

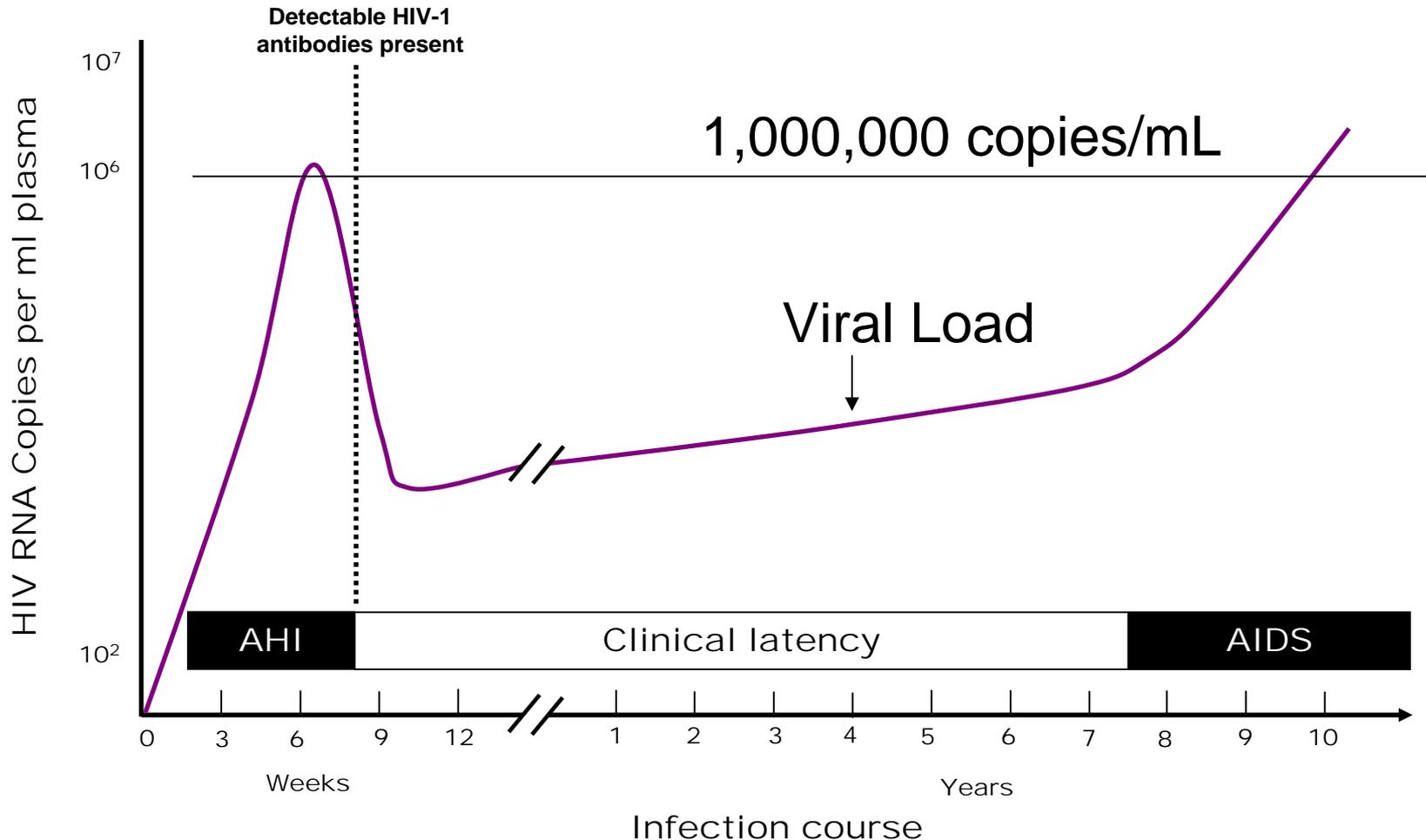
Evaluating factors associated with high viral load values among HIV-infected individuals in New York City



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<http://www.nyc.gov/html/doh/html/dires/hivepi.shtml>

Natural history of HIV viral load



Public health importance of individuals with high HIV viral load (VL)

- Increased HIV infectiousness
- Faster progression to AIDS
- Single, high viral load
 - Can be used as an indicator
- Sustained high VLs may reflect:
 - Lack of adherence to ART
 - Sporadic access to care and treatment
 - Infection with ART-resistant strain
 - In care but not on ART
 - Terminal stage of HIV infection

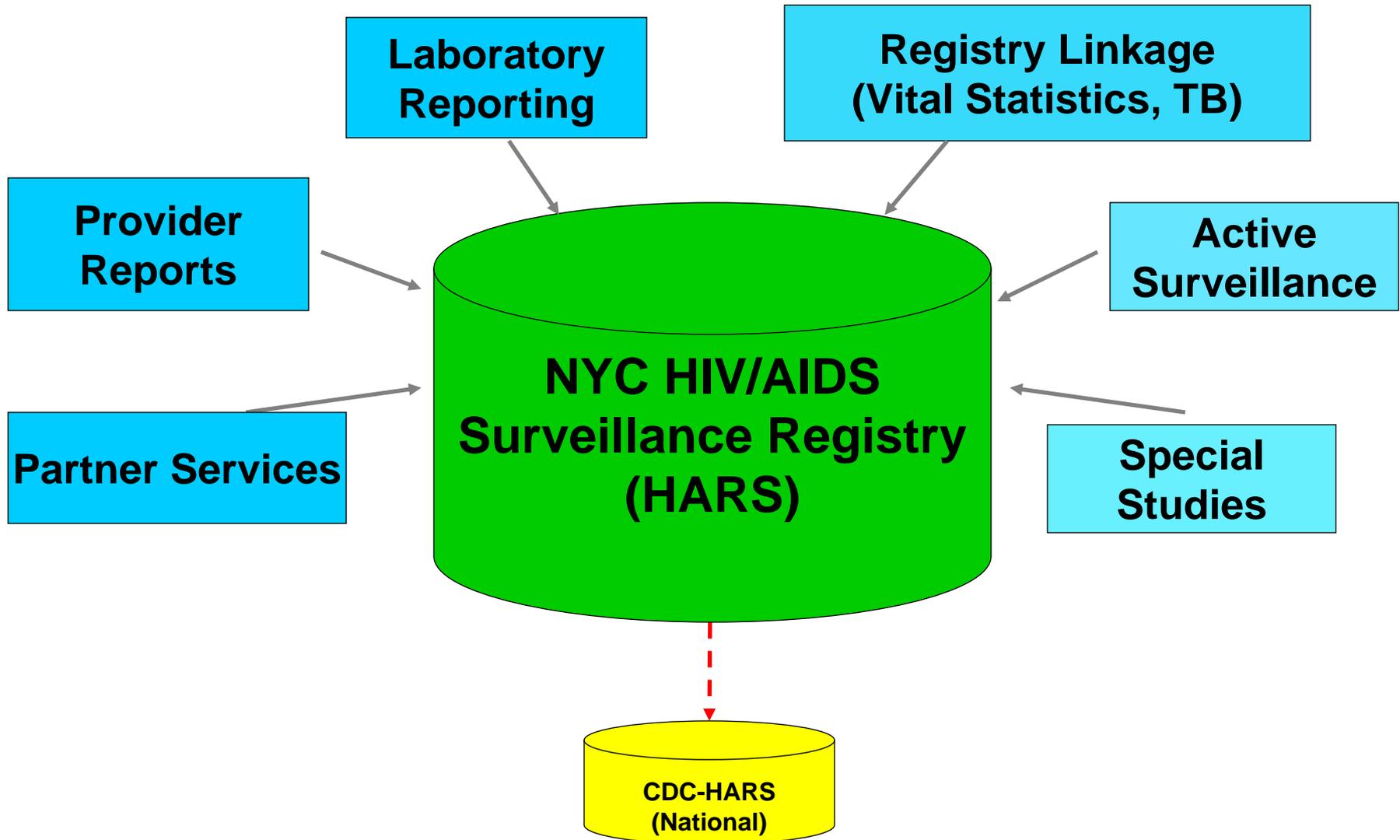
Objectives

1. Categorize HIV-infected New Yorkers (13 years of age or older) according to peak (i.e., highest in 2006-2007) VL
2. Define the proportion of persons living with HIV (PLWH) and in care in NYC with a very high peak VL, and compare their sociodemographic characteristics to those with lower peak VL
3. Assess the frequency of HIV VL testing among these PLWH, and key outcomes among those with very high peak VL
4. Summarize individual-level and group-level VL values following peak VL among those with peak VL $\geq 100K$

HIV reporting in New York City (NYC)

- *Providers* must report:
 - All new diagnoses of HIV and AIDS
 - HIV-related illness in a previously unreported individual
- *Laboratories* must report:
 - All positive Western Blot results
 - And, since June, 2005:
 - All viral load test results (detectable and undetectable)
 - All CD4 test results
 - All viral nucleotide sequence results

Data Source: NYC HIV/AIDS Surveillance Registry (HARS)



Methods: Population

- HIV-infected persons aged 13 years or older
- Living in NYC at end of 2005
- At least one viral load test in 2006 or 2007

Methods: Peak viral load

- Peak viral load
 - One person's highest VL out of total number of VL tests
 - Categories:
 - $< 10,000$ (Low)
 - $10,000 - 99,999$ (Middle)
 - $\geq 100,000$ (Very High)
- Compare sociodemographic characteristics and HIV transmission risk by peak VL categories

Methods: Characterizing VL values following peak VL $\geq 100K$

- Persons with very high peak VL in **2006**
- Care following very high peak VL?
 - In care: ≥ 1 CD4 or VL tests after peak VL test
 - Out of care: 0 CD4 or VL tests after peak VL test
- Number of VL tests following peak
- Viral load trajectory following peak
- Mortality as of December 31, 2007

Results

HIV-infected persons reported to NYC HIV registry & alive at the end of 2005 (N=97,842)

RESIDENCE
out-of-jurisdiction/
unknown borough
N=7,381

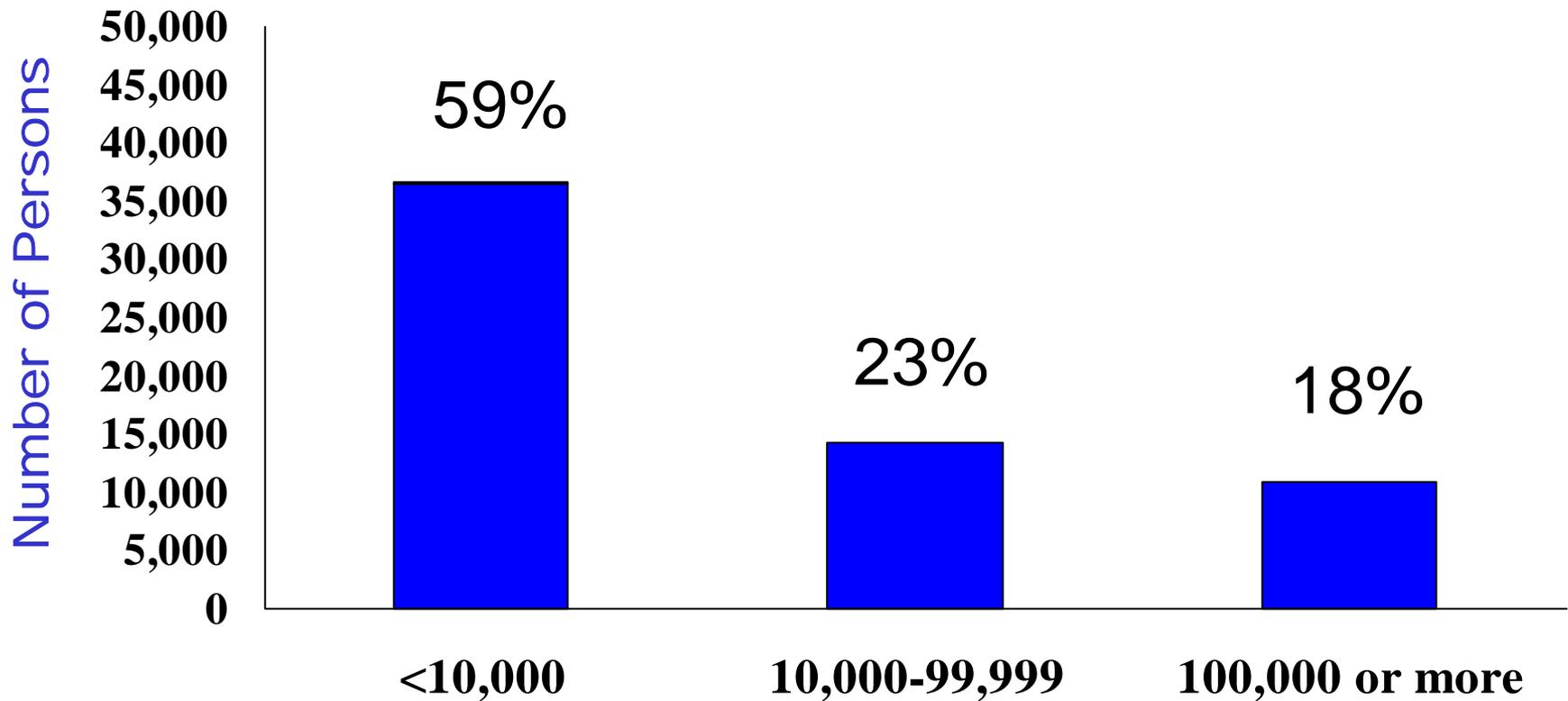
AGE
< 13 yrs of age
N=794

89,667

69%
≥1 VL in 2006 or 2007
N=61,692

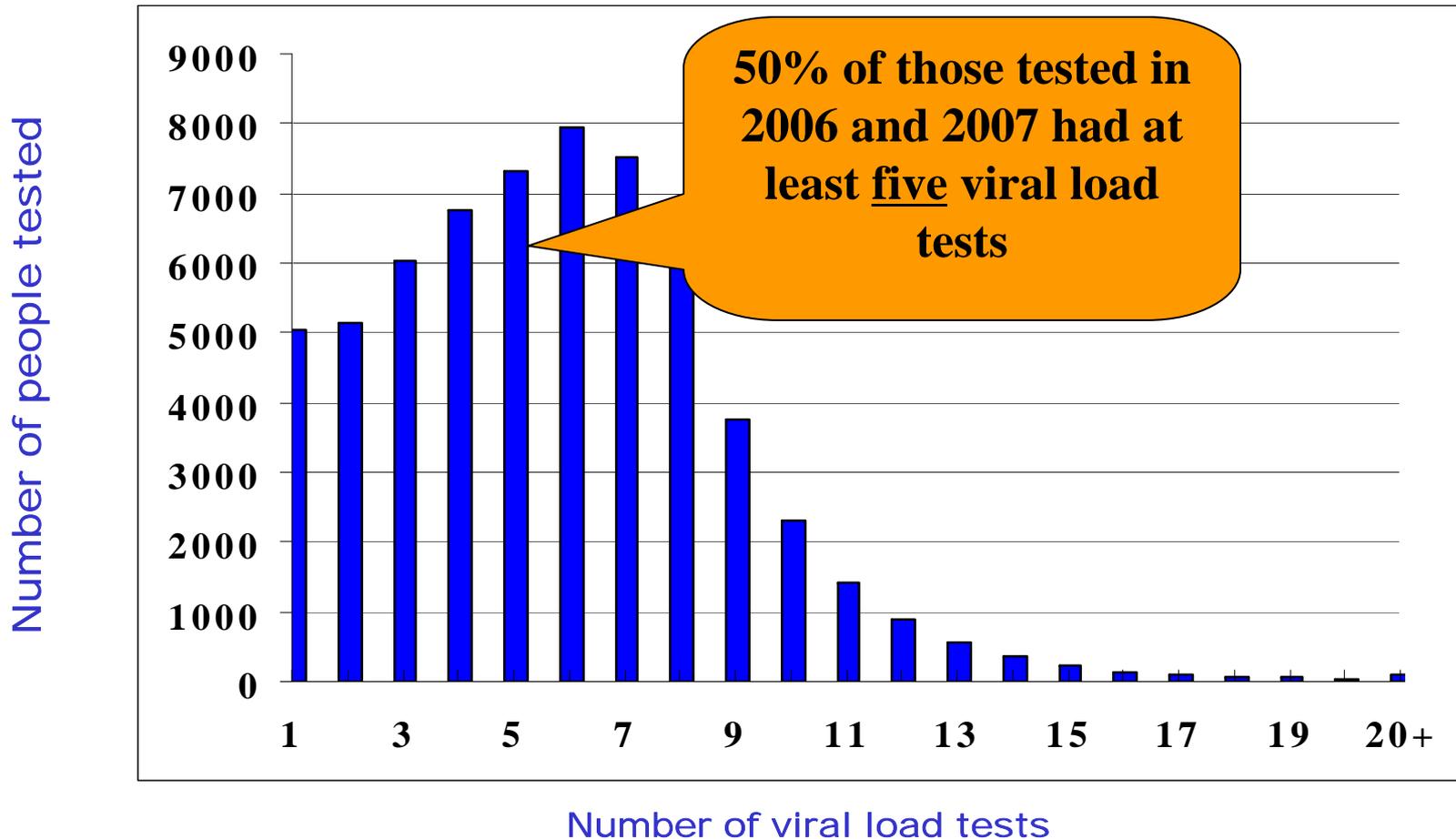
31%
No VL test in 2006 or 2007
N=27,946

HIV-infected New Yorkers with at least one viral load test in 2006-07, by peak viral load category (N=61,692)



Peak HIV RNA copies/ml in 2006 or 2007

Results: Frequency of viral load testing among persons receiving a viral load test in 2006-2007 (n= 61,692)



Results: Comparing HIV-infected New Yorkers with peak VL in 2006-07 by sociodemographics (n=61,692)

Low & high peak VL groups

	Total N (%)	<10,000 N (%)	≥ 100,000 N (%)	p
	61,692 (100)	36,550 (59)	10,840 (18)	
Sex				
M	41,507 (67)	24,882 (68)	7,283(67)	0.08
F	20,157 (33)	11,668 (32)	3,577 (33)	
Age				
Median (IQR)	44 (38-51)	45 (39-52)	42 (37-48)	<0.01
Race/ethnicity				
Black	28,516 (46)	16,029 (44)	5,387 (49)	<0.01
White	11,977 (20)	8,053 (22)	1,679 (16)	
Hispanic	20,026 (33)	11,703 (32)	3,621 (34)	
API	752 (1)	517 (1)	96 (1)	

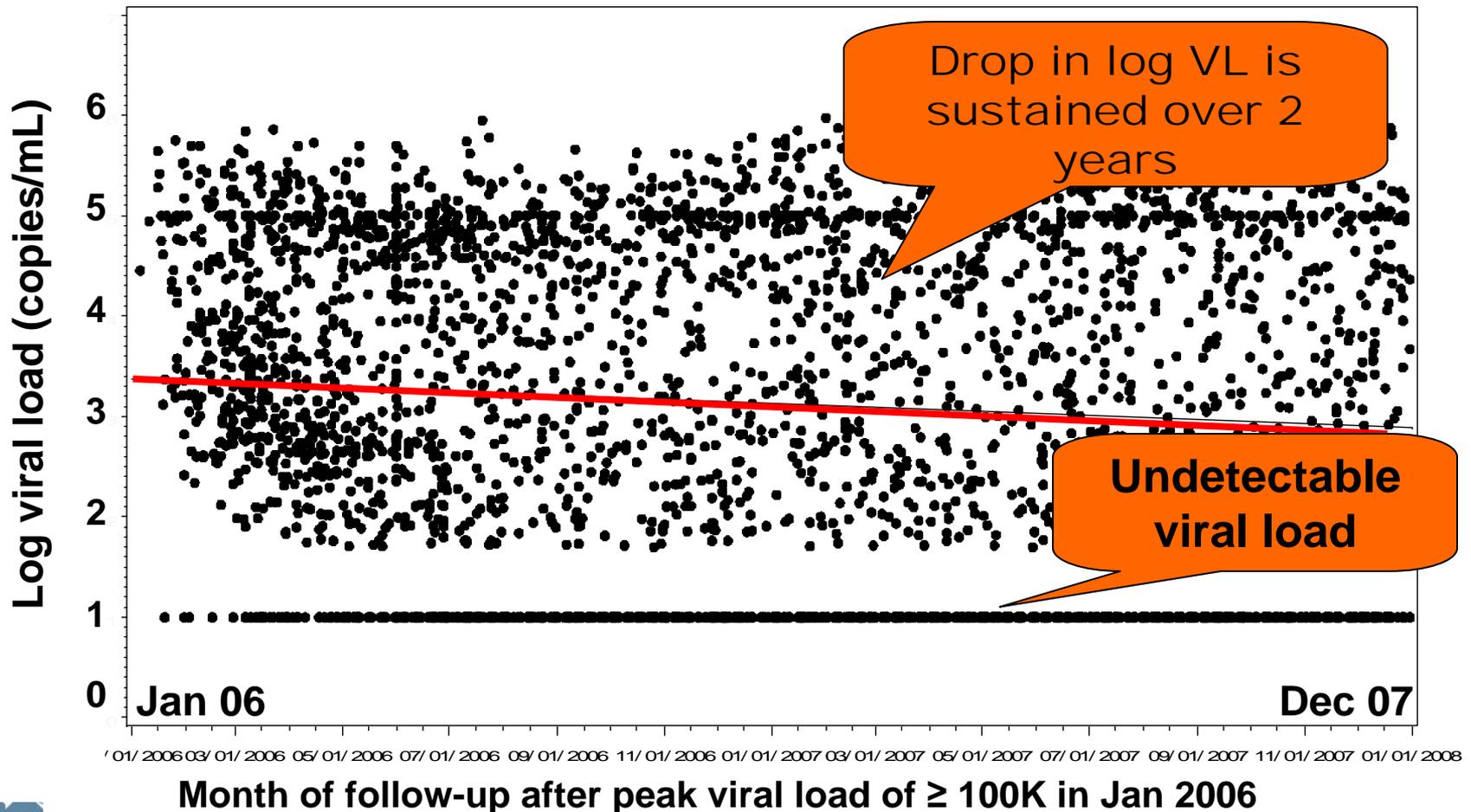
Results: Characteristics of persons with a peak viral load $\geq 100\text{K}$ in 2006 by care status (≥ 1 test after peak VL; N=7,289)

Among those with peak VL of $\geq 100\text{K}$ in 2006

	Total N (%) (100)	In Care N (%) 6,935 (95)	Out of Care N (%) 354 (5)	p
Sex				
M	4,913 (67)	4,675 (67)	238 (67)	0.94
F	2,376 (33)	2,260 (33)	116 (33)	
Age				
Median (IQR)	42 (37, 48)	42 (37, 48)	43 (38, 50)	<0.01
Race/ethnicity				
Black	3,540 (49)	3,357 (48)	183 (52)	0.32
White	1,166 (16)	1,112 (16)	54 (15)	
Hispanic	2,483 (34)	2,371 (34)	112 (32)	
API	63 (1)	58 (1)	5 (1)	

Results:

Smoothing plot of log viral load over time among those tested in the first month of 2006 with a peak viral load of 100K (N=546)



Summary

- Expansion of reportable lab events in 2005 allows for longitudinal assessment of HIV-infected New Yorkers using viral load
- Most HIV-infected New Yorkers received a viral load test in 2006 or 2007
- More than half of HIV-infected persons tested had low viral loads

Summary, continued

- One-fifth had a very high peak viral load
 - Almost all had follow-up viral load testing
- Aggregate downward trend in viral load following very high peak
 - Possible reflection of HIV care and treatment

Limitations

- Variations in viral load testing patterns
- Duration of HIV infection unknown
 - Some very high viral loads are early/acute HIV
 - Some are people with longstanding, advanced illness
- Antiretroviral treatment history not available
 - Adherence?
 - Presence of antiretroviral resistance strains?
- Data on out-migration from NYC very limited
 - Out-of-NYC follow-up rarely reported back to NYC

Conclusions

- First use of viral load values in analysis of New York City surveillance data
- Analysis of HIV viral load data from surveillance registries has value
- HIV-infected New Yorkers with very high peak viral loads remain in care within a two-year period
- More detailed understanding of viral load trends in New York City – including those with no viral load values or those with only one – is needed

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