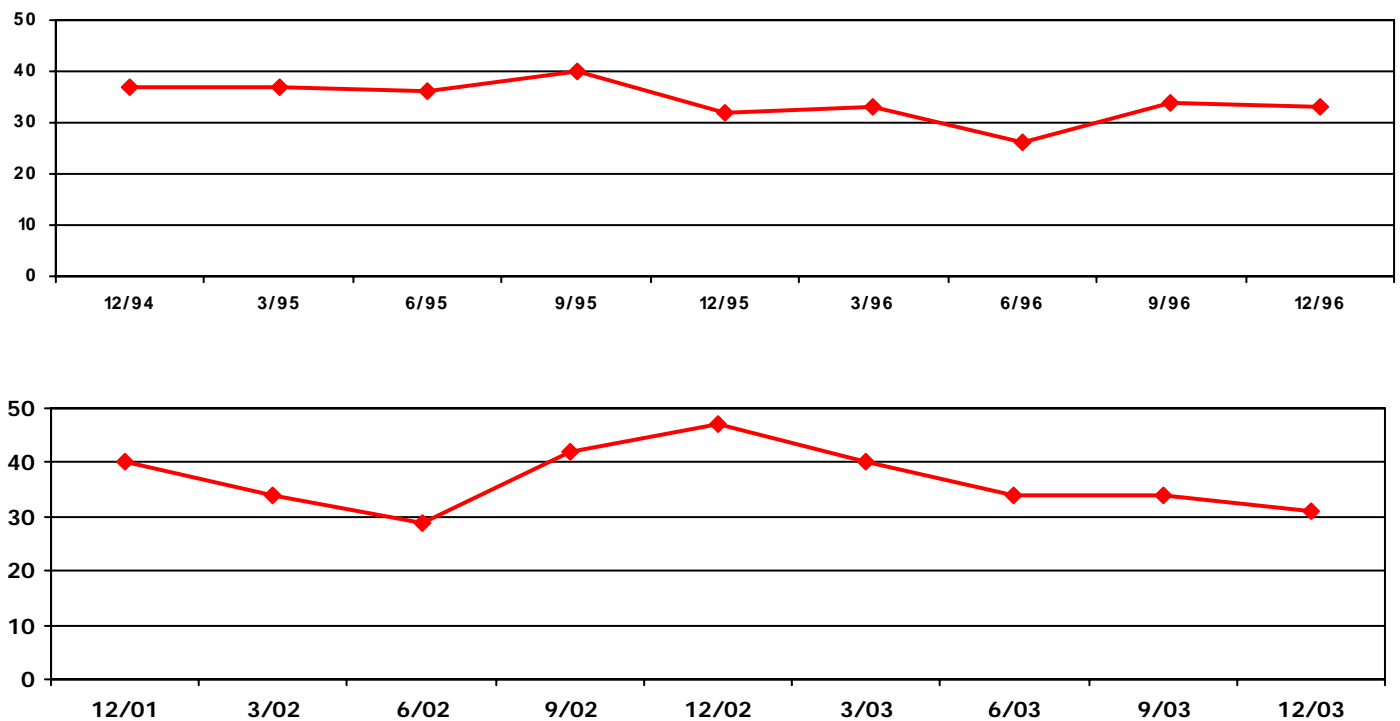
3. Percent answering "YES" in response to the question: "In the last six months, have you had a problem or needed assistance in the area of housing?" and examples of housing problems described.

### Over-time Rates of Housing Service Need

Figure 1 presents cross-sectional rates of self-reported housing problems or need for housing services. Arranging all interviews chronologically, cross-sectional rates of housing problems vary between 30% and 40% for each quarter during which interviews were conducted from 1994 to 2004. Almost all have experienced housing difficulties, showing the relative constancy of self-reported need for housing services at the service system level.

Housing needs are fluid. As some persons get their housing needs met, others develop housing problems due to both personal and structural factors including the growing disparities between income and rent requirements; loss of income due to progressive inability to maintain employment; relationship breakup including leaving abusive situations; loss of spouse/partner due to HIV related death or disability; loss of shared housing options subsequent to disclosure of HIV status; disease progression requiring accessible facilities; and policy requirements that limit residence in temporary or transitional programs.

**Figure 1. Rate of Housing Service Need by Date of Interview - 1994 - 1996 and 2001- 2003**



### Housing Status and Connection to HIV Medical Care

We will consider a number of indicators of connection to medical care including timely or delayed entry into medical care after initial awareness of HIV diagnosis and access to medical care that meets clinical practice standards. Our determination of whether the medical care an individual receives is consistent with standards for appropriate medical care for HIV is based on interview data assessing the number of visits for outpatient care, receipt of diagnostic services such as blood work-ups for CD4 T-cell counts and viral loads, and drug therapies. Standards for HIV medical care were obtained from those promulgated by the New York State Department of Health (NYS

DOH) AIDS Institute<sup>1</sup>. We also have a separate measure of “comprehensive primary care.” At each wave of interviews, study participants were asked a series of questions about specific features of their medical care including whether their provider offers primary care characterized by coordination (single doctor or medical person “in charge of overall HIV care”), comprehensiveness (indicated by the provision of “routine check-ups, vaccinations, and medical tests” as well as being a place they could go for “information or advice about a health concern”) and access (whether the provider or covering service would be available 24/ 7 in case of a medical emergency). These features of coordination, comprehensiveness, and access have been established as characteristics of good primary care by the Institute of Medicine (IOM, 1994; 1996) that patients can reliably report upon (Flocke, 1997).

The relationship between housing status and medical care is strong and consistent (see Table 4). Almost all CHAIN study participants have a source of medical care. However, among the most recently interviewed cohort, 10% of the homeless were without any medical provider for HIV. Among the stably housed, only 2% do not have a medical provider. Fifteen percent (15%) of the homeless did not have any visit to a primary care provider in the six months prior to interview.

When we move beyond simply having a source of care to examining characteristics of care received, differences by housing status are more pronounced. Almost half (46%) of the homeless were not receiving care that meets minimum clinical practice guidelines, compared to 23% of PLWH with their own, stable housing, 26% of those doubled up, and 35% of those in a temporary or transitional housing program. Turning to the measure of comprehensive primary care, the rates of less than optimal care are 37% for the homeless, 33% for the doubled-up and 22% for those in their own housing or a transitional housing program.

As we saw among CHAIN participants interviewed during earlier time periods, homeless or unstably housed persons were more likely to report disruptions in medical care than those with more secure living arrangements. One third of those in temporary or transitional housing and 28% of the homeless report one or more times when they dropped out of care and did not have any medical appointments for more than six months (against medical recommendation). Lack of insurance is not likely a cause of interruptions in care. Unlike in other jurisdictions, all New Yorkers living with HIV are eligible for a range of medical benefits and homeless consumers as well as the more stably housed appear to be taking advantage of these benefits (Table 4).

In a separate series of reports we examined patterns of entry into HIV medical care after initial diagnosis (Aidala and Lee, 2006; Aidala et al 2005). There were differences in medical service sites, pathways to care, and timeliness of entering HIV medical care associated with differences in housing status at the time of HIV diagnosis. Rates of delayed entry into HIV medical care after diagnosis vary from 23% among those in temporary or transitional housing to 44% of PLWH who were on the streets when they found out about their HIV infection. The same general pattern remains when we limit our analysis to those who were not ill at the time of their initial diagnosis, excluding care received in response to symptoms that resulted in the initial HIV or AIDS diagnosis. Among the street homeless who were experiencing some symptoms at the time of their diagnosis, close to 40% nonetheless delayed their initial visit for HIV medical care (data not shown).

---

<sup>1</sup> Sources include New York State AIDS Institute, the latest edition of “Criteria for the Medical Care of Adults with HIV Infection” (2003) and “The Primary Care Approach To The HIV-Infected Patient” (2007) by the AIDS Institute and personal interviews with key program staff at the AIDS Institute. See specific criteria in Appendix A.

**Table 4. Connection to HIV Medical Care by Housing Status**

	<b>Stable, Own Place</b>	<b>Temp Doubled Up</b>	<b>Temp/ Transit Housing</b>	<b>Home- less</b>
Total Sample (n=)	(487)	(54)	(85)	(67)
<b>No Source of Medical Care</b> Does not have any medical provider for HIV care	2%	4%	4%	10% **
<b>No Visit with Primary Care Provider</b> Does not have regular medical provider for HIV or no visit to primary medical care provider in past 6 months	4%	6%	6%	15% ***
<b>Comprehensive Primary Care</b> Does not have primary medical care that is coordinated, comprehensive, and provides 24 hour access	22%	33%	22%	37% *
<b>Lack of Adequate Clinical Care</b> Is not receiving medical care that meets minimum clinical practice guidelines	23%	26%	35%	46% ***
<b>Unmet Need for Medical Care</b> Self-reported unmet need for medical care or experienced barrier to receiving care past 6 months	20%	26%	29%	36% *
<b>Interruption of Medical Care</b> Has ever dropped out of care for 6+ months	19%	22%	33%	28% *
<b>Lack of Medical Insurance</b> Has no medical insurance of any kind to cover HIV care	<1%	4%	0%	0% *
<b>Not on HAART<sup>2</sup></b> No HIV medications or not on HAART regimen	32%	18%	32%	47% #
<b>Not Adherent to HIV Medications<sup>2</sup></b> Self-report less than 100% adherent or missed pills during the past 2 days	27%	32%	20%	49% *
<b>Hospitalization &amp; ER Visits</b> <i>One or more ER visit past 6 months</i>	31%	33%	32%	39%
<i>One or more hospitalization past 6 months</i>	18%	20%	26%	19%

# p≤ .10 \* p≤ .05 \*\* p≤ .01 \*\*\* p≤ .001

1. Among PLWH with CD4 count below 350: stable n=205, doubled n=28, temp/transit n=41, homeless n=36.

2. Among PLWH on any type of HIV medications: stable n=379, doubled n=41, temp/transit n=55, homeless n=37.

As Table 4 shows, the homeless are less likely than others to be on any HAART medication regimen. Restricting the sample to individuals with CD4 counts below 350/ $\mu$ l, the most common indication for initiation of therapy, 47% of the homeless are not on HAART, compared to 32% of those in temporary or transitional housing or in their own place. The lowest rates of HAART (18%) are found among PLWH doubled up in someone else's home, perhaps influenced by disclosure concerns. Half of the homeless who are on any type of HIV medications report that they are not consistently adherent to their medication regimen.

Current housing status was not associated with recent visit to an emergency room or overnight hospital stay. However, there are indicators that those with longer periods of unstable housing are high end users. For example, among CHAIN participants who were homeless or unstably housed at two interview periods, 66% reported emergency room visits or hospital stays during this time. The odds of a hospital stay or emergency room visit were over twice as high for those without stable housing as for those continuously in stable housing (OR 2.17, CI 1.15,4.07) (data not shown). This is consistent with prior CHAIN reports (Aidala et al. 2001) and other research that has shown more emergency room and hospital visits among homeless or unstably housed New Yorkers living with HIV/AIDS (Arno et al. 1996; Smith et al.2000).

### Health Outcomes

Although housing status, housing services and health outcomes are the topic of a companion report, Table 5 presents bivariate relationships between housing status at baseline interview and multiple health indicators. In general, there are fewer differences in functional health status by housing status than with regard to clinical markers of HIV disease such as t-cell count and viral load. There are important differences in health burden from infectious disease other than HIV. Compared to 40% of individuals in stable housing, more than half of PLWH who are homeless (57%), in temporary or transitional housing (53%), or doubled up with others (52%), report being diagnosed or experiencing symptoms of one or more of the following in the six months prior to interview: thrush, PCP, bacterial pneumonia, KS, CMV retinitis or colitis, MAI or MAC, salmonella, PML, cryptococcosis, TB, toxoplasmosis, histoplasmosis, cervical cancer, cervical dysplasia, hepatitis, herpes, chlamydia, gonorrhea, syphilis, HPV, PID or other STD. Housing status is associated with mental health symptoms. More than half of the homeless have scores on a standardized mental health screening tool (MOS-Sf12) indicating 'very low' mental health functioning; 52% scored below 37.0, the mean score seen in psychiatric in-patient populations. Individuals in temporary or transitional housing programs have much better scores, comparable to persons in stable housing. The provision of mental health services as part of supportive housing programs likely contributes to improved mental health functioning among formerly homeless residents.

### Predicting Entry and Maintenance in HIV Medical Care

For the final section of this report we examine the extent to which homelessness/unstable housing or other housing difficulties are associated with lack of consistent HIV medical care or lack of care that meets clinical practice standards. We also examine the role of housing services for entry into care among those not in care, and for maintenance in care over time. *Housing need* is indicated by either homelessness or unstable housing at the time of interview, or self-report of housing difficulties or need for housing assistance. Receipt of *housing assistance* is indicated by past six month contact with an agency or paid provider for help with solving housing problems, or current

**Table 5. Health Indicators by Housing Status**

	<b>Stable, Own Place</b>	<b>Temp Doubled Up</b>	<b>Temp/ Transit Housing</b>	<b>Home- less</b>
Total Sample (n=)	487	54	85	67
<b>In general, would you say your health is...</b>				
<i>Excellent or Very Good</i>	33%	35%	28%	25%
<i>Good</i>	33	17	34	33
<i>Fair or Poor</i>	33	48	38	42
<b>Compared to six months ago, is your health generally...</b>				
<i>Better</i>	49%	43%	50%	50% *
<i>Same</i>	40	30	25	31
<i>Worse</i>	12	28	15	19
<b>Physical Health Functioning<sup>1</sup></b>				
<i>Physical Health Summary Score, mean(sd) (PCS)</i>	42.26 (11.1)	42.35 (12.1)	41.28 (11.6)	39.56 (11.4)
<i>"Poor" Physical Functioning</i>	55%	63%	60%	64%
<b>Mental Health Functioning<sup>2</sup></b>				
<i>Mental Health Summary Score, mean(sd) (MCS)</i>	43.44 (12.4)	39.19 (13.1)	43.23 (12.0)	39.94 ** (11.2)
<i>"Very Low" Mental Health</i>	34%	46%	26%	52% **
<b>T-cell Count</b>				
<i>Below 200</i>	20%	26%	31%	37% *
<i>200 - 499</i>	46	43	47	37
<i>500 or higher</i>	34	32	22	26
<b>Viral load</b>				
<i>10,000 + or "bad"</i>	17%	31%	18%	30% **
<i>9999 - 400</i>	25	27	38	18
<i>Undetectable, below 400, "good"</i>	58	43	43	53
<b>Chronic Disease<sup>3</sup></b>				
<i>Any chronic disease diagnosed or symptomatic past 6 months</i>	58%	50%	52%	60%
<b>Infectious Disease/ STDs<sup>4</sup></b>				
<i>Any opportunistic infection, hepatitis, or STD past 6 months</i>	40%	52%	53%	57% **

# p=.10      \* p < .05      \*\* p < .01      \*\*\* p < .001

1. MOS SF-36 Physical Component Summary Score mean (sd). Scores below 45.0 are associated with physical limitations sufficient to impair regular employment.
2. MOS SF-36 Mental Component Summary Score mean (sd). Scores below 37.0 are consistent with psychiatric diagnosis and the mean scores seen in psychiatric inpatient populations.
3. Any of the following diagnosed or symptomatic during the past six months: Asthma, hypertension, cardio-vascular disease (heart problems), high cholesterol, diabetes, arthritis, chronic sinusitis.
4. Any of the following diagnosed or symptomatic during the past six months: Thrush, PCP, bacterial pneumonia, KS, CMV retinitis or colitis, MAI or MAC, salmonella, PML, Cryptococcosis, TB, toxoplasmosis, histoplasmosis, cervical cancer, cervical dysplasia, hepatitis, herpes, chlamydia, gonorrhea, syphilis, HPV, chancroid, PID or other STD.

receipt of rental assistance. Prior CHAIN studies (Aidala et al. 2001b; Messeri et al 2002 )lead us to expect that housing need is a major impediment to entry and maintenance in care, and that receipt of housing services facilitates connection to care.

A series of multiple logistic regression models were estimated, pooling data for all the CHAIN cohorts (n=1660). Since housing needs are fluid, each interview with each CHAIN study participant constituted an opportunity to examine the relationship between housing need and receipt of housing assistance for medical care outcomes, controlling for a wide range of individual characteristics and contextual factors that other research has shown to affect use of HIV medical services (Uphold et al, 2005). Models control for socio-demographics (age, gender, race/ethnicity, risk exposure group); SES (education, income, living in poverty neighborhood); health status (t-cell count); mental health and substance abuse co-morbidities (very low mental health functioning score, problem drug use past six months); receipt of supportive services (case management, transportation, mental health and substance abuse services); length of time since HIV diagnosis, and secular trend. Medical case management (helped respondent get specific medical services or referred to medical services) and social services case management (developed a care plan, helped get or referred to specific social services, coordinated social services, helped fill out forms for entitlements) are considered separately. Bivariate and multivariate cross-sectional time series logistic regression models were constructed using generalized estimation equation (GEE) random effects procedures to adjust standard errors of the estimates of the regression coefficients to account for the dependency among multiple observations contributed by the same individual.

For the first set of outcome variables, we examined any medical care—regardless of the level or type of clinical service reported. A respondent is considered to be in medical care if he or she can name a current medical provider and had at least one visit to that provider in the six months prior to interview. Conversely a respondent is considered to have no medical care if he or she does not have a current medical provider or has not visited his or her current provider since the time of the previous interview. Using this analytical formulation, we considered retention in care as the continuity of a patient's being seen at the same medical provider organization. For patients receiving medical care in a clinic or a group practice, medical provider refers to the agency and not the individual provider

Table 6 presents the adjusted odds ratios associated with 'any medical care' outcomes. Model 1 tests the relationship between housing need, mental health and substance abuse co-morbidities, and the receipt of housing assistance and other supportive services at each interview period as these factors increase or decrease the likelihood that the individual reports a regular source of medical care and at least one outpatient visit for HIV care in the past 6 months. Model 2 examines continuity of medical care at successive interviews. Model 3 examines predictors of entry into care among respondents who were out of care at the previous interview period.

Housing need is a barrier to entering and staying in medical care; receipt of housing assistance has a strong effect on having a regular source of medical care, continuity of care over time, and entry into care among those who were previously unconnected. The strongest effect of housing need and housing services is on entry into care. PLWH who were not in care and who were homeless, unstably housed or experiencing other housing needs were only half as likely to have accessed care by the next interview as those who did not have housing needs (AOR 0.49, CI 0.27,0.87). Persons outside of care who received housing assistance were two and one-half times as likely to have transitioned into care as unconnected individuals who had not

**Table 5. Health Indicators by Housing Status**

	<b>Stable, Own Place</b>	<b>Temp Doubled Up</b>	<b>Temp/ Transit Housing</b>	<b>Home- less</b>
Total Sample (n=)	487	54	85	67
<b>In general, would you say your health is...</b>				
<i>Excellent or Very Good</i>	33%	35%	28%	25%
<i>Good</i>	33	17	34	33
<i>Fair or Poor</i>	33	48	38	42
<b>Compared to six months ago, is your health generally...</b>				
<i>Better</i>	49%	43%	50%	50% *
<i>Same</i>	40	30	25	31
<i>Worse</i>	12	28	15	19
<b>Physical Health Functioning<sup>1</sup></b>				
<i>Physical Health Summary Score, mean(sd) (PCS)</i>	42.26 (11.1)	42.35 (12.1)	41.28 (11.6)	39.56 (11.4)
<i>"Poor" Physical Functioning</i>	55%	63%	60%	64%
<b>Mental Health Functioning<sup>2</sup></b>				
<i>Mental Health Summary Score, mean(sd) (MCS)</i>	43.44 (12.4)	39.19 (13.1)	43.23 (12.0)	39.94 ** (11.2)
<i>"Very Low" Mental Health</i>	34%	46%	26%	52% **
<b>T-cell Count</b>				
<i>Below 200</i>	20%	26%	31%	37% *
<i>200 - 499</i>	46	43	47	37
<i>500 or higher</i>	34	32	22	26
<b>Viral load</b>				
<i>10,000 + or "bad"</i>	17%	31%	18%	30% **
<i>9999 - 400</i>	25	27	38	18
<i>Undetectable, below 400, "good"</i>	58	43	43	53
<b>Chronic Disease<sup>3</sup></b>				
<i>Any chronic disease diagnosed or symptomatic past 6 months</i>	58%	50%	52%	60%
<b>Infectious Disease/ STDs<sup>4</sup></b>				
<i>Any opportunistic infection, hepatitis, or STD past 6 months</i>	40%	52%	53%	57% **

# p=.10      \* p < .05      \*\* p < .01      \*\*\* p < .001

1. MOS SF-36 Physical Component Summary Score mean (sd). Scores below 45.0 are associated with physical limitations sufficient to impair regular employment.
2. MOS SF-36 Mental Component Summary Score mean (sd). Scores below 37.0 are consistent with psychiatric diagnosis and the mean scores seen in psychiatric inpatient populations.
3. Any of the following diagnosed or symptomatic during the past six months: Asthma, hypertension, cardio-vascular disease (heart problems), high cholesterol, diabetes, arthritis, chronic sinusitis.
4. Any of the following diagnosed or symptomatic during the past six months: Thrush, PCP, bacterial pneumonia, KS, CMV retinitis or colitis, MAI or MAC, salmonella, PML, Cryptococcosis, TB, toxoplasmosis, histoplasmosis, cervical cancer, cervical dysplasia, hepatitis, herpes, chlamydia, gonorrhea, syphilis, HPV, chancroid, PID or other STD.

received housing assistance (AOR 2.49, CI 1.39,4.47). Current problem drug use decreases the odds of maintaining continuity of medical care, and is a barrier to accessing care among the unconnected. Receipt of mental health services increases the odds that an unconnected PLWH will access care. Interestingly, case management oriented toward addressing social service needs is more consistently associated with access and maintenance in care than medical case management, specifically oriented to obtaining or coordinating medical services (Table 6).

#### Access and Maintenance in Care that Meets Practice Guidelines

The same analytical approach was used to examine housing need and receipt of housing assistance as predictors of receipt of HIV medical care that meets good clinical practice guidelines (Table 7). A respondent is considered to be “in appropriate medical care” at each interview in which all indicators are consistent with standards for appropriate medical care for HIV. For the continuity analysis, a person is considered retained in care if he or she continues to receive appropriate HIV care at successive interviews. We also examine predictors of entry into appropriate care among respondents who were not in care or receiving less than appropriate medical care at the previous interview period. As previously, all models control for age, race/ethnicity, education, income, poverty neighborhood, risk exposure group, t-cell count, transportation services, year of HIV diagnosis, and year of cohort enrollment, in addition to mental health, drug use, and service utilization variables.

PLWH who are homeless/unstably housed or have other housing needs are substantially less likely to be receiving medical care that meets good clinical practice standards (AOR 0.74, CI 0.64,0.86). Low mental health functioning and current problem drug use are also associated with lower odds of receiving appropriate medical care for HIV. On the other hand, the odds of receiving medical care that meets clinical practice guidelines are substantially increased for persons who receive housing assistance compared to persons not receiving such assistance (AOR 1.50, CI 1.31,1.77). Housing assistance is also strongly associated with continuity of care that meets clinical practice standards (AOR 1.27, CI 1.04,1.56), and entry into care that meets practice standards among those who were not in care or in care that did not meet guidelines (AOR 1.87, CI 1.32,2.64).

Receipt of mental health treatment, substance abuse treatment, and case management oriented toward addressing social service needs also increases the odds that a CHAIN participant will be receiving medical care that meets clinical standards. Receipt of mental health and social service case management are associated with continuity of appropriate care. Only social services case management, in addition to receipt of housing assistance, is significantly associated with transitioning into care that meets good practice guidelines.

**TABLE 6 -- Housing Need, Housing Services and Entry and Maintenance in HIV Medical Care**

	Model 1 Regular Source of Medical Care		Model 2 Continuity of Medical Care		Model 3 Entry into Regular Source of Medical Care from No Care	
	AOR	95% CI	AOR	95% CI	AOR	95% CI
<b>Housing Need</b>						
Unstably housed or report need for housing assistance	0.84	(0.66, 1.07)	0.84	(0.70, 0.99) *	0.49	(0.27, 0.87) *
<b>Co-Morbidities</b>						
Very low mental health functioning <sup>b</sup>	0.87	(0.68, 1.13)	0.83	(0.69, 1.00)	1.00	(0.55, 1.81)
Current problem drug use <sup>c</sup>	0.78	(0.60, 1.02)	0.95	(0.78, 1.16) *	0.44	(0.25, 0.80) **
<b>Housing Services</b>						
Assistance with housing needs or receipt of rental assistance	1.54	(1.21, 1.97) ***	1.23	(1.02, 1.47) *	2.49	(1.39, 4.47) **
<b>Supportive Services</b>						
Mental health services <sup>d</sup>	1.53	(1.15, 2.03) **	1.14	(0.95, 1.37)	2.67	(1.22, 5.86) **
Substance abuse treatment <sup>e</sup>	1.17	(0.86, 1.60)	0.98	(0.78, 1.22)	1.28	(0.65, 2.55)
Medical case management <sup>f</sup>	0.93	(0.66, 1.29)	0.85	(0.69, 1.06)	1.29	(0.60, 2.76)
Social services case management <sup>g</sup>	2.01	(1.49, 2.70) ***	1.22	(1.00, 1.48) *	1.81	(0.92, 3.56)

\*  $p \leq .05$ ; \*\*  $p \leq .01$ ; \*\*\*  $p \leq .001$

<sup>a</sup> Logistic regression equations using random effects procedure to adjust for the dependency among multiple observations contributed by the same individual. Model 1 tests the relationship between housing need, co-morbidities, and the receipt of housing and other supportive services at each interview period as these factors increase or decrease the likelihood that the individual reports a regular source of medical care and at least one outpatient visit for HIV care in the past 6 months (n=1607 respondents interviewed up to 8 times each for a total of 5,720 observation points). Model 2 examines continuity of medical care at successive interviews (n=1271 respondents with over time data, 3684 observation points). Model 3 examines predictors of entry into appropriate care among respondents who were in care at the previous interview period (n=523 respondents who were out of care at one or more interview periods, 673 observation points). All models control for age, race/ethnicity, education, income, poverty neighborhood, risk exposure group, t-cell count, transportation services, year of HIV diagnosis, and year of cohort enrollment.

<sup>b</sup> MOS-SF36 Mental Component Summary Score <37.0, mean score among psychiatric inpatient populations

<sup>c</sup> Any use of heroin, cocaine, crack or methamphetamine, or problem drinking (CAGE) currently or past six months

<sup>d</sup> One or more visits to a mental health professional

<sup>e</sup> Methadone, residential, in-patient, out-patient, therapeutic community, detox

<sup>f</sup> Case manager has helped respondent get medical services or referred to medical services.

<sup>g</sup> Case manager developed a care plan, helped get or referred to specific social services, coordinated social services, filled out forms for entitlements.

**TABLE 7 -- Housing Need, Housing Services and Receipt of Medical Care that Meets Good Clinical Practice Standards**

	Model 1 Receiving Medical Care that Meets Clinical Practice Standards <sup>a</sup>		Model 2 Continuity of Medical Care that Meets Clinical Practice Standards		Model 3 Entry into Medical Care that Meets Clinical Practice Standards	
	AOR	95% CI	AOR	95% CI	AOR	95% CI
<b>Housing Need</b>						
Unstably housed or report need for housing assistance	0.74	(0.64, 0.86) ***	0.79	(0.65, 0.96) *	0.78	(0.55, 1.10)
<b>Co-Morbidities</b>						
Very low mental health functioning <sup>b</sup>	0.81	(0.69, 0.94) **	0.84	(0.68, 1.03)	0.75	(0.53, 1.08)
Current problem drug use <sup>c</sup>	0.75	(0.63, 0.88) ***	0.80	(0.64, 0.99) *	0.71	(0.49, 1.01)
<b>Housing Services</b>						
Assistance with housing needs or receipt of rental assistance	1.50	(1.31, 1.77) ***	1.27	(1.04, 1.56) *	1.87	(1.32, 2.64) ***
<b>Supportive Services</b>						
Mental health services <sup>d</sup>	1.42	(1.21, 1.67) ***	1.60	(1.29, 2.00) ***	1.32	(0.90, 1.92)
Substance abuse treatment <sup>e</sup>	1.26	(1.04, 1.52) *	1.18	(0.91, 1.54)	1.40	(0.89, 2.19)
Medical case management <sup>f</sup>	1.07	(0.88, 1.29)	1.17	(0.91, 1.51)	0.83	(0.52, 1.30)
Social services case management <sup>g</sup>	1.70	(1.43, 2.01) ***	1.40	(1.12, 1.74) **	1.77	(1.19, 2.64) **

\*  $p \leq .05$ ; \*\*  $p \leq .01$ ; \*\*\*  $p \leq .001$

<sup>a</sup> Logistic regression equations using random effects procedure to adjust for the dependency among multiple observations contributed by the same individual. Model 1 tests the relationship between housing need, co-morbidities, and the receipt of housing and other supportive services at each interview period as these factors increase or decrease the likelihood that the individual is receiving medical care that meets good clinical practice standards (n=1607 respondents interviewed up to 8 times each for a total of 5,720 observation points). Model 2 examines continuity of appropriate care at successive interviews (n=1203 respondents with over time data; 3133 observation points). Model 3 examines predictors of entry into appropriate care among respondents who were not receiving appropriate medical care at the previous interview period (n=622 respondents who were not receiving appropriate care at one or more interview periods, 956 observation points). All models control for age, race/ethnicity, education, income, poverty neighborhood, risk exposure group, t-cell count, transportation services, year of HIV diagnosis, and year of cohort enrollment.

<sup>b</sup> MOS-SF36 Mental Component Summary Score <37.0, mean score among psychiatric inpatient populations

<sup>c</sup> Any use of heroin, cocaine, crack or methamphetamine, or problem drinking (CAGE) currently or past six months

<sup>d</sup> One or more visits to a mental health professional

<sup>e</sup> Methadone, residential, in-patient, out-patient, therapeutic community, detox

<sup>f</sup> Case manager has helped respondent get medical services or referred to medical services.

<sup>g</sup> Case manager developed a care plan, helped get or referred to specific social services, coordinated social services, filled out forms for entitlements.

## Discussion

While increasing attention is being paid to 'the homeless' as a special population, CHAIN research has consistently shown that homelessness is only the most extreme form of housing need. The majority of persons living with HIV in New York City will experience unstable housing and the need for housing assistance at some point during the course of their illness. In addition, housing instability, including living in a temporary or transitional housing program, as well as literal homelessness, is associated with delayed entry into medical care, not receiving care that meets good clinical practice standards, dropping out of care, and inconsistent use of antiretroviral medications, even when indicated by established clinical markers.

Data provided from 5857 interviews conducted from 1994 to 2004 with 1661 persons living with HIV/AIDS representing three cohorts of CHAIN study participants demonstrate a strong and consistent relationship between homelessness/ unstable housing or housing need, and remaining outside of or marginal to HIV medical care. In contrast, it is evident housing services have consequences for increasing access and engagement with medical care and appropriate treatment. The relationship between housing status, housing assistance and medical care outcomes remain essentially unchanged regardless of concurrent receipt of other services indicating an independent effect of housing as such. Medical case management providing medical referral or focusing on medical coordination did not increase the odds of entering medical care among those outside of care, nor facilitate access to care that meets clinical practice standards. Findings strongly suggest that it is the social service planning element of case management and not medical referrals per se, that is associated with improved access to medical care. Currently HOPWA and RW portfolios contain elements of care coordination; perhaps reviewing the structure of these service categories might be helpful in creating a responsive portfolio.

The longitudinal analyses also point to the importance of additional supportive services, especially mental health services and substance abuse treatment, as exerting an impact on entry and retention in medical care. This points to the importance of service linkages and integrated service models of care, especially for unstably housed persons with HIV who also struggle with mental illness and chemical dependency.

The decrease in funding to provide housing assistance and reduced support for case management and other services oriented toward identifying housing resources for PLWH would seem ill advised. The ability of substantial numbers of infected persons to maintain stable housing without housing assistance is highly questionable. Findings from the current report are consistent with findings from prior analyses (Aidala et al. 2000; 2001; Messeri et al. 2002) regarding barriers to care associated with unmet housing need and the impact of housing assistance for securing and maintaining connection to appropriate care. Housing should be understood as a 'core' service needed to achieve outcomes that affect the HIV-related clinical status of persons living with HIV/AIDS. Improving access to housing will improve access to and effectiveness of HIV care and treatment.

## **References**

- Abramson D, Aidala A, Lee F. (2000). Comorbid Conditions: Intersecting Needs among the CHAIN Cohort. Community Health Advisory & Information Network Update Report #24. Columbia University: Mailman School of Public Health.
- Aidala A, Davis N, Abramson D, Lee G. (2001a). Housing Status and Health Outcomes among Persons with HIV/AIDS. Community Health Advisory & Information Network Update Report #41. Columbia University: Mailman School of Public Health.
- Aidala A, Lee G. (2000). Housing Assistance and Housing Stability Among Persons Living with HIV/AIDS. Community Health Advisory & Information Network Update Report #32. Columbia University: Mailman School of Public Health.
- Aidala A, Lee G. (2006). Housing Status and Entry into HIV Medical Care. Community Health Advisory & Information Network Report 2006-3. Columbia University: Mailman School of Public Health.
- Aidala A, Messeri P, Abramson D, Lee G. (2001b). Housing and Medical Care among Persons Living with HIV/ AIDS. Community Health Advisory & Information Network Update Report #37. Columbia University: Mailman School of Public Health.
- Aidala A, Needham-Waddell, Sotheran J. (2005). Delayers, Drop-outs, the Unconnected, and “Unmet Need.” Community Health Advisory & Information Network Report 2005-3. Columbia University: Mailman School of Public Health.
- Aidala A, Needham-Waddell L, Sotheran J, Cross J. (2004). Factors Associated with Delayed Entry into HIV Medical Care. New York City Department of Health and Mental Hygiene: Office of AIDS Policy Coordination.
- Arno PS, Bonuck KA, Green J, Bennett CL, Fahs MC, Maffeo C, Drucker E. (1996). The impact of housing status on health care utilization among persons with HIV disease. *J Health Care Poor Underserved*. 7(1):36-49.
- Flocke SA. (1997). Measuring attributes of primary care: development of a new instrument. *J Family Practice*,45(1):64-74.
- Institute of Medicine (IOM). (1994). *Defining primary care: An interim report*. Washington, DC: National Academy Press.
- Institute of Medicine (IOM). (1996). *Primary Care: America’s Health in a New Era*. Washington, DC: National Academy Press.
- Messeri, P., Abramson, D., Aidala, A., Lee, F. and Lee, G. (2002). The Impact of Ancillary HIV Services on Engagement in Medical Care in New York City. *AIDS Care*, 14(Supp1): S15-S30.
- New York State AIDS Institute (2003). *Criteria for the Medical Care of Adults with HIV Infection*. Albany, NY: New York State Department of Health.
- New York State AIDS Institute (2007). *The Primary Care Approach To The HIV-Infected Patient*. Albany, NY: New York State Department of Health.
- Smith M Y, Rapkin BD, Winkl G, Springer C, Chhabra R, Feldman I. (2000). Housing status and health care service utilization among low-income persons with HIV/AIDS. *J Gen Intern Med*, 15: 731-738.
- Uphold CR and Mkanta WN.(2005). Use of health services among persons living with HIV infection: State of the science and future directions. *AIDS Patient Care and STDs*, 19(8):473-485.