Implementing National HIV/AIDS Strategy 2015 Treatment Targets Is Cost-effective and Would Save Lives: What Other Evidence Do We Need?

Adaora A. Adimora

UNC School of Medicine and UNC Gillings School of Global Public Health, University of North Carolina at Chapel Hill

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In response to persistently elevated human immunodeficiency virus (HIV) incidence in the United States, the Obama administration released the first National HIV/AIDS Strategy (NHAS) in 2010 to concentrate national attention on ending the domestic epidemic and coordinate the nation's response [1]. The NHAS incorporated measurable objectives to help repair defects in the continuum of HIV care that contributed to high HIV infection rates [2].

Considerable advances have been made in HIV prevention and care since then. Research has demonstrated the efficacy of preexposure prophylaxis for preventing HIV infection and the efficacy of early antiretroviral therapy (ART) for persons with HIV in decreasing their risk of illness and death and sexual transmission of HIV to others [3–5]. The vision of a world without new HIV infections has become increasingly plausible. In the United States, new HIV infections have declined among women, persons who inject drugs, heterosexuals, and overall, with the 40 000 new diagnoses reported in 2015 falling below the NHAS 2010 target [6].

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Correspondence: A. A. Adimora, MD, MPH, Division of Infectious Diseases, UNC School of Medicine, University of North Carolina at Chapel Hill, CB 7030, 130 Mason Farm Rd, Chapel Hill, NC 27599-7030 (adimora@med.unc.edu).

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Progress has been uneven, however. Marked racial disparities in HIV infection rates persist; rates among black women have declined but were still 16-fold higher than among white women in 2015 [6]. Most alarming, however, is the epidemic among men who have sex with men (MSM)—especially black MSM. Despite the lack of racial differences in sexual behaviors among MSM [7], HIV rates among black MSM have remained persistently high. The Centers for Disease Control and Prevention estimates an annual incidence rate of 5% among black MSM aged 18–24 years (compared with 1.6% among non-Hispanic white MSM) in 21 US cities sampled in the National HIV Behavioral Surveillance System [8]—a rate that rivals the epidemic in southern Africa—and by all reasonable standards has long constituted a public health emergency.

One of the enduring obstacles to ending the domestic epidemic has been the fractured nature of the US HIV care continuum—the number of persons with HIV whose infection is diagnosed and who are linked to care, prescribed ART, retained in care, and virally suppressed. The Centers for Disease Control and Prevention estimated that of the 1.2 million persons in the United States with HIV infection in 2011, only 86% had their infection diagnosed, 40% were receiving HIV medical care, 37% were prescribed ART, and 30% were virally suppressed [9]. Barriers to care occur at every step of the continuum. For example, despite high sexually transmitted infection rates and an estimated HIV prevalence of 39.5% among MSM in Jackson, Mississippi [10], as of July 2017 the state health department planned to discontinue free HIV testing and begin charging patients for all laboratory tests for HIV and sexually transmitted infections [11]. Lack of insurance limits patients' access to HIV care, ART, and preexposure prophylaxis in states that refused to expand Medicaid. Some states impose cumbersome policies for implementing semiannual recertification for the AIDS Drug Assistance Program (the Ryan White CARE Act–funded program for individuals with low income and inadequate insurance), leading to interruptions in ART [12, 13].

In 2015 the Obama administration revised the NHAS (hereafter NHAS 2015) with adoption of new HIV "treatment targets" that align with those of the Joint United Nations Programme on HIV/AIDS (UNAIDS) [14, 15]. The new targets raise the proportion of persons with HIV infection who know their serostatus to ≥90%, from the previous baseline of 85.7%. One of the most ambitious revisions is the goal of increasing the percentage of persons with diagnosed HIV infection whose plasma viral loads are below detectable to ≥80%, from the previous baseline of 43%.

A few countries have already achieved UNAIDS targets. Sweden, a country with low HIV prevalence, was the first [16], but other countries with fewer resources and much higher HIV prevalence than

the United States have also succeeded. Botswana, a middle-income country with 25% HIV prevalence among individuals aged 15–49 years, provides free ART. Among persons who met the country's HIV treatment guidelines, 83.3% of persons with HIV were aware of their serostatus, and 70.2% of all persons with HIV had viral suppression [17]. In rural Kenya and Uganda (both low-income countries), HIV prevalence was 10.3%, and 44.7% of persons with HIV were virally suppressed at baseline. However, after 2 years of an intervention comprising population-based HIV testing, facilitated linkage to care, and streamlined delivery of ART, 95.9% of persons with HIV had received a previous diagnosis, and 80.2% of HIV-seropositive persons were virally suppressed [18].

Achieving this level of success in the United States would require enough additional investment in healthcare to repair the HIV care continuum and fully implement the NHAS. In this issue of *The Journal of Infectious Diseases*, Borre et al [19] report the results of mathematical simulations that compare the 5- and 20-year clinical and economic impacts of our current pace and practice of HIV testing, linkage to and retention in care, and viral suppression with the enhanced investments in expanded testing and adherence required to reach the NHAS 2015 targets of 72% viral suppression among persons with HIV in the US general population and black MSM.

The results are striking. Implementation of NHAS 2015 would save 199 000 lives (including 45 000 among black MSM) and >2.1 million years of life over 20 years. Even with increased survival of persons with HIV, the 280 000 averted transmissions among the general population, including 80 000 among black MSM, would decrease the number of US persons with HIV at 20 years by 82 000 [19]. Moreover, although NHAS 2015 would increase HIV care costs by 23%, it is clearly cost-effective, with an incremental cost-effectiveness ratio of $68 900/quality-adjusted life-years (QALY) for the general population and $38 300/QALY for black MSM [19]—values well below the accepted $100 000/QALY threshold for cost-effectiveness [20].

A key strategy for achieving the NHAS 2015 targets is enhancing access to care, a critical factor in each step of the care continuum. Because health insurance is so important for accessing care in the United States, a major driver of the gains in controlling the HIV epidemic during the past few years has been the Affordable Care Act (ACA), which legislated reforms to extend affordable healthcare coverage and protect consumers from abusive practices of the insurance industry [15].

While benefitting the general public, the ACA has also substantially affected HIV infection in the United States by increasing health coverage for persons with HIV; removing barriers to care, such as denial of coverage and higher premium charges based on health status; and providing preventive care for covered individuals, including HIV testing. Nationwide, the percentage of uninsured nonelderly adults in the United States declined by 37% between 2013 and 2015 (from 20.4% to 12.8%) [21]. A key provision of the ACA was expansion of Medicaid, the health insurance for lower-income persons. Some states, however, including a disproportionate number in the southern United States, where rates of HIV are among the nation's highest, refused to expand Medicaid, leaving many of their low-income residents without healthcare coverage because their incomes render them ineligible for both Medicaid and subsidies to enable their purchase of private insurance. As a result, the percentage of uninsured persons with HIV remained essentially stable in non-Medicaid expansion states between 2012 and 2014 (26% and 23%, respectively)—but fell significantly from 13% to 7% in states that expanded Medicaid [22].

Observational studies suggest that insurance status and type affect viral suppression. Among predominantly low-income women with HIV, those with private insurance were most likely to be virally suppressed, but additional support through the AIDS Drug Assistance Program also increased the likelihood of viral suppression among women with Medicaid or no insurance [23]. Among white and Hispanic women, lack of health insurance (compared with public health insurance) was associated with virologic failure after initial suppression [24]. These findings highlight the importance of health insurance in gaining access to treatment for HIV infection.

High drug prices, facilitated by a byzantine legal and regulatory system, escalate HIV treatment costs for patients and payers in the United States. In their analysis, Borre et al [19] included the costs of ART, HIV RNA testing with test result confirmation and posttest counseling, routine care stratified according to CD4 cell count, and a high-impact intervention resulting in high treatment adherence and retention in care. Of all these variables, variations in drug prices caused the most dramatic changes in NHAS 2015 cost outcomes. A 50% reduction in drug prices yielded a 37% reduction in the additional cost of NHAS 2015—reducing overall NHAS costs to less than the cost of the current US practice at baseline drug prices [19]. An overhaul of US drug pricing regulations could conceivably lower drug costs and improve access to treatment for HIV infection and other conditions.

Of all the threats to progress in controlling the US HIV epidemic, however, the constant assault on the ACA and expansion of healthcare access is potentially the most damaging. The gains that have been made in HIV control are fragile and could easily be reversed by reductions in healthcare access and/or quality. Conversely, increasing investment in healthcare to achieve the major NHAS treatment targets would decrease human suffering and is clearly cost-effective. Ending the US HIV epidemic will require political will at the state and federal levels to ensure good healthcare for everyone in the nation—and an understanding that what benefits the most vulnerable in society ultimately benefits us all.

Note

Potential conflict of interest. A. A. A. reports receiving grants from Gilead and personal fees from Merck outside the submitted work. She has served as a member of the Presidential Advisory Council (PACHA) on HIV/AIDS (9/2013 to 9/2017); the opinions expressed are her own and do not necessarily represent the views of PACHA. The author has submitted the ICMJE Form for Disclosure of Potential Conflicts of Interest. Conflicts that the editors consider relevant to the content of the manuscript have been disclosed.

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