A 25-Year Perspective on the HIV Epidemic from The Johns Hopkins Emergency Department

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BACKGROUND

- Emergency Departments (EDs) serve as a lens for revealing the state of public health within the local community. In this report we focus on evolving trends in HIV and HCV infections and care.
- In 2011 there were 136 million visits representing more than 45% of the US population. At JHHED, there are over 60,000 adult visits annually.
- Starting in 1987 through 2013, the JHHED conducted systematic serosurveys for HIV, HBV, HCV, and other blood-borne infections on all adults requiring blood draws during a 6-8 week period.

OBJECTIVES

- To examine local trends in the HIV epidemics over a 25 year period in our ED population
- To assess the impact of ED-based screening, early diagnosis and linkage to care and treatment.

METHODS

STUDY SETTING

- A U.S. urban academic adult ED (JHH ED) with 60,000 to 70,000 annual census from 1987 to 2013.
- The ED serves a diverse and socioeconomic disadvantaged population.

DESIGN

- Identity-unlinked methodology was used to determine the prevalence of HIV infection in ED patients.
- Eligible patients were ≥15 years of age, required blood drawn for a medical reason, and had matched chart review data.
- Only one visit from each patient included for analysis.

METHODS

DESIGN - Continued

- 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 data (e.g. age; gender; race; risk factors) before serology testing for HIV. De-identified data were merged with serology testing data by study id.
- The study was approved by The Johns Hopkins University School of Medicine Institutional Review Board.

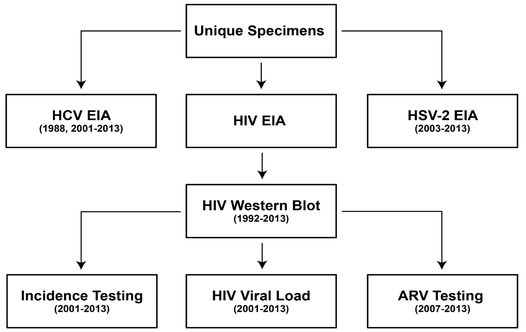
STUDY PERIOD

- A 6-8 week (24h/d) identity-unlinked serosurvey was conducted in the JHH ED in the summer of: 1987, 1988, 1992, 2001, 2003, 2007, and 2013.

DATA COLLECTION

- Socio-demographic information (e.g. age, gender, race, injection drug use) was abstracted from the administrative database or electronic medical record system.

SEROLOGIC ANALYSIS



JHH ED HIV Screening and Linkage to Care (LTC) Program

- A rapid ED-based voluntary HIV-screening and LTC program, restricted only by CDC aged-based recommendations, has been in continuous existence since 2005

RESULTS

Table 1: Demographic Characteristics of the Study Population (n=18,144) (1987-2013)

Characteristic	Demographics of Study Population by Study Year (%)						
	1987 N=2302	1988 N=2544	1992 N=1606	2001 N=1418	2003 N=2144	2007 N=3417	2013 N=4713
Sex							
Male	51.0	48.3	52.9	47.8	45.5	46.0	45.1
Female	49.0	51.7	47.1	52.2	54.5	54.0	54.9
Race							
Black	74.0	77.3	77.7	68.0	69.0	67.3	63.1
White	24.9	22.1	21.5	28.3	26.4	26.9	29.4
Other	1.0	0.7	0.8	3.7	4.6	5.9	7.6
Age (years)							
Mean (SD)	43.4±18.8	43.3±18.9	42.6±18.0	47.1±17.0	48.0±17.1	46.3±16.8	46.5±17.5
15-24	17.6	15.4	15.0	9.4	9.8	11.3	11.3
25-34	24.0	27.1	27.5	16.4	14.0	16.5	19.4
35-44	16.2	17.0	20.4	24.3	22.2	21.4	15.3
45-54	12.3	10.9	11.8	20.5	22.3	22.5	21.6
≥55	29.9	29.6	25.3	29.5	31.7	28.2	32.3

Figure 1: Trends in HIV Prevalence and Proportion of Undiagnosed Infections (1987-2013).)

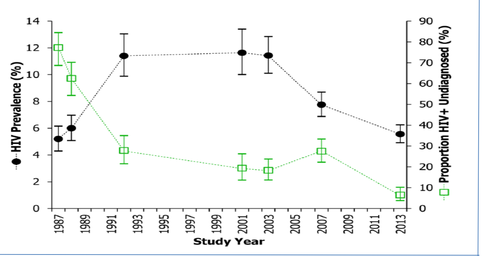


Figure 2: Trends in HIV Prevalence Stratified by Race and Gender

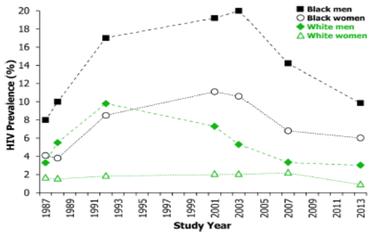


Figure 3: Proportion of HIV Positive Individuals Virally Suppressed and HIV Incidence Estimates (2001-2013)

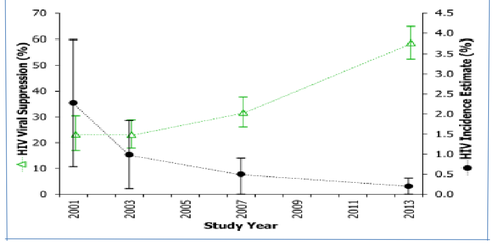


Figure 4: HIV Testing in JHH ED and Linkage to Care

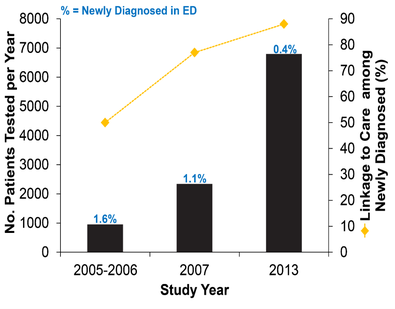


Figure 5: HIV Cascade of Care (2007 and 2013)

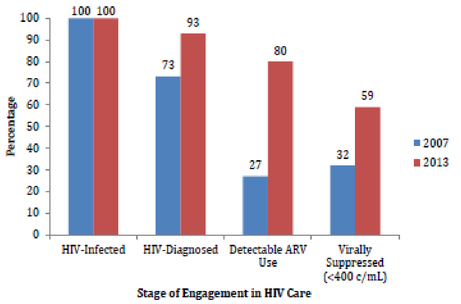


Table 2: Distribution of HIV Viral Load Levels (2001-2013)

HIV Viral Load copies/mL	2001 (*N*=164)		2003 (*N*=243)		2007 (*N*=265)		2013[a] (*N*=252)	
	%	95% CI	%	95% CI	%	95% CI	%	95% CI
≤ 400[b]	23.2	(17.0, 30.4)	23.1	(17.9, 28.9)	31.7	(26.1, 37.7)	58.7	(52.4, 64.9)
401-1,000	7.3	(3.8, 12.4)	3.3	(1.4, 6.4)	4.9	(2.6, 8.2)	4.8	(2.5, 8.2)
1,001-10,000	16.5	(11.1, 23.0)	19.8	(14.9, 25.3)	19.3	(14.7, 24.5)	13.5	(9.5, 18.3)
10,001-100,000[c]	31.7	(24.7, 39.4)	26.8	(21.3, 32.8)	30.6	(25.1, 36.5)	12.3	(8.5, 17.0)
>100,000[c]	21.3	(15.3, 28.4)	27.2	(21.7, 33.2)	13.6	(9.7, 18.3)	10.7	(7.2, 15.2)

[a] *P-value* for the distribution of HIV viral load in 2013 compared to previous survey years <0.001.
[b] *P-value by the* Cochran Armitage Trend test for proportion of HIV viral load ≤ 400 copies/mL (undetectable level) by study year was <0.001
[c] *P-value by the* Cochran Armitage Trend test for proportion of HIV viral load > 10,000 copies/mL (high viral load l evel) by study year was <0.001

LIMITATIONS

- Study population was restricted to ED patients who had blood drawn as part of clinical procedures.
- Patients might be aware of their HIV infection but their infection status was not documented in the medical charts.

CONCLUSIONS

- Over a 25-yr period, JHH ED based HIV testing has evolved from describing the local epidemic to participating in a strategic role in testing and linkage to care.
- This change is partially evidenced by declining undiagnosed HIV infection, increased use of ARVs, increased viral suppression, and decline in incidence.
- While causation cannot be proven, these improvements in HIV status in this ED population coincides with increased screening and linkage to care in the ED and the community.

FUNDING SOURCES

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