

HIV Screening Practices Among Youth Tested for Other Sexually Transmitted Infections in Pediatric Primary Care

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ABSTRACT

Introduction: HIV remains a significant public health concern. In Wisconsin, new cases increased by 36% during 2020 through 2022, and 22% were 13 to 24 years old. Despite recommendations for routine HIV screening, youth testing remains inadequate. This study aimed to understand HIV screening practices among youth receiving care in pediatric primary care clinics in southeastern Wisconsin.

Methods: Clinic HIV testing rates were measured in patients aged 12 to 26 undergoing gonorrhea and/or chlamydia testing at pediatric primary care clinics affiliated with a not-for-profit children's hospital.

Results: Youth HIV testing rates at all clinic sites were low (median 19.7%) ranging from 13.2% to 36.1%. Higher rates were seen in clinics with higher rates of sexually transmitted infections.

Conclusions: Interventions are needed to enhance HIV testing rates in pediatric primary care clinics.

INTRODUCTION

HIV remains a significant public health concern in the United States, including Wisconsin, where the number of HIV diagnoses increased 36% from 2020 through 2022. Notably, youth 13 to 24 years old represented 22% of the state's new HIV diagnoses in that 3-year period.¹ Milwaukee County has the highest HIV incidence and prevalence in Wisconsin, and the City of Milwaukee has the highest incidence and prevalence of HIV cases in Milwaukee County.

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Early HIV detection through routine screening is crucial for linkage to care that improves patient outcomes.² For this reason, the American Academy of Pediatrics recommends universal HIV screening for adolescents age 15 and 18 years at least once and at least annually for adolescents of any age with increased risk of HIV acquisition, including those who are sexually active.³ Despite this recommendation, HIV testing in youth remains underperformed—even among those at increased risk.⁴⁻⁶

During encounters to obtain tests for other sexually transmitted infections (STIs) either for routine screening of the

sexually active adolescent, known exposure from a partner, or because of symptoms suggestive of an STI, there is an opportunity to address HIV risk and provide counseling on HIV prevention strategies. Such counseling should include offering HIV testing, as well as pre-exposure and post-exposure prophylaxis when appropriate.³

This retrospective study was conducted to better understand HIV testing practices and between-clinic variability in HIV screening among youth being tested for gonorrhea and/or chlamydia during pediatric primary care encounters at our institution. We hypothesized that there would be higher HIV screening rates in clinics located in the City of Milwaukee versus other locations, clinics with higher STI screening positivity, and in clinics with laboratory facilities on-site.

METHODS

We measured the rates of HIV screening among all patients aged 12 to 26 who underwent testing for *Neisseria gonorrhoeae* (gonococcus [GC]) and/or *Chlamydia trachomatis* (CT) from July 2022

Table. Characteristics of Clinics That Performed GC/CT Testing in Youth Aged 12 to 26 Years by Geographic Location, July 2022–June 2023

	City of Milwaukee (4 clinics, 641 patients tested)		Other cities in Milwaukee County (7 clinics, 990 patients tested)		Other Counties ^a (11 clinics, 759 patients tested)		
	n eval	n (%) or median (IQR)	n eval	n (%) or median (IQR)	n eval	n (%) or median (IQR)	P value
Site Characteristics							
Laboratory facility at same location	4	0 (0)	7	0 (0)	11	4 (36)	0.141
Census tract SVI percentile (clinic location)	4	91.4 (86.2–95.6)	7	50.7 (25.2–67.0)	11	18.2 (11.0–50.2)	0.001
County HIV Prevalence 2021 (per 100 000)	4	411	7	411	11	49.7 (46.8–49.7)	<0.001
Characteristics of patients tested for GC/CT							
Number of patients tested for GC/CT per clinic	4	82 (62.8–336.0)	7	113 (76.0–161.0)	11	57 (26.0–109.0)	0.126
GC/CT positivity rate, %	4	22.2 (18.2–25.3)	7	12.4 (9.7–16.7)	11	10.3 (6.1–13.8)	0.011
Female population, %	4	75.5 (70.3–81.7)	7	75.2 (70.2–87.6)	11	80.8 (78.7–83.9)	0.374
Non-Hispanic black population, %	4	86.1 (62.8–93.2)	7	29.2 (20.0–65.8)	11	20.2 (14.8–27.6)	0.008
Hispanic/Latino population, %	4	4.9 (1.7–22.4)	7	10.5 (6.1–26.7)	11	11.8 (10.1–22.2)	0.475
Medicaid coverage, %	4	93.6 (87.3–95.3)	7	67.1 (60.5–70.8)	11	58.1 (53.9–59.1)	0.006
Outcome							
HIV screen rate, %	4	24.1 (16.0–33.2)	7	18.4 (15.0–20.2)	11	19.2 (15.4–22.8)	0.356

Abbreviations: IQR, interquartile range; SVI, social vulnerability index; GC, *Neisseria gonorrhoeae*, CT, *Chlamydia trachomatis*.

^aAll counties adjacent to Milwaukee County where hospital-affiliated pediatric primary care clinics are located were included: Kenosha, Ozaukee, Washington, and Waukesha.

through June 2023 at primary care clinics affiliated with a tertiary care pediatric center. Patients undergoing screening for GC/CT were selected to ensure all included patients had an indication for HIV screening. The 22 hospital-affiliated clinic sites in 5 southeast Wisconsin counties adjacent to and including Milwaukee County (Kenosha, Milwaukee, Ozaukee, Washington, and Waukesha) that provide primary care for adolescents and young adults were included. We determined the social vulnerability index for each clinic based on the clinic census tract location.

Patient demographic characteristics and clinic HIV screening rates were obtained from the electronic medical record. We collected available test results for HIV antigen/antibody (Ag/Ab) for patients who underwent screening for GC or CT via nucleic acid amplification test (NAAT) from urine or vaginal, urethral, oropharyngeal, or rectal swabs within the 12-month study period. Routine screening for HIV at all clinic sites within our institution is performed by obtaining laboratory-based HIV Ag/Ab screens, with positive tests reflexed to the antibody differentiation assay and quantitative HIV-1 NAAT.

We also collected syphilis screening rates from each clinic. Routine syphilis screening at our institution is performed by rapid plasma reagin (RPR) test with reflex to *Treponema pallidum* particle agglutination (TP-PA) test during the study period. Aggregated data were collected and evaluated by clinic site.

Categorical variables were reported as No. (%) and continuous variables as median (interquartile range [IQR]). Clinics were grouped by location (City of Milwaukee, other clinics in Milwaukee County, and clinics outside Milwaukee County), the presence of an on-site laboratory (eliminating the need to travel elsewhere for testing), and by the rate of STI testing positivity

(first [lowest] quartile, second and third quartiles, and fourth [highest] quartile). HIV testing rates were compared between groups using Fisher exact test and Mann-Whitney test as appropriate. The Fisher-Freeman-Halton test and Kruskal-Wallis test were used, respectively, for comparisons involving more than 2 groups.

Classification and regression tree (CART) analysis was used to explore the relationship between various factors and clinic HIV screening rates. The split criteria were 4 for the parent node and 4 minimum for terminal nodes. The Gini function was used for optimization, and 10-fold cross-validation was used to evaluate model performance. A *P* value <0.05 was considered statistically significant. SPSS, version 28 (IBM Corp, Armonk, New York) and Salford Predictive Modeler 8 CART (Minitab LLC) were used for statistical analyses.

Our institution's Human Research Protection Program determined that this project was not human subjects research.

RESULTS

A total of 2390 patients were tested for GC/CT at all clinic sites (*n* = 22) from July 2022 through June 2023. Of these, 362 patients (15.1%) had at least 1 positive test for either or both organisms. Of all the patients tested for GC/CT (*n* = 2390), most were female (80.6%), non-Hispanic Black (45.2%), and had Medicaid as their primary insurance coverage (70.7%). Of the 2390 patients tested for GC/CT, 470 (19.7%) were tested for HIV within the 12-month study period. HIV screening rates by clinic site ranged from 13.2% to 36.1%. A total of 437 (18.3%) of the 2390 patients were screened for syphilis, with syphilis screening rates per clinic ranging from 11.8% to 32.8%.

We compared the characteristics of clinic sites and the pop-

ulation served by each, grouped by clinic location. The groups included the City of Milwaukee (4 clinics, 641 patients tested for GC/CT), other cities within Milwaukee County (7 clinics, 990 patients tested for GC/CT), and cities in other counties (11 clinics, 759 patients tested for GC/CT). These groups were chosen based on the known differences in HIV epidemiology between these locations. There were significant differences in the social vulnerability index of the clinic location, the proportion of non-Hispanic Black patients, GC/CT positivity rates, and the rate of Medicaid insurance coverage. However, there was no significant difference in the median HIV screening rates (24.1% [16-33.2] for the City of Milwaukee vs 18.4% [15-20.2] for other cities within Milwaukee County vs 19.2% [15.4-22.8] for cities in other counties, $P=0.356$) (Table).

There was no significant difference in HIV screening rates at clinics with on-site laboratory capabilities ($n=4$; screening rate 19.3% [16.6-20.8]) compared to those without on-site laboratory capabilities ($n=18$; screening rate 18.8% [15.0-23.8]), $P=0.90$.

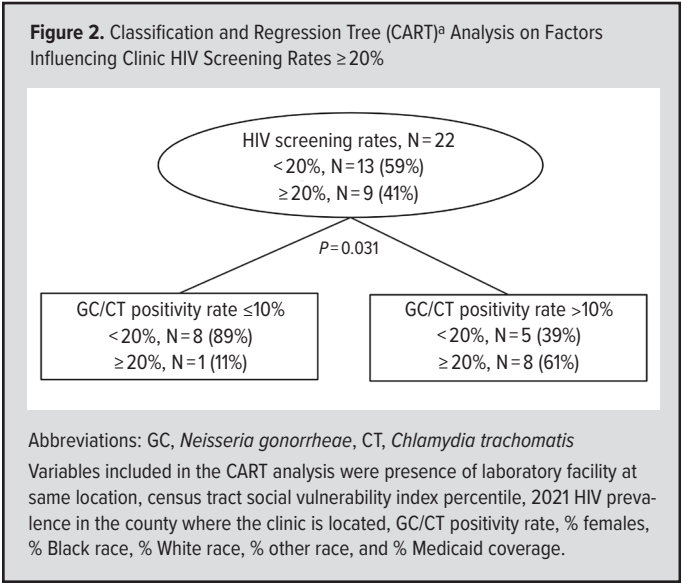
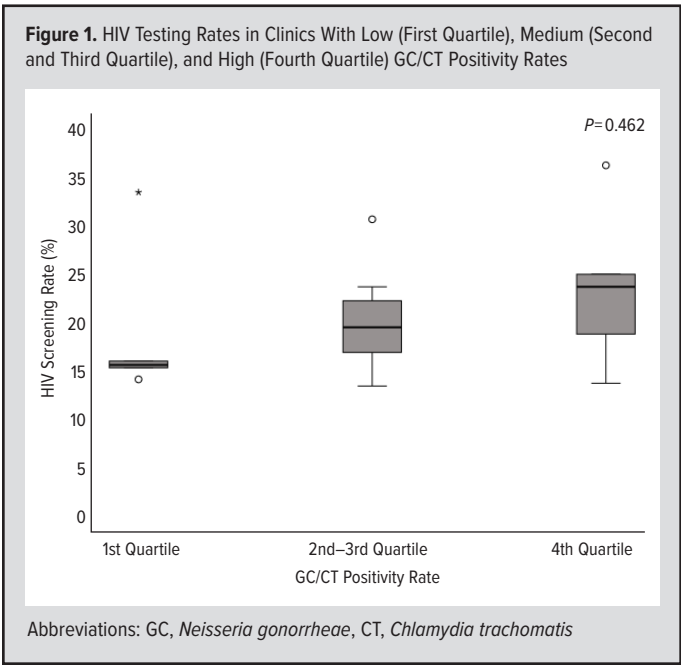
Univariate analysis suggested higher HIV screening rates in clinics with higher GC/CT positivity rates, but this was not statistically significant (Figure 1). When grouping clinic sites by HIV screening rates above or below the median screening rate of 20%, CART analysis demonstrated that clinics with GC/CT positivity of $>10\%$ were more likely to have an HIV testing rate $\geq 20\%$ (61% vs 11%, $P=0.031$) (Figure 2).

DISCUSSION

In this study of youth being tested for STIs in primary care clinics, the rate of HIV screening showed considerable variability between clinics but was low overall (under 40%). While HIV screening rates trended somewhat higher in the City of Milwaukee, the highest screening rates were seen in the clinics with the highest GC/CT test positivity rates, regardless of location.

When comparing HIV screening rates among the City of Milwaukee, Milwaukee County, and other counties, we found no statistically significant differences in HIV screening rates, despite the significant differences in HIV prevalence and incidence rates across these areas. We hypothesized that patients attending clinics in the City of Milwaukee are more likely to be tested due to the local epidemiology of HIV and the higher rates of STIs (which put youth at higher risk of HIV acquisition), as well as higher rates of Medicaid coverage potentially reducing the concern around inadvertent parental disclosure compared to those with commercial insurance. However, we observed consistently low screening rates across all locations.

We wondered if low HIV screening rates could be attributed partly to lack of on-site laboratory capabilities—especially in clinics serving areas with higher social vulnerability index percentiles where patients are more likely to face transportation barriers to travel to laboratory facilities. To explore this further, we compared the HIV screening rates from clinics with and without laborato-



ries on-site, but no significant difference was found, suggesting that barriers to HIV testing completion might be driven by factors other than access to the test. Notably, clinics outside Milwaukee that have laboratory capacity demonstrated low screening rates, potentially influenced by lower provider awareness or perception of low patient risk. These clinics cared for more patients covered by non-Medicaid insurance, which may lead them to face concerns related to loss of confidentiality, further impeding HIV testing completion even when tests are readily available.

Barriers for HIV testing in youth have been explored to some degree, but not extensively. Importantly, youth commonly list the lack of recommendation by a health care provider as a reason for not getting tested for HIV,⁷ and acceptance rates of HIV tests after pediatrician recommendation in populations at risk have been reported to be high.⁸ In a study that surveyed pediatricians who

care for adolescents and young adults, only 28% reported recommending HIV screening for their sexually active patients, and the most-listed barrier for offering HIV screening was lack of time to provide adequate counseling.⁹

There are several limitations to this study. We utilized a cohort of patients who were screened for other STIs as a proxy for sexual activity and risk of HIV acquisition. However, STI screening among sexually active youth has been reported to be low,¹⁰ which may result in our rates being an overestimation of true HIV testing rates among at-risk youth. We used aggregated clinic-level data, which did not allow us to evaluate some of these factors at the individual patient level and prevented us from determining HIV testing rates among populations at highest risk (such as those with a positive test for GC/CT).

Our findings highlight a significant challenge in addressing the HIV epidemic among youth that is not limited to southeast Wisconsin. Goyal et al⁶ reported a HIV screening rate of 36% among adolescents 13 to 19 years old with documented sexual activity in pediatric primary care clinics in Philadelphia and nearby areas where the HIV prevalence is estimated to be 1%.¹ In an urban pediatric clinic located in Phoenix, Arizona (HIV prevalence 0.3%¹), the universal HIV screening rate for adolescents 15 years and older receiving care at that location was 5% prior to the implementation of a quality improvement initiative, which successfully increased the HIV screening rates to 42%.¹¹

This report aims to raise awareness among primary care clinicians caring for youth and to encourage them to integrate HIV testing counseling into routine preventive visits. This could be accomplished by reminders incorporated into the electronic medical record, adjusting the workflow for clinic staff to offer these tests prior to the visit, or by incorporating HIV and syphilis into order panels for other STIs. Point-of-care tests may also eliminate the barrier of access to laboratory facilities.

The report also underscores the need for exploratory studies to understand what other barriers pediatric primary care providers and patients face in completing these tests. Addressing these barriers will be essential for implementing interventions to improve HIV screening rates among youth.

CONCLUSIONS

While HIV screening rates were somewhat higher in clinics with higher rates of STI positivity, HIV screening rates overall were low among youth being screened for other STIs. Future studies aimed at identifying barriers to HIV testing from both pediatric clinicians and patients who get pediatric primary care, followed by interventions to enhance HIV testing rates among youth receiving primary care, are urgently needed

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