DO MOST POSITIVE HIV-1 WESTERN BLOT TESTS IN NEW YORK CITY DIAGNOSE NEW CASES?

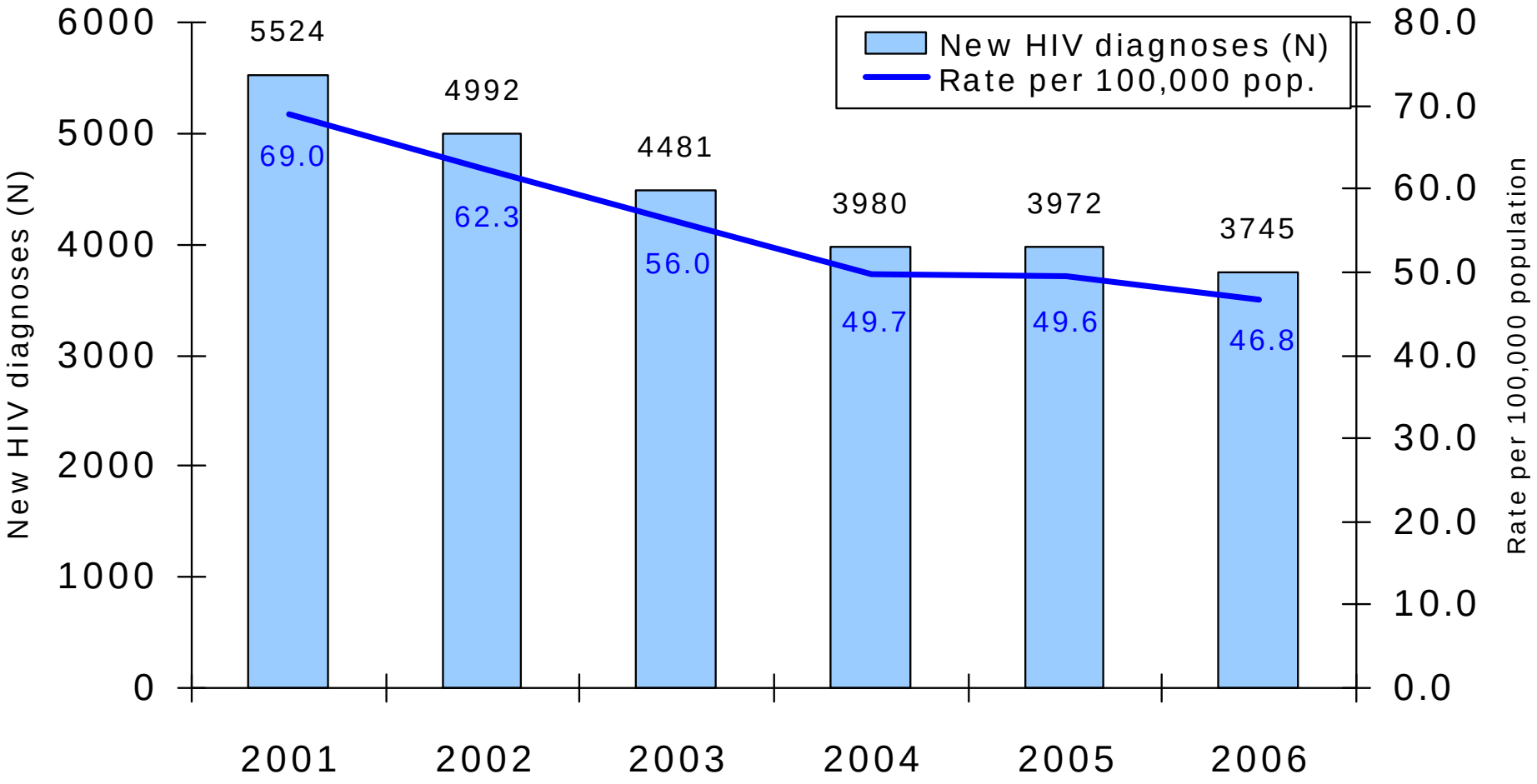
David B Hanna[1], Melissa R Pfeiffer[1], Benjamin Tsoi[2], Matt H Henn[2], Adam M Karpati[3], Elizabeth M Begier[1]

[1]HIV Epidemiology and Field Services Program,
[2]HIV Testing Unit, [3]Office of the Assistant Commissioner

Bureau of HIV/AIDS Prevention and Control
New York City Department of Health and Mental Hygiene

2007 NATIONAL HIV PREVENTION CONFERENCE, ATLANTA, 12/3/2007

New HIV Diagnoses & Rates in NYC, 2001-2006



Thousands of new cases of HIV are diagnosed in New York City (NYC) every year

As reported to the New York City Department of Health and Mental Hygiene by September 30, 2007.

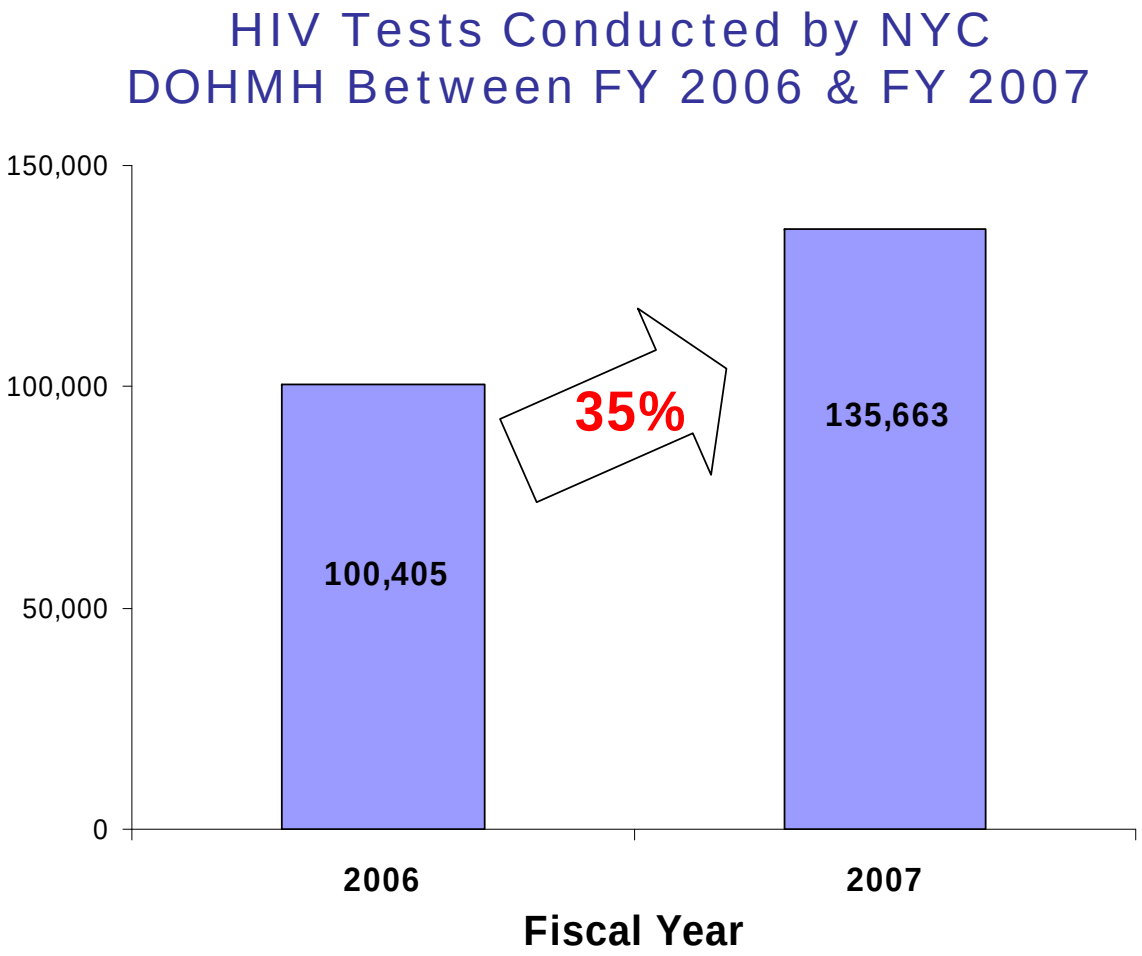
Background

- **Key part of CDC's approach to HIV prevention:**
  - **Developing and supporting programs to diagnose the estimated 25% of HIV-infected persons unaware of their status**

- **Many interventions have been evaluated for their value in HIV case finding, e.g.,**
  - **Social networks (*MMWR*, 2005)**
  - **Partner counseling and referral services (PCRS) (Brewer, 2005)**

Background

- **HIV testing in New York City has increased substantially in recent years**
  - **Improvements in rapid test technology**
  - **Increased support for population-based testing**



Source: HIV Testing Unit, Bureau of HIV/AIDS Prevention and Control, New York City Department of Health and Mental Hygiene.

Background

- **Positive cases identified through increased testing have not been evaluated to assess if they are truly newly diagnosed infections**
  - **Self-report of HIV-positive status, even if available, may not be accurate (Lindan, 1994)**

New York City HIV/AIDS Surveillance Registry

- **Since June 2000, all positive confidential HIV-1 Western blot (WB) results have been reportable in New York State**
  - **NYC DOHMH processes results for all positive tests conducted in New York City**
    - **New cases are investigated**
    - **Prior diagnostic information exists in Registry for cases already known to the NYC DOHMH**

- **Data used for epidemiologic monitoring**
  - **Identifying trends in new diagnoses in NYC**
  - **Evaluation of HIV testing programs?**
    - **Recommended as core surveillance activity by CDC**

NYC Health

Objectives

1. **To determine % of all positive confidential WB results reported in NYC that were new diagnoses**
   - **Overall for NYC, by type of provider**
2. **To assess yearly trends in the % of tests that are new diagnoses**
3. **To characterize new diagnoses versus repeat testers**

Data Source and Inclusion/Exclusion Criteria

- **NYC HIV/AIDS Surveillance Registry**
  - **Includes any positive confidential HIV-1 WB test reported to the NYC DOHMH**
    - **WB tests occurring 2004-2006 and received by the NYC DOHMH through 9/30/2007**
  - **Excludes:**
    - **duplicate WBs reported on same day**
    - **new WBs that could not be confirmed through field investigation**
  - **Demographic and clinical information based on chart review by field surveillance staff**

Analysis: Diagnostic vs. repeat tests

- **Number of positive WB tests determined in analysis period (2004-2006)**
- **Each categorized as diagnostic or repeat test**
  - **<u>Diagnostic test</u>: if the first evidence of HIV positive status occurred in the same month or the month immediately prior to the Western blot**
  - **<u>Repeat test</u>: if there was any evidence of HIV positive status >1 month before the Western blot**
- **Time trends assessed with the Mantel-Haenszel chi-square test for trend**

Analysis: Case characterization

- **Tests collapsed to the case level to characterize individual cases for 2006 tests**
  - **Those with at least one diagnostic test in 2006 considered <u>new cases</u>**
  - **Those without a diagnostic test considered <u>repeat testers</u>**
- **Frequency distributions of demographic and clinical characteristics determined for new cases vs. repeat testers**
  - **Significant differences ($p<.05$) tested by the chi-square test**

NYC Health
nyc.gov/health

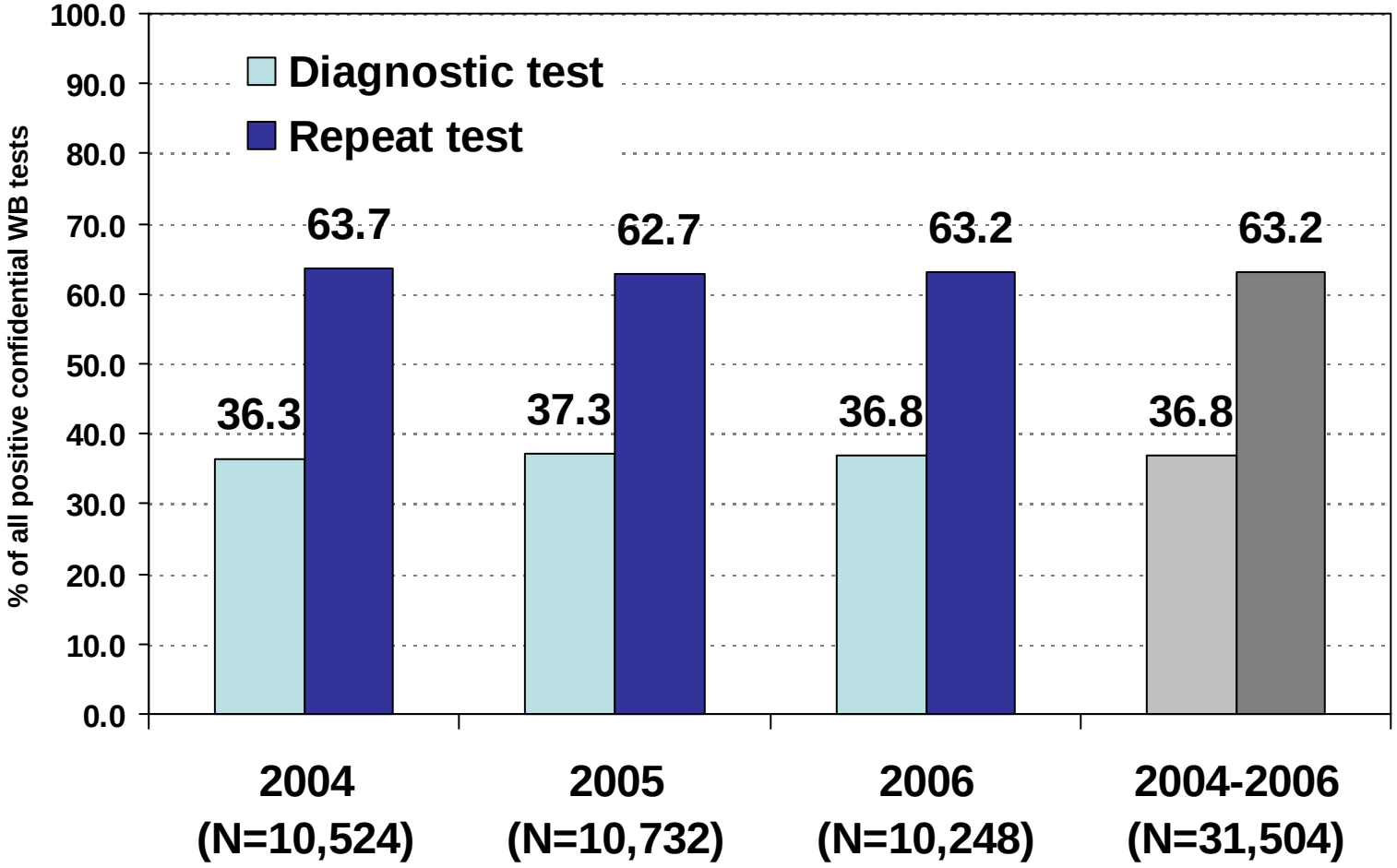
Results

- **35,594 positive confidential WB tests reported in NYC between 2004 and 2006**

- **Of these, 31,504 retrospectively linked to a Registry case**
  - **11,600 diagnostic tests (36.8%)**
  - **19,904 repeat tests (63.2%)**
    - **54.8% of repeat tests were in those diagnosed at least 5 years prior to the test date**

NYC Health
nyc.gov/health

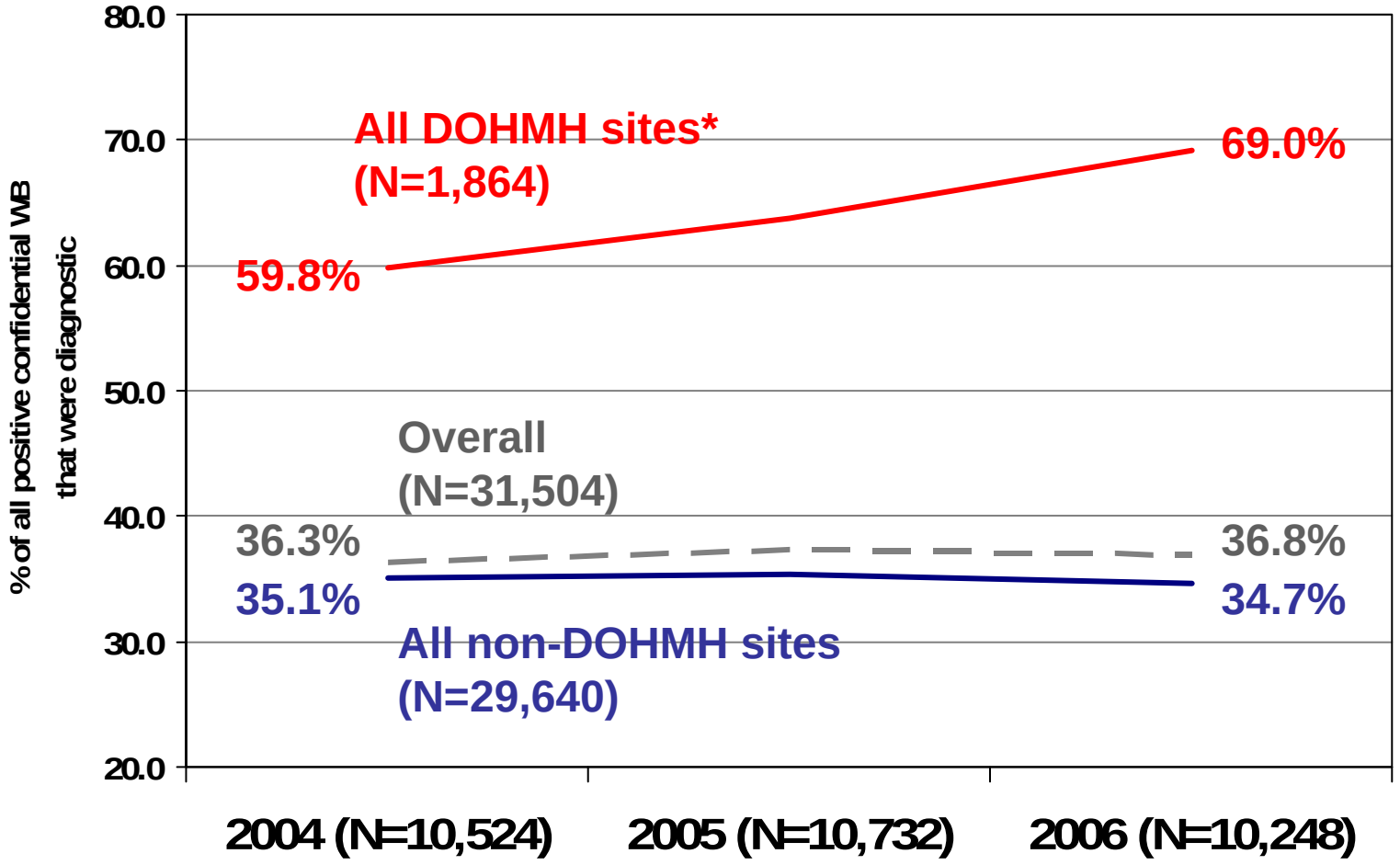
Time trends: Diagnostic vs. repeat positive WB tests in New York City 2004-2006



P trend = NS

As reported to the New York City Department of Health and Mental Hygiene by September 30, 2007.

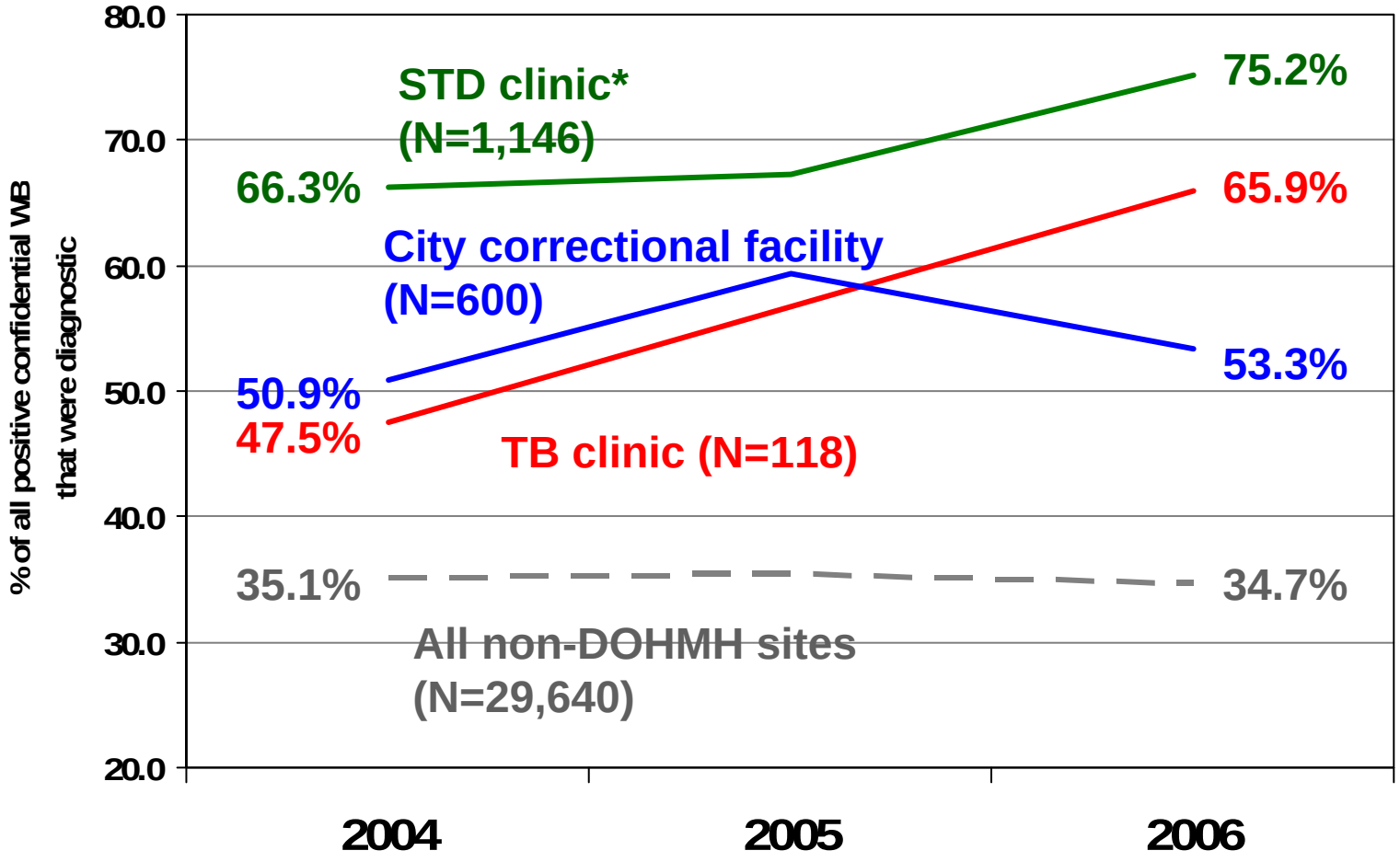
Time trends: % of positive WB tests that were diagnostic in NYC, by provider type 2004-2006



*P trend = 0.001

As reported to the New York City Department of Health and Mental Hygiene by September 30, 2007.

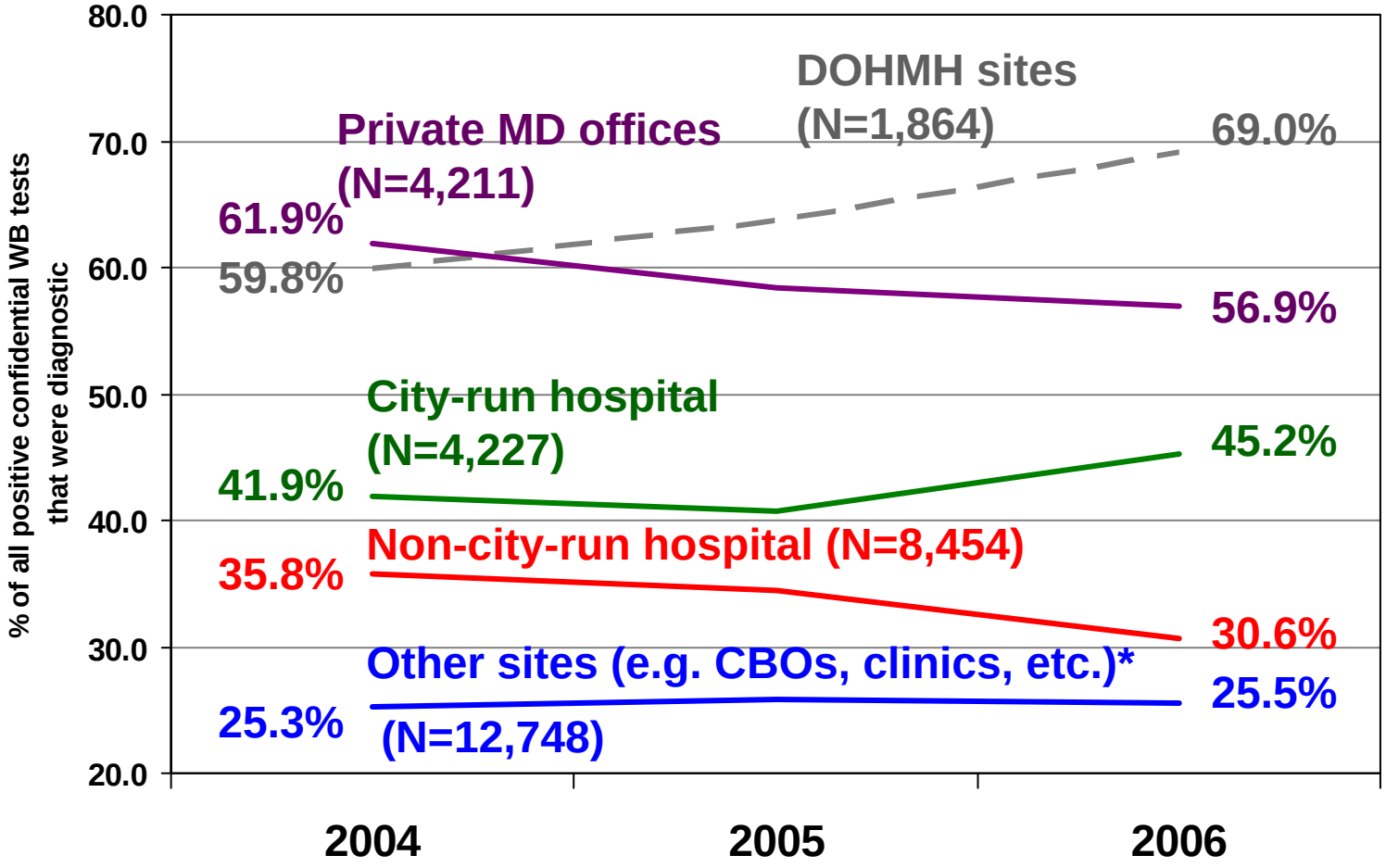
Time trends: % of positive WB tests that were diagnostic in NYC, DOHMH sites 2004-2006



*P trend = 0.01

As reported to the New York City Department of Health and Mental Hygiene by September 30, 2007.

Time trends: % of positive WB tests that were diagnostic in NYC, non-DOHMH sites 2004-2006



***Significant variability among other sites (P<0.0001)**

As reported to the New York City Department of Health and Mental Hygiene by September 30, 2007.

Characteristics of new cases versus repeat testers, 2006

	New case (N=3,192)	Repeat tester (N=5,347)	P-value
Sex			<0.0001
Male	72.1%	64.0%	
Female	**27.9%**	**36.0%**	
Median age	**38**	**43**	<0.0001
Race/ethnicity			<0.0001
Black (non-Hispanic)	**51.3%**	**56.6%**	
Hispanic	**30.4%**	**32.4%**	
White (non-Hispanic)	16.0%	9.8%	
Asian/PI	2.0%	0.8%	
Other/unknown	0.3%	0.3%	

Significant differences tested by the chi-square test or the Wilcoxon test.
As reported to the New York City Department of Health and Mental Hygiene by September 30, 2007.

Characteristics of new cases versus repeat testers, 2006

	New case (N=3,192)	Repeat tester (N=5,347)	P-value
HIV transmission category			<0.0001
MSM	**37.9%**	**23.0%**	
IDU history	**6.2%**	**29.5%**	
Heterosexual	23.7%	22.1%	
Perinatal	0.3%	0.9%	
Other/unknown	31.9%	24.4%	
Clinical status at end of 2006			<0.0001
HIV (non-AIDS)	67.8%	38.3%	
AIDS	**32.2%**	**61.8%**	

Significant differences tested by the chi-square test.
As reported to the New York City Department of Health and Mental Hygiene by September 30, 2007.

Summary

- **Do most positive HIV-1 Western blot tests diagnose new cases in NYC?**
  - **NO: only 37% were in newly diagnosed cases between 2004 and 2006**
  - **No significant changes by year**

- **Repeat testers:**
  - **more likely to be older, black or Hispanic, have a history of IDU, and have AIDS**

Summary

- **Significant variability by provider type in % of WB tests that are repeat tests**

<u>Potential explanations</u>

- **Sites may consciously repeat testing:**
  - **to confirm HIV infection prior to tx initiation**
  - **to certify status for social service benefits**
- **Sites offering testing incentives may unintentionally encourage repeat testing**

Summary

- **City-run STD and TB clinics and correctional facilities reported higher proportions of new diagnoses**
  - **Patient incentives for testing are not provided at these sites**
  - **STD and TB clinics do not provide HIV-related clinical care**

Limitations

- % of tests diagnostic depends on:
  - both true epidemiologic burden and amount of testing/outreach done
  - availability of information in the Registry
- Some testing sites not clearly differentiated from clinical care sites
- Little information available on which sites offer HIV testing incentives

Implications

- **High overall rate of repeat testing indicates that case finding programs can and should be evaluated using surveillance information**
  - **to ensure that cases identified are truly newly diagnosed and not repeat testers**

- **Results could be provided to individual testing programs for case finding evaluation**
  - **Pilot project started with certain programs**
  - **Information provided in aggregate only, in order to maintain confidentiality**

Acknowledgments

- **HIV Epidemiology and Field Services Program, NYC DOHMH, especially:**
  - **Roy Shum**
  - **Sonny Ly**
  - **Dipal Shah**
  - **Chitra Ramaswamy**

- **HIV Testing Program, NYC DOHMH**
  - **Vanessa Woog**

NYC Health
nyc.gov/health