

## Perspective

# HIV Infection in Hard-to-Reach Populations

*HIV disproportionately impacts populations that have traditionally suffered from health disparities; thus, it is unsurprising that health disparities are a major driver of the ongoing HIV epidemic in the United States. High rates of HIV prevalence and incidence are now seen in the Southern United States and among black men who have sex with men, transgender women, and individuals in low-income settings. In addition, substance use continues to be a major driver of the HIV epidemic and impacts care outcomes. Efforts at reducing HIV transmission must include focus on engagement and retention in care among individuals at risk of being lost to care. This requires particular emphasis on understanding and addressing patient needs and removing structural barriers to engagement in care. This article summarizes a presentation by Carlos del Rio, MD, at the IAS–USA continuing education program, Improving the Management of HIV Disease, held in New York, New York, in March 2016.*

**Keywords:** HIV, HIV care, HIV transmission, retention, men who have sex with men, MSM, substance use, engagement

The HIV epidemic in the United States disproportionately affects populations that have historically suffered from health disparities. Thus, addressing HIV prevention and care requires that practitioners consider health disparities and social determinants of health as major drivers of outcomes.

In the United States, there are approximately 50,000 new HIV infections per year, with men who have sex with men (MSM) accounting for approximately 62% of infections and black and Hispanic persons accounting for more than 50% of new infections. National Health and Nutrition Examination Survey (NHANES) data from 2007 to 2012 indicate an HIV prevalence of 0.39% in the general adult population, with HIV prevalence being higher among men than women (0.61% and 0.16%, respectively;  $P < .01$ ), among non-Hispanic black individuals than other racial or ethnic groups combined (1.6% and 0.23%, respectively;  $P < .001$ ), and among MSM than men who have sex with women (7.7% and 0.17%, respectively;  $P < .01$ ).

The goals of the National HIV/AIDS Strategy (NHAS) for the United States through 2020 are to: 1) reduce the rate of new HIV infections; 2) increase access to care and improve health outcomes for HIV-infected persons; 3) reduce HIV-related disparities and health inequities; and 4) achieve a more coordinated national response to the HIV epidemic. Indicators for the NHAS include increasing the percentage of HIV-infected persons who are aware of their HIV serostatus to 90%, of persons who are linked to care within 30 days of HIV diagnosis

to 85%, of persons with diagnosed HIV infection who are retained in care to 90%, and of persons with diagnosed HIV infection who are virally suppressed to 80%.

## Rates of HIV Infection in Hard-to-Reach Populations

Centers for Disease Control and Prevention (CDC) data for 2014 indicate that the highest rate of HIV infection among racial or ethnic groups occurs among black populations, with rates among adults and adolescents of 64.7 per 100,000 in the Southern United States, 64.3 per 100,000 in the Northeastern United States, 47.0 per 100,000 in the Midwestern United States, and 48.8 per 100,000 in the Western United States (Figure 1). The incidence of new HIV infections declined between 2002 and 2011 in all risk groups except MSM (Figure 2).<sup>1</sup> The CDC now estimates that the lifetime risk of HIV infection is 1 in 20 for black men, 1 in 48 for black women, 1 in 48 for Hispanic men, 1 in 227 for Hispanic women, 1 in 132 for white men, and 1 in 880 for white women.<sup>2</sup> Lifetime risks are 1 in 6 for MSM, 1 in 23 for women who inject drugs, 1 in 36 for men who inject drugs, 1 in 241 for heterosexual women, 1 in 473 for heterosexual men, 1 in 2 for black MSM, 1 in 4 for Hispanic MSM, and 1 in 11 for white MSM.<sup>2</sup>

Although the HIV epidemic disproportionately affects black MSM in the United States, there are in fact a similar number of new HIV transmissions per year among black compared with white MSM (9833 and 9710, respectively) but within a smaller overall population. As a result, the incidence of HIV infection per 100 persons per year is estimated at 0.32 among white MSM and 2.57 among black MSM, and the prevalence is much higher among black MSM. Given the greater prevalence of HIV infection among black MSM, the likelihood of transmission per sexual encounter for black MSM is 5.8 times higher than that for white MSM.<sup>3</sup>

There are also racial disparities across the HIV care continuum. Among black MSM with HIV infection, it is estimated that 75% have been diagnosed, 24% are retained in care, 20% are on antiretroviral therapy, and 16% are virally suppressed. Among white MSM with HIV infection, it is estimated that 84% have been diagnosed, 43% are retained in care, 39% are on antiretroviral therapy, and 34% are virally suppressed. Thus, in addition to being more likely to have HIV infection, black MSM are less likely to be on antiretroviral therapy and less likely to be virally suppressed, increasing the risk of HIV transmission. This calls for greater scale up of preexposure prophylaxis to uninfected black MSM and better retention in care for black MSM with HIV infection.

Since the early years of the HIV epidemic in the United States, the geographic impact of the infection has also changed. Although early in the epidemic most new cases of HIV infection were in the West and Northeast, most new HIV infections today occur in the Southern United States. For example, in 2011, there were 23,988 HIV infections

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diagnosed in the Southern United States, 8765 in the Northeastern United States, 7956 in the Western United States, and 6061 in the Midwestern United States. The Southern United States now has the greatest proportion of HIV-infected persons: 43% compared with 26% in the Northeastern United States, 19% in the Western United States, and 12% in the Midwestern United States, according to 2013 data. In addition to the greater burden of the epidemic in the Southern United States, there is also a greater impact on rural communities.<sup>4</sup>

The epidemic continues to impact cities, but even in cities it is concentrated within particular areas within cities. In New York City, for example, an estimated 115,000 people were living with HIV infection in 2012, with 2832 new diagnoses in 2013. Among those diagnosed with HIV infection in New York City in 2012, 72% were men, 28% were women, 45% were black, 32% were Hispanic, and 21% were white. Of the new HIV diagnoses in New York City in 2012, 51% were attributed to sexual contact with MSM, 14% to injection drug use, and 3% to injection drug use and sexual contact with MSM; 52% of HIV infections among women were attributed to sexual contact and 17% to injection drug use.<sup>5</sup> The highest concentrations of HIV-infected persons live in zip codes with higher concentrations of black residents and higher levels of poverty. The higher concentration of HIV diagnoses in low-income areas holds true for black, Hispanic, and white individuals in New York City and other cities. In fact, when poverty is taken into account, some of the racial and ethnic disparities are less apparent. For example, 1 study showed a similarly high HIV prevalence (approximately 1.9%-2.4%) among black, Hispanic, and white individuals in census tracts in which 20% or more of residents had household incomes below the US poverty level in 24 cities.<sup>6,7</sup>

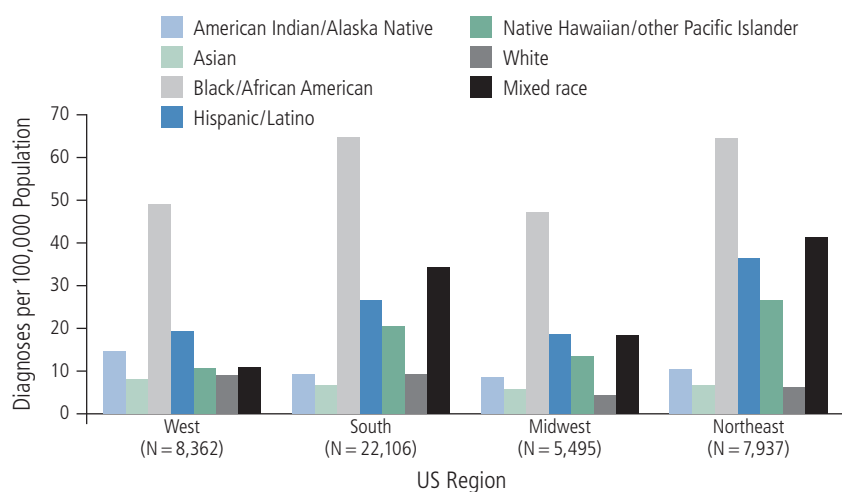
There is also a high burden of HIV infection among transgender women. Globally, data from 2000 to 2011 indicate an HIV prevalence of 19% in this population, with more recent data indicating a prevalence of 2% among youths and 45% among sex workers and women of color.<sup>8,9</sup> Improved engagement and retention in care are crucial for this population to

reduce stigma and prevent secondary trauma (eg, racism, transphobia, economic disadvantage), to address concerns about the impact of HIV medications on hormones, to provide mental health and substance use treatment, and to improve practitioner knowledge about medical issues specific to transgender individuals.

Substance use is a major driver of the ongoing HIV epidemic. Up to 50% of HIV-infected persons in the United States have a co-occurring substance use disorder. Substance use is associated with reduced viral suppression and accelerated disease progression, and up to 50% of persons hospitalized for an HIV-related condition have a substance use disorder. Controlled prescription drugs have become an increasingly common driver of the substance use epidemic in the United States. The outbreak of HIV infection among persons who injected prescription opioids in Indiana was a wakeup call about this emerging public health problem.<sup>10,11</sup> The CDC recently conducted a county-level analysis to identify areas at risk of experiencing a similar outbreak of HIV or hepatitis C virus infection and concluded that 220 counties in 26 states are most at risk.<sup>12</sup>

### Improving the HIV Care Continuum

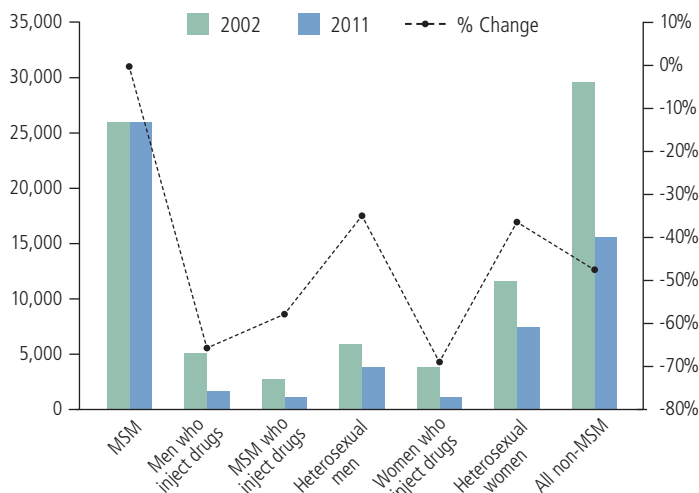
The biggest challenges in the HIV care continuum are engagement and retention in care. Data from 2011 indicate that among all HIV-infected persons, 86% have been diagnosed, 80% of those diagnosed are linked to care, 40% are engaged in care, 37% have been prescribed antiretroviral therapy, and 30% have achieved viral suppression.<sup>13</sup> Consistent retention in care has been associated with faster time to virologic suppression, lower cumulative viral load burden, improved immune function, decreased mortality, and decreased engagement in behaviors associated with HIV transmission. Available data indicate that today the highest number of HIV transmissions are from individuals who have been diagnosed with HIV infection but are not retained in care.<sup>14</sup> A study by Mugavero and colleagues showed that



**Figure 1.** Diagnoses of HIV infection in the United States in 2014, by region. Adapted from the Centers for Disease Control and Prevention.<sup>20</sup>

in addition to failure to achieve Institute of Medicine or US Department of Health and Human Services core indicators for retention in care, increased number of missed clinic visits was associated with statistically significantly increased risk of mortality. Increased risk of mortality was associated with increased missed visits, even among individuals who met indicators for retention in care.<sup>15</sup>

Longitudinal retention in care is also important. A disparity in retention in care between black and nonblack individuals became evident at approximately 24 months in 1 study, with retention rates of 84% and 85%, respectively, at 12 months; 60% and 70%, respectively, at 24 months; and 46% and 63%, respectively, at 36 months.<sup>16</sup> Such data indicate that retention in care and maintenance of viral suppression should be viewed as long-term commitments.



**Figure 2.** New HIV infections by risk group in 2002 and 2011. MSM indicates men who have sex with men. Adapted from Johnson et al.<sup>7</sup>

Metsch and colleagues examined whether patient navigation could improve rates of retention in care and of viral suppression.<sup>17</sup> In the study, 801 hospitalized individuals who were not virologically suppressed were randomly assigned to receive patient navigation for 6 months ( $n = 266$ ), patient navigation and contingency management for 6 months ( $n = 271$ ), or treatment as usual ( $n = 264$ ). Patient navigators were assigned to help coordinate treatment and care; provide health education; assist patients in overcoming such barriers as lack of transportation, childcare, or insurance; and provide psychosocial and emotional support. Participants in the 2 groups that received patient navigation attended 11 meetings with a patient navigator. Contingency management consisted of financial incentives for patients, whereby a patient could earn up to \$1160 by meeting specific goals, including attending 11 meetings with a patient navigator, completing paperwork, having 4 HIV care visits, receiving substance use treatment, providing substance-negative urine specimens, undergoing 2 blood draws, taking HIV medications, having a 2  $\log_{10}$  copies/mL drop in HIV RNA level, and achieving viral suppression.

At 6 months, virologic suppression had been achieved in 46.2% of the group that received patient navigation and contingency management, 39.1% of the group that received patient navigation only, and 33.6% of the group that received treatment as usual ( $P = .04$ ); however, at 1 year, 6 months after the interventions ended, rates of virologic suppression did not differ among these groups (38.6%, 35.7%, and 34.1%, respectively;  $P = .68$ ). Overall, these findings suggest that such interventions may improve outcomes but should be continued for longer periods during treatment. Subgroup analysis indicated that black individuals were less likely to achieve virologic suppression than white individuals (odds ratio [OR], 0.53; 95% CI, 0.36-0.78) and that stimulant use (eg, cocaine or methamphetamine) was associated with reduced likelihood of achieving virologic suppression compared with opiate use (OR, 0.73; 95% CI, 0.55-0.97).


It remains unclear whether contingency management can be successful in the setting of HIV care. Data from the HIV Prevention Trials Network (HPTN) 065 study indicated that financial incentives did not increase rates of linkage to care or virologic suppression, although these outcomes were improved in hospital clinics, smaller sites, or sites with lower rates of virologic suppression, suggesting that targeting such interventions to these settings may be beneficial.<sup>18</sup> In a pilot study reported by Marconi and colleagues, financial incentives given as part of a commitment contract did increase adherence to antiretroviral therapy and rates of virologic suppression, suggesting that such incentives coupled with individual choice may sustain behaviors that would otherwise dissipate when incentives are removed.<sup>19</sup>

Structural issues are a major barrier to engagement and retention in care. Not much is done to improve the socioeconomic dimension of care outside an HIV clinic. As a result, individuals are provided much support in the clinic but are then left to face a multiplicity of problems, including poverty, joblessness, food insecurity, unstable housing, depression, and substance use when they leave the clinic. Clinicians face the difficult task of balancing needs from the health care perspective and the patient perspective. Medical care is a high priority for a clinic, whereas an individual may be more concerned with factors such as cigarettes, recreational drugs, housing, transportation, sex, phone availability, benefits, and more.

How can the likelihood that individuals will remain in care be optimized? Shared needs that must be satisfied include mental health services, substance use treatment, benefits advocacy, childcare, transportation, food, housing, companion services, and respite care. Substance use treatment is a priority, given the high association between ongoing substance use and ongoing transmission of HIV. At the patient level, care must focus on changing behavior by improving trust and communication, reducing stigma, and removing structural barriers to engagement in care. At the practitioner and system levels, practical strategies that may help in accommodating patients at risk of being lost to care include changes in appointment scheduling systems (eg, open access), extended clinic hours, consolidation of health insurance and health care systems, and reorganization of clinical practices and structures to be able to support decades of HIV care for every patient. Appropriate staffing and resources are required for such strategies to be successful.

## Conclusion

Finding hard-to-reach populations and linking them to and retaining them in HIV care should be prioritized if NHAS goals are to be reached. Not just HIV-related issues but all medical (eg, mental health and substance use) and nonmedical issues that are barriers to achieving engagement in care and virologic suppression must be addressed. Practitioners should know their patients and their patients' needs. Social services, case management, patient navigation, contingency management, and motivational interviewing can be important tools

and strategies to address some of the needs of hard-to-reach populations. 

Presented by Dr del Rio in April 2016. First draft prepared from transcripts by Matthew Stenger. Reviewed and edited by Dr del Rio in August 2016.

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## 2016 Recommendations of the IAS–USA Antiretroviral Guidelines Panel Now Available!

Recommendations on the use of antiretroviral drugs for treatment and prevention of HIV infection in adults, by the IAS–USA Antiretroviral Guidelines Panel, were published in the *Journal of the American Medical Association* in July 2016 (Gunthard HF, Saag MS, Benson CA, et al. Antiretroviral drugs for treatment and prevention of HIV infection in adults: 2016 recommendations of the International Antiviral Society–USA panel. *JAMA*. 2016;316[2]:191–210).

The paper includes updated recommendations for the use of antiretroviral therapy in adults with established HIV infection, including when to start treatment, initial regimens, and changing regimens, along with recommendations for using antiretroviral drugs for preventing HIV among those at risk, including as preexposure and postexposure prevention. Visit the IAS–USA home page ([www.iasusa.org](http://www.iasusa.org)) for a link to the full paper.

Clinical Review & Education

**Special Communication**

### Antiretroviral Drugs for Treatment and Prevention of HIV Infection in Adults

#### 2016 Recommendations of the International Antiviral Society–USA Panel

Huldrych F. Günthard, MD; Michael S. Saag, MD; Constance A. Benson, MD; Carlos del Rio, MD; Joseph J. Eron, MD; Joel E. Gallant, MD, MPH; Jennifer F. Hoy, MBBS, FRACP; Michael J. Mugavero, MD, MHS; Paul E. Sax, MD; Melanie A. Thompson, MD; Rajesh T. Gandhi, MD; Raphael J. Landovitz, MD; Davey M. Smith, MD; Donna M. Jacobsen, BS; Paul A. Volberding, MD

**IMPORTANCE** New data and therapeutic options warrant updated recommendations for the use of antiretroviral drugs (ARVs) to treat or to prevent HIV infection in adults.

**OBJECTIVE** To provide updated recommendations for the use of antiretroviral therapy in

 Editorial page 151

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