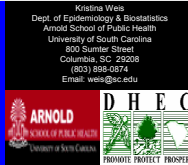


Missed Opportunities to Identify HIV-Infected Individuals in South Carolina, Jan 2001 – Dec 2005

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Abstract

Background South Carolina (SC) had a 2004 AIDS case rate ranked 10th in the nation at 18.1 per 1000,000. We sought to determine to what extent the SC HIV/AIDS cases in the recent past could have been diagnosed earlier at a prior healthcare encounter.

Methods Our strategy was to link HIV/AIDS case reports in SC to prior healthcare encounters. HIV data from individuals first diagnosed with HIV infection between January 2001 and December 2005 were matched using several variables such as gender, race/ethnicity, and county of patient's residence, with encounters in 60 emergency rooms, 62 inpatient facilities, 63 outpatient surgical facilities, and 19 free medical clinics around the state. Medical encounters were categorized to distinguish visits that were likely versus unlikely to prompt an HIV test. Diagnostic codes likely to suggest the need for an HIV test were: STDs, acute retroviral syndrome, 37 diagnostic codes probably or possibly related to HIV (e.g., lymphadenopathy, fevers, tuberculosis, pneumonia), and codes related to IV drug use. All remaining codes were considered unlikely to suggest the need for an HIV test. Odds ratios and 95% CI's were used to compare the significance of gender, race, exposure group and number of visits as determinants of late versus early testing.

Results Of the 4,221 HIV-positive individuals diagnosed between 2001 and 2005, 3,054 (72.4%) visited a SC healthcare facility one or more times prior to testing HIV-positive. 1,286 of the 3,054 (42.1%) developed AIDS within 1 year of testing (late testers). Fewer females than males were late testers (OR 0.63, 95% CI 0.54 – 0.73). There were no other significant results. Overall, 19,296 separate visits were recorded for these 3,054 persons and 11,078 visits (57.4%) occurred no more than 3 years prior to HIV testing. Diagnostic codes for 15,408 visits (79.9%) were for diagnoses unlikely to prompt an HIV test, and diagnostic codes for 3,888 visits (20.1%) were likely to suggest the need for an HIV test.

Conclusions In SC, there were many prior visits among HIV-infected persons that could have provided an opportunity for earlier HIV diagnosis. However, most of the diagnostic codes from these healthcare visits would not have prompted an HIV test. These data present a persuasive argument for routine HIV screening in healthcare settings to detect undiagnosed HIV in SC.

Introduction

- Nationwide, about 25% of HIV-infected individuals are unaware of their HIV status¹, and 43% are 'late testers'².
- Former CDC guidelines encouraged risk-based testing, but this type of testing may miss individuals unaware of their risk.
- Evidence shows many access healthcare services but are not tested until they show some sign of HIV infection³.
- New CDC recommendations encourage routine testing for all individuals between 13 – 64 years with the option to decline⁴.

Objectives

- To examine whether HIV-infected individuals utilize healthcare services prior to receiving their first positive HIV test (FPHIV).
- To determine if a positive HIV test result is associated with certain ICD diagnostic codes.
- To assess the effectiveness of risk-based testing in SC and determine the need for routine screening according to new CDC recommendations.

Methods

- Study subjects were SC residents receiving their FPHIV between 01/01 – 12/05.
- Healthcare data were linked to HIV records by name, date of birth, gender, race, and SSN, and date of FPHIV was used to determine the timing of visits in relation to diagnosis.
- Healthcare visits ranged from 01/97 – 12/05.
- Variables of interest included patient demographics, diagnosis and procedure codes, source of payment, and setting of visit.
- Outcome was AIDS diagnosis within 1 year of the FPHIV ('AIDS ≤ 1 Yr') vs. those with only an HIV diagnosis ('HIV Only').

Figure 1. Diagram of Potential Missed Opportunities

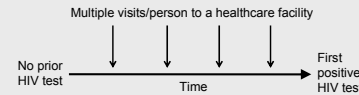


Figure 2. Overall Characterization of SC Residents Diagnosed with HIV, 2001 – 2005

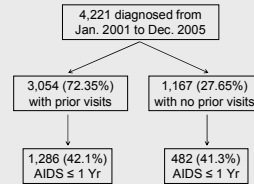


Table 1. Comparison of selected characteristics of HIV-infected individuals in SC with prior healthcare visits (N = 2,867)

Variable*	HIV Only	AIDS ≤ 1 Yr	OR (95% CI)
Female	669 (42.3)	406 (31.6)	0.63 (0.54, 0.73)
Male	912 (57.7)	880 (68.4)	1.00
Black	1,240 (79.1)	1,044 (81.3)	1.18 (0.97, 1.43)
Hispanic	24 (1.5)	21 (1.6)	1.22 (0.66, 2.26)
White	295 (18.8)	211 (16.4)	1.00
IDU	67 (4.2)	78 (6.1)	1.38 (0.97, 1.97)
MSM & IDU	22 (1.4)	18 (1.4)	0.97 (0.51, 1.84)
Heterosexual	585 (37.0)	462 (35.9)	0.94 (0.78, 1.13)
MSM	401 (25.4)	338 (26.3)	1.00

* Data is reported as N (column %). Table does not include data on 187 individuals diagnosed with AIDS greater than 1 year after FPHIV.

Figure 3. Healthcare Visits by Setting

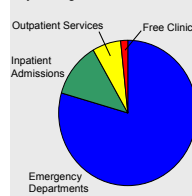


Figure 4. Individuals by Number of Healthcare Visits*

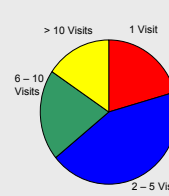


Table 2. Number (%) of prior healthcare visits by time in relation to the first positive HIV test (N = 18,063 visits)

Time from Healthcare Visit to First Positive HIV Test†	HIV Only	AIDS ≤ 1 Yr
< 6 months	1,103 (10.9)	1,128 (14.3)
6 months – 1 year	1,029 (10.1)	813 (10.3)
1 – 2 years	1,903 (18.7)	1,338 (16.9)
2 – 3 years	1,634 (16.1)	1,336 (16.9)
> 3 years	4,491 (44.2)	3,288 (41.6)

† Data is reported as N (column %). Table does not include data on 1,233 visits made by individuals diagnosed with AIDS greater than 1 year after FPHIV.

Figure 5. Healthcare Visits by Payment Method

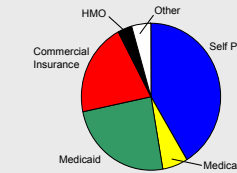


Table 3. Number (%) of prior healthcare visits by reported diagnosis (N = 19,296 visits)

Reported Diagnosis	N (%)
Visits with diagnoses not likely to prompt a test†	15,408 (79.8)
Visits with diagnoses likely to prompt a test	3,888 (20.2)
STDs and related diagnoses	522 (2.7)
Symptoms suggestive of ARS†	2,734 (14.2)
Diseases possibly related to HIV‡	871 (4.5)
Diseases probably related to HIV†	92 (0.5)
Intravenous drug use and related behaviors	314 (1.6)

† Including hypertension, diabetes, and constipation.
 ‡ ARS = acute retroviral syndrome, including fever, lymphadenopathy, and rash.
 § Including peripheral neuropathy, pneumonia, and thrombocytopenia.
 ¶ Including cerebral toxoplasmosis, pulmonary tuberculosis, and thrush.

Results

- 72% of HIV-infected individuals in SC had at least one potential missed opportunity for earlier HIV detection, represented by a healthcare visit in the years prior to their FPHIV.
- Of those, 42% developed AIDS within 1 year of their FPHIV (late testers), who would most likely have been found to be positive earlier if they had been offered and had accepted testing.
- Most visits (80%) included diagnoses not likely to prompt a test.

Results (continued)

- 44% of individuals had 2 – 5 visits to a healthcare facility, with almost 80% of visits occurring in emergency departments.
- The majority of visits for both HIV only individuals (56%) and late testers (58%) occurred within 3 years of their FPHIV.
- Fewer females than males were late testers.

Conclusions

- This study demonstrates HIV-infected individuals are accessing health services prior to their FPHIV but are being missed.
- As many of these missed individuals are 'late testers', these individuals are the strongest evidence from our study of the need for routine HIV screening in SC.
- 'Late testers' have poorer response to treatment, greater morbidity, and shorter life expectancy, and overall, there are greater healthcare costs associated with these individuals.
- Undiagnosed infection leads to continued transmission.
- Statewide, more attention should be given to finding and diagnosing these individuals, especially in the healthcare settings where the majority of these missed opportunities are occurring.
- Greater efforts are also necessary in educating the public on HIV prevention and the benefits of early detection.

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Acknowledgements

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