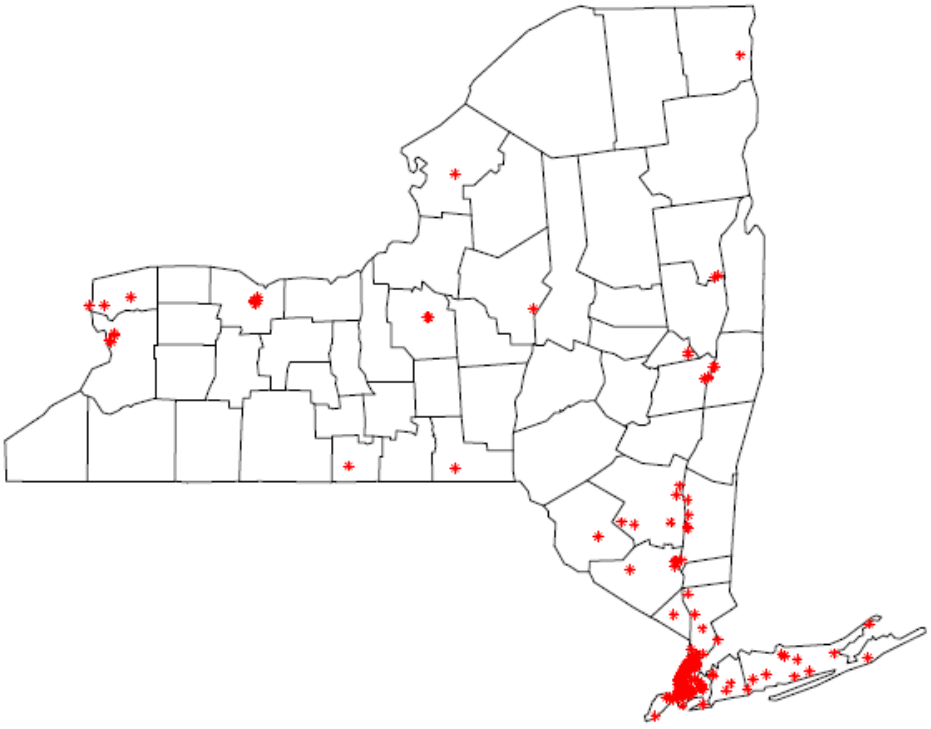
New York State
HIV Quality of Care Program

Annual Data Report
Based on 2016 Performance Data



230 sites entered approved data for 2016. Each ✸ represents a site.

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Introduction

The New York State Department of Health (NYSDOH) AIDS Institute HIV Quality of Care (QOC) Program, overseen by the Office of the Medical Director (OMD), is committed to promoting the quality of HIV clinical care and supportive services delivered to people with HIV in New York State (NYS) and to building capacity for quality management in HIV programs throughout the state. Major activities of the Program include: performance measurement of clinical care and services, improvement coaching and consultation, exchange of improvement resources, peer learning, and collaborative participation of clinical experts and consumer representatives.

The Quality of Care Program is committed to ensuring that patients who are in care receive the best care to achieve desired outcomes of good health and viral suppression. Performance data focusing on viral load suppression are a vital component of the Ending the Epidemic (EtE) metrics and drive actions by providers to achieve the goals set forth in the Governor's EtE Initiative.

The 2016 New York State HIV Quality of Care Program Review was developed using a new multifaceted approach focused on activities directly linked to the EtE Initiative as well as other AIDS Institute priorities around tobacco cessation and treatment of sexually transmitted infections. Viral load suppression, antiretroviral therapy, and STI indicators were included in the eHIVQUAL online application. In addition, providers were asked to submit the following:

- Organizational HIV treatment cascades
- Plans to improve aspects of HIV care as indicated by the cascades
- Results of a stigma survey focusing on organization-level characteristics
- Plans to address problems identified through the stigma survey
- Smoking cessation campaign data

The review was initiated in January 2017 with an initial deadline for submission of April 30, 2017, for the eHIVQUAL data component. Unlike previous years, where providers could submit data on a random sample of eligible patients, each participating organization was asked to submit data on all their HIV-infected patients. Some organizations were granted extensions due to challenges in collecting the required data.

Design and Methodology

Through review of previous submissions and correspondence with providers, the OMD identified a total of 237 clinics, including community health centers, drug treatment centers and hospitals, that provided clinical care to HIV-infected individuals in 2016. When the application was closed for this review on August 30, 2018, reviews for 230 of these clinics had been completed and approved. 142 of these clinics entered data themselves through manual data entry, upload of an import file that they populated or a combination of these approaches. 64 clinics submitted data via an EMR extraction facilitated by Azara Healthcare. The Azara extract was limited to data available in a mapped field, and similar restrictions likely applied to large facilities querying and importing data on their own. Under a special agreement with NYC Health + Hospitals, the public hospital system in New York City, they facilitated submissions for their 17 major treatment sites (hospitals and diagnostic treatment centers). The remaining 7 approved reviews were conducted by an outside review agency (IPRO) based on copies of medical records submitted by the clinics.

(Of the remaining 7 originally targeted sites, 6 were excused or deemed ineligible, and 1 site, Montefiore Medical Group-CICERO-Williamsbridge Family Practice, submitted data deemed unusable.)

Eligibility Criteria

In alignment with our request for submission of an organizational treatment cascade, the definitions that specified the patients eligible for inclusion in eHIVQUAL were broadened this year to encompass all HIV-infected patients that touched an organization ("open patients"), not just those enrolled in the HIV program ("active patients"). All patients, regardless of age, with a known diagnosis of HIV infection who received services in the organization—whether routine, urgent, or emergent, and irrespective of whether these services were provided on an outpatient or inpatient basis—during the measurement year (1/1/2016 through 12/31/2016) were eligible for review. While providers were required to include demographic information and ARV and VLS indicator data for all patients, they had the option of entering STI indicator data for a random sample of active patients; no STI data were collected for inactive patients.

Submission Process

Providers submitting data directly determined their total open patient caseload and the number of active patients, often drawing upon work done in preparing their organizational treatment cascade. Then, depending on staff resources and patient volume, they entered data on all these patients into the eHIVQUAL application either through manual data entry or upload of an Excel import template populated through external data queries. In either case, they distinguished which patients were active and, among the inactive patients, which ones had died during the review period, were incarcerated or were receiving ongoing care at another (specified) provider.

When reviews were facilitated by IPRO, they first obtained from the provider organization a case list with demographic information for all active and inactive patients seen in 2016. They then checked this against medical records uploaded by the provider via their secure online document portal. When reasonably complete information had been provided, they conducted a chart review of all patients using the uploaded records. The data obtained from these audits were first entered into a staging database designed by IPRO and then imported by IPRO into the eHIVQUAL web application. These submissions were then checked by the OMD data analyst using the standard eHIVQUAL validation reports.

Reviews for Azara-partnered sites were provided to the OMD in a text-file extract and merged with additional data about HIV care status (active v. inactive) independently submitted by the sites. The merged data were then uploaded to the eHIVQUAL application by a consultant database programmer and reviewed for completeness and consistency in the standard fashion.

The submissions from the NYC Health + Hospitals sites were excused from full reporting of inactive patients, and these sites are excluded from those analyses throughout this report. Submission of data from these sites was mediated by Health + Hospitals organizational administrative staff. One other site, Westchester Medical Center, was also excused and excluded from reporting of inactive patients, and inactive patients for another site, St. Barnabas Hospital, were excluded from analysis after discovery of a data limitation related to patients reportedly receiving external care. After these exclusions, 187 sites had inactive patients, including 161 with inactive patients eligible for the viral load suppression and ART indicators.

All data collected by participating clinics, IPRO and Azara are stored in the password-protected eHIVQUAL application. Clinic staff are expected to generate facility-specific reports for internal use during the review and to initiate improvement projects. Technical support was provided through OMD staff.

Data Cleaning and Analysis

The OMD analyzed the 231 reviews that were entered or uploaded by August 30, 2018, for completeness and data integrity. A ten-step evaluation process included identification of data gaps and comparison of the number of patients entered in eHIVQUAL to the numbers reported in the corresponding organizational treatment cascade.

Data that met the inclusion criteria were scored using SAS statistical software. SAS was also used to perform logistic regression analyses and conduct "fuzzy" matching of active and inactive patients. Microsoft Excel 2016 was then used to create charts, generate indicator score spark lines and calculate random effects benchmarks. Finally, R statistical software was used to create the viral load suppression heat map and the map of submitting clinics.

Active-patient performance rates (among the 210 clinics with active patients) are displayed for each clinical indicator. Clinic means and interquartile range (IQR) analyses are included to help visualize the spread of performance. The number of sites included for each indicator may be lower than the number of sites with acceptable data as some sites did not have any eligible patients for some indicators. 155 patients (139 active; 16 inactive) whose reported last viral load date for the review period was in 2017 (not 2016) were also excluded from analysis of viral load suppression. 11 patients (10 active and 1 inactive) diagnosed in 2017 were eliminated from all analyses.

Other data cleaning decisions related to the indicator definitions and demographic analysis included the following:

- Inactive patients reported as receiving outside care (n=9,040) were excluded from the ART and VLS indicators. While we also collected data about the specific location of this care, we did not assess each entry to make sure it was a meaningful description of an external care site.
- Patients (n=4,707) were excluded from the STI analyses if they were inactive, less than 13 years old as of 1/1/2016 or not in the designated STI sample (where applicable).
- Patients who were seen in 2016 and then died after transferring care or being incarcerated (n=18) were counted as eligible for the ART and VLS indicators (i.e., need for close monitoring of severely ill patients takes precedence over transfer of responsibility).
- Patients with reported ages under 0 or over 100 (n=16) were excluded from analyses based on age.

Analysis by Subpopulation

In addition to cross-tabulations of viral load suppression and ARV therapy with age, gender, race/ethnicity, risk factor, housing status and geographic region, we also tabulated the various categories of inactive patients at both site and statewide levels, and a summary of these numbers is presented in a flowchart in this report.

Key Findings

Viral Load Suppression

A key HIV measure is the viral load suppression (VL<200 copies/mL) rate, as measured by the last viral load of the year. The mean clinic rate for VLS of all active patients who had at least one visit in 2016 was, for all included clinics with eligible patients, 79% (IQR=75-88%, n=71,557 patients). Suppression rates are also provided by region, gender, race/ethnicity, risk factor, age and housing status. Patients without a viral load value recorded during the 2016 review period were considered unsuppressed.

These benchmarks were also calculated for newly diagnosed active patients, where the mean clinic rate was 63% (IQR=50-80%, n=2,575). Of note, though, we did not collect the diagnosis date (just year), and some of these patients were likely diagnosed within the last few weeks of the review period.

Antiretroviral Therapy

Antiretroviral therapy usage was measured for all patients. The mean clinic rate for ART prescription among active patients during the 2016 review period was, for all included clinics with eligible patients, 96% (IQR=95-99%, n=71,696). Prescription rates are also characterized by region, gender, race/ethnicity, risk factor, age and housing status.

These benchmarks were also calculated for newly diagnosed active patients, where the mean clinic rate was 86% (IQR=80-100%, n=2,575). Of note, though, we did not collect the diagnosis date (just year), and some of these patients were likely diagnosed within the last few weeks of the review period.

STI Screening

The mean clinic rate for genital Chlamydia testing among eligible patients was, for all included clinics with eligible patients, 65% (IQR=53-84%, n=38,493). The mean clinic rate for genital gonorrhea testing among eligible patients was, for all included clinics with eligible patients, 65% (IQR=53-84%, n=38,493).

Extragenital Chlamydia and gonorrhea testing rates were assessed for MSM and MtF transgender patients. The mean clinic-level rates were, for all included clinics with eligible patients, 29% for rectal Chlamydia (IQR=0-51%, n=14,385), 29% for rectal gonorrhea (IQR=0-50%, n=14,385) and 30% for pharyngeal gonorrhea (IQR=0-54%, n=14,385).

Summary

The data presented here suggest improvement in all areas of active-patient care under review. The mean clinic rate for viral load suppression has increased from 76% in 2014 to 79% in 2016. This may be due in part to an increase in the average ARV prescription rate from 92% to 96%. STI screening rates in the data analyzed here are also higher than those seen in the 2014 report, with for example, an increase in screening for genital Chlamydia from an average rate of 60% to an average rate to 65% in 2016. Although the rates of screening for extra-genital screening remain low, even among the subpopulation eligible for these indicators, they are approximately twice those seen in 2014.

However, we still see variation in these outcomes among subpopulations. While the total viral load suppression rate in New York City, among all active patients, was 82%, the suppression rate in the Bronx was only 77% while the rate in Queens was 87%. Suppression rates among unstably housed patients (69%), adolescents (71%) and transgender patients (74%) also remain below the statewide rate.

We investigated these variations in viral suppression using a hierarchical mixed-effects logistic regression analysis that considered both “fixed effects” (housing instability, age, etc.) and the “random effects” of where the patients were receiving care (which medical organization and then, in turn, where applicable, which clinic within the organization). Statistically significant results were obtained for both types of effect. These results are reported in more detail in the body of the report, and appendixes provide an assessment of the relative performance of different clinics as well as a complete table of parameter estimates for the fixed effects.

The findings regarding the open patient population suggest both strengths and weaknesses among the medical record systems used to track this information. While information about the care status of inactive patients was available for only 38% of these patients (9,838/25,728), most of the remaining patients (10,408/15,890 = 66%) were seen exclusively in the emergency department (ED) or as inpatients, presenting clear opportunities for improved tracking of care status. Also, the sites with larger caseloads tend to have relatively larger percentages of their patients not enrolled in care, suggesting that prioritized attention to these facilities could be particularly helpful in identifying out-of-care patients.

To assess care status from a broader perspective, we used conservative fuzzy matching on names, sex and date of birth to identify likely matches between inactive patients at one site and active patients at another site. Among patients reported as ED only at the inactive site, 64% were matched with patients reported for another site. The match rate for patients reported as inpatients only was 57%, and for other patients with unknown care status it was 50%. Of some concern, the match rate for patients reported as in external care within NYS was only 46%. However, it’s likely that many if not most of the unmatched patients were receiving care from medical providers who would not appear in these data (at a non-reporting site, at a Veteran’s Administration facility or in private practice).

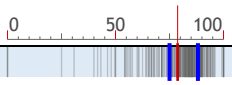
These results were further analyzed by examining both the matched and unmatched patients by geographic region. Comparison of the region of the sites reporting the matched patients as inactive and active shows, as we would expect, that most patients received their non-HIV-specific care within the same region as where they were enrolled for HIV care. However, many patients received HIV care in another region, particularly in NYC, where, for example, of 2,190 matches between patients listed as inactive at a Brooklyn site and an active site, 609 (28%) were with care at a site in Manhattan.

Examination of care status by region among the unmatched inactive patients also revealed considerable variation. While 211 of 1,386 (15%) inactive patients in the Bronx were reported as inpatient only, 3,407 of the 6,756 (50%) inactive patients in Manhattan were reported as inpatient only. It is possible that a significant portion of these patients were visiting New York from out of state.

Reporting Conventions and Glossary

Data analyzed in this report were submitted by New York State HIV ambulatory care clinics for the January 1 - December 31, 2016, review period. Clinic-level data from the 2007, 2009, 2011, 2013 and 2014 review periods are included for longitudinal comparisons among key indicators. Note that through 2011 only patients with at least one HIV primary care visit in each six-month period of the year were eligible for the review. In 2013, eligibility changed to include all patients who had at least one visit during the 12-month review period. For the 2016 review, eligibility was further expanded to include non-enrolled HIV-infected patients, but most of the results presented here are for the active (enrolled) patient population. In addition to the total number of clinics and the total number of eligible patients, clinic-level indicator scores were used to calculate aggregate scores: means, medians, percentiles, and minimum and maximum values.

Example: Viral Load Suppression: Last Viral Load Suppressed

Population	Clinics	Eligible Patients	0 50 100	Clinic Mean	Median	25th Percentile	75th Percentile	Min	Max
NYS	210	71,557		79%	83%	75%	88%	0%	100%

Mean - average clinic score

Median - score separating the top half from the bottom half of all clinic scores

Percentiles - score below which a certain percentage of clinic scores fall

Maximum - highest clinic score

Minimum - lowest clinic score

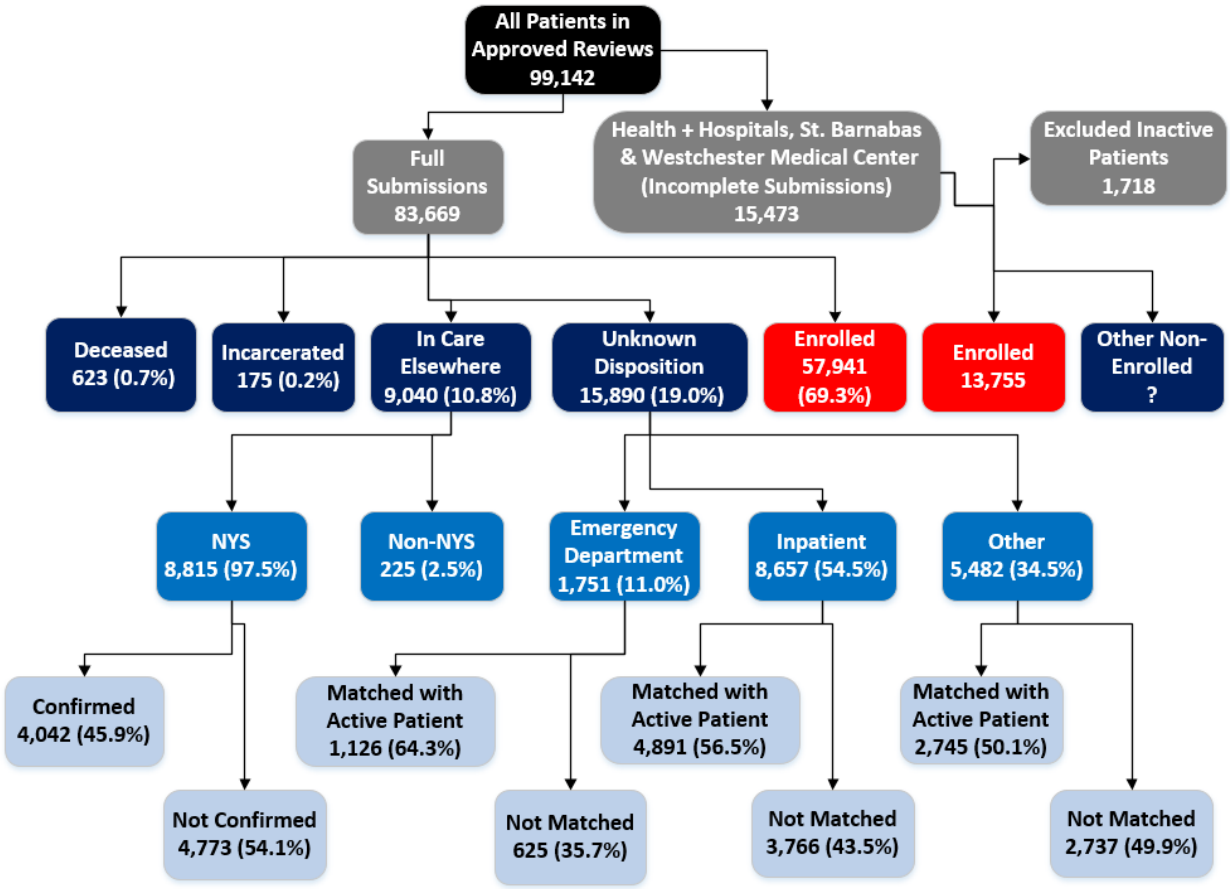
Number of clinics - number of clinics with a score for this indicator

Number of eligible patients - total number of sampled patients who were eligible for this indicator

Spread - the distribution of clinic scores. Each line represents one clinic score. The mean clinic score is highlighted in red. The 25th and 75th percentiles are highlighted in blue.

Scope of Review

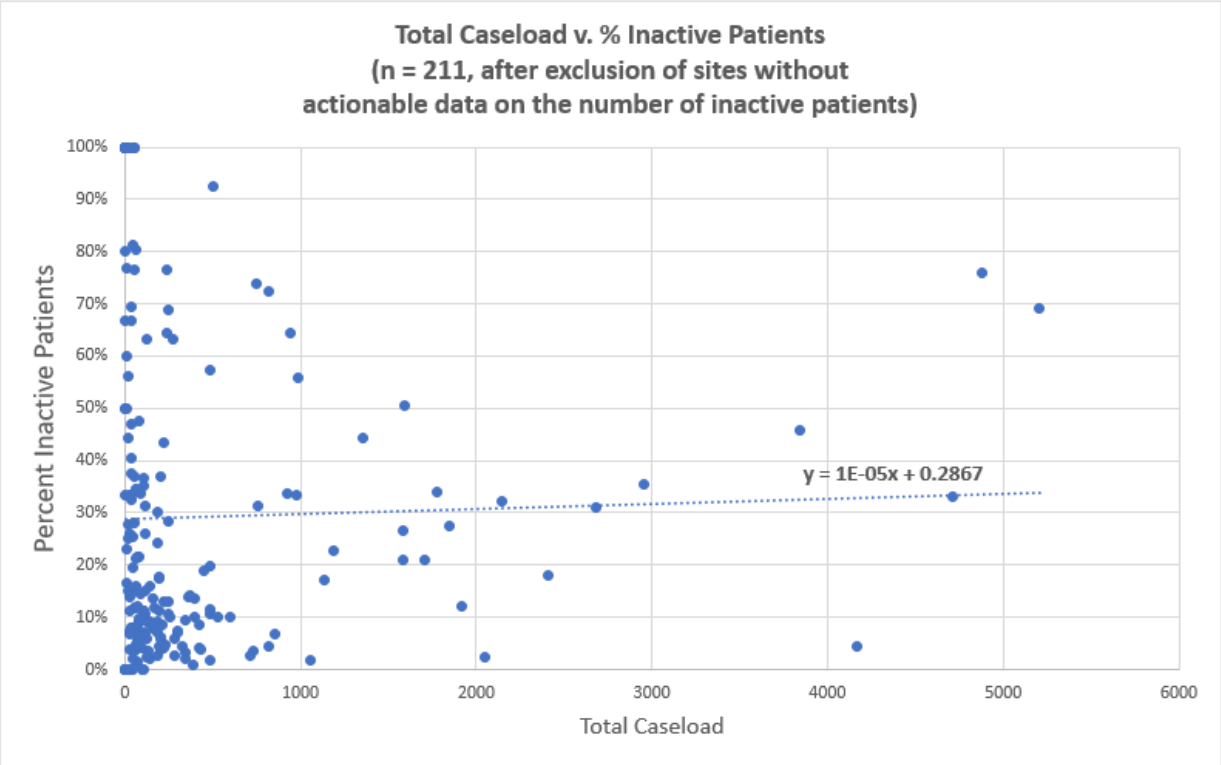
2016 Active vs. Inactive Patients



Even though patients may have died, been incarcerated or were receiving care at an outside organization by the end of the review period, they were to be entered/uploaded into eHIVQUAL, whereupon their status could be confirmed in one of these "inactive" categories. Of note, patients who were listed as inactive at one site may have been active at another site, and the number of these patients who were matched is reported in the bottom rows of this chart. Some patients may have been reported as inactive by two or more sites. A region-based analysis of both matched and unmatched patients is presented on the following pages.

As we granted an exception to Westchester Medical Center (WMC) and the Health + Hospitals (H+H) sites and excluded St. Barnabas Hospital (SBH) for this part of the review, their patients are not included in the relative frequency of enrolled and unenrolled patients on the left side of the chart. However, at the bottom of the chart, when checking whether inactive patients at the non-WMC, SBH & H+H sites could be matched with active patients at another site, we included matches with active patients at WMC, SBH & H+H sites.

Percentage Inactive Patients by Caseload



Inactive Patients by Region

Matched Patients

Number of matches between patients who were identified as inactive at one site but also seen as an active patient at another site, either in the same geographic region (highlighted diagonal) or elsewhere in NYS. (Some patients were matched at more than one site.)

Location of Site Where Inactive	Location of Site Where Active									
	Bronx	Brooklyn	Manhattan	Queens	Staten Island	Central-West	Long Island	Lower Hudson	Mid-Hudson	Northeast
Bronx (n=3,028)	2,029	148	756	21	6	10	14	37	5	2
Brooklyn (n=2,190)	154	1,321	609	67	5	5	26	3	0	0
Manhattan (n=6,784)	864	624	4,931	201	17	12	86	22	12	15
Queens (n=390)	37	58	121	148	0	0	25	1	0	0
Staten Island (n=217)	47	38	93	11	27	0	0	0	0	1
Central-West (n=845)	17	10	18	3	0	708	1	0	4	84
Long Island (n=246)	6	7	15	11	0	1	204	2	0	0
Lower Hudson (n=649)	269	48	193	14	2	2	2	114	5	0
Mid-Hudson (n=29)	2	0	2	2	0	1	1	0	20	1
Northeast (n=188)	6	5	15	0	0	25	2	0	4	131

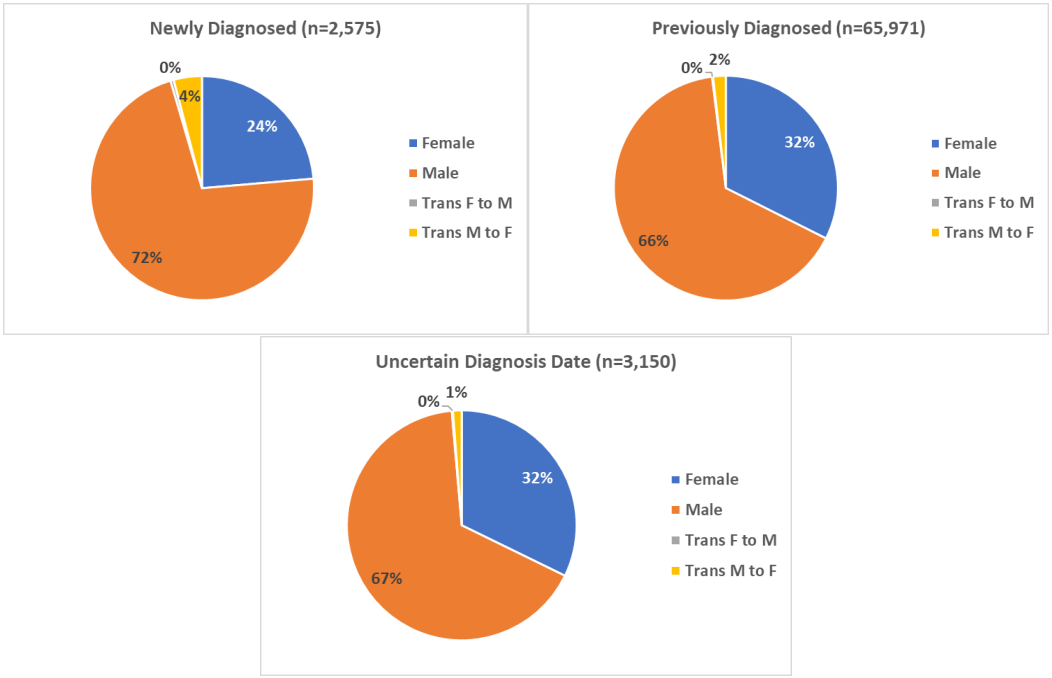
Unmatched Patients

Number of patients who were identified as inactive at one site and not matched with an enrolled patient at another site, listed by region and status.

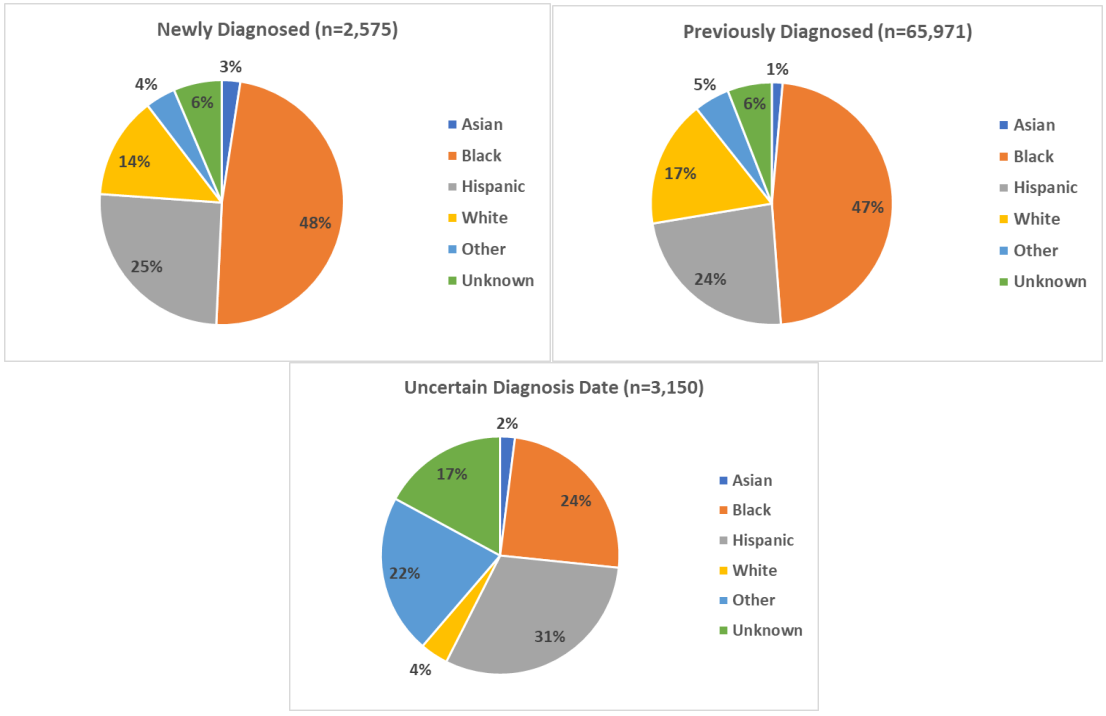
Location of Site Where Inactive	Care Status						
	Died in 2016	Incarcerated as of 12/31/16	Believed to be in care in NYS	Believed to be in care outside NYS	Unknown status: ED only	Unknown status: inpatient only	Unknown status: other
Bronx (n=1,386)	121	7	187	12	178	211	670
Brooklyn (n=1,757)	63	4	868	11	110	40	661
Manhattan (n=6,756)	160	3	2,375	23	196	3,407	592
Queens (n=525)	19	0	414	9	20	6	57
Staten Island (n=595)	16	0	116	0	16	20	427
Central-West (n=690)	67	44	298	88	18	18	157
Long Island (n=214)	39	10	101	28	11	0	25
Lower Hudson (n=486)	14	26	331	17	48	27	23
Mid-Hudson (n=101)	10	0	60	7	0	0	24
Northeast (n=267)	28	37	23	13	28	37	101

Active Patient Characteristics (Newly Diagnosed and Previously Diagnosed)

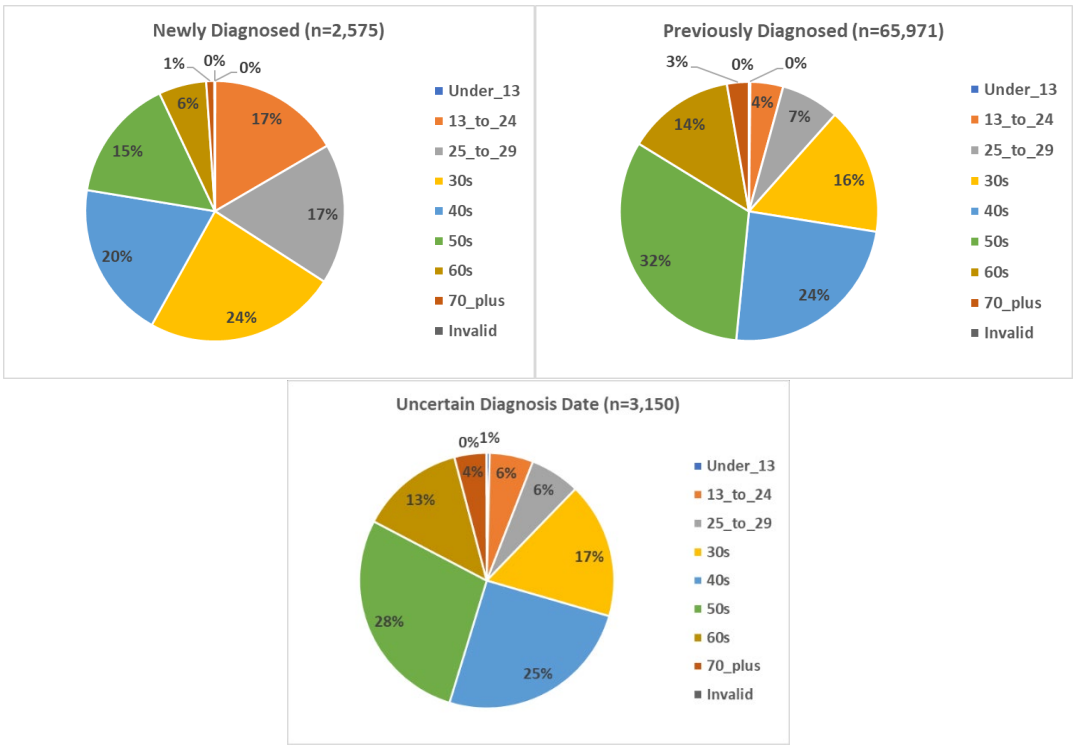
By Gender



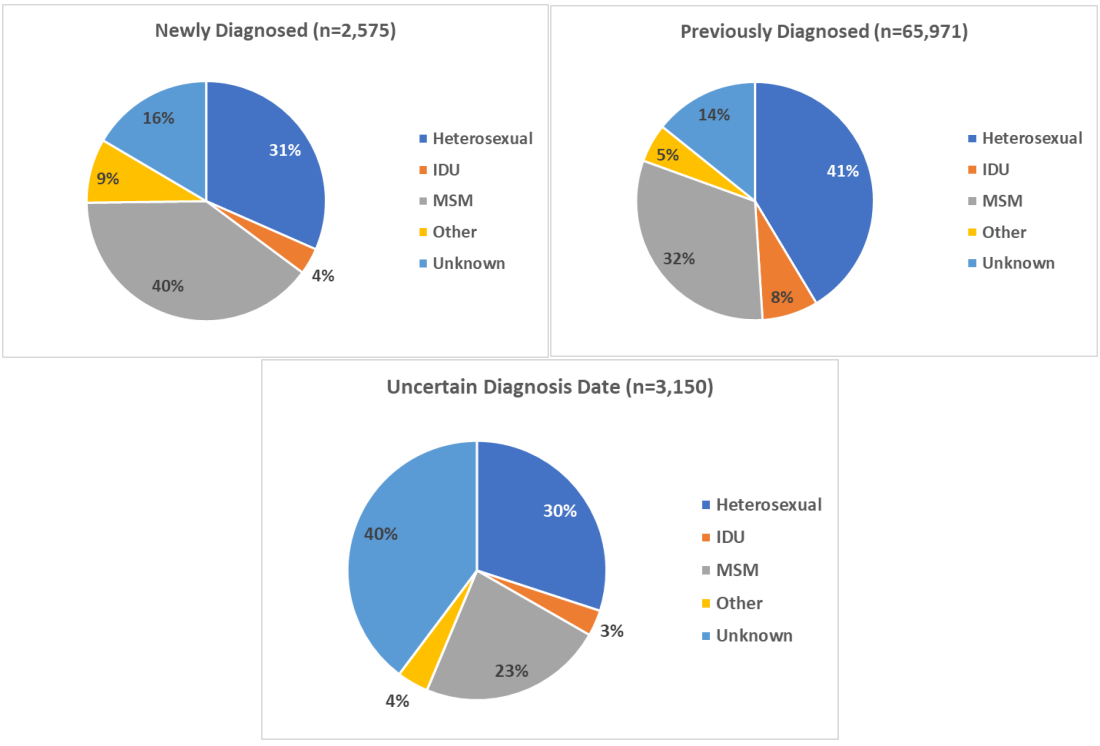
By Race



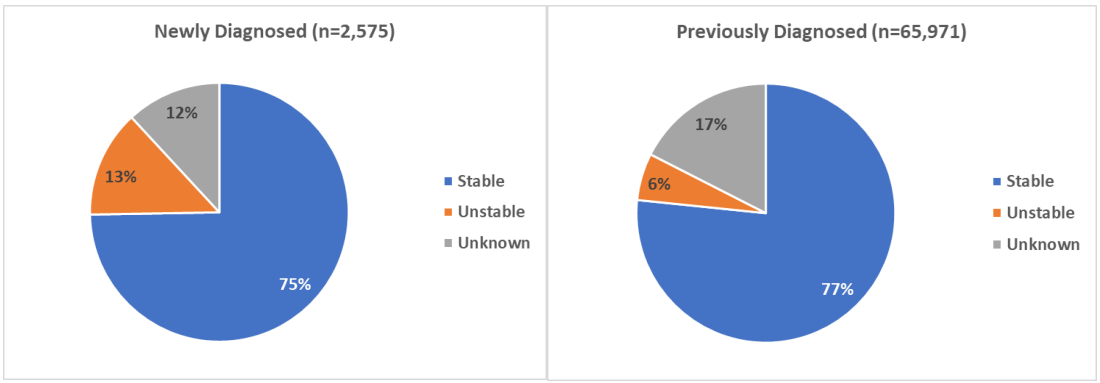
By Age

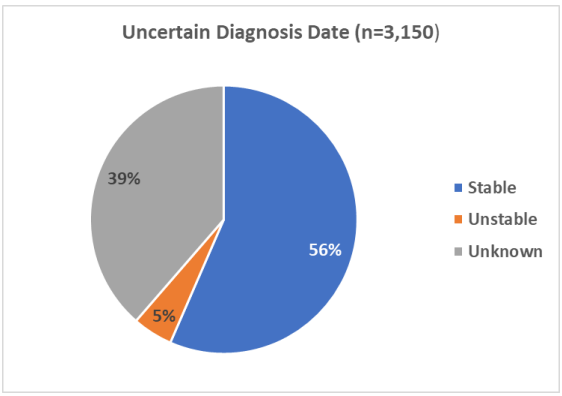


By Risk Category

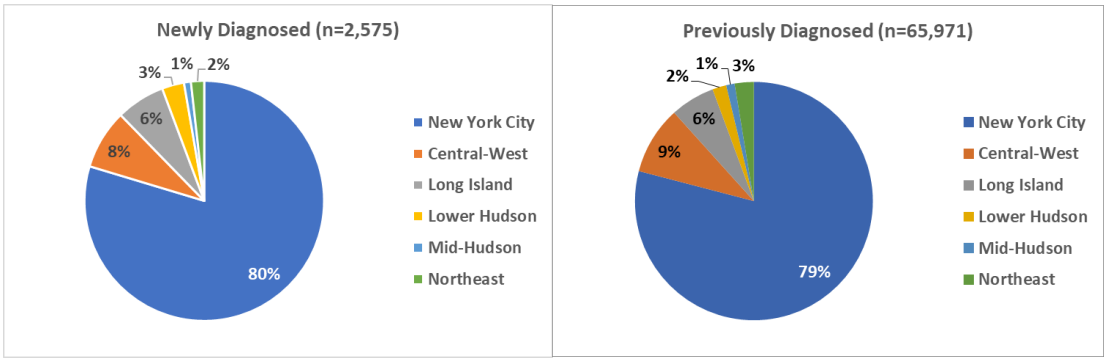


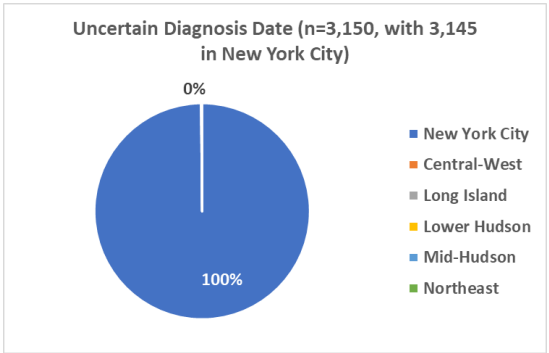
By Housing Status



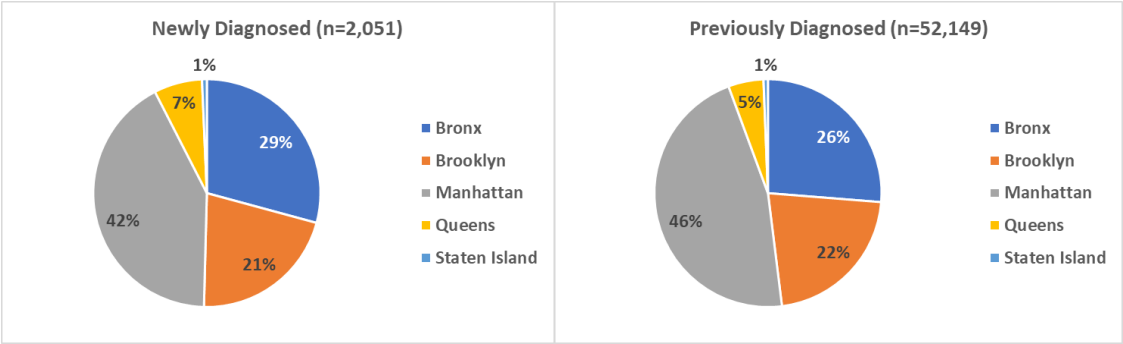


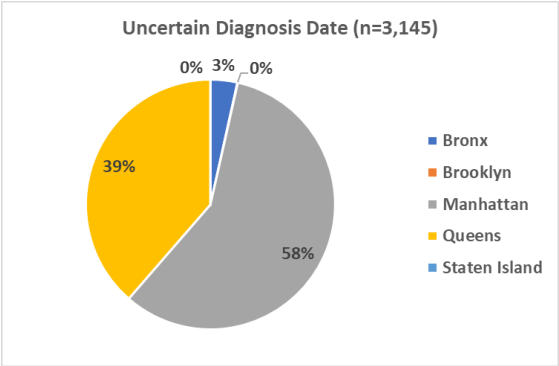
By Region





By NYC Borough





Age of Active Patients by Diagnosis Status and Region

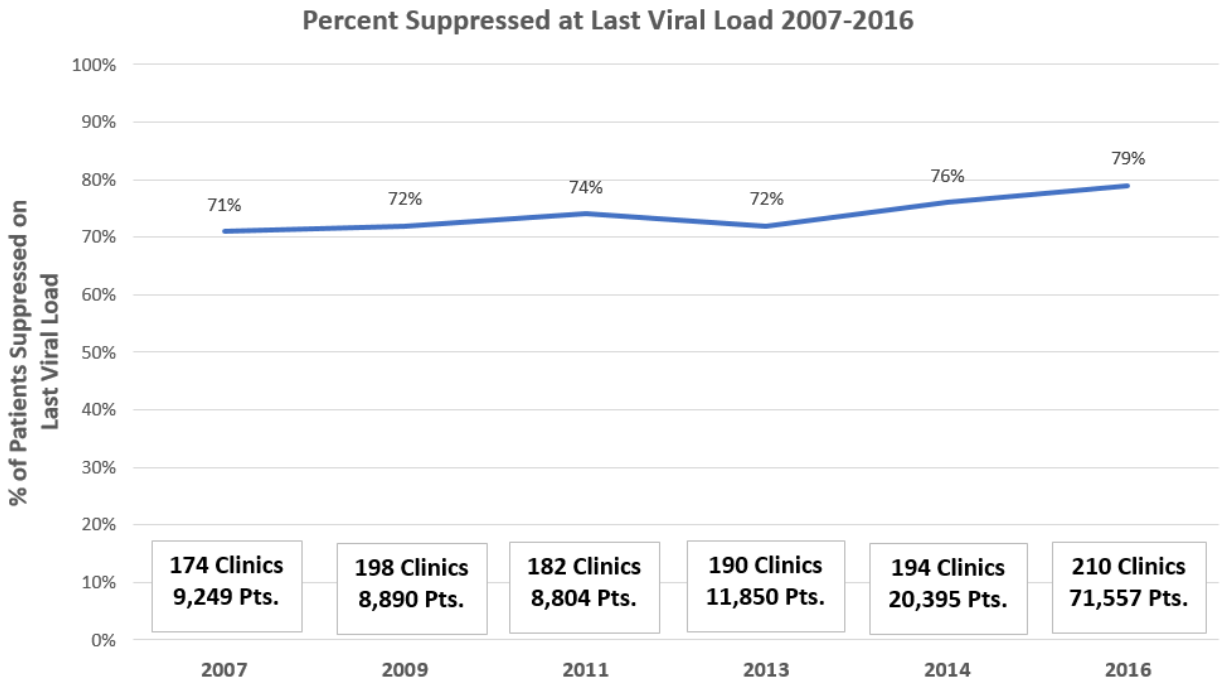
Dx. Status	Region	Patients*	Mean	10th Pct.	25th Pct.	Median	75th Pct.	90th Pct.
Newly Diagnosed	Central-West	206	33.5	20	24	29	41	54
	Long Island	170	37.5	23	27	35	48	55
	Lower Hudson	77	39.4	22	29	38	50	61
	Mid-Hudson	24	41.4	21	29	43	52	57
	Northeast	46	33.7	21	23	32	40	54
	NYC	2,050	38.4	23	27	36	49	56
	Bronx	599	40.1	23	29	40	50	57
	Brooklyn	434	38.6	23	27	36	49	58
	Manhattan	862	37.3	22	26	35	47	55
	Queens	141	37.9	23	26	36	48	56
	Staten Island	14	37.4	23	27	35	43	58
Previously Diagnosed	Central-West	6,104	47.5	29	39	49	56	62
	Long Island	3,992	48.4	28	40	50	58	64
	Lower Hudson	1,251	47.9	29	39	50	57	63
	Mid-Hudson	758	48.5	29	40	50	57	63
	Northeast	1,717	49.2	32	43	51	57	63
	NYC	52,136	47.1	28	37	49	56	62
	Bronx	13,690	48.0	29	40	50	57	63
	Brooklyn	11,343	47.4	27	37	49	57	64
	Manhattan	24,161	46.3	28	36	48	55	62
	Queens	2,619	47.8	29	39	49	57	63
	Staten Island	323	49.3	33	42	51	57	62

*Patients with uncertain diagnosis status or invalid age were excluded

Viral Load Suppression

Suppression is currently defined by a viral load value of < 200 copies/mL (either detectable or undetectable). Patients without a viral load value recorded are considered unsuppressed. See table below for scoring of suppression in previous years, particularly in 2007, 2009 and 2011, when fewer patients were included in the measure.

Viral Load Suppression Rates 2007-2016 (Mean Clinic Scores for Active Patients)

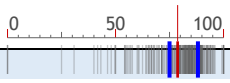


Year	Numerator	Denominator
2007 and 2009	Patients for whom the last viral load during the review period was < 400 cells/mL (either detectable or undetectable).	Patients with at least one visit in each half of the review period who had at least two viral loads during the review period and who were on ART at any time during the review period.
2011	Patients for whom the last viral load during the review period was < 200 copies/mL (detectable) or undetectable using an assay with a sensitivity of 400 copies/mL or less.	Patients with at least one visit during each half of the review period who were on ART for a minimum of 12 weeks by the end of the review period.
2013 and 2014	Patients for whom the last viral load during the review period was < 200 copies/mL (detectable) or undetectable using an assay with a sensitivity of 200 copies/mL or less.	All patients in the review.
2016	Patients for whom the last viral load during the review period was < 200 copies/mL (detectable) or undetectable (threshold not specified).	All active patients in the review.

Last Viral Load of Review Period

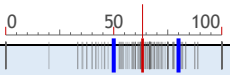
All Active Patients

Mean 79%

Population	Clinics	Eligible Patients	0 50 100	Clinic Mean	Median	25th Percentile	75th Percentile	Min	Max
NYS	210	71,557		79%	83%	75%	88%	0%	100%

Newly Diagnosed Patients

Mean 63%

Population	Clinics	Eligible Patients	0 50 100	Clinic Mean	Median	25th Percentile	75th Percentile	Min	Max
NYS	165	2,575		63%	67%	50%	80%	0%	100%

Last Viral Load Suppressed: Percentage of patients who are considered suppressed as derived from the last recorded viral load of the review period; "suppressed" defined as the viral load is < 200 copies/mL (either detectable or undetectable).
Exclusions: None

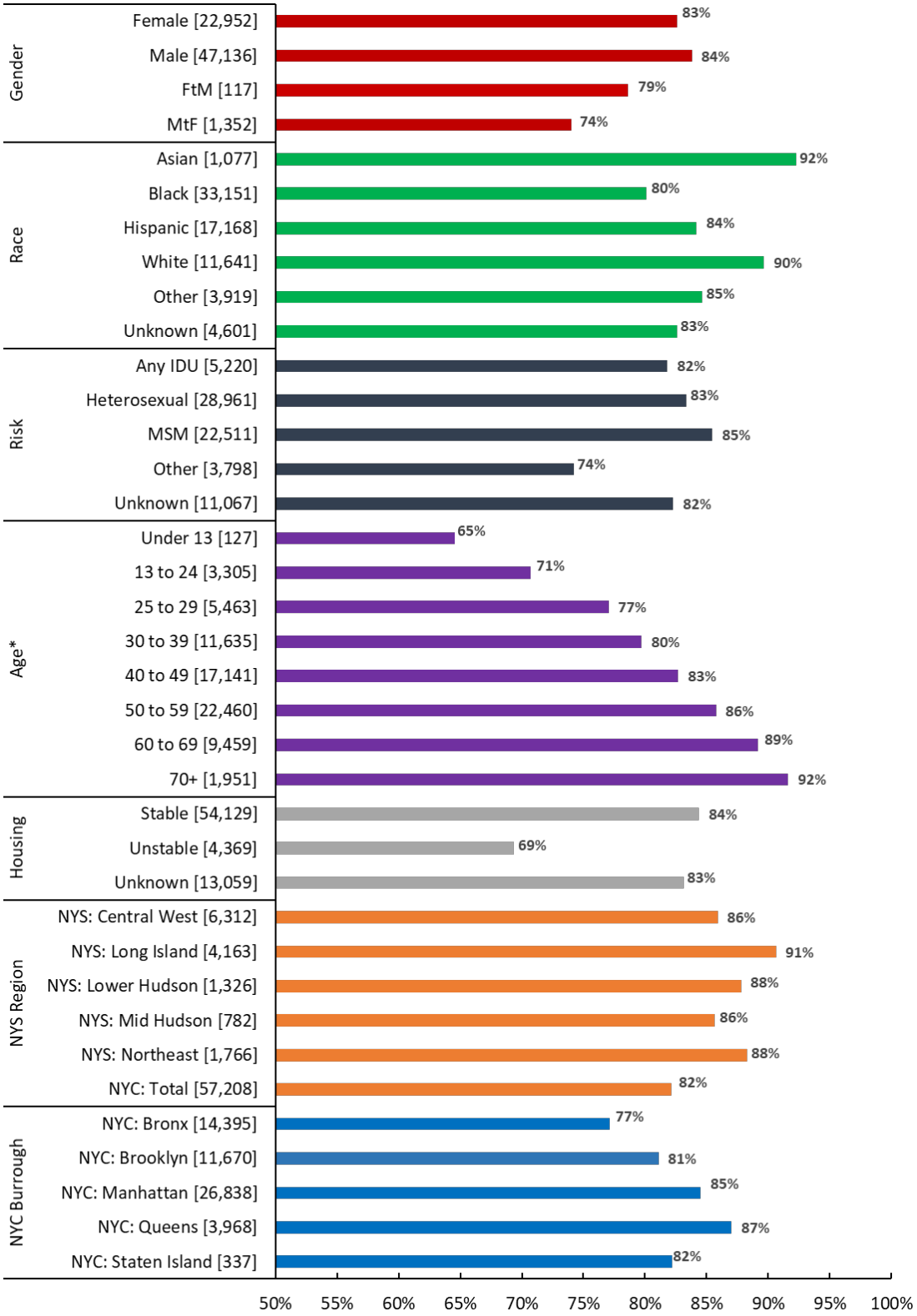
Viral Load Suppression among Active and Inactive Patients

		Eligible Active Patients*			Eligible Non-Enrolled Patients**	
		Documented Suppression	Not Suppressed or Unknown		Documented Suppression	Not Suppressed or Unknown
On ART		56,048			7,741	
	VL obtained	47,306 (84.4%)	7,345 (13.1%)		3,636 (47.0%)	1,088 (14.1%)
	No viral load		1,247 (2.2%)			1,672 (21.6%)
	Unknown if tested		150 (0.3%)			1,345 (17.4%)
Not on ART		1,704			6,763	
	VL obtained	626 (36.7%)	706 (41.4%)		943 (13.9%)	800 (11.8%)
	No viral load		361 (21.2%)			4,656 (68.8%)
	Unknown if tested		11 (0.6%)			364 (5.4%)
ART Unknown		63			1,993	
	VL obtained	10 (15.9%)	34 (54.0%)		240 (12.0%)	129 (6.5%)
	No viral load		3 (4.8%)			163 (8.2%)
	Unknown if tested		16 (25.4%)			1,461 (73.3%)

*126 patients whose date of last viral load for the review year was in 2017, rather than 2016, were excluded. Active patients from sites with incomplete data on inactive patients were also excluded.

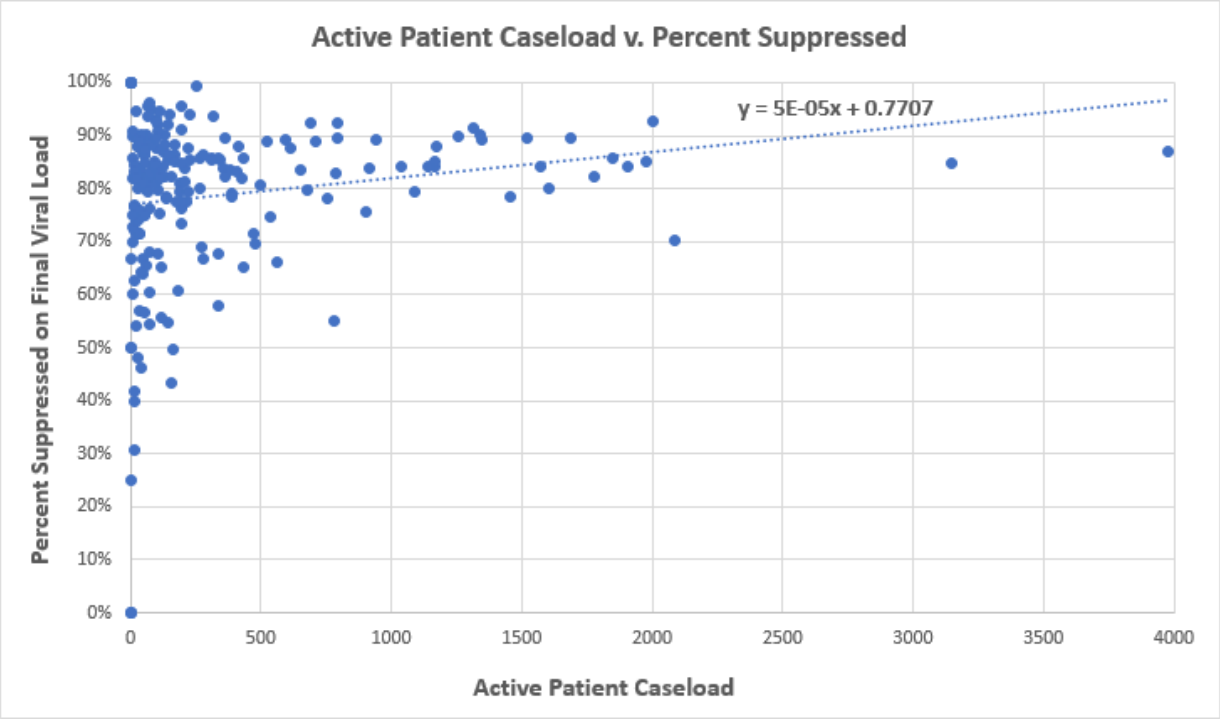
** Patients known to be in care elsewhere or incarcerated were ineligible and excluded, as were any from sites with incomplete data on inactive patients. 16 patients whose date of last viral load for the review year was in 2017, rather than 2016, were also excluded.

Viral Load Suppression Rates by Patient Characteristics (Active Patients)



*Invalid DOB data was provided for 16 patients.

Viral Load Suppression v. Caseload (Active Patients)



Viral Load Suppression Regression Analysis

To evaluate the variation in viral load suppression rates among active patients, we conducted a hierarchical mixed-effects logistic regression analysis modeling the likelihood of being suppressed on final viral load. (As in the rest of this report, the relatively few active patients with no viral load at all in 2016 were treated as unsuppressed. See Appendix 2 for a more detailed discussion of logistic regression.) Beginning with a "null model," where the only information was where patients were treated and their outcomes, we confirmed the presence of significant facility effects ($p<0.0001$). In addition to these influences, which we modeled as a normally distributed "random" factor, we found significant "fixed effects" (i.e., influences on suppression rates independent of site of care) for several of the available patient-level factors when we added them to the model. Most prominently, patients who were newly diagnosed, of younger age or unstably housed were significantly less likely to be suppressed. In some cases, the original set of classes for a factor was simplified to improve model fit. For example, the full set of possible combinations of gender and risk was reduced to women with heterosexual exposure, other women, cisgender MSM patients, and all other patients combined.

We then expanded the model to include interactive effects at the patient level. Several significant interactive effects were seen, particularly between race and other factors. Interactions were also seen between housing status and exposure risk; housing status and insurance status; age and exposure risk; age and insurance status; and between diagnosis date and insurance status.

We also evaluated fixed effects at the facility level, but these were less pronounced. However, significant variation was seen in performance by facility type (with higher suppression rates at Designated AIDS Centers and other relatively large facilities) and by geographic region (with higher suppression rates outside New York City).

Finally, we added a third level to the model to look at patients within clinics within broader care organizations. An initial "null" model again confirmed significant effects at both the clinic and organization level. Adding the patient-level and facility level fixed effects back to the model gave similar results as seen in the 2-level model but with modestly better model fit.

Type III Tests of Fixed Effects on VLS for Final Model (3-level Hierarchical Logistic Regression Analysis)		
Statistically Significant Effects	**F Value**	**Pr > F**
Race (Asian, Black, Hispanic, White, Other, Unknown)	12.72	<0.0001
Housing Status (Stable, Unknown/Unstable)	20.42	< 0.0001
Age (Under 25, 25 to 29, 30 to 39, 40 to 49, 50 to 59, 60 to 69, 70 plus)	67.95	< 0.0001
Sex/Exposure Risk (Female Heterosexual, Female Other, MSM, Other)	15.34	< 0.0001
Diagnosis Date (Newly Diagnosed, Previously Diagnosed/Unknown)	153.44	< 0.0001
Insurance Status (ADAP, Medicaid, Medicare, Private, Other/Unknown, Missing)	2.64	0.0217
Race x Housing Status	4.03	0.0012
Race x Sex/Exposure Risk	2.42	0.0016
Race x Insurance Status	1.73	0.0130
Housing Status x Sex/Exposure Risk	4.60	0.0032
Housing Status x Insurance Status	4.56	0.0004

Age x Sex/Exposure Risk	1.85	0.0152
Age x Insurance Status	2.30	<0.0001
Diagnosis Date x Insurance Status	4.00	0.0013
Facility Type (DAC, D&TC, Large CHC, Medium CHC, Large Hospital, Medium Hospital, Small Site)	3.22	0.0037
Region (NYC, Rest of State)	6.23	0.0126

Solutions for these fixed effects allow us to compare the relative odds of suppression for different patient groups at the same "typical" facility. For example, to look at the relative likelihood of newly diagnosed patients being suppressed, we can examine the effect of housing status as well as its interactions with race and sex/exposure risk:

Factor(s)	Levels			Regression Coefficient Estimate
Housing Status		Stable		1.0151
		Unknown or Unstable		0
Insurance Status x Housing Status	ADAP Plus	Stable		-0.4993
		Unknown or Unstable		0
	Medicaid	Stable		-0.2720
		Unknown or Unstable		0
	Medicare	Stable		-0.3245
		Unknown or Unstable		0
	Private	Stable		0
		Unknown or Unstable		0
	Other or Unknown	Stable		-0.4510
		Unknown or Unstable		0
	No Data	Stable		0.6386
		Unknown or Unstable		0
Housing Status x Sex/Risk		Stable	Heterosexual Female	-0.09053
		Unknown or Unstable		0
		Stable	Other Female	-0.2281
		Unknown or Unstable		0
		Stable	MSM	0.08716
		Unknown or Unstable		0
		Stable	Other	0
		Unknown or Unstable		0

The coefficient estimates can be added and the differences between the totals exponentiated to calculate relative odds of suppression. For example, the sum of the listed coefficients for a stably housed cisgender MSM patient on ADAP is 1.0151 – 0.4993 + 0.08716 = 0.60296, and the sum of these coefficients for an unstably housed MSM patient on ADAP is zero. So, the odds of suppression (probability of being suppressed divided by probability not suppressed) for the stably housed patient are approximately 1.83 (i.e., $e^{(0.60296 - 0)}$) times those of the unstably housed patient in this case. For a heterosexual women insured through Medicaid, the odds are of suppression for a stably housed patient are approximately 1.92 (i.e., $e^{(0.65257 - 0)}$) times those of an unstably housed patient. Additional refinements in these calculations can be made using other factors such as age, diagnosis date, etc., and

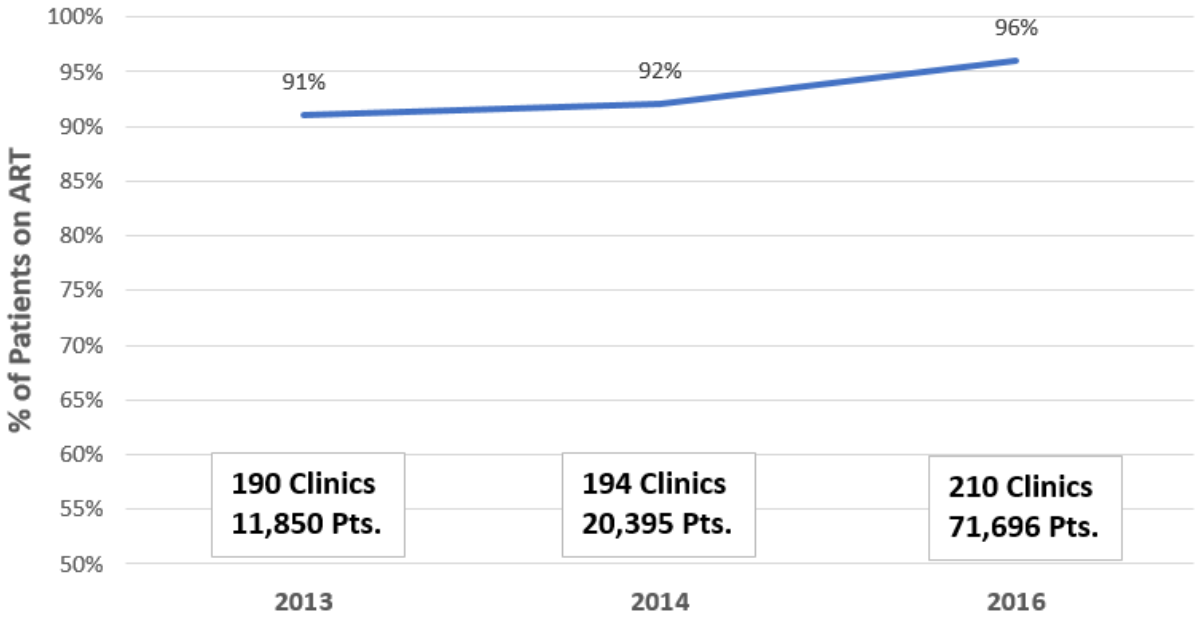
their interactions with these factors. A full table of the fixed-effects coefficient estimates is provided as an appendix to this report.

Of note, these odds ratios emphasize the relative risk of “failure” (lack of suppression) and can be more dramatic than the relative probabilities of success. For instance, the predicted probability of suppression on final viral load for an unstably housed 22-year-old white patient with IDU exposure risk who was previously diagnosed, on private insurance and receiving care at a “typical” small CHC outside New York City is approximately 67%, while the probability for a similar but stably housed patient is approximately 85%. This corresponds to an odds ratio of approximately 5.60/2.03 = 2.78.

We also used the estimates of the “random” effects to gauge the positive or negative influence of each site and its umbrella organization on outcomes. The results are presented as a heatmap in an appendix to this report.

Antiretroviral Therapy Usage

Percentage of Active Patients on ART 2013-2016 (Mean Clinic Rates)



Assessment of antiretroviral therapy prescription rates has changed over the years as expectations have moved from treatment of everyone whose CD4 count had descended below a certain threshold to guidelines for universal treatment. Data presented here are restricted to years when ARV rates among all patients were obtained.

Antiretroviral Therapy

All Active Patients

Mean 96%

Population	Clinics	Eligible Patients	0 50 100	Clinic Mean	Median	25th Percentile	75th Percentile	Min	Max
NYS	210	71,696		96%	98%	95%	99%	0%	100%

Newly Diagnosed Patients

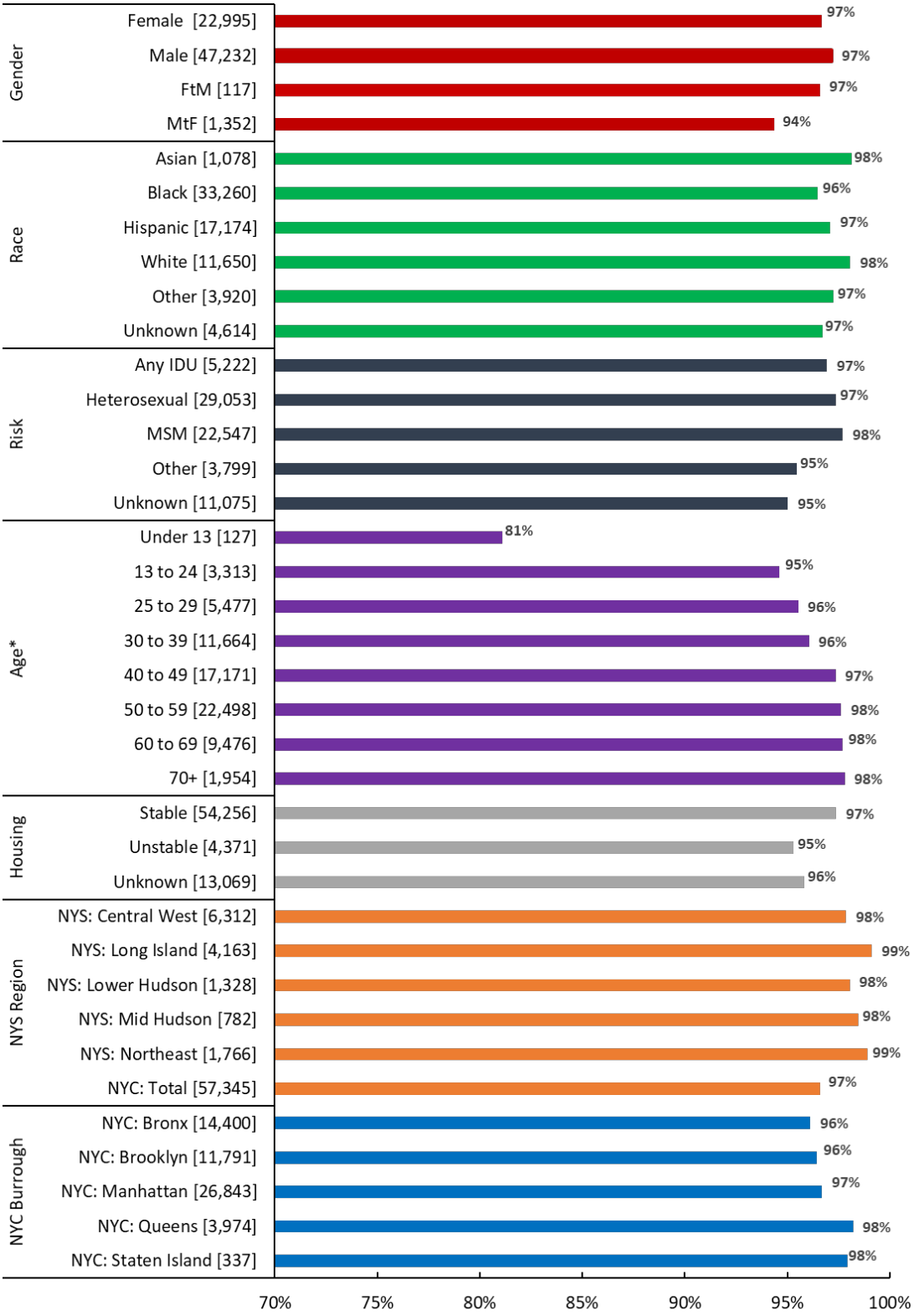
Mean 86%

Population	Clinics	Eligible Patients	0 50 100	Clinic Mean	Median	25th Percentile	75th Percentile	Min	Max
NYS	165	2,575		86%	92%	80%	100%	0%	100%

Antiretroviral Therapy: Percentage of patients with at least one ART drug prescribed at any time during or before the review period, and not ended before the review period.

Exclusions: None

ART Rates by Patient Characteristics (Active Patients)



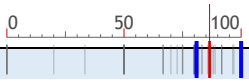
*Invalid DOB data were provided for 16 patients.

Sexually Transmitted Infections

Note: The rates for the STI treatment indicators are based on documented treatment, where medical history is available, and may not reflect treatment provided at other agencies.

Syphilis Treatment

Mean: 87%

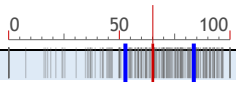
Population	Clinics	Eligible Patients	0 50 100	Clinic Mean	Median	25th Percentile	75th Percentile	Min	Max
NYS	124	1,002		87%	100%	81%	100%	0%	100%

Syphilis Treatment

Percentage of patients who were treated following a diagnosis of primary syphilis.

Genital Gonorrhea Testing

Mean: 65%

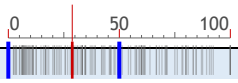
Population	Clinics	Eligible Patients	0 50 100	Clinic Mean	Median	25th Percentile	75th Percentile	Min	Max
NYS	210	38,493		65%	70%	53%	84%	0%	100%

Genital Gonorrhea Testing

Percentage of patients who had a genital test for gonorrhea.

Rectal Gonorrhea Testing Among MSM and MtF Transgender Patients

Mean 29%

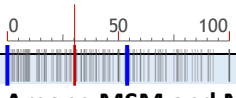
Population	Clinics	Eligible Patients	0 50 100	Clinic Mean	Median	25th Percentile	75th Percentile	Min	Max
NYS	195	14,385		29%	17%	0%	50%	0%	100%

Rectal Gonorrhea Testing Among MSM and MtF Transgender Patients

Percentage of MSM or MtF transgender patients who had a rectal test for gonorrhea.

Pharyngeal Gonorrhea Testing Among MSM and MtF Transgender Patients

Mean 30%

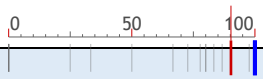
Population	Clinics	Eligible Patients	0 50 100	Clinic Mean	Median	25th Percentile	75th Percentile	Min	Max
NYS	195	14,385		30%	22%	0%	54%	0%	100%

Pharyngeal Gonorrhea Testing Among MSM and MtF Transgender Patients

Percentage of MSM or MtF transgender patients who had a pharyngeal test for gonorrhea.

Genital Gonorrhea Treatment

Mean 90%

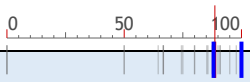
Population	Clinics	Eligible Patients	0 50 100	Clinic Mean	Median	25th Percentile	75th Percentile	Min	Max
NYS	87	516		90%	100%	100%	100%	0%	100%

Gonorrhea Treatment

Percentage of patients who were treated following a positive genital gonorrhea test.

Rectal Gonorrhea Treatment Among MSM and MtF Transgender Patients

Mean 89%

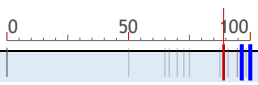
Population	Clinics	Eligible Patients	0 50 100	Clinic Mean	Median	25th Percentile	75th Percentile	Min	Max
NYS	62	734		89%	100%	88%	100%	0%	100%

Rectal Gonorrhea Treatment

Percentage of patients who were treated following a positive rectal gonorrhea test.

Pharyngeal Gonorrhea Treatment Among MSM and MtF Transgender Patients

Mean 89%

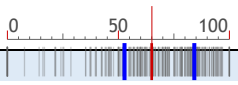
Population	Clinics	Eligible Patients	0 50 100	Clinic Mean	Median	25th Percentile	75th Percentile	Min	Max
NYS	59	595		89%	100%	95%	100%	0%	100%

Pharyngeal Gonorrhea Treatment

Percentage of patients who were treated following a positive pharyngeal gonorrhea test.

Genital Chlamydia Testing

Mean 65%

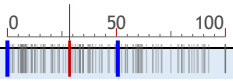
Population	Clinics	Eligible Patients	0 50 100	Clinic Mean	Median	25th Percentile	75th Percentile	Min	Max
NYS	210	38,493		65%	70%	53%	84%	0%	100%

Genital Chlamydia Testing

Percentage of patients who had a genital test for Chlamydia.

Rectal Chlamydia Testing Among MSM and MtF Transgender Patients

Mean 29%

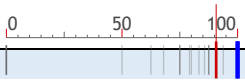
Population	Clinics	Eligible Patients	0 50 100	Clinic Mean	Median	25th Percentile	75th Percentile	Min	Max
NYS	195	14,385		29%	17%	0%	51%	0%	100%

Rectal Chlamydia Testing Among MSM and MtF Transgender Patients

Percentage of MSM or MtF transgender patients who had a rectal test for Chlamydia.

Genital Chlamydia Treatment

Mean 91%

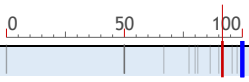
Population	Clinics	Eligible Patients	0 50 100	Clinic Mean	Median	25th Percentile	75th Percentile	Min	Max
NYS	109	709		91%	100%	100%	100%	0%	100%

Genital Chlamydia Treatment

Percentage of patients who were treated following a positive Chlamydia test.

Rectal Chlamydia Treatment

Mean 92%

Population	Clinics	Eligible Patients	0 50 100	Clinic Mean	Median	25th Percentile	75th Percentile	Min	Max
NYS	75	952		92%	100%	100%	100%	0%	100%

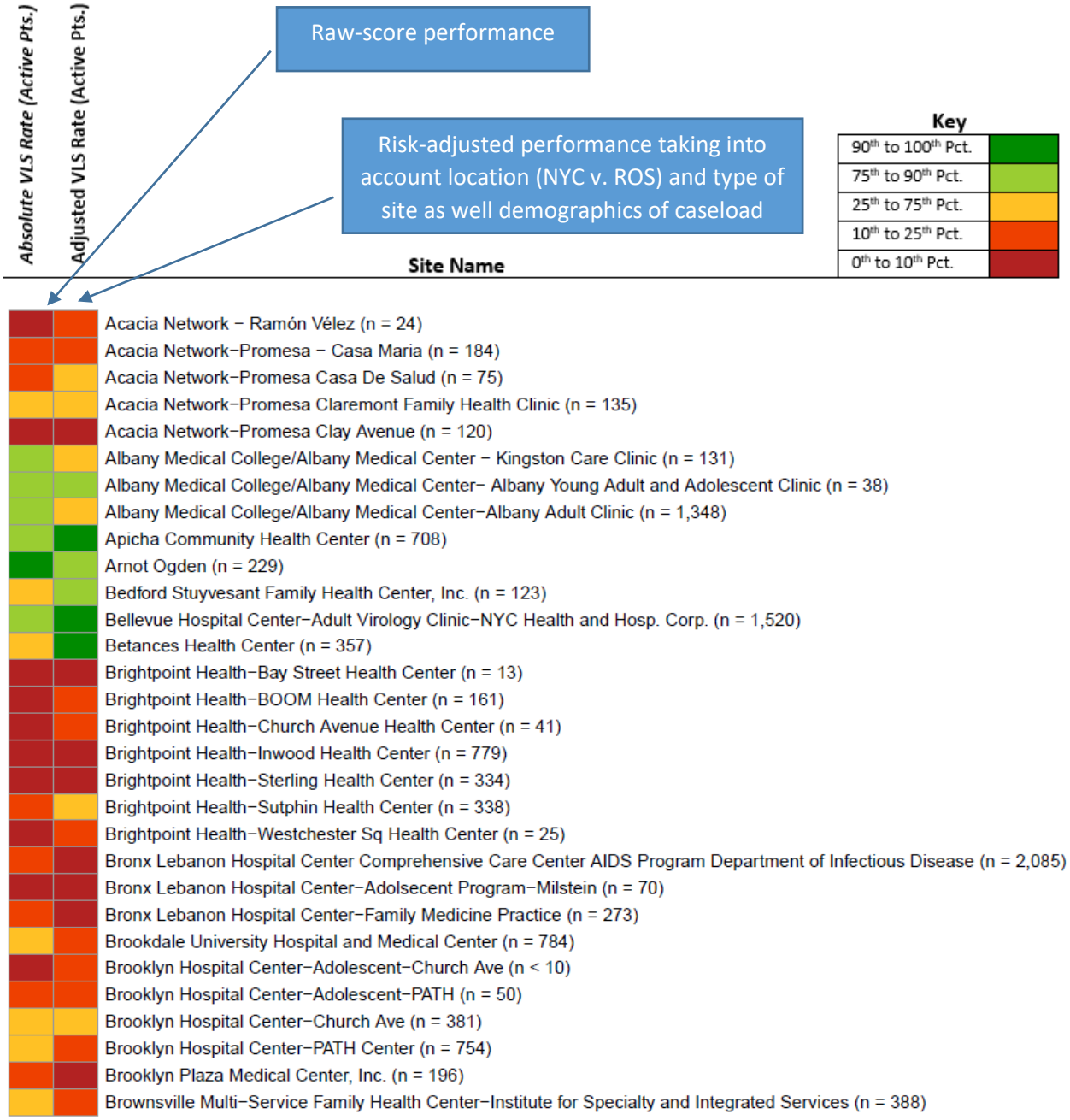
Genital Chlamydia Treatment

Percentage of patients who were treated following a positive rectal Chlamydia test.

Appendixes

Appendix 1: Viral Load Suppression Heat Maps (Active Patients)

All sites with approved 2016 submissions are reported here if they had any active patients. We ranked these sites from best to worst in terms of absolute viral load suppression rates among active patients and then again by the facility effect seen in the regression model described in the body of this report. We then bracketed each set of rankings into five performance levels, with half of the sites in the middle range (yellow) and smaller groupings of very high performing (green), high performing (yellow-green), low performing (orange) and very low performing (red) sites.



Absolute VLS Rate (Active Pts.)	Adjusted VLS Rate (Active Pts.)	Site Name
		Callen–Lorde Community Health Center (n = 3,974)
		Care for the Homeless (n = 12)
		Center for Comprehensive Health Practice (n = 40)
		Champlain Valley Physicians' Hospital (n = 80)
		Community Health Center of Buffalo – Buffalo (n < 10)
		Community Health Center of Buffalo – Lockport (n < 10)
		Community Health Center of Buffalo – Niagara Falls (n < 10)
		Community Healthcare Network–Bronx Health Center (n = 407)
		Community Healthcare Network–CABS Health Center (n = 267)
		Community Healthcare Network–Caribbean House Health Center (n = 129)
		Community Healthcare Network–Community League Health Center (n = 52)
		Community Healthcare Network–Downtown Health Center (n = 70)
		Community Healthcare Network–Dr. Betty Shabazz Health Center (n = 76)
		Community Healthcare Network–Family Health Center (n = 103)
		Community Healthcare Network–Helen B. Atkinson Health Center (n = 66)
		Community Healthcare Network–Long Island City Health Center (n = 55)
		Community Healthcare Network–Queens Health Center (n = 170)
		Coney Island Hospital –NYC Health and Hosp. Corp. (n = 256)
		Cornerstone Family Healthcare – Harper Health (n < 10)
		Cornerstone Family Healthcare – Kaplan Family Pavilion (n = 157)
		Cumberland Diagnostic and Treatment Center–NYC Health and Hosp. Corp. (n = 141)
		Damian Family Care Centers – 121st St. Family Health Center (n < 10)
		Damian Family Care Centers – 35th Street Health Center (n = 69)
		Damian Family Care Centers – 53rd Street Health Center (n < 10)
		Damian Family Care Centers – Damian Family Health Center (n = 35)
		Damian Family Care Centers – Ellenville Health Center (n = 10)
		Damian Family Care Centers – Firehouse Health Center (n = 102)
		Damian Family Care Centers – Highbridge Health Center (n < 10)
		Damian Family Care Centers – Rhinebeck (n = 21)
		Damian Family Care Centers – Richmond Hill Health Center (n < 10)
		Damian Family Care Centers – Starhill Health Center (n = 25)
		Damian Family Care Centers – Third Avenue Health Center (n = 430)
		David E. Rogers Center for HIV/AIDS Care (n = 195)
		East Harlem Council for Human Services, Inc.–Boriken Neighborhood Health Center (n = 195)
		East New York Diagnostic and Treatment Center–HATS Unit–NYC Health and Hosp. Corp. (n = 264)
		Ellis Family Health Center–McClellan Street site (n = 86)

Key

90th to 100th Pct.	
75th to 90th Pct.	
25th to 75th Pct.	
10th to 25th Pct.	
0th to 10th Pct.	

Absolute VLS Rate (Active Pts.)	Adjusted VLS Rate (Active Pts.)	Site Name
		Ellis Family Health Center–Nott Street site (n = 69)
		Elmhurst Hospital ID Clinic–NYC Health and Hosp. Corp. (n = 1,312)
		Erie County Medical Center (n = 918)
		Evergreen Health Services (n = 1,036)
		Gouverneur Healthcare Services–NYC Health and Hosp. Corp. (n = 592)
		Harlem Hospital Center–NYC Health and Hosp. Corp. (n = 900)
		Harlem United–Upper Room AIDS Ministries–El Faro (n = 53)
		Harlem United–Upper Room AIDS Ministries–The Nest (n = 538)
		Harlem United–Upper Room AIDS Ministries–Willis P. Green Center (n = 155)
		HEAT Program–University Hospital of Brooklyn–Research Foundation of SUNY (n = 105)
		Heritage HealthCare Center (n = 121)
		Housing Works–Downtown Brooklyn Health Center (n = 478)
		Housing Works–East New York Health Center (n = 472)
		Housing Works–Keith D. Cylar House Health Center (n = 276)
		Hudson Headwaters Health Network– West Mountain Health Services (n = 29)
		Hudson Headwaters Health Network–Health Center at Broad Street (n = 96)
		Hudson River HealthCare – Atrium/Poughkeepsie (n = 144)
		Hudson River HealthCare – Beacon (n = 101)
		Hudson River HealthCare – Brentwood Family Health Center (n = 168)
		Hudson River Healthcare – Health Center at Patchogue (n = 62)
		Hudson River HealthCare – Health Center at Riverhead (n = 25)
		Hudson River Healthcare – Marilyn Shellabarger Health Center at Shirley (n = 45)
		Hudson River Healthcare – Martin Luther King Jr. Health Center (n = 113)
		Hudson River HealthCare – Monticello (n = 96)
		Hudson River HealthCare – North Brookhaven (n = 19)
		Hudson River HealthCare – Peekskill (n = 66)
		Hudson River Healthcare – The Maxine S. Postal Tri–Community Health Center (n = 55)
		Institute for Family Health–Ali Forney Center (n = 16)
		Institute for Family Health–All Angels (n < 10)
		Institute for Family Health–Amsterdam Center (n < 10)
		Institute for Family Health–Broadway Presbyterian Church (n = 13)
		Institute for Family Health–Ellenville (n < 10)
		Institute for Family Health–Family Health Center of Harlem (n = 424)
		Institute for Family Health–Hyde Park (n = 15)
		Institute for Family Health–New Paltz (n = 10)
		Institute for Family Health–Sidney Hillman and Phillips Family Practice (n = 346)

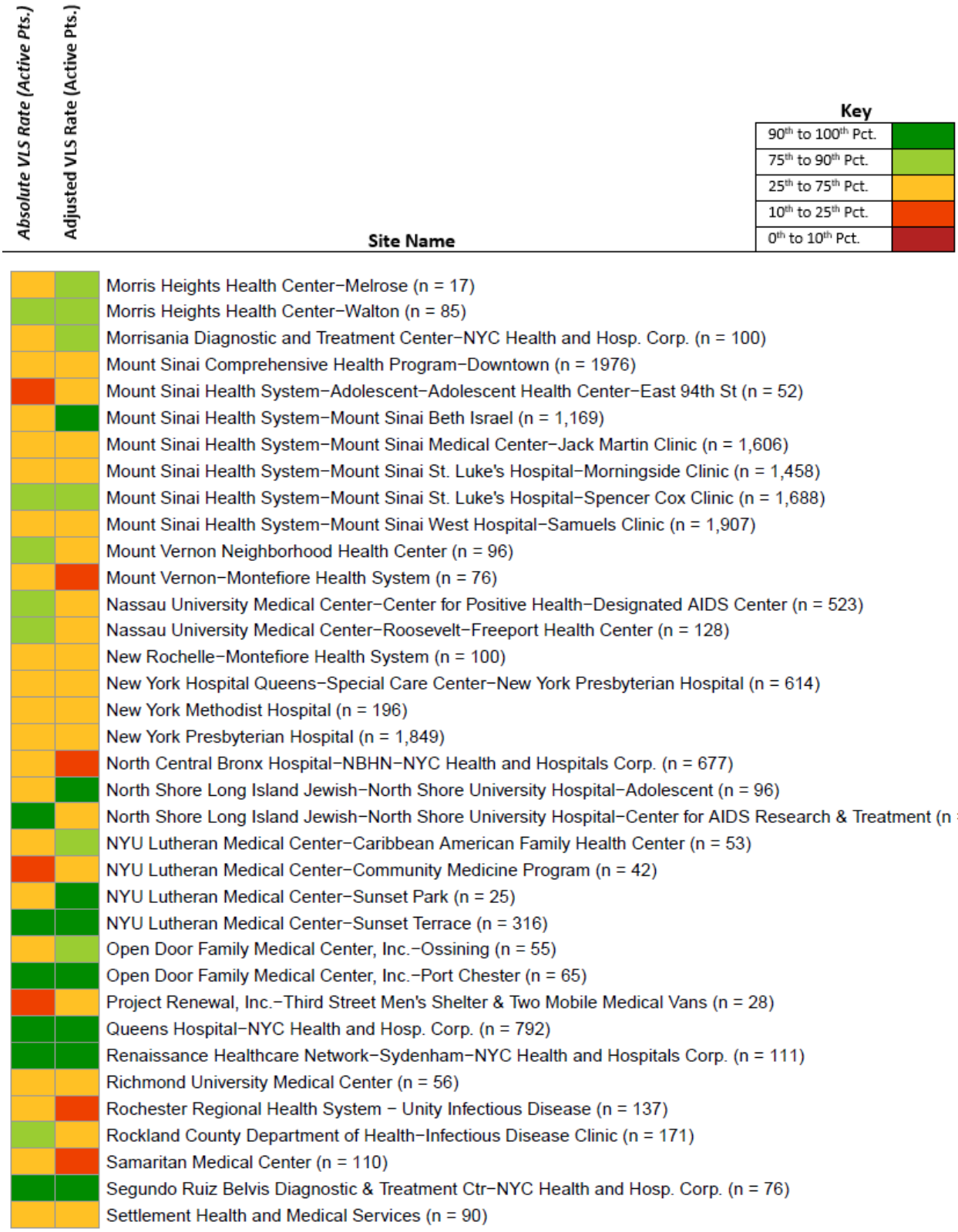
Key

90th to 100th Pct.
75th to 90th Pct.
25th to 75th Pct.
10th to 25th Pct.
0th to 10th Pct.

Absolute VLS Rate (Active Pts.)	Adjusted VLS Rate (Active Pts.)	Site Name
		Institute for Family Health–Stevenson Family Health Center (n < 10)
		Institute for Family Health–Urban Horizon Family Health Center and River Center for Counseling (n = 189)
		Interfaith Medical Center (n = 391)
		Jacobi Medical Center–Adult HIV Clinic–NBHN–NYC Health and Hosp. Corp. (n = 1,570)
		Jamaica Hospital Medical Center – ACC Infectious Disease Clinic (n = 37)
		Jordan Health Center –Woodward Health Center (n = 51)
		Jordan Health Center–Holland Health Center (n = 141)
		Joseph P. Addabbo Family Health Center–Arverne (n = 188)
		Joseph P. Addabbo Family Health Center–Jamaica (n = 209)
		Joseph P. Addabbo Family Health Center–South Brooklyn Health Center (n = 68)
		Kaleida Health–Women & Children's Hospital of Buffalo–PACT Program (n = 35)
		Kings County Hospital Center–NYC Health and Hosp. Corp. (n = 1,777)
		Kingsbrook Jewish Medical Center (n = 364)
		Lenox Hill Hospital–Retroviral Disease Clinic/Primary Care Center (n = 430)
		Lincoln Medical and Mental Health Center–NYC Health and Hosp. Corp. (n = 1,088)
		Maimonides Medical Center Life Forward Program (n = 208)
		Medalliance Medical Health Services (n = 212)
		Metropolitan Hospital Center Virology Clinic–NYC Health and Hosp. Corp. (n = 496)
		Middletown Community Health Center, Inc. (n = 94)
		Montefiore DOSA–Melrose Complex (n = 52)
		Montefiore DOSA–Port Morris (n = 63)
		Montefiore DOSA–Waters Place (n = 61)
		Montefiore Health System – Substance Abuse Treatment Program – Unit I (n = 45)
		Montefiore Health System – Substance Abuse Treatment Program – Unit III (n = 61)
		Montefiore Health System–Montefiore Medical Center–Center for Positive Living–Designated AIDS Center (n = 3,147)
		Montefiore Medical Center Department of Pediatrics (n = 127)
		Montefiore Medical Group–CICERO Program–Castle Hill Family Practice (n = 35)
		Montefiore Medical Group–CICERO Program–Comprehensive Family Care Center (n = 150)
		Montefiore Medical Group–CICERO Program–Comprehensive Health Care Center (n = 313)
		Montefiore Medical Group–CICERO Program–Marble Hill Family Practice (n = 25)
		Montefiore Medical Group–CICERO Program–Montefiore Family Health Center (n = 193)
		Montefiore Medical Group–CICERO Program–South Bronx Center for Child. & Fam. (n = 108)
		Montefiore Medical Group–CICERO Program–University Avenue Family Practice (n = 17)
		Montefiore Medical Group–CICERO Program–West Farms Family Practice (n = 33)
		Morris Heights Health Center–137th Street [St. Ann's] (n = 13)
		Morris Heights Health Center–Burnside (n = 277)

Key

90th to 100th Pct.	
75th to 90th Pct.	
25th to 75th Pct.	
10th to 25th Pct.	
0th to 10th Pct.	


Absolute VLS Rate (Active Pts.)
Adjusted VLS Rate (Active Pts.)
Site Name
Key
90th to 100th Pct.
75th to 90th Pct.
25th to 75th Pct.
10th to 25th Pct.
0th to 10th Pct.
Morris Heights Health Center–Melrose (n = 17)
Morris Heights Health Center–Walton (n = 85)
Morrisania Diagnostic and Treatment Center–NYC Health and Hosp. Corp. (n = 100)
Mount Sinai Comprehensive Health Program–Downtown (n = 1976)
Mount Sinai Health System–Adolescent–Adolescent Health Center–East 94th St (n = 52)
Mount Sinai Health System–Mount Sinai Beth Israel (n = 1,169)
Mount Sinai Health System–Mount Sinai Medical Center–Jack Martin Clinic (n = 1,606)
Mount Sinai Health System–Mount Sinai St. Luke's Hospital–Morningside Clinic (n = 1,458)
Mount Sinai Health System–Mount Sinai St. Luke's Hospital–Spencer Cox Clinic (n = 1,688)
Mount Sinai Health System–Mount Sinai West Hospital–Samuels Clinic (n = 1,907)
Mount Vernon Neighborhood Health Center (n = 96)
Mount Vernon–Montefiore Health System (n = 76)
Nassau University Medical Center–Center for Positive Health–Designated AIDS Center (n = 523)
Nassau University Medical Center–Roosevelt–Freeport Health Center (n = 128)
New Rochelle–Montefiore Health System (n = 100)
New York Hospital Queens–Special Care Center–New York Presbyterian Hospital (n = 614)
New York Methodist Hospital (n = 196)
New York Presbyterian Hospital (n = 1,849)
North Central Bronx Hospital–NBHN–NYC Health and Hospitals Corp. (n = 677)
North Shore Long Island Jewish–North Shore University Hospital–Adolescent (n = 96)
North Shore Long Island Jewish–North Shore University Hospital–Center for AIDS Research & Treatment (n = 2,003)
NYU Lutheran Medical Center–Caribbean American Family Health Center (n = 53)
NYU Lutheran Medical Center–Community Medicine Program (n = 42)
NYU Lutheran Medical Center–Sunset Park (n = 25)
NYU Lutheran Medical Center–Sunset Terrace (n = 316)
Open Door Family Medical Center, Inc.–Ossining (n = 55)
Open Door Family Medical Center, Inc.–Port Chester (n = 65)
Project Renewal, Inc.–Third Street Men's Shelter & Two Mobile Medical Vans (n = 28)
Queens Hospital–NYC Health and Hosp. Corp. (n = 792)
Renaissance Healthcare Network–Sydenham–NYC Health and Hospitals Corp. (n = 111)
Richmond University Medical Center (n = 56)
Rochester Regional Health System – Unity Infectious Disease (n = 137)
Rockland County Department of Health–Infectious Disease Clinic (n = 171)
Samaritan Medical Center (n = 110)
Segundo Ruiz Belvis Diagnostic & Treatment Ctr–NYC Health and Hosp. Corp. (n = 76)
Settlement Health and Medical Services (n = 90)

Absolute VLS Rate (Active Pts.)	Adjusted VLS Rate (Active Pts.)	Site Name
		St. Barnabas Hospital–Pathways Center for Comprehensive Care (n = 564)
		St. Elizabeth Medical Center–Sister Rose Vincent Family Medicine Center ID Clinic (n = 219)
		St. John's Riverside Hospital–The HOPE Center (n = 334)
		START Treatment and Recovery Centers–Highbridge (n = 11)
		START Treatment and Recovery Centers–Kaleidoscope (n < 10)
		START Treatment and Recovery Centers–Starting Point (n = 12)
		START Treatment and Recovery Centers–Third Horizon (n = 11)
		Staten Island University Hospital [South Campus] –Primary Care–North Shore LIJ (n = 227)
		Staten Island University Hospital Center [Water Street]–North Shore LIJ (n = 41)
		Staten Island University Hospital–Canarsie MultiService Center [MMTP]–North Shore LIJ (n = 11)
		Staten Island University Hospital–North Shore LIJ–Coney Island Multi–Service Center [MMTP] (n = 19)
		Strong Memorial Hospital Adult Clinic–University of Rochester Medical Center (n = 1,173)
		SUNY Downstate Medical Center–STAR Health Center–Research Foundation of SUNY (n = 1,163)
		SUNY Stony Brook Med. Center–Comprehensive HIV Treatment Center–Research Foundation of SUNY (n = 691)
		SUNY Stony Brook Medical Center–Department of Family Medicine (n = 22)
		SUNY Stony Brook University Med. Ctr. Adolescent Program–HSC–Children's Hospital (n = 18)
		SUNY Upstate Medical University–Designated AIDS Center [Adolescent]–Research Foundation of SUNY (n = 22)
		SUNY Upstate Medical University–Designated AIDS Center [Adult]–Research Foundation of SUNY (n = 942)
		Syracuse Community Health Center (n = 36)
		Trillium Health (n = 792)
		United Health Services Hospitals, Inc–Binghamton Family Care Center (n = 310)
		Urban Health Plan, Inc. – Bella Vista Health Center (n = 35)
		Urban Health Plan, Inc. – El Nuevo San Juan (n = 195)
		Urban Health Plan, Inc. – Plaza Del Sol Family Health Center (n = 10)
		VIP Community Services (n = 76)
		Weill Cornell–New York Presbyterian Hospital–Bernbaum (n = 1,337)
		Weill Cornell–New York Presbyterian Hospital–Rogers (n = 1,254)
		West Midtown Medical Group (n = 47)
		Westchester Medical Center–AIDS Care Center (n = 363)
		Whitney M. Young Jr. Health Services – Troy (n < 10)
		Whitney M. Young Jr. Health Services (n = 174)
		William F. Ryan Community Health Center Network–97th Street (n = 417)
		William F. Ryan Community Health Center Network–Chelsea–Clinton (n = 220)
		William F. Ryan Community Health Center Network–Ryan–NENA Community Health Center (n = 141)
		Woodhull Medical Center–NYC Health and Hosp. Corp. (n = 1,143)
		Wyckoff Heights Medical Center (n = 654)

Key

90th to 100th Pct.
75th to 90th Pct.
25th to 75th Pct.
10th to 25th Pct.
0th to 10th Pct.

Appendix 2: VLS Logistic Regression Parameter Estimates

Logistic regression estimates the natural log of the odds of an occurrence in terms of an intercept value and parameter estimates for various factors that may affect the likelihood of that occurrence. Mixed-effects models as used in this report also include a normally distributed set of "random" effects for the group in which each of the occurrences did or did not occur. In this case, we analyzed the likelihood of suppression on final viral load for each patient, considering both the clinic where he/she was treated and the medical organization managing that clinic.

The odds of viral load suppression for a patient seen at a "typical" facility (i.e., where the "random" effects for that facility at the clinic and organization level sum to zero) can be calculated from this equation, where both sides of the initial regression equation have been exponentiated: Odds = $e^{(\alpha + B_1 + B_2 + ... + B_N)}$, where α is the intercept estimate listed below in the table of fixed effects and the various Bs are all of the parameter estimates that apply based on the patient's age, housing status, insurance status, etc.

The odds of suppression are defined as the probability of suppression divided by the probability that the patient was not suppressed (i.e., 1 – probability of suppression), and algebraic rearrangement yields the following equation for the probability of suppression: Probability = Odds / (Odds + 1).

Using these two equations allows for estimation of the probability of suppression for any patient seen at a typical facility. Of note, though, the sum of the clinic and organization-level "random" effects ranged from approximately -1.57 to 1.84. Adding these to the original intercept and fixed-effects regression parameters is equivalent to multiplying the odds of suppression by $e^{-1.57}$ or $e^{1.84}$, respectively. So, the odds for suppression at a typical facility are approximately 5 times those at the lowest performing site, and the odds at the highest performing site are about 6 times those of a typical facility. These extreme outliers may reflect data anomalies, but the influence of facility effects is clearly significant. The table immediately below calculates these effects for various benchmarks within the distribution of combined clinic and organization effects.

Random Effect Parameter Benchmarks: Site and Organizational Effects Combined

Benchmark	Combined Parameter Estimate	Odds Relative to Typical (Median) Site
Minimum	-1.566	0.2088
10th Percentile	-0.4497	0.6378
25th Percentile	-0.2446	0.7830
75th Percentile	0.3085	1.361
90th Percentile	0.6297	1.877
Maximum	1.841	6.270

Please see the following pages for a table of the fixed-effect parameter estimates.

Solutions for Fixed-Effects Parameter Estimates in Viral Load Suppression Regression Model

Effect	Race	Housing	Age	Sex/Risk	Diagnosis	Insurance	Fac. Type	NYC v. ROS	Estimate	Std. Error	DF	t Value	Pr > |t|
Intercept									0.7081	0.2479	86	2.86	0.0054
Race	Asian								1.4723	0.5561	71204	2.65	0.0081
Race	Black								-0.5484	0.1276	71204	-4.3	<.0001
Race	Hispanic								-0.3023	0.15	71204	-2.02	0.0439
Race	Other								-0.3065	0.2391	71204	-1.28	0.1999
Race	Unknown								-0.771	0.2265	71204	-3.4	0.0007
Race	White								0	.	.	.	.
Housing		Stable							1.0151	0.1314	71204	7.73	<.0001
Housing		Unknown_or_unstable							0	.	.	.	.
Age			25_to_29						0.2156	0.1923	71204	1.12	0.2623
Age			30s						0.2004	0.1692	71204	1.18	0.2362
Age			40s						0.4451	0.166	71204	2.68	0.0073
Age			50s						0.7284	0.1648	71204	4.42	<.0001
Age			60s						0.8457	0.1907	71204	4.44	<.0001
Age			70_plus						1.0881	0.3732	71204	2.92	0.0036
Age			Under_25						0	.	.	.	.
Sex/Risk				Female_hetero					0.06503	0.1817	71204	0.36	0.7204
Sex/Risk				Female_other					-0.2819	0.1723	71204	-1.64	0.1018
Sex/Risk				Male_MSM					0.5851	0.1323	71204	4.42	<.0001
Sex/Risk				Other					0	.	.	.	.
Diagnosis					Newly_diagnosed				-1.1317	0.1307	71204	-8.66	<.0001
Diagnosis					Prev_dx_or_unknown				0	.	.	.	.
Insurance						ADAP_plus			0.005198	0.2962	71204	0.02	0.986
Insurance						Any_Medicare			-0.1316	0.3712	71204	-0.35	0.7229
Insurance						Medicaid			-0.5332	0.2018	71204	-2.64	0.0082
Insurance						Missing			-0.9874	0.4104	71204	-2.41	0.0161
Insurance						Other_or_unknown			-0.8902	0.2086	71204	-4.27	<.0001
Insurance						Private			0	.	.	.	.
Race * Housing	Asian	Stable							-1.0543	0.3755	71204	-2.81	0.005
Race * Housing	Asian	Unknown_or_unstable							0	.	.	.	.
Race * Housing	Black	Stable							-0.2308	0.08779	71204	-2.63	0.0086
Race * Housing	Black	Unknown_or_unstable							0	.	.	.	.
Race * Housing	Hispanic	Stable							-0.2515	0.09732	71204	-2.58	0.0098
Race * Housing	Hispanic	Unknown_or_unstable							0	.	.	.	.
Race * Housing	Other	Stable							-0.0676	0.1473	71204	-0.46	0.6463
Race * Housing	Other	Unknown_or_unstable							0	.	.	.	.
Race * Housing	Unknown	Stable							0.04811	0.1304	71204	0.37	0.7122
Race * Housing	Unknown	Unknown_or_unstable							0	.	.	.	.
Race * Housing	White	Stable							0	.	.	.	.
Race * Housing	White	Unknown_or_unstable							0	.	.	.	.
Race * Sex/Risk	Asian			Female_hetero					0.9148	0.4842	71204	1.89	0.0589
Race * Sex/Risk	Asian			Female_other					0.04817	0.4945	71204	0.1	0.9224
Race * Sex/Risk	Asian			Male_MSM					0.1763	0.2833	71204	0.62	0.5338
Race * Sex/Risk	Asian			Other					0	.	.	.	.

Race * Sex/Risk	Black			Female_hetero					0.09091	0.1075	71204	0.85	0.3977
Race * Sex/Risk	Black			Female_other					0.3232	0.1317	71204	2.45	0.0141
Race * Sex/Risk	Black			Male_MSM					-0.09316	0.0842	71204	-1.11	0.2685
Race * Sex/Risk	Black			Other					0	.	.	.	.
Race * Sex/Risk	Hispanic			Female_hetero					0.04195	0.1172	71204	0.36	0.7204
Race * Sex/Risk	Hispanic			Female_other					0.1852	0.1457	71204	1.27	0.2037
Race * Sex/Risk	Hispanic			Male_MSM					0.06453	0.09266	71204	0.7	0.4862
Race * Sex/Risk	Hispanic			Other					0	.	.	.	.
Race * Sex/Risk	Other			Female_hetero					-0.0067	0.1847	71204	-0.04	0.9711
Race * Sex/Risk	Other			Female_other					-0.1473	0.1798	71204	-0.82	0.4126
Race * Sex/Risk	Other			Male_MSM					0.09074	0.1472	71204	0.62	0.5377
Race * Sex/Risk	Other			Other					0	.	.	.	.
Race * Sex/Risk	Unknown			Female_hetero					0.1028	0.1557	71204	0.66	0.5092
Race * Sex/Risk	Unknown			Female_other					0.2183	0.1728	71204	1.26	0.2067
Race * Sex/Risk	Unknown			Male_MSM					-0.1894	0.1376	71204	-1.38	0.1686
Race * Sex/Risk	Unknown			Other					0	.	.	.	.
Race * Sex/Risk	White			Female_hetero					0	.	.	.	.
Race * Sex/Risk	White			Female_other					0	.	.	.	.
Race * Sex/Risk	White			Male_MSM					0	.	.	.	.
Race * Sex/Risk	White			Other					0	.	.	.	.
Race * Insurance	Asian					ADAP_plus			-0.597	0.561	71204	-1.06	0.2872
Race * Insurance	Asian					Any_Medicare			0.09461	0.8592	71204	0.11	0.9123
Race * Insurance	Asian					Medicaid			-0.2653	0.5016	71204	-0.53	0.5968
Race * Insurance	Asian					Missing			-1.6162	0.718	71204	-2.25	0.0244
Race * Insurance	Asian					Other_or_unknown			-0.4549	0.4717	71204	-0.96	0.3349
Race * Insurance	Asian					Private			0	.	.	.	.
Race * Insurance	Black					ADAP_plus			0.4157	0.1736	71204	2.4	0.0166
Race * Insurance	Black					Any_Medicare			0.1509	0.1404	71204	1.08	0.2822
Race * Insurance	Black					Medicaid			0.3329	0.1136	71204	2.93	0.0034
Race * Insurance	Black					Missing			0.2107	0.2973	71204	0.71	0.4786
Race * Insurance	Black					Other_or_unknown			0.3462	0.1149	71204	3.01	0.0026
Race * Insurance	Black					Private			0	.	.	.	.
Race * Insurance	Hispanic					ADAP_plus			0.3402	0.1957	71204	1.74	0.0821
Race * Insurance	Hispanic					Any_Medicare			0.1985	0.1662	71204	1.19	0.2325
Race * Insurance	Hispanic					Medicaid			0.366	0.1354	71204	2.7	0.0069
Race * Insurance	Hispanic					Missing			0.2008	0.3332	71204	0.6	0.5467
Race * Insurance	Hispanic					Other_or_unknown			0.2753	0.1365	71204	2.02	0.0436
Race * Insurance	Hispanic					Private			0	.	.	.	.
Race * Insurance	Other					ADAP_plus			0.07897	0.4172	71204	0.19	0.8499
Race * Insurance	Other					Any_Medicare			-0.2228	0.2817	71204	-0.79	0.429
Race * Insurance	Other					Medicaid			0.2693	0.2257	71204	1.19	0.2328
Race * Insurance	Other					Missing			0.3998	0.3656	71204	1.09	0.2741
Race * Insurance	Other					Other_or_unknown			0.1015	0.2308	71204	0.44	0.6603
Race * Insurance	Other					Private			0	.	.	.	.
Race * Insurance	Unknown					ADAP_plus			0.5822	0.2974	71204	1.96	0.0503
Race * Insurance	Unknown					Any_Medicare			0.112	0.2723	71204	0.41	0.681
Race * Insurance	Unknown					Medicaid			0.5909	0.2183	71204	2.71	0.0068
Race * Insurance	Unknown					Missing			0.6703	0.3862	71204	1.74	0.0827
Race * Insurance	Unknown					Other_or_unknown			0.66	0.2214	71204	2.98	0.0029
Race * Insurance	Unknown					Private			0	.	.	.	.
Race * Insurance	White					ADAP_plus			0	.	.	.	.

Race * Insurance	White					Any_Medicare			0	.	.	.	.
Race * Insurance	White					Medicaid			0	.	.	.	.
Race * Insurance	White					Missing			0	.	.	.	.
Race * Insurance	White					Other_or_unknown			0	.	.	.	.
Race * Insurance	White					Private			0	.	.	.	.
Housing * Sex/Risk		Stable		Female_hetero					-0.09053	0.07369	71204	-1.23	0.2193
Housing * Sex/Risk		Stable		Female_other					-0.2281	0.0791	71204	-2.88	0.0039
Housing * Sex/Risk		Stable		Male_MSM					0.08716	0.06423	71204	1.36	0.1748
Housing * Sex/Risk		Stable		Other					0	.	.	.	.
Housing * Sex/Risk		Unknown_or_unstable		Female_hetero					0	.	.	.	.
Housing * Sex/Risk		Unknown_or_unstable		Female_other					0	.	.	.	.
Housing * Sex/Risk		Unknown_or_unstable		Male_MSM					0	.	.	.	.
Housing * Sex/Risk		Unknown_or_unstable		Other					0	.	.	.	.
Housing * Insurance		Stable				ADAP_plus			-0.4993	0.1628	71204	-3.07	0.0022
Housing * Insurance		Stable				Any_Medicare			-0.3245	0.1431	71204	-2.27	0.0234
Housing * Insurance		Stable				Medicaid			-0.272	0.1164	71204	-2.34	0.0194
Housing * Insurance		Stable				Missing			0.6386	0.5672	71204	1.13	0.2603
Housing * Insurance		Stable				Other_or_unknown			-0.451	0.1178	71204	-3.83	0.0001
Housing * Insurance		Stable				Private			0	.	.	.	.
Housing * Insurance		Unknown_or_unstable				ADAP_plus			0	.	.	.	.
Housing * Insurance		Unknown_or_unstable				Any_Medicare			0	.	.	.	.
Housing * Insurance		Unknown_or_unstable				Medicaid			0	.	.	.	.
Housing * Insurance		Unknown_or_unstable				Missing			0	.	.	.	.
Housing * Insurance		Unknown_or_unstable				Other_or_unknown			0	.	.	.	.
Housing * Insurance		Unknown_or_unstable				Private			0	.	.	.	.
Age * Sex/Risk			25_to_29	Female_hetero					0.171	0.182	71204	0.94	0.3474
Age * Sex/Risk			25_to_29	Female_other					0.002718	0.1742	71204	0.02	0.9876
Age * Sex/Risk			25_to_29	Male_MSM					-0.2743	0.1253	71204	-2.19	0.0285
Age * Sex/Risk			25_to_29	Other					0	.	.	.	.
Age * Sex/Risk			30s	Female_hetero					-0.04684	0.1559	71204	-0.3	0.7638
Age * Sex/Risk			30s	Female_other					-0.09555	0.1496	71204	-0.64	0.5229
Age * Sex/Risk			30s	Male_MSM					-0.4399	0.1145	71204	-3.84	0.0001
Age * Sex/Risk			30s	Other					0	.	.	.	.
Age * Sex/Risk			40s	Female_hetero					0.08619	0.1498	71204	0.58	0.5652
Age * Sex/Risk			40s	Female_other					0.19	0.1366	71204	1.39	0.1642
Age * Sex/Risk			40s	Male_MSM					-0.3151	0.1131	71204	-2.79	0.0053
Age * Sex/Risk			40s	Other					0	.	.	.	.
Age * Sex/Risk			50s	Female_hetero					0.191	0.1489	71204	1.28	0.1994
Age * Sex/Risk			50s	Female_other					0.03159	0.1283	71204	0.25	0.8055
Age * Sex/Risk			50s	Male_MSM					-0.2495	0.1147	71204	-2.17	0.0297
Age * Sex/Risk			50s	Other					0	.	.	.	.
Age * Sex/Risk			60s	Female_hetero					0.08184	0.1642	71204	0.5	0.6182
Age * Sex/Risk			60s	Female_other					0.1585	0.1555	71204	1.02	0.3079
Age * Sex/Risk			60s	Male_MSM					-0.2528	0.1514	71204	-1.67	0.0949
Age * Sex/Risk			60s	Other					0	.	.	.	.
Age * Sex/Risk			70_plus	Female_hetero					0.1141	0.2399	71204	0.48	0.6345
Age * Sex/Risk			70_plus	Female_other					0.3601	0.3255	71204	1.11	0.2686
Age * Sex/Risk			70_plus	Male_MSM					0.04469	0.3267	71204	0.14	0.8912
Age * Sex/Risk			70_plus	Other					0	.	.	.	.
Age * Sex/Risk			Under_25	Female_hetero					0	.	.	.	.
Age * Sex/Risk			Under_25	Female_other					0	.	.	.	.

Age * Sex/Risk			Under_25	Male_MSM					0	.	.	.	.
Age * Sex/Risk			Under_25	Other					0	.	.	.	.
Age * Insurance			25_to_29			ADAP_plus			0.3318	0.2748	71204	1.21	0.2273
Age * Insurance			25_to_29			Any_Medicare			-0.2604	0.3992	71204	-0.65	0.5143
Age * Insurance			25_to_29			Medicaid			-0.1259	0.1921	71204	-0.66	0.5121
Age * Insurance			25_to_29			Missing			0.2693	0.2768	71204	0.97	0.3305
Age * Insurance			25_to_29			Other_or_unknown			0.3335	0.198	71204	1.68	0.0921
Age * Insurance			25_to_29			Private			0	.	.	.	.
Age * Insurance			30s			ADAP_plus			0.5342	0.2441	71204	2.19	0.0286
Age * Insurance			30s			Any_Medicare			0.1378	0.3564	71204	0.39	0.6989
Age * Insurance			30s			Medicaid			0.1853	0.1684	71204	1.1	0.2711
Age * Insurance			30s			Missing			0.2298	0.2391	71204	0.96	0.3363
Age * Insurance			30s			Other_or_unknown			0.5608	0.175	71204	3.21	0.0014
Age * Insurance			30s			Private			0	.	.	.	.
Age * Insurance			40s			ADAP_plus			0.4203	0.2425	71204	1.73	0.083
Age * Insurance			40s			Any_Medicare			0.1356	0.344	71204	0.39	0.6933
Age * Insurance			40s			Medicaid			0.1252	0.166	71204	0.75	0.4508
Age * Insurance			40s			Missing			0.2435	0.2315	71204	1.05	0.2929
Age * Insurance			40s			Other_or_unknown			0.3012	0.1732	71204	1.74	0.0821
Age * Insurance			40s			Private			0	.	.	.	.
Age * Insurance			50s			ADAP_plus			0.2307	0.2464	71204	0.94	0.3493
Age * Insurance			50s			Any_Medicare			0.2064	0.3407	71204	0.61	0.5445
Age * Insurance			50s			Medicaid			0.1107	0.1653	71204	0.67	0.5031
Age * Insurance			50s			Missing			0.4577	0.2323	71204	1.97	0.0488
Age * Insurance			50s			Other_or_unknown			0.2528	0.1731	71204	1.46	0.144
Age * Insurance			50s			Private			0	.	.	.	.
Age * Insurance			60s			ADAP_plus			0.5647	0.3095	71204	1.82	0.0681
Age * Insurance			60s			Any_Medicare			0.374	0.3545	71204	1.06	0.2913
Age * Insurance			60s			Medicaid			0.3597	0.1971	71204	1.82	0.0681
Age * Insurance			60s			Missing			0.4112	0.276	71204	1.49	0.1362
Age * Insurance			60s			Other_or_unknown			0.4798	0.2045	71204	2.35	0.019
Age * Insurance			60s			Private			0	.	.	.	.
Age * Insurance			70_plus			ADAP_plus			-0.7344	0.5556	71204	-1.32	0.1862
Age * Insurance			70_plus			Any_Medicare			0.2959	0.4829	71204	0.61	0.54
Age * Insurance			70_plus			Medicaid			-0.1886	0.4018	71204	-0.47	0.6388
Age * Insurance			70_plus			Missing			0.7504	0.5549	71204	1.35	0.1763
Age * Insurance			70_plus			Other_or_unknown			0.7523	0.424	71204	1.77	0.076
Age * Insurance			70_plus			Private			0	.	.	.	.
Age * Insurance			Under_25			ADAP_plus			0	.	.	.	.
Age * Insurance			Under_25			Any_Medicare			0	.	.	.	.
Age * Insurance			Under_25			Medicaid			0	.	.	.	.
Age * Insurance			Under_25			Missing			0	.	.	.	.
Age * Insurance			Under_25			Other_or_unknown			0	.	.	.	.
Age * Insurance			Under_25			Private			0	.	.	.	.
Diagnosis * Insurance					Newly_diagnosed	ADAP_plus			0.1227	0.2038	71204	0.6	0.5472
Diagnosis * Insurance					Newly_diagnosed	Any_Medicare			-0.2331	0.2747	71204	-0.85	0.396
Diagnosis * Insurance					Newly_diagnosed	Medicaid			0.3904	0.1525	71204	2.56	0.0105
Diagnosis * Insurance					Newly_diagnosed	Missing			0.3223	0.3379	71204	0.95	0.3402
Diagnosis * Insurance					Newly_diagnosed	Other_or_unknown			0.5109	0.1504	71204	3.4	0.0007
Diagnosis * Insurance					Newly_diagnosed	Private			0	.	.	.	.
Diagnosis * Insurance					Prev_dx_or_unknown	ADAP_plus			0	.	.	.	.

Diagnosis * Insurance					Prev_dx_or_unknown	Any_Medicare			0	.	.	.	.
Diagnosis * Insurance					Prev_dx_or_unknown	Medicaid			0	.	.	.	.
Diagnosis * Insurance					Prev_dx_or_unknown	Missing			0	.	.	.	.
Diagnosis * Insurance					Prev_dx_or_unknown	Other_or_unknown			0	.	.	.	.
Diagnosis * Insurance					Prev_dx_or_unknown	Private			0	.	.	.	.
Facility Type							DAC		0.5917	0.1532	71204	3.86	0.0001
Facility Type							DTC		0.293	0.207	71204	1.42	0.1569
Facility Type							Large CHC		0.4786	0.148	71204	3.23	0.0012
Facility Type							Med. CHC		0.5569	0.1521	71204	3.66	0.0003
Facility Type							Other large		0.547	0.2581	71204	2.12	0.0341
Facility Type							Other med.		0.2729	0.2358	71204	1.16	0.2471
Facility Type							Small site		0	.	.	.	.
Region								NYC	-0.2822	0.1131	71204	-2.5	0.0126
Region								ROS	0	.	.	.	.