Published in final edited form as:

J Acquir Immune Defic Syndr. 2015 August 01; 69(4): 487–492. doi:10.1097/QAI.0000000000000619.

HIV Infection and Linkage to HIV-Related Medical Care in Large Urban Areas in the United States, 2009

Benjamin T. Laffoon, BS[*], **H. Irene Hall, PhD**[*], **Aruna Surendera Babu, MPH**[†], **Nanette Benbow, MAS**[‡], **Ling C. Hsu, MPH**[§], **Yunyin W. Hu, MPH**[‖], **Urban Areas HIV Surveillance Workgroup**

[*]Division of HIV/AIDS Prevention, National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention, Centers for Disease Control and Prevention, Atlanta, GA

[†]ICF Macro International, Inc, Atlanta, GA

[‡]HIV/STI Services Division, Chicago Department of Public Health, Chicago, IL

[§]Population Health Division, San Francisco Department of Public Health, San Francisco, CA

[‖]Division of HIV and STD Programs, Los Angeles County Department of Public Health, Los Angeles, CA.

Abstract

Background: Residents of urban areas have accounted for the majority of persons diagnosed with HIV disease in the United States. Linking persons recently diagnosed with HIV to primary medical care is an important indicator in the National HIV/AIDS Strategy.

Methods: We analyzed data reported to the HIV Surveillance System in 18 urban areas in the United States. Standardized executable SAS programs were distributed to determine the number of HIV cases living through 2008, number of HIV cases diagnosed in 2009, and the percentage of those diagnosed in 2009 who had reported CD4 lymphocyte or HIV viral load test results within 3 months of HIV diagnosis. Data were presented by jurisdiction, age group at diagnosis, race/ethnicity, sex at birth, birth country, disease stage, and transmission category.

Results: By jurisdiction, the percentage of persons diagnosed in 2009 with at least 1 CD4 or HIV viral load test within 3 months of diagnosis ranged from 48.5% to 92.5% (median: 70.9). The percentage of persons linked to care varied by age group and by racial/ethnic groups. Fourteen of the 18 areas reported that the percentage of persons linked to care was greater than 65%, the baseline measure indicated in the National HIV/AIDS Strategy.

Conclusions: A wide range in percent linked to HIV medical care was observed between residents of 18 urban areas in the United States with noted age and racial disparities. Routine

Correspondence to: Benjamin T. Laffoon, BS, Centers for Disease Control and Prevention, 1600 Clifton Road NE, MS E47, Atlanta, GA 30329 (blaffoon@cdc.gov).

The Urban Areas HIV Surveillance Workgroup members are listed in Appendix.

The authors have no funding or conflicts of interest to disclose.

The findings and conclusions in this article are those of the authors and do not necessarily represent the views of the Centers for Disease Control and Prevention.

testing and linkage efforts and intensified prevention efforts should be considered to increase access to primary HIV-related medical care.

Keywords

HIV; linkage to care; HIV care indicators; HIV infection; HIV in urban areas

INTRODUCTION

Since the beginning of the HIV epidemic, residents of urban areas have accounted for the majority of persons diagnosed with HIV disease in the United States. In 2009, more than 80% of reported HIV cases diagnosed in the United States were in persons who resided in an urban area with more than 500,000 residents.[1] To address the high-HIV burden, many cities have implemented expanded programs to test and link persons with HIV to medical care.

Linkage to medical care is an essential step in the continuum of care. Persons who promptly engage in care are more likely to initiate antiretroviral therapy earlier and to attain viral suppression.[2] Viral suppression is linked to improved health outcomes and reduced risk of transmitting the virus to partners, an essential component of a successful approach to reduce HIV incidence. In addition, persons linked to care can benefit from screening and counseling for risk behaviors.[3]

In 2010, the National HIV/AIDS Strategy (NHAS) was released and included an objective related to the routine linkage of persons diagnosed with HIV to primary HIV-related medical care. This objective called for an increase in the percentage of persons diagnosed with HIV who are linked to medical care from 65% to 85% by 2015. Local HIV surveillance data are analyzed to assist with more effective prevention program planning. The results of local analyses can be used to tailor existing prevention programs or to identify service gaps in prevention efforts.[4]

In this article, initial measures to evaluate local progress toward meeting the NHAS objective for linkage to care are presented. HIV surveillance data reported to state and local health departments are used to describe the number and rate of persons diagnosed with HIV in 2009, and the percentage and characteristics of persons recently diagnosed with HIV who were linked to care in 18 urban jurisdictions.

METHODS

Since 1982, all 50 US states and the District of Columbia have reported AIDS cases to the Centers for Disease Control and Prevention (CDC) in a uniform format. Over time, states implemented surveillance programs to include HIV cases that have not progressed to AIDS. By April 2008, all states had implemented name-based HIV surveillance.[1] Data are reported to CDC without identifying information.[1]

Metropolitan Statistical Areas (MSAs), defined by the Office of Management and Budget, are areas with at least 1 urbanized municipality of 50,000 or more population, and an adjacent territory that has a high degree of social and economic integration with the core

as measured by commuting ties.[5] For this analysis, cities/counties were selected if (1) at least 7500 adolescents and adults (age, ≥13 years) were living with HIV infection in their respective MSA at the end of 2009 using data reported to CDC through June 2011[1] and (2) CD4 and viral load (VL) test reporting that includes all values had been mandated and implemented for at least 2 years. Because results from HIV-related laboratory tests conducted in 2009 were critical for the analysis, sites were surveyed to determine the level of completeness by which these results were reported to the HIV surveillance system. A total of 19 areas were surveyed. Of these, 18 met or exceeded levels of completeness required for inclusion in the analysis. The decision to report data based on city-level or county-level residence boundaries was made by the local surveillance jurisdiction. Seven jurisdictions chose to report data based on city boundaries (Atlanta, GA; Baltimore, MD; Chicago, IL; Dallas, TX; Houston, TX; New York City, NY; and Washington, DC) and 11 selected county boundaries (Denver, CO; Detroit, MI; Los Angeles, CA; Miami, FL; Orlando, FL; Phoenix, AZ; Philadelphia, PA; San Diego, CA; San Francisco, CA; Seattle, WA; and Tampa, FL). The Boston, MA, MSA was one of the sites surveyed but it was excluded because of limited available laboratory data.

To standardize the analysis and ensure complete data, an executable SAS program was created and distributed to the participating sites to obtain local HIV case and laboratory data that may not have been reported to the CDC. The requested information included, as reported from January 2009, through August 2012, the number of persons diagnosed with HIV in 2009, the number of persons living with HIV through December 2008, and the number and percentage of persons diagnosed with HIV in 2009 who had evidence of linkage to HIV-related medical care by race/ethnicity (black/African American, Hispanic or Latino, white, other/multiple race), age at diagnosis, sex, country of birth (United States vs. foreign born/unknown), stage of disease at diagnosis (stage 3–AIDS vs. other), and transmission category [male-to-male sexual contact (MSM), injection drug use (IDU), MSM and IDU, heterosexual contact, other/unknown]. The number of persons for which country of birth was reported as other than the United States or was unknown was small, and these groups were combined. A person newly diagnosed with HIV in 2009 was considered to have evidence of linkage to HIV-related medical care if one or more laboratory test results for CD4 lymphocyte or HIV VL testing within 3 months of HIV diagnosis were reported.[6] Rates for each city or county were calculated using 2010 population estimates from the US Census Bureau. City-level population estimates by single year of age for persons aged 13 years or older were not available for 2009.

RESULTS

There were a total of 16,394 adult and adolescent residents of 18 cities or counties diagnosed with HIV in 2009. The rate of new diagnoses in 2009 per 100,000 residents ranged from 14.6 (Phoenix, AZ) to 188.2 (Atlanta, GA) (Table 1). Rates among persons living with HIV infection at the end of 2008 per 100,000 ranged from 260.0 (Phoenix, AZ) to 3210.4 (Atlanta, GA). Nine areas reported a rate of persons living with HIV infection greater than 1% of the population: Atlanta, GA (3.2%), Baltimore, MD (2.6%), Washington, DC (2.4%), San Francisco, CA (1.9%), New York City, NY (1.4%), Dallas, TX (1.3%), Denver, CO (1.3%), Philadelphia, PA (1.2%), and Miami, FL (1.1%).

The percentage of persons diagnosed in 2009 with at least 1 CD4 or HIV VL test within 3 months of diagnosis (linked to care) ranged from 48.5% (Miami, FL) to 92.5% (Denver, CO) with a median of 70.9% (Table 2). Fourteen of the 18 areas reported the percentage of persons linked to care greater than 65%. In Denver, CO; Seattle, WA; and San Francisco, CA, more than 85% of persons diagnosed with HIV in 2009 were linked to care.

Among men, the percentage linked to care ranged from 49% (Miami, FL) to 95% (Denver, CO) with a median of 71%, and among women, the percentage ranged from 47% (Miami, FL) to 97% (San Francisco, CA) with a median of 72% (Table 3).

The percentage of persons linked to care varied by age group. The median was lower among persons aged 13–24 years (64%) and increased among persons in older age groups. Of persons in the 25–44, 45–64, and ≥65 years age groups, the median percentages were 72%, 78%, and 83%, respectively. Additionally, differences in the percentage of persons linked to care were observed between racial/ethnic groups. The median percentage among Whites, Blacks/African Americans, Hispanics or Latinos, and those reported with other/multiple races was 79%, 67%, 76%, and 77%, respectively. Differences between racial/ethnic groups were also observed within jurisdictions. Whites, in 16 jurisdictions, and Hispanics or Latinos, in 14 jurisdictions, had higher percentages of linkage to care than blacks/African Americans (Fig. 1).

The median percentage linked to care among persons diagnosed with stage 3 HIV infection (AIDS) was higher (98%), compared with those diagnosed with stage 1, stage 2, or unknown stage (60%). Among persons who were born in the United States and in a foreign country, the median percentage linked to care was 73% and 71%, respectively.

The median percentage for transmission categories for persons linked to care was distributed as follows: MSM/IDU (75%), MSM (74%), and IDU (72%). A greater percentage of white MSM (82%) than Hispanic or Latino MSM (76%), and Black/African American MSM (70%) were linked to care.

DISCUSSION

The burden of HIV was high in the areas included in this analysis, with more than 1% of the population living with HIV in 9 areas. Three (Denver, San Francisco, Seattle) of the 18 selected geographic areas met the NHAS goal[7] of 85% of persons newly diagnosed with HIV infection being linked to primary medical care within 3 months of diagnosis. Eleven of the remaining 15 areas demonstrated that greater than 65% of newly diagnosed persons were linked to care within 3 months of diagnosis of HIV infection. Differences in percent linked to primary HIV medical care between jurisdictions may be attributed to variations of social and environmental factors that have been shown to correlate with lower levels of access to primary HIV care, such as poverty, homelessness, unemployment, lack of transportation, and lower education.[8,9] These factors may also contribute to the differences in linkage to care observed between the age and racial/ethnic groups included in this analysis. To address these differences, CDC supports various projects, such as the Secretary’s Minority AIDS Initiative Fund Care and Prevention in the United States Demonstration Project, in 8 states (6 of which

are southern states). The goals of this project include expanding and improving HIV testing capacity among racial and ethnic minorities and optimizing linkage to, retention in, and reengagement with prevention and care services for racial and ethnic minorities diagnosed with HIV.[10]

These analyses are subject to limitations. First, the data were not adjusted for reporting delays, and the number of persons diagnosed in 2009 and the number of persons living with HIV in 2008 may have been underestimated. These data also do not include persons who resided in the geographic areas and who were infected with HIV but were not diagnosed. These analyses are based on test results reported and entered local surveillance systems whether or not these results were reported to CDC. Laboratory reporting of CD4 and VL test results to local surveillance programs may be incomplete, and local sites may not have entered all of the reported test results into their surveillance database. The use of 1 reported CD4 lymphocyte or VL test result as a definition of linkage to care may overestimate linkage to quality HIV-related medical care in areas where HIV testing centers submit samples for CD4 or VLs testing without offering ongoing medical care to HIV-infected persons. The percentage linked to care may be underestimated for sites that have less complete laboratory data and may vary by jurisdiction depending on the maturity of their laboratory reporting system. As additional laboratory test result data become available to HIV surveillance programs, analyses of other NHAS indicators related to access and retention in HIV-related medical care are possible.

A wide range in the level of linkage to HIV medical care was observed between residents of 18 urban areas in the United States with noticeable age and racial disparities. Linkage to HIV-related primary medical care is 1 factor in measuring the continuum of care for those with a recent HIV diagnosis. Continued routine testing and linkage efforts, such as case management-based linkage to medical care,[11,12] and intensified prevention efforts should be considered to increase access to primary HIV-related medical care.

APPENDIX

Urban Areas HIV Surveillance Workgroup Members

Rick DeStephens[1], Julia Skinner[1], Mersija Hadzihasanovic[1], Karen Mark[2], Steven Starr[2], Nanette Benbow[3], Donna Peace[3], Anita Watkins[4], Tiffany West[5], Taskrik Ahmed[5], Lorene Maddox[6], Rodriques Lambert[7], Cheryl Ward[8], Yunyin W. Hu[9], Douglas Frye[9], Colin Flynn[10], Attillio Zarrella[10], Karen MacMaster[11], Mary-Grace Brandt[11], Kathryn Macomber[11], Eve Mokotoff[11], Elizabeth Hamilton[11], Sarah Braunstein[12], Colin Shepard[12], Bridget Anderson[13], Daniel Gordon[13], Martin Ngokion[14], Kathleen Brady[15], Mark Shpaner[15], Jim Kent[16], Ling Hsu[17], Jennifer Chase[18], Miranda Fanning[18], Rebecca Filipowich[18], Tom Jaenicke[19], Benjamin T. Laffoon[20], H. Irene Hall[20], Aruna Surendera Babu[20], Jane Kelly[20], Tebitha Kajese[20].

[1]Arizona Department of Health Services, [2]California Department of Public Health, [3]Chicago Department of Public Health, [4]Colorado Department of Public Health & Environment, [5]District of Columbia Department of Health, [6]Florida Department of Health, [7]Georgia

Department of Community Health, [8]Illinois Department of Public Health, [9]Los Angeles County Department of Public Health, [10]Maryland Department of Health and Mental Hygiene, [11]Michigan Department of Community Health, [12]New York City Department of Health & Mental Hygiene, [13]New York State Department of Health, [14]Pennsylvania Department of Health, [15]Philadelphia Department of Public Health, [16]Public Health—Seattle and King County, [17]San Francisco Department of Public Health, [18]Texas Department of State Health Services, [19]Washington State Department of Health, [20]Centers for Disease Control and Prevention.

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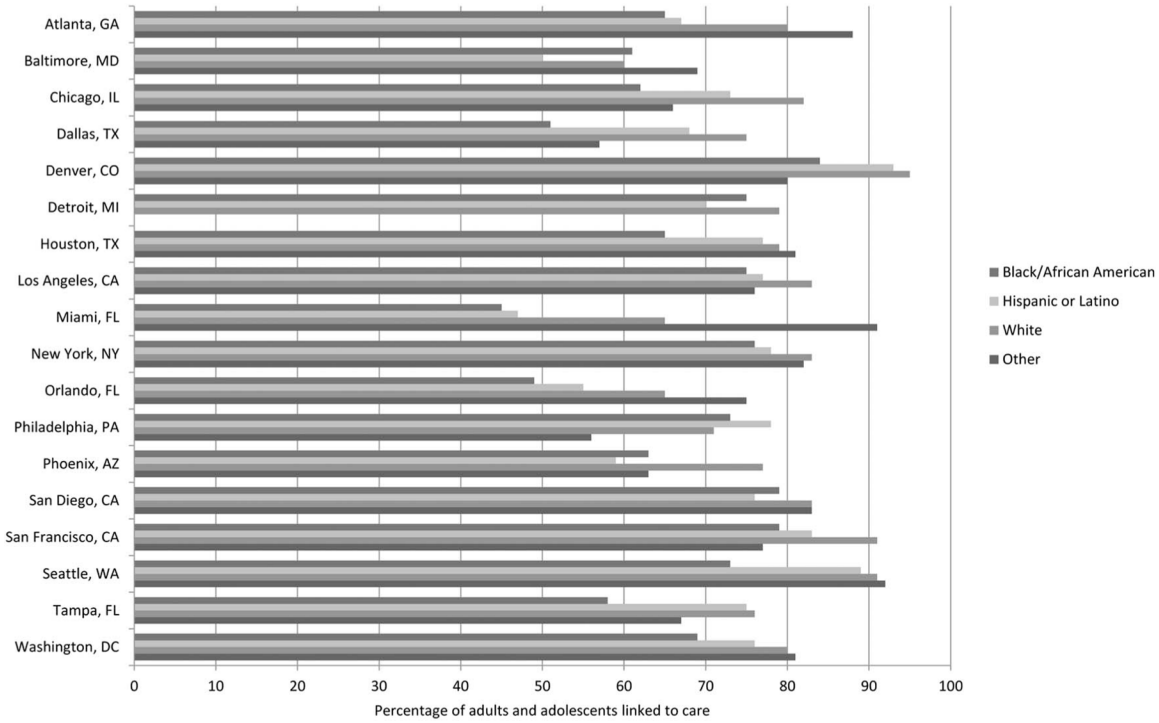

FIGURE 1.

Percentage of adults and adolescents linked to care within 3 months of diagnosis of HIV infection, by race/ethnicity and area of residence, 2009—in 18 selected US cities and counties.

TABLE 1.

Number and Rate of Adults and Adolescents Diagnosed With HIV Infection and Living With HIV, by Area of Residence—in 18 Selected US Cities and Counties

	Persons Diagnosed With HIV Infection, 2009		Persons Living With HIV Infection, Year-End 2008	
Area of Residence	**Number**	**Rate per 100,000**	**Number**	**Rate per 100,000**
Atlanta, GA *	674	188.2	11,496	3210.4
Baltimore, MD *	625	119.4	13,436	2566.7
Chicago, IL *	1140	50.8	19,539	870.3
Dallas, TX *	860	89.9	12,425	1298.2
Denver, CO †	159	31.8	6285	1256.2
Detroit, MI †	374	24.9	6324	421.6
Houston, TX *	1164	68.7	16,479	973.1
Los Angeles, CA †	2127	26.1	38,310	470.6
Miami, FL †	1326	62.8	23,799	1127.8
New York, NY *	3598	52.1	95,074	1376.5
Orlando, FL †	465	48.8	6577	690.1
Philadelphia, PA †	909	71.0	15,780	1232.8
Phoenix, AZ †	450	14.6	8019	260.0
San Diego, CA †	577	22.4	10,791	418.2
San Francisco, CA †	483	66.5	14,096	1941.5
Seattle, WA †	293	18.0	6146	376.8
Tampa, FL †	342	33.6	5177	507.9
Washington, DC *	828	156.8	12,694	2403.7

* City residents at the time of HIV diagnosis.

† County residents at the time of HIV diagnosis.

TABLE 2.

Number and Percentage of Adults and Adolescents Linked to Care Within 3 Months of Diagnosis of HIV Infection, by Area of Residence, 2009—in 18 Selected US Cities and Counties

	Persons Diagnosed With HIV Infection	Persons Linked to Care Within 3 Months of Diagnosis*	
Area of Residence	**Number**	**Number**	**%**
Atlanta, GA	674	462	68.6
Baltimore, MD	625	345	55.2
Chicago, IL	1140	776	68.1
Dallas, TX	860	533	62.0
Denver, CO	159	147	92.5
Detroit, MI	374	280	74.9
Houston, TX	1164	821	70.5
Los Angeles, CA	2127	1651	77.6
Miami, FL	1326	643	48.5
New York, NY	3598	2798	77.8
Orlando, FL	465	258	55.5
Philadelphia, PA	909	663	72.9
Phoenix, AZ	450	308	68.4
San Diego, CA	577	460	79.7
San Francisco, CA	483	413	85.5
Seattle, WA	293	255	87.0
Tampa, FL	342	229	67.0
Washington, DC	828	590	71.3

* Persons who have at least 1 CD4 or VL test within 3 months of diagnosis are considered as linked to care during that time.

J Acquir Immune Defic Syndr. Author manuscript; available in PMC 2024 August 16.

TABLE 3.

Percentage of Adults and Adolescents Linked to care[*] Within 3 Months of Diagnosis of HIV Infection, by Selected Characteristics and Area of Residence, 2009—in 18 Selected US Cities and Counties

	Atlanta, GA	Baltimore, MD	Chicago, IL	Dallas, TX	Denver, CO	Detroit, MI	Houston, TX	Los Angeles, CA	Miami, FL	New York, NY
Characteristics	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**
Sex										
Male	68	54	70	64	95	73	70	78	49	77
Female	70	58	60	54	60	81	72	72	47	79
Age at diagnosis, yrs										
13–24	51	61	64	42	87	71	63	72	30	75
25–44	70	50	69	68	94	76	71	77	45	78
45–64	78	60	70	70	92	79	77	83	60	79
≥65	67	69	82	60	100	†	86	74	74	86
Race/ethnicity										
Black/African American	65	61	62	51	84	75	65	75	45	76
Hispanic or Latino[‡]	67	50	73	68	93	70	77	77	47	78
White	80	60	82	75	95	79	79	83	65	83
Other[§]	88	69	66	57	80	†	81	76	91	82
Stage at diagnosis										
Stage 3 (AIDS)	98	98	99	99	98	98	100	99	97	99
Other	55	45	58	47	91	67	58	69	31	70
Country of birth										
United States	68	57	69	61	92	74	75	78	47	78
Foreign/missing	69	45	66	70	95	76	68	77	50	78
Transmission category										
MSM	62	74	76	64	94	75	70	80	48	78
IDU	50	66	58	55	86	76	77	84	58	77
MSM and IDU	75	80	73	0	100	†	89	80	71	76
Heterosexual contact[‖]	59	72	75	54	70	81	75	84	47	86
Other/Unknown	74	43	57	60	90	75	67	72	49	75

MSM

Characteristics	Atlanta, GA %	Baltimore, MD %	Chicago, IL %	Dallas, TX %	Denver, CO %	Detroit, MI %	Houston, TX %	Los Angeles, CA %	Miami, FL %	New York, NY %
Black/African American	56	73	67	50	91	74	61	75	37	72
Hispanic or Latino[‡]	60	50	76	71	95	†	77	80	47	77
White	83	77	89	75	94	84	81	83	66	85
Total	69	55	68	62	92	75	71	78	48	78

Characteristics	Orlando, FL %	Philadelphia, PA %	Phoenix, AZ %	San Diego, CA %	San Francisco, CA %	Seattle, WA %	Tampa, FL %	Washington, DC %
Sex								
Male	55	73	67	80	85	88	67	72
Female	56	74	76	75	97	81	68	71
Age at diagnosis, yrs								
13–24	34	72	58	73	83	68	54	57
25–44	57	72	65	78	84	87	71	73
45–64	67	75	83	88	89	97	71	74
≥65	42	72	100	85	100	100	83	87
Race/ethnicity								
Black/African American	49	73	63	79	79	73	58	69
Hispanic or Latino[‡]	55	78	59	76	83	89	75	76
White	65	71	77	83	91	91	76	80
Other[§]	75	56	63	83	77	92	67	81
Stage at diagnosis								
Stage 3 (AIDS)	99	98	99	100	98	99	99	98
Other	38	66	57	72	81	83	56	62
Country of birth								
United States	55	74	71	80	85	87	66	71
Foreign/missing	56	61	59	79	87	88	73	74
Transmission category								
MSM	56	76	66	83	87	89	66	73
IDU	60	69	72	60	93	82	72	72
MSM and IDU	33	47	59	75	77	94	78	45

Characteristics	Orlando, FL %	Philadelphia, PA %	Phoenix, AZ %	San Diego, CA %	San Francisco, CA %	Seattle, WA %	Tampa, FL %	Washington, DC %
Heterosexual contact[//]	50	77	73	80	95	80	66	69
Other/Unknown	60	68	74	56	68	82	67	72
MSM								
Black/African American	41	72	50	84	83	69	53	69
Hispanic or Latino[‡]	58	81	53	78	84	86	76	74
White	67	81	76	87	92	90	74	82
Total	55	73	68	80	86	87	67	71

[*] Persons who have at least 1 CD4 or VL test within 3 months of diagnosis of HIV infection are considered as linked to care during that time.

[†] Jurisdiction chose not to share these data for publication.

[‡] Hispanic or Latino can be of any race.

[§] Multiple race, American-Indian/Alaska Native, Asian, Native Hawaiian/Other Pacific Islander, and unknown race.

[//] Heterosexual contact with persons known to have, or to be at high risk for, HIV infection.