

WISCONSIN AIDS/HIV PROGRAM NOTES

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Wisconsin 2014 HIV Care Continuum: Statewide and Select Population Groups

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Background

The HIV care continuum—sometimes referred to as the HIV treatment cascade—is a conceptual model representing the sequential steps or stages of HIV medical care that people living with HIV go through from initial diagnosis to achieving the goal of viral suppression (a very low level of HIV in the body). In addition, the care continuum shows the proportion of individuals living with HIV who are engaged at each stage. The continuum has become a routine tool for federal, state and local agencies to:

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

The Centers for Disease Control and Prevention (CDC) have described two different approaches for developing a care continuum:¹

- A prevalence-based continuum, depicting each step of the continuum as a percentage of the *total* number of people living with HIV, including those unaware of their infection
- A diagnosis-based continuum, depicting each step of the continuum as a percentage of those diagnosed and reported with HIV infection (i.e., those aware of their HIV infection)

The diagnosis-based continuum, which is presented in this paper, is most useful for monitoring and evaluating the HIV care delivery system.

This paper covers:

- The HIV care continuum for all people living with HIV and AIDS (PLWHA) 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 continuums presented below use the same stages and definitions used by the CDC to develop the national diagnosis-based continuum, using data from the National HIV Surveillance System, with the exception of *Antiretroviral Use*, which is not available in Wisconsin. In addition, Wisconsin includes an *In Care* stage (also described in the federal guidance but not

¹ Centers for Disease Control and Prevention. Understanding the HIV Care Continuum. http://www.cdc.gov/hiv/pdf/dhap_continuum.pdf. Published December 2014. Accessed October 5, 2015.

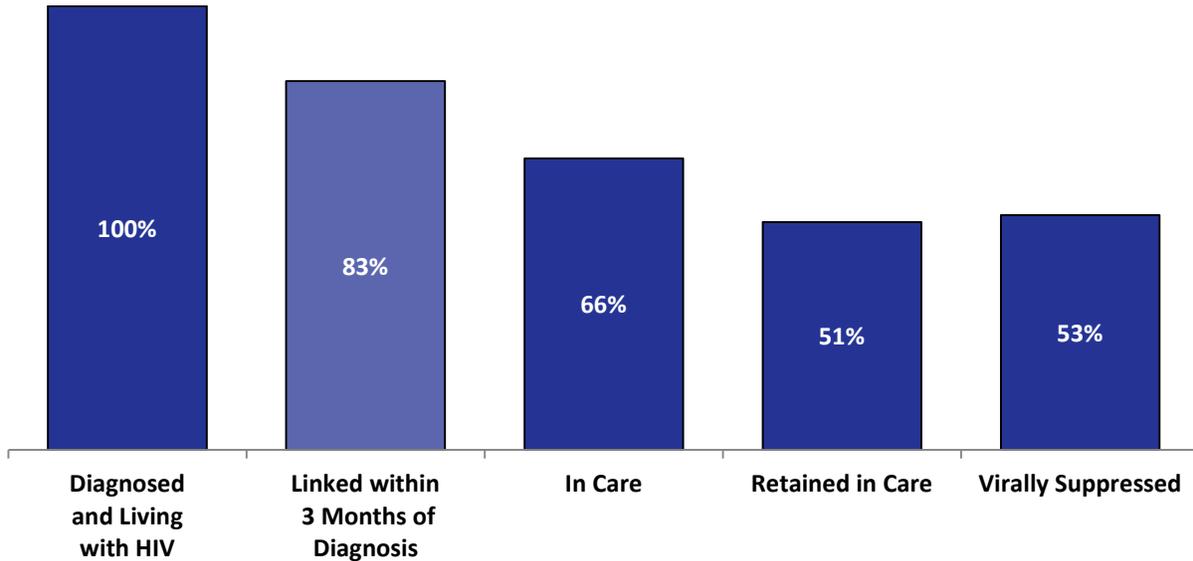
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depicted on national continuums), which acknowledges that some PLWHA may be engaged in care but do not meet the federal definition of engagement.

Results

Figure 1 shows the 2014 HIV care continuum for all Wisconsin cases.

Figure 1. 2014 Wisconsin HIV Care Continuum



- *Diagnosed and Living with HIV [n=6,373 or 100%]:* There were an estimated 6,462 PLWHA of any age reported to be alive and living in Wisconsin as of December 31, 2013. Of those, 6,373 were ages 13 or older and were still alive and living in Wisconsin as of December 31, 2014.
- *Linked within Three Months of Diagnosis [n=187/225 or 83%]:* Among 225 people newly diagnosed with HIV infection during 2014, 83% had laboratory evidence of linkage to care within three months of diagnosis. An additional 8% (n=19) were linked to care more than three months after diagnosis, and the remaining 19 remain unlinked at the time of this analysis.
- *In Care [n=4,187/6,373 or 66%]:* Of those diagnosed and living with HIV, 66% had at least one care visit during 2014.
- *Retained in Care [n=3,272/6,373 or 51%]:* Of those diagnosed and living with HIV, 51% had at least two visits, 90 days apart, during 2014.
- *Virally Suppressed [n=3,373/6,373 or 53%]:* Of those diagnosed and living with HIV, 53% had suppressed viral load as of their last viral load test in 2014.
- *Viral Suppression among Those with a Viral Load Test [n=3,373/3,849]:* While not shown in Figure 1, most (88%) PLWHA who had at least one viral load test (indicating some care) were virally suppressed as of their last viral load test during 2014.

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

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Table 1. Comparison of 2014 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	Viral Suppression among Those with a Viral Load Test	Statistically Significant Differences
Statewide	187 of 225	6,373	83%	66%	51%	53%	88%	Not applicable
Geography								
City of Milwaukee (MKE)	103 of 119	2,714	87%	68%	56%	54%	85%	<ul style="list-style-type: none"> • MKE > Non-MKE retained in care • Non-MKE > MKE virally suppressed among those with a viral load test
State excluding City of Milwaukee (Non-MKE)	84 of 106	3,439	79%	68%	51%	55%	90%	
Sex								
Male	158 of 192	5,114	82%	64%	50%	52%	89%	<ul style="list-style-type: none"> • Female > Male in care • Female > Male retained • Male > Female virally suppressed among those with a viral load test
Female	29 of 33	1,259	88%	72%	58%	55%	81%	
Race/Ethnicity								
White	59 of 74	2,998	80%	69%	52%	56%	92%	<ul style="list-style-type: none"> • White > Black and Hispanic in care • White > Black virally suppressed • White and Hispanic > Black virally suppressed among those with a viral load test
Black	86 of 98	2,407	88%	63%	50%	49%	81%	
Hispanic	36 of 42	787	86%	61%	51%	52%	89%	

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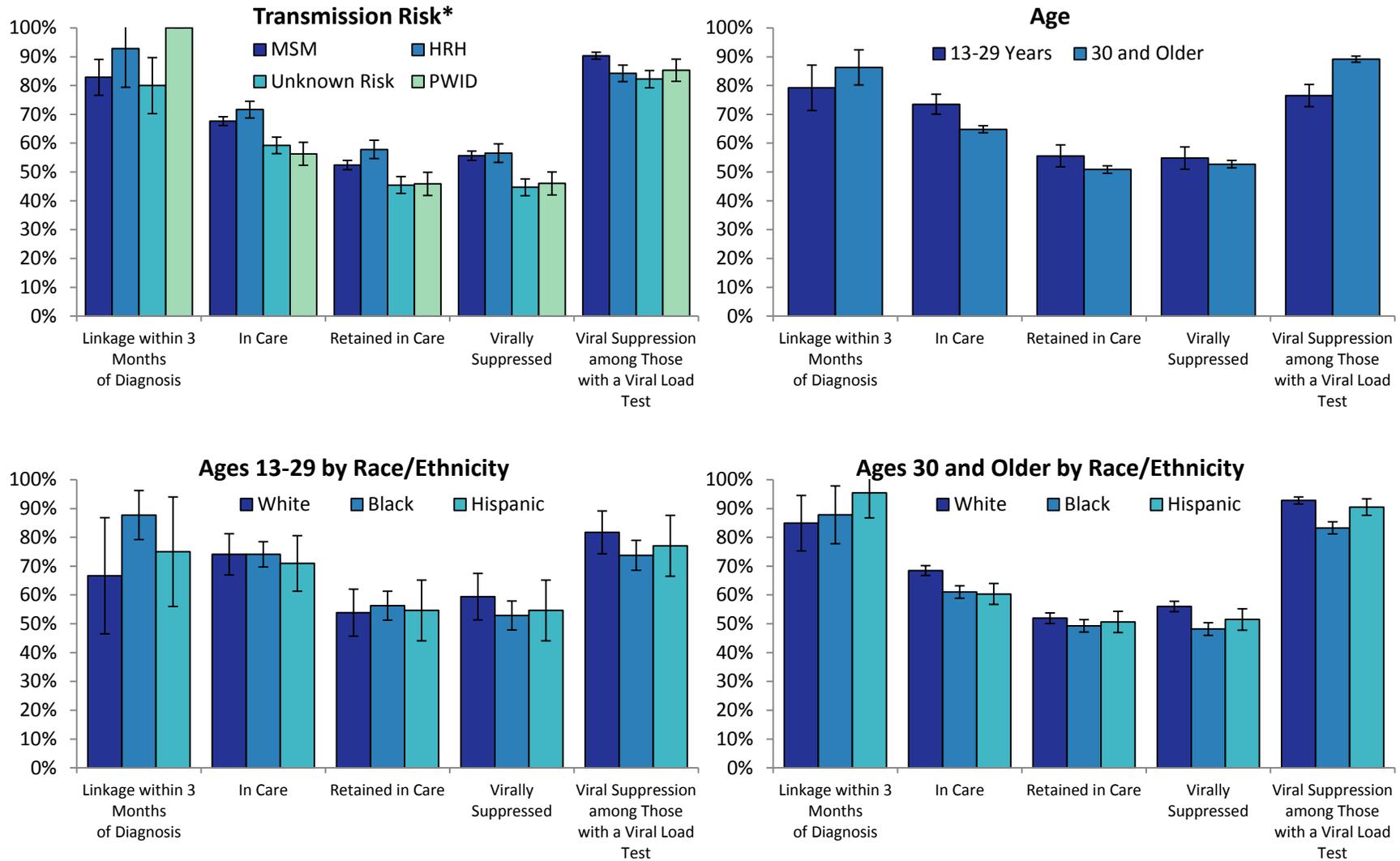
	Linkage Numbers	Number Diagnosed and Living with HIV	Linked within 3 Months of Diagnosis	In Care	Retained in Care	Virally Suppressed	Viral Suppression among Those with a Viral Load Test	Statistically Significant Differences
Age								
13-29 Years (13-29)	80 of 101	642	79%	74%	56%	55%	77%	<ul style="list-style-type: none"> • 13-29 > 30+ in care • 30+ > 13-29 virally suppressed among those with a viral load test
30 and Older (30+)	107 of 124	5,731	86%	65%	51%	53%	89%	
Transmission Risk‡								
MSM (including MSM/PWID)	116 of 140	3,716	83%	68%	52%	56%	90%	<ul style="list-style-type: none"> • MSM and HRH > unknown and PWID risk in care • HRH > all other risk groups retained; MSM > IDU and unknown risk retained • MSM and HRH > unknown and IDU risk virally suppressed • MSM > HRH and unknown risk virally suppressed among those with a viral load test
High Risk Heterosexual (HRH)	13 of 14	925	93%	72%	58%	57%	84%	
Unknown Risk	52 of 65	1,139	80%	59%	45%	45%	82%	
PWID	6 of 6	593	100%	56%	46%	46%	85%	

†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. Relationships not mentioned in the “Statistically Significant Differences” column may be numerically different but not statistically different.

‡MSM=Men who have sex with men. PWID=people who inject drugs.

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Figure 2. Comparison of 2014 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

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Figure 3 shows the trend in the Wisconsin HIV care continuum from 2011-2014. The only statistically significant difference is in viral load suppression, where a greater proportion of PLWHA had suppressed viral load in 2014 compared to 2011 and 2012.

Figure 3. Wisconsin HIV Care Continuum, 2011-2014

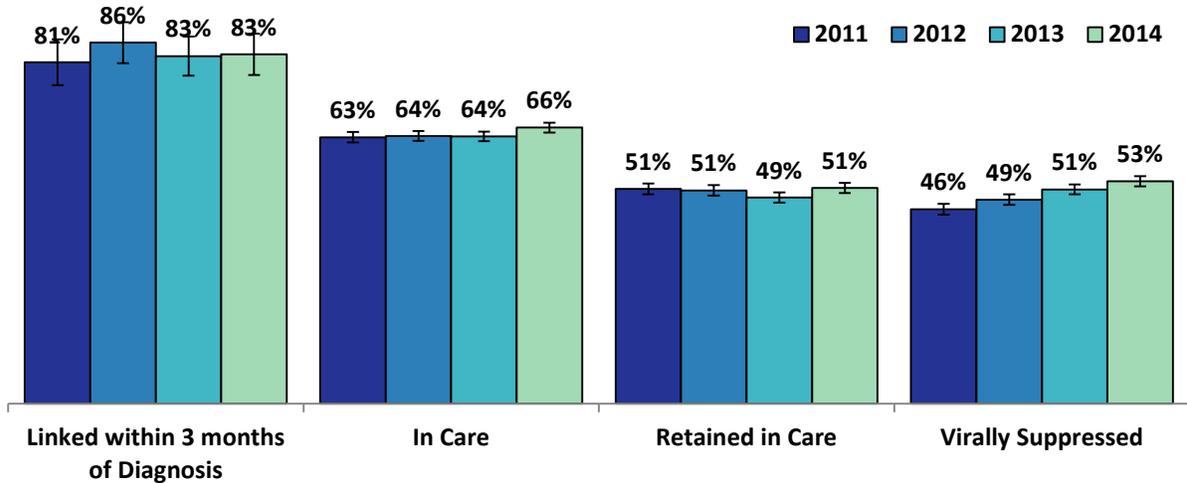
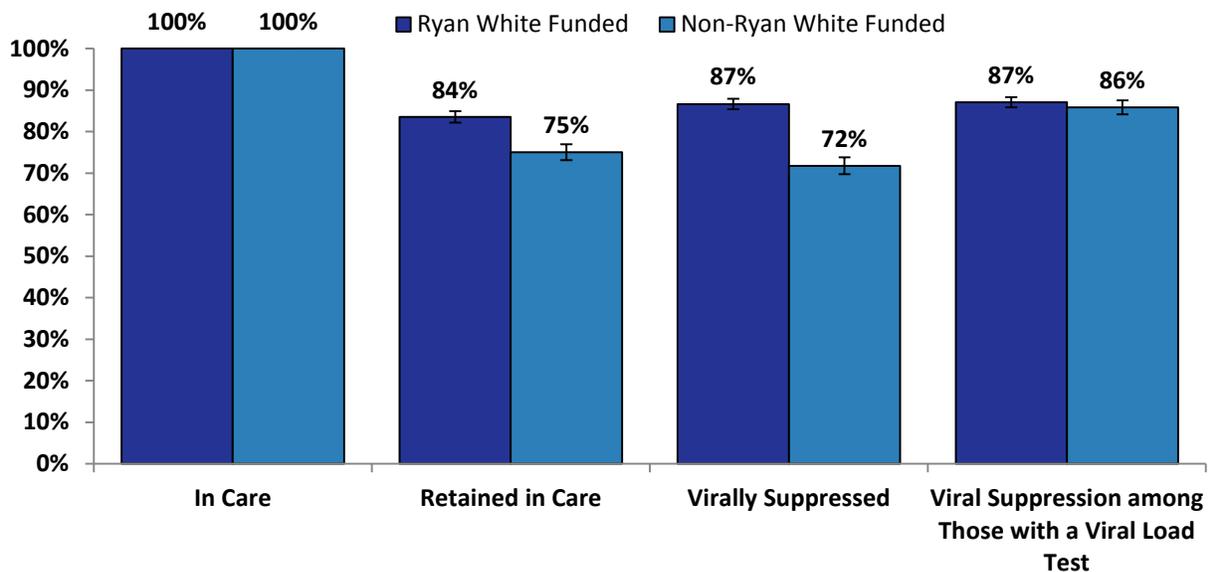


Figure 4 shows the 2014 HIV care continuum for PLWHA receiving care at Ryan White-funded clinics compared to PLWHA receiving care at clinics that do not receive Ryan White funding. Because all individuals in this continuum received some care during 2014, this continuum can be considered an *In Care* continuum and has fewer stages than the other continuums in this paper.

Figure 4. Wisconsin HIV *In Care* Continuum: Care at Ryan White Funded versus non-Ryan White Funded Clinics, 2014



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Discussion

2014 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, 83% of individuals newly diagnosed with HIV infection during 2014 were linked to HIV medical care within three months of diagnosis. There were no significant differences in linkage across any demographic groups, and linkage remained stable over time. In the future, linkage within *one* month of diagnosis will be measured as evidence of care to align with the 2015 updated National HIV/AIDS Strategy.² During 2014, 73% of individuals were linked to care within one month, which is less than the 85% target for 2020 in the National Strategy update.

Among PLWHA in Wisconsin at the end of 2013 who had the opportunity to receive care during 2014, 66% received some care, 51% met the federal definition of retained in care, and 53% were virally suppressed at their last test. The fact that 88% of individuals whose viral load was measured during 2014 were virally suppressed suggests that the primary reason that 47% of PLWHA in Wisconsin had unsuppressed viral load is that they were not in care. The national 2020 benchmarks for retention in care and viral suppression are 90% and 80%, respectively.²

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. It is difficult to know whether these improvements are due to better laboratory reporting in recent years or better adherence to care due to programs such as Linkage to Care. However, differences in care outcomes among various demographic groups have not changed over time and the differences indicated in Table 2 and Figure 3 are almost identical to those noted in the February 2014 [Wisconsin AIDS/HIV Program Notes](#) describing care patterns during 2012.³

National Comparison

Wisconsin performs better than the national average at each stage of the continuum and is 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 8th of 28 jurisdictions in the proportion of individuals linkage to care within three months, 4th of 28 in the proportion of PLWHA retained in care, and 9th of 28 in the proportion of PLWHA who are virally suppressed.⁴ Due to differences in the base population used, the federal and local Wisconsin continuums for the same time period will not match.

² Office of National AIDS Policy. National HIV/AIDS Strategy for the United States: Updated to 2020.

³ Wisconsin AIDS/HIV Program Notes. Wisconsin HIV Care Continuums: Statewide and Select Population Groups. Available at <https://www.dhs.wisconsin.gov/aids-hiv/notes.htm>.

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). <http://www.cdc.gov/hiv/library/reports/surveillance/>. Published July 2015. Accessed October 2, 2015.

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Ryan White versus Non-Ryan White Clinics

PLWHA receiving care at a clinic that received some Ryan White funding had better health outcomes at all stages except viral suppression among those with at least one viral load test. Better health outcomes at Ryan White funded clinics has also been observed nationally.⁵

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 retained in care during 2014. This may be due to greater access to care in an urban 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 2014. However, among those with a viral load test, men were more likely to be virally suppressed.

Race/Ethnicity

Similar to national data, there are disparities in HIV care by race/ethnicity in Wisconsin. While Black PLWHA were the most likely to be linked to care within three months, they were less likely to be in care or to be virally suppressed. The disparity in viral suppression among Blacks was true for both younger and older black PLWHA, but the disparity in care status was observed only for older Black PLWHA.

Age

HIV care patterns also varied by age. Younger people (13-29 years of age) had among the lowest percentages linked to care within three months of diagnoses but had among the highest proportions to have accessed and engaged in care during 2014. Younger people were less likely than those ages 30 and older 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. The low proportion of success among those with unknown transmission risk should be interpreted with caution – those who are out of care are more likely to have unknown risk, as medical providers are an important source of risk information.

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, Worley PM, et al. Ryan White HIV/AIDS Program Assistance and HIV Treatment Outcomes. *CID*. Available at: <http://cid.oxfordjournals.org>. Accessed October 12, 2015.

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Based on a local eHARS validation study, reporting of HIV-related laboratory data is high⁶ and the correlation between laboratory data and medical visits is also high.⁷ Therefore, use of eHARS laboratory data is a reasonable approximation for care over a one-year period. The correlation between HIV laboratory data and clinic visit dates within a 90-day period is lower, therefore the linkage estimates presented here may overestimate the true linkage rates.

Finally, this analysis is based on PLWHA 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 2005, the proportion of PLWHA in Wisconsin with successful care outcomes increases across all categories to 80% in care, 63% retained in care, and 64% virally suppressed.

Conclusion

The HIV care continuum is a useful tool for visualizing health outcomes, identifying health disparities, and prioritizing programmatic efforts. Visual displays of the HIV care continuum are useful for identifying and clearly communicating gaps in the various stages of HIV care. Individual stages, primarily retention in care and viral suppression, have been used locally and nationally as evaluation measures for interventions designed to improve care along the continuum. Finally, the continuum can be used to more easily identify disparities across sub-populations. Individual agencies, as well as the AIDS/HIV Program, should use the HIV care continuum to assist in strategic planning and prioritize interventions designed to improve health outcomes and reduce health disparities.

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 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.

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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 2014. Individuals were included in the care, retention and viral suppression measures if they met all the following criteria:

- Reported with HIV infection in Wisconsin by 12/31/2013
- Alive and living in Wisconsin as of 12/31/2014
- Age 13 or older as of 12/31/2013

Geography was assigned using the *current city* variable in eHARS. PLWHA whose current city at the end of 2013 was Milwaukee and who were still living in Milwaukee at the end of 2014 were included in the City of Milwaukee analysis, while individuals with any other city listed in the *current city* variable were included in the “State excluding Milwaukee” analysis. There were 220 (3.4% 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 but with a different base population. The base population consisted of all PLWHA in Wisconsin as of the end of 2014. The 6,899 cases were divided into those who had at least one lab test from a Ryan White provider or facility (n=2,810) and those who had lab tests only from non-Ryan White funded providers and facilities (n=1,931). These numbers were used as the denominator to calculate the stages of care. Those individuals with no care during 2014 (n=2,158 or 31%) were excluded from the analysis.

Because eHARS does not contain medical visit dates, CD4 and viral load test results were used as proxy indicators of clinical care. Ninety-five percent confidence intervals 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 PLWHA ≥ 13 years of age who were reported with HIV in Wisconsin at the end of 2013 and who were still alive and living in Wisconsin at the end of 2014.
Linked within Three Months of Diagnosis	Number of PLWHA newly diagnosed during 2014 who had evidence of a CD4 or viral load test with a specimen collection date within three months of the HIV diagnosis date, divided by the number of PLWHA newly diagnosed during 2014. CD4 or viral load tests 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 PLWHA who had evidence of at least one CD4 or viral load test during 2014 divided by the number diagnosed and living with HIV.

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Table 2 continued

Care Stage	Measurement Definition
Retained in Care	Number of PLWHA who had evidence of at least two CD4 or viral load tests that were ≥ 90 days apart during 2014 divided by the number diagnosed and living with HIV.
Virally Suppressed	Number of PLWHA whose last viral load test result during 2014 was <200 copies/mL divided by the number diagnosed and living with HIV. Those without a viral load test were considered unsuppressed.
Viral Suppression among Those with a Viral Load Test	Number of PLWHA whose last viral load test result during 2014 was <200 copies/mL divided by the number who had at least one viral load test during 2014. This measure may not be depicted on all continuums.

