Factors Associated with Achieving Clinical Core Indicators among Patients Newly Initiating HIV Care

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Background

- National HIV/AIDS Strategy (NHAS) of 2010
  - Goals:
    - To enable more people with HIV to enter continuous care
    - To achieve the best health results possible for patients with HIV
    - To decrease inequalities in HIV-associated healthcare and health outcomes

- Patient Protection and Affordable Care Act (ACA)
  - To be implemented in 2014

- White House Office of National AIDS Policy Request
  - To analyze the effectiveness and determine the true impact of the NHAS and the ACA
  - To pinpoint core indicators that are associated with the achievement of continuous HIV care

- Institute of Medicine (IOM) Response
  - Establishment of 9 clinical core indicators to be used in reporting national HIV statistics

IOM (Institute of Medicine). 2012. *Monitoring HIV Care in the United States: Indicators and Data Systems.* Washington, DC: The National Academies Press.

Clinical Core Indicators from IOM

- Proportion of people newly diagnosed with HIV with a CD4+ cell count >200 cells/mm^3 and without a clinical diagnosis of AIDS

- Proportion of people newly diagnosed with HIV who are linked to clinical care for HIV within three months of diagnosis

- Proportion of people with diagnosed HIV infection who are in continuous care (two or more visits for routine HIV medical care in the preceding 12 months at least three months apart)

- Proportion of people with diagnosed HIV infection who received two or more CD4 tests in the preceding 12 months

- Proportion of people with diagnosed HIV infection who received two or more viral load tests in the preceding 12 months

- Proportion of people with diagnosed HIV infection in continuous care for 12 or more months and with a CD4+ cell count ¯ 350 cells/mm^3

- Proportion of people with diagnosed HIV infection and a measured CD4+ cell count <500 cells/mm^3 who are not on ART

- Proportion of people with diagnosed HIV infection who have been on ART for 12 or more months and have a viral load below the level of detection

- All cause mortality rate among people diagnosed with HIV infection

Objective

❑ To examine factors associated with achieving clinical core indicators among patients newly initiating HIV care

Methods

- <u>Design</u>:
  - Retrospective cohort study
  - UAB 1917 Clinic Cohort

- <u>Study Period</u>: January 2007-July 2012

- <u>Eligibility Criteria</u>:
  - At least 19 years of age
  - First HIV primary care appointment within the time frame of the study
  - New to HIV care/no prior visits to any other HIV treatment clinics
  - Treatment naïve/no prior treatment with antiretroviral therapy

Methods (cont'd)

Outcome of interest: Achieved*: yes vs. no

Selected indicators from the Institute of Medicine:

1) The patient has arrived for at least two HIV primary-care visits separated by at least 90 days.

2) The patient has had at least two CD4 tests.

3) The patient has had at least two viral load tests.

4) The patient has had at least one CD4 count greater than 350.

5) If the patient had a CD4 count that fell below 350 at least once, then the patient was prescribed antiretroviral therapy.

*Achieved: Fulfillment of at least 4 of the 5 selected indicators during the <u>first twelve months after initiating care</u>.

Methods (cont'd)

❑ <u>Statistical Analyses</u>:

    ❑ Descriptive statistics

    ❑ Univariate and multivariable logistic regression

RESULTS

Criteria fulfilled		N=448
		n (%)
Achieved {	5	130 (29)
	4	231 (52)
	3	34 (8)
	2	14 (3)
	1	23 (5)
	0	16 (4)

Results: Patient Characteristics

Characteristic	Achieved, N=361	Not Achieved, N=87	Total
Age (years)			
Mean +/- SD	35.0 +/- 11	35.3 +/- 11.4	35.1 +/- 11.1
Male (%)	80.6	72.4	79
White (%)	36.6	31.0	35.5
Insurance (%)			
Private	41.3	31.0	39.3
Public	11.1	23.0	13.4
Uninsured	47.7	46.0	47.3
Education (%)			
College/Postgraduate	57.9	52.9	56.9
Housing (%)			
Permanent	92.8	62.1	86.8
Non permanent	1.1	3.4	1.6
Unknown	6.1	34.5	11.6
Monthly Income ฿1000 (%)	59.3	83.9	64.1

Results: Patient Characteristics

Characteristic	Achieved, N=361	Not Achieved, N=87	Total
Transportation Barriers (%)	3.3	5.8	3.8
Depressive symptoms (%)	53.7	54.0	53.8
Anxiety symptoms/Panic Syndrome (%)	23.3	31.0	24.8
Low risk/at risk alcohol (%)	71.2	65.5	70.1
Disclosure of HIV status to zero family members (%)	37.4	32.5	36.5

Univariate Analysis

Variable	Crude OR (95% CI)	p-value
Insurance		
Public vs. None*	0.47 (0.25-0.88)	0.02
Private vs. None*	1.28 (0.75-2.19)	0.36
Housing: Permanent vs. Not*	4.65 (1.01-21.37)	0.048
Income: >1000 vs. ṁ1000*	3.58 (1.95-6.59)	<0.001
Education: College vs. Other*	1.16 (0.72-1.88)	0.55
Transportation barriers: Yes vs. No*	0.56 (0.19-1.65)	0.29
Depression: Yes vs. No*	0.99 (0.62-1.58)	0.96
Anxiety: Yes vs. No*	0.67 (0.40-1.13)	0.13
Alcohol: Yes vs. No*	1.30 (0.79-2.14)	0.30
Disclosure to family: Not disclosed vs. Disclosed*	1.24 (0.75-2.06)	0.41

Multivariable Analyses

Variable	Model 1 (N=427)		Model 2 (N=427)	
	OR (95% CI)	p-value	OR (95% CI)	p-value
Insurance				
Public vs. None*	0.51 (0.24-1.07)	0.07	0.46 (0.23-0.92)	0.03
Private vs. None*	1.05 (0.54-2.05)	0.89	0.82 (0.43-1.55)	0.54
Housing				
Permanent vs. Not*	2.28 (0.44-11.74)	0.32	--	--
Unknown vs. Not*	0.34 (0.06-1.95)	0.23	--	--
Income: >1000 vs. m1000*	2.56 (1.24-5.31)	0.01	3.53 (1.75-7.15)	<0.001
Education: College vs. Other*	0.83 (0.45-1.50)	0.53	0.78 (0.44-1.37)	0.39
Transportation barriers: Yes vs. No*	0.80 (0.23-2.85)	0.73	1.05 (0.31-3.52)	0.94
Depression: Yes vs. No*	1.43 (0.80-2.55)	0.23	1.38 (0.80-2.38)	0.25
Anxiety: Yes vs. No*	0.73 (0.39-1.39)	0.34	0.64 (0.35-1.17)	0.15
Alcohol: Yes vs. No*	1.04 (0.58-1.86)	0.90	1.23 (0.71-2.10)	0.46
Disclosure to family: Not disclosed vs. Disclosed*	1.49 (0.83-2.65)	0.18	1.32 (0.77-2.27)	0.32

*Reference   Model 1: Housing = unknown as a separate category   Model 2: Housing variable excluded

Results

In multivariable analysis:

❑ Having a monthly income over $1000 (OR=3.53) was found to be a significant predictor of achievement of clinical core indicators.

❑ Compared to uninsured patients, those with public insurance were less likely (OR=0.46) to achieve clinical core indicators.

❑ Education level, access to transportation, depression, anxiety, alcohol and disclosure of HIV status to others were not significant.

Conclusions

❑ Income insufficiencies decrease the chances for HIV patients to meet the selected IOM criteria.

❑ Addressing financial barriers on entry into HIV care may improve individual health outcomes and achievement of the goals of the National HIV/AIDS Strategy.

Limitations

❑ Potential for unmeasured confounding factors

❑ Modest sample size may limit ability to detect differences between patients who achieved selected clinical core indicators and those who did not

❑ Limited time to assess outcome of achievement of clinical core indicators

Future Directions

❑ Determination of all cause mortality rate among patients who achieved selected IOM clinical core indicators

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Questions?

Multivariable Analysis (N=378)

Variable	OR (95% CI)	p-value
Insurance		
Public vs. None*	0.610 (0.238-1.567)	0.305
Private vs. None*	0.707 (0.329-1.522)	0.376
Housing: Permanent vs. Not*	3.725 (0.660-21.024)	0.136
Income: >1000 vs. m1000*	2.218 (1.009-4.877)	0.048
Education: College vs. Other*	0.915 (0.464-1.803)	0.797
Transportation barriers: Yes vs. No*	0.794 (0.215-2.933)	0.729
Depression: Yes vs. No*	1.512 (0.775-2.950)	0.225
Anxiety: Yes vs. No*	0.643 (0.309-1.338)	0.237
Alcohol: Yes vs. No*	0.746 (0.361-1.540)	0.428
Disclosure to family: Not disclosed vs. Disclosed*	1.569 (0.795-3.097)	0.194
Age (continuous variable)	1.013 (0.982-1.045)	0.411
Race: White vs. Non-white*	0.725 (0.373-1.410)	0.344
Sex: Male vs. Female*	1.681 (0.765-3.696)	0.196

*Reference
Model: If data missing, subject excluded

Housing data: more specific

Characteristic	Available=396	Unknown=52	p-value
Age (years), median	33	36	0.09
Male, %	79.6	75.0	0.45
Blacks, %	64.6	61.5	0.66
Insurance, %			0.49
Uninsured	48.2	40.4	
Private	38.9	42.3	
Public	12.9	17.3	
College or more, %	57.6	64.0	0.39
Income >1000, %	38.9	13.5	0.0003

Sensitivity Analyses (Housing, unknown=52)

A. Univariate analyses:

❑ Permanent + Missing vs. Non permanent; Crude: 3.19 (0.70-14.51)

❑ Permanent vs. Non permanent + Missing; Crude: 7.87 (4.37-14.18)

❑ Housing coded per income: Permanent (or income >1000) vs. Non permanent (or income m100
11.00 (5.84-20.72)

B. Multivariable analyses:

❑ Permanent + Missing vs. Non permanent; Adjusted: 1.79 (0.35-9.13)

❑ Permanent vs. Non permanent + Missing; Crude: 5.79 (3.07-10.93)

❑ Housing coded per income: Permanent (or income >1000) vs. Non permanent (or income m
1000): 7.99 (3.94-16.20)

Missing Criteria for Patients Who Fulfilled 4/5 Criteria

Characteristic	Overall Sample (N=231)
If CD4 <350, patient was not prescribed ART	114 (49%)
Did not have at least one CD4 count >350	105 (45%)
Did not arrive for 2 or more visits	11 (5%)
Did not have at least 2 CD4 counts	1 (0.4%)
Did not have at least 2 viral load tests	0 (0%)

Results

In univariate logistic regression analysis:

- Having permanent housing (OR= 4.65) and having a monthly income over $1000 (OR=3.58) were found to be significant predictors of achievement of clinical core indicators.

- Compared to uninsured patients, those with public insurance were less likely (OR=0.47) to achieve clinical core indicators.

Multivariable Analyses

Model 1, N=378   Model 2, N=427

Variable	Adjusted OR (95% CI)	p-value	Adjusted OR (95% CI)	p-value
Insurance				
Public vs. None*	0.52 (0.22-1.24)	0.14	0.46 (0.23-0.92)	0.03
Private vs. None*	0.69 (0.32-1.49)	0.35	0.82 (0.43-1.55)	0.54
Housing: Permanent vs. Not*	2.88 (0.54-14.28)	0.21	--	--
Income: >1000 vs. m1000*	2.27 (1.04-4.97)	0.04	3.53 (1.75-7.15)	<0.001
Education: College vs. Other*	0.83 (0.43-1.63)	0.59	0.78 (0.44-1.37)	0.39
Transportation barriers: Yes vs. No*	0.74 (0.21-2.65)	0.65	1.05 (0.31-3.52)	0.94
Depression: Yes vs. No*	1.48 (0.77-2.83)	0.24	1.38 (0.80-2.38)	0.25
Anxiety: Yes vs. No*	0.59 (0.29-1.21)	0.15	0.64 (0.35-1.17)	0.15
Alcohol: Yes vs. No*	0.82 (0.41-1.61)	0.56	1.23 (0.71-2.10)	0.46
Disclosure to family: Not disclosed vs. Disclosed*	1.67 (0.85-3.27)	0.14	1.32 (0.77-2.27)	0.32

*Reference

Model 1: If data missing, subject excluded   Model 2: Housing excluded