

Raimi Ewetola, MD, MPH, Dr.PH. Epidemiologist/Regional Coordinator. Gulzar H. Shah, PhD, MStat, MS. Associate Professor. Gregory Evans, MPH, PhD. Dean; Renee Hotchkiss, PhD. Associate Professor. Cherie L. Drenzek, DVM, MS. State Epidemiologist. Jane Kelly, MD, Director, HIV Epidemiology. Diane Z. Weems, MD. Director, CHD. Susan Alt, BSN, RN. Director, HIV Program. Delores B. Cooper, BS, RN. Ryan White Manager. Coastal Health District/ Georgia Department of Public Health and Jiann-Ping Hsu College of Public Health/Georgia Southern University

INTRODUCTION

Staying in medical care is important for HIV patients to benefit from lifesaving treatment, which leads to better indicators of health status and decreased HIV transmission within communities. Of the 1.1 million HIV-positive people in the US, only 40% get diagnosed, enter care, and stay in HIV care (Gardner et al., 2011).

There are limited number of studies on predictors of retention in HIV care in rural areas of Georgia. This study is the first in the Coastal Health District (CHD) to focus on loss to follow-up (LTFU) for HIV primary medical care and its associated factors. Previous studies on this topic were done at the state level. However, when assessing Georgia statewide LTFU for HIV care, large public health agencies may be overrepresented. Also, research findings may not effectively address the needs and uncertainties arising in smaller settings such as CHD. Determining factors associated with LTFU at the local level is necessary to ensure effective strategies tailored to local needs. It also helps decrease HIV transmission in the CHD, which had the 4th highest number of people living with HIV/AIDS in the state through December 2010.

OBJECTIVES

The primary purpose of this research study was to evaluate demographic and clinical factors associated with loss to follow-up for HIV primary medical care in the Coastal CARE Centers (Coastal Health District)

METHODS AND MATERIALS

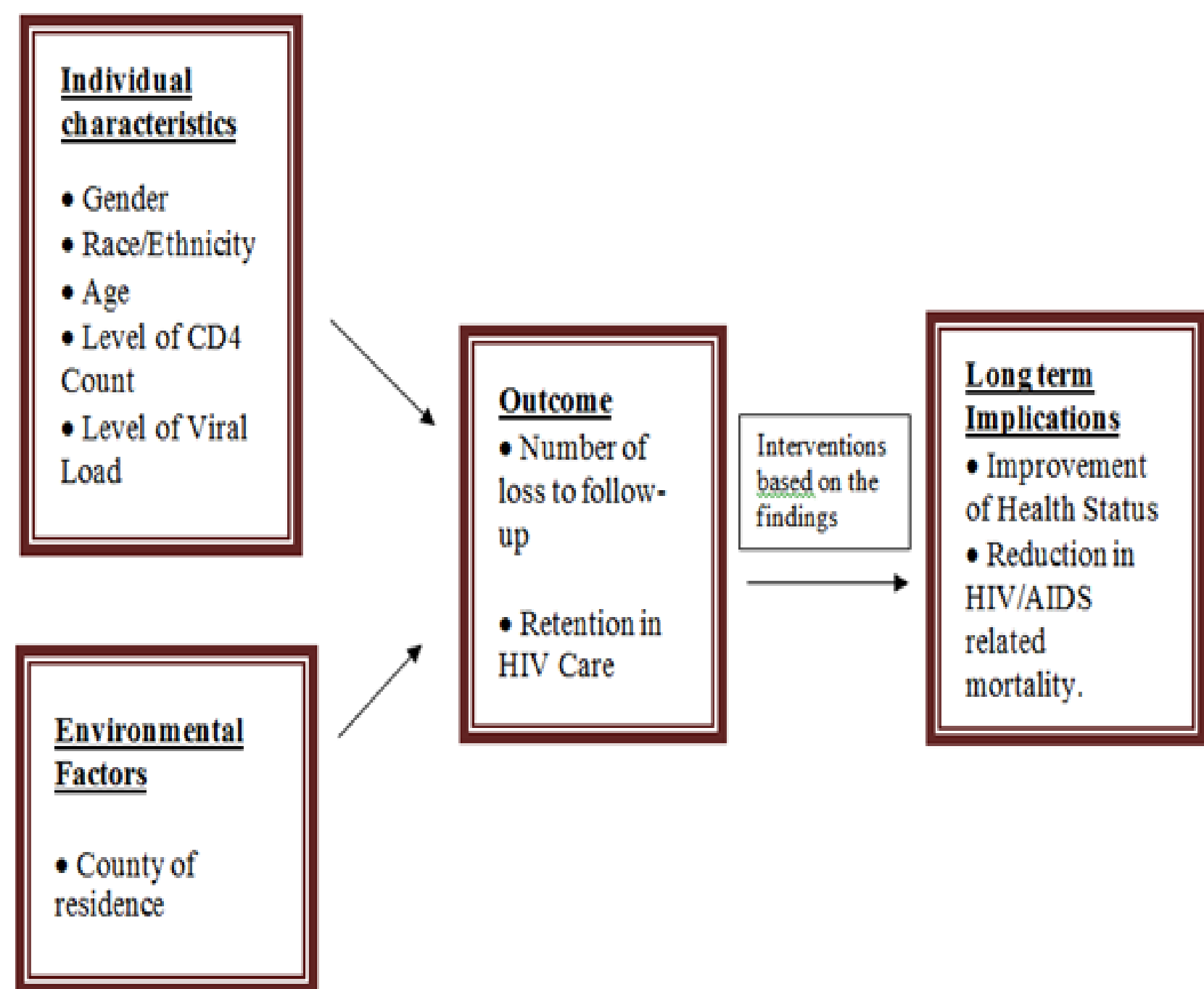
This study was conducted at the Coastal CARE Centers (CCC), which are HIV outpatient Ryan White clinics in the CHD. We extracted data from CAREWare database, which is a software for managing and monitoring HIV clinical and supportive services. We then matched the dataset with Georgia HIV surveillance system. The matching process was done using first name, last name, date of birth, and social security number to determine those who met the criteria of LTFU.

Eligible patients for LTFU were those living with HIV/AIDS, who were aware of their infection, had attended the Coastal CARE Centers at least once for their medical needs between January 1, 2006 and October 30, 2012, and had not received any of the following within a 12-month period: a CD4 count, a viral load test, and/or provision of anti-retroviral therapy (ART).

Independent Variables were: race/ethnicity, gender, age at loss to follow-up, county of residence, time in care at loss to follow-up, CD4 count and viral load at loss to follow-up. Logistic regression analysis was conducted to determine the association between independent variables and LTFU dependent variable. Data management and statistical analysis was performed using SPSS software version 21.

CONCEPTUAL FRAMEWORK

The conceptual framework describes biological/environmental factors and their impact on retention in HIV medical care, as well as interventions, which ultimately leads to improvement in health status and reduction HIV/AIDS related mortality.



Demographic and clinical factors of patients in CCC

Demographic and clinical characteristics	Coastal CARE Centers N (%)	Chatham CARE Center N (%)	Glynn ARE Center N (%)	P-value
Gender				
Male	974 (63.5)	636 (65.3)	338 (34.7)	.026
Female	559 (36.5)	396 (70.8)	163 (29.2)	
Mean age at enrollment		39	39	.944
Age				
0-19	54 (3.50)	31 (57.4)	23 (42.6)	.586
20-29	308 (20.1)	211 (68.5)	97 (31.5)	
30-39	384 (25.0)	260 (67.7)	124 (32.3)	
40-49	543 (35.4)	368 (67.8)	175 (32.2)	
50-59	196 (12.8)	133 (67.9)	63 (32.1)	
≥ 60	48 (3.10)	29 (60.4)	19 (39.6)	
Race/ethnic origin				
White, non-Hispanic	355 (23.2)	166 (46.8)	189 (53.2)	.000
Black/African Am.	1077(70.3)	798 (74.1)	279 (25.9)	
Others	101 (6.60)	68 (67.3)	33 (32.7)	
Viral load				
< 75 Copies	433 (28.2)	285 (65.8)	148 (34.2)	.005
75-9999 Copies	824 (53.8)	536 (65.0)	288 (35.0)	
10000-99999 Copies	192 (12.5)	146 (76.0)	46 (24.0)	
≥ 100,000 Copies	84 (5.50)	65 (77.4)	19 (22.6)	
CD4 Count				
< 200 cells/mm3	297 (19.4)	234 (78.8)	63 (21.2)	.000
200-499 cells/mm3	618 (40.3)	573 (92.7)	45 (7.30)	
≥ 500 cells/mm3	618 (40.3)	225 (36.4)	393 (63.6)	

LTFU rates by the number of months in HIV care

- The highest proportion of patients were LTFU in the first 12 months.
- Decline in the LTFU rate over time as the number of years of follow-up increased.
- Glynn CARE Center had higher LTFU rate in the first three years compare to the Chatham CARE.

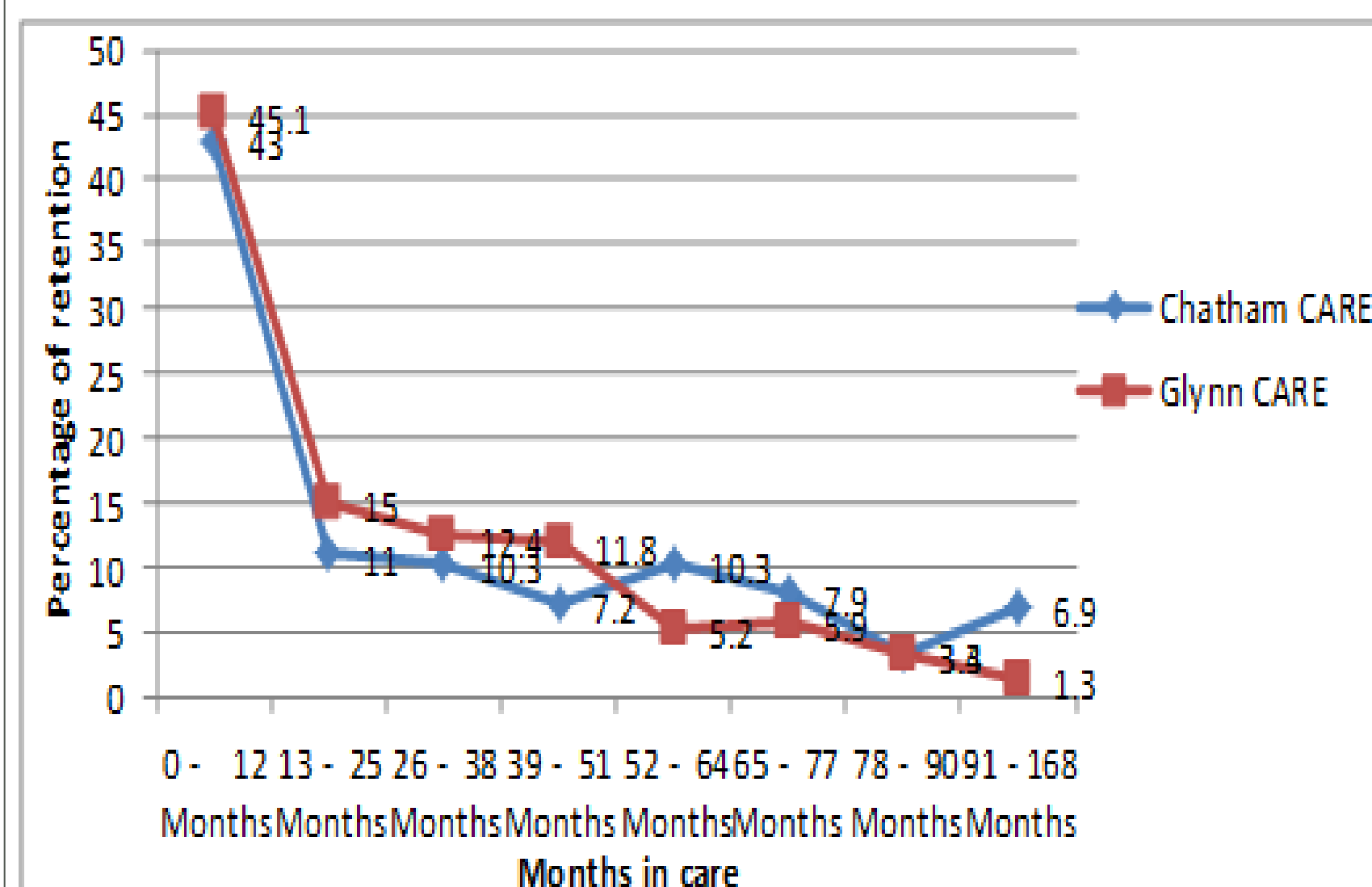


Figure 6: Percentage of retention by months in care

Factors associated with LTFU in the CARE Centers

Patients over 50 years, Black/African-Americans, with Viral Load less than 75 copies and CD4 over 500 cells were more likely to be LTFU.

Individual and environmental characteristics	LTFU (Yes) N (%)	LTFU (No) N (%)	Bivariate P-value	Logistic Regression Odd Ratio	95% CI	P-value
Gender						
Male (1)	315 (32.3)	659 (67.7)	.000	(Ref.)		
Female	129 (23.1)	430 (76.9)		1.168	(.883-1.545)	.166
Age						
0-19	16 (29.6)	38 (70.4)	.251	(Ref.)		
20-29	97 (31.5)	211 (68.5)		1.258	(.592-2.675)	.551
30-39	113 (29.4)	271 (70.6)		1.814	(.853-3.861)	.122
40-49	163 (30.0)	380 (70.0)		1.760	(.838-3.696)	.135
50-59	46 (23.5)	150 (76.5)		2.245	(1.001-5.035)	.050
≥ 60	9 (18.8)	39 (81.3)		3.465	(1.136-10.566)	.038
Race/ethnic origin						
White, non-Hispanic	245 (69.0)	110 (31.0)	.000	(Ref.)		
Black/African Am.	192 (17.8)	885 (82.2)		12.269	(9.034-16.663)	.000
Others	7 (6.90)	94 (93.1)		48.067	(20.369-113.432)	.000
Viral load						
< 75 Copies	67 (15.5)	366 (84.5)	.000	(Ref.)		
75-9999 Copies	287 (34.8)	537 (65.2)		.348	(.248-.490)	.000
10000-99999 Copies	61 (31.8)	131 (68.2)		.523	(.326-.839)	.007
≥ 100000 Copies	29 (34.5)	55 (65.5)		.412	(.225-.757)	.757
CD4 Count						
< 200 cells/mm3	113 (38.0)	184 (62.0)	.000	(Ref.)		
200-499 cells/mm3	183 (29.6)	435 (70.4)		1.211	(.856-1.713)	.279
≥ 500 cells/mm3	148 (23.9)	470 (76.1)		2.820	(1.928-4.123)	.000

Comparison of loss to follow-up rates

Patients were more likely to be lost to follow-up in the Glynn CARE Center (30.5%), which is located in more rural area (Brunswick) compared to Chatham CARE Center located in Savannah (28.2%).

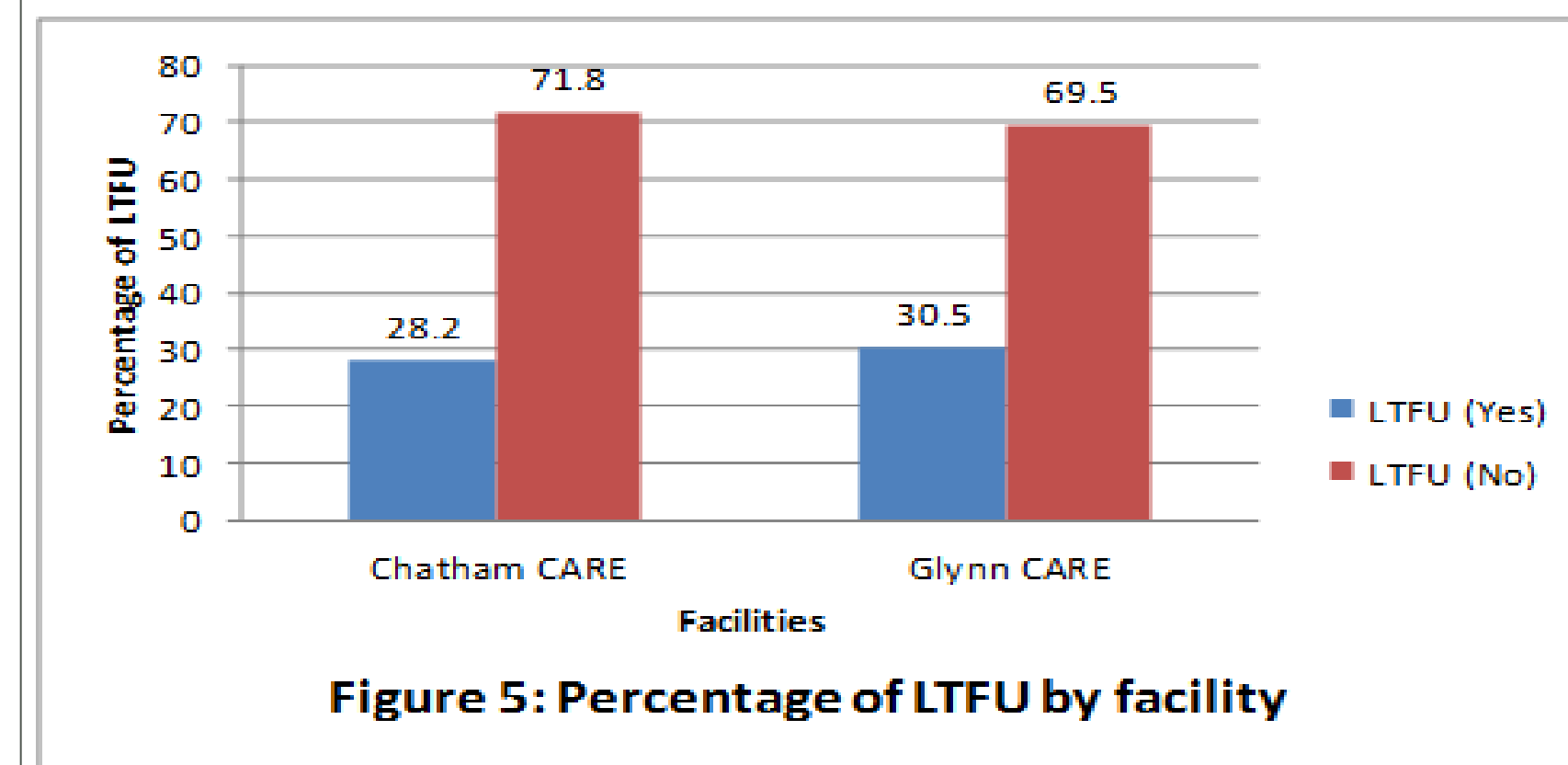


Figure 5: Percentage of LTFU by facility

Factors associated with LTFU in Chatham CARE Center

Individual and environmental characteristics	LTFU (Yes) N (%)	LTFU (No) N (%)	Bivariate P-value	Logistic Regression Odd Ratio	95% CI	P-value
Gender						
Male	208 (32.7)	428 (67.3)	.000	(Ref.)		
Female	83 (21.0)	313 (79.0)		1.310	(.881-1.949)	.183
Age						
0-19	5 (16.1)	26 (83.9)	.332	(Ref.)		
20-29	62 (29.4)	149 (70.6)		2.529	(.646-9.896)	.182
30-39	72 (27.7)	188 (72.3)		2.773	(.726-10.598)	.136
40-49	114 (31.0)	254 (69.0)		2.922	(.774-11.024)	.114
50-59	32 (24.1)	101 (75.9)		4.714	(1.143-19.441)	.032
≥ 60	6 (20.7)	23 (79.3)		5.785	(.863-38.769)	.071
Race/ethnic origin						
White, non-Hispanic	162 (97.6)	4 (2.40)	.000	(Ref.)		
Black/African Am.	129 (16.2)	669 (83.8)		22.884	(7.645-62.736)	.000
Others	0 (0.00)	68 (100)		0.000	(0.000-0.001)	.000
Viral load						
< 75 Copies	37 (13.0)	248 (87.0)	.000	(Ref.)		
75-9999 Copies	184 (34.3)	352 (65.7)		.241	(.136-.427)	.000
10000-99999 Copies	46 (31.5)	100 (68.5)		.437	(.206-.929)	.031
≥ 100000 Copies	24 (36.9)	41 (63.1)		.211	(.093-.481)	.000
CD4 Count						
< 200 cells/mm3	93 (39.7)	141 (60.3)	.000	(Ref.)		
200-499 cells/mm3	138 (24.1)	435 (75.9)		1.886	(1.195-2.977)	.006
≥ 500 cells/mm3	60 (26.7)	165 (73.3)		1.620	(.917-2.864)	.097

Factors associated with LTFU in the Glynn CARE Center

Individual and environmental characteristics	LTFU (Yes) N (%)	LTFU (No) N (%)	Bivariate P-value	Logistic Regression Odd Ratio	95% CI	P-value
Gender						
Male	107 (31.7)	231 (68.3)	.469	(Ref.)		
Female	46 (28.2)	117 (71.8)		.967	(.588-1.589)	.895
Age						
0-19	11 (47.8)	12 (52.2)		(Ref.)		
20-29	35 (36.1)	62 (63.9)		2.417	(.851-6.867)	.098
30-39	41 (33.1)	83 (66.9)		2.321	(.855-6.299)	.098
40-49	49 (28.0)	126 (72.0)		3.115	(1.159-8.369)	.024
50-59	14 (22.2)	49 (77.8)		3.259	(1.018-10.438)	.047
≥ 60	3 (15.8)	16 (84.2)		4.497	(.946-21.384)	.059
Race/ethnic origin						
White, non-Hispanic	83 (43.9)	106 (56.1)	.000	(Ref.)		
Black/African Am.	63 (22.6)	216 (77.4)		2.402	(1.484-3.887)	.000
Others	7 (21.2)	26 (78.8)		2.757	(.829-9.170)	.098
Viral load						
< 75 Copies	30 (20.3)	118 (79.7)	.010	(Ref.)		
75-9999 Copies	103 (35.8)	185 (64.2)		.536	(.313-.919)	.023
10000-99999 Copies	15 (32.6)	31 (67.4)		.725	(.295-1.783)	.484
≥ 100000 Copies	5 (26.2)	14 (73.7)		1.160	(.294-4.580)	.832
CD4 Count						
< 200 cells/mm3	20 (31.7)	43 (68.3)	.000	(Ref.)		
200-499 cells/mm3	45 (100)	0 (0.00)		.000	(.000-1.123)	.997
≥ 500 cells/mm3	88 (22.4)	305 (77.6)		1.974	(1.001-3.892)	.040

DISCUSSION

- In both Chatham and Glynn CARE centers, Black/African Americans, older patients over 50 years, those with higher CD4 counts, and lower viral load as well as patients in their first 12 months of care were more likely to be LTFU.
- A study at Johns Hopkins University found whites were more likely than other racial groups to have missed HIV care, as whites may have a greater belief in their ability to access care whenever they need it, and therefore miss their medical visits (Lurie, et al. 2003).
- Other studies indicated that younger patients were more likely to be LTFU because they are more mobile and have other priorities (Lanoy, et al., 2006).
- However, another study in Georgia found patients over 40 years were more like to have unmet needs for HIV care.
- Also, the same study shows VL < 75 copies was associated with poor adherence to ART. However, a high level of adherence to ART is still important to achieve optimal individual clinical status as well as community health outcomes (Conway, 2007).
- In California, a study indicated retention was also better among HIV individuals with higher CD4 counts (Dudley, et al. 1995).
- LTFU rate was lower in the Chatham CARE Center than in the Glynn CARE Center located in a rural area. A study in South Carolina indicated that greater stigma surrounding HIV infection in rural areas may lead to less adherence to medical care.
- A study in Alabama also documented high rates of attrition within the first year after enrollment in HIV care (Ulett, et al. 2009). Retention in care beyond initial linkage is important to ensure sustained ART and reduce community HIV burden (Metsch, et al., 2008).

CONCLUSION

Our findings provide opportunities for policy development as well as interventions targeting patients at highest risk of LTFU to improve retention in care, improve their health status, and ultimately reduce HIV transmission and control the epidemic in the Coastal Health District, which had the third highest cumulative HIV/AIDS cases in the state of Georgia as of December 2010.

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