

Background

- Pre-exposure prophylaxis (PrEP) has the potential to reduce new HIV transmission events
- Identification of clients at greatest risk of acquiring HIV is critical for PrEP implementation.
- CDC issued clinical practice guidelines in 2014 to support broader implementation of PrEP with additional guidance provided by CDC's 2012 HIV Incidence Risk Index for MSM (HIRI-MSM) screening tool and Gilead's TRUVADA for PrEP package insert

Objective

- To examine 3 published guidelines in identifying eligible PrEP candidates, including seroconverters, in a population-based cohort of young Black men who have sex with men (YBMSM).

Methods

Study population

- uConnect cohort included YBMSM aged 16-29 years during PrEP roll-out in Chicago from 2013-2016.
- Study included a baseline interview (wave 1) and two follow-up interviews (wave 2 and wave 3) 9-months apart over an 18 month period.
- Participants were included in analyses if HIV-uninfected at wave 1.

Definitions

- Table 1 shows PrEP Eligibility definitions for the three guidelines
- HIV seroconversion measured using 4th generation and NAAT testing at 3 time points.

Table 1. Indications for PrEP by guidelines

Guideline	Indication
CDC clinical practice guidelines ¹	Any male sex partners in past 6 months, Not in a monogamous partnership with a recently tested, HIV- negative man & at least one of the following:
	Any anal sex without condoms (receptive or insertive)
	Any STI diagnosed or reported in past 6 months
	Is in an ongoing sexual relationship with an HIV-positive male partner
HIRI Risk Index – Risk Level (Score) ²	Age - < 18 years (0) ; 18-28 years (8); 29-40 years (5)
	How many men have you had sex with in the last 6 months? -> 10 male partners (7); 6-10 male partners (4); 0 – 5 male partners (0)
	In the last 6 months, how many times did you have receptive anal sex with a man? - 1 or more times (10); 0 times (0)
	How many of your male sex partners were HIV positive? - > 1 positive partner (8); 1 positive partner (4); < 1 positive partner (0)
Gilead indications ³	Inconsistent or no condom use
	Diagnosis of sexually transmitted infections
	Exchange of sex for commodities
	Use of illicit drugs or alcohol dependence/ Use of illicit drugs or alcohol dependence (excluding marijuana)
	Incarceration
Partners of unknown HIV-1 status with any of the factors listed above	

Analysis

- Determined proportion YBMSM with indications for PrEP using guidelines
- Sensitivities, specificities and area under the curve (AUC) for HIV seroconversion over 18 months calculated
- Incidence Rate Ratios using Poisson regression modeled to compare individual and network factors associated with seroconversion

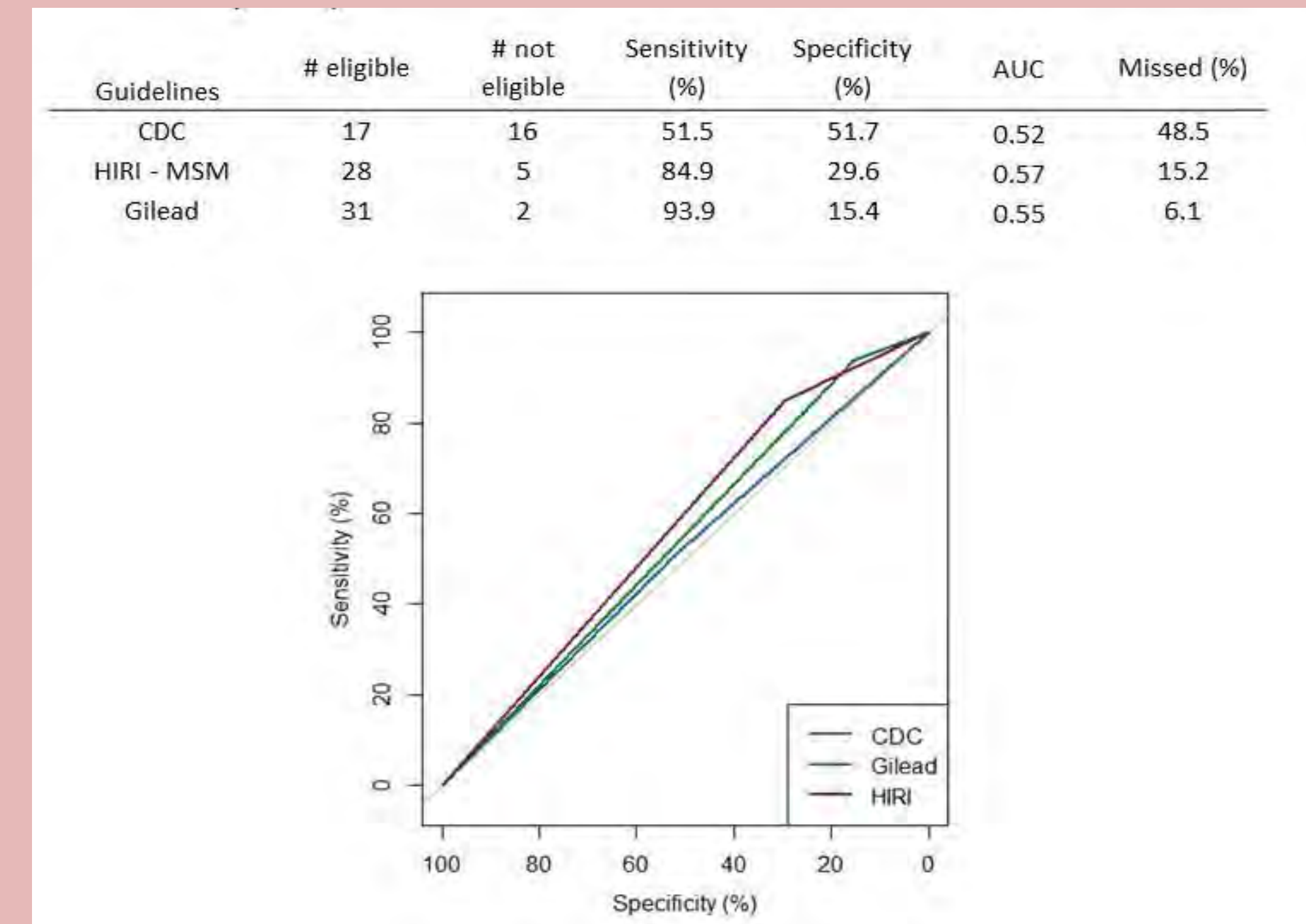
Results

- 300 HIV uninfected YBMSM contributed 390.4 person-years (PY) of follow-up.
- Mean age (SD), 22.3 years (3.07), 9% identify as transgender, 83% income <20k, 33% high school education or less.
- HIV incidence was 8.5 cases per 100 PY (95% CI, 6.0-11.9)
- Approximately half of the sample (49%) met criteria for PrEP use according to CDC guidelines, 72% according to HIRI-MSM Risk Index, and 86% met the Gilead indications for PrEP
- Having any partner ≥10 years older (IRR=2.30, 95% CI 1.1-4.9) was associated with seroconversion.

Table 2. Predictors of incident HIV infection among uConnect cohort, Chicago, 2013-2016 (N=300)

Characteristic	HIV infections	Person-years (PY)	Incidence rate per 100 PY (95% CI)	Incidence rate ratio (95% CI)	Characteristic (contd)	HIV infections	Person-years (PY)	Incidence rate per 100 PY (95% CI)	Incidence rate ratio (95% CI)
Overall	33	390.4	8.5 (6.0, 11.9)	-	Sexual network				
Age					Any partners HIV +				
18-24	28 (84.8)	298	9.4 (6.5, 13.6)	1.7 (0.7, 4.5)	Yes	1 (3.0)	39.9	2.5 (0.4, 17.8)	0.3 (0.04, 1.9)
≥ 25	5 (15.2)	92.4	5.4 (2.3, 13.0)	ref	No	32 (97.0)	339.2	9.4 (6.7, 13.3)	ref
Sexual identity					Partner with unknown HIV status				
Gay	21 (65.6)	241.1	8.7 (5.7, 13.4)	ref	Yes	11 (33.3)	91.9	12.0 (6.6, 21.6)	1.6 (0.8, 3.2)
Bisexual	7 (21.9)	131.7	5.3 (2.5, 11.2)	0.6 (0.3, 1.4)	No	22 (66.7)	287.2	7.7 (5.0, 11.6)	ref
Straight/other	4 (12.5)	17.4	23.0 (8.6, 61.3)	2.6 (0.9, 7.7)	Any partner ≥ 10 years older				
Sociodemographic					Yes	10 (30.3)	65.9	15.2 (8.2, 28.2)	2.1 (1.0, 4.5)*
Education					No	23 (69.7)	324.5	7.1 (4.7, 10.7)	ref
HS or GED, or less	7 (24.1)	116.4	6.0 (2.9, 12.6)	ref	Any partners in jail				
Some college/Aatech	21 (72.4)	215.2	9.8 (6.4, 15.0)	1.6 (0.7, 3.8)	Yes	16 (48.5)	169	9.5 (5.8, 15.5)	1.2 (0.6, 2.3)
College grad /post-bacc	1 (3.4)	27.5	3.6 (0.5, 25.8)	0.7 (0.1, 4.9)	No	17 (51.5)	210.1	8.1 (5.0, 13.0)	ref
Employed					Any sex drug use with partner*				
Full time	5 (15.2)	114.5	4.4 (1.8, 10.5)	ref	Yes	17 (51.5)	162.9	10.4 (6.5, 16.8)	1.4 (0.7, 2.8)
Part time	9 (27.3)	108.1	8.3 (4.3, 16.0)	1.9 (0.6, 5.7)	No	16 (48.5)	216.1	7.4 (4.5, 12.1)	ref
Unemployed	19 (57.6)	167.9	11.3 (7.2, 17.7)	2.6 (1.0, 6.9)	Any race mixing				
Health insurance					Yes	4 (12.1)	56.3	7.1 (2.7, 18.9)	0.8 (0.3, 2.3)
Yes	18 (62.1)	205.1	8.8 (5.5, 13.9)	ref	No	29 (87.9)	322.8	9.0 (6.2, 12.9)	ref
No	11 (37.9)	173.9	6.3 (3.5, 11.4)	0.7 (0.3, 1.5)	Social Network				
Unstably housed					Any network members HIV+				
Yes	7 (21.2)	293.1	7.2 (3.5, 15.2)	0.8 (0.4, 1.9)	Yes	4 (12.1)	53	7.5 (2.8, 20.1)	1.2 (0.5, 2.9)
No	26 (78.8)	96.6	8.9 (6.0, 13.0)	ref	No	29 (87.9)	328.1	8.8 (6.1, 12.7)	ref
Ever in jail					Any network members in jail				
Yes	12 (39.4)	168.3	7.1 (4.0, 12.6)	0.8 (0.4, 1.7)	Yes	16 (48.5)	198	8.1 (5.0, 13.2)	1.2 (.5, 2.9)
No	21 (60.6)	222.1	9.5 (6.2, 14.4)	ref	No	17 (51.5)	183.1	9.3 (5.8, 14.9)	ref
Sexual behaviors					Any partners who use illicit drugs				
Any main partner					Yes	21 (63.6)	230.5	9.1 (5.9, 14.0)	ref
Yes	13 (36.4)	148.9	8.7 (5.1, 15.0)	1.0 (0.5, 2.0)	No	12 (36.4)	150.6	8.0 (4.5, 14.0)	ref
No	20 (63.6)	228.9	8.7 (5.6, 13.5)	ref	PrEP Use				
Any condomless sex					Any PrEP use	4 (12.5)	54.7	7.3 (2.7, 19.5)	0.86 (0.3, 2.5)
Yes	19 (57.6)	203.8	9.3 (5.9, 14.6)	1.2 (0.6, 2.3)	No PrEP use	28 (87.5)	329.2	8.5 (5.9, 12.3)	ref
No	14 (42.4)	175.3	8.0 (4.7, 13.5)	ref	Eligibility by guidelines				
Exchanged sex[†]					CDC guidelines				
Yes	0 (0)	36.1	0	-	Eligible	17 (51.5)	195.1	8.7 (5.4, 14.0)	1.1 (0.5, 2.1)
No	33 (100)	342.9	9.6 (6.8, 13.5)	-	Not eligible	16 (48.5)	195.3	8.2 (5.0, 13.4)	ref
Personal Behaviors					HIRI-MSM Risk Index				
Any drug use^b					Risk score ≥ 10	28 (84.8)	277.4	10.1 (7.0, 14.6)	2.2 (0.8, 5.7)
Yes	17 (51.5)	187.1	9.1 (5.6, 14.6)	1.2 (0.6, 2.3)	Risk score < 10	5 (15.2)	108.3	4.6 (1.9, 11.1)	ref
No	16 (48.5)	203.3	7.9 (4.8, 12.8)	ref	Gilead guidelines				
Marijuana use					Eligible	31 (93.9)	332	9.3 (6.5, 13.3)	2.7 (0.7, 11.4)
Yes	27 (81.8)	284.9	9.5 (6.5, 13.8)	1.7 (0.7, 4.0)	Not eligible	2 (6.1)	58.4	3.4 (0.9, 13.7)	ref
No	6 (18.2)	105.6	5.7 (2.6, 12.6)	ref	Footnotes:				
Meth use					[†] For drugs, goods, other benefits				
Yes	0 (0)	1.3	0	-	[‡] Excluding marijuana use, p<.10				
No	33 (100)	389.2	8.5 (6.0, 11.9)	-	[§] p<.05, **p<.01, ***p<.001				
Poppers use									
Yes	4 (12.1)	17.9	22.4 (8.4, 59.6)	2.4 (0.9, 6.9)					
No	29 (87.9)	312.6	9.3 (6.4, 13.3)	ref					

Figure 1. Sensitivity, specificity, AUC and proportion of HIV seroconverters missed by PrEP Guidelines (n=33)



Conclusion

- Low sensitivity of CDC guidelines and limited specificity of HIRI MSM and Gilead screening tools is of concern for PrEP implementation in most at risk populations.
- Consideration of local epidemiology and network factors may better guide identification of clients who could benefit the most from PrEP.

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