The potential for selection and misclassification bias when sampling men who have sex with men (MSM) in gay bars

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Background

- The majority of cases of HIV among MSM have been attributed to unprotected anal intercourse (UAI).
- Characteristics associated with engagement in UAI in the literature:
  - Younger age;
  - Less formal education;
  - Being HIV positive;
  - Self-identified gay sexual orientation;
  - Having multiple sexual partners;
  - Having primary partners; and
  - Using alcohol or illicit non-injection or injection drugs.
- Race/ethnicity is not consistently associated with engagement in UAI in the literature.
- Most studies of MSM's HIV risk behavior enroll participants using venue-based sampling.

Variation Between Gay Bars

- Most venue-based studies did not describe the bars where participants were enrolled.
- HIV research and prevention activities often target gay bar patrons.
- Differences between types of gay bars were rarely studied quantitatively.
- Gay bars are typically analyzed as homogeneous venues.
- Types of gay bars
  - Cruising bars - patronized by MSM looking for sexual partners.
  - Hustler bars - frequented by commercial sex workers.
  - Mixed bars - patronized by both gay and heterosexual clients.
  - Traditional gay bars – frequented by MSM who are not looking for sexual partners.

Objectives

- This study describes:
  - Variation between gay bars and
  - The impact of enrollment in different bars on the sociodemographic characteristics of the sample and on the estimated prevalence of UAI among MSM.

Methods

Data Sources

- Enrollment
  - Upstate NY HIV Testing Survey (HITS): Gay bars in Rochester and Buffalo (2000).
  - HIV Testing, Attitudes, and Practices Survey (H-TAPS) (2001-2004):
    - Rochester and Buffalo : Gay bars.
    - Syracuse: Gay bars, a non-alcoholic café, 2 highway rest areas.
    - Albany: Gay bars, a bathhouse, a community center.
- Survey administration
  - Statement of informed consent.
  - 30 minute anonymous face-to-face interview.
  - Incentive: $20 money order.
- Overall H-TAPS response rate: 73.2%.
- Survey of gay bar interviewers.
- Supported by a grant from the CDC.

Eligibility Criteria

- HITS/H-TAPS eligibility criteria:
  - 18+ years old;
  - Resided in New York State;
  - Capable of giving informed consent; and
  - Spoke English.
- This analysis:
  - Males in the HITS/H-TAPS MSM sample;
  - Interviewed in a site that could be classified as a sex or non-sex venue;
  - Had sex with a man in the past year or self-identified as gay or bisexual; and
  - Completed questions used to assess condom use during anal intercourse with male partners.

Types of gay bars

- Classification of gay bars. Interviewers asked about:
  - Typical patrons of the bars and
  - HIV prevention activities within the bars.

	Bars		Participants	
	n	%	n	%
Traditional gay bars	12	42.9%	235	48.2%
Mixed bars	8	28.6%	142	29.1%
Cruising/Hustler bars	7	25.0%	92	18.9%
Drag bar*	1	3.6%	19	3.9%
Total	28		488	
* Excluded due to the small number of participants.				

Variables

- UAI with male partners in the 12 past months.

- Estimated prevalence of UAI =

$$\frac{\text{\# MSM who had anal intercourse without a condom}}{\text{\# MSM who answered questions about condom use during anal intercourse*}}$$

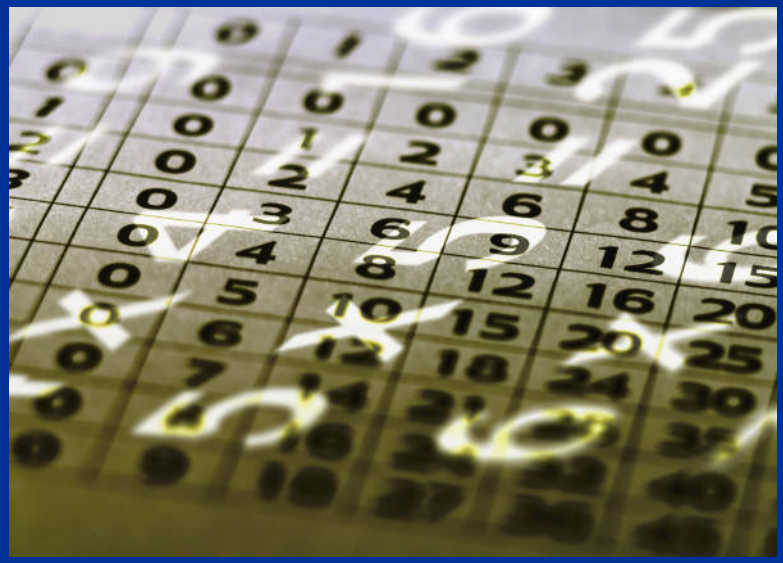
- Covariates:
  - Age;
  - Race/ethnicity;
  - Self-reported HIV status; and
  - Self-identified sexual orientation.

* Includes MSM who had anal intercourse without a condom, MSM who always used condoms during anal intercourse and MSM who did not have anal intercourse with male partners.

Data analysis

- Univariable analysis
- Bivariable analysis
  - Relationship between type of bar, sociodemographic and other personal characteristics.
  - Relationship between UAI and sociodemographic and other personal characteristics.
  - Relationship between UAI and type of bar.
- Multivariable regression analysis
  - Poisson regression.
  - All models include type of gay bar, age, race/ethnicity, self-reported HIV status and self-identified sexual orientation.

Results



Sample Characteristics (n=469)

		n	%
Age	18-30	193	41.2%
	31-40	180	38.4%
	41+	96	20.5%
Race/ethnicity	Hispanic	47	10.4%
	Non-Hispanic black	125	27.8%
	Non-Hispanic other race	69	15.3%
	Non-Hispanic white	209	46.4%
Education	<= high school/GED	140	30.2%
	Some college	185	40.0%
	>= college degree	138	29.8%
Self-reported HIV status	HIV positive	57	12.3%
	HIV negative	322	69.5%
	Never tested	84	18.1%
Self-reported sexual orientation	Gay	346	74.7%
	Bisexual	81	17.5%
	Heterosexual	17	3.7%
	Other/Not sure	19	4.1%

Difference Between MSM Interviewed in Different Types of Gay Bars (1)

		Traditional Gay Bars		Mixed Bars		Cruising/ Hustler Bars		X^2 p-value
		n	%	n	%	n	%	
Age	18-30	91	38.7%	73	51.4%	29	31.5%	0.0022
	31-40	88	37.5%	43	30.3%	49	53.3%	
	41+	56	23.8%	26	18.3%	14	15.2%	
Race/ ethnicity	Hispanic	19	8.3%	20	14.8%	8	9.3%	<0.0001
	Non-Hisp. black	79	34.5%	28	20.7%	18	20.9%	
	Non-Hisp. white	18	7.9%	26	19.3%	25	29.1%	
	Non-Hisp. other	113	49.3%	61	45.2%	35	40.7%	
Education	<= HS/GED	72	30.6%	48	34.3%	20	22.7%	0.2107
	Some college	89	37.9%	59	42.1%	37	42.1%	
	>= degree	74	31.5%	33	23.6%	31	35.2%	

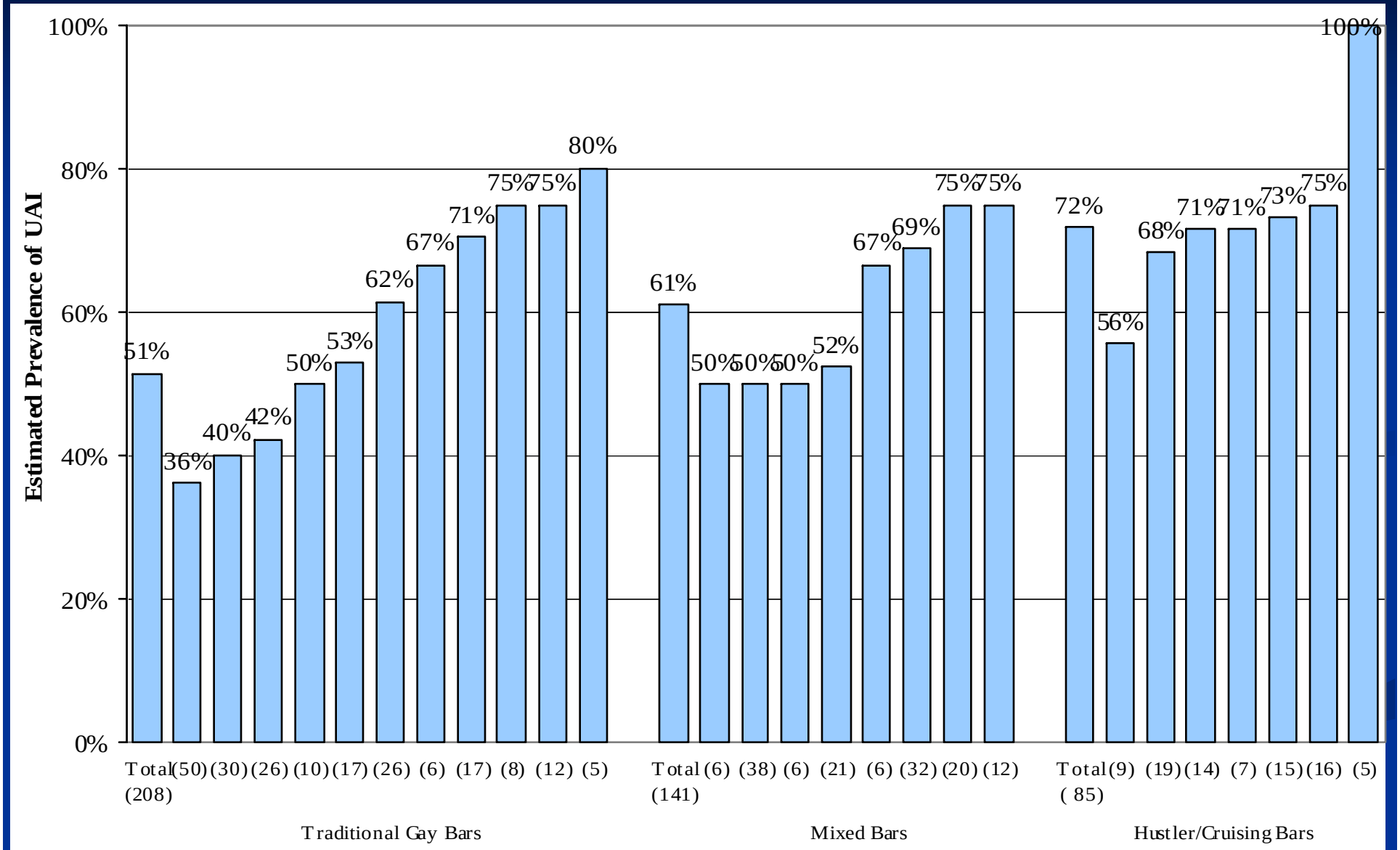
Difference Between MSM Interviewed in Different Types of Gay Bars (2)

		Traditional Gay Bars		Mixed Bars		Cruising/ Hustler Bars		χ^2 p-value
		n	%	n	%	n	%	
HIV status	HIV +	30	12.8%	9	6.5%	18	19.8%	0.0034
	HIV-	158	67.8%	98	70.5%	66	72.5%	
	Never tested	45	19.3%	32	23.0%	7	7.7%	
Sexual orientation	Gay	173	75.2%	103	73.1%	70	76.1%	0.0182
	Bisexual	31	13.5%	31	22.0%	19	20.6%	
	Other	26	11.3%	7	5.0 %	3	3.3%	

Variation in the Prevalence of UAI in Different Types of Gay Bars

	UAI (95% CI)	Receptive UAI (95% CI)	Insertive UAI (95% CI)
Traditional gay bar	107/208 = 51.4% (44.6%, 58.3%)	72/194 = 37.1% (30.2%, 44.0%)	93/235 = 39.6% (33.3%, 45.9%)
Mixed bar	86/141 = 61.0% (52.8%, 69.1%)	67/138 = 48.6% (40.1%, 57.0%)	73/141 = 51.8% (43.4%, 60.1%)
Cruising/ hustler bar	61/85 = 71.8% (62.0%, 81.5%)	45/79 = 57.0% (45.8%, 68.1%)	49/92 = 53.3% (42.9%, 63.6%)

Prevalence of UAI in Different Gay Bars



The numbers in parentheses denote the number of participants interviewed in each bar. Limited to gay bars where at least 5 MSM were interviewed.

Prevention Activities in the Gay Bars

		Bars		Estimated Prevalence of UAI (p-value)	
		n	%		
HIV testing	Yes No	10 18	35.7% 64.3%	69.1% 54.9%	(0.0063)
HIV prevention or safer sex posters	Yes No	15 13	53.6% 46.4%	66.1% 51.5%	(0.0017)
HIV prevention or safer sex brochures	Yes No	18 10	64.3% 35.7%	52.9% 69.4%	(0.0007)
Outreach	Yes No	26 2	92.9% 7.1 %	58.4 % 66.7%	(0.4867)
Distributed condoms	Yes No	25 3	89.3 % 10.7 %	61.4 % 44.1%	(0.0078)

Variation in the Prevalence of UAI

	Estimated Prevalence of UAI (95% CI)		
	Any UAI	**Receptive UAI**	**Insertive UAI**
Age			
18-30	63% (56%, 70%)	46% (39%, 54%)	52% (45%, 58%)
31-40	58% (50%, 65%)	46% (38%, 53%)	45% (37%, 52%)
41+	50% (39%, 61%)	39% (28%, 51%)	36% (27%, 46%)
Race/ ethnicity			
Hispanic	65% (51%, 80%)	48% (32%, 63%)	55% (41%, 70%)
Non-Hisp. black	47% (38%, 57%)	32% (23%, 41%)	35% (27%, 44%)
Non-Hisp. other	61% (49%, 73%)	45% (32%, 58%)	51% (39%, 63%)
Non-Hisp. White	62% (55%, 69%)	51% (44%, 58%)	47% (40%, 53%)
HIV status			
HIV positive	50% (36%, 64%)	44% (29%, 58%)	30% (18%, 42%)
HIV negative	62% (57%, 68%)	46% (41%, 52%)	52% (46%, 57%)
Unknown	47% (35%, 58%)	38% (27%, 50%)	35% (24%, 45%)
Sexual orientation			
Gay	60% (55%, 66%)	50% (44%, 56%)	46% (41%, 51%)
Bisexual	59% (47%, 70%)	34% (22%, 45%)	49% (38%, 61%)
Other	50% (32%, 68%)	21% (5%, 38%)	44% (27%, 61%)

Multivariable Poisson Regression Analysis

		Adjusted PRR (95% CI)		
		Any UAI (n=387)	**Receptive UAI (n=368)**	**Insertive UAI (n=420)**
Type of gay bar	Cruising/hustler bar	1.3 (0.9, 1.9)	1.5 (1.0, 2.3)	1.2 (0.8, 1.8)
	Mixed bar	1.1 (0.8, 1.5)	1.3 (0.9, 1.8)	1.2 (0.9, 1.7)
	Traditional gay bar	1.0	1.0	1.0
Age (years)	18-30	1.4 (0.9, 2.1)	1.4 (0.9, 2.3)	1.5 (1.0, 2.4)
	31-40	1.2 (0.8, 1.8)	1.2 (0.8, 2.0)	1.2 (0.8, 1.9)
	41 or older	1.0	1.0	1.0
Race/ ethnicity	Hispanic	1.0 (0.6, 1.5)	0.9 (0.5, 1.5)	1.1 (0.7, 1.7)
	Black	0.7 (0.5, 1.1)	0.7 (0.4, 1.0)	0.7 (0.5, 1.1)
	Mixed/other	0.9 (0.6, 1.3)	0.8 (0.5, 1.3)	1.0 (0.6, 1.5)
	White	1.0	1.0	1.0
HIV status	HIV positive	0.9 (0.6, 1.4)	1.1 (0.6, 1.8)	0.7 (0.4, 1.2)
	Unknown	0.7 (0.4, 1.0)	0.8 (0.5, 1.3)	0.6 (0.4, 0.9)
	HIV negative	1.0)	1.0	1.0
Sexual orientation	Gay	1.0	1.0	1.0
	Bisexual or other	1.0 (0.7, 1.4	0.7 (0.4, 1.0)	1.1 (0.7, 1.5)

Discussion

Major findings

- High prevalence of UAI more than 20 years after the start of the HIV epidemic.
  - Despite the availability of HIV prevention messages.
  - Variation between types of gay bars.
  - Variation between bars of the same type.
- Contextual information about bars may help explain variation in estimates of the prevalence of UAI.
- Need for consistency in reporting enrollment venue and personal characteristics of samples of MSM.

Strengths and Limitations

- Strengths
  - First study to quantify variation between MSM in different types of gay bars.
  - Relatively high response rate.
  - Study protocol minimized potential for misclassifying risky sexual behavior.
- Limitations
  - Assumes that men's attendance at the venue where they were interviewed is typical of their venue attendance .
  - Cannot establish temporality.
  - Small numbers of participants from some venues limits generalizability.

Significance

- Importance of collecting contextual information.
  - Minimize misclassification and selection bias.
  - Guide prevention efforts.
- Enrolling MSM in very few bars or one type of bar does not produce a representative sample.

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