

Annual HIV Viral Load Analysis Protocol Report

Indianapolis Transitional Grant Area

CY 2018



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ABBREVIATIONS USED

ART	Antiretroviral therapy
CDC	Centers for Disease Control and Prevention
c/mL	Copies per milliliter
CQM	Clinical quality management
CVL	Community viral load
eHARS	Enhanced HIV/AIDS Reporting System
GM	Geometric mean
HRSA	Health Resources and Services Administration
IDU	Injection drug use
LLD	Lower limit of detection
MAI	Minority AIDS Initiative
MSM	Men who have sex with men
MVL	Monitored viral load
NHAS	National HIV/AIDS Strategy
PLWH/A	People living with HIV/AIDS
RISE	Ryan White Information Services Enterprise
RWSP	Ryan White HIV Services Program
TGA	Transitional grant area
ULD	Upper limit of detection
VLAP	Viral Load Analysis Protocol

BACKGROUND

The Ryan White HIV Services Program (RWSP) is managed by the Marion County Public Health Department, a division of Health & Hospital Corporation of Marion County. RWSP is comprised of Ryan White Part A, Minority AIDS Initiative (MAI), and Part C funding. The RWSP has received Part C funding since 1991, and Part A/MAI funding since 2007.

The RWSP is designed to address the needs of people living with HIV in central Indiana, including those out of care and/or those who are historically underserved or uninsured. The program helps clients who are out-of-care to gain access to points of entry; provides a comprehensive HIV continuum of care; and complies with the National HIV/AIDS Strategy (NHAS).¹ The RWSP seeks to increase access to and utilization of core medical and support services; and helps clients remain in care in order to optimize health outcomes, decrease disparities in access to care, reduce individual and community viral loads, and improve the quality of life for residents living with HIV.

The ultimate measure of health for people living with HIV is suppressed viral load. Evaluating community viral load (CVL) – an average viral load taken from among all PLWH/A in a defined population – is imperative to serving those living with this infection. The RWSP has historically evaluated viral load among HIV-positive residents of its transitional grant area (TGA); however, confidence intervals tended to be too wide for group comparisons. Without the ability to confidently evaluate differences in viral load by population grouping, disparities in HIV viral load could not be reported. A root cause analysis was conducted during the 2016-2017 grant year which led to changes in viral load analysis methods as the RWSP Clinical Quality Management (CQM) Committee worked with the RWSP Epidemiologist to determine a method that would provide more useable data. The result was development of the RWSP's Viral Load Analysis Protocol (VLAP) in 2017, followed by the Viral Load Protocol Reports for calendar year (CY) 2016 and 2017. It is the intention of the RWSP to revise and reproduce this report annually.

An individual with less than 200 HIV RNA copies per milliliter (c/mL) of blood is considered to have a suppressed viral load, an indication of successful HIV treatment.² The term undetectable is used to describe a result below the level at which a lab instrument can reliably quantify HIV viral load. This is known as the lower limit of detection (LLD). Similarly, laboratory instruments have an upper limit of detection (ULD), above which a result is not quantified.

Currently, most laboratories use instruments that can detect 20 to 50 c/mL. Because results falling under the LLD cannot be quantified, the term undetectable is used. LLD and ULD vary by instrument type. In addition, laboratories may use a variety of conventions, including the use of zero (0) or the "less than" symbol (e.g., <50). In order to standardize lab results and facilitate more accurate statistical analyses, results reported as less than a given laboratory's LLD (e.g., <50) or ULD (e.g., >75,000), including 0 and regardless of convention, are recoded with a simple

¹ White House Office of National AIDS Policy. (2015). National HIV/AIDS strategy for the United States: Updated to 2020. <https://www.aids.gov/federal-resources/national-hiv-aids-strategy/nhas-update.pdf>

² CDC. (2014). Vital signs: HIV diagnosis, care, and treatment among persons living with HIV – United States, 2011. <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6347a5.htm>

numeric value using the conversion methodology recommended in the Centers for Disease Control and Prevention's (CDC) viral load analysis guidance as shown below.³

- Results of 0 c/mL are replaced with a value that is half the instrument's LLD
- Results less than the instrument's LLD are replaced with a value equal to half the LLD (Example: A report of <50 c/mL is transformed to 25 c/mL)
- Results more than the instrument's ULD are replaced with a value equal to the ULD plus 1 (Example: A report of >75,000 c/mL is transformed to 75,001 c/mL)

In order to normalize viral load data and tighten the confidence intervals for group comparisons, the CDC recommends doing comparisons using a geometric, rather than arithmetic, mean.³ The geometric mean (GM) is often used to evaluate data covering several orders of magnitude and is calculated using logarithmic transformation of individual viral load results. The CDC recommends its use when evaluating differences in viral load between groups of individuals by race, gender, etc. The rationale for use of the GM is that it helps to normalize viral load distribution, reducing the influence of outlying measurements such as extremely high viral load seen in those newly infected or presenting with multiple infections (e.g., viral hepatitis, sexually-transmitted infection). It is important to remember that the GM does not represent a true viral load. Instead, it may be used only as a comparison between groups.

INTRODUCTION

The VLAP Report is limited geographically to the Ryan White Part A TGA, a section of central Indiana comprised of Boone, Brown, Hamilton, Hancock, Hendricks, Johnson, Marion, Morgan, Putnam, and Shelby Counties. Data for the report (i.e., demographics, labs data) were acquired using information shared between local and state health departments and the CDC. These data are managed using the CDC's *Enhanced HIV/AIDS Reporting System (eHARS)*.⁴ Mandatory reporting and a strong health information exchange permits confidence in this data. Geocoding was performed by the Marion County Public Health Department. Finally, RWSP service utilization was captured using *Ryan White Information Services Enterprise (RISE)* software.⁵ Ryan White clients were enrolled at some point for the calendar year of interest and received Part A/C/MAI services. Group wise comparison by race/ethnicity, gender, age, risk, and county was obtained from eHARS. Care site data for Ryan White clients was obtained from RISE. Care continuum information was obtained via eHARS.

Outcomes along the HIV continuum of care have steadily improved in the TGA. The percentage of PLWH/A with a suppressed viral load increased from 54% in 2014 to 62% in 2018, leading to a subsequent decrease in CVL. The significance of the decreasing CVL is illustrated by a comparison of GM viral load seen in Figure 1. While CVL is decreasing in the TGA, improved health outcomes are not distributed equitably. The goal of this report is to identify these disparities in order to arm core medical and supportive care providers with the knowledge necessary to focus resources to address them. The disparities noted herein will be presented to

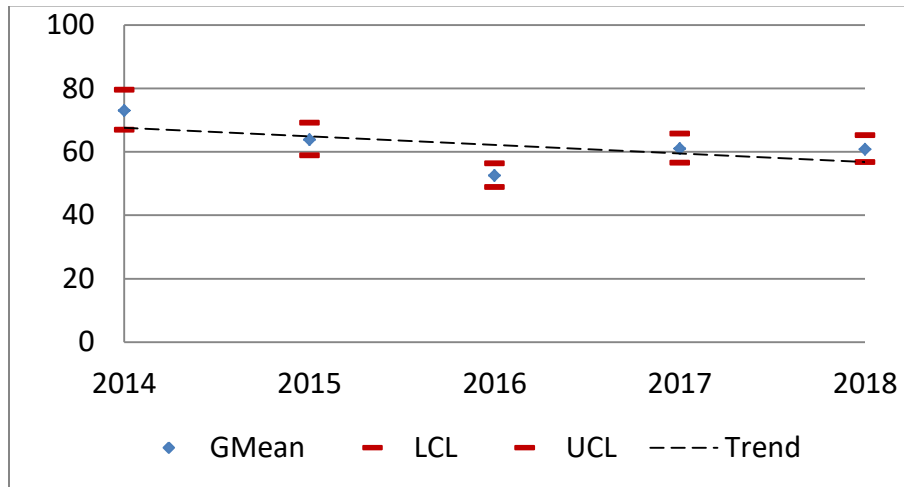
³ CDC. (2011). Guidance on community viral load: A family of measures, definitions, and method for calculation. http://www.ct.gov/dph/lib/dph/aids_and_chronic/surveillance/statewide/community_viralload_guidance.pdf

⁴ CDC. (2019). Enhanced HIV/AIDS reporting system (eHARS).

⁵ Health & Hospital Corp. of Marion County. (2019). Ryan White information services enterprise (RISE). Available from Marion County Public Health Department, Ryan White HIV Services Program: Indianapolis.

the RWSP’s Part A/MAI CQM Committee and Planning Council, as well as Part A/MAI/C sub-recipients.

Figure 1: Geometric Mean Viral Load among Indianapolis TGA Residents with Diagnosed HIV who received at least One Viral Load Test and was Alive on 31-DEC: 2014-2018



Note that geometric mean does not represent a true viral load. It is a mathematical function used to limit the effect of wide variation in results, narrowing confidence limits so that statistical comparisons can be made. Pearson correlation coefficient omitted because was not significant.

GROUP COMPARISONS

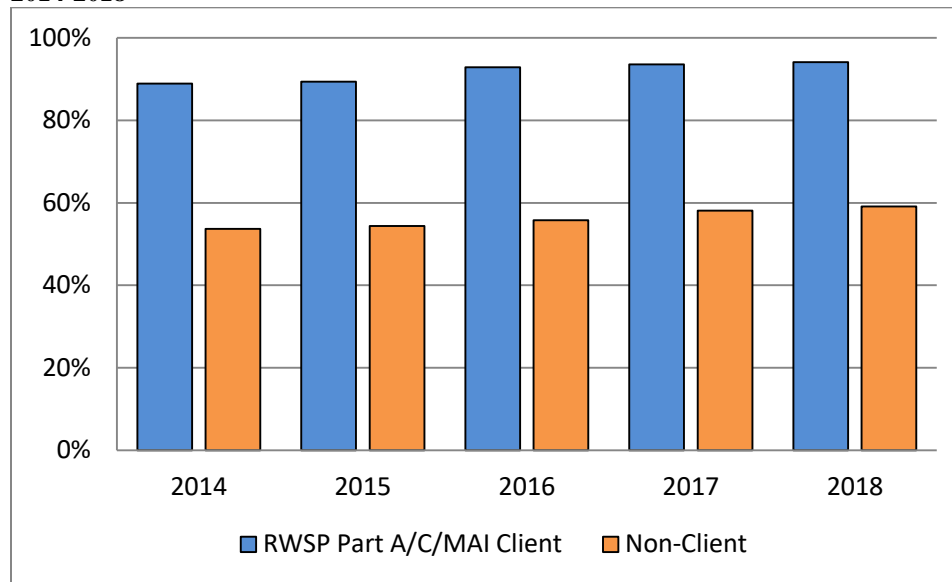
Snapshot 1 – Engagement

Table 1: Engagement in Care among PLWH/A in the Indianapolis TGA, by RWSP Client Status: 2018

People Living with HIV/AIDS 6,170	Persons In Care (≥ 1 CD4/VL) 4,589 – 74.4%	Enrollees In Care	2,530 – 41.0%
		Non-Enrollees in Care	2,059 – 33.4%
	Persons Out of Care (no CD4/VL) 1,581 – 25.6%	Enrollees Out of Care	157 – 2.5%
		Non-Enrollees Out of Care	1,424 – 23.8%

Unmet need – defined as people living with HIV/AIDS (PLWH/A) in the Indianapolis TGA but not receiving at least one CD4 and/or viral load test in any given year – has declined substantially since Part A/MAI funding was initially received in 2007, from 43.8% to 25.6%. During 2018, 74.4% of the TGA’s PLWH/A were in care (Table 1). When evaluated by Part A/MAI/C enrollment status, enrollees were at least 11 times more likely (OR=11.1; 95% CI: 9.3-13.3) to have been in care than non-enrollees, at 94% (2,530 of 2,687) versus 59% (2,059 of 3,589), respectively. CY 2018 was similar to prior years, with the proportion of enrollees in care consistently exceeding the proportion of non-enrollees in care (Figure 2).

Figure 2: Engagement in Care among PLWH/A in the Indianapolis TGA, by Year and RWSP Client Status: 2014-2018



Snapshot 2 – Basic Monitored Viral Load

Monitored viral load (MVL) is limited to PLWH/A who received a viral load test during the measurement year. Because it can be reliably calculated, MVL serves as a good indicator of the level of care being received by those who are medically engaged. The CDC notes that MVL, if measured over time, can, “reflect the combined access and adherence to antiretroviral therapy at a population-based level.”⁶

During 2018, about 61.6% of the TGA’s PLWH/A were virally suppressed. This exceeds the CDC’s most recent report of viral suppression nationally (59.8%).⁷ The NHAS goal is that at least 80% of people diagnosed with HIV be virally suppressed.⁸ The ultimate outcome in terms of gauging HIV care in the TGA is viral load suppression, and despite exceeding national results, there remains room for improvement in the TGA.

Beginning in 2014 to 2017, among PLWH/A in-care, non-enrollees were less likely to have had a suppressed viral load than enrollees; and GM viral load was lower among enrollees (Figure 2). However, during 2018, 85.8% of in-care non-enrollees had a suppressed viral load, as compared to 83.5% of in-care enrollees (OR=1.18; 95% CI: 1.0-1.4). The year prior (2017) had 83.9% of in-care non-enrollees with a suppressed viral load and 85.9% of in-care enrollees (OR=0.85; 95% CI: 0.72-1.0). Both geometric and arithmetic mean viral load among PLWH/A with at least one viral load test during 2014 and 2015 was significantly higher among non-enrollees than among enrollees (P<.05).

⁶ CDC. (2011). Guidance on community viral load: A family of measures, definitions, and method for calculation. http://www.ct.gov/dph/lib/dph/aids_and_chronic/surveillance/statewide/community_viralload_guidance.pdf

⁷ CDC. (2018). Monitoring selected national HIV prevention and care objectives by using HIV surveillance data - United States and 6 dependent areas - 2016. *HIV Surveillance Supplemental Report*, 23(4).

⁸ White House Office of National AIDS Policy. (2015). National HIV/AIDS strategy for the United States: Updated to 2020. <https://www.aids.gov/federal-resources/national-hiv-aids-strategy/nhas-update.pdf>

It is important to note that this is among individuals in-care (at least CD4/VL test during period of interest) and our clients are much more likely to be in care at 94.1% of enrollees in-care vs. 59.1% of non-enrollees in-care (OR=11.1; 95% CI: 9.4-13.3), as mentioned in Snapshot 1.

Table 2: Geometric and Arithmetic Viral Load among PLWH/A with at Least One Viral Load Test in the Indianapolis TGA, by RWSP Client Status: 2018

No. of Enrollees with at Least One VL 2530	Arithmetic Mean Viral Load 10835 c/mL 95% CI: 8234-13436 c/mL Geometric Mean Viral Load 61 c/mL 95% CI: 56-67 c/mL	Enrollees < 50 c/mL	1908 – 76.2%
		Enrollees ≥ 50 c/mL	390 – 23.8%
No. of Non-Enrollees with at Least One VL 2059	Arithmetic Mean Viral Load 16687 c/mL 95% CI: 12768-20605 c/mL Geometric Mean Viral Load 60 c/mL 95% CI: 54-67 c/mL	Enrollees < 200 c/mL	2092 – 83.5%
		Enrollees ≥ 200 c/mL	412 – 16.4%
No. of Non-Enrollees with at Least One VL 2059	Arithmetic Mean Viral Load 16687 c/mL 95% CI: 12768-20605 c/mL Geometric Mean Viral Load 60 c/mL 95% CI: 54-67 c/mL	Non-Enrollees < 50 c/mL	1596 – 80%
		Non-Enrollees ≥ 50 c/mL	400 – 20%
No. of Non-Enrollees with at Least One VL 2059	Arithmetic Mean Viral Load 16687 c/mL 95% CI: 12768-20605 c/mL Geometric Mean Viral Load 60 c/mL 95% CI: 54-67 c/mL	Non-Enrollees < 200 c/mL	1712 – 85.8%
		Non-Enrollees ≥ 200 c/mL	284 – 14.2%

Figure 3: Suppressed Viral Load among PLWH/A in the Indianapolis TGA with at Least One Viral Load Test, by Year and RWSP Client Status: 2014-2018

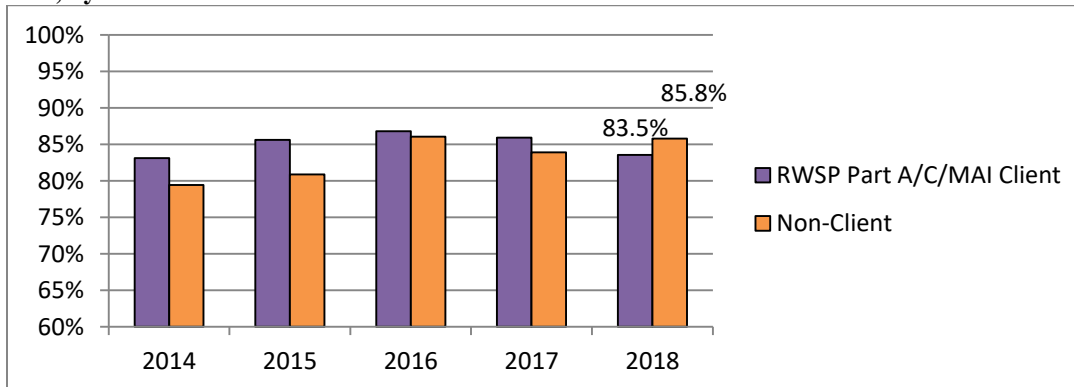
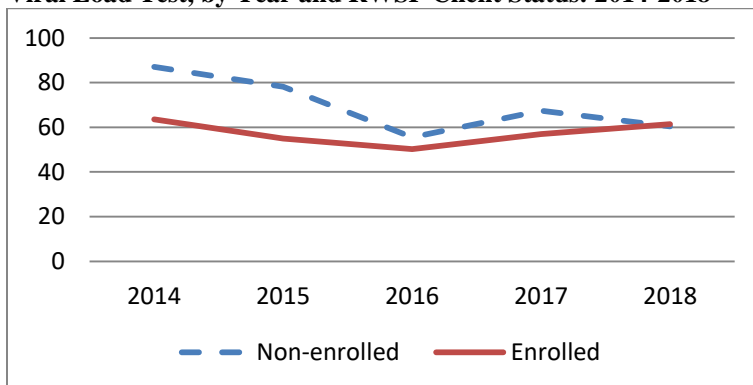


Figure 4: Trend in Geometric Mean Viral Load among PLWH/A in the Indianapolis TGA with at Least One Viral Load Test, by Year and RWSP Client Status: 2014-2018



Note that geometric mean does not represent a true viral load.

Snapshot 3 – Suppression by Race

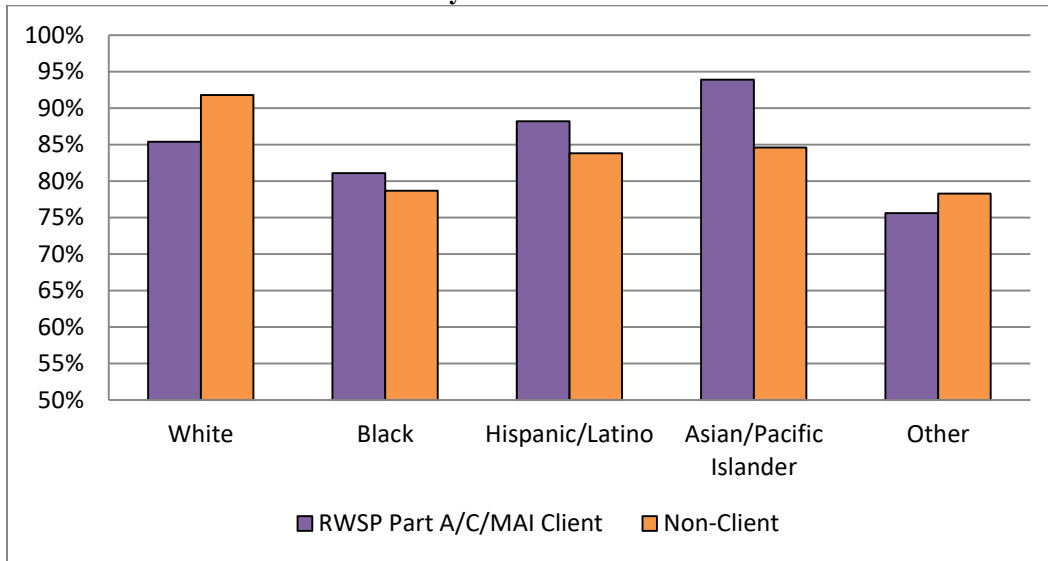
Racial disparities in HIV diagnosis and care have been an ongoing concern in the TGA. Racial/ethnic minorities have a higher prevalence of undiagnosed HIV and are least likely to be linked to care in a timely fashion.⁹ Hispanics are at highest risk with nearly three in ten (32.4%) newly diagnosed Hispanics during 2018 (11 of 34 total new diagnoses) in the TGA having received an AIDS diagnosis within 90 days, indicating they were diagnosed late. African Americans and people of ‘Other’ races/ethnicities (i.e., Native American/Alaskan, multiracial) have a lower likelihood of viral suppression, despite care status. Among enrollees in care during 2018, White, Hispanic, and Asian/Pacific Islander residents experienced viral load suppression exceeding 85%; whereas, African Americans and Others achieved only 81.1% and 75.6% suppression, respectively (Table 3). GM viral load comparisons also reflect these disparities (Table 3, Figure 5). Findings were similar among non-enrollees in care; however, White individuals were more likely to be virally suppressed if not enrolled in Part A/MAI/C services than their client peers (91.8% vs. 85.4%).

Table 3: Viral Load Suppression among PLWH/A with at Least One Viral Load Test in the Indianapolis TGA, by RWSP Client Status and Race/Ethnicity: 2018

Enrollees				
	In Care (N)	Suppressed (N)	Suppressed (%)	GM VL (c/mL)
White	829	708	85.4	53 (95% CI: 46-61)
Black	1252	1016	81.1	72 (95% CI: 63-82)
Hispanic	238	210	88.2	49 (95% CI: 38-64)
Asian/Pacific Isl.	99	93	93.9	29 (95% CI: 23-36)
Other	86	65	75.6	107 (95% CI: 58-198)
Non-Enrollees				
	In Care (N)	Suppressed (N)	Suppressed (%)	GM VL (c/mL)
White	1008	926	91.8	39 (95% CI: 35-44)
Black	759	597	78.7	98 (95% CI: 80-120)
Hispanic	130	109	83.8	80 (95% CI: 49-131)
Asian/Pacific Isl.	39	33	84.6	72 (95% CI: 30-176)
Other	60	47	78.3	97 (95% CI: 46-206)

⁹ CDC. (2018). Monitoring selected national HIV prevention and care objectives by using HIV surveillance data - United States and 6 dependent areas - 2016. *HIV Surveillance Supplemental Report*, 23(4).

Figure 5: Suppressed Viral Load among Indianapolis TGA Residents with at Least One Viral Load Test, by RWSP Client Status and Race/Ethnicity: 2018



Snapshot 4 – Suppression by Gender

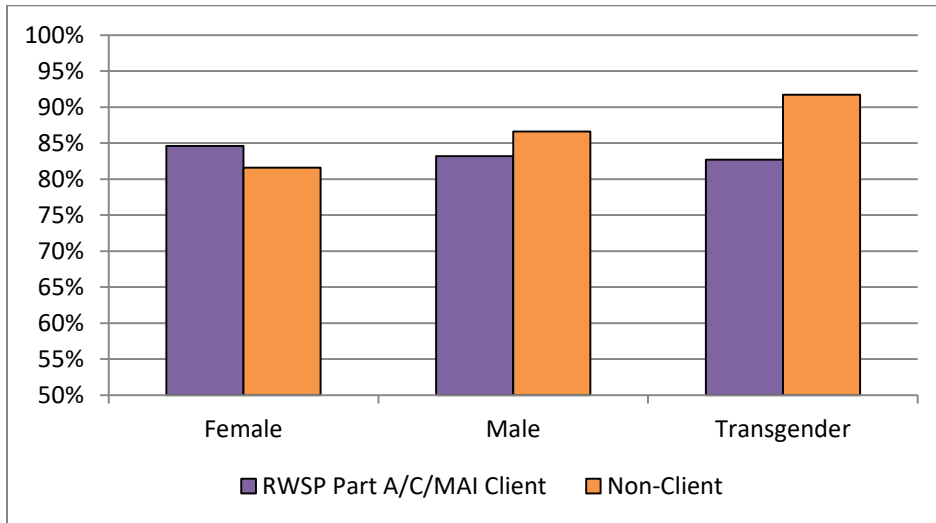
When evaluated by gender and enrollment status, there is no significant difference in viral suppression between male and female enrollees, and enrollees of all genders were more likely to be suppressed than non-enrollees (Table 4). There is a significant disparity overall among the non-enrollees, however, in that women (81.5%) are less likely than men (86.6%) to have a suppressed viral load and transgender most likely for 2018 (91.7%). This disparity is not apparent in the enrollees group. The most significant disparity seen by gender is between enrolled and non-enrolled transgender persons. While only 82.7% of transgender enrollees were virally suppressed during 2018, only 91.7% of non-enrolled transgender PLWH/A had a suppressed viral load (Table 4). This difference is illustrated in Figure 6.

Table 4: Viral Load Suppression among PLWH/A with at Least One Viral Load Test in the Indianapolis TGA, by RWSP Client Status and Gender: 2018

Enrollees				
	In Care (N)	Suppressed (N)	Suppressed (%)	GM VL (c/mL)
Female	585	495	84.6	56 (95% CI:47-67)
Male	1867	1554	83.2	63 (95% CI: 57-70)
Transgender	52	43	82.7	* (95% CI: 34-131)
Non-Enrollees				
	In Care (N)	Suppressed (N)	Suppressed (%)	GM VL (c/mL)
Female	347	283	81.5	82 (95% CI: 61-109)
Male	1637	1418	86.6	57 (95% CI:51-64)
Transgender	12	11	91.7	* (95% CI: 16-91)

* Point estimate suppressed due to excessively wide confidence interval

Figure 6: Suppressed Viral Load among Indianapolis TGA Residents with at Least One Viral Load Test, by RWSP Client Status and Gender: 2018



Snapshot 5 – Suppression by Age

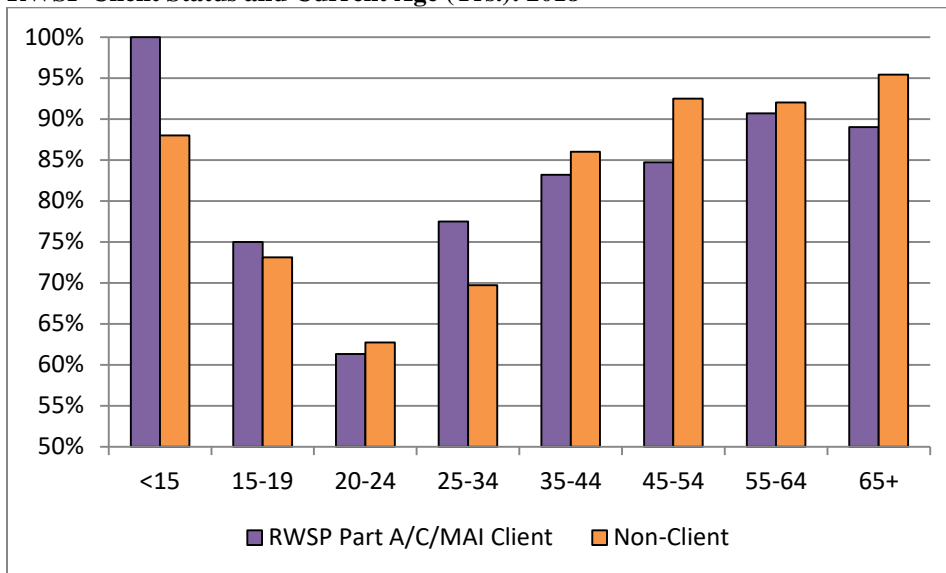
Age is one of the most reliable predictors of viral suppression among those in HIV care. Those 15-34 are least likely to be virally suppressed (Table 5). Young adults experience this poor outcome for a variety of reasons. Although they are not most at risk for late diagnosis, they were least likely to be linked to care within 90 days. Also, those newly infected tend to have extremely high viral loads. Viral suppression tends to increase after 34 years of age (Figure 7).

Table 5: Viral Load Suppression among PLWH/A with at Least One Viral Load Test in the Indianapolis TGA, by RWSP Client Status and Current Age (Yrs.): 2018

Enrollees				
	In Care (N)	Suppressed (N)	Suppressed (%)	GM VL (c/mL)
<15	3	5	100.0	*
15-19	8	6	75.0	* (95% CI: 14-581)
20-24	75	42	61.3	228 (95% CI: 115-454)
25-34	510	342	77.5	95 (95% CI: 75-119)
35-44	583	443	83.2	66 (95% CI: 54-81)
45-54	679	580	84.7	54 (95% CI: 45-63)
55-64	483	392	90.7	38 (95% CI: 33-44)
≥65	146	110	89.0	42 (95% CI: 31-57)
Non-Enrollees				
	In Care (N)	Suppressed (N)	Suppressed (%)	GM VL (c/mL)
<15	25	22	88.0	* (95% CI: 16-104)
15-19	26	19	73.1	* (95% CI: 40-328)
20-24	75	47	62.7	* (95% CI: 114-716)
25-34	353	246	69.7	194 (95% CI: 137-276)
35-44	349	300	86.0	63 (95% CI: 49-82)
45-54	532	492	92.5	38 (95% CI: 32-42)
55-64	477	439	92.0	38 (95% CI: 32-45)
≥65	151	144	95.4	28 (95% CI: 23-35)

* Point estimate suppressed due to excessively wide confidence interval

Figure 7: Suppressed Viral Load among Indianapolis TGA Residents with at Least One Viral Load Test, by RWSP Client Status and Current Age (Yrs.): 2018



Snapshot 6 – Suppression by Risk

Risk is the HIV exposure category reported by PLWH/A. Nearly 80% (3,575 of 4,500) of the TGA’s PLWH/A who were in care during 2018 were men who had sex with men (MSM) or those who contracted HIV via heterosexual activity. Among enrollees, persons reporting injection drug use (IDU) or heterosexual HIV risk were most likely to have a suppressed viral load, at 84.4% and 86.6%, respectively (Table 6, Figure 8). Enrollees exposed perinatally or via MSM and IDU (both risks reported) were least likely to be suppressed; however, the distribution of viral load among the perinatal group were such that even GM viral load had a range too wide to be significant. Similarly, non-enrollees exposed perinatally or MSM and IDU (combined) were least likely to have a suppressed viral load among non-enrollees, but the perinatal group had such wide GM viral load ranges that CVL differences were insignificant. While this evaluation gives the illusion that HIV risk is not a good predictor of CVL, some key facts are missing.

A larger proportion of MSM are thought to be living with undiagnosed HIV than any other group. In fact, 10% of MSM are thought to be HIV-positive, and 19% are thought to be undiagnosed.^{10,11} Young MSM (13-24) suffer greatest, with 23% thought to be undiagnosed and unaware. While targeted prevention efforts and a concentration of resources (e.g., targeted testing and prevention) have maintained the health outcomes of those diagnosed and in HIV care, many HIV-positive MSM are thought to be in need of diagnosis and linkage to care.

¹⁰ CDC. (2018). Estimated HIV Incidence and Prevalence in the United States 2010-2015. *HIV Surveillance Supplemental Report*, 23(1).

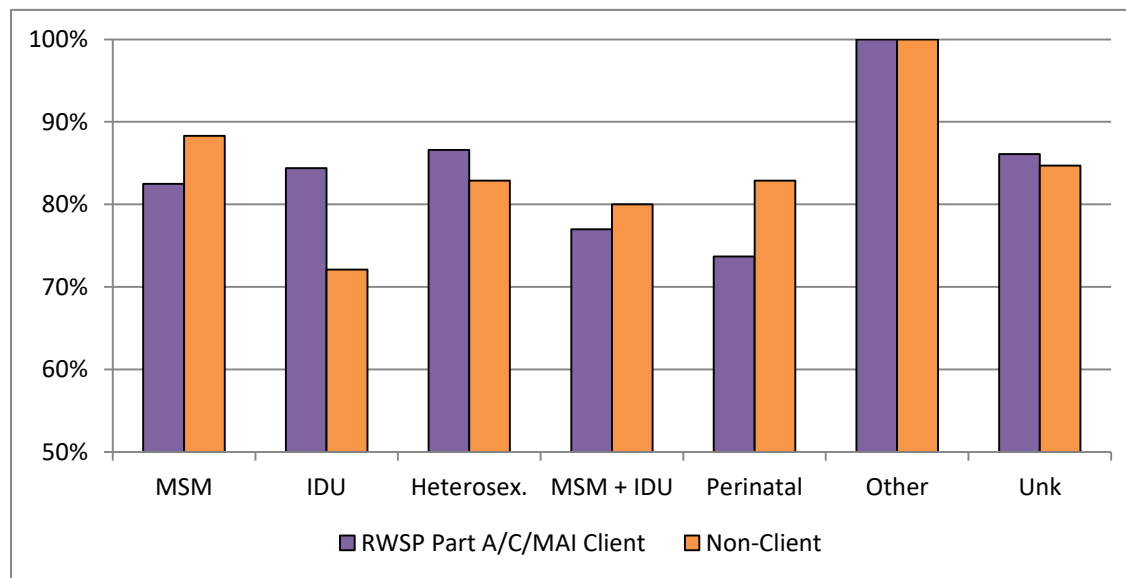
¹¹ CDC. (2015). Fact sheet: HIV among gay and bisexual men. <https://www.cdc.gov/nchstp/newsroom/docs/factsheets/cdc-msm-508.pdf>

Table 6: Viral Load Suppression among PLWH/A with at Least One Viral Load Test in the Indianapolis TGA, by RWSP Client Status and HIV Exposure Category: 2018

Enrollees				
	In Care (N)	Suppressed (N)	Suppressed (%)	GM VL (c/mL)
MSM	1378	1337	82.5	66 (95% CI: 58-75)
IDU	122	103	84.4	55(95% CI: 37-83)
Heterosexual	612	530	86.6	50 (95% CI: 42-59)
MSM+IDU	148	114	77.0	87 (95% CI: 57-134)
Perinatal	19	14	73.7	* (95% CI: 35-728)
Other	2	2	100	*(All undetectable)
Unknown	223	192	86.1	54 (95% CI: 40-72)
Non-Enrollees				
	In Care (N)	Suppressed (N)	Suppressed (%)	GM VL (c/mL)
MSM	1194	1054	88.3	49 (95% CI: 43-55)
IDU	86	62	72.1	191 (95% CI: 89-408)
Heterosexual	391	324	82.9	75 (95% CI: 57-98)
MSM+IDU	75	60	80.0	104 (95% CI: 53-204)
Perinatal	41	34	82.9	* (95% CI: 29-170)
Other	6	6	100	27 (95% CI: 15-46)
Unknown	203	172	84.7	70(95% CI: 49-101)

* Point estimate suppressed due to excessively wide confidence interval

Figure 8: Suppressed Viral Load among Indianapolis TGA Residents with at Least One Viral Load Test, by RWSP Client Status and HIV Exposure Category: 2018



Snapshot 7 – Suppression by County

Among non-enrollees who were in care during 2018, the lowest percentage of suppressed viral load by resident county was that of Shelby, at 50%. On the other hand, among enrollees, the lowest percentage was that of Johnson at 82%. Notably, viral load suppression among Shelby County enrollees together was one of the highest, at 100% (Table 7, Figure 9). This is likely related to Shelby County residents receiving care from a provider that is not affiliated

with the RWSP; however, the distribution of viral load among the Shelby non-enrollees were such that GM viral load had a range too wide to be significant. Similar to the evaluation by HIV risk, it appears that county of residence alone is not a reliable predictor of viral load suppression among those receiving HIV care.

Distance is a barrier to some residents of the TGA's outlying counties because most of the TGA's provider networks are located in Marion County. Many PLWH in outlying counties must travel significant distances to access testing, medical and support services. Given these barriers, recent increases in insurance and medical transportation access led to no significant difference in CVL among residents in the outlying counties during 2018. It seems that the interplay of geography in the TGA is more complicated. This may best be illustrated by examining maps of GM viral load throughout the TGA and Marion County. It used to be that residents of the outlying TGA counties would have the highest CVL; however, we see in Figure 10 and Figure 11 that some of the lowest and highest GM viral loads are found throughout both Marion and the outlying counties. This is likely due to a relationship between proximity to care, access to insurance and transportation, and inner city poverty.

Table 7: Viral Load Suppression among PLWH/A with at Least One Viral Load Test in the Indianapolis TGA, by RWSP Client Status and County of Residence: 2018

Enrollees				
	In Care (N)	Suppressed (N)	Suppressed (%)	GM VL (c/mL)
Boone	11	9	81.8	43 (95% CI: 18-115)
Brown	0	0	0	* (All undetectable)
Hamilton	68	61	89.7	47 (95% CI: 27-80)
Hancock	18	16	88.9	* (95% CI: 21-165)
Hendricks	44	37	84.1	69 (95% CI: 31-154)
Johnson	50	41	82.0	60 (95% CI: 31-117)
Marion	2259	1878	83.1	62 (95% CI: 57-68)
Morgan	15	15	100	27 (95% CI: 19-38)
Putnam	15	14	93.3	44 (95% CI: 13-150)
Shelby	7	7	100	22 (95% CI: 18-28)
Non-Enrollees				
	In Care (N)	Suppressed (N)	Suppressed (%)	GM VL (c/mL)
Boone	23	19	82.6	60 (95% CI: 20-179)
Brown	7	7	100	25 (95% CI: 16-35)
Hamilton	144	134	93.1	37 (95% CI: 27-52)
Hancock	26	26	100	246 (95% CI: 20-29)
Hendricks	92	76	82.6	65 (95% CI: 39-105)
Johnson	72	66	91.7	45 (95% CI: 29-70)
Marion	1553	1323	85.2	63 (95% CI: 55-72)
Morgan	23	21	91.3	23 (95% CI: 17-81)
Putnam	36	31	86.1	* (95% CI: 36-175)
Shelby	12	6	50.0	* (95% CI: 53-6056)

* Point estimate suppressed due to excessively wide confidence interval

Figure 9: Suppressed Viral Load among Indianapolis TGA Residents with at Least One Viral Load Test, by RWSP Client Status and County of Residence: 2018

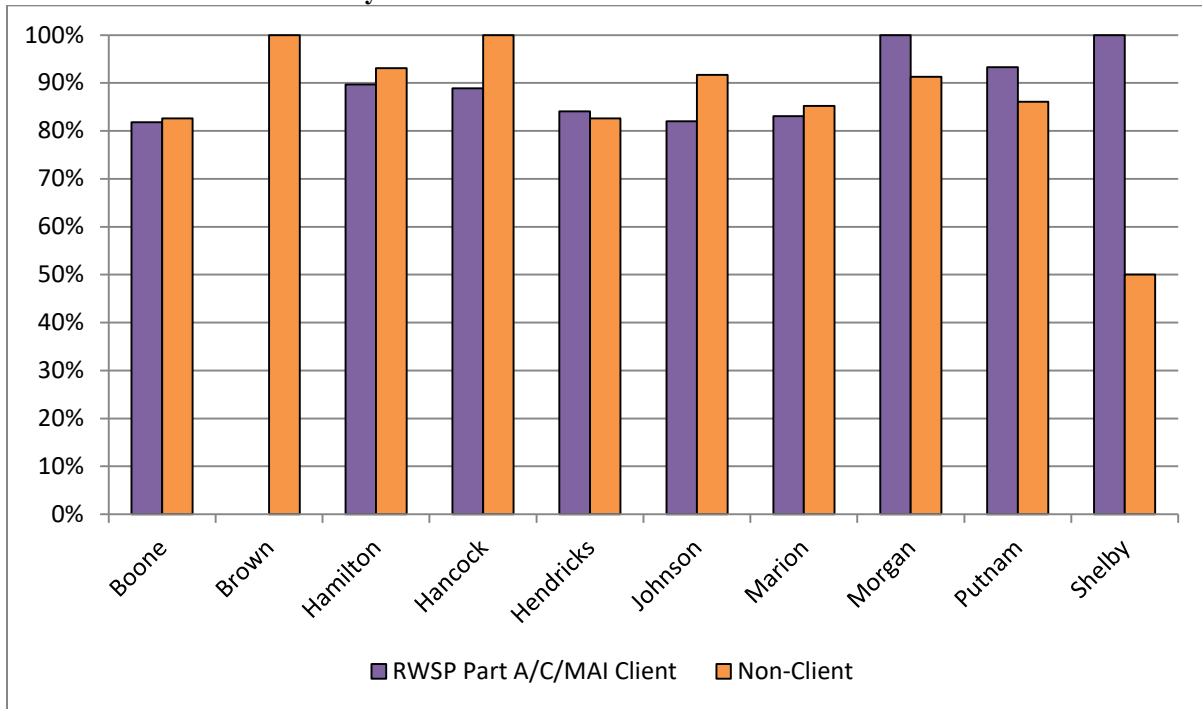


Figure 10

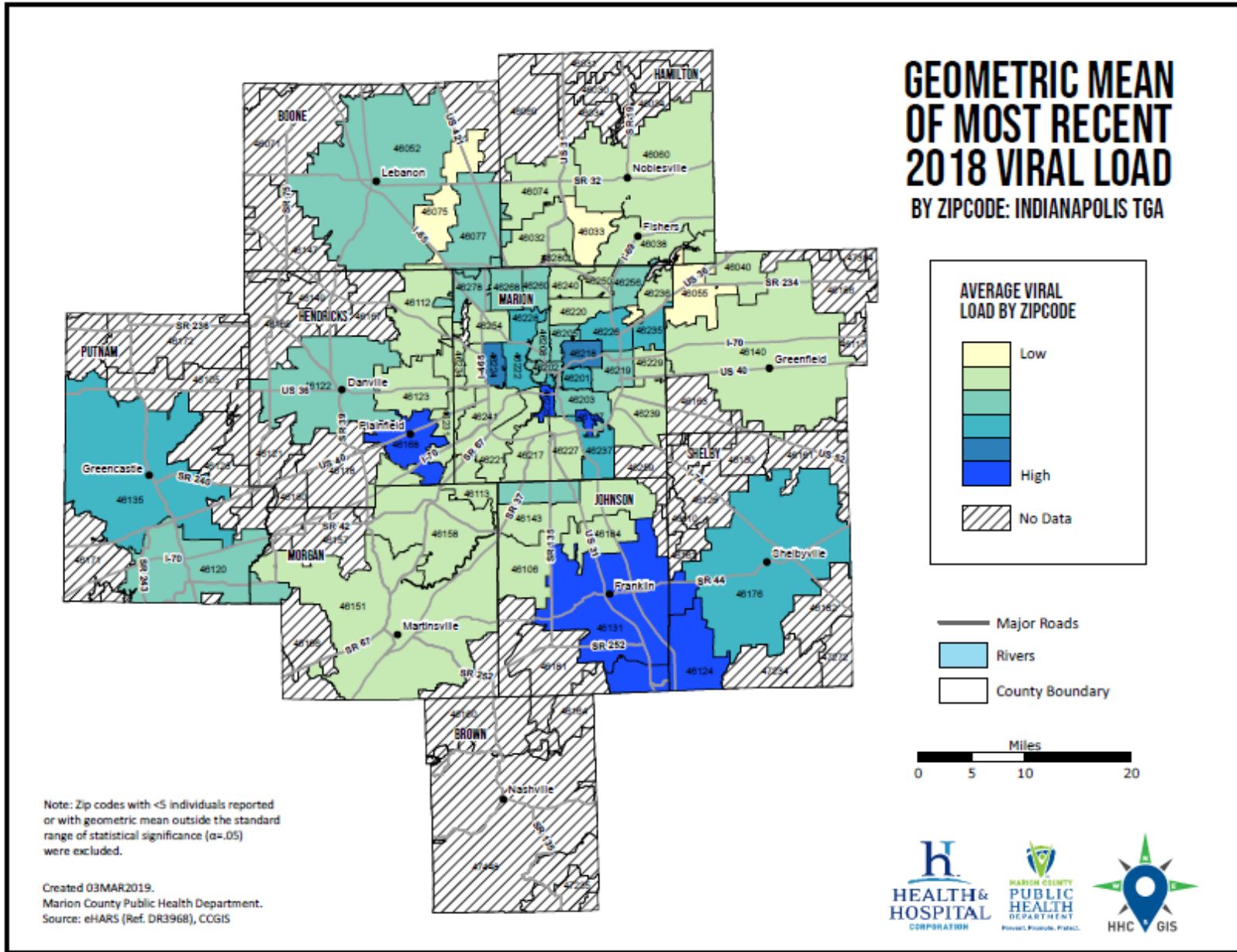
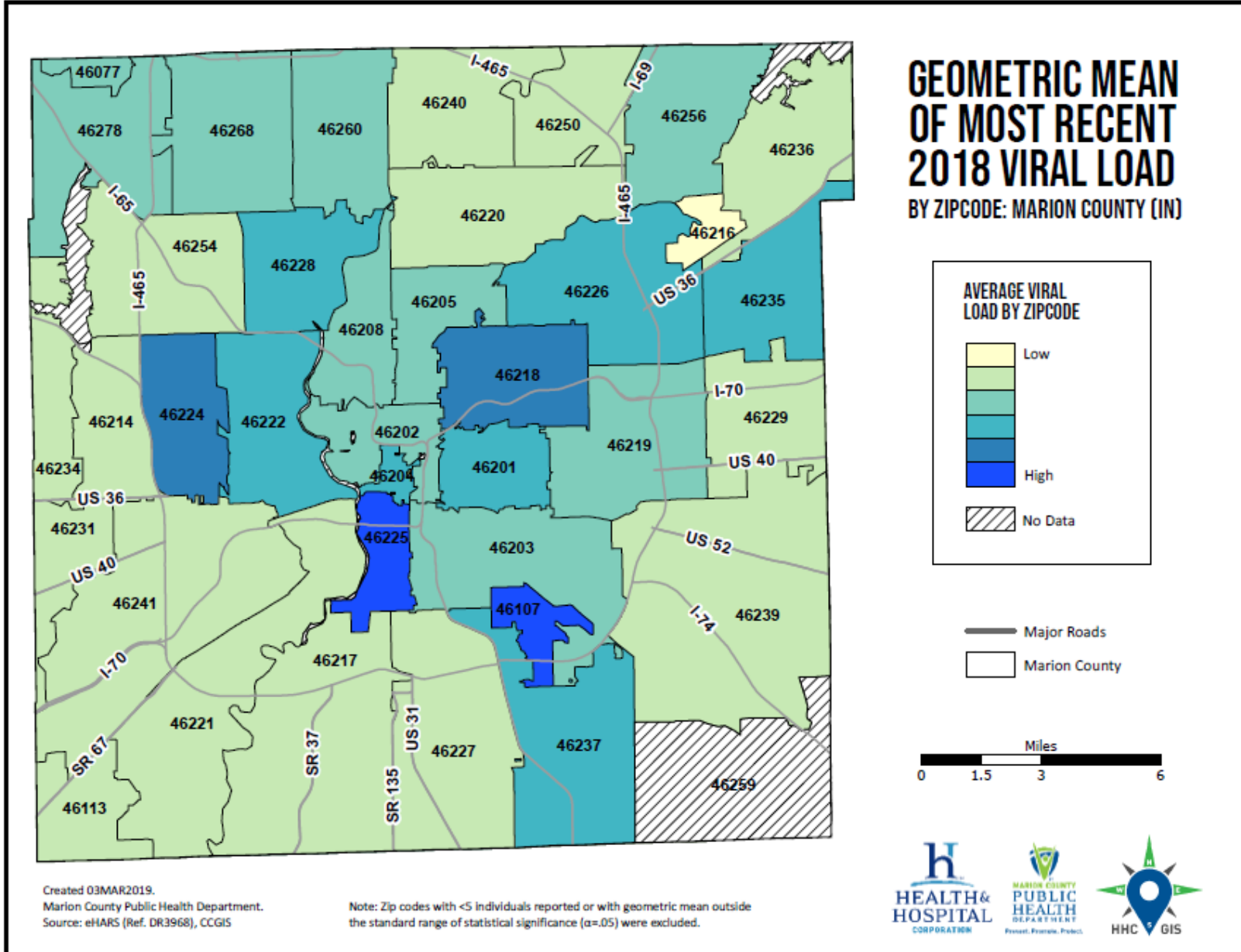


Figure 11



CARE CONTINUUM

In 2013, President Obama announced the HIV Care Continuum Initiative with the primary goal of improving the impact of HIV diagnosis and care efforts. To ascertain progress toward this goal, a series of independent milestones from diagnosis to successful treatment are measured. These milestones are collectively referred to as the HIV Care Continuum. As described in the introduction, most of the data for this report were acquired from eHARS. Outcomes of the TGA's care continuum are based on: Health Resources and Services Administration (HRSA) HIV/AIDS Bureau measures of linkage to care, ART, and suppressed viral load;^{12,13} and the CDC's retention in care definition recommended for states with complete laboratory reporting.¹⁴ Definitions used in the HIV care continuum are provided in Table 8.

Table 8: Definitions for the Continuum of Care in the Indianapolis TGA: 2018

Measure	Numerator	Denominator
Estimated Prevalence	Estimated number of PLWH/A, diagnosed or undiagnosed, who resided in the TGA during the year	Estimated number of PLWH/A, diagnosed or undiagnosed, who resided in the TGA during the year
Diagnosed	Number who have been diagnosed with HIV	Estimated number of PLWH/A, diagnosed or undiagnosed, who resided in the TGA during the year
Linked to Care	Number with first CD4/viral load test within 30 days (1 month) of diagnosis	Persons newly diagnosed with HIV during the measurement year
Retained in Care	Number with two or more CD4/viral load tests performed at least 3 months apart during the measurement year	Estimated number of PLWH/A, diagnosed, who resided in the TGA during the year
Prescribed ART	Number who are known to have received a prescription for antiretroviral therapy and at least one medical visit (w/VL test)	Estimated number of PLWH/A, diagnosed, who resided in the TGA during the year
Suppressed Viral Load	Number whose most recent HIV viral load test during the measurement year was <200 c/mL	Number of PLWH/A, diagnosed, with at least one medical visit (w/VL test) during the year and who resided in the TGA during the year

Table 9: Numerators and Denominators from the Continuum of Care among Indianapolis TGA Residents Living with HIV/AIDS: 2018

Measure	Numerator	Denominator	%
Estimated Prevalence	6972	6972	100
Diagnosed	6170	6972	88.5
Linked to Care	141	243	58.0
Retained in Care	2999	6170	48.6
Prescribed ART*	4143	4500	92.0
Suppressed Viral Load	3804	4500	82.6

¹² HRSA. (2017). HIV/AIDS Bureau: System performance measures.

<https://hab.hrsa.gov/sites/default/files/hab/clinical-quality-management/systemlevelmeasures-part1.pdf> and <https://hab.hrsa.gov/sites/default/files/hab/clinical-quality-management/systemlevelmeasures-part2.pdf>

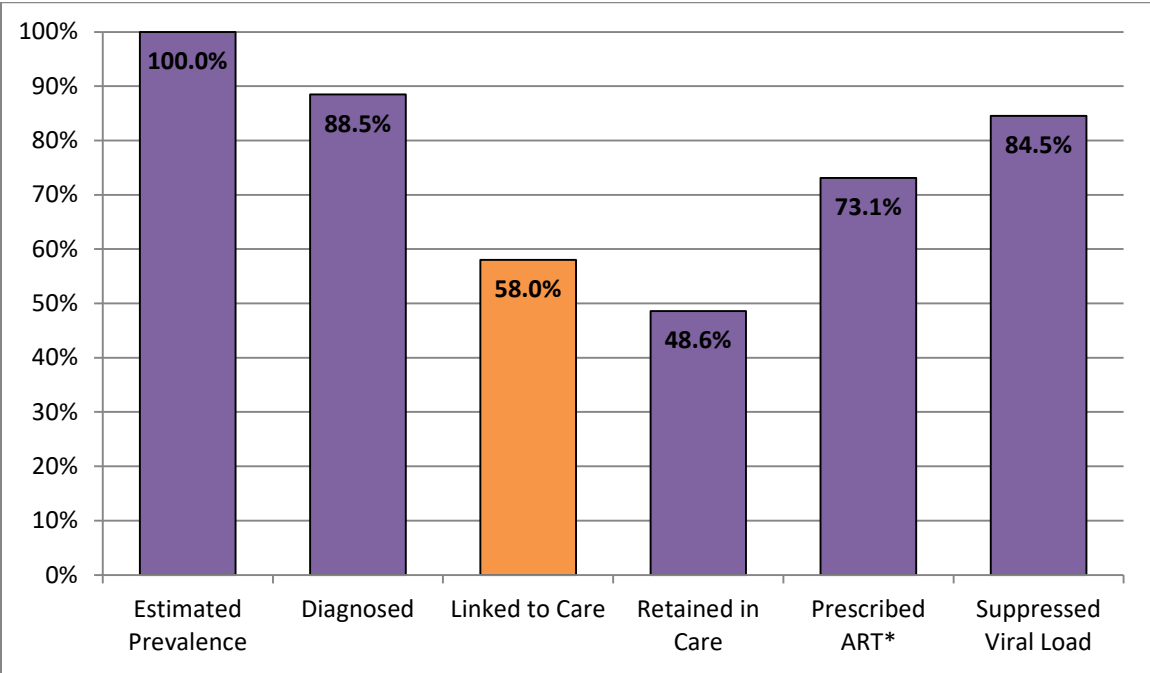
¹³ HRSA. (2017). HIV/AIDS Bureau: Core performance measures.

<https://hab.hrsa.gov/sites/default/files/hab/clinical-quality-management/coremeasures.pdf>

¹⁴ CDC. (2018). Understanding the HIV care continuum. <https://www.cdc.gov/hiv/pdf/library/factsheets/cdc-hiv-care-continuum.pdf>

* Estimated based on RWSP clients known to have received ART numbered and viral suppression of others.

Figure 12: HIV Continuum of Care among Indianapolis TGA Residents Living with HIV/AIDS: 2018



Estimated Prevalence and Diagnosed: The first measure in the TGA’s HIV continuum of care is estimated prevalence. Estimated prevalence is the total estimated number of people living with HIV, including those undiagnosed and unaware of their status. To estimate this number, the most recently estimated national proportion of undiagnosed HIV published by the CDC was used.¹⁵ Not knowing one’s HIV status is a major barrier along the HIV care continuum. The NHAS goal is that 90% of HIV-positive individuals be diagnosed and seroaware.¹⁶ Based on CDC estimates, 802 (13% of diagnosed) HIV-positive TGA residents are thought to be undiagnosed and unaware of their status. As a result, many people newly diagnosed with HIV enter care late in the disease process. While the TGA’s late diagnoses decreased 4% between 2012 (28%, N=57/204) and 2018 (24%, N=58/243), many HIV-positive residents still need to be tested and made aware of their status.

Linked to Care: Of individuals newly diagnosed with HIV in 2018, 58% were linked to care within 30 days. Additionally, 81% were linked within 90 days, exceeding statewide (80%)¹⁷ and national (82%)¹⁵ findings. Delayed linkage and poor engagement in care are associated with: increased risk of secondary HIV transmission; quicker progression to AIDS; drug resistance; and

¹⁵ CDC. (2018). Estimated HIV Incidence and Prevalence in the United States 2010-2015. *HIV Surveillance Supplemental Report*, 23(1).

¹⁶ White House Office of National AIDS Policy. (2015). National HIV/AIDS strategy for the United States: Updated to 2020. <https://www.aids.gov/federal-resources/national-hiv-aids-strategy/nhas-update.pdf>

¹⁷ Indiana State Department of Health and Marion County Public Health Department. (2016). Integrated HIV prevention and care plan for the state of Indiana. [https://www.in.gov/isdh/files/Final%20STATE%20OF%20INDIANA%20INTEGRATED%20PREVENTION%20AND%20CARE%20PLAN%202016\(a\).pdf](https://www.in.gov/isdh/files/Final%20STATE%20OF%20INDIANA%20INTEGRATED%20PREVENTION%20AND%20CARE%20PLAN%202016(a).pdf)

increased morbidity and mortality.^{18,19,20} It has even been argued that HIV screening without linkage to care “confers little or no benefit to the patient”.²¹ Although linkage to care in the TGA has been steadily increasing (Figure 13) and exceeds state and national reports, there is still room for improvement. The updated NHAS recommends that 85% be linked to care within 30 days which is included in Figure 14 (versus 90 days).

Retained in Care: Of 6,170 residents diagnosed with HIV at any time during 2018, only 48.6 % (N=2,999) were retained in care. This finding is approaching the national rate (53.8%),²² but is far below the NHAS goal of 90%. Furthermore, the proportion of PLWH/A in the TGA who were retained in care has increased over the previous five years (Figure 13). However, it did drop from 2017 to 2018 (from 53% to 51.4%).

Retention in care is thought to be underreported in the TGA. Medical visits are not reportable by law; therefore, only HIV labs can be used to reliably calculate this outcome. Furthermore, if an individual living with HIV faces high deductible or co-pays, attends regular HIV care visits, and is ART compliant, he or she may opt to receive only a single, annual viral load test to confirm continued suppression. So, while two CD4 or viral load tests are necessary to be considered retained in care, the healthiest of PLWH may opt for a single annual test.

Prescribed ART: Indiana providers are not required to report antiretroviral therapy (ART) to local health departments. For this reason, the continuum of care was supplemented with prescription data from CAREWare²³ electronic health records of Part A/MAI/C clients, and ART was estimated among non-RWSP clients based on proportionality of ART and viral suppression among clients. The number of RWSP Part A/MAI/C clients known to have received ART was 4,511 or 64.7% of the total estimated prevalence; however, 73.1% of diagnosed PLWH/A in the TGA are thought to have received ART.

Suppressed Viral Load: During 2018, 54.6% (N=3,804) of all diagnosed PLWH/A and 84.5% (N=3,804) of PLWH/A with at least one medical visit during the year in the TGA were virally suppressed. This exceeds the CDC’s most recent report of viral suppression nationally (59.8% among all diagnosed PLWH/A and 81.5% among people at least one viral load test),²² and viral suppression has been steadily increasing in the TGA (Figure 13). Moreover, the number of PLWH/A who have an undetectable viral load (<50 c/mL) has been increasing even more rapidly than those with a detectable, suppressed viral load (50 to <200 c/mL) (

¹⁸ U.S. Health & Human Services. (2013). Guidelines for the use of antiretroviral agents in HIV-1-infected adults and adolescents. <https://aidsinfo.nih.gov/contentfiles/lvguidelines/adultandadolescentgl.pdf>

¹⁹ Gardner, E.M., McLees, M.P., Steiner, J.F., Rio, C., and Burman, W.J. (2011). The spectrum of engagement in HIV care and its relevance to test-and-treat strategies for prevention of HIV infection. *Clin Infect Dis.* 2011;52(6): 793-800.

²⁰ CDC. (2011). Vital signs: HIV prevention through care and treatment – U.S. *MMWR.* 2011;60(47): 1618-1623.

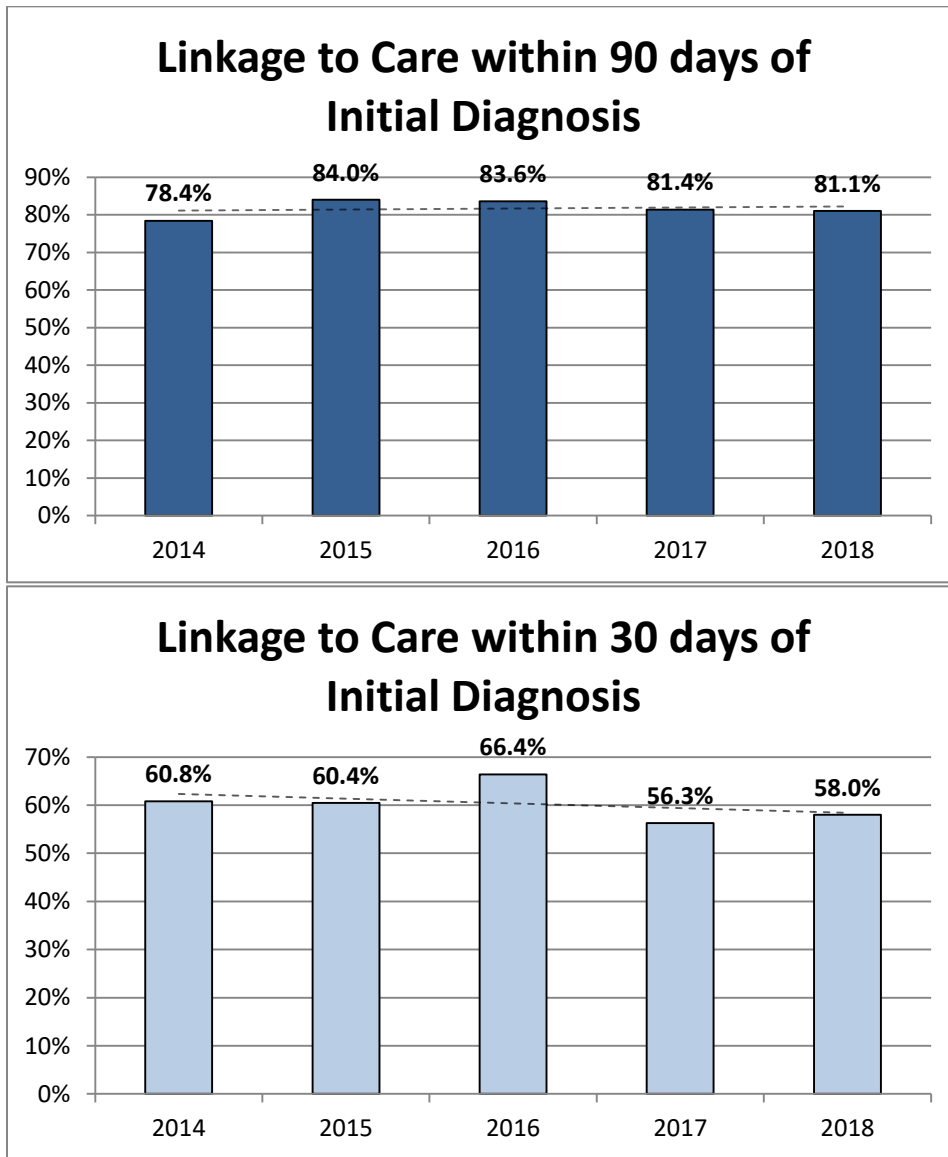
²¹ Branson, B.M., Handsfield, H.H., Lampe, M.A., Janssen, R.S., Taylor, A.W., Lyss, S.B., and Clark, J.E. (2006). Revised recommendations for HIV testing of adults, adolescents, and pregnant women in health-care settings. *MMWR.* 2006; 55(RR14): 1-17.

²² CDC (2018). Monitoring selected national HIV prevention and care objectives by using HIV surveillance data - United States and 6 dependent areas - 2016. *HIV Surveillance Supplemental Report,* 23(4).

²³ HRSA. (2017). Ryan White CAREWare. <https://hab.hrsa.gov/program-grants-management/careware>

Figure 14). Despite these improvements, the NHAS goal is that at least 80% of people diagnosed with HIV be virally suppressed. The ultimate outcome in terms of gauging HIV care in the TGA is viral load suppression, and despite exceeding national results, there remains room for improvement in the TGA.

Figure 13: Trends in the HIV Care Continuum (diagnosis-based) among Indianapolis TGA Residents Living with HIV/AIDS: 2014-2018 (Linkage to Care, Retention in Care, and Viral Suppression)



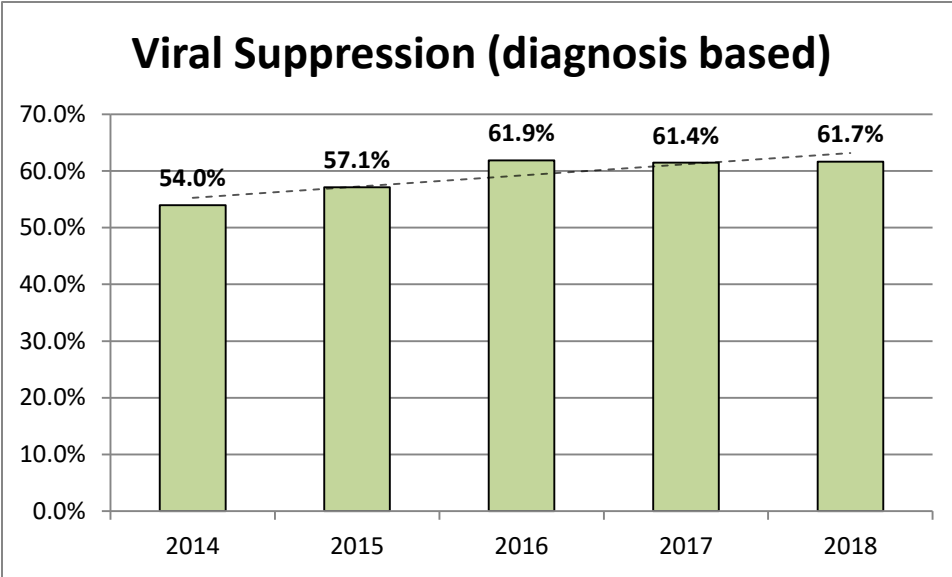
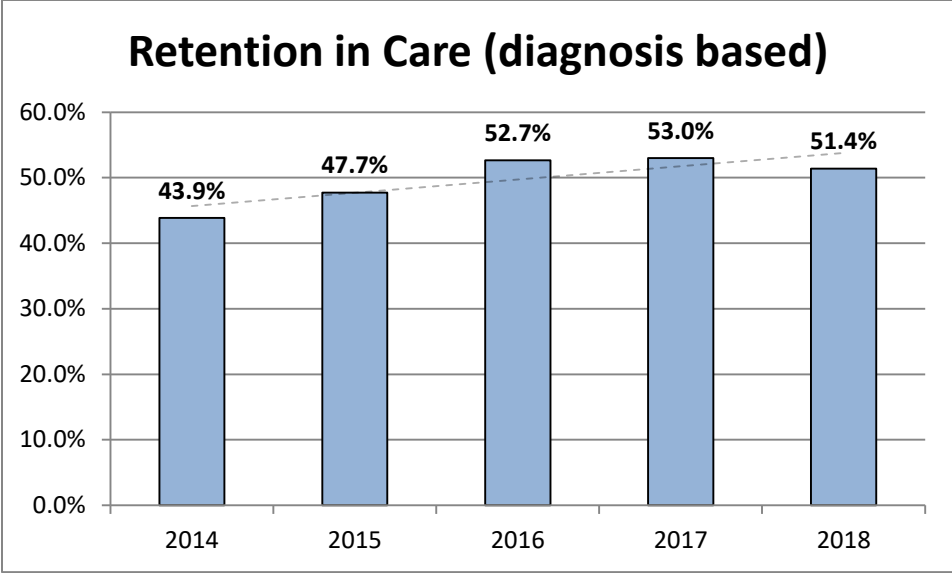
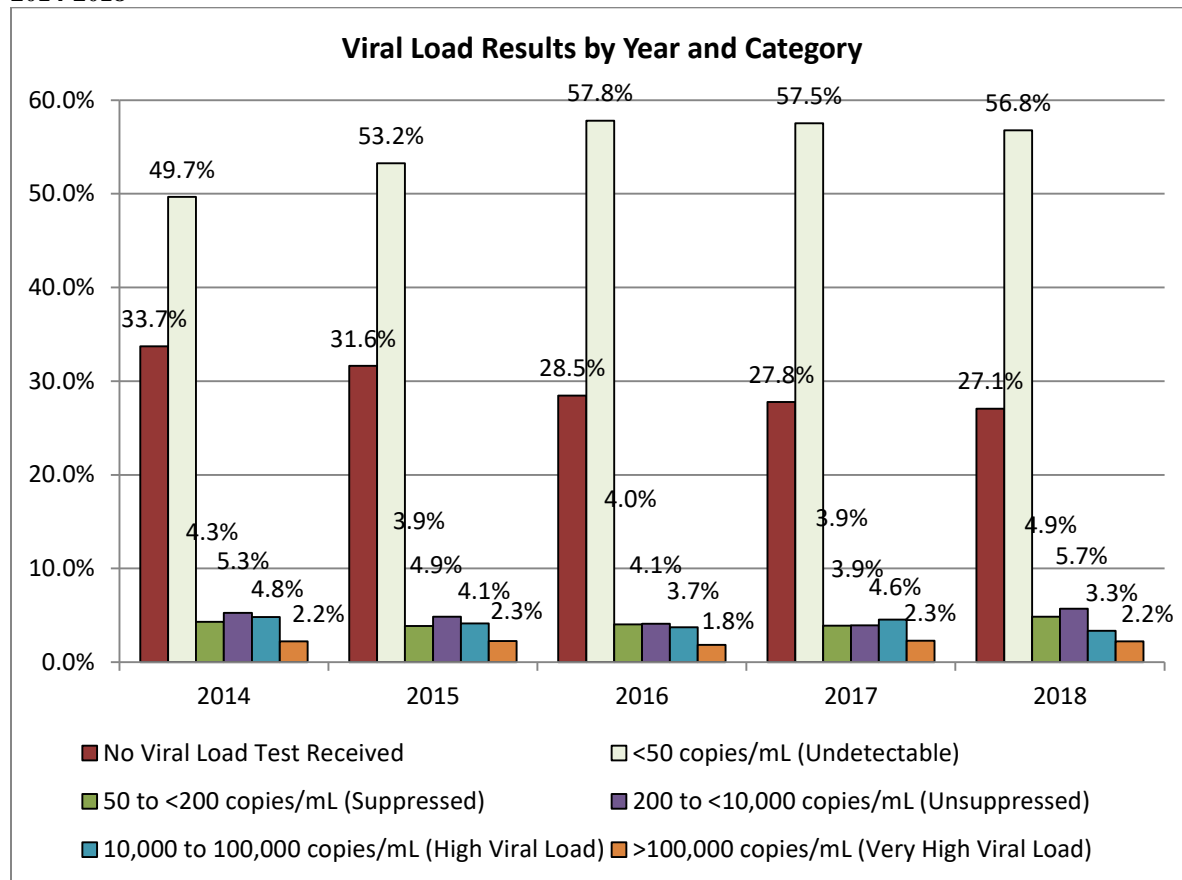


Figure 14: Trends in HIV Viral Load Results among Indianapolis TGA Residents Living with HIV/AIDS: 2014-2018



TREATMENT CASCADE

Prior to the launch of the HIV Care Continuum Initiative, progress towards local and national goals was often represented graphically as the HIV Treatment Cascade. Unlike the care continuum, each column in the treatment cascade is dependent on the preceding column (with the exception of the first and last), making it a useful tool to monitor the step-like progress of a group of individuals from diagnosis to viral suppression. For instance, the number of PLWH/A and a suppressed viral load reported in the treatment cascade must also have been retained in care. Thus, estimated and diagnosed HIV are unchanged between the care continuum and the treatment cascade, but each of the other measures differ except unfiltered viral load, which directly relates to suppressed viral load on the care continuum. Definitions used to create the TGA’s treatment cascade can be reviewed in Table 10.

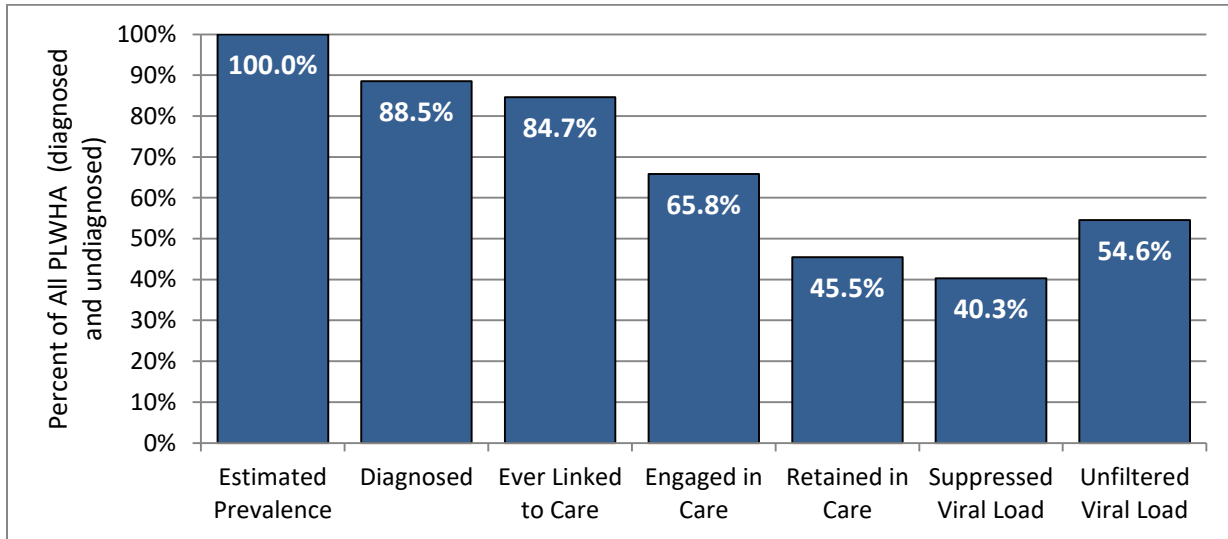
Of 6972 TGA residents estimated to be living with HIV (diagnosed and undiagnosed), 6170 (88.5%) have been diagnosed and are aware of their status (Figure 15). Of those who have been diagnosed with HIV, 5902 (84.7%) have been ever linked to care at some time since their diagnosis (received at least one CD4 or viral load test). Of those who have been diagnosed and were linked to care since diagnosis, 4589 (65.8%) were engaged in care during 2018. Of those who have been diagnosed and linked to care, and who were engaged in care during the 2018 calendar year, 3171 (45.5%) were retained in care. Finally, of those who have been diagnosed

and linked to care, and who were retained in care during the 2018 calendar year, 2811 (40.3%) had a suppressed viral load. This demonstrates that those who enter and remain in continuous care have exceptional outcomes.

Table 10: Definitions for the Treatment Cascade in the Indianapolis TGA: 2018

Measure	Definition
Estimated Prevalence	Estimated number of PLWH/A, diagnosed or undiagnosed, who resided in the TGA during the year
Diagnosed	Number who have been diagnosed with HIV
Ever Linked to Care	Number of those diagnosed who have ever received a CD4/viral load test
Engaged in Care	Number of those diagnosed and linked to care who received a CD4/viral load test during the measurement year
Retained in Care	Number of those diagnosed, linked to care, and engaged in care who received two or more CD4/viral load tests performed at least 3 months apart during the measurement year
Suppressed Viral Load	Number of those diagnosed, linked to care, and retained in care whose most recent HIV viral load test during the measurement year was <200 copies/mL
Unfiltered Viral Load	Number of those who received at least one viral load test during the measurement year whose most recent HIV viral load test was <200 copies/mL (directly relates to suppressed viral load on the care continuum)

Figure 15: HIV Treatment Cascade among Indianapolis TGA Residents Living with HIV/AIDS: 2018



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