

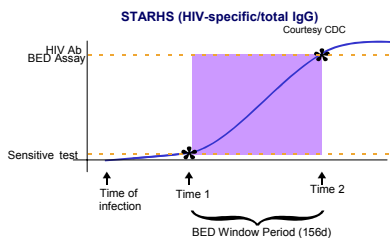
# HIV Incidence in New York City in 2006

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## BACKGROUND

Because most diagnoses of HIV occur one or more years into the chronic phase of infection, HIV diagnoses do not accurately represent new HIV infections, and HIV surveillance cannot reflect HIV incidence. The serologic testing algorithm for recent HIV seroconversion (STARHS) is a laboratory method that uses the ratio of HIV-specific to total IgG antibody to distinguish between recent ( $\leq 5$  months) and established ( $> 5$  months) infection in the diagnostic Western Blot specimen.

STARHS results combined with testing history and data reported to HIV surveillance can be used to estimate population-based incidence.



**Objective:** To estimate HIV incidence in New York City using a new CDC laboratory algorithm and statistical method.

## METHODS

### History of HIV incidence Surveillance in NYC

- NYC used STARHS to estimate incidence in specimens tested at the NYC Public Health Laboratory (21% of all new positives in NYC) from June 1, 2000 through December 31, 2005.
- NYS Communicable Disease Laboratory Reporting Guidelines issued on June 1, 2005, expanded specimen salvage to include all laboratories performing diagnostic Western Blot testing in New York State.

### Calculation of NYC HIV Incidence in 2006

#### BED Testing

- The diagnostic WB of all new HIV diagnoses in 2006 was salvaged and tested using the Calypte BED Capture Assay®.
- Remnant serum was available for 62% of all new diagnoses (81% of all new WB-based diagnoses).

#### Stratified Extrapolation Approach (SEA)\*

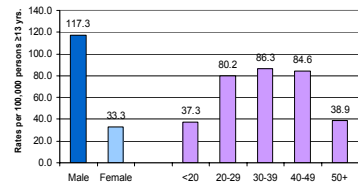
- Multiple imputation used to generate missing BED results and test history (test history data available for 41% of specimens).
- Probability of testing during STARHS window period computed.
- Probability of testing positive during STARHS window period computed.
- Sampling weights and incidence estimates calculated for 20 strata.

\*Hall et al., Estimation of HIV incidence in the United States. JAMA 2008 300;5:520

## RESULTS

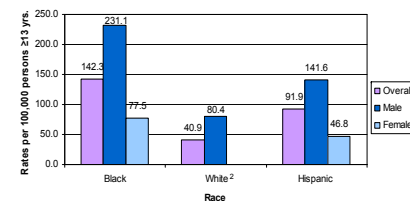
### HIV Incidence in NYC by Sex and Age, 2006<sup>1</sup>

- In 2006, an estimated 4,762 (72/100,000 population) New Yorkers were recently infected with HIV.
- Men accounted for 75.5% (117.3/100,000) and women for 24.6% (33.3/100,000) of recent infections.
- 61.8% of new infections were in persons  $\geq 30$  years.



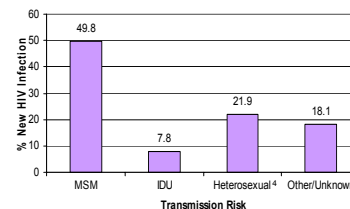
### HIV Incidence in NYC by Race and Sex, 2006<sup>1</sup>

- Blacks accounted for 46.3% (142.3/100,000) and Hispanics for 32.2% (91.9/100,000) of recent infections.
- Black and Hispanic men have incidence rates of 231.1/100,000 and 141.6/100,000, respectively.



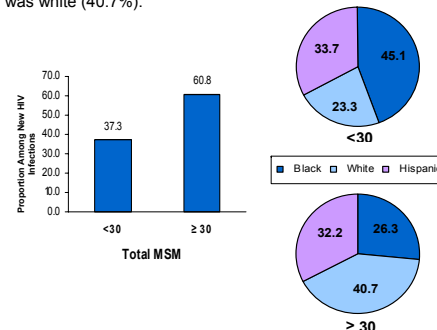
### Proportion of New HIV Infection in New York City by Risk, 2006<sup>1,3</sup>

- Men who have sex with men (MSM) accounted for 49.8% of all new infections.



### Proportion of New HIV Infection in Men Who Have Sex with Men in New York City – Distributions by Age Group and Race, 2006<sup>1,3</sup>

- MSM aged 30 years and over made up almost two thirds (60.8%) of the newly infected MSM.
- There is a generational divide in the race distribution of newly infected MSM – almost half of those under 30 were black (45.1%). In contrast, the largest group among newly infected MSM aged 30+ was white (40.7%).



<sup>1</sup> Numbers in breakdowns will not add to total due to size of strata generated by the multi-stage imputation process and/or elimination of cells not meeting minimum cell size criteria.

Percentages are similarly affected and may not add to 100%.

<sup>2</sup> Case numbers for white women are too low to calculate incidence.

<sup>3</sup> Incidence rates not calculated due to lack of population data for risk factor categories.

<sup>4</sup> Heterosexual risk category includes persons classified as probable heterosexual risk by NYCDOHMH as well as those meeting the strict CDC definition of heterosexual risk.

## LIMITATIONS

- 2006 is the first full year for which citywide BED results are available and the first year to which the CDC formula has been applied and validated. Therefore, this estimate cannot be compared to any previous estimate.
- Missing BED results and missing test history data were imputed by the SEA formula. In 2006, 38% of NYC BED results and 62% of NYC test history data were missing and had to be imputed to calculate incidence.
  - The SEA formula requires that a minimum of 25% actual BED results be available.
  - SEA assumes that the HIV test hazard is constant between time of infection and AIDS (in reality it is more likely to be a gamma distribution).
- The probability of testing 'recent' was calculated based on the testing behavior of those with actual BED results. This population disproportionately represents MSM and others (e.g., STD clinic clients) who test routinely due to high risk behavior.
- Populations for calculation of rates were derived from 2000 Census data. The city population has grown since 2000 so true denominators are much larger. Therefore, these estimates are inflated, particularly in populations experiencing high growth.

## CONCLUSIONS

- Black and Hispanic New Yorkers, persons aged 30 years and over, and MSM were at highest risk for incident HIV infection in 2006.
- The data underscore the need for increased condom distribution and HIV testing in New York City.
- This is the first citywide estimate of HIV incidence. The new CDC methodology provides a baseline incidence estimate that can be used to monitor future epidemic trends and evaluate expanded testing and prevention initiatives.

### Acknowledgements

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