

# Lessons Learned from Epidemiologic Studies of Men Who Have Sex with Men in Atlanta

## ...the pitfalls of self-report

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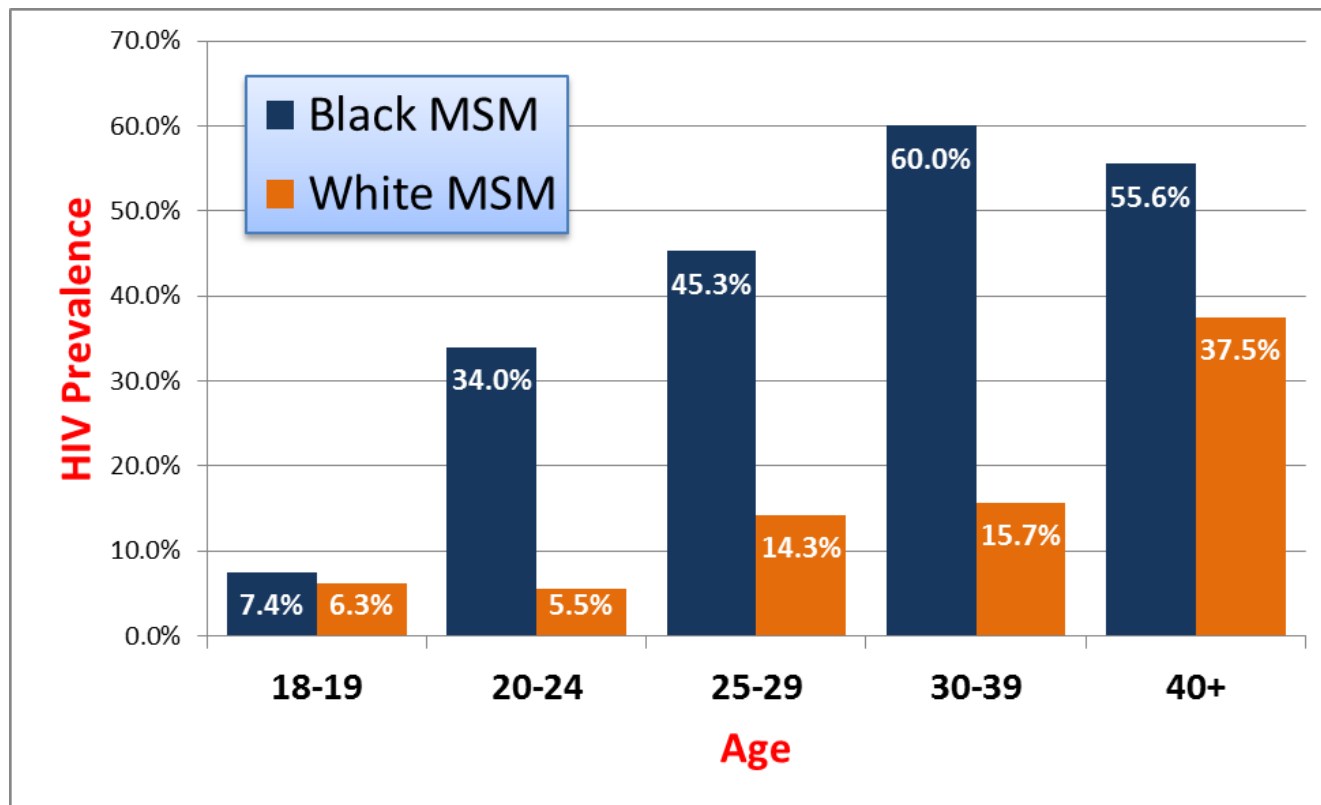
**UCLA Workshop**  
**March 4, 2016**



# Outline for today

1. Overview of the epi and studies
2. Validation studies of 3 important factors + lessons learned
  1. Substance use
  2. Partnership attributes and risk behaviors
  3. Awareness of HIV status
3. Model-based exploration of misclassification
4. Wrap-up

- Atlanta: 2010 - 2014
  - 803 MSM enrolled
  - 30% HIV-positive (BMSM: 44%, WMSM: 13%)



# Meta-analysis: differences between B and W MSM

Figure: Rank order of summary ORs comparing US black MSM with other US MSM across outcomes associated with HIV infection

Individual

Partner demo.

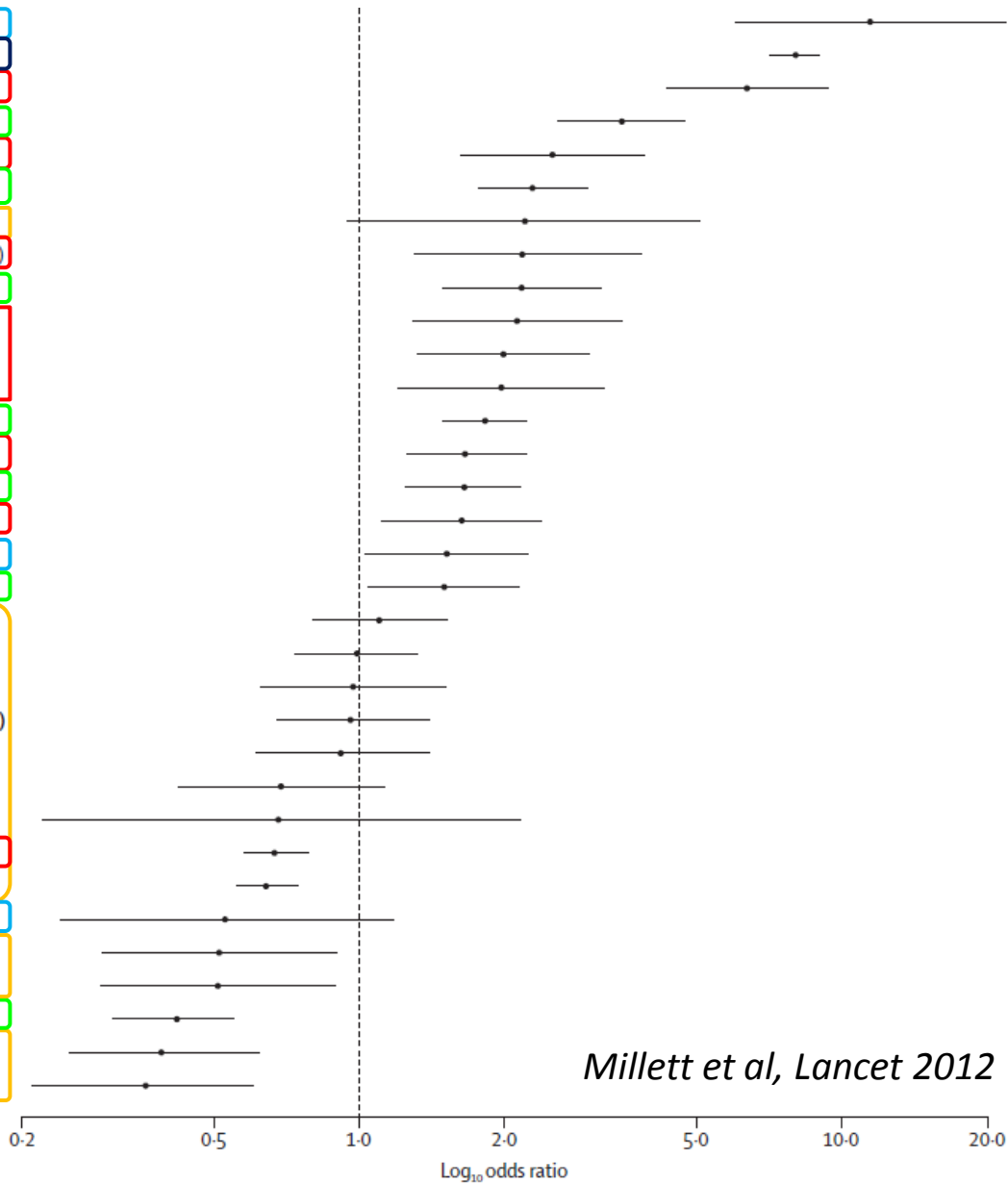
Inadequate suppression of HIV+

Partner pool/network

Social / cultural

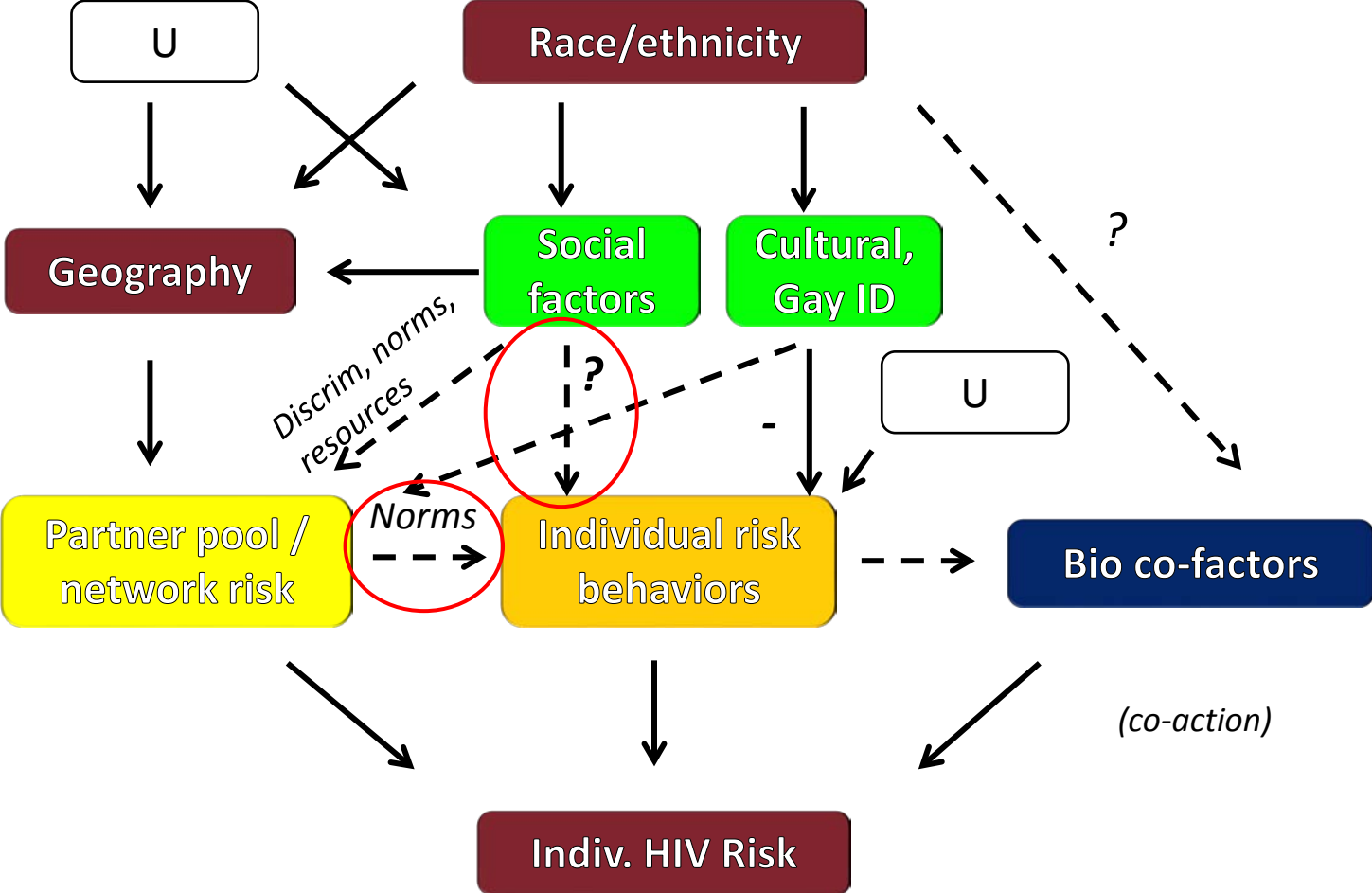
Bio co-factors

1. Black partners
2. Current STI diagnosis
3. Undiagnosed HIV (HIV-positive MSM)
4. Low education
5. CD4 <200 (HIV-positive MSM)
6. Low income
7. Crack cocaine
8. HIV status non-disclosure (HIV-positive MSM)
9. Ever incarcerated
10. No health coverage (HIV-positive MSM)
11. Less ART adherence (HIV-positive MSM)
12. Not virally suppressed (HIV-positive MSM)
13. Childhood sex abuse
14. Less ART access (HIV-positive MSM)
15. Early sex debut
16. Fewer clinical visits (HIV-positive MSM)
17. Older partners
18. Unemployment
19. Concurrent partners
20. Receptive UAI
21. Serodiscordant UAI (HIV-negative MSM)
22. HIV-positive partners (HIV-negative MSM)
23. Serodiscordant UAI (HIV-positive MSM)
24. Injection drugs
25. Circumcised
26. 1 vs >1 lifetime HIV tests
27. Number of sex partners
28. Same race partners
29. Serosorting (HIV-negative MSM)
30. Drug use before or during sex
31. Gav ID
32. Amphetamines
33. Amyl nitrites











Millett et al, Lancet 2012

# Empirical findings suggest causal diagram for MSM racial HIV disparities



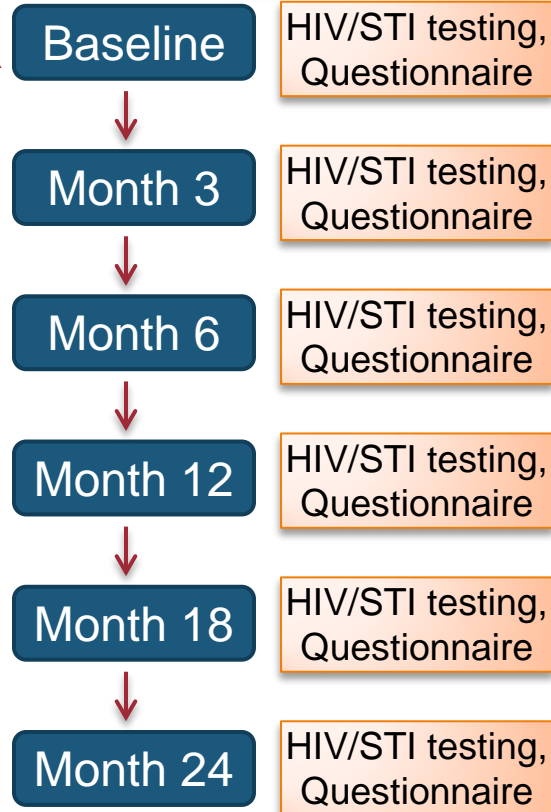
# Research program on MSM HIV disparities

	Fund period	Mech.	Design
 <p><b>BOPR:</b> Barriers to Online Prevention Research</p>	2009	CFAR micro	Online cross-sectional: recruitment and retention methods feasibility
	2009 – 2012	RC1 NIMHD	Online cohort: retention methods and at-home HIV incidence; <i>sex-behaviors</i>
	2009 – 2014	R01 NIMH	HIV/STI incidence cohort (Atlanta)
	2010 – 2013	R01 NICHD	HIV/STI, cross-sectional networks design (Atlanta)
	2011 – 2015	R01 NIAID	Combination prevention package pilot trial (South Africa)
<p><b>MARDHAM:</b> Modeling Analyses for Racial Disparities in HIV in American MSM</p>	2013 – 2015	R21 NICHD	Agent-based network modeling (Atlanta)
	2014 – 2019	R01 NIDA	HIV/STI incidence cohort (Atlanta)
	2014 – 2019	CDC CoAG	Numerous modeling studies to address HIV/STI transmission & prevention
	2015 – 2019	R01 NIAID	HIV care engagement cohort (Atlanta)

# Study Design



- Prospective HIV/STI incidence cohort study: 2010-2014
  - Sexually active black and white MSM in Atlanta
  - Ages 18 - 39
- Recruitment
  - MSM community venues, Facebook
- Procedures
  - Testing: HIV, Chlamydia, Gonorrhea, Syphilis
  - Behavioral questionnaire
- Enrollment
  - 803 men enrolled
  - 30% HIV-positive (BMSM: 44%, WMSM: 13%)
  - 562 HIV-negative MSM observed for 24 months
  - 79% retained in study at 24-months



**Validation studies of 3 important factors + lessons learned**



# Comparisons of disparities and risks of HIV infection in black and other men who have sex with men in Canada, UK, and USA: a meta-analysis

Gregorio A Millett, John L Peterson, Stephen A Flores, Trevor A Hart, William L Jeffries 4th, Patrick A Wilson, Sean B Rourke, Charles M Heilig, Jonathan Elford, Kevin A Fenton, Robert S Remis

*Millett et al, Lancet 2012*

Some might also argue that the differences noted in risk behaviours and HIV infection between black MSM and other MSM are due to reporting bias and that black MSM under-report their risk behaviour. However, racial comparative studies of MSM have yet to find differences in reporting of risk behaviour between black and other MSM.<sup>18,21,22</sup> Moreover, the fact that the same pattern (less risk and greater HIV infection) is evident across studies with different methods, samples of black MSM, and regions of a country (and different countries), and consistent across data collected from 1987 to 2011,<sup>13</sup> that black MSM in all these places, time periods, and circumstances are all under-reporting risk behaviour becomes less credible. In our current study, we extend

# Challenging the narrative...

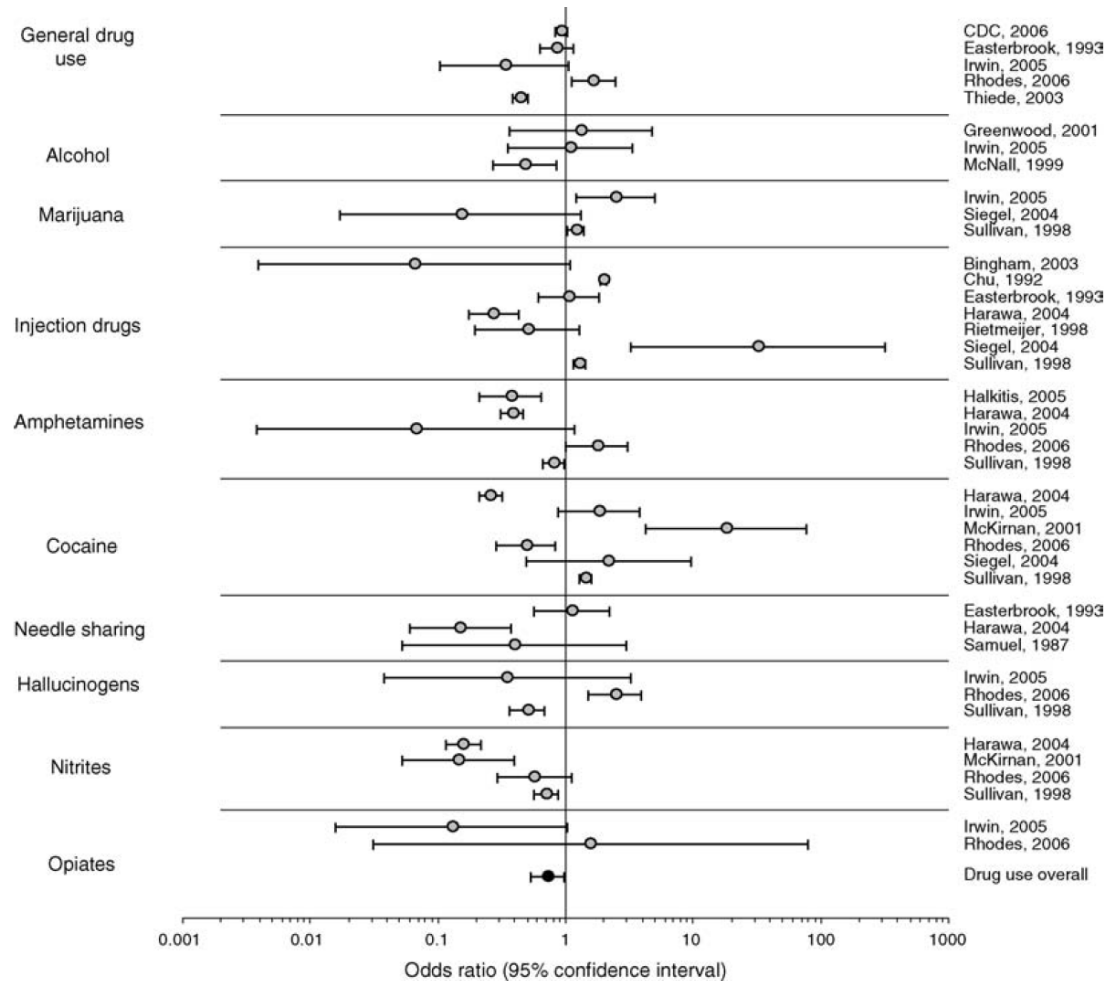
- BMSM report lower or equivalent levels of risk behaviors, compared to WMSM
- In parallel, clear evidence of stigma and historical biases impacting BMSM...
- Yet misclassification often ruled out
- Studies of Involvement and MAN Project data showed racially differential validity of self-reported:
  1. Drug use
  2. Risk behaviors
  3. Awareness of HIV infection
  4. Main/casual partner typology
- Need more validity studies and understanding of the 'why'



# Meta-analysis of racial differences in substance use

- Consistently mixed evidence for BMSM use > WMSM
- All studies self-report
- End of story?

*Millett et al, AIDS 2007*



**BMSM vs. WMSM OR**

# Validity of self-reported drug use

Racial differences in the validity of self-reported drug use among men who have sex with men in Atlanta, GA

Darcy White<sup>a,b</sup>, Eli S. Rosenberg<sup>a,\*</sup>, Hannah L.F. Cooper<sup>c</sup>, Carlos del Rio<sup>b</sup>, Travis H. Sanchez<sup>d</sup>, Laura F. Salazar<sup>d</sup>, Patrick S. Sullivan<sup>d</sup>

- Validation studies of urine, hair, saliva in other populations shown racial differences in validity.
  - Differences in reactions to interviewers, measurement tools?
  - Historically justifiable mistrust
    - Medical research community
    - Fear of judgement and/or legal consequences
- What about MSM?
  - At Baseline visit, men gave urine specimens for dip-stick screening:
    - Marijuana (<30 day detection period)
    - Cocaine (<4 day)
    - Opiates (<4 day)
    - Ecstasy (<3 day)
    - Methamphetamine (<5 day)
  - In CASI, asked about self-reported drug use (past 12m)

# Ideally we would compute...

Can't rule out detection window mismatch

		Urine screen		
		Drug +	Drug -	
Self-report	Drug +	True Pos	<del>False Pos</del>	TP + FP
	Drug -	False Neg	True Neg	FN + TN
		TP + FN	FP + TN	

- Sensitivity =  $TP / (TP + FN)$
- ~~Specificity =  $TN / (FP + TN)$~~

- That's ok!
  - Sensitivity is most of interest
  - False positive self-reports less a concern
  - Sens. hard to study, given short detection windows, rare drugs

# Unadjusted results

	Black		White		Unadjusted PR	95% CI
	%	(n/N)	%	(n/N)		
Self-reported use						
Marijuana	28.8	(130/451)	42.7	(147/344)	0.68	0.56, 0.82
Cocaine	10.3	(45/435)	24.9	(84/337)	0.42	0.30, 0.58
Ecstasy	8.6	(37/431)	15.9	(54/339)	0.54	0.36, 0.80
Methamphetamine	1.8	(8/433)	12.6	(43/341)	0.15	0.07, 0.31
Non-injection opiates	0.2	(1/428)	0.3	(1/334)	0.78 <sup>a</sup>	
Urine-detected use						
Marijuana	26.7	(121/454)	19.2	(67/349)	1.39	1.07, 1.81
Cocaine	7.9	(36/454)	5.4	(19/349)	1.46	0.85, 2.50
MDMA (Ecstasy)	0.7	(3/454)	0.6	(2/349)	1.15 <sup>a</sup>	
Methamphetamine	0.4	(2/454)	3.2	(11/349)	0.14	0.03, 0.63
Opiates	1.1	(5/454)	0.0	(0/349)	N/A <sup>a</sup>	
Sensitivity of self-report						
Marijuana	64.2	(77/120)	91.0	(61/67)	0.71	0.60, 0.82
Cocaine	54.3	(19/35)	84.2	(16/19)	0.65	0.45, 0.93
MDMA (Ecstasy)	33.3	(1/3)	50.0	(1/2)	0.67 <sup>a</sup>	
Methamphetamine	100.0	(2/2)	81.8	(9/11)	1.22 <sup>a</sup>	
Opiates	0.0	(0/5)	N/A	N/A	N/A <sup>a</sup>	

- Direction of association flips for marijuana, cocaine
- Owing to lower sensitivity among BMSM
- WMSM results suggests information about *frequency*

# Validity of self-reported drug use

	Self-reported use		Urine-detected use		Sensitivity of self-report	
	Black/white PR	95% CI	Black/white PR	95% CI	Black/white PR	95% CI
Marijuana <sup>b</sup>						
Unadjusted	0.68	0.56, 0.82	1.39	1.07, 1.81	0.71	0.60, 0.82
Adjusted <sup>c</sup>	0.59	0.48, 0.73	0.96	0.73, 1.27	0.71	0.60, 0.84
Cocaine <sup>b</sup>						
Unadjusted <sup>d</sup>			1.46	0.85, 2.50	0.65	0.50, 0.93
Ages 18–24	0.20	0.09, 0.46				
Ages 25–34	0.43	0.28, 0.66				
Ages 35+	0.93	0.46, 1.86				
Adjusted <sup>c,d</sup>			1.06	0.59, 1.91	0.64	0.42, 1.00 <sup>e</sup>
Ages 18–24	0.13	0.05, 0.33				
Ages 25–34	0.38	0.24, 0.59				
Ages 35+	0.73	0.36, 1.45				

- Adjustments for age, education, income, sex identity, arrest history
  - Model of “sensitivity” is p(self-report), among UDS+ participants
  - Causal pathways uncertain and thus also presented unadjusted
- Results indicate lack of mediation by these factors. Some other explanation downstream of ‘race’...



# Validity of drug use: now what?

- Need to replicate results in other settings
  - Preferably with more sensitive assays (detection window)
- Old findings might need to be revisited
- Future projects can incorporate biomarkers
  - Urine cup assays are cheap (\$5-10/test), self-contained, w/ numerous tests
  - MSM willing to provide, particularly if obtain and explain NIH Certificate of Confidentiality
  - Longitudinal studies?



- Profound disparities in HIV incidence exist for young black/African American MSM compared to other subgroups of MSM.
- Substance use is prevalent and associated with HIV infection for young black/African American MSM, but the mechanisms by which substances impart added HIV risk are unclear.
- A cohort study of HIV-negative black MSM ages 18-29 to further understanding of the relationships between substances and HIV/STI incidence and risk behaviors, and suggest possible interventions.


- Five year prospective cohort study
  - Sexually active young black MSM (YBMSM) in Atlanta
  - Ages 18 - 29
- Recruitment
  - MSM community venues
  - Peer Referral
  - Facebook
- Procedures at all visits
  - Testing: HIV, Chlamydia, Gonorrhea, Syphilis, Hep C
  - Non-prescription drug testing (7 drug urine panel)
  - Heavy alcohol use (CDT blood conc.)
  - Surveys
  - Nested interviews to understand risk, resiliency, and seroconversion
  - PrEP
- Enrollment
  - 300 HIV-negative YMSM → 2-year follow-up
  - 176 HIV-positive YMSM

# What about risk behaviors?

Arch Sex Behav  
DOI 10.1007/s10508-015-0668-0

ORIGINAL PAPER

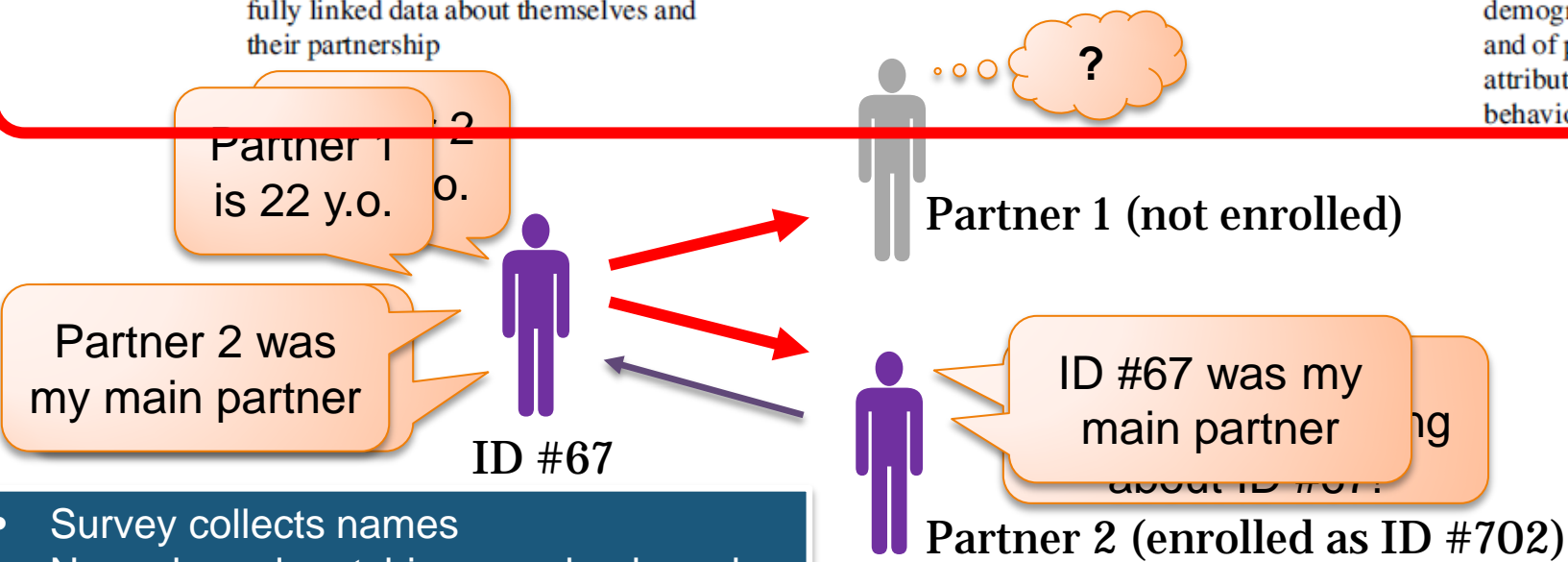
## Concordance of Demographic Characteristics, Sexual Behaviors, and Relationship Attributes Among Sex Dyads of Black and White Men Who Have Sex with Men

Alfonso C. Hernández-Romieu<sup>1</sup>  · Patrick S. Sullivan<sup>1</sup> · Richard Rothenberg<sup>2</sup> · Jeremy Grey<sup>1</sup> · Nicole Luisi<sup>1</sup> · Travis Sanchez<sup>1</sup> · Aaron J. Siegler<sup>1</sup> · Eli S. Rosenberg<sup>1</sup>

- No biomarkers for sexual behaviors (ie: partner number, UAI)
- But we can conduct agreement studies
- MAN Project
  - Chain-link referral sampling of BMSM, WMSM in Atlanta
  - Men refer partners within survey, allowing linkage

**Table 1** Definitions of type of partnership data and sample sizes used for analyses of reliability of self-described and partner-reported demographic characteristics, sexual behaviors, and other partnership attributes, Atlanta, GA, 2011–2013

Dyadic data type	Definition	Ego provides data about			Alter provides data about			MAN project Sample size <i>n</i> dyads	Informs this analysis
		Ego	Alter	Ego-alter partnership	Ego	Alter	Ego-alter partnership		
One-sided	Ego describes himself, and gives data on his partner alters, but the alters are not enrolled	Y	Y	Y	N	N	N	1414	n/a
Two-sided									
Unidirectional	Ego provides data on his alter and their partnership. Alter is subsequently referred to the study and provides data on himself, but his partnership data may not be linked back to the referring Ego	Y	Y	Y	Y	N	N	65	Validity of alter demographic data
Bidirectional	Both ego and alter are enrolled and provide fully linked data about themselves and their partnership	Y	Y	Y	Y	Y	Y	62	Validity of alter demographic data and of partnership attributes and risk behaviors



- Survey collects names
- Name-based matching = go backwards
- Could have also just asked...

# Good news first: demographics

**Table 3** Comparisons of self-described and partner-reported age and race/ethnicity of 189 MSM dyads, Atlanta, GA, 2011–2013

	Black <i>n</i> = 99	White <i>n</i> = 68	Hispanic <i>n</i> = 18	Other <i>n</i> = 4	<i>p</i> value <sup>‡§  </sup>
Age difference in years <sup>*</sup> , median (IQR)	0 (0–1)	0 (0–1)	0 (0–1)	0.5 (0–1.5)	0.83
Race referred by partner <sup>†</sup> , <i>n</i> (%)					0.71
Black	96 (97)	0 (0)	2 (11)	0 (0)	
White	1 (1)	65 (96)	1 (6)	1 (25)	
Hispanic	1 (1)	1 (1)	14 (78)	2 (50)	
Other	0 (0)	1 (1)	1 (6)	0 (0)	
Unknown	1 (1)	1 (1)	0 (0)	1 (25)	

- Excellent validity of partner-perceived demographics
- Good news
  - for assessing risk due to mixing patterns
  - for modelers

# Bad news: Relationship attributes, behaviors

**Table 4** Dyadic concordance of partnership attributes and sexual behaviors in 62 MSM dyads, Atlanta, GA, 2011–2013

Partnership attributes	Total			Black			White			<i>p</i> value <sup>  </sup>
	<i>n</i> = 62			<i>n</i> = 32			<i>n</i> = 28			
	<i>P</i> <sub>o</sub> (CI)	Freq.	<i>K</i> <sub>m</sub> <sup>†</sup>	<i>P</i> <sub>o</sub> (CI)	Freq.	<i>K</i> <sub>m</sub> <sup>†</sup>	<i>P</i> <sub>o</sub> (CI)	Freq.	<i>K</i> <sub>m</sub> <sup>†</sup>	
Venue of first meeting <sup>*</sup>	76 (65,87)	41/54	0.60	71 (55,87)	22/31	0.50	81 (64,98)	17/21	0.70	0.47
Main Partner	83 (73,92)	48/58	0.63	84 (72,97)	27/32	0.68	79 (63,95)	19/24	0.54	0.66
Had sex more than once	84 (75,93)	52/62	0.48	84 (72,97)	27/32	0.58	82 (68,96)	23/28	0.25	0.97
Discussed HIV at first sex	70 (58,83)	38/54	0.18	72 (56,87)	23/32	0.19	57 (37,77)	13/23	-0.49	0.22
Ongoing relationship <sup>†</sup>	56 (43,69)	32/57	0.13	45 (27,63)	13/29	0.01	69 (51,87)	18/26	0.30	0.11
AI in the previous 12 months	94 (88,100)	50/53	0.61	93 (84,100)	27/29	0.57	95 (87,100)	21/22	0.71	0.98
UAI in the previous 12 months	78 (67,89)	39/50	0.47	68 (51,85)	19/28	0.26	90 (77,100)	18/20	0.77	0.09

- $P_o$  = proportion agreeing on response (whatever it is)
- $K_m$  = Chance-corrected agreement with ‘kappa-like’ statistic
- Only moderate agreement throughout
- BMSM participants: lower UAI agreement?
- Limited sample size.
  - VERY difficult to collect data. Sex partner referrals = HARD

# Risk behaviors: Now what?

- Biomarkers for UAI
  - Two primary technologies for research with UVI
    - PSA qualitative and quantitative: CDC/UNC/OSU
    - Y-chromosome (Yc) amplification: JHU
  - ~7 studies reporting use
    - Misclassification in African females, US STD clinics, GA teens
    - Differential by race, SES, HIV risk
  - Adapting assays for male-male sex
    - New challenges with 2 males, and with rectum site
    - Preliminary PSA study failed to detect PSA
    - Need Yc or other assay for male-male sex....
- More clever agreement studies

# Awareness of HIV Status

## Lack of Awareness of HIV Infection: Problems and Solutions with Self-reported HIV Serostatus of Men Who Have Sex with Men

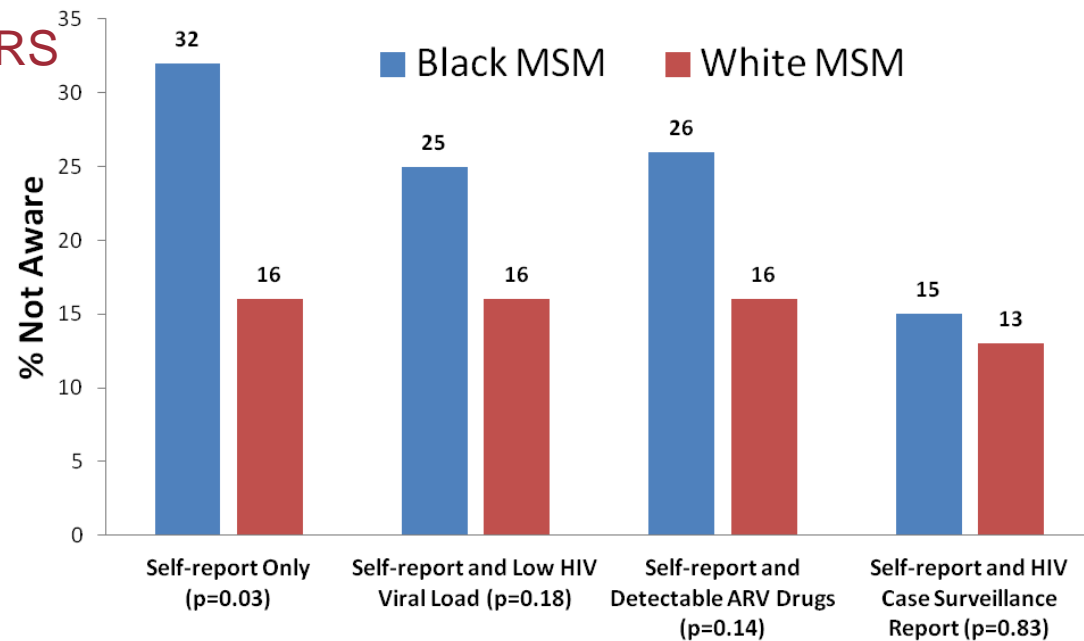
Travis H. Sanchez<sup>1</sup>, Colleen F. Kelley<sup>1,2</sup>, Eli Rosenberg<sup>1</sup>, Nicole Luisi<sup>1</sup>, Brandon O'Hara<sup>1</sup>, Rodriques Lambert<sup>3</sup>, Raphael Coleman<sup>1</sup>, Paula Frew<sup>1,2</sup>, Laura F. Salazar<sup>4</sup>, Sijia Tao<sup>5</sup>, William Clarke<sup>6</sup>, Carlos del Rio<sup>1</sup> and Patrick S. Sullivan<sup>1</sup>

- Proportion of HIV infections that are diagnosed important indicator
  - For monitoring the HIV epidemic and state of care
  - As a component of HIV transmission risk
  
- CDC monitors two ways, often finding conflicting results:
  - National HIV Surveillance System (NHSS) – model-based undiagnosed
  - National HIV Behavioral Surveillance System (NHBS) – “awareness”
    - Narrative of racial difference in status-awareness at odds with high testing frequencies for BMSM
  
- Many possible reasons to under-report
  - Mistrust of healthcare providers
  - HIV criminalization laws
  - HIV stigma
  - Improper questions
  - Perception of eligibility criteria/incentives



# Awareness of HIV Status

- For “unaware” participants, examined:
  - Response to counselor during post-HIV-test counseling
  - Low VL (< 1000 copies/mL)
  - ARV testing on stored specimen
  - Aggregate match with GA eHARS



- Substantial number of black MSM had detectable ARVs and > ½ had a previous surveillance case report
- Adjusting for either laboratory testing or surveillance case match made racial disparity in lack of awareness of HIV status no longer significant

# Awareness of HIV status

- 15 in-depth interview with unaware participants
  - 12 endorsed survey responses
  - 3 disagreed with survey responses. 1 had known status, was retested, but did not receive results
- Lessons learned
  - Improve comfort, assurances of confidentiality
  - Improve questions
  - Embrace limitations of this measure?

# Now what? Improving the diagnosis questions

## Involvement / NHBS MSM-1 question

62. Have you ever been tested for HIV?

- 1  Yes  
0  No

If yes, then #63, #64, #65, #66

HIVtest\_ever

63. In what month and year did you have your most recent HIV test?

Month:

- |           |     |
|-----------|-----|
| January   | =1  |
| February  | =2  |
| March     | =3  |
| April     | =4  |
| May       | =5  |
| June      | =6  |
| July      | =7  |
| August    | =8  |
| September | =9  |
| October   | =10 |
| November  | =11 |
| December  | =12 |

HIVtest\_month

HIVtest\_month.

- Doesn't allow for a previous diagnosis,
- May also be confused with CD4/VL monitoring tests

64. Year: HIVtest\_year

65. What was the result of your most recent HIV test?

- 0  Negative  
1  Positive  
2  Indeterminant/Inconclusive  
3  Didn't get the results of my last HIV test

HIVtest\_result

If positive, then hide #67, #70, #71, #72, #73. If positive

# Now what? Improving the diagnosis questions

## • Element

### HIV testing history

This next section will ask some questions about your experiences with HIV testing. We appreciate very much your complete and honest answers to better understand the HIV epidemic in Atlanta.

#### Please remember:

- Everything you tell us today is confidential and protected against subpoena.
- You can participate in today's study and receive your incentive, no matter your HIV status.
- You will receive an HIV test today, no matter your HIV status.

#### Have you ever had an HIV test?

- Yes | 1
- No | 0
- Don't know | 9

/\* if yes:\*/

Have you ever tested positive for HIV, that is, do you have HIV?

*(This includes having gotten the virus earlier, but are now suppressed.)*

- Yes | 1
- No | 0
- Don't know | 9

Still possible to  
have residual gap  
where diagnosis  
was never  
communicated ...

# Now what? Improving the diagnosis questions

- NHBS MSM-4

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DISPLAY: "READ: Now I'm going to ask you a few questions about getting tested for HIV. Remember, an HIV test checks whether someone has the virus that causes AIDS."

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Negative.....	1
Positive .....	2
Never obtained results .....	3
Indeterminate.....	4
Don't Know .....	9
Refuse to Answer.....	7

**Before your test &[RCNTSTST], did you ever test positive for HIV?**

Before recent test, ever test positive for HIV

No .....	0
Yes .....	1
Don't Know .....	9
Refuse to Answer.....	7

# Model-based exploration of misclassification

- Modeling Approaches to Racial Disparities in HIV among Atlanta MSM
- Agent-based model of MSM in Atlanta
- Comprehensive examination of possible sources of disparity:
  - Network structure
  - Behaviors within relationships
  - HIV care continuum
  - CCR5d32
- Platform for >5 large downstream studies



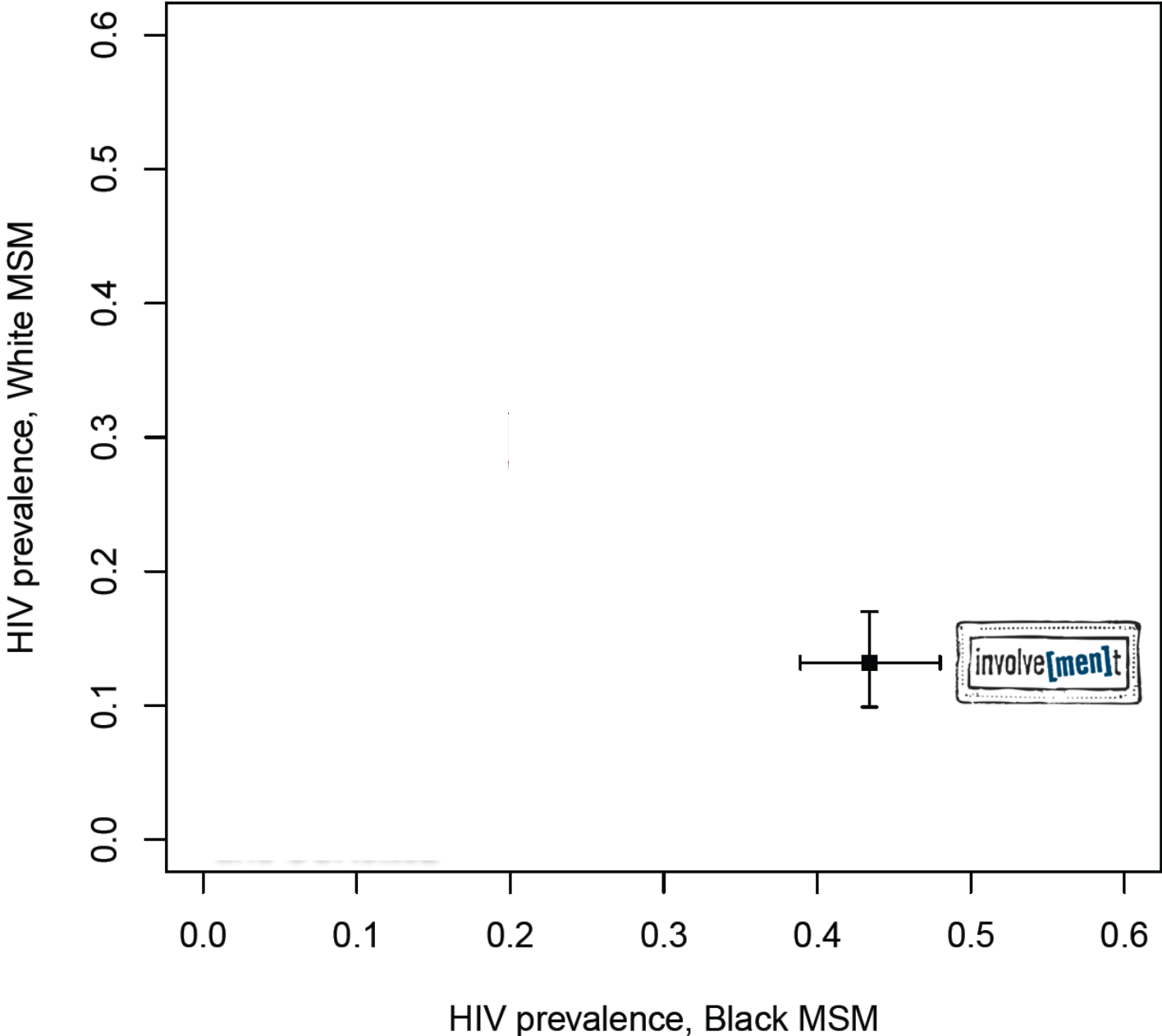
# MARDHAM: Model scenarios

- All factors parameterized as race-specific
- Five mutually-exclusive factors groups
- Scenarios from factor groups to isolate sources of disparity

Description	Factor group				
	HIV care continuum	CCR5Δ32	Sexual behaviors	Stigma-assoc. behaviors	Residual determinants
Null <i>(all factors set to mean)</i>	-	-	-	-	-
As-observed <i>(all factors race-specific)</i>	✓	✓	✓	✓	✓
<b>Factor groups in isolation</b>					
Care continuum	✓	-	-	-	-
CCR5Δ32	-	✓	-	-	-
Sexual behaviors	-	-	✓	-	-
Stigma-associated behaviors <i>(relationship duration, HIV serodiscussion)</i>	-	-	-	✓	-
Residual background factors <i>(mortality, circ. rates)</i>	-	-	-	-	✓
<b>Combined factor groups</b>					
Care continuum and CCR5Δ32	✓	✓	-	-	-
Care continuum and stigma	✓	-	-	✓	-
All behaviors	-	-	✓	✓	-
Maximum disparity	✓	✓	-	✓	✓
Misclassification of risk behaviors	✓	✓	BMSM assigned WMSM values	✓	✓



# MARDHAM Results: HIV Prevalence Estimates



# MARDHAM conclusions

- Model-based probing of misclassification yields observed BMSM epidemic
- Future models will directly build in the variation in risk parameters from above papers, rather than as a single scenario

# Lessons learned wrap-up

- Need more understanding of why MSM under-report behaviors and the factors that particularly place BMSM at discomfort
- We need to adapt how we study MSM at highest risk:
  - Comfortable and open study environment
    - Formative work
    - Environment of research clinic
    - Certificate of Confidentiality
    - Language of forms, study counselors, surveys
  - Smart tools and methods to meet men where they are
    - Survey language
    - Clever survey structure
      - Measures to ease longitudinal burden
      - Alternative modalities – brief SMS, app, diaries, etc.
    - Biomarkers
    - Indirect methods
  - Adjust for biases in analyses
    - Agent-based models
    - Regression models with sensitivity analyses/simulations

# *THANK YOU!*

## **Work supported by:**

- NIMH R01MH085600
- NICHD R01HD067111
- NIMHD RC1MD004370
- NICHD R21HD075662
- CDC 5U38PS004646
- CDC 12IPA1209434
- NIH P30AI050409 – the Emory Center for AIDS Research

Eli Rosenberg

[esrose2@emory.edu](mailto:esrose2@emory.edu)

The upcoming section about sex partners is one that you may remember from your previous visits. We understand the time and the energy it takes to complete partner information so we have changed a few things to make this a shorter experience for you.

Here's how we've made things easier:

1. If asked to tell us about previous partners, we will only ask a few questions about them.
2. If asked to provide nicknames for new partners (up to 5), we have changed the survey and will only ask in-depth questions for a max of two. This is instead of up to 5 like we did during your previous surveys. We promise!
3. For any additional new partners after those two, we will only ask a few questions.

Please be truthful in your responses, by providing accurate totals partner numbers and partner question responses. Your answers directly impact how this study will benefit your community and HIV prevention research.

Thanks so much for doing your part to help!

## Introduction to previous visit's partners - BASELINE

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When you took the survey at your first study visit (in [%%3245:Month baseline %%]), you told us about [%%3261:Total number of %%] of your recent sex partners:

1. [%%3257\_O0:Store partner n %%] - a [%%3296\_O0:Store partner g %%] partner who you met [%%3297\_O0:Store where eac %%].

2. [%%3257\_O1:Store partner n %%] - a [%%3296\_O1:Store partner g %%] partner who you met [%%3297\_O1:Store where eac %%].

3. [%%3257\_O2:Store partner n %%] - a [%%3296\_O2:Store partner g %%] partner who you met [%%3297\_O2:Store where eac %%].

4. [%%3257\_O3:Store partner n %%] - a [%%3296\_O3:Store partner g %%] partner who you met [%%3297\_O3:Store where eac %%].

5. [%%3257\_O4:Store partner n %%] - a [%%3296\_O4:Store partner g %%] partner who you met [%%3297\_O4:Store where eac %%].

Now we'd like to ask you a few short follow-up questions about those partners.

This is just a screen that the participant sees reminding them about their baseline partners with stored info

## Baseline Partner #1 - sex again, UAI/UVI, dt of last sex

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93 You first told us about [%%3257\_O0:Store partner n %%].  
[%%3257\_O0:Store partner n %%] was a [%%3296\_O0:Store partner g %%] partner who you met  
[%%3297\_O0:Store where eac %%].

Since your first visit with us, have you had anal or oral sex with [%%3257\_O0:Store partner n %%]  
again? (Required)

- 1 Yes
- 0 No
- 9 I'm not sure who [%%3257\_O0:Store partner n %%] is.

baselinepartner\_sex

Binary\_notsure.

94 Have you had unprotected anal sex with [%%3257\_O0:Store partner n %%] since your  
first visit with us?

(This means that you or [%%3257\_O0:Store partner n %%] did not use a condom at any point  
during sex, at least one time that you had anal sex.)

- 1 Yes
- 0 No
- 9 Don't know

baselinepartner\_uai

Binary\_prefernot.

# Element Scientific Aims

1. To describe the longitudinal patterns in individual predictors of biomarker-supported substance use
2. To describe the overlap of sexual and substance-using networks
3. To assess the associations between individual, dyadic, and event-level substance and sexual risk behaviors and incident HIV/STI
4. To qualitatively explore the context of YBAAMSM risk by collecting data after prospectively observed “sentinel risk events”

