Comparison of ED HIV Testing Data with Visit or Patient as the Unit of Analysis

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OBJECTIVES

Large-scale HIV screening in the emergency department (ED) setting leads to a proportion of tests that are not for newly tested patients but rather are repeat tests for patients previously tested in the ED.

- Most reports of ED HIV testing have considered visits as the primary unit of analysis and any patient who underwent HIV testing multiple times was counted in program statistics multiple times.
- As healthcare settings providing episodic care begin to focus on expanded HIV testing, the need to understand service delivery on a longitudinal basis using unique patients rather than unique visits as the primary unit of analysis must be considered.
- Duplicate tests for the same patient are certain to have different and as yet unknown consequences for program costs and outcomes.

We examined the differences in programmatic outcomes observed between patient-level and traditional visit-level analysis for our ED-based HIV testing program. We hypothesized that while the program does test some patients repeatedly, the primary programmatic outcome of percent positive is not substantially altered by the unit of analysis.

METHODS

This was a secondary analysis of HIV risk counseling and testing data compiled in an electronic medical record. The Institutional Review Board approved the study.

All adults presenting to the ED of a Midwestern, urban, teaching hospital with an annual ED census of about 85,000 primarily indigent patients are eligible for HIV counseling and testing. The regional prevalence of HIV/AIDS is 217 per 100,000 persons.

Patients are identified for targeted screening and diagnostic testing based on review of triage notations, electronic medical records, or referral by ED staff. Risk profile, clinician concern, and patient request are the primary means of selection. The test positivity rate of the program is 0.9%. Patients are tested either by dedicated counselors or, when counselors are unavailable, by physicians. Written informed consent to undergo a conventional, non-rapid HIV test is required.

The main outcome measure for this study is the positive rate computed with the visit as the unit of analysis (positive test rate) or the patient as the unit of analysis (positive patient rate). Descriptive statistics are used to report the data. Data were managed using Microsoft Access (Microsoft Corporation, Redmond, WA) and they were analyzed using SPSS v 15.0 (SPSS Inc., Chicago, Il).

RESULTS

HIV testing was offered during 15,462 visits. HIV testing was provided at 9,629 visits (62.3%), representing 8, 450 unique patients. (Figure 1). The mean time between repeat tests was 478 days (SD 373 days) and the median time between tests was 383 days (range 1-1,742 days). Overall, 544 (46%) of the 1,179 repeat tests were conducted more than a year after the prior test. For patient-level analysis, the proportion of patients found to be positive was 0.91%. For visit-level analysis, the proportion of tests with positive results was 0.83%. Of the 910 patients with repeat testing, 7 (0.77%) were identified as positive at a repeat test.

Table 1 Sample with analysis at patient level versus visit level

	Per-patient (N=8450)		Per-visit (N=9629)	
Age	31	(11)	31	(11)
Sex				
Male	4448	(52.6)	5084	(52.8)
Female	3955	(46.8)	4489	(46.6)
Transgendered	2	(0.0)	2	(0.0)
Unknown	45	(0.5)	54	(0.6)
Race				
White	2262	(26.8)	2441	(25.4)
Black	5766	(68.2)	6721	(69.8)
other or mixed raced	92	(1.1)	100	(1.0)
Hispanic	184	(2.2)	196	(2.0)
Unknown	146	(1.7)	171	(1.8)
HIV test results				
Negative	8073	(95.5)	9208	(95.6)
Positive	77	(0.9)	77	(0.8)
Indeterminate	38	(0.4)	46	(0.5)
Unknown	262	(3.1)	298	(3.1)

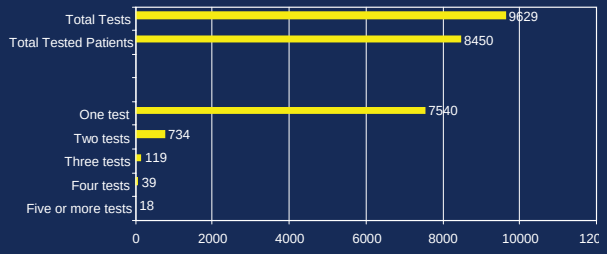

Figure 1 Additional tests by unique ED patients during repeat ED visits

LIMITATIONS

- Testing was offered during only a minority of ED visits on a targeted basis and prior recent prior testing was a common reason for refusing testing. Thus, our results likely represent a lower limit of repeat testing effects and may be dissimilar from programs that operate on a larger scale, use less controlled methods, use progressive consent methodologies, or emphasize non-targeted as opposed to targeted screening.
- Data collection was conducted on a clinical basis rather than as part of rigorous research methodology. However, the use of structured, comprehensive risk assessment questionnaires with patient identifiers does allow for accurate estimation of repeat testing.
- This study was not intended to assess the advisability of repeat testing. However, our data suggest that targeted repeat testing was about as effective at identifying HIV positive patients as providing an initial test.

CONCLUSIONS

- Although one in eight HIV tests were for patients who had been tested previously, results changed relatively little regardless of whether unique patients or unique visits were used as the unit of analysis.
- Potential differences in positive rates were mitigated by the contribution of repeat testing to the identification of newly infected patients. Therefore, our reporting of basic operational outcomes would not be greatly affected whether conducting analysis at the visit versus the patient level.
- Given these findings, and the frequent difficulty of tracking repeat testing over time, visit-level analysis may be appropriate for comparing reports of program methods when detailed modeling of epidemiology, cost, and/or outcomes is not required.

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