

Population-Based Prevalence Estimates of Diagnosed and Undiagnosed HIV and Associated Risk Behaviors among New York City Adults — 2004

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Known and Unknown HIV Infections

- **Nationally**
 - HIV prevalence — 0.37%
 - 25% of infected persons unaware of their infection
- **New York City (NYC)**
 - Prevalence of reported HIV — 1.2%
 - Estimated seroprevalence — 1.3-1.6%
 - 12–29% infections undiagnosed or unreported

HIV Surveillance

- **Dependent on reported cases**
 - **Based on testing of high-risk groups**
 - **Limited to those who seek or are recommended for testing**
- **Underestimate of HIV burden in general population**

Objectives

- **Determine prevalence of HIV in NYC adults**
- **Calculate population-based and HIV-specific prevalence measures**
 - **Risk behaviors**
 - **Perceptions of HIV/STD risk**
- **Determine proportion of unreported HIV**

Data Sources

- **Sample of non-institutionalized adults**
 - **NYC Health and Nutrition Examination Survey (HANES)**
 - **Data match with NYC HIV/AIDS Registry System (HARS)**

NYC HANES

- **June – December 2004**
- **3-stage cluster, household-based sampling**
 - **1,999 non-institutionalized adults aged ≥ 20 years**
- **Interview and physical examination**
- **Serologic repository for future anonymous testing**

NYC HARS

- **Reported HIV/AIDS in people tested or in care in NYC**
- **Linked to NYC HANES**
 - **Based on first and last name, date of birth, social security number**

Blinded HIV Serosurvey

- **N = 1626**
- **New identification numbers assigned**
- **Data stripped of all identifying information**
- **ELISA and Western Blot tests**

Cross-Match: Serosurvey and HARS

	In HARS	Not in HARS
HIV+ By Serosurvey		Unreported HIV
HIV- By Serosurvey		

Analyses

- **Survey weighting and post-stratification**
 - **Representative of non-institutionalized NYC population**
- **Weighted prevalence of demographics, behaviors and risk perception**
 - **General population**
 - **HIV-infected subgroup**

HIV Behavioral Risk

	Men		Women	
	n	%	n	%
MSM History	63	10%	—	—

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History of Needle Use	17	3%	6	1%

HIV Behavioral Risk

	Men		Women	
	n	%	n	%
MSM History	63	10%	—	—
History of Needle Use	17	3%	6	1%
Multiple Sex Partners (past yr)	192	25%	149	16%

Participants with Multiple Sex Partners in Past Year

	Men n=192		Women n=149	
	n	%	n	%
Last sex not with main partner	70	41%	35	24%

Participants with Multiple Sex Partners in Past Month

	Men n=162		Women n=114	
	n	%	n	%
Inconsistent condom use	90	59%	70	63%

Risk Behaviors and Perceptions

- **96% reported no or low chance of having HIV or STD**
- **Overall, 20% engaged in at least 1 behavioral risk activity**
 - **Of whom, 92% perceived minimal HIV/STD risk**

NYC HANES HIV Prevalence

- 21 of 1626 tested HIV-positive
 - 1.4% (95% CI: 0.6-2.2%)
- Higher among:

	Prevalence	95% CI
Males	2.0%	1.1-3.6%
MSM	13.7%	6.0-28.3%
Blacks	3.3%	1.4-7.5%
Aged 40-49	2.4%	1.0-6.1%

HIV Prevalence Comparison

	NYC HANES		HARS
Males	1.9%	>	1.7%
MSM	13.7%	>	8.4%
Blacks	3.3%	>	2.1%
Aged \geq 50	1.6%	>	1.3%

Unreported and Unknown HIV

Unreported HIV

- 1 of 21 not matched to HARS record
 - 5% unreported HIV
 - 95% CI: 0.7%-29.9%

Unaware of HIV-positive status

- 3 of 21 (15%) of HIV-infected perceived low or no risk of HIV or STD infection
 - 95% CI: 5.1%-35.1%

Conclusions

- **Surveillance approximates HIV prevalence in the general household adult population**
- **5% unreported HIV (n=1, 95% CI 0.7%-29.9%)**
- **15% seemed unaware of their HIV infection**
- **High prevalence of high-risk behavior and perceptions of minimal risk for HIV/STD**

Discordant Behavioral Risk and Perceptions

- **Most people do not consider themselves at risk of HIV or STD infection**
 - **Substantial proportion engage in high-risk activities**
- **Targeting traditional high-risk groups for HIV testing misses others at risk**

Possible Errors in Estimation

- **Errors in HIV Testing or HARS Matching**
 - **3 people tested HIV-negative but matched to HARS**
 - **3 inconclusive HIV testing results**

Limitations and Opportunities

- **Small sample size**
- **Generalizability among non-institutionalized adults**
 - **Opportunity to describe HIV in general adult population**
- **Non-participants might represent undiagnosed population**

Recommendations

- **Interim local-level HIV prevalence studies**
- **Widespread rapid HIV testing**
- **Routine screening approach for HIV**

Disclaimer

The findings and conclusions in this presentation have not been formally disseminated by the Centers for Disease Control and Prevention (CDC) and should not be construed to represent any CDC determination or policy.

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NYC Seroprevalence Estimation

- **Known PLWHA that have been diagnosed and reported to HARS and presumed to be living in NYC**
- **Estimated cases diagnosed with HIV prior to named reporting rules**
- **Estimated cases not reported due to laboratory or provider error**
- **Estimated HIV+ persons not yet tested for HIV**

3 Cluster Sampling

- Neighborhood
- Households
- Study Participants

Sampling Design and Response Rate

SEGMENT

~20,000 segments in NYC

144 segments randomly selected

HOUSEHOLD

4026 households approached

Household Response Rate
 $3388/4026 = 84\%$

3388 completed eligibility interview

638 did not complete eligibility interview

Overall Response Rate
 $84\% \times 66\% = 55\%$

PARTICIPANT

3047 participants identified

Participant Response Rate
 $1999/3047 = 66\%$

1999 participants examined

1048 participants refused

Data De-Identification

- Collapsed select NYC HANES interview variables
- Randomly assigned new identification numbers (ID2) corresponding to original ID
- Merged dataset of select variables and HARS match status by ID2

Blinded Serosurvey

- Aliquots of sera from repository to tubes labeled with corresponding ID2
- All data files stripped of original ID and identifying information
- EIA and WB testing on 1626 specimens
- HIV-1 RNA PCR testing of inconclusive results

NYC HANES Sample — Gender

	N	Weighted %	Census 2000 %
Total	1626		
Female	933	53.8	54.0
Male	693	46.2	46.0

NYC HANES Sample — Race/Ethnicity

	N	Weighted %	Census 2000 %
Total	1626		
White	477	38.3	39.2
Black	342	22.9	22.8
Hispanic	575	10.8	10.1
Asian	207	26.2	24.4

NYC HANES Sample — Age

	N	Weighted %	Census 2000 %
Total	1626		
20-39	808	42.7	44.7
40-49	357	20.2	19.4
≥ 50	461	37.1	35.9

Age-Adjusted HIV Prevalence

- 1.5%
- 95% CI: 0.8-2.6%

HIV Prevalence

	No. Positive	Weighted %	Prevalence OR (95% CI)
Male	12	2.0	2.0 (0.9-4.4)
Female	9	1.0	—
Black	11	3.3	5.5 (1.0-30.7)
Hispanic	6	1.3	2.1 (0.4-11.4)
Asian	1	0.7	1.1 (0.1-12.7)
White	2	0.6	—

HIV Prevalence

	No. Positive	Weighted %	Prevalence OR (95% CI)
≥50	7	1.6	1.9 (0.6-6.2)
40-49	8	2.4	2.9 (0.9-10.0)
20-39	6	0.9	—
MSM	7	13.7	15.1 (4.1-55.9)
HSV2	15	3.7	6.5 (2.3-18.1)

HIV Risk

	No. Positive	Weighted %	Prevalence OR (95% CI)
Needle Use History	3	20.9	21.0 (4.0-110.6)
Multiple Sex Partners (past yr)	6	2.1	1.4 (0.6-3.4)
Last Sex Not w/ Main Partner	3	3.5	2.5 (0.4-16.2)
Inconsistent Condom Use (past month)	1	0.7	0.3 (0.03-3.8)

Prevalence Odds Ratios for HIV Risk

- **MSM**
 - **POR 15.1 (4.1-55.9)**
- **History of needle use**
 - **POR 21.0 (4.0-110.6)**
- **Herpes Simplex Virus-2 Infection**
 - **POR 6.5 (2.3-18.1)**

HIV Reporting Completeness

	NYC HANES	HARS
Females	37.%	30%
Blacks	54%	44%
Asians	5%	1%
≥50	41%	29%
Not IVDU or MSM	62%	47%

Imperfect Processes

HIV Testing

- **3 inconclusive results**
 - Possible cross-contamination
 - Insufficient RNA detected

HARS Matching

- **3 HIV-negatives matched to HARS**
 - Manual reviews
 - Common names
 - Limited matching variables

Inconclusives as Positive

- **Prevalence**
 - **1.6% (95% CI, 0.8–2.5)**
- **Unreported HIV**
 - **Inconclusives had not matched to HARS**
 - **14.3% (95% CI, 4.7–35.7).**

Inconclusives as Negative

- Prevalence
 - 1.4% (95% CI, 0.6–2.2)