

Evaluation of a Rapid HIV Screening Program in an Urban Academic Adult Emergency Department to Identify Individuals with Undiagnosed HIV Infection

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BACKGROUND

- ~16% of 1.1 million HIV-infected individuals aged 13 years and older in the United States were unaware of their positive serostatus.
- Emergency departments (EDs) in U.S. are the leading sites of encounter for “late-testers” and the most common site of ‘missed opportunities’ for HIV testing in medical settings.
- Since 2006 CDC revised recommendations for HIV testing, EDs have successfully identified thousands of unrecognized HIV-infected patients.
- In spite of intensive efforts, many ED screening programs still fail to identify many infected patients.
- Czarnogorski *et al.* recently found that the rate of undiagnosed HIV infection was 3 times higher in those who declined routine ED HIV testing compared with those who accepted the test.
- A seroprevalence study was conducted in our site to evaluate the program metrics during the early years of our testing program in 2007 (Hsieh 2013). We found higher prevalence of undiagnosed HIV in patients who were not offered testing, and in those who declined testing versus those who were actually tested, suggesting missed opportunities.
- More streamlined programmatic approaches (e.g. verbal consent, bed-side POC testing, triage nurse offering and consent) to testing have since been implemented, but the impact of these advances on reducing undiagnosed HIV remains unknown.

OBJECTIVES

- To assess the impact of streamlined ED rapid HIV testing processes for detection of previously undiagnosed HIV infections using an identity-unlinked seroprevalence methodology.

METHODS

STUDY SETTING

- An urban adult ED with 60,000 to 66,000 annual census.
- ED-Based Rapid HIV Screening Program**
- A rapid, non-targeted, opt-in program since 2005.
- During the summer of 2007, exogenous testing staff 24/7 offered testing at bedside, performed written consent for HIV testing and brief pre- and post-test counseling, collected oral swab specimens for ED lab POC testing.
- During the summer of 2013, testing staff 16 hours / weekday, offered testing at bedside, performed verbal consent, POC testing at bedside. During the later part of the summer, triage nurses offered and consented patients for HIV testing, the 4th generation blood-based HIV testing for patients who were drawn blood for their clinical care were implemented with exogenous testing staff provided supplementary support for POC testing at the bedside.

DESIGN

Identity-unlinked methodology involves the collection of excess sera collected as part of clinical procedures, the assigning of a unique study code, and the removal of all identifiers and protected health information from samples following collection of basic demographic and clinical data.

- The study was approved by Institutional Review Board.

STUDY PERIOD

- 8 weeks (24h/d), 06/2007-08/2007 and 06/2013-08/2013.

DATA COLLECTION

- Socio-demographic information (e.g. age, gender, race) was abstracted from the administrative database or electronic medical record system.
- Diagnosis of HIV, laboratory testing of HIV were also abstracted from the electronic medical record system.

HIV SEROLOGIC ANALYSIS

- Samples were tested by EIA; reactives confirmed by WB

STATISTICAL METHODS

- Descriptive statistical analysis performed to summarize numbers and prevalence of HIV by ‘program status’ (i.e. offered, declined or tested).
- Prevalence difference between program periods (2007 versus 2013) was analyzed by chi-square or exact test.

RESULTS

Table 1: Characteristics of ED Patients by ED-Based Rapid HIV Screening Program Status, 2007

Variables	Categories	HIV Screening	
		Offered N=1165	Not Offered N=2042
Age (years)*	18-24	153 (13)	252 (11)
	25-34	214 (18)	328 (16)
	35-44	278 (24)	391 (19)
	45-54	279 (24)	398 (19)
	55-64	209 (18)	236 (12)
	≥ 65	32 (3)	462 (23)
Gender	Female	658 (56)	1105 (54)
	Male	507 (44)	937 (46)
Race*	Black	817 (70)	1309 (64)
	White	296 (25)	600 (29)
	Other	52 (6)	133 (7)
	Unknown	0 (0)	2 (0)
Acuity*	1	27 (2)	140 (7)
	2	335 (29)	605 (30)
	3	701 (60)	1168 (57)
	4	83 (7)	84 (4)
	5	0 (0)	7 (0)
	Unknown	19 (2)	38 (2)

*p<0.05

Table 2: Characteristics of ED Patients by ED-Based Rapid HIV Screening Program Status, 2013

Variables	Categories	HIV Screening	
		Offered N=969	Not Offered N=3499
Age (years)*	18-24	133 (14)	389 (11)
	25-34	263 (27)	633 (18)
	35-44	172 (18)	503 (14)
	45-54	235 (24)	684 (20)
	55-64	150 (15)	562 (16)
	≥ 65	16 (2)	725 (21)
Gender*	Female	626 (65)	1128 (53)
	Male	343 (35)	2371 (67)
Race*	Black	643 (66)	2114 (60)
	White	269 (28)	1093 (31)
	Other	57 (6)	292 (8)
	Unknown	0 (0)	3 (0)
Acuity*	1	35 (4)	430 (12)
	2	102 (11)	761 (22)
	3	804 (83)	2244 (64)
	4	27 (3)	61 (2)
	5	0 (0)	2 (0)
	Unknown	0 (0)	2 (0)

*p<0.05

Table 3: Number of Patients and Prevalence of Undiagnosed HIV Infection by ED-Based HIV Screening Program Status, 2007 versus 2013.

HIV Screen Program Status	Number (%)		Prevalence Diff. (95% CI)
	2007	2013	
Overall Unique ED Patients	3417	4713	
Total HIV Infection	265 (7.8)	262 (5.6)	-2.2 (-3.3, -1.1)
- Known	192 (72.5)	245 (93.5)	21.1 (14.9, 27.2)
ED Patients Excluding Known HIV	3225	4468	
- Undiagnosed HIV Infection	73 (2.3)	17 (0.4)	-1.9 (-2.4, -1.3)
Patients Offered an HIV Test	1165	969	
- Undiagnosed HIV Infection	12 (1.0)	4 (0.4)	-0.6 (-1.3, 0.1)
Patients Not Offered an HIV Test	2060	3499	
- Undiagnosed HIV Infection	61 (3.0)	13 (0.4)	-2.6 (-3.4, -1.8)
Patients Accepted	567	522	
- Undiagnosed HIV Infection	4 (0.7)	1 (0.2)	-0.5 (-0.5, 5.4)
Patients Declined	598	447	
- Undiagnosed HIV Infection	8 (1.3)	3 (0.7)	-0.7 (-0.8, 5.5)

Characteristics of 17 undiagnosed HIV Infections, 2013

- Male: 7 (53%); Black: 13 (76%); 25-45 years: 10 (59%)
- Medicare or Medicaid: 13 (76%); IDU: 4 (24%)
- Triage Acuity: level 1-2: 6 (35%); level 3: 10 (59%)
- Disposition: Discharge 12 (71%); Admit: 4 (24%)
- Documented HCV infection: 5 (29%); anti-HCV Ab: 7 (53%)
- HIV viral load: >100,000 copies: 4 (24%)

LIMITATIONS

- Underestimation of known HIV positivity status from electronic medical record system is possible.
- HIV seroprevalence was unknown for those ED patients who did not have blood drawn.
- Confounders (beyond the programmatic changes) could have impacted the observed outcomes.

CONCLUSIONS

- Our streamlined ED HIV screening program is associated with improvements in identification of undiagnosed infections, but missed opportunities still exist for those who were not offered testing. Additional programmatic process improvement is required to address those missed opportunities.

FUNDING SOURCES

- NIH grant K01AI100681, NIAID Division of Intramural Research, Baltimore City Health Department, Gilead HIV Focus Program

Figure 1: Undiagnosed HIV Prevalence by ED-Based HIV Screening Program Status in 2007

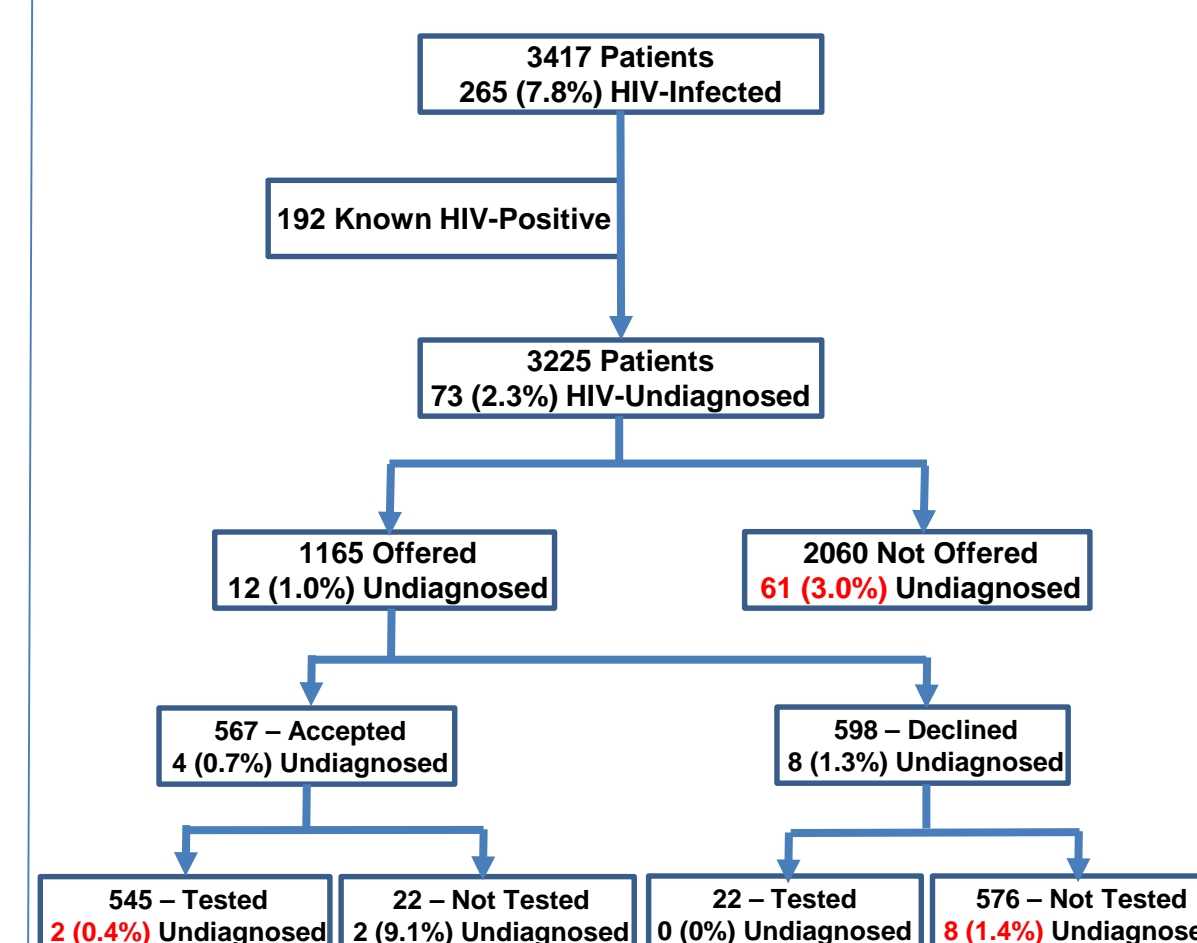
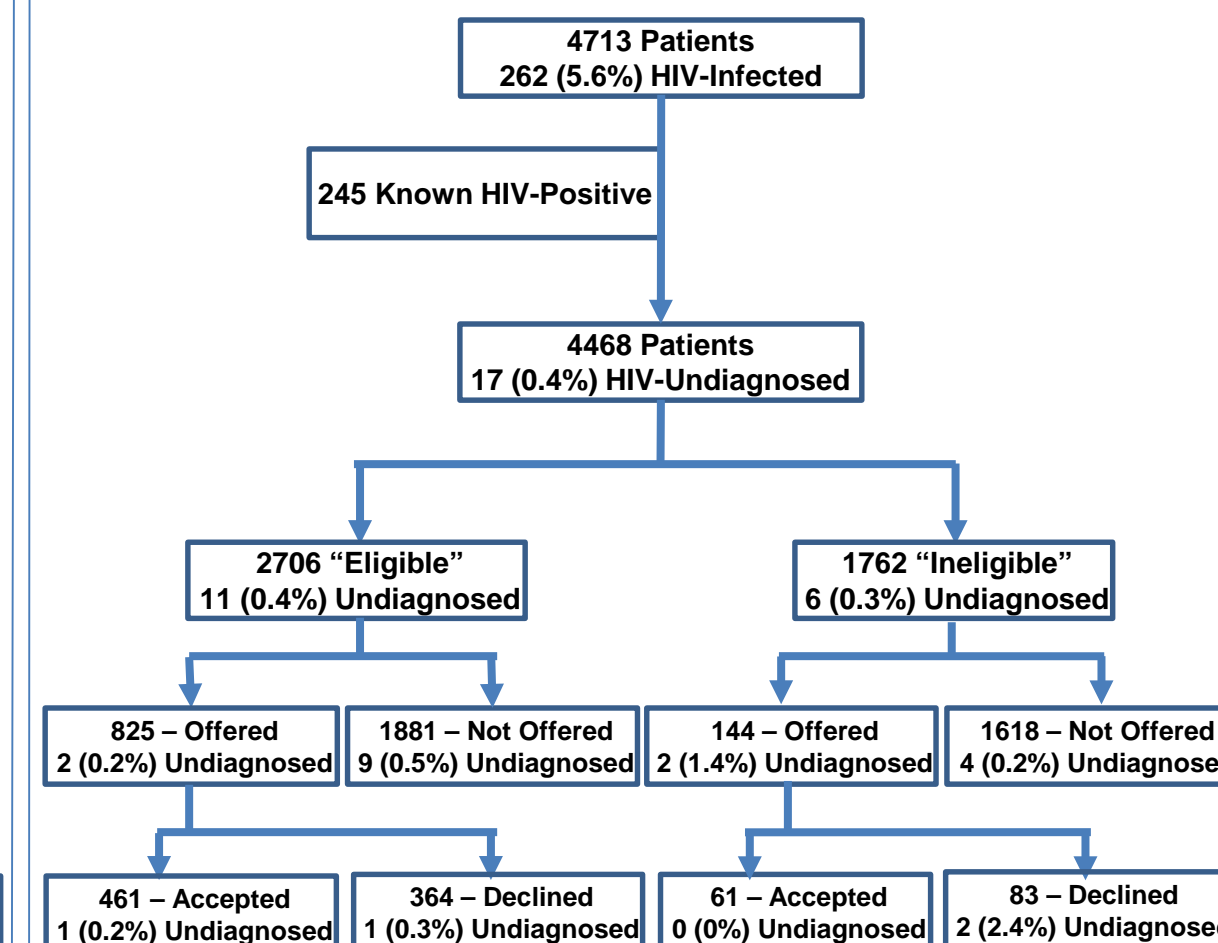


Figure 2: Undiagnosed HIV Prevalence by ED-Based HIV Screening Program Status in 2013



*: 'eligible' was broadly defined to include all ED patients aged 18-65 years who were not critically ill (i.e. triage acuity level 3-5)