WISCONSIN AIDS/HIV PROGRAM NOTES

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Wisconsin 2015 HIV Care Continuum: Statewide and Select Population Groups

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Background

The HIV care continuum continues to be an important framework for understanding and assessing the status of HIV care and treatment in the United States. The HIV care continuum illustrates the stages through which persons living with HIV infection (PLWH) can progress in the management of their HIV infection—diagnosis, linkage to care, retention in care, and the ultimate goal of viral suppression. Taken collectively for a given population, the care continuum shows the proportion of PLWH who are engaged at each stage of the continuum and is therefore a useful tool to:

- Monitor engagement in care and health outcomes.
- Identify health disparities.
- Prioritize strategies and interventions.
- Evaluate the impact of prevention, care, and treatment initiatives.

This issue of *Wisconsin AIDS/HIV Program Notes* is an annual review of the Wisconsin HIV care continuum and examines:

- The HIV care continuum for all PLWH in Wisconsin and selected subpopulations.
- Trends in the Wisconsin continuum over time.
- A comparison to the national continuum.

Methods

For details on how the measures were calculated and the assumptions made in developing the Wisconsin HIV care continuum, see the Detailed Methods section at the end of the article. The continua presented below use the same stages and definitions used by the Centers for Disease Control and Prevention (CDC) to develop the national diagnosis-based continuum,[1] using data from the National HIV Surveillance System, with the following exceptions:

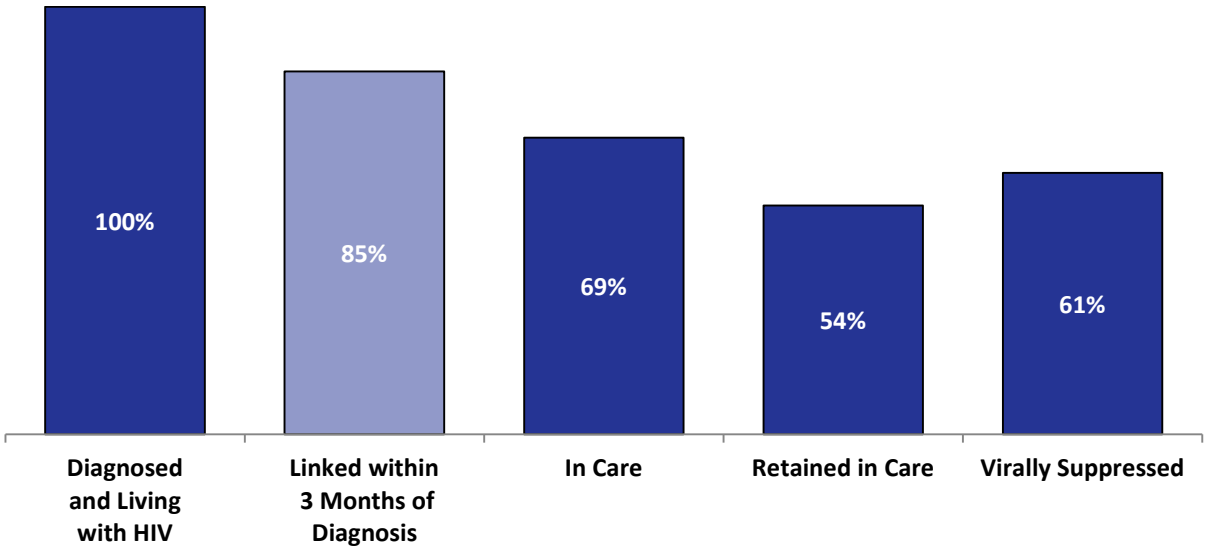
- The national continuum is based on individuals ≥ 13 years of age, whereas Wisconsin includes people of all ages.
- *Antiretroviral Use* is included in the national continuum but these data are not available in Wisconsin.
- Wisconsin includes an *In Care* stage (also described in the federal guidance but not depicted on the national continuum), which acknowledges that some PLWH may be engaged in care but do not meet the federal definition of retention.

[1] Centers for Disease Control and Prevention. Understanding the HIV Care Continuum. December 2014. Available at: http://www.cdc.gov/hiv/pdf/DHAP_Continuum.pdf.

Results

Figure 1 shows the 2015 HIV care continuum for all Wisconsin cases.

Figure 1. 2015 Wisconsin HIV Care Continuum†



†Reflects laboratory data received through April 5, 2016

- **Diagnosed and Living with HIV** [n=6,337 or 100%]: There were an estimated 6,899 PLWH of any age reported to be alive and living in Wisconsin as of December 31, 2014. Of those, 6,337 were still alive and living in Wisconsin as of December 31, 2015.
- **Linked within Three Months of Diagnosis** [n=191/225 or 85%]: Among 225 people newly diagnosed with HIV infection during 2015, 85% had laboratory evidence of linkage to care within three months of diagnosis. An additional 20 people were linked to care more than three months after diagnosis, and the remaining 14 remain unlinked at the time of this analysis. Using the definition of timely linkage presented in the most recent National HIV/AIDS Strategy,[2] 64% of people newly diagnosed were linked to care within one month of diagnosis.
- **In Care** [n=4,398/6,337 or 69%]: Of those diagnosed and living with HIV, 69% had at least one care visit during 2015.
- **Retained in Care** [n=3,391/6,337 or 54%]: Of those diagnosed and living with HIV, 54% had at least two visits, 90 days apart, during 2015.
- **Virally Suppressed** [n=3,874/6,337 or 61%]: Of those diagnosed and living with HIV, 61% had suppressed viral load as of their last viral load test in 2015.
- **Viral Suppression among Those Tested** [n=3,874/4,334]: While not shown in Figure 1, most (89%) PLWH who had at least one viral load test (indicating some care) were virally suppressed as of their last viral load test during 2015.

Table 1 and Figure 2 show the percentages at each stage of the HIV care continuum by select demographic characteristics.

[2] Office of National AIDS Policy. National HIV/AIDS Strategy of the United States: Updated to 2020. July 2015. Available at: https://www.aids.gov/federal-resources/national-hiv-aids-strategy/nhas-update.pdf.

Table 1. Comparison of 2015 Wisconsin HIV Care Continuum by Select Demographic Characteristics†

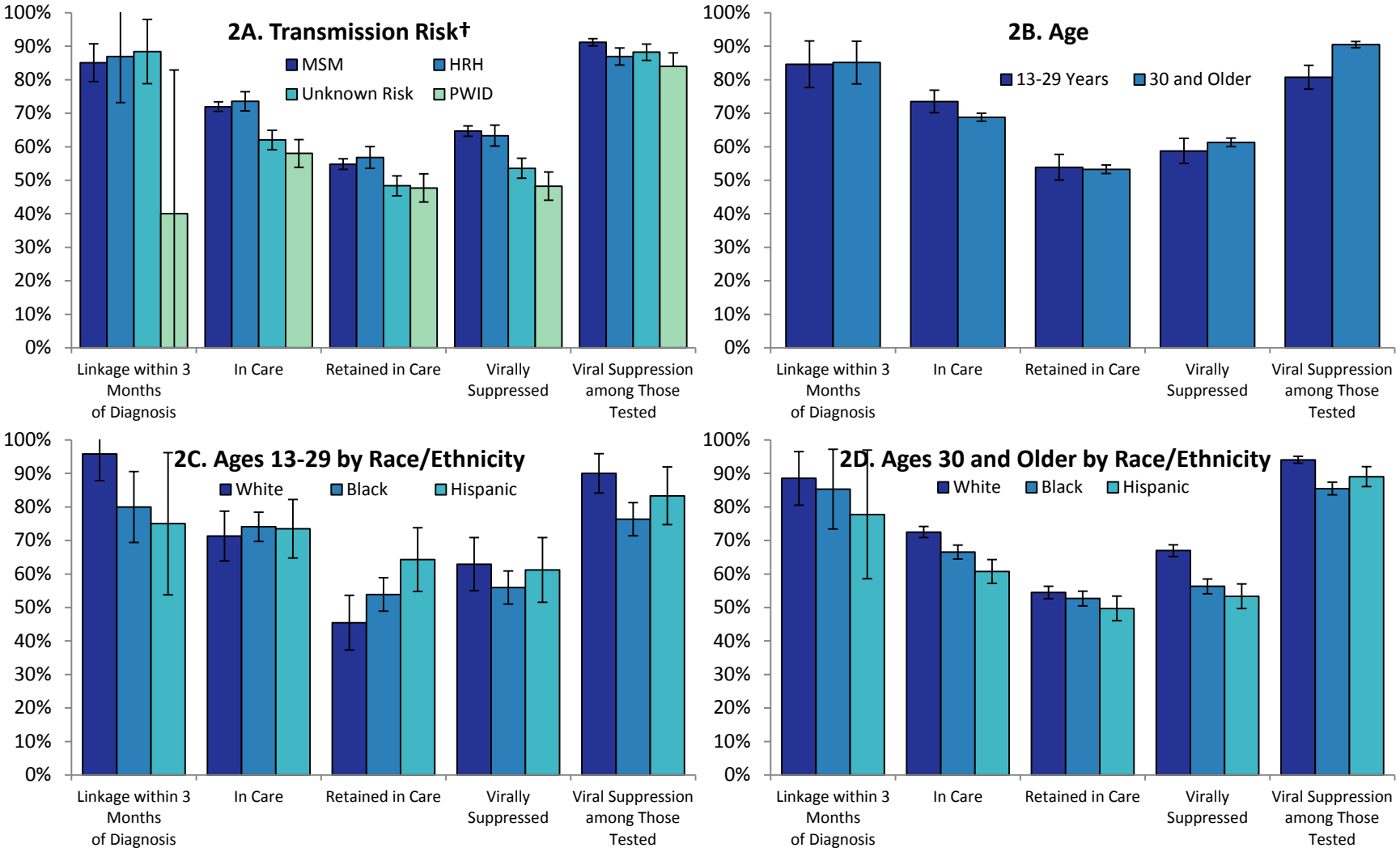
	Linkage Numbers	Number Diagnosed and Living with HIV	Linked within 3 Months of Diagnosis	In Care	Retained in Care	Virally Suppressed (VS)	Virally Suppressed among Those Tested	Statistically Significant Differences‡
Statewide	191 of 225	6,337	85%	69%	54%	61%	89%	Not applicable
Geography								
City of Milwaukee (MKE)	88 of 105	2,676	84%	73%	58%	62%	87%	• **In care**: MKE > Non-MKE • **Retained:** MKE > Non-MKE • **VS among those tested:** Non-MKE > MKE
State excluding City of Milwaukee (Non-MKE)	103 of 120	3,516	86%	69%	52%	62%	92%	
Sex								
Male (M)	166 of 196	5,078	85%	68%	52%	61%	91%	• **In care:** F > M • **Retained:** F > M • **VS among those tested:** M > F
Female (F)	25 of 29	1,259	86%	74%	59%	62%	85%	
Race/Ethnicity								
White (W)	77 of 85	2,958	91%	72%	54%	67%	94%	• **Linkage:** W > H • **In care:** W > B and H; B > H • **VS:** W > B and H • **VS among those tested:** W > B and H; H > B
Black (B)	74 of 89	2,371	83%	68%	53%	56%	84%	
Hispanic (H)	26 of 34	817	76%	62%	52%	54%	88%	

Table 1. Continued

	Linkage Numbers	Number Diagnosed and Living with HIV	Linked within 3 Months of Diagnosis	In Care	Retained in Care	Virally Suppressed (VS)	Virally Suppressed among Those Tested	Statistically Significant Differences‡
Age								
13-29 Years (13-29)	88 of 104	657	85%	74%	54%	59%	81%	• **In care:** 13-29 > 30+ • **VS among those tested:** 30+ > 13-29
30 and Older (30+)	103 of 121	5,644	85%	69%	53%	61%	90%	
Transmission Risk§								
MSM (including MSM/PWID)	131 of 154	3,698	85%	72%	55%	65%	91%	• **Linkage:** All categories > PWID • **In care:** MSM and HRH > PWID and unknown risk • **Retained:** MSM and HRH > PWID and unknown risk • **VS:** MSM and HRH > PWID and unknown risk; Unknown risk > PWID • **VS among those tested:** MSM > all other risk categories
High Risk Heterosexual (HRH)	20 of 23	905	87%	74%	57%	63%	87%	
Unknown Risk	38 of 43	1,090	88%	62%	48%	54%	88%	
PWID	2 of 5	349	40%	58%	48%	48%	84%	

†The populations are mutually exclusive within categories (e.g., within race/ethnicity) but not across categories. Reading the table by row shows the HIV care continuum for a specific population, while reading the table by column allows a comparison of each stage in the care continuum across populations.
‡Statistically significant at $p < 0.05$. Relationships not mentioned may be numerically different but not statistically different.
§MSM=Men who have sex with men. PWID=people who inject drugs.

Figure 2. Comparison of 2015 Wisconsin HIV Care Continuum by Select Demographic Characteristics



†MSM=men who have sex with men, including MSM who also inject drugs; PWID=people who inject drugs; HRH=high-risk heterosexual.

Figure 3 shows the trend in the Wisconsin HIV care continuum from 2012 to 2015. A greater proportion of PLWH was in care and virally suppressed during 2015 compared to previous years. Viral suppression has increased at least incrementally each year.

Figure 3. Wisconsin HIV Care Continuum, 2012-2015

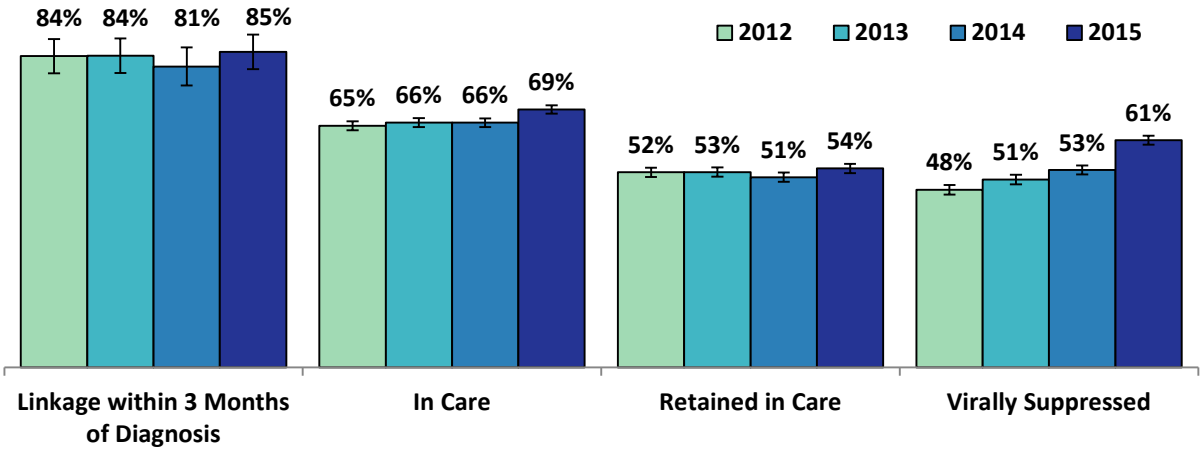
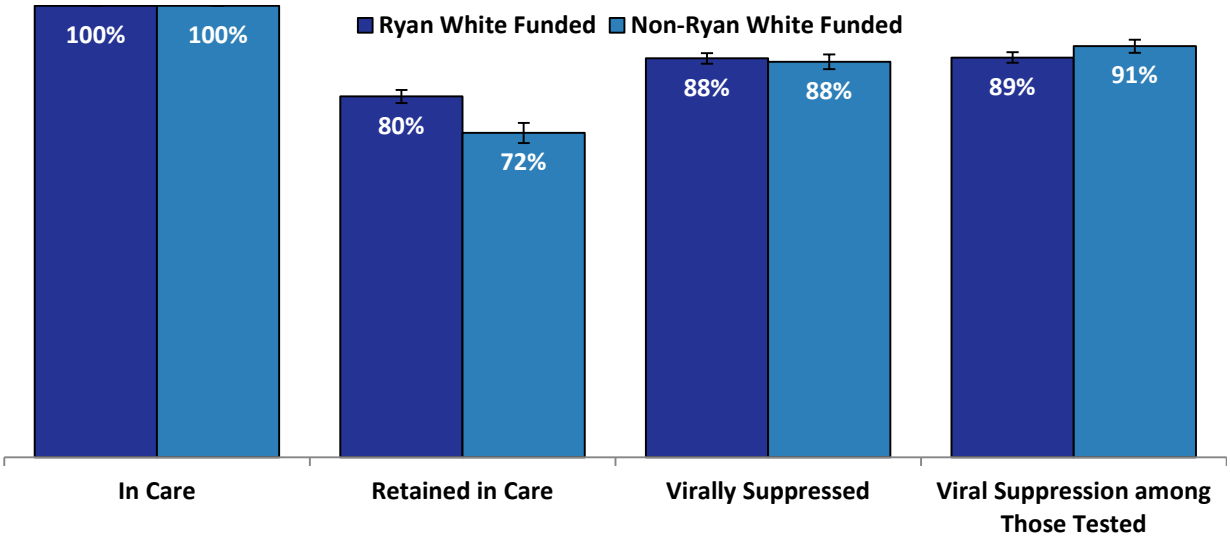


Figure 4 shows the 2015 HIV care continuum for PLWH receiving care at Ryan White-funded clinics compared to PLWH receiving care at clinics that do not receive Ryan White funding. Because all individuals in this continuum received some care during 2015, this continuum can be considered an *In Care* continuum and has different stages than the other continua in this paper. Those receiving care at a Ryan White-funded facility were more likely to be retained in care (80%) compared to those receiving care at clinics that do not receive Ryan White funding (72%).

Figure 4. Wisconsin HIV *In Care* Continuum: Care at Ryan White-Funded versus non-Ryan White-Funded Clinics, 2015



Discussion

2015 Results

Access to HIV medical care is critical for improving individual health outcomes, reducing HIV transmission, and linking to other needed health and social services. Overall, 85% of individuals newly diagnosed with HIV infection during 2015 were linked to HIV medical care within three months of diagnosis. The only significant differences in linkage were among PWID compared to other risk groups, although the number of PWID diagnosed in 2015 was small (n=5). Statewide linkage was stable during 2012-2015. Using the definition of timely linkage presented in the 2020 update of the National HIV/AIDS Strategy, 64% of people newly diagnosed were linked to care within one month of diagnosis.

Among PLWH in Wisconsin at the end of 2014 who had the opportunity to receive care during 2015, 69% received some care, 54% met the federal definition of retained in care, and 61% were virally suppressed. The national 2020 benchmarks for retention in care and viral suppression are 90% and 80%, respectively.[2] The continued high proportion (89%) of viral suppression among those whose viral load was measured suggests that the primary reason for unsuppressed viral load in Wisconsin is lack of HIV care.

Trend over Time

There have been small but incremental improvements in Wisconsin's HIV care continuum over time, primarily among those with some care and viral suppression. Improvements over time may be due to enhanced data quality or enhanced efforts in linking and retaining individuals in HIV care.

While there have been improvements in health outcomes among almost every demographic group over time, disparities between groups have remained virtually unchanged from year to year.[3]

National Comparison

Wisconsin typically performs better than the national average at each stage of the continuum and has been in the top tier of jurisdictions with measureable data. Based on the most recent national data (2013 new diagnoses and 2011 prevalent cases still alive at the end of 2012), Wisconsin ranked eighth of 28 jurisdictions in the proportion of individuals linked to care within three months, fourth of 28 in the proportion of PLWH retained in care, and ninth of 28 in the proportion of PLWH who are virally suppressed.[4] Due to differences in the base population used, the federal and local Wisconsin continuum for the same time period will not match.

Continuum Differences by Population

Geography

In Wisconsin, people living with HIV in the city of Milwaukee were more likely than their non-Milwaukee counterparts (those living in Wisconsin outside Milwaukee City limits) to be in care, and retained in care during 2015. This may be due to greater access to care in an urban

[3] Wisconsin AIDS/HIV Program Notes. Wisconsin 2014 HIV Care Continuum: Statewide and Select Population Groups. Available at https://www.dhs.wisconsin.gov/publications/p00792-15-november.pdf.

[4] Centers for Disease Control and Prevention. Monitoring selected national HIV prevention and care objectives by using HIV surveillance data—United States and 6 dependent areas—2013. *HIV Surveillance Supplemental Report* 2015;20 (No. 2). July 2015. Available at: http://www.cdc.gov/hiv/library/reports/surveillance/.

environment or to the high proportion of health care providers receiving Ryan White funding in the Milwaukee area.

Sex
Females had among the highest percentages of success at each stage of the care continuum and were more likely than males to have accessed and engaged in care during 2015. However, among those with a viral load test, men were more likely to be virally suppressed, suggesting differences in prescribing or that females may struggle with adherence more than males.

Race/Ethnicity
Similar to national data, there are disparities in HIV care by race/ethnicity in Wisconsin. Hispanics were less likely than Whites to meet the desired outcome across each stage of the continuum. Blacks were also less successful than Whites across the continuum with the exception of timely linkage. Blacks were the least likely of the three racial/ethnic groups to be virally suppressed among those tested, again suggesting differences in prescribing habits or unique adherence issues.

These overall trends by race/ethnicity mostly held true for adults ages 30 and older, but some trends were different for younger individuals, ages 13-29 years. For example, younger individuals were equally likely to be in care, and virally suppressed, regardless of race. In addition, the trend among younger individuals for retention was opposite of that observed among older individuals, with Hispanics being the most likely to be retained, followed by Blacks and then Whites (only the Hispanic-White difference was statistically significant).

Age
HIV care patterns also varied by age. Younger people (13-29 years of age) were more likely than those ages 30 and older to be in care, but were less likely to have suppressed viral load among those with a viral load test (possibly due to a recent diagnosis).

Risk
MSM (men who have sex with men) and those with high-risk heterosexual transmission risk had among the highest percentages of success at each stage of the HIV care continuum. Those with unknown and injection drug transmission risk had the lowest percentage of success for the two care markers and viral suppression. Those with injection drug transmission risk were the least likely to be virally suppressed. The low proportion of success among those with unknown transmission risk should be interpreted with caution—those with unknown risk may be a proxy for being out of care, as medical providers are an important source of risk information.

Ryan White versus Non-Ryan White Clinics
Those receiving care at a Ryan White-funded facility were more likely to be retained in care (80%) compared to those receiving care at clinics that do not receive Ryan White funding (72%). Better health outcomes at Ryan White-funded clinics have also been observed nationally.[5]

Limitations
In this analysis, the presence of laboratory data was used as a proxy for receiving HIV medical care. This method assumes that laboratory reporting of CD4 and viral load test results to the HIV Surveillance Program is high and that laboratory data correlate highly with an HIV medical visit.

[5] Bradley H, Viall AH, Worlety PM, et al. Ryan White HIV/AIDs Program Assistance and HIV Treatment Outcomes. *CID*. Available at: http://cid.oxfordjournals.org. Accessed October 12, 2015.

Studies done both in Wisconsin[6] and other jurisdictions[7,8] have concluded that laboratory data reasonably approximates retention to care, but may overestimate linkage to care.[6,9]

This analysis is based on PLWH presumed to be alive and living in Wisconsin. Therefore, individuals who moved out of state or who died, without the HIV Surveillance Program's knowledge, may have been included. For example, if the care continuum analysis excludes individuals with no information reported to the HIV Surveillance Program since 2006, the proportion of PLWH in Wisconsin with successful care outcomes increases across all categories to 79% in care, 61% retained in care, and 70% virally suppressed (compared to 69% in care, 54% retained, and 61% virally suppressed). Finally, small numbers in some demographic groups may have prevented the identification of statistically significant differences.

Conclusion

The HIV care continuum is a useful tool for planning, prioritizing, targeting, and monitoring available resources in response to the needs of PLWH in the jurisdiction, with the goal of improving engagement and outcomes at each stage of the continuum. Wisconsin has used or will use the HIV care continuum to:

- Form the foundation of a five-year integrated strategic plan in Wisconsin to meet the goals of the National HIV/AIDS Strategy.
- Monitor, track, and disseminate measures of linkage, retention, and viral suppression and part of reporting on the progress of Wisconsin's strategic plan.
- Identify health disparities and service gaps, which direct the development of the strategic plan, and can be used for competitive funding applications.
- Evaluate the efficacy of interventions designed to improve linkage, retention, and viral suppression.
- Serve as the basis for a Data to Care program in which out of care individuals are identified and actively re-engaged in HIV medical care.

[6] Ngaboh-Smart F, Peng M, Schumann, C, et al. Validity of using laboratory-reported HIV surveillance data for measuring retention in HIV medical care in Wisconsin. Poster session presented at: 2014 Treatment as Prevention Workshop. April 1-4, 2014. Vancouver, British Columbia.

[7] Lubelchek R, Finnegan K, Hotton A, et al. Assessing the use of HIV surveillance data to help gauge patient retention-in-care. *J Acquir Immune Defic Syndr*. 2015; 69 Suppl(1): S25-30.

[8] Dean BD, Hart RLD, Buchacz K, et al. HIV laboratory Monitoring Reliably Identifies Persons Engaged in Care. *J Acquir Immune Defic Syndr*. 2015; 68(2): 133-139.

[9] Sabharwal C, Braunstein S, Robbins R, et al. Optimizing the use of surveillance data for monitoring the care status of persons recently diagnosed with HIV in NYC. *J Acquir Immune Defic Syndr*. 2014; 65(5): 571-578.

Detailed Methods

The measurement of each milestone of the care continuum is based on individual-level demographics and laboratory data reported to the AIDS/HIV Program and stored in the Enhanced HIV/AIDS Reporting System (eHARS). Individuals were included in the linkage calculation if they were first diagnosed with HIV in Wisconsin during 2015. Individuals were included in the care, retention, and viral suppression measures if they were reported with HIV infection in Wisconsin by December 31, 2014, and were alive and living in Wisconsin as of December 31, 2015. Continua from previous years were re-calculated using the same definitions, but were updated to take into account deaths and residence changes that were previously unknown to the surveillance program.

There were 6,899 individuals living with HIV in Wisconsin at the end of 2014, of whom 6,337 were still living in Wisconsin at the end of 2015. The 562 individuals who are not included either died or are known to have moved out of state. The 6,337 cases included in this analysis reflect reported deaths and last known address as of February 7, 2016.

Geography was assigned using the *current city* variable in eHARS. PLWH whose current city at the end of 2014 was Milwaukee and who were still living in Wisconsin at the end of 2015 (n=2,676) were included in the city of Milwaukee analysis, while individuals with any other city listed in the *current city* variable (n=3,516) were included in the "State excluding Milwaukee" analysis. There were 145 (2.3% of eligible cases) people excluded from the geographic comparison analysis due to missing data in the *current city* variable.

The *In Care* continuum, comparing outcomes at clinics that do and do not receive Ryan White funding, was calculated using the same stage definitions described below. The 4,398 cases who received some care during 2015 were divided into those who had at least one lab test from a Ryan White provider or facility (n=2,868) and those who had lab tests only from non-Ryan White-funded providers and facilities (n=1,530). These numbers were used as the denominator to calculate the stages of care. Those individuals with no care during 2014 (n=1,939 or 31%) were excluded from the analysis.

Because eHARS does not contain medical visit dates, CD4, viral load, and HIV-1 genotype test results were used as proxy indicators of clinical care. The care continuum reflects laboratory data reported to the HIV surveillance program through April 4, 2016.

Chi-squared tests were used to determine statistically significant differences between groups.

Definitions used for the HIV care continuum stages are shown in Table 2.

Table 2. Wisconsin HIV Care Continuum Stage Definitions

Care Stage	Measurement Definition
Diagnosed and Living with HIV	Number of PLWH who were reported with HIV in Wisconsin at the end of 2014 and who were presumed still alive and living in Wisconsin at the end of 2015.
Linked within Three Months of Diagnosis	Number of PLWH newly diagnosed during 2015 who had evidence of a CD4, viral load, or HIV-1 genotype test with a specimen collection date within three months of the HIV diagnosis date, divided by the number of PLWH newly diagnosed during 2015. Specimens collected on the date of diagnosis were excluded as they are considered part of the diagnostic workup. Linkage is shown in a different color in the continuum as it represents a different population than the other care stages.
In Care	Number of PLWH who had evidence of at least one CD4, viral load, or HIV-1 genotype test during 2015 divided by the number diagnosed and living with HIV.

Retained in Care	Number of PLWH who had evidence of at least two CD4, viral load or HIV-1 genotype tests that were ≥ 90 days apart during 2015 divided by the number diagnosed and living with HIV.
Virally Suppressed	Number of PLWH whose last viral load test result during 2015 was <200 copies/mL divided by the number diagnosed and living with HIV. Those without a viral load test were considered unsuppressed.
Virally Suppressed among Those Tested	Number of PLWH whose last viral load test result during 2015 was <200 copies/mL divided by the number who had at least one viral load test during 2015. This measure may not be depicted on all continua.