

## State of HIV in the US Deep South

Susan Reif, PhD, LCSW (corresponding author)<sup>1,2</sup>  
Research Scholar

Donna Safley, MS<sup>1</sup>  
Data Analyst

Carolyn McAllaster, J.D.<sup>3</sup>  
Clinical Professor of Law

Elena Wilson, MPH<sup>1</sup>  
Project Coordinator

Kathryn Whetten, PhD, MPH<sup>1,2</sup>  
Professor of Public Policy and Global Health  
Director, Center for Health Policy and Inequalities Research

<sup>1</sup>Center for Health Policy and Inequalities Research, Duke University, 310 Trent Drive, Durham NC 27708, T: 704 258-7111, susan.reif@duke.edu

<sup>2</sup>Duke Global Health Institute, 310 Trent Drive, Durham NC, 27710, 919 681-7760

<sup>3</sup>Duke University School of Law Box 90360, Durham, North Carolina 27708, T: (919) 613-7036/ F: (919) 613-7262

i

---

### ACKNOWLEDGMENTS:

This research was commissioned by the HIV/AIDS Policy Clinic at Duke University through a Ford Foundation grant (1115-1373).

## ABSTRACT

The Southern United States has been disproportionately affected by HIV diagnoses and mortality. To inform efforts to effectively address HIV in the South, this manuscript synthesizes recent data on HIV epidemiology and care financing and current research literature on factors that predispose this region to experience a greater impact of HIV. The manuscript focuses on a specific Southern region, the Deep South, which has been particularly affected by HIV.

Epidemiologic data from the Centers for Disease Control and Prevention indicate that the Deep South had the highest HIV diagnosis rate and the highest number of individuals diagnosed with HIV (18,087) in 2014. The percentage of new HIV diagnoses that were female has decreased over time (2008-2014) while increasing among minority MSM. The Deep South also had the highest death rates with HIV as an underlying cause of any US region (2014). Despite higher diagnosis and death rates, the Deep South received less federal government and private foundation funding per person living with HIV than the US overall. Factors that have been identified as contributors to the disproportionate effects of HIV in the Deep South include pervasive HIV-related stigma, poverty, higher levels of sexually transmitted infections (STIs), racial inequality and bias, and laws that further HIV-related stigma and fear. Interventions that address and abate the contributors to the spread of HIV disease and the poorer HIV-related outcomes in the Deep South are warranted. Funding inequalities by region must also be examined and addressed to reduce the regional disparities in HIV incidence and mortality.

Key Words: HIV, AIDS, South, Stigma

## INTRODUCTION

The US South is known for its warm climate, Southern hospitality, and population growth in recent years.<sup>(1)</sup> However, the South also has some of the highest poverty levels and most negative health indicators in the country.<sup>(2, 3)</sup> For example, 9 of the 10 states with the worst overall health ratings are in the South (defined by the Census Bureau as including 16 states and DC).<sup>(2, 4)</sup><sup>ii</sup> HIV is no exception to this trend, as the South has consistently reported the highest HIV diagnosis rates of any US region.<sup>(5, 6)</sup> A 9 state region (AL, FL, GA, LA, MS, NC, SC, TN, TX) in the South, hereafter referred to as the Deep South for the purposes of this manuscript, has been particularly affected by HIV disease. Forty percent of individuals diagnosed with HIV in 2013 resided in the Deep South while the Deep South accounted for only 28% of the US population. The Deep South region also had the highest death rates among individuals diagnosed with HIV (2012).<sup>(5)</sup> Despite the concentration of HIV in the Deep South, previous studies of federal funding for HIV prevention and care identified regional inequities; with a lower allocation of funding per person living with HIV in the Deep South compared to US overall.<sup>(7-9)</sup>

The updated National HIV/AIDS Strategy (NHAS) specifically targets the South in recognition of the disparate impact of HIV in this region.<sup>(10)</sup> The strategy contains the goal of reducing HIV diagnoses by 25% and reducing disparities in the rate of new HIV diagnoses by at least 15% in persons living in the Southern United States.<sup>(11)</sup> However, to bring these goals to fruition, it is imperative to better understand the characteristics of HIV in this region and identify and

---

<sup>ii</sup> AL, AR, DE, FL, GA, KY, LA, MD, MS, NC, OK, SC, TN, TX, VA, WV, DC

address the structural, financial, and cultural factors that contribute to the disproportionate Southern HIV epidemic. This manuscript furthers our understanding of HIV in the Deep South by examining recent data on HIV epidemiology and federal HIV care and prevention funding to describe longitudinal and regional trends, which are areas that have not been explored in recent literature. In addition, the manuscript summarizes recent research literature to determine characteristics of the Deep South that may predispose the region to be disproportionately affected by HIV incidence and poor HIV-related outcomes. This information is critical to devise interventions to reduce HIV-related disparities in the US Deep South.

## METHODS

HIV epidemiology, including HIV and AIDS diagnosis rates and death rates, among individuals 13 or older, were examined using data from the Centers for Disease Control (CDC) Atlas Database for 2008-2014.<sup>(6)</sup> The Atlas data are statistically adjusted by the CDC for missing data (such as reporting delays). Regional comparisons were made by comparing HIV diagnosis and death rates across US regions. US regions were defined using the U.S. Census Bureau's segmentation of the country into South, Northeast, Midwest, and West.<sup>(4)</sup> The South was then divided into two groups: the Deep South (AL, FL, GA, LA, MS, NC, SC, TN, TX) and the rest of the South (AR, DE, KY, MD, OK, VA, WV, DC).

We also examined HIV diagnoses and death rates from 2008-2014 to describe trends over time. In addition, the CDC releases death data for ICD-10 codes related to HIV in the CDC Wonder database and calculates age adjusted death rates per 100,000 population for each state and for

the four Census regions.(12) We utilized the CDC Wonder data from each state to calculate the death rate where HIV was an underlying cause in the Deep South and other US regions.

Data regarding federal financing of HIV care and prevention services were obtained through the Kaiser Family Foundation's State Health Facts data releases.(13) These data included funding through the CDC, Health Services Resource Administration (HRSA), Substance Abuse and Mental Health Services Administration (SAMHSA), and HUD (which funds Housing Opportunities for People with AIDS, HOPWA) and were obtained from NASTAD. NASTAD requested the data directly from the funding agencies for 2015. For each funding source, we calculated the amount of funding per person living with HIV using CDC HIV prevalence figures from year end 2013.(6)

To examine evidence regarding the structural, social, and individual factors that contribute to the disproportional HIV epidemic in the Southern US, we performed a comprehensive search of research literature containing the terms "HIV" and "South" using the search engines Pubmed, Google Scholar and the Cochrane Library from 2012 to the present. Sources identified through this search were also used to identify other related research.

## FINDINGS

*HIV and AIDS diagnoses:* CDC HIV diagnosis data indicated that the Southern US region had the highest diagnosis rate in 2014 of any of the 4 regions defined by the US Census Bureau (Table 1).(6) When examined as a region, the Deep South had the highest HIV diagnosis rate (24 per 100,000 population) of any region (16.6/100,000 in the Northeast, 16.6/100,000 in the rest of

the South, 9.7/100,000 in the Midwest, and 13.4/100,000 in the West). In 2014, the Deep South also had the highest number of individuals newly diagnosed with HIV (18,087) of any region. This finding is consistent with prior years, as the Deep South region had the highest HIV diagnosis rates and highest numbers of individuals diagnosed with HIV of any US region in years 2008-2013 as well.(5)

The percentage of individuals diagnosed with HIV who were African American was higher in the Deep South in 2014 (53.5%) than in the overall US (44.0%). The demographic characteristics of individuals newly diagnosed with HIV have changed over time in the Deep South consistent with trends in the US overall. The percentage of newly diagnosed individuals who were female declined from 26.8% to 20.4% from 2008-2014 in the Deep South and from 24.2% to 19.0% in the US overall. In the Deep South, the percentage of HIV diagnoses that were African American women declined from 19.2% in 2008 to 14.1% in 2014. The HIV diagnosis rate also declined among African American women from 52.8 per 100,000 population in 2008 to 32.9 in 2014 but remained over 10 times that of white women (2.5 per 100,000) in the Deep South in 2014.

The percentage of new diagnoses that were men who have sex with men (MSM) increased over time in the Deep South (56.9% in 2008 to 67.8% in 2014)(5, 6) and in the US overall (59.9%-69.8%). The increase in the proportion of new diagnoses occurring among MSM in the Deep South was identified only for African American MSM (Figure 1) and Latino MSM; the proportion of HIV diagnoses that were white MSM remained relatively consistent over time.

The US Deep South region had a higher AIDS diagnosis rate (11.7 per 100,000) than the US overall (7.8 per 100,000) in 2014 and the highest number of individuals diagnosed with AIDS (8,849) compared to the other US regions.(6) Consistent with HIV diagnoses, there was a shift in the demographic characteristics of individuals diagnosed with AIDS over time, as the proportion of diagnoses that were female decreased whereas the proportion among African American MSM increased from 2008-2014.(6)

### *HIV Death Rates*

In 2013, 2.0% (6,723) of individuals living with HIV in the Deep South were reported to have died (Table 1). The Deep South has consistently had the highest death rates among people diagnosed with HIV of any US region and the highest number of individuals diagnosed with HIV that died (2008-2013) of any region.(5, 6) (Figure 2) Consistent with the US overall, death rates among individuals diagnosed with HIV in the Deep South have decreased over time.

Although the death rates among individuals diagnosed with HIV provide vital information regarding deaths among persons who have been diagnosed with HIV, these statistics do not accurately reflect deaths attributable to HIV disease rather than to other chronic comorbidities and acute medical events not necessarily related to HIV. When CDC data from 2014 regarding deaths where HIV was an underlying cause were examined, the death rate attributable to HIV was higher in the South (2.9 per 100,000) than the rate in the overall US (2.0) and the rates of the other US regions (Table 1).(14) When the South was divided into the Deep South and the

rest of the South, the death rate where HIV was an underlying cause was higher in the Deep South states at 3.3, than the rest of the South, 2.1. In 2014, 2,952 individuals were reported to have died where HIV was an underlying cause in the Deep South, with the highest death rates in Louisiana and Mississippi followed by Florida (Table 2). Similar trends in death rates with HIV as an underlying cause of death were found for years 2008-2013, as the Deep South also had the highest death rates of any US region for these years.(5)

Death rates where HIV was the underlying cause were appreciably higher among African Americans compared to whites, as African Americans had a death rate of over 5 times that of whites in the Deep South in 2014 (10.1 per 100,000 population and 1.5 per 100,000 respectively).(12) There was a higher death rate among African American men in the Deep South (14.2 per 100,000) than in any other US region in 2014 (Northeast, 13.4; Midwest 7.9; Rest of the South, 10.1; West 8.4) and 1,199 African American men died from HIV as an underlying cause in the Deep South that year. African American women also had a higher death rate where HIV was the underlying cause (6.8 per 100,000) in the Deep South than in other regions and 657 African American women died from HIV as an underlying cause in the Deep South in 2014. In the Deep South, the death rate was 2.4 per 100,000 for white men and .6 per 100,000 for white women in 2014.

### *Federal Financing of HIV Care and Prevention*

HIV care and prevention is funded through several federal funding sources including the CDC, Ryan White Care Act, HOPWA, and SAMHSA. We examined the total amount of these federal funds distributed in 2015 per person living with HIV and found that the Deep South received less funding per individual living with HIV (\$3313.80) in 2015 compared to the US overall (\$3410.80) (Table 3).<sup>(6, 13)</sup> The level of funding per person living with HIV (PLWH) in the Deep South was less than other US regions except the Midwest. Federal funding per PLWH was comparable between the Deep South and US overall for Ryan White, SAMHSA, and HOPWA funding. However, for CDC funding there was a disparity of \$100 per person living with HIV between the Deep South (\$494/PLWH) and the US overall (\$596/PLWH). The Deep South received less funding for the CDC funding categories of surveillance, community based, community based organization, community building assistance provider, school health and miscellaneous and received comparable funding for HIV testing and prevention, which are formula based grants.

In 2014, the gap in overall funding per PLWH (HRSA, CDC, SAMHSA, Ryan White) between the Deep South (\$3041.90/PLWH) and the overall US (\$3151.70/PLWH) was similar to that of 2015. This inequity was primarily due to the Deep South receiving lower levels of CDC funding per PLWH (\$503.60) compared to the US overall (\$585.60).<sup>(15)</sup>

Medicaid, which is a mix of federal and state funding, is also a critical funder of HIV care. Past examination of Medicaid funding for HIV determined that Medicaid funding constituted just over half (51%) of spending for medical and social services for PLWH in 2010 (16) and that the

Southern region had a lower proportion of PLWH that were enrolled in Medicaid (23%) than the national average (26%) as well as lower spending per enrollee.(16) A literature search revealed no studies that examined Medicaid spending for HIV care since implementation of Medicaid Expansion through the Affordable Care Act (ACA). Of the 9 Deep South states, only Louisiana has expanded Medicaid. One study on the impact of Medicaid expansion not specific to HIV found that ninety-one percent of persons who fall into the Medicaid coverage gap (meaning their income is above the Medicaid eligibility limit but below the limit to qualify for an ACA insurance subsidy) live in the South.(17)

### ***Contributing factors to the disproportionate HIV rates in the Deep South***

Sexually Transmitted Infections (non HIV) Deep South states have been disproportionately affected by sexually transmitted infections (STIs) in addition to HIV. From 2008-2013 the Deep South had the highest rates of Chlamydia, Gonorrhea, and Syphilis of any US region.(5) The rates of Chlamydia and Syphilis increased from 2008-2013 in the Deep South while the rates of Gonorrhea declined over time. STIs have been consistently found to increase the risk of HIV transmission.(18, 19)

### Demographic Factors

*Poverty:* All 9 Deep South states have higher poverty rates than the US average and Louisiana had the 3<sup>rd</sup> highest poverty rate in the country in 2015 followed by Mississippi in 2015.(3) In addition, five of the 10 states with the lowest median incomes were located in the Deep South

in 2015.(20) Poverty has been consistently associated with poorer health (21-23) thus may be a contributor to the higher concentration of diseases such as HIV and diabetes in the South.(24-26) Previous research demonstrated that states with the lowest incomes had the highest death rates among individuals diagnosed with HIV.(27)

All Deep South states, except TX, were among the 15 states with the highest unemployment rates in 2015,(28) and all Deep South states were among the 15 states with the highest rates of uninsured individuals in the US.(29) Poverty and unemployment may contribute to the lower rates of health insurance coverage and these three factors may synergistically influence individual health, the spread of disease, and access to medical care.(30, 31)

*Race/ethnicity:* African Americans are disproportionately affected by HIV in the US. For both African American men and women HIV is among the 10 leading causes of death for ages 20-54.(32, 33) African Americans have been particularly affected in the Deep South where over half of individuals diagnosed with HIV (53%) in 2014 were African American.(5) The rate of HIV diagnoses among African Americans in the Deep South (66.9/100,000 population) was higher than the overall US (60.1/100,000) and other regions.(5) In addition, the Deep South had the highest number of African American MSM diagnosed with HIV (n=5734) of any region in 2014, which accounted for 50% of African American MSM diagnosed in the US that year.

There are a number of factors that have been implicated as contributing to higher HIV rates among African Americans. For instance, nationally, African Americans have a poverty rate twice

that of whites, which could lead to higher disease rates.(34) However, research has consistently demonstrated a link between African American race and poorer health care access even after controlling for income and/or health insurance.(31, 35-37) Additional documented phenomena which could potentially explain the racial disparities in HIV diagnosis rates include institutionalized racism, high STI rates, lack of trust in health care and the government, and higher rates of incarceration, which have been shown to negatively influence sexual networks.(38-45) HIV-related stigma has also been implicated as a contributing factor for the higher HIV rates among African Americans, as HIV-related stigma has been identified to be particularly high in African American communities.(46-48) A HRSA article on HIV among African Americans states that “Stigma is perhaps the greatest driving force behind HIV infection among African Americans.”(49) Anti-LGBT bias has been hypothesized as one contributor to this stigma.(48, 50, 51) Many of these contributing factors, including poverty, stigma, and high STI rates, have been shown to be intensified in the Deep South.(46, 52, 53) Finally, the high rates of HIV in the African American community and the finding that African Americans tend to have sex with partners of the same race/ethnicity may result in greater likelihood of new infections among this population due in part to higher saturation of HIV within sexual networks.(45, 54)

A review of the literature on greater prevalence of HIV among African American MSM in comparison to white MSM found that the elevated levels of HIV among African American MSM may be explained by differences in STIs, undiagnosed HIV, and lack of access to or use of care services and HIV medications.(44) Greater risk behavior and substance abuse were not identified as contributing factors to the higher levels of HIV among African American MSM.

Another study found that among African American MSM, use of pre-exposure prophylaxis (PrEP) has been found to be less than among their white counterparts.(55)

Studies that have examined HIV prevalence among transgender individuals in the US have identified higher prevalence among minority transgender populations than their white counterparts.(56, 57) One such study, a review of literature on HIV prevalence among transgender individuals, documented higher prevalence among minority individuals but identified no studies of HIV prevalence among transgender individuals conducted in the Deep South. The authors of the review noted the need to document HIV among transgender individuals in the South due to the higher prevalence of HIV in general. A study of a related topic, health care discrimination experienced by transgender/gender nonconforming (GNC) individuals, found greater reported discrimination while obtaining medical care in the South and West compared to the Northeast, mid-Atlantic, and Midwest.(58)

The disproportionate effect of HIV in minority communities in the South is not limited to African Americans. In 2013, 37% of the 10,101 Hispanic/Latino individuals diagnosed with HIV resided in the Deep South.(6) The proportion of individuals diagnosed with HIV in the Deep South that are Hispanic/Latino is increasing, particularly for Hispanic/Latino MSM.(6) Barriers to accessing HIV care identified among Hispanic/Latinos in the South included stigma, lack of Spanish-speaking health-care providers, and fear of deportation.(59)

#### Medical Care Access:

Deep South states have historically had some of the most restrictive Medicaid benefits for physician visits and prescriptions and all but Louisiana have not participated in Medicaid expansion, resulting in continued dependence on the Ryan White Care system to fund basic HIV medical care.(60, 61) Consequently, these states often lack sufficient Ryan White funding for critical HIV services such as HIV case management and transportation to medical care and support services.(48, 62) A recent study found some evidence of less availability of HIV care providers in the South. This study identified that 40% of HIV care providers practiced in the South while 44% of individuals living with HIV reside in the South. In contrast, the other US regions had a greater proportion of the total US HIV care providers than their proportion of individuals living with HIV.(63) Individuals living in the South have also been found to have less knowledge about and access to HIV clinical trials compared to their counterparts in the Northeast and West.(64)

Southern Culture and Stigma: The cultural conservatism in the Deep South has been implicated in influencing perceptions and experiences of stigma among people living with HIV in this region.(65) In turn, HIV-related stigma has been shown to have negative effects on preventive behaviors and health outcomes,(66-70) thereby influencing the spread of HIV disease. HIV stigma has been identified to be particularly high in the US South.(52) For example, a study investigated regional differences in HIV-related stigma and knowledge among African American adolescents in four midsized cities in the Northeastern and Southeastern US and found greater HIV-related stigma among adolescents from the Southeast compared to adolescents from the Northeast.(46)

A qualitative study of HIV care infrastructure that included individuals living with HIV and individuals working in HIV prevention and care in the Deep South found that stigma was pervasive and reduced willingness to be tested for HIV, engage in HIV care and participate in HIV support groups and advocacy efforts. Stigma regarding sexual orientation, which is closely linked with HIV-related stigma, was also reported to be highly prevalent in the Deep South study areas, as it is in much of the Southeastern US.(27, 71) One study participant reported *“Despite this thing about Southern hospitality, but if it’s something that people deem dirty, then there’s nothing hospitable about it. So, the stigma that you face and the rejection that you face as a person living with HIV and AIDS in the South is what I would say is very unique to us.”*(48) Religious institutions have also been implicated as perpetuating HIV and LGBT stigma and often wield a strong influence in communities in the South.(72)

Another study of stigma among individuals living with HIV in Tennessee documented substantial concerns about HIV-related discrimination, resulting in individuals isolating themselves from friends/families to avoid disclose of their HIV status.(73) Additional studies of stigma in the South describe high levels of HIV-related stigma, which is often layered with other related stigmas including stigmas associated with substance abuse, sexual orientation, sex work, poverty, and race.(74-77)

Additionally, HIV-related stigma has also been found to be greater in rural areas.(67, 78, 79) Rural areas often have additional challenges to consistent HIV care including long travel times to receive care, less availability of medical and social services, and confidentiality concerns. (78,

80-82) Living in a rural area has also been found to be associated with lower retention in HIV care, less viral suppression, and higher HIV-related mortality.(83, 84) The South has the highest number of individuals with HIV residing in rural areas compared to other US regions, so these issues are particularly relevant in this region.(83, 85) One study in the Southeastern US found that individuals living with HIV in rural areas were more likely to have an AIDS diagnosis within a year of HIV diagnosis than their urban counterparts.(86)

Some of the Southern laws and policies have been implicated in fostering the spread of HIV. For example, most Deep South states have abstinence-based sex education, which has been shown to be ineffective in STI prevention.(65, 87) In addition, laws that criminalize HIV-related sexual and other behaviors and prohibit syringe exchange are commonplace in the South.(40, 65, 88) The majority of the Deep South States have prosecuted PLWH for actions like spitting or biting that pose negligible or no risk of HIV transmission.(89) These laws fuel stigma by perpetuating myths about how HIV is transmitted, further marginalizing populations at extremely high risk for acquiring HIV, such as sex workers and injecting drug users, discouraging HIV testing and making illegal interventions that have been proven effective. Finally, the lack of Medicaid expansion by 8 of the 9 Deep South states, has implications for the health of vulnerable populations such as individuals living with HIV. A recent examination of 14 states that opted out of Medicaid expansion identified that 3.6 million fewer people would be insured than had the states expanded Medicaid. (40, 90)

## DISCUSSION

Epidemiologic data consistently reveal that the Deep South region of the US has been disproportionately affected by HIV. In 2014, the Deep South had the highest HIV diagnosis rate, the highest number of individuals diagnosed with HIV and the highest death rate attributed to HIV of any US region. African Americans have been disproportionately affected by HIV and comprise a majority of new diagnoses as well as people living with HIV in the Deep South.(6) The proportion of new HIV diagnoses in the Deep South that are African American MSM has continued to climb and lifetime risk among this group is highest in the Southern region.(91) The proportion of HIV diagnoses that are Latino MSM has also risen in the Deep South and nationally.

Despite the higher HIV diagnosis and death rates in the Deep South, federal funding for HIV care and prevention lags behind in this region primarily due to lower levels of CDC funding. In 2015, the Deep South received \$100 less in CDC funding per person living with HIV than the US overall and \$82 less in 2014. CDC funding differentials by region are not unique to more recent years, as an examination of CDC funding for HIV in 2009 also revealed that Deep South states received less HIV-related funding per individual living with HIV than the national average.(27, 92) In contrast, gaps in Ryan White funding for the Deep South identified in previous studies(7-9) appear to have been eliminated, as Ryan White funding per person living with HIV in the Deep South in 2015 was comparable to the US overall.

Funding inequity by region has also been identified in private foundation grants for HIV-related programs. A recent study found that although 40% of PLWH reside in the Deep South, only 12%

of the private foundation funding for HIV was allocated in the Deep South in 2014.(93) The Deep South received \$35 per PLWH in private foundation funding while the US average was \$116 per PLWH.

Closing the gap in federal and private funding for HIV prevention and care is a strategy important to addressing the disparity in HIV incidence and mortality in the Deep South. However, additional strategies are necessary to attenuate other determinants of HIV diagnoses and poor HIV outcomes in the region.(94) These determinants include the interrelated effects of poverty, unemployment and lack of health insurance; racial inequalities and bias; policies and laws that further HIV-related stigma and fear; and the regional culture that often displays intolerance of differences and remains closed to open dialogue regarding sexuality.

The situation with respect to HIV in the Deep South is not all bleak, as HIV death rates are declining consistent with the US overall(5) and there are numerous innovative programs and initiatives, a sampling of which have been highlighted in a Southern HIV/AIDS Strategy Initiative (SASI) report.(48) However, these types of innovations need to be disseminated to other communities and supported fiscally and structurally so they can have the potential for a wider impact in addressing HIV in the Deep South.

The needs for HIV prevention and care in the Deep South must be addressed if the goals of the National HIV/AIDS Strategy (NHAS) are to be met. The strategy specifically mentions intensifying efforts to address HIV in areas where it is most heavily concentrated including the South.(11) Indicator 9 of the strategy calls for a 15% reduction in HIV diagnosis rate disparities

for people in the South.(17) The National HIV/AIDS Strategy is also specific regarding funding distribution, stating the goal is to “allocate public funding consistent with geographic distribution of the epidemic.” The strategy further discusses the need for holistic approaches to HIV care(10) Enhancing current HIV care models is particularly necessary in the Deep South where Ryan White dollars are often stretched to meet basic HIV medical needs and thus may not be able to adequately meet the needs for other critical services including transportation, case management, and mental health treatment. Finally, the NHAS discusses the essential need to attenuate HIV-related stigma stating that “stigma and discrimination must be eliminated in order to diminish barriers to HIV prevention, testing, and care.” (11) HIV stigma has been documented as ubiquitous in the Deep South and results in a myriad of negative health outcomes. Innovative interventions to reduce stigma and its negative sequelae are essential to effectively abate HIV in the Deep South. Coordinated efforts at the federal, state, and local levels that integrate existing natural resources of Deep South, including committed HIV care and prevention providers and innovative local programs, to address determinants of HIV disease and reduce funding inequities have the potential to reduce the HIV incidence and mortality gap between the Deep South and other US regions.

Table 1: HIV and AIDS Diagnoses and Death Rates

	Deep South <sup>^</sup>	Remaining Southern States <sup>#</sup>	Northeast	Midwest	West	US
HIV diagnosis rate per 100,000 (2014)	24	16.6	16.6	9.7	13.4	16.5
AIDS Diagnosis rate (2014)	11.7	8.4	7.9	4.6	5.6	7.8
Death rate among individuals diagnosed with HIV (2013)	2.0	1.5	1.8	1.7	1.4	1.8
Death rate (age adjusted) attributable to HIV per 100,000 (2014)	3.3	2.1	2.0	1.0	1.4	2.0

<sup>^</sup>AL, FL, GA, LA, MS, NC, SC, TN, TX

<sup>#</sup>AR, DE, KY, MD, OK, VA, WV, DC

Table 2: Death rates by state

	Death rate among individuals diagnosed with HIV (2013)	Death rate attributable to HIV per 100,000 (2014)
Alabama	2.4	2.5
Florida	2.2	4.1
Georgia	1.1	3.6
Louisiana	2.5	4.2
Mississippi	2.2	4.2
North Carolina	2.0	2.1
South Carolina	2.1	3.4
Tennessee	2.3	2.4
Texas	1.8	2.5
US	1.8	2.0

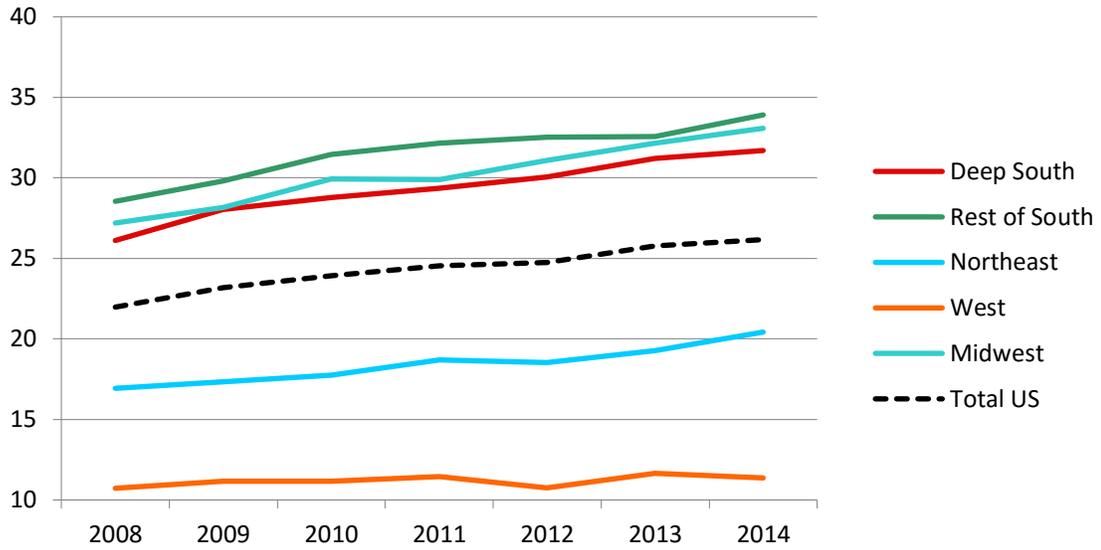
Table 3: Funding Per Person Living with HIV (2015)

	Deep South <sup>^</sup>	Remaining Southern States <sup>#</sup>	Northeast	Midwest	West	US
Ryan White funding per PLWH	\$2358.0	\$2217.4	\$2428.1	\$2229.1	\$2314.3	\$2338.5
SAMHSA funding per PLWH	\$130.7	\$136.0	\$142.0	\$121.0	\$136.4	\$134.0
HOPWA funding per PLWH	\$331.1	\$330.8	\$396.7	\$306.7	\$314.72	\$342.3
CDC funding per PLWH	\$494.0	\$856.0	\$629.8	\$551.0	\$627.4	\$596.0
Total funding from these federal sources per PLWH	\$3316.5	\$3540.8	\$3596.7	\$3207.9	\$3392.8	\$3410.8

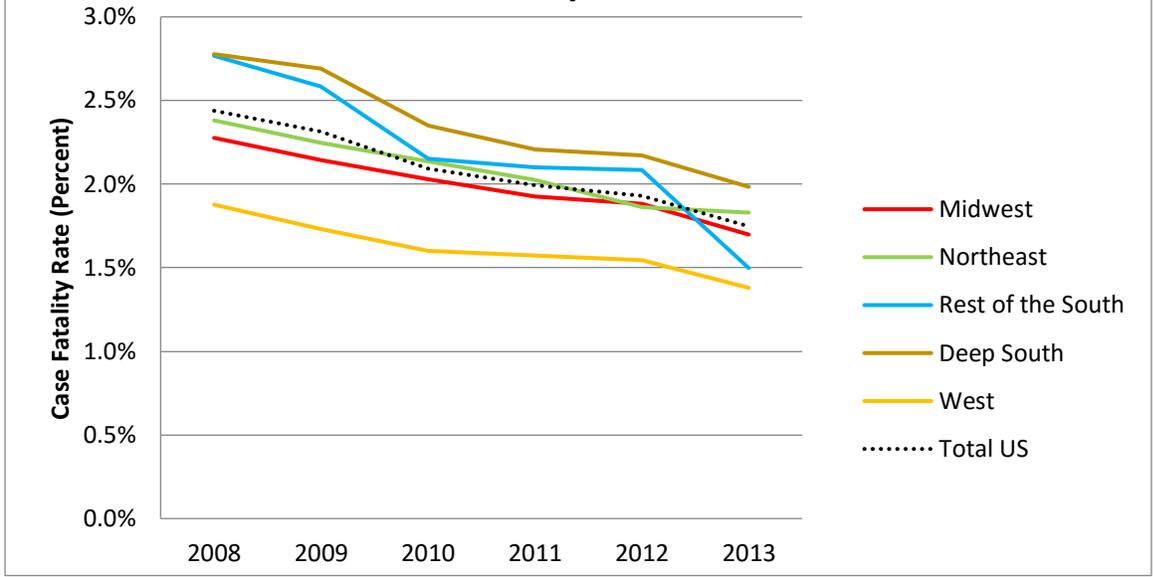
<sup>^</sup>AL, FL, GA, LA, MS, NC, SC, TN, TX

<sup>#</sup>AR, DE, KY, MD, OK, VA, WV, DC

### Percent of HIV Diagnoses that are Black MSM



**Figure 2: Regional HIV Death Rates**  
**HIV Deaths/PLWH**



**Compliance with Ethical Standards:**

This research was commissioned by the HIV/AIDS Policy Clinic at Duke University through a Ford Foundation grant (1115-1373). The authors declare that they have no conflict of interest.

## REFERENCES:

1. US Census Bureau. (2016). United States Population Growth by Region. [https://www.census.gov/popclock/data\\_tables.php?component=growthhttps://www.census.gov/popclock/data\\_tables.php?component=growth](https://www.census.gov/popclock/data_tables.php?component=growthhttps://www.census.gov/popclock/data_tables.php?component=growth). Accessed September 2016.
2. United Health Foundation. (2015). Annual Report. In: America's Health Rankings. 2015. <http://www.americashealthrankings.org/reports/Annual-stateranking> Accessed September 2016.
3. Kaiser Family Foundation. (2016). State Health Facts: Poverty Rate by Age. 2016. <http://kff.org/other/state-indicator/poverty-rate-by-age/?currentTimeframe=0&sortModel=%7B%22colId%22:%22Total%22,%22sort%22:%22desc%22%7D>.
4. U.S. Census Bureau. Census Regions and Divisions of the United States. [http://www.census.gov/geo/www/us\\_regdiv.pdf](http://www.census.gov/geo/www/us_regdiv.pdf). Accessed November 2011.
5. Reif, S., Safley, D., Wilson, E., Whetten, K. (2016). HIV/AIDS in the U.S. Deep South: Trends from 2008-2013. HIV/AIDS in the U.S. Deep South: Trends from 2008-2013.
6. NCHHSTP Atlas. (2016). Available from: <http://www.cdc.gov/nchhstp/atlas/>.
7. Institute of Medicine. (2004). Measuring What Matters: Allocation, Planning, and Quality Assessment for the Ryan White CARE Act. Washington DC: National Academies Press.
8. Government Accountability Office. (2005). Ryan White Care Act: Factors that Impact HIV and AIDS funding and client coverage. <http://www.gao.gov/new.items/d05841t.pdf>.
9. Reif, S., Whetten, K., Wilson, E., et al. (2014) HIV/AIDS in Southern USA: A disproportionate epidemic. *AIDS Care*, 26(3):351-9.
10. Office of National AIDS Policy. National HIV/AIDS Strategy for the United States, Updated to 2020. (2015). <https://www.aids.gov/federal-resources/national-hiv-aids-strategy/nhas-update.pdf>. Accessed September 2016.
11. Office of National AIDS Policy. (2015). National HIV/AIDS strategy for the United States.
12. Centers for Disease Control and Prevention. (2016). Underlying Cause of Death 1999-2014 on CDC Wonder Online Database. 2016. <http://wonder.cdc.gov/ucd-icd10.html>.
13. Kaiser Family Foundation.(2016). State Health Facts. <http://kff.org/state-category/hivaids/>. Accessed September 2016.
14. Centers for Disease Control and Prevention. (2015). Underlying Cause of Death 1999-2014 on CDC Wonder Online Database. 2015. <http://wonder.cdc.gov/ucd-icd10.html>.
15. Kaiser Family Foundation. State Health Facts: Total federal HIV/AIDS grant funding by agency. 2015. <http://kff.org/hivaids/state-indicator/total-federal-grant-funding>. Accessed 2015.
16. Kaiser Family Foundation. (2011). Medicaid and HIV: A National Analysis. 2011. <http://www.kff.org/hivaids/upload/8218.pdf>. Accessed October 2011.
17. Garfield, R, Damico, A. (2016). The coverage gap: Uninsured poor adults in states that do not expand Medicaid. 2016. <http://files.kff.org/attachment/Issue-Brief-The-Coverage-Gap-Uninsured-Poor-Adults-in-States-that-Do-Not-Expand-Medicaid>.
18. Wasserheit, J. (1992). Epidemiological synergy. Interrelationships between human immunodeficiency virus infection and other sexually transmitted diseases. *Sexually Transmitted Diseases*, 19(2):61-77.

19. Cohen, M. (2012). Classical Sexually Transmitted Disease Drive the Spread of HIV-1: Back to the Future. *Journal of Infectious Diseases*, 206(1):1-2.
20. Kaiser Family Foundation. State Health Facts: Median Annual Household Income. 2016. <http://kff.org/other/state-indicator/median-annual-income/?currentTimeframe=0&sortModel=%7B%22colId%22:%22Location%22,%22sort%22:%22asc%22%7D>. 2016.
21. Haan, M., Kaplan, G., Camacho, T. (1998). Poverty and health prospective Evidence from the Alameda County study. *American Journal of Epidemiology*, 125(6):989-98.
22. Conroy, K., Sandel, M., Zuckerman, B. (2010). Poverty grown up: how childhood socioeconomic status impacts adult health. *Journal of Developmental and Behavioral Pediatrics*, 31(2):154-160.
23. Ahnquist, J., Wamala, S., Lindstrom, M. (2012). Social determinants of health - a question of social or economic capital? Interaction effects of socioeconomic factors on health outcomes. *Social Science and Medicine*, 74(4):930-9.
24. Pellowski, J., Kalichman, S., Matthews, K., Adler, N. (2013), A pandemic of the poor: social disadvantage and the US HIV epidemic. *American Psychologist*, 68(4):197-209.
25. Kaiser Family Foundation. State Health Facts: Percent of adults who have ever been told by a doctor that they have hypertension, 2013. 2016. <http://kff.org/other/state-indicator/percent-of-adults-who-have-ever-been-told-by-a-doctor-that-they-have-hypertension/?currentTimeframe=0&sortModel=%7B%22colId%22:%22Yes%22,%22sort%22:%22desc%22%7D>. 2016.
26. Kaiser Family Foundation. State Health Facts: Percent of adults who have ever been told by a doctor that they have diabetes, 2014. 2016. <http://kff.org/other/state-indicator/adults-with-diabetes/?currentTimeframe=0&sortModel=%7B%22colId%22:%22Yes%22,%22sort%22:%22desc%22%7D>. 2016.
27. Reif, S., Whetten, K., Wilson, L., Gong, W. (2011). HIV/AIDS epidemic in the South reaches crisis proportions in the last decade. Durham. <https://southernaids.files.wordpress.com/2011/10/research-report-final-revised10-26-121.pdf>. Accessed July 2012.
28. Kaiser Family Foundation. Unemployment Rate 2015. 2016. <http://kff.org/other/state-indicator/unemployment-rate/?currentTimeframe=0&sortModel=%7B%22colId%22:%22Location%22,%22sort%22:%22asc%22%7D>. 2016.
29. Kaiser Family Foundation. State Health Facts: Health insurance coverage of the total population. 2016. <http://kff.org/other/state-indicator/total-population/?currentTimeframe=0&sortModel=%7B%22colId%22:%22Uninsured%22,%22sort%22:%22desc%22%7D>. 2016.
30. Heiman, H., Artiga, S. (2016). Beyond health care: The role of social determinants in promoting health and health equity. Kaiser Family Foundation. 2015. <http://kff.org/disparities-policy/issue-brief/beyond-health-care-the-role-of-social-determinants-in-promoting-health-and-health-equity/>.
31. Napravnik, S., Eron, J., McKaig, R., et al. (2007). Factors associated with fewer visits for HIV primary care at a tertiary care center in the Southeastern US. *AIDS Care*, 18(Supp 1):45-50.

32. Centers for Diseases Control and Prevention. Leading causes of death by age, black females, 2013. 2016. [https://www.cdc.gov/women/lcod/2013/womenblack\\_2013.pdf](https://www.cdc.gov/women/lcod/2013/womenblack_2013.pdf). 2017.
33. Centers for Diseases Control and Prevention. Leading causes of death by age, black males, 2013. 2016. <https://www.cdc.gov/men/lcod/2013/blackmales2013.pdf>. 2017.
34. National Poverty Center. Poverty in the United States. 2011. <http://www.npc.umich.edu/poverty/>. Accessed November 2011.
35. Mays, V., Cochran, S., Barnes, N. (2007). Race, Race-Based Discrimination, and Health Outcomes Among African Americans. *Annual Review of Psychology*. 58:201-25.
36. CERD Working Group on Health and Environment Health. Unequal Health Outcomes in the United States. 2008. <http://www.prrac.org/pdf/CERDhealthEnvironmentReport.pdf>. Accessed November 2011.
37. Williams, D., Priest, N., Anderson, N. (2016) Understanding associations among race, socioeconomic status, and health: Patterns and prospects. *Health Psychology*, 35(4):407-11.
38. Fullilove, R. (2006). African Americans, Recommendations for Confronting the Epidemic in Black America Health Disparities and HIV/AIDS. National Minority Council. [http://www.thenightministry.org/070\\_facts\\_figures/030\\_research\\_links/050\\_hiv\\_aids/NMACA\\_dvocracyReport\\_December2006.pdf](http://www.thenightministry.org/070_facts_figures/030_research_links/050_hiv_aids/NMACA_dvocracyReport_December2006.pdf). Accessed November 2011.
39. Whetten, K., Leserman, J., Whetten, R., et al. (2006). Exploring Lack of Trust in Care Providers and the Government as a Barrier to Health Service Use. *American Journal of Public Health*, 96(4):716-21.
40. Adimora, A., Ramirez, C., Schoenbach, V., Cohen, M. (2014). Policies and politics that promote HIV infection in Southern United States. *AIDS*, 28(10):1393-1397.
41. Adimora, A., Schoenback, V., Doherty, I. (2006). HIV and African Americans in the Southern United States: Sexual Networks and Social Context. *Sexually Transmitted Diseases*, 33(7):39-45.
42. Khan, M., Wohl, D., Weir, S., et al. (2008). Incarceration and risky sexual partnerships in a southern US city. *Journal of Urban Health*, 85(1):100-13.
43. Kalichman, S., Eaton, L., Kalichman, M., et al. (2016). Race-based medical mistrust, medication beliefs and HIV treatment adherence: test of a mediation model in people living with HIV. *Psychology and Health*, 39(6):383-395.
44. Maulsby, C., Millett, G., Lindsey, K., et al. (2014). HIV among black men who have sex with men in the United States: A Review of the Literature. *AIDS and Behavior*, 18(1):10-25.
45. Centers for Disease Control and Prevention. (2016). HIV among African Americans. 2016. <http://www.cdc.gov/hiv/group/raciaethnic/africanamericans/>.
46. Kerr, J., Valois, R., DiClemente, R., et al. (2014). HIV-related stigma among African-American youth in the northeast and southeast US. *AIDS and Behavior*, 18:1063-7.
47. Kaiser Family Foundation. (2011). HIV/AIDS at 30: A Public Opinion Perspective. <http://kff.org/hivaids/report/hivaids-at-30-a-public-opinion-perspective/>. Accessed March 2016.
48. Reif, S., Sullivan, K., Wilson, E., Berger, M., McAllaster, C. (2016). HIV/AIDS Care and Prevention Infrastructure in the U.S. Deep South. Southern HIV/AIDS Strategy Initiative. <https://southernaids.files.wordpress.com/2016/03/hiv-aids-care-and-prevention-infrastructure-in-the-u-s-deep-south1.pdf>.

49. Health Resources and Services Administration. African-Americans: A living history, the Ryan White HIV/AIDS Program. 2016. <http://hab.hrsa.gov/livinghistory/issues/African-Americans.pdf>.
50. Koll, G., Gutierrez. (2009). Stigma and Homophobia: Fueling the Fire. The Body. <http://www.thebody.com/content/art54913.html>
51. Vaughan, A., Rosenberg, E., Sullivan, P. (2014). Spatial relationships between gay stigma, poverty, and HIV infection among black and white men who have sex with men in Atlanta. *AIDS Research and Human Retroviruses*, 30(8):740-751.
52. National Alliance of State and Territorial AIDS Directors. (2012). Stigma and the Impact on Public Health. Ryan White HIV/AIDS Program Grantee Meeting; Washington DC
53. Reif, S., Safley, D., Wilson, E., Whetten, K. (2014). HIV/AIDS in the Southern US: Trends from 2008-2011 Show a Consistent Disproportionate Epidemic.
54. Millett, G., Flores, S., Peterson, J., Bakeman, R. (2007). Explaining disparities in HIV infection among black and white men who have sex with men: a meta-analysis of HIV risk behaviors. *AIDS*, 21:2083-2091.
55. Elopre, L., Kudroff, K., Westfall, A., Overton, E., Mugavero, M. (2016). The right people, right places, and right practices: Disparities in PrEP access among African American men, women and MSM in the Deep South. *JAIDS*.
56. Poteat, T., Scheim, A., Xavier, J. et al. (2016). Global epidemiology of HIV infection and related syndemics affecting transgender people. *JAIDS*, 72(3):S210-S9.
57. Herbst, J., Jacobs, E., Finlayson, T., et al. (2008). Estimating HIV prevalence and risk behaviors of transgender persons in the United States: a systematic review. *AIDS and Behavior*, 12(1):1-17.
58. Kattari, S., Walls, N., Whitfield, D., Langenderfer-Magruder, L. (2015). Racial and ethnic differences in experiences of discrimination in accessing health services among transgender people in the United States. *International Journal of Transgenderism*, 16:68-79.
59. Morales-Aleman, M., Sutton, M.. (2014). Hispanics/Latinos and the HIV continuum of care in the Southern USA: a qualitative review of the literature, 2002-2013. *AIDS Care*, 26(12):1592-604.
60. Kaiser Family Foundation. (2016). Medicaid Benefits: Physician Services. 2012. <http://kff.org/medicaid/state-indicator/physician-services/?currentTimeframe=0&sortModel=%7B%22colId%22:%22Location%22,%22sort%22:%22asc%22%7D>.
61. Kaiser Family Foundation. (2016). Medicaid benefits: Prescription drugs. In: State Health Facts. 2012. <http://kff.org/medicaid/state-indicator/prescription-drugs/?currentTimeframe=0&sortModel=%7B%22colId%22:%22Location%22,%22sort%22:%22asc%22%7D>.
62. Alsentzer, D., Chang, P., Kelly, C.. (2010). South Carolina State Report: An Analysis of the Successes, Challenges, and Opportunities for Improving Healthcare Access (State Summary). Boston: Health Law and Policy Clinic of Harvard Law School.
63. Gilman, B., Bouchery, E., Hogan, P., et al. (2016). The HIV clinician workforce in the United States. *HIV Specialist*, 8(3):2-9.
64. Heumann, C., Cohn, S., Krishnan, S., et al. (2015). Regional variation in HIV clinical trials participation in the United States. *Southern Medical Journal*, 108(2):107-116.

65. Human Rights Watch. (2011). Southern Exposure: Human Rights and HIV in the Southern United States. 2010.  
[http://www.hrw.org/sites/default/files/related\\_material/BPapersouth1122\\_6.pdf](http://www.hrw.org/sites/default/files/related_material/BPapersouth1122_6.pdf). Accessed 2016.
66. Katz, I., Ryu, A., Anuegbu, A., et al. (2013) Impact of HIV-related stigma on treatment adherence: systematic review and meta-analysis. *Journal of International AIDS Society*, 16(3(suppl 2)):18640.
67. Whetten, K., Reif, S., Whetten R. et al. (2008). Trauma, Mental Health, Distrust, and Stigma Among HIV-Positive Persons: Implications for Effective Care. *Psychosomatic Medicine*, 70:531-538.
68. Auerbach, J., Kinsky, S., Brown, G., Charles, V. (2015). Knowledge, attitudes, and likelihood of pre-exposure prophylaxis (PrEP) use among US women at risk of acquiring HIV. *AIDS Patient Care and STDs*, 29(2):102-110.
69. Rueda, S., Mitra, S., Chen, S., et al. (2016). Examining the association between HIV-related stigma and health outcomes in people living with HIV/AIDS: a series of meta-analyses. *BMJ Open*, 6(7).
70. Turan, B., Smith, W., Cohen, M., et al. (2016). Mechanisms for the negative effects of internalized HIV-related stigma on antiretroviral therapy adherence in women: The mediating roles of social isolation and depression. *JAIDS*, 72(2):198-205.
71. Lieb, S., Prejean, J., Thompson, D., et al. (2009). HIV Prevalence Rates Among Men Who Have Sex with Men in the Southern United States: Population-based Estimates by Race/Ethnicity. *AIDS and Behavior*, 15:596-606.
72. Wilson, C. (2004). Religion and the US South. In: *Southern Spaces*.  
<https://southernspaces.org/2004/overview-religion-and-us-south>.
73. Audet, C., McGowan, C., Wallston, K., Kipp, A. (2013). Relationship between HIV stigma and self-isolation among people living with HIV in Tennessee. *PLoS ONE*. 8(8).
74. Darlington, C., Hutson, S.. (2016). Understanding HIV-related stigma among women in the Southern United States: A literature review. *AIDS and Behavior*.
75. Phillips, K., Moneyham, L., Thomas, S., Gunther, M, Vyavaharkar, M. (2011). Social context of rural women with HIV/AIDS. *Mental Health Nursing*, 32(6):374-381.
76. Quinlivan, E., Messer, L., Adimora, A., et al. (2013) Experiences with HIV testing, entry, and engagement in care by HIV-infected women of color and the need for autonomy, competency, and relatedness. *AIDS Patient Care and STDs*, 27(7):408-15.
77. Vyavaharkar, M., Moneyham, L., Corwin, S., et al. (2010). Relationships between stigma, social support and depression in HIV-infected African American women living in the rural Southeastern United States. *Journal of Association of Nurses in AIDS Care*. 2010; 21(2):144-52.
78. Heckman, T., Somlai, A., Peters, J., et al. (1998). Barriers to care among persons living with HIV/AIDS in urban and rural areas. *AIDS Care*, 10:365-375.
79. Costelloe, S., Kempainen, J., Brion, J., et al. (2015), Impact of anxiety and depressive symptoms on perceptions of stigma in person with HIV disease in rural versus urban North Carolina. *AIDS Care*, 27(12):1425-8.
80. Golin, C., Isasi, F., Bontempi, J., Eng, E. (2002). Secret pills: HIV-positive patients' experiences taking antiretroviral medications in North Carolina. *AIDS Education and Prevention*, 14:318-329.

81. Pellowski, J. (2013). Barriers to care for rural people living with HIV: A review of domestic research and health care models. *Journal of Association of Nurses in AIDS Care*, 24(5):422-427.
82. Krawczyk, C., Funkhouser, E., Kilby, M., Vermund, S. (2006). Delayed access to HIV diagnosis and care: Special concerns for the Southern United States. *AIDS Care*, 18(supp 1):35-44.
83. Reif, S., Pence, B.W., Hall, I., et al. (2015). HIV Diagnosis, Prevalence and Outcomes in Nine Southern States. *Journal of Community Health*, 40(4):642-51.
84. Nelson, J., Kinder, A., Johnson, A., et al. (2016). Differences in selected HIV care continuum outcomes among people residing in rural, urban, and metropolitan areas - 28 US jurisdictions. *Journal of Rural Health*. Epub.
85. Centers for Disease Control and Prevention. (2016). CDC Issue Brief: HIV in the Southern United States. <https://www.cdc.gov/hiv/pdf/policies/cdc-hiv-in-the-south-issue-brief.pdf>. 2016.
86. Weissman, S., Duffus, W., Iyer, M., et al. (2015). Rural-urban differences in HIV viral loads and progression to AIDS among new HIV cases. *Southern Medical Journal*, 108(3):180-8.
87. Underhill, K., Operario, D., Montgomery, P. (2007). Abstinence-only Programs for HIV Infection Prevention in High-Income Countries. *Cochrane Database of Systematic Reviews*. 4.
88. Lehman, J., Carr, M., Nichol, A., et al. (2014). Ruisanchez A, Knight D, Langford A. Prevalence and public health implications of state laws that criminalize potential HIV exposure in the United States. *AIDS and Behavior*, 18(6):997-1006.
89. Center for HIV Law and Policy. (2016). State-by-state chart of HIV-specific statutes and prosecutorial tools. 2014. [http://www.hivlawandpolicy.org/sites/www.hivlawandpolicy.org/files/State By State HIV Laws Chart updated May 2014.pdf](http://www.hivlawandpolicy.org/sites/www.hivlawandpolicy.org/files/State%20By%20State%20HIV%20Laws%20Chart%20updated%20May%202014.pdf) .
90. Price, C., Eibner, C. (2013). For states that opt out of Medicaid expansion: 3.6 million fewer insured and \$8.4 billion less in federal payments. *Health Affairs*, 32:1030-6.
91. Rosenberg, E., Grey, J., Sanchez, T., Sullivan, P. (2016). Rates of prevalent diagnoses, and new diagnoses among men who have sex with men in US state, metropolitan statistical areas, and counties, 2012-2013. *JMIR Public Health and Surveillance*, 2(1):e22.
92. Kaiser Family Foundation. (2011). Total HIV/AIDS Federal Grant Funding, FY 2011. <http://www.statehealthfacts.org/comparetable.jsp?ind=528&cat=11>. Accessed November 2011.
93. Funders Concerned about AIDS. (2016). HIV Philanthropy for the US South. <http://files.constantcontact.com/3d94026f001/addc858a-3a04-426d-9ca5-ce2b3124e4c0.pdf>. Accessed September 2016.
94. Meditz, A., MaWhinney, S., Allshouse, A., et al. (2011). Sex, Race, and Geographic Region Influence Clinical Outcomes Following Primary HIV-1 Infection. *Journal of Infectious Diseases*, 203:442-451.