# The National HIV Behavioral Surveillance (NHBS) Detroit Partner Study

Partnership characteristics and female knowledge of male partner risk behavior in heterosexual couples

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### **Overview of NHBS**



- The National HIV Behavioral Surveillance system (NHBS)
  - CDC-sponsored and multi-site
  - Monitors behaviors that place people at risk for HIV infection
  - Core questionnaire and local questionnaire
    - Sexual behaviors
    - Drug use
    - HIV testing behaviors
    - Access to and use of prevention services
  - HIV testing offered

### **Overview of NHBS**



- Importance of behavioral surveillance
  - Monitor behaviors that lead to HIV infection
  - Unlike other HIV surveillance activities, participants are mostly uninfected
  - Used to help control epidemic through the development and evaluation of HIV prevention programs

### Overview of NHBS



- NHBS implemented in annual cycles
  - MSM (men who have sex with men)
    - Data collection for first cycle began nationally in 2004
    - Detroit participated in MSM2 in 2008
    - Currently NHBS in data collection cycle for MSM3 (2011)
  - IDU (injecting drug users)
    - Detroit participated in IDU1 (2005) and IDU2 (2009)
  - HET (heterosexuals)
    - Detroit participated in HET1 (2006-2007) and HET2 (2010)

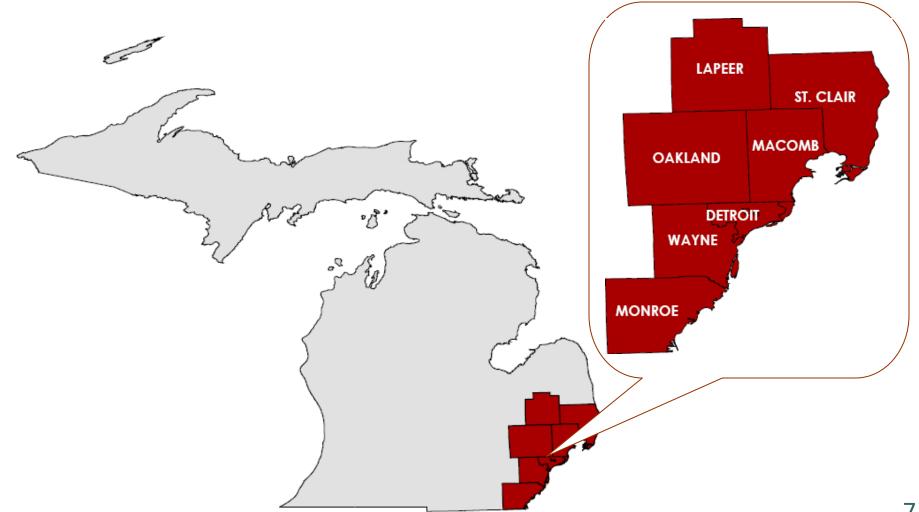
## • • Overview of NHBS-HET1

- CDC definition of a heterosexual at high risk for HIV infection for the HET1 cycle:
  - Male or female age 18-50
  - At least one opposite sex partner in the past
     12 months
  - Physical or social connection to a high risk area (HRA)
    - Lives in HRA (physical connection)
    - Recruited by someone who lives in an HRA (social connection)

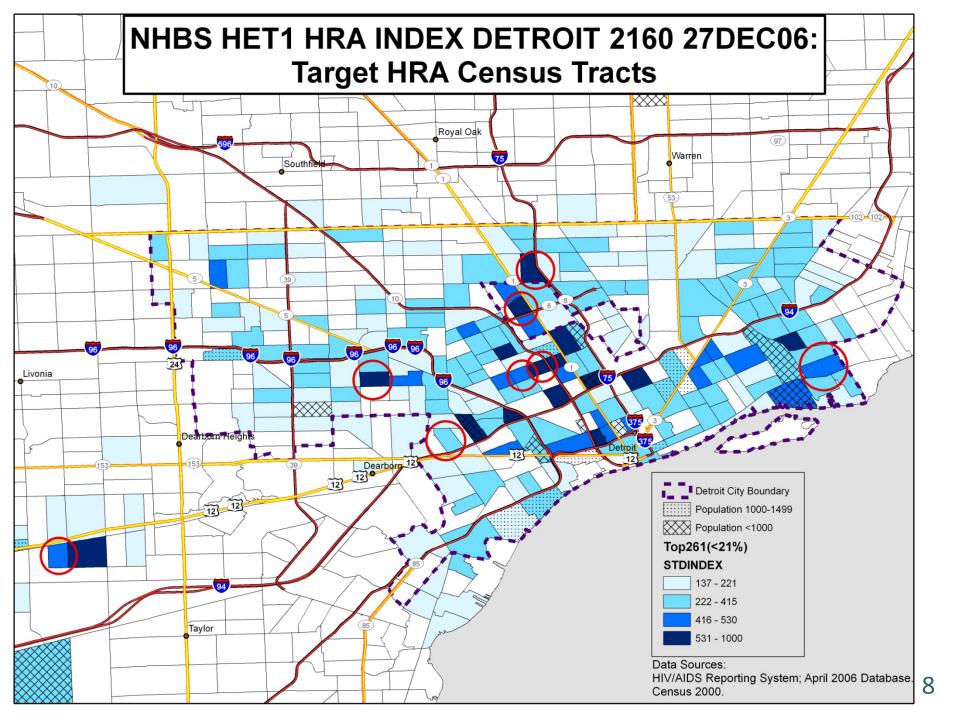
### **Overview of NHBS-HET1**

- High risk area (HRA) defined as a geographic area (census tract) with
  - High rate of heterosexually-acquired HIV
  - High rates of poverty
- Standardized HRA index calculated
  - Relative measure of risk of HIV acquisition among heterosexuals in different census tracts within the Detroit MSA (metropolitan statistical area)

## Detroit Metropolitan Statistical Area



1



## Overview of NHBS-HET1

- Respondent-driven sampling (RDS) used in Detroit
  - Peer referral method
  - Begins with carefully selected "seeds"
  - Train seeds on how to recruit
  - Recruitment chains
  - Dual incentive structure

# Respondent-Driven Sampling-Seeds

- 18 eligible seeds that participated in Detroit HET1 cycle
  - All residents of one of 8 target high risk areas
  - 9 black males
  - 8 black females
  - 1 Hispanic male
  - Age range: 19-49 years old
    - Majority (67%) were between 19-29

## NHBS-HET1 Respondent-Driven Sampling (RDS) Steps

Identify, recruit, interview and offer HIV test to seeds (resided in *target* HRAs)

Train seed on who and how to recruit in their network and given 3 coupons to each seed.

Recruits bring valid coupons to study site. Eligible recruits (opposite sex partner past 12 mos.) are interviewed and offered HIV testing (962 non-seeds completed screening)

Eligible recruits who are residents of an HRA are offered chance to recruit others. Those who agree are trained and given 3 coupons.

Seeds/recruiters given incentive for participation and every recruit enrolled and interviewed.

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807 non-seeds found eligible and completed interview 652 were HRA residents (81%)



- Recruitment for partner study occurred alongside NHBS-HET1
- Minority women (defined as black or Hispanic) recruited from HET1 interview based on self-reported race/ethnicity
- Asked additional question during HET1 survey: "In the past 3 months, with how many different men have you had vaginal or anal sex?"

## Partner Study Methods- Females

Black and Hispanic females who completed HET1 activities invited to participate in Partner Study

Informed consent obtained (interview and HIV testing) and up to 2 coupons given to female to recruit her male sex partner(s)

HIV test done if wasn't done as part of HET1 activities (HIV test required for Partner Study)

Female version of Partner Study questionnaire administered

## • • Partner Study Methods- Males

Recruited male partner brought in a valid coupon to study site OR called to schedule an appointment

Eligibility screening

Obtained informed consent for NHBS-HET1 questionnaire, Partner Study questionnaire, and HIV testing. Male partner was interviewed and HIV tested.

Female could return to study site to receive recruitment reward and confirm the partner to whom she gave the coupon



- Minority females are disproportionately affected by HIV/AIDS
- 22% of prevalent HIV/AIDS cases in Michigan are women
  - 74% of all female HIV/AIDS cases are black females, with 62% attributed to heterosexual transmission (Quarterly HIV/AIDS Report, July 2011)
- o In SE Michigan, the rate of new HIV diagnoses among black females is 14.8 times the rate among white females (2010 Epidemiological Profile of HIV/AIDS in Michigan)

### **Partner Study Data Analysis**



- Included variables from male and female versions of Partner Study questionnaire and NHBS-HET1 survey
- Variables for each male-female pair found in a single row
- 107 dyads
  - Each considered a unique partnership (unique male-female pair)
- 15 females recruited 2 male partners
- 1 male was recruited by 2 different females

## Analysis of data

- Individual analysis
  - Demographics (92 females and 106 males)
- Response-level analysis (107 female responses and 107 male responses)
  - Includes male and female duplicates
- Dyad-level analysis (107 unique dyads)
  - Percent agreement and percent disagreement
  - Limitations of agreement/disagreement
  - McNemar's test

# Analysis of data McNemar's test

- Analyze questions with dichotomous (two) outcomes (yes-no)
- Assess if significant difference between two correlated/dependent proportions
  - Was the proportion of females who responded "yes" equal to the proportion of males who responded "yes"?
- Asymmetry in disagreement?
  - Were the number "yes-no" couples significantly different from the number of "no-yes" couples?
- Asymmetry in disagreement may indicate that males and females have different perceptions

### **Demographics**

HET1 survey variables

## • • Demographics

#### Gender

Female recruiters 92

Male partners 106

Total 198



Race/Ethnicity	Females	Males	
Black	91 (99%)	100 (94%)	
White	0	4 (4%)	
Other/multiracial	1 (1%)	2 (2%)	

## • • Demographics cont.

#### Age

18-29	66 (33%)
30-39	37 (19%)
40-50	85 (43%)
51+	10 (5%)

#### **Education**

<high school<="" th=""><th>55 (28%)</th></high>	55 (28%)
High school diploma/GED	92 (46%)
Some college or technical school	42 (21%)
College graduate or beyond	9 (5%)

### Demographics cont.

#### **Employment Status**

Employed 75 (38%)

Unemployed 76 (38%)

Disabled 20 (10%)

Other\* 27 (14%)

#### Income

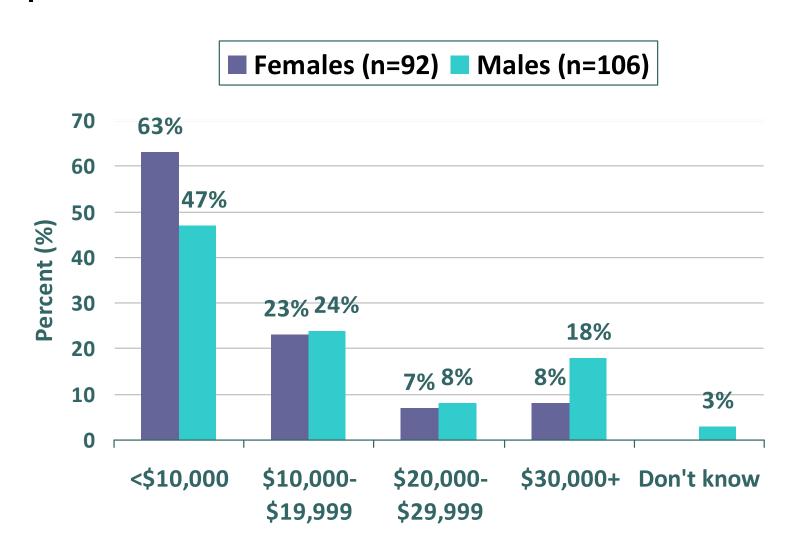
**<\$10,000 108 (55%)** 

\$10,000-\$19,999 46 (23%)

\$20,000-\$29,999 15 (8%)

\$30,000+ 26 (13%)

## Combined Household Income for Previous Year (before taxes) (N=198)



## • • Demographics cont.

#### Homelessness\*

Homeless at time of interview 7 (4%)

Homeless during 12 months prior to interview 17 (9%)

Not homeless 174 (88%)

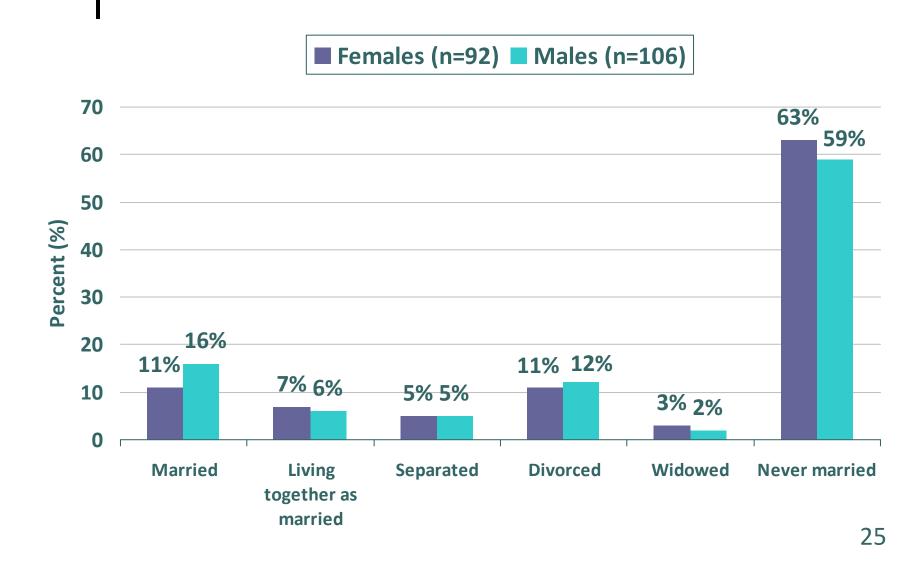
#### **Incarceration**

Incarcerated (12 months prior to interview) 28 (14%)

Not incarcerated (12 months prior to interview) 170 (86%)

<sup>\*</sup>Defined as living on the street, in a shelter, or in a Single Room Occupancy hotel (SRO)

### Marital Status (N=198)

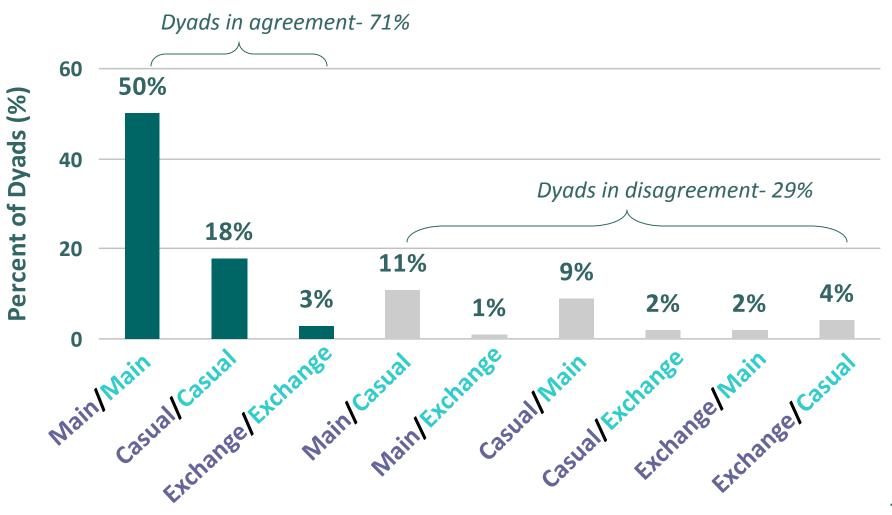


### **Partnership Characteristics**



- Participants were asked to classify their partner as either a main, casual, or exchange partner
  - Main partner: a partner you have sex with and someone you feel committed to above anyone else and someone you would call boyfriend/girlfriend, husband/wife, significant other, or life partner
  - Casual partner: a partner you have sex with but do not feel committed to or don't know very well
  - Exchange partner: someone you had sex with in exchange for things like money or drugs

## Type of Partner- *Dyad-level analysis* (Female Response/Male Response)



### Discussion of risk factors

O "Next, I'm going to ask about some issues you may have discussed with <initials of partner>. For each one, please answer yes or no if you have discussed it with <initials of partner> in the past 3 months"

# Discussion of Risk Factors Dyad-level analysis

 Overall, high disagreement on whether or not topics were discussed during past 3 months (34%-47%)

Topic	Proportion of <b>female</b> 'yes' responses	Proportion of <b>male</b> 'yes' responses	Symmetry of disagreement
Number of his current sex partners	0.41	0.38	Symmetry
Number of his past sex partners	0.42	0.32	Symmetry
Whether male EVER had sex with a man	0.37	0.18	Asymmetry (p<0.01)
Whether male CURRENTLY has sex with men	0.30	0.13	Asymmetry (p<0.01)
His HIV status	0.41	0.38	Symmetry
His drug use history	0.46	0.46	Symmetry
His STD history	0.38	0.26	Asymmetry (p<0.10)
Using condoms	0.54	0.48	Symmetry

### **Physical Abuse and Forced Sex (1)**

"No matter how well a couple gets along, there are times when they disagree. Please tell me if any of these things has ever happened with <initials of partner>"

#### **Female PS Questionnaire:**

- "Has <initials of male partner> ever slapped, punched, shoved, kicked, shaken or otherwise physically hurt you?"
  - 20% of female responses were 'yes'

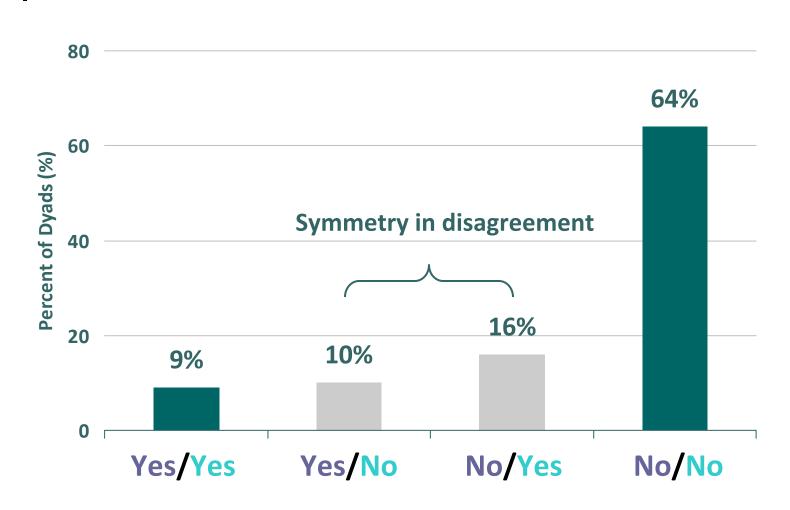
#### Male PS Questionnaire:

- "Have you ever slapped, punched, shoved, kicked, shaken, or otherwise physically hurt <initials of female partner>?"
  - 25% of male responses were 'yes'

#### Male Ever Physically Abused Female

(Female Response/Male Response)

Dyad-level analysis



### Physical Abuse and Forced Sex (2)

"No matter how well a couple gets along, there are times when they disagree. Please tell me if any of these things has ever happened with <initials of partner>"

#### **Female PS Questionnaire:**

- "Has <initials of male partner> ever forced or pressured you to have vaginal, oral or anal sex when you did not want to?"
  - 13% female responses were 'yes'

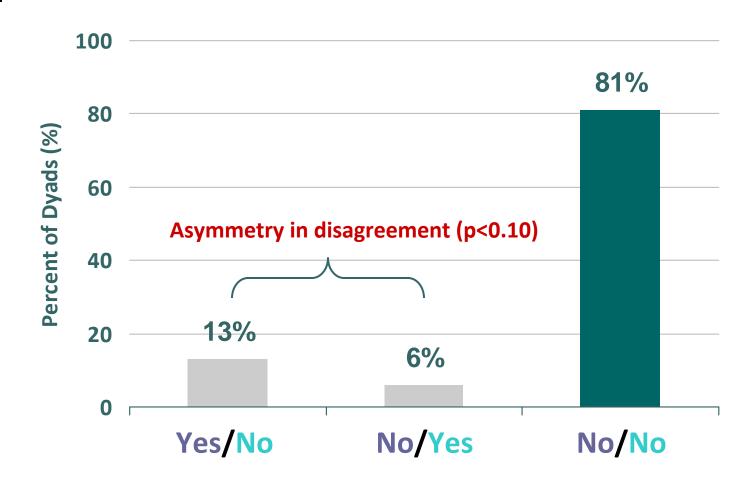
#### Male PS Questionnaire:

- "Have you ever forced or pressured <initials of female partner> to have vaginal, oral, or anal sex when she did not want to?"
  - 6% of males responses were 'yes'

#### **Male Ever Forced Sex**

(Female Response/Male Response)

Dyad-level analysis



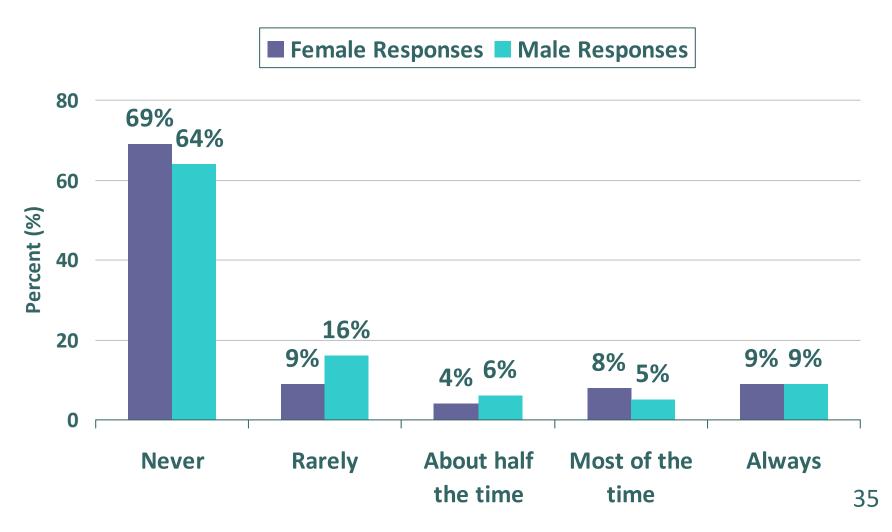


- 71% of dyads agreed on partner type with half of dyads in agreement that partner was a main partner
- More females reported having a conversation with their male partner on the following topics:
  - Whether the male ever had sex with another man (p<0.05)
  - Whether the male currently has sex with men (p<0.05)
  - Male's STD history (p<0.10)</li>
- More females reported forced sex (p<0.10)

## **Dyad Sexual Behavior in the Past Three Months**

### Condom Use for Vaginal Sex During the Past 3 Months

Response level analysis (214 responses)



### Vaginal Sex and Condom Use

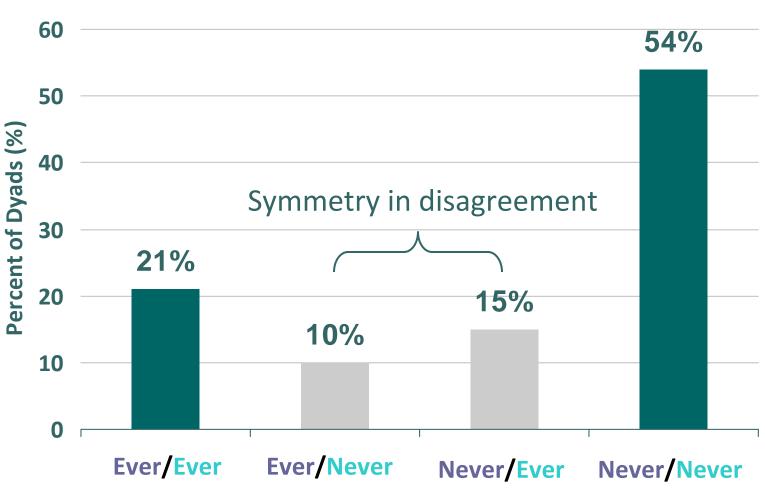
Dichotomizing frequency of condom use

- o Ever vs. never
- "Ever" category composed of always, most of the time, about half the time, and rarely categories

#### **Ever vs. Never Condom Use for Vaginal Sex**

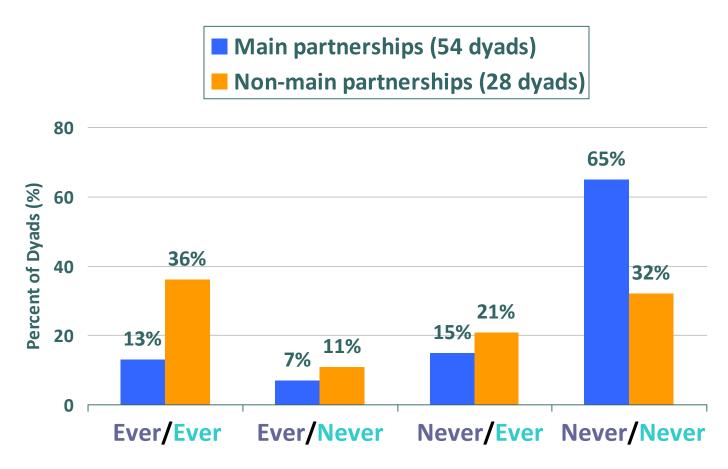
(Female Response/Male Response)

Dyad-level analysis



### Ever vs. Never Condom Use for Vaginal Sex by Main and Non-Main Partnerships

(Female Response/Male Response)



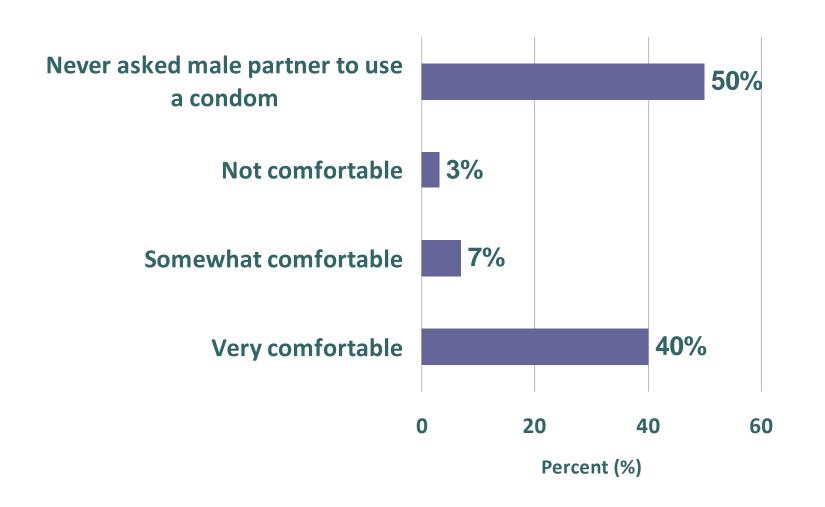
<sup>\*</sup>Compares dyads in agreement that their partner was a main partner (main/main) with dyads in agreement that their partner was a non-main partner (casual/casual, casual/exchange, exchange/casual, and exchange/exchange).

Excludes dyads in disagreement on whether partner was a main or non-main partner (25 dyads)

## Female Level of Comfort Asking Male to Use Condoms

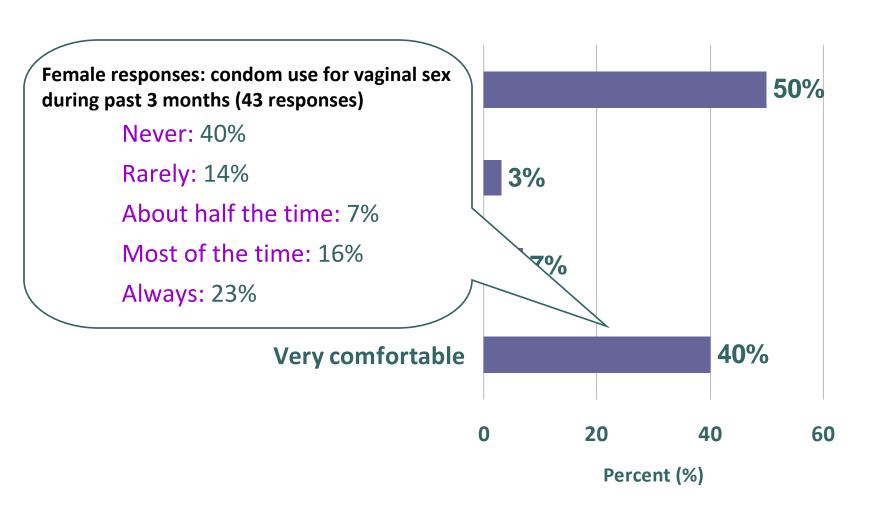
- "During the past 3 months, how comfortable were you asking <initials of partner> to use a condom during vaginal or anal sex? Were you:
  - Very comfortable
  - Somewhat comfortable
  - Not comfortable, or
  - You never asked him to use a condom"

## Female Level of Comfort Asking Male to Use Condoms 107 female responses



### Female Level of Comfort Asking Male to Use Condoms

107 female responses



## Anal Sex and Condom Use Dyad-level analysis

- 80% of dyads were in agreement about whether or not they had anal sex in the past 3 months
  - 9% had (10 dyads)
  - 71% had not
  - 20% in disagreement (symmetry)
- Of the 10 dyads in agreement that they had anal sex, 6 dyads agreed they never used condoms for anal sex
- Unprotected anal sex more efficient route of HIV/STI transmission compared to unprotected vaginal sex



- Low condom use reported for vaginal and anal sex
  - 21% of dyads in agreement that they EVER used condoms
  - 54% in agreement that they NEVER use condoms
  - 6% of dyads in agreement that they NEVER used condoms for anal sex
- 50% of females reported that they NEVER asked male partner to use a condom

### Female Knowledge of Male Partner Risk Behavior



- Partner study questionnaire did NOT have questions for males about their knowledge of their female partner's risk behaviors
- Study design sought to investigate female knowledge of male risk behavior
- NHBS-HET1 preliminary analysis suggests females have high prevalence of HIV risk behaviors (such as multiple sex partners and drug use)
- Assumption that male told the truth (if disagreement between members of dyad, female assumed to have incorrect perception)

## Male Risk Factors and Female Perceptions

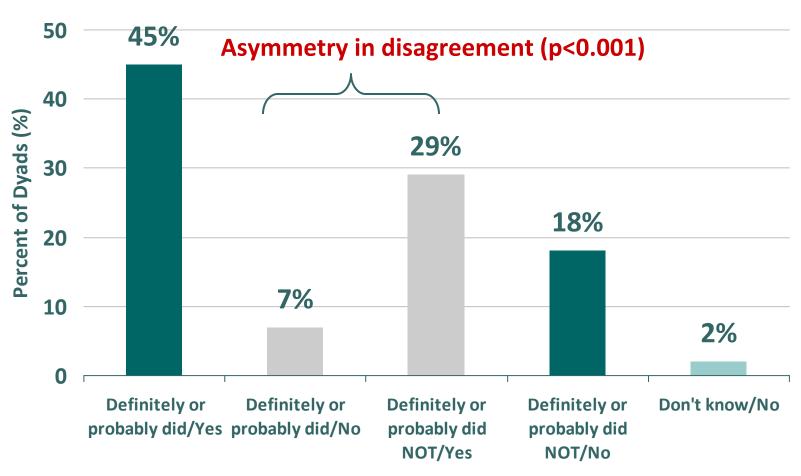
Concurrency: sexual relationships that overlap in time

### Male Partner Concurrency

- Any extra-dyadic sexual relationships that overlapped in time with the dyad's sexual relationship (length of dyad sexual relationships ranged from <1 year to 20 years, median=4 years)
- 74% of males (n=79) reported extra-dyadic sexual relationships
  - 75% (n=59) reported >1 extra-dyadic sexual relationships
- o Median: 3
- Range: 1-39
- Few males reported having sex with men during dyad sexual relationship (3% of males)
  - None of the females were aware that their male partner had sex with men during their sexual relationship

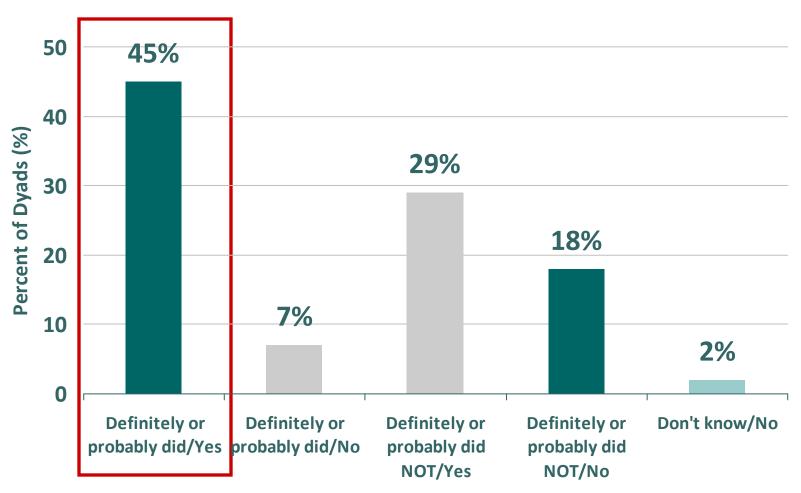
### Male Extra-Dyadic Sexual Relationships

(Female Perception/Male Response)



#### Male Extra-Dyadic Sexual Relationships

(Female Perception/Male Response)



## Male Partner Concurrency- Female Aware

- 45% (48 dyads) were in agreement that the male had extra-dyadic sexual relationships
  - 40% (19 dyads) had females who reported they didn't know how many extra-dyadic sexual partners their male partner had
  - 60% (29 dyads) had females who reported the number of extra-dyadic partners their male partner had
    - Female estimates lower than what the male reported
    - Female median: 2 (range: 1-10)
    - Male median: 4 (range: 1-39)

# Male Risk Factors and Female Perceptions

Ever diagnosed with an STD

## Female Knowledge of Male Partner STD Diagnosis

- "Has <male partner initials> EVER been diagnosed with any of the following sexually transmitted diseases or STDs?
  - Syphilis
  - Gonorrhea (clap or drip)
  - Chlamydia
  - Herpes (HSV)
  - Genital warts (HPV)
  - Any other STDs"



- "Has <male partner initials> EVER been diagnosed with any of the following sexually transmitted diseases or STDs?
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  - Chlamydia
  - Herpes (HSV)
  - Genital warts (HPV)
  - Any other STDs"

"Any STD"



	% dyads "Yes-Yes"	% dyads in disagreement	% dyads "No-No"	% dyads with female members "Don't know"
Syphilis	0	5%	76%	20%
Gonorrhea	3%	21%	57%	21%
Chlamydia	1%	17%	61%	22%
Any STD	9%	36%	54%	

#### Gonorrhea

Males-yes: 0.23

Females-perceived yes: 0.12

#### **Any STD**

Males-yes: 0.36 Females-perceived yes: 0.20 \-p<0.10

# Male Risk Factors and Female Perceptions

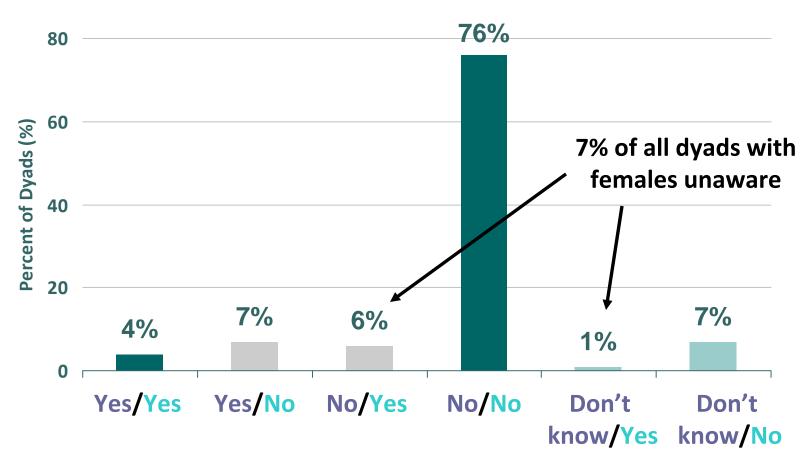
Ever inject drugs

Ever use crack cocaine

#### Male Ever Injected Drugs

(Female Perception/Male Response)

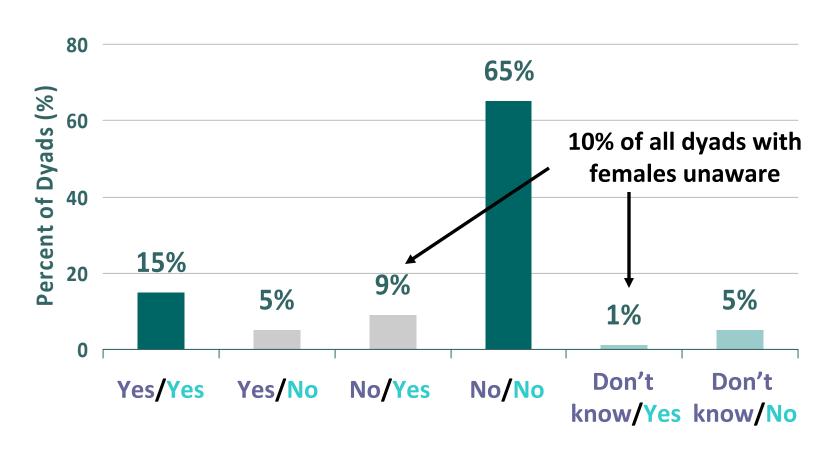
10% of males (n=11) ever injected drugs



#### Male Ever Used Crack Cocaine

(Female Perception/Male Response)

• 25% of males (n=26) ever used crack cocaine



# Male Risk Factors and Female Perceptions

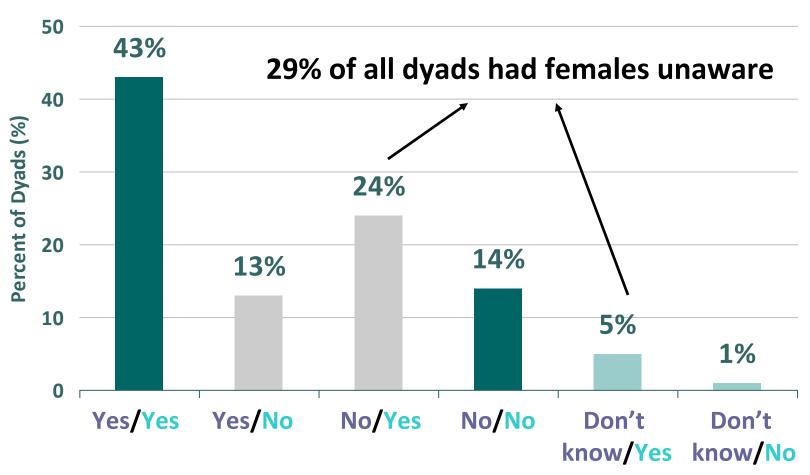
Ever been arrested and in jail or prison (at least 24 hours)

## Male Ever Been in Jail or Prison Individual analysis, 106 males

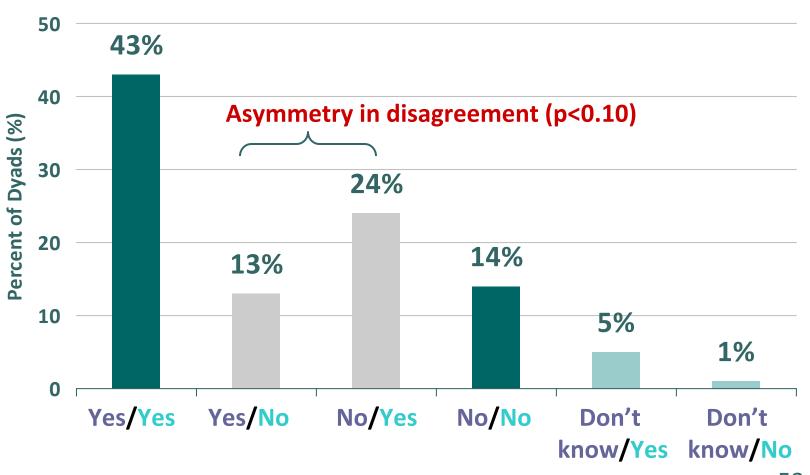
- 72% of males (n=76) had ever been arrested by the police and booked
  - 25% of males who had ever been arrested (n=19) had been arrested in the 12 months prior to interview
  - Among those not arrested during the previous 12 months (n=57):
    - Median length of stay: 23 days
    - Range: <1 day-1825 days (5 years)

### Male Ever Been in Jail/Prison- Dyad-level

(Female Perception/Male Response)



### Male Ever Been in Jail/Prison- Dyad-level (Female Perception/Male Response)



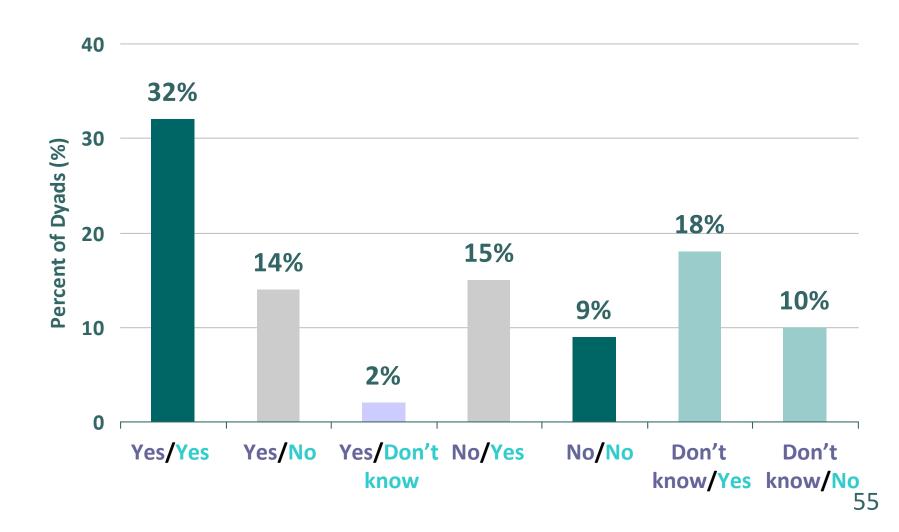
# Male Risk Factors and Female Perceptions

Ever tested for HIV

## Ever Tested for HIV Individual analysis

- 64% of males (n=68) who participated in the Partner Study reported they had ever been tested for HIV
- 71% of females (n=65) who participated in the Partner Study had ever been tested for HIV

## Male Ever Tested for HIV (Female Perception/Male Response)



#### **Discussion**

Discussion
From the literature...

- Studies suggest there are likely many interrelating factors contributing to black females higher risk of HIV infection
  - Contextual factors (social and economic)
  - Sexual networks (prevalence of HIV in partner pool, pattern of connections)
  - Individual risk behaviors (concurrency)
  - Discussion of sexual/behavioral history with partner

#### **Contextual factors and concurrency**

From the literature...

Discussion
From the literature...

- Contextual factors
  - Income, education (low)
  - Incarceration rates (high)
  - Male: female sex ratio (low)
  - Marriage rates (low)
- Influence prevalence of partnership concurrency and other HIV risk behaviors

Adimora AA, Schoenbach VJ (2002). Contextual factors and the black-white disparity in heterosexual HIV transmission. Epidemiology 13:707-712.

Adimora AA, Schoenbach VJ (2005). Social context, sexual networks, and racial disparities in rates of sexually transmitted infections. J Infect Dis 191 Suppl 1:S115-22.

Discussion
From the literature- concurrency

- Black heterosexuals report more sex partners and higher concurrency
- Sexual relationships that overlap in time
- Enhance the transmission of HIV and other STIs in mathematical modeling studies

## Context-Network Relationships From the literature- attributed to Ada Adimora

### \ncarceration



New long term links with antisocial networks

Inmates: sex with others in population with high HIV prevalence

Disrupts partnerships

Reduces employment prospects- † poverty, destabilizes partnerships

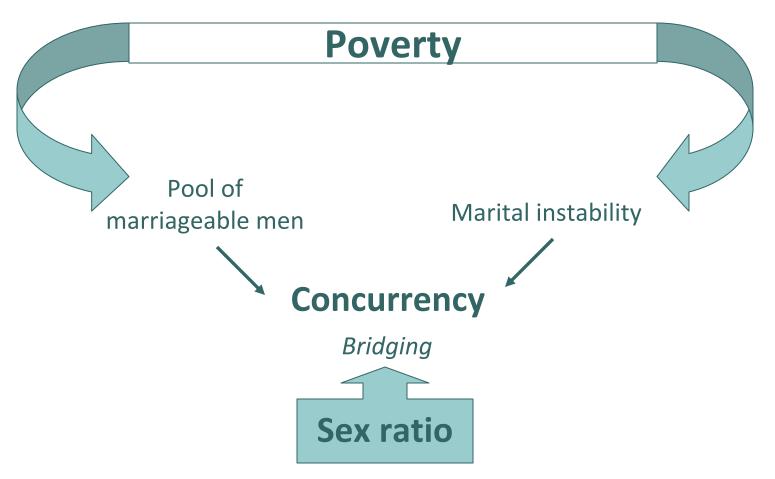
Unemployment in community

Prevalence of men

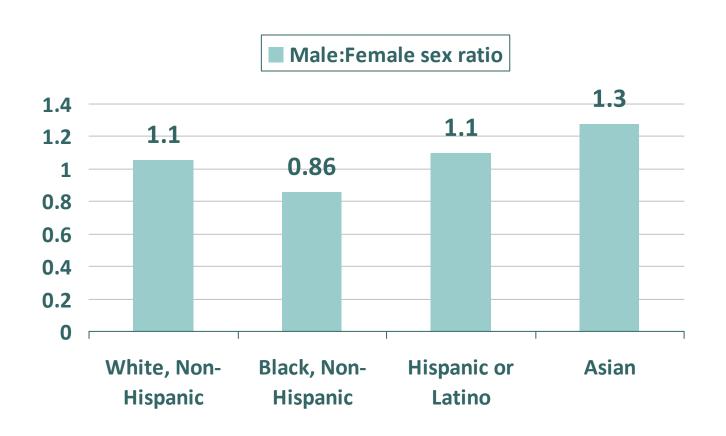
### Sexual networks

Adimora AA, Schoenbach VJ (2005). Social context, sexual networks, and racial disparities in rates of sexually transmitted infections. J Infect Dis 191 Suppl 1:S115-22.

# Context-Network Pathways From the literature- attributed to Ada Adimora



## Male:Female Sex Ratio by Race/Ethnicity, Detroit 2007



M:F sex ratio under one= more females then males

### Contextual factors and concurrency

Partner study data

# Discussion Demographics of Partner study sample

- 55% reported an income <\$10,000</p>
- 28% reported less than a high school education
- 38% unemployed
- The majority of males (63%) and females (59%) reported that they were never married

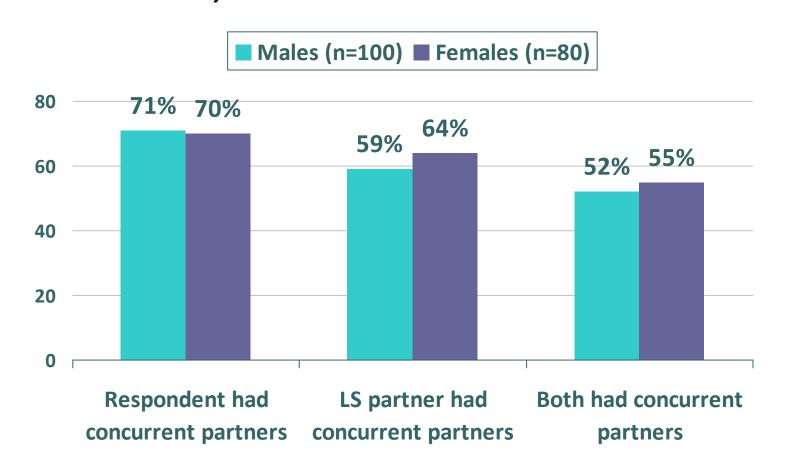
Discussion
Partner study sample- Incarceration

- High incarceration
  - 72% of males ever arrested and booked
    - 40% of female partners unaware
  - 25% of males had been arrested during the 12 months prior to interview
- Incarceration is associated with high risk partnerships, including multiple and concurrent partnerships

Discussion
Partner study sample- concurrency

- 74% of males reported extra-dyadic sexual relationships
- Significantly more males reported concurrency compared to females who perceived male partner concurrency (p<0.001)
- What about female concurrency?
  - HET1 survey question on concurrent relationships with last sex partner

# Concurrent Partners with Last Sex (LS) Partner (over a 12 month time period or less, n=180) HET1 Survey



### **Discussion of HIV risk factors**

Discussion
From the literature-discussed HIV risk factors

- HIV-positive black women less likely to discuss a variety of HIV risk behaviors with their male partners (prior to HIV diagnosis) compared to HIV-negative black women
  - Number of past sex partners
  - Number of current sex partners
  - HIV status
  - STD history
  - Drug use history
  - Incarceration history

Discussion
Partner study sample- discussed HIV risk factors

- Agreement that communication occurred during the past 3 months
  - Discuss number of male's current sex partners: 21%
  - Discuss number of male's past sex partners: 13%
  - Discuss whether male had ever had sex with a man: 7%
  - Discuss whether male currently has sex with men: 5%
  - Discuss male's HIV status: 18%
  - Discuss male's drug use history: 22%
  - Discuss male's STD history: 10%
  - Discuss using condoms: 34%

## Partner Study Questions More females responded 'Yes'

	Proportion of <b>female</b> 'Yes' responses	Proportion of male 'Yes' responses	Significance level met
<b>Discussed</b> (during the past 3 months) whether male ever had sex with a man	0.37	0.18	<i>p</i> <0.01
<b>Discussed</b> (during the past 3 months) whether male currently has sex with men	0.30	0.13	<i>p</i> <0.01
<b>Discussed</b> (during the past 3 months) male's sexually transmitted disease history	0.38	0.26	<i>p</i> <0.10
Male ever forced sex with female	0.13	0.06	<i>p</i> <0.10

# Partner Study Questions More males responded 'Yes'

	Proportion of <b>female</b> 'Yes' responses	Proportion of <b>male</b> 'Yes' responses	Significance level met
Male had extra-dyadic sexual relationships(s)	0.52	0.75	<i>p</i> <0.001
Male <b>ever</b> diagnosed with gonorrhea	0.12	0.23	p<0.10
Male <b>ever</b> diagnosed with an STD (regardless of type reported by male and type perceived by females)	0.20	0.36	<i>p</i> <0.01
Male <b>ever</b> been in jail or prison >24 hours	0.59	0.71	<i>p</i> <0.10

### Partner Study Questions- Patterns

- Certain partnership characteristics were reported more by females
  - Discuss certain issues related to HIV risk
  - Forced sex

- Certain male risk factors reported more by *males*
  - Male partner concurrency
  - Male ever diagnosed with an STD
  - Male ever incarcerated

### HIV Testing Results- Partner Study

- All final HIV test results for males were negative
- One positive HIV final test result for a female (1%)
  - Female reported never being tested for HIV
  - One male partner during past 12 months; no unprotected sex
  - Never injected drugs
  - Unknown date of infection

## HIV Testing Results- Detroit HET1

- Detroit HET1 sample (n=786), HIV prevalence
  - 6 positive HIV final test results
  - 3 male and 3 female
- NHBS-HET1 nationwide sample (n=14,837) had an HIV prevalence of 2%
  - All sites targeted high poverty areas with high rates of HIV
  - 10-20 times greater estimated prevalence of HIV in non-IDU heterosexuals in U.S.

## • Implications for prevention

- Investigating the extent of couple agreement is important for understanding how partner level dynamics influence HIV risk behavior
  - Partner level HIV prevention strategies
    - Improve communication of HIV risk factors in couples
    - Identifying barriers to condom use
- Multi-dimensional approach to HIV prevention needed for black females
  - Social and economic environment
  - Individual HIV prevention for black females
    - Empower females to protect themselves
      - Know your sex partner's HIV status
      - Consistent condom use

## • • Thank you!

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- Testing Organizations- provided space and HIV testing
  - DDHWP Counseling and Testing
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