



HIV/AIDS in the U.S. Deep South: Trends from 2008-2013

January 2016

<http://southernaidsstrategy.org>

Susan S. Reif, Research Associate
susan.reif@duke.edu

Donna Safley, Analyst Programmer
donna.safley@duke.edu

Elena Wilson, Research Assistant
elena.wilson@duke.edu

Kathryn Whetten, Director, CHPIR
kathryn.whetten@duke.edu



With support from:



FORDFOUNDATION

BACKGROUND

Surveillance data from the Centers for Disease Control and Prevention (CDC) regarding new HIV diagnoses indicated that the Southern U.S.¹ had the highest HIV diagnosis rate of any U.S. region in 2013.¹ Data from the CDC HIV Surveillance Report indicated that in 2013, just over half (51%) of HIV diagnoses reported (which includes any new HIV diagnoses regardless of stage of HIV disease) were located in the Southern U.S., while the Southern region accounted for only 38% of the U.S. population.^{1,2} In addition, the Southern U.S. had the highest death rates among individuals living with HIV of any of the four US Census regions.³

A subset of Southern states has been disproportionately affected by HIV disease and shares characteristics such as overall poorer health, high poverty rates, an insufficient supply of medical care providers and a cultural climate that likely contributes to the spread of HIV.⁴⁻⁶ These states include Alabama, Florida, Georgia, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee and Texas, henceforth referred to as the “targeted states.” Epidemiologic data from 2013 indicated as a region, the targeted states had the highest HIV diagnosis rate of any U.S. region.¹ The targeted states also shared similarities in HIV-related outcomes including some of the highest death rates among individuals diagnosed with HIV in the U.S.³ Longitudinal data from the CDC have been consistent in showing a greater concentration of HIV diagnoses in the targeted Southern states. A Southern HIV/AIDS Strategy Initiative (SASI) report from 2014 provided results from a longitudinal analysis of CDC HIV epidemiologic data from 2008-2011.⁷ These findings indicated that the targeted states region had the highest HIV diagnosis rates and highest HIV death rates among individuals diagnosed with HIV from 2008-2011.

This manuscript updates the previous longitudinal analysis of HIV epidemiologic data by including CDC HIV surveillance data from 2012 and 2013. In addition, the report analyzes HIV mortality using ICD-10 codes to examine death rates with HIV as an underlying cause and compares these rates by state and U.S. region. Acquiring a better understanding of these epidemiologic trends is critical to developing strategies to more adequately address the HIV crisis in the Southern U.S.

METHODS

Data for this report were downloaded from the CDC’s HIV Surveillance System Database, Atlas, for the years 2008 through 2013—the earliest and most recent years of all 50 states reporting with standard definitions of people diagnosed with HIV and AIDS at the time of this report.⁸ The Atlas data are statistically adjusted by the CDC for missing data (such as reporting delays) but not for incomplete reporting (such as anonymous testing). The data are also unduplicated for individuals on a national level. With these caveats, the Atlas numbers are estimated to be 80% complete and are currently the best source for reporting trends in HIV diagnoses, prevalence and deaths.⁹

We report rates for HIV and AIDS diagnoses, prevalence, deaths, case fatality, and STDs for the years 2008-2013, providing a comparative regional assessment of trends in HIV disease in the U.S. with a focus on the targeted Southern states.

¹ The U.S. Census Bureau defines the South as including Alabama, Arkansas, Delaware, District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, Oklahoma, North Carolina, South Carolina, Tennessee, Texas, Virginia, and West Virginia

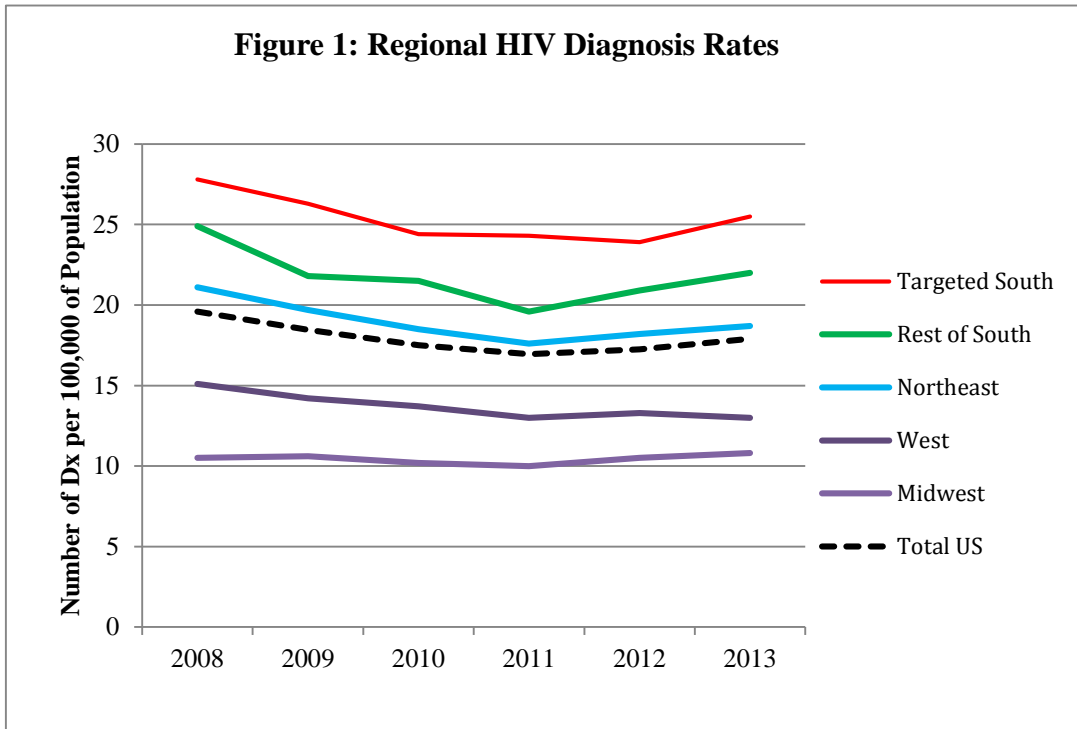
U.S. regions were defined using the U.S. Census Bureau’s segmentation of the country into South, Northeast, Midwest, and West.¹⁰ The South was broken into two groups: the targeted states (Alabama, Florida, Georgia, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Texas) and the rest of the South (Maryland, Delaware, DC, Virginia, West Virginia, Arkansas, Kentucky, Oklahoma).

The HIV and AIDS diagnosis and prevalence rates and death rates were calculated by dividing the total number of cases in the region by the total population within the region divided by 100,000. HIV death rates among individuals diagnosed with HIV were calculated as the number of HIV deaths divided by the number of people living with HIV (prevalence) and reported as the percentage of all people with HIV that died during that year. AIDS death rates among individuals diagnosed with AIDS were calculated using a similar method. In addition, the CDC releases HIV death data for ICD-10 codes related to HIV in their CDC Wonder database and calculates age adjusted death rates per 100,000 population for each state and for the four Census regions.¹¹ The CDC Wonder data from each state were used to calculate the HIV death rate where HIV was the underlying cause of death in the targeted states region for 2008-2013.

RESULTS

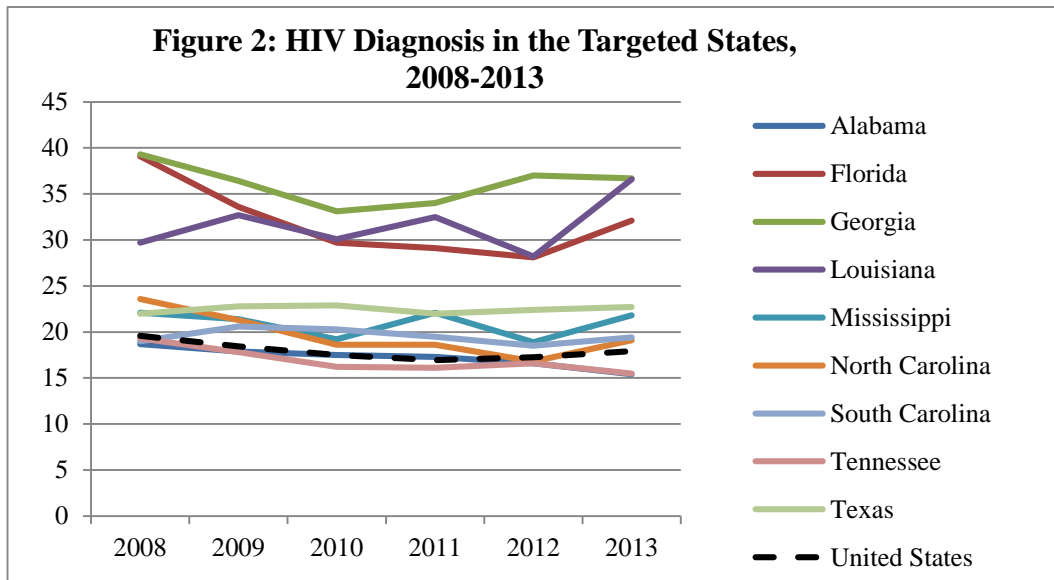
HIV/AIDS Diagnoses

Examination of HIV diagnosis rates for the six-year period 2008-2013 identified a consistent trend in rates by U.S. region with the targeted South having the highest diagnosis rates for all years followed by the rest of the South and the Northeast (Figure 1 and Appendix Table 1). In 2013, the most recent year of data available at the time of this report, 40% of HIV diagnoses were in the targeted states region of the South, which only comprises 28% of the U.S. population.¹²



(Appendix Figure 1A) For all six years of data studied, the targeted states contained the majority of new HIV diagnoses in terms of both number of cases and percent of all cases in the U.S.

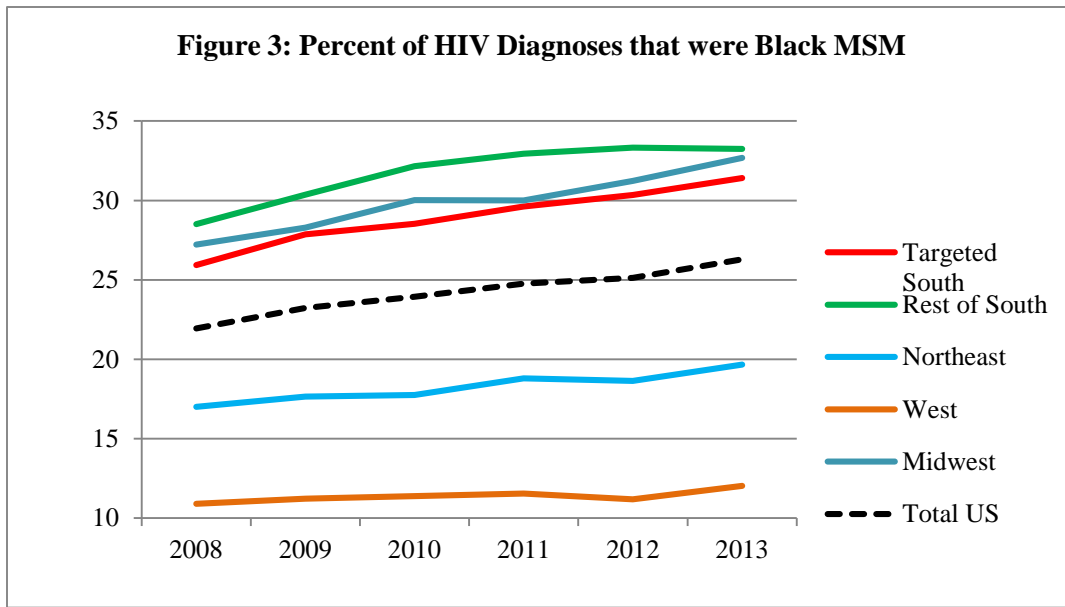
In 2013, of the targeted states, Georgia and Louisiana had the highest HIV diagnosis rates at 36.7 and 36.6 per 100,000 population, respectively, followed by Florida at 32.1 per 100,000 population. (Figure 2). In addition, during the same year, eight of the 10 metropolitan areas with populations of 500,000 or greater that had the highest HIV diagnosis rates were located in the targeted states.¹³



Demographic Characteristics

The majority of HIV diagnoses in the targeted states were among individuals of black or African American race, hereafter referred to as black, each year from 2008 through 2013. The racial disparity in HIV diagnosis rates has been consistent in the targeted states and throughout the United States, with more blacks per 100,000 population being diagnosed each year than whites. For example, in 2013, for every 100,000 blacks in the targeted states, 62 more blacks were diagnosed with HIV than for every 100,000 whites.

The percentage of individuals newly diagnosed with HIV that were black decreased slightly during the time period of study (from 56.4% to 54.4%) in the targeted states while the percentage of newly diagnosed individuals that were Hispanic/Latino increased from 16.8 in 2008 to 19.6 in 2013. The percentage of new diagnoses that were Hispanic/Latino increased slightly in the U.S. from 20.0% in 2008 to 21.4% in 2013. In 2013, over one-third (37%) of the 10,101 Hispanic/Latino individuals diagnosed with HIV resided in the targeted states.



Surveillance data from 2008-2013 indicated that the *percentage* of HIV diagnoses that were female declined over time in the targeted states region (26.8% in 2008 to 21.3% in 2013) and in the U.S. overall (24.2% to 19.7%). The HIV *diagnosis rate* among women also declined over time in the targeted states and the overall U.S. A large disparity in HIV diagnosis rates between black and white women remains in the targeted states and the overall U.S. In 2013 the HIV diagnosis rate for black women in the targeted states was 37.5 per 100,000 while the rate for white women was 2.6 per 100,000.

In contrast to the decline in the percentage of individuals diagnosed with HIV who were female, the percentage of HIV diagnoses that were men who have sex with men (MSM) increased over time in the targeted states (56.7% in 2008 to 66.3% in 2013) and in the U.S. overall (59.7% to 67.8%) (Figure 3). Further, the percentage of HIV diagnoses that were black MSM increased in the targeted states from 25.9% in 2008 to near one-third (31.4%) in 2013 and increased in the U.S. overall (22.0% to 26.3%). All regions experienced an increase in the percentage of new diagnoses that were black MSM; however, this increase was the largest in the targeted states and Midwest. In contrast, the percentage of individuals diagnosed with that were white MSM remained relatively constant over time in the targeted states. In the Northeast, the increases in the percentage of HIV diagnoses were fairly similar between white and black MSM. Although all targeted states experienced increases in the percentage of individuals diagnosed with HIV that were black MSM, Alabama had the greatest increase (34.8% to 47.0%) followed by Georgia and Tennessee. In addition, in 2013, nearly half (48%) of black MSM diagnosed with HIV in the U.S. resided in the targeted states.

AIDS diagnosis rates followed a similar pattern to HIV diagnosis rates, as the targeted states region consistently had the highest AIDS diagnosis rate in the U.S. from 2008-2013 (Figure 4). The Northeast region had the next highest AIDS diagnosis rates from 2008-2013. The gap between AIDS diagnosis rates in the targeted states region and the Northeast region increased over time.

For all six years of the time period described herein, the targeted states contained the majority of new AIDS diagnoses in terms of number of cases and percent of all cases in the U.S. (Appendix Figure 2A). In 2013, the targeted states accounted for 43% of AIDS diagnoses in the U.S. despite only accounting for 28% of the population. The targeted states also contained eight of the 10 metropolitan areas with the highest AIDS diagnosis rates in 2013 (Figure 5).¹³ Within the targeted states, AIDS diagnosis rates varied, with Louisiana and Georgia having the highest AIDS diagnosis rates followed by Florida and Mississippi. All targeted states had AIDS diagnosis rates higher than the U.S. overall AIDS diagnosis rate in 2013.

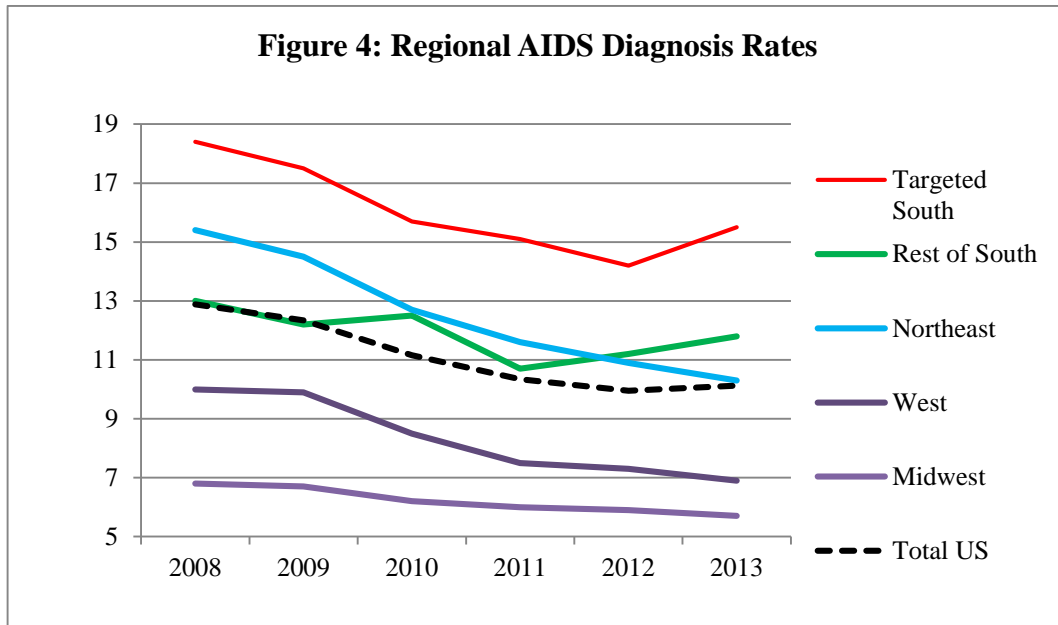
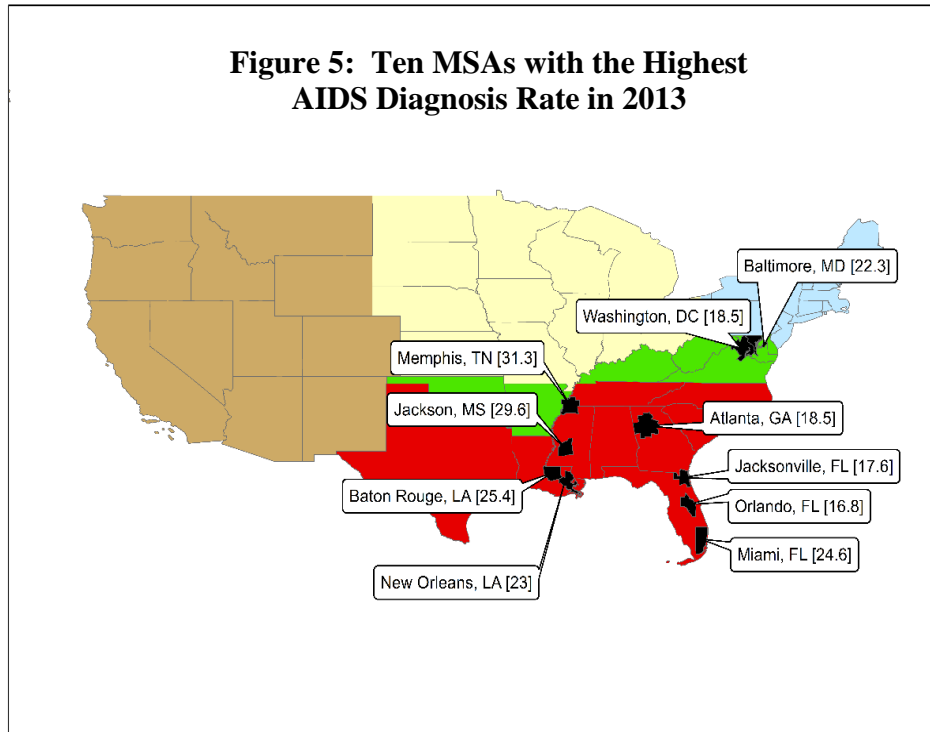


Figure 5: Ten MSAs with the Highest AIDS Diagnosis Rate in 2013



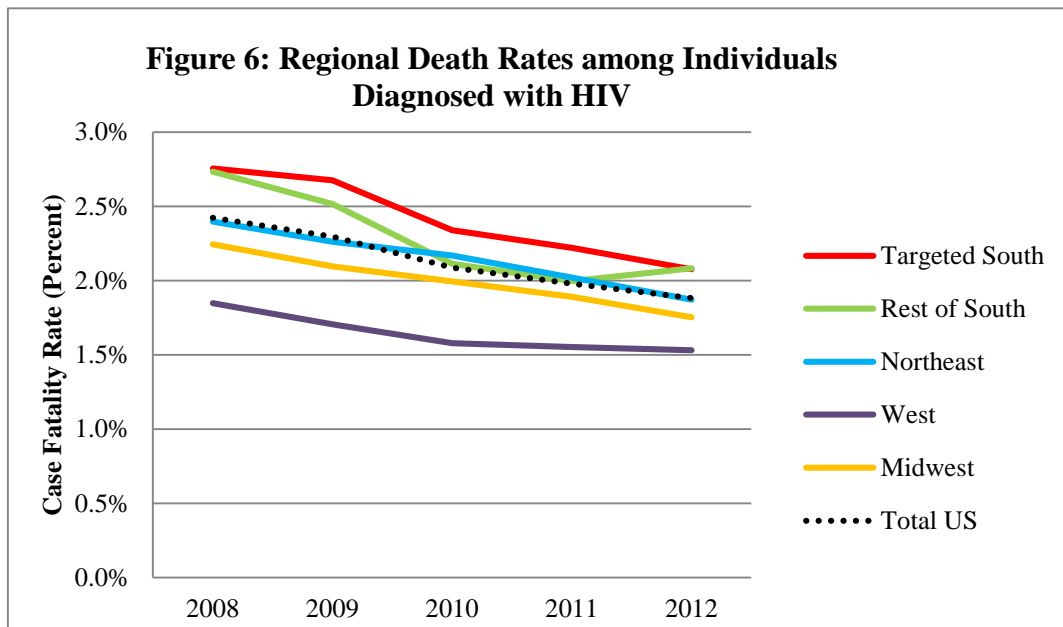
African-Americans comprised the majority of AIDS diagnoses in the targeted states (range 58-59%) in 2008-2013. This percentage has shown very little change over time. The percentage of AIDS diagnoses that were female declined somewhat over time in the targeted states (29.6% in 2008 to 27% in 2013) and in the U.S. overall – 26.3% to 24.1%). The percentage of individuals diagnosed with AIDS that were black MSM increased (21.7% in 2008 to 27.3% in 2013) over time in the targeted states while this percentage stayed fairly consistent for white MSM over time (15.7 to 15.3) (Appendix Figure 3A).

HIV/AIDS Prevalence

The targeted states region had the highest number and percentage of individuals living with HIV (34%) of any region (2012). However, HIV prevalence rates, which are the number of individuals estimated to be living with HIV per 100,000 population, were highest in the Northeast from 2008-2012, followed by the targeted states (Appendix Figure 4A). Similarly, the Northeast had the highest AIDS prevalence rates (defined as having ever been classified as Stage 3 HIV disease) likely due to the origination of the U.S. HIV epidemic in this region. Florida consistently had the highest HIV and AIDS prevalence rates of the targeted states followed by Georgia and Louisiana.

HIV/AIDS Deaths

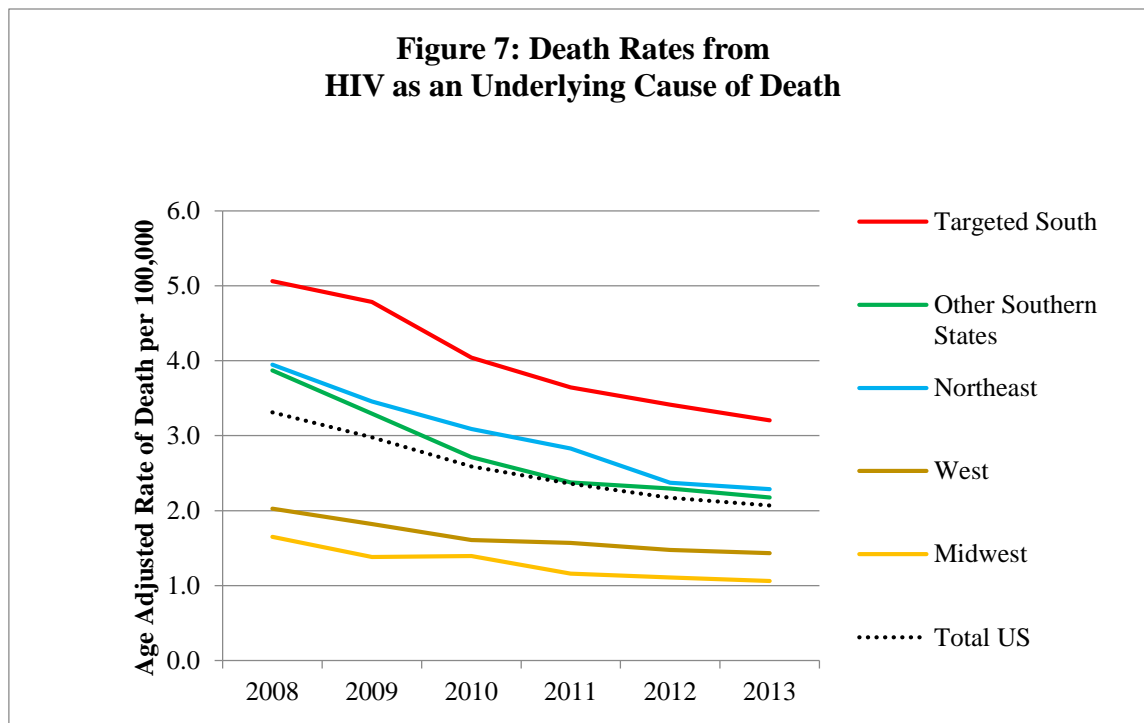
We examined deaths among individuals diagnosed with HIV (Figure 6). Death rates among individuals diagnosed with HIV differ from conventional death rate calculations, which include both HIV-infected and uninfected individuals in the denominator to describe HIV mortality in a population overall. HIV death rates among individuals diagnosed with HIV may reflect the extent to which HIV-infected individuals are not engaged and/or retained in medical care, among other factors.



In 2008-2011, the death rates among individuals diagnosed with HIV were the highest in the targeted states region, followed by the Northeast and rest of the South. However, in 2012 the death rates among individuals diagnosed with HIV were the highest in the targeted states and rest of the South, which had nearly identical rates, followed by the Northeast. Death rates among individuals diagnosed with AIDS were highest in the targeted states from 2008-2012 followed by the rest of the South and the Northeast.

The targeted states had the largest number of HIV-positive individuals who died in 2012 (n=6362; 37% of all deaths of HIV-positive individuals in the U.S. in 2012) and the largest number of individuals who died in the time period 2008-2012 (n=34,072). HIV death rates have decreased over time in all targeted states consistent with the overall U.S. trend. Of the targeted states, Alabama, Louisiana, and Mississippi generally have experienced the highest death rates (2008-2012) among individuals diagnosed with HIV.

Although the death rate among individuals diagnosed with HIV provides vital information regarding deaths among persons who have been diagnosed with HIV, these statistics may not clearly reflect deaths due to HIV disease rather than other chronic comorbidities and acute illnesses not related to HIV. When CDC data regarding deaths in 2013 due to HIV as an underlying cause were examined, the number of HIV related deaths per 100,000 population was higher in the South (3.0) than the overall U.S. death rate due to HIV infection (2.1) and the rates of the other U.S. regions including the Northeast (2.3) (Figure 7). When the South was divided into the targeted states and the rest of the South, the HIV death rate was higher in the targeted states at 3.2, which was also the highest of any U.S. region. The death rate due to HIV for the rest of the Southern states was 2.2. Similar trends in death rates with HIV as an underlying cause of death were found for years 2008-2012.



From 2008-2013, 21,308 individuals in the targeted states died of HIV as the underlying cause of death, representing 43% of deaths in the U.S. where HIV was the underlying cause. CDC data regarding death rates due to HIV infection indicated that all targeted states had higher death rates than the U.S. overall for 2008-2013. In addition, when death rate from HIV as the underlying cause was examined among African Americans, the targeted states again had the highest death rate in 2013 (10.8 per 100,000 population) followed by the Northeast (9.9 per 100,000). In contrast, the death rate from HIV as underlying cause was similar across most regions among whites (1.4 in targeted states; 1.3 in South, West and Northeast and 0.6 in Midwest)

Racial disparities are also evident in the top 15 cause of deaths in the targeted states in 2013. HIV disease is not among the top 15 leading cause of death in 2013 for white males or females, but is the 9th leading cause of death for black men (16.5 deaths due to HIV disease per 100,000 age-adjusted), and is the 12th leading cause of death for black women (7.5 deaths due to HIV disease per 100,000 age-adjusted) in the targeted states.¹¹

Sexually Transmitted Infections (STIs)

STIs such as gonorrhea, syphilis, and chlamydia have been shown to increase the risk for HIV infection.¹⁴ CDC epidemiologic data indicate that the rates of infection for chlamydia and gonorrhea were consistently higher for individuals living in the targeted states from 2008-2013 as compared to other U.S. regions (Appendix Figures 5A & B). The targeted states region also had the highest rates of early latent syphilis from 2008-2013 and the highest primary and secondary syphilis rates from 2008-2012 (Appendix Figures 5 C & D). However, the West experienced a notable increase in primary and secondary syphilis diagnoses and surpassed the primary and secondary syphilis rate of the targeted states in 2013.

Insurance Status and the Affordable Care Act (ACA)

In 2014, five of the targeted states were ranked among the 10 U.S. states with the highest uninsured rates including Texas, which had the highest proportion of residents without health insurance of any state in the U.S.¹⁵ All of the targeted states had higher proportions of uninsured individuals than the U.S. average. To date, none of the targeted states have participated in Medicaid expansion to date. An analysis of insurance status and the ACA by the Kaiser Family Foundation (KFF) found that a significant proportion of the uninsured in all of the targeted states fell into the “coverage gap,” meaning that they were not eligible for Medicaid because their state of residence had not elected to participate in Medicaid Expansion. This proportion ranged from 17% of the uninsured in the coverage gap in Texas to one-third in Louisiana.¹⁶ Lower-income uninsured individuals living with HIV have been impacted by these coverage gaps. Snider and colleagues in their study of HIV and ACA Medicaid Expansion estimated that over 60,000 individuals living with HIV would be covered through Medicaid if their states selected Medicaid Expansion – the vast majority of these individuals were living in the targeted states.¹⁶

Findings from a recent examination of health insurance coverage for individuals living with HIV in five states (three were targeted states) underscored the growing disparity between states expanding Medicaid and those selecting not to participate in the program.¹⁷ Study findings generated from focus groups of people living with HIV in the three Southern non-Medicaid expansion states found that:

Focus group participants living in states not expanding their Medicaid programs, but who would have otherwise been eligible, continued to receive their HIV care through Ryan White but worried about how to meet other health needs. They were frustrated by their state’s decision not to expand and continued to be worried about health and economic insecurity that accompanied being uninsured.

These studies also continue to highlight the key role of Ryan White funding in covering HIV-related health care needs of individuals living with HIV.

DISCUSSION

The analyses outlined in this manuscript expand on the findings from a previous study of HIV

epidemiology in the U.S. South from 2008-2011 by including the two most recent years of HIV surveillance data to examine for more recent epidemiologic trends and to allow for a longer period of study. HIV surveillance data from 2012-2013 were consistent with data from 2008-2011 in revealing that the South, particularly the targeted states, has been and remains disproportionately affected by HIV. For the six year period of study, the targeted Southern states had the highest HIV and AIDS diagnosis rates along with the highest number of individuals diagnosed with HIV and AIDS. In 2013, 40% of new HIV diagnoses were within the targeted states while the targeted states contained only 28% of the U.S. population. The targeted states also continue to have the highest rates of chlamydia, syphilis, and gonorrhea of any U.S. region. STIs have been strongly associated with future HIV acquisition,¹⁴ raising concerns regarding a continued disproportionate impact of HIV in the targeted states.

The targeted states and U.S. overall experienced a shift in the demographic composition of HIV diagnoses in the last six years with the proportion of new diagnoses among women declining and the proportion of new diagnoses increasing among black MSM. In the targeted states, just over one-quarter of those diagnosed with HIV in 2008 were black MSM compared to nearly one-third (31.4%) in 2013. In addition, in 2013, nearly half (48%) of black MSM diagnosed with HIV in the U.S. resided in the targeted states.

An examination of CDC data on underlying cause of death revealed that the targeted states had the highest death rates attributable to HIV disease (deaths of individuals where HIV disease was the underlying cause of death/100,000 population) followed by the Northeast. Due to the emergence of effective HIV medications, these HIV-attributable deaths should be largely preventable from a medical standpoint. Higher death rates from HIV may reflect barriers to timely testing and treatment such as HIV-related stigma, lack of transportation and inadequate availability of HIV medical providers.

Death rates among individuals diagnosed with HIV (regardless of cause of death) were higher in the targeted states than in any other U.S. region. This method of examining HIV-related deaths may also be an indicator of the extent to which HIV-positive individuals are not engaged and/or retained in medical care. These findings are consistent with findings from CDC survival data that indicated that the targeted states had the lowest HIV and AIDS survival rates of any region among individuals diagnosed 2003-2004.³ Analysis of the survival data in the targeted states found that within five years of an AIDS diagnosis, over one-quarter (27%) had died.

There were differences in HIV epidemiology between the targeted states. Louisiana, Florida and Georgia had particularly high HIV and AIDS diagnosis rates and rates of death attributable to HIV. Mississippi also had some of the highest AIDS diagnosis rates and death rates among the targeted states. However, all targeted states had AIDS diagnosis rates and HIV death rates (where HIV was an underlying cause) greater than the U.S. average.

The longitudinal nature of the epidemiologic data demonstrates that the significant impact of HIV in the targeted states is not unique to one specific year or a brief period of time. Rather, these trends have been consistent over the last six years of data available and indicate a critical need to strengthen efforts to reduce HIV transmission and mortality within the region. Failure to adopt Medicaid Expansion in the targeted states, which has resulted in tens of thousands of individuals living with HIV remaining uninsured and dependent on an overburdened Ryan White program for basic HIV health services, is likely to widen the gap between the targeted states and other U.S. regions.

One federally-funded effort from the U.S. Health and Human Services and the CDC, the Care and

Prevention in the United States (CAPUS) grants, has attempted to address HIV in some of the states highly impacted by HIV, including targeted states, by providing funding for HIV-related activities such as prevention and linkage to care.¹⁸ Five targeted states received CAPUS funding beginning in 2012 and utilized these funds for prevention and care activities such as linkage to care programs and prevention programming for minority MSM. Although the three year CAPUS program has ended, all of the funded states have received approval to extend the program for an additional year to utilize remaining grant funds.

In 2014, the Secretary's Minority AIDS Initiative Fund and the ACA, with leadership from the CDC and HRSA, initiated a grant funded program titled Partnerships for Care.¹⁹ Nine states with high HIV prevalence in minority populations and that did not receive CAPUS funds were eligible to apply for Partnerships for Care funding. The purpose of the program was to expand provision of HIV services in treatment centers providing treatment to populations highly affected by HIV, to enhance partnerships between state health departments and health centers that provide HIV care, and improve outcomes for individuals living with HIV. Although four targeted states were eligible to apply for the Partnerships in Care funding only one targeted state, Florida, secured this funding.

A recent funding announcement from the CDC was directed at providing much-needed HIV prevention funding for community-based organizations (CBOs) in the U.S., Puerto Rico and the U.S. Virgin Islands.²⁰ Unfortunately, despite having 40% of new diagnoses and 34% of all persons living with HIV in the U.S., the targeted state region received only 26% of the total CDC funding in the U.S.²¹ Two states, New York and California, received a combined 36% of the total PS15-1502 funding despite having only 19% of all new HIV diagnoses and 27% of all persons living with HIV in the U.S. These two states received more than the entire Southern region which received 33% of the total CDC funding.

Holistic approaches that include local, state and federal partnerships and address the multiple factors that contribute to the disproportionate epidemic in the South such as lack of resources, inadequate HIV services infrastructures, and regional resource inequities as well as stigma and high STI rates are needed to adequately address HIV in the region. It is also important that the South and particularly the targeted states receive an equitable share of HIV care and prevention funding and that funding is distributed consistent with the geographic distribution of the epidemic.

APPENDIX FIGURES & TABLE

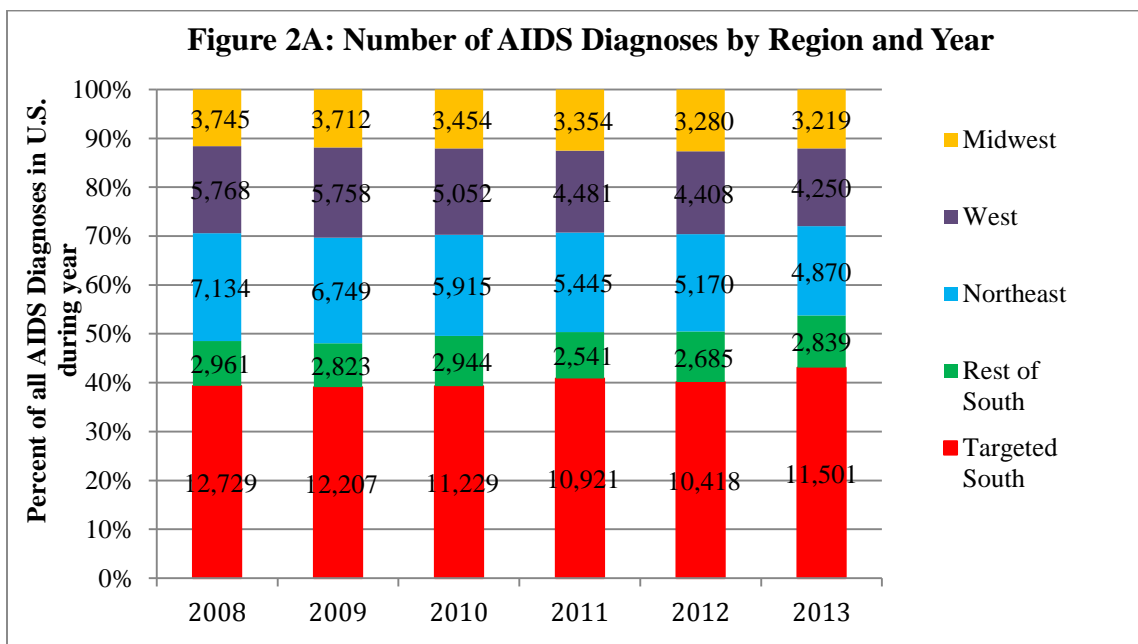
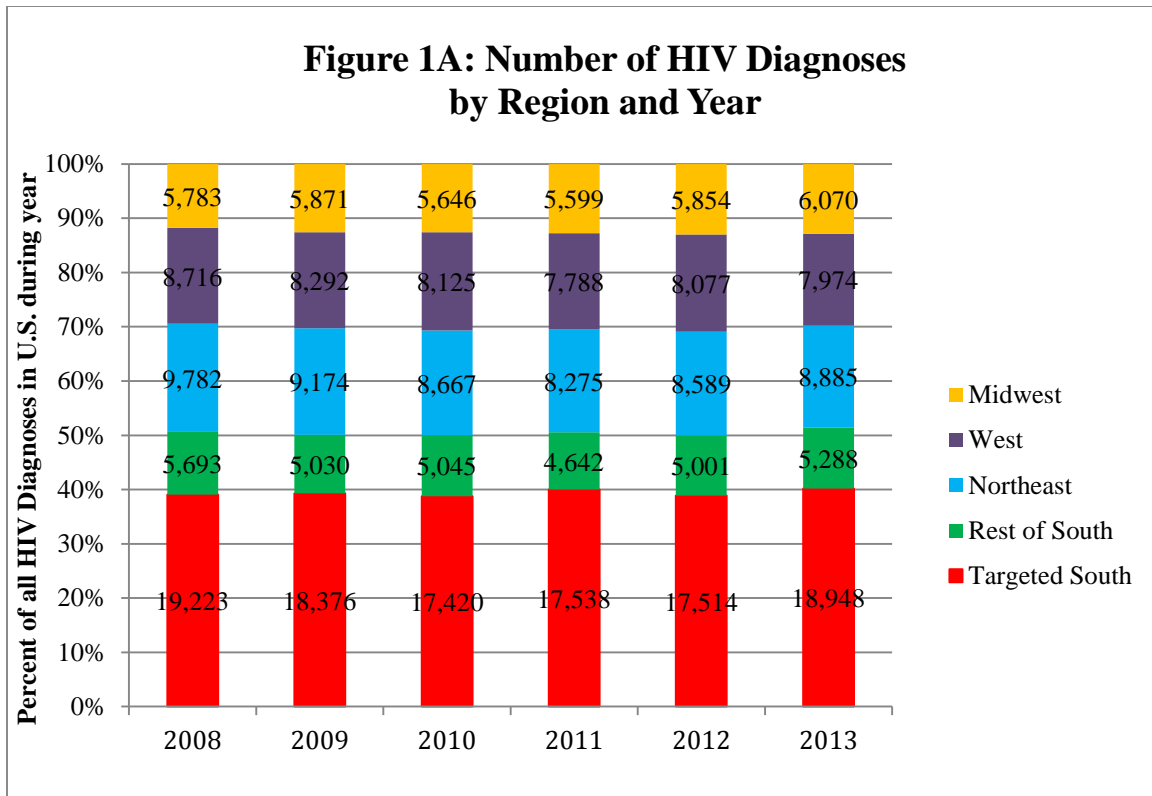


Figure 3A: Percent of AIDS Diagnoses that are Black MSM

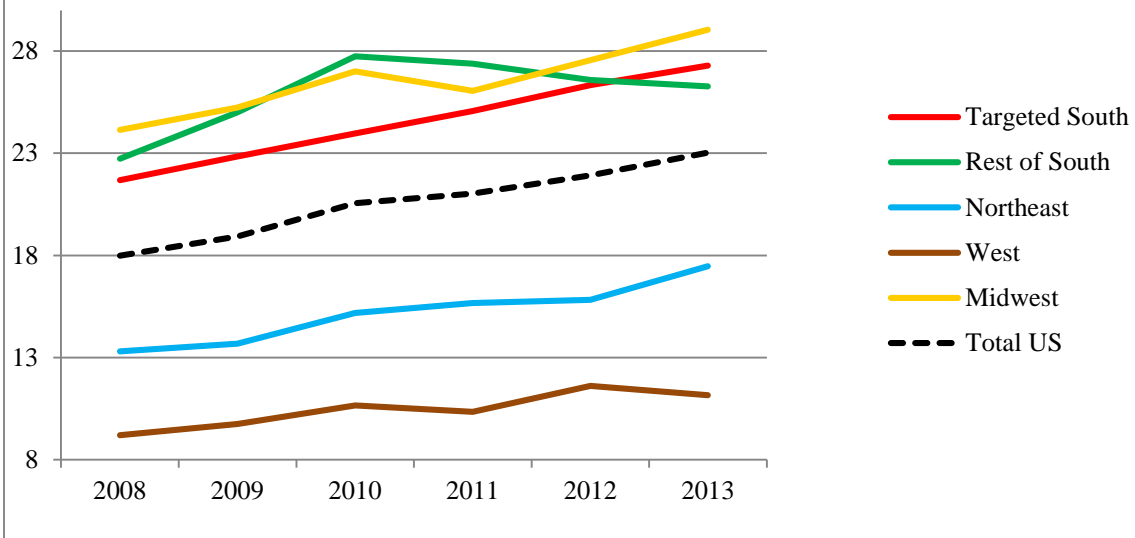
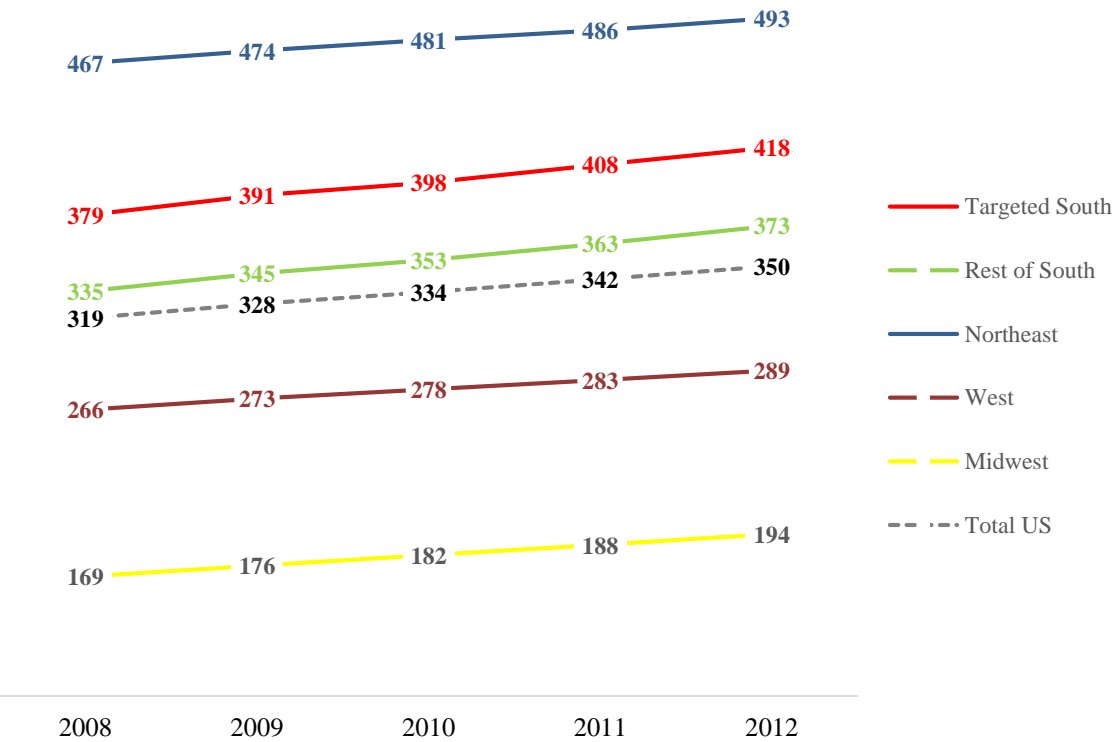


Figure 4A: HIV Prevalence Rates



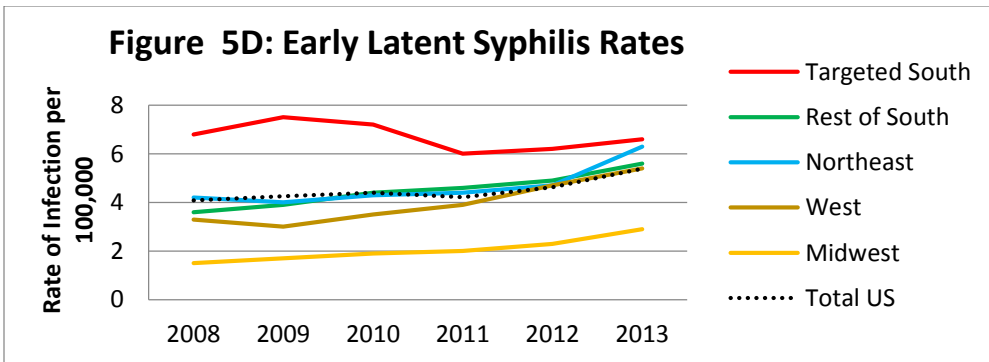
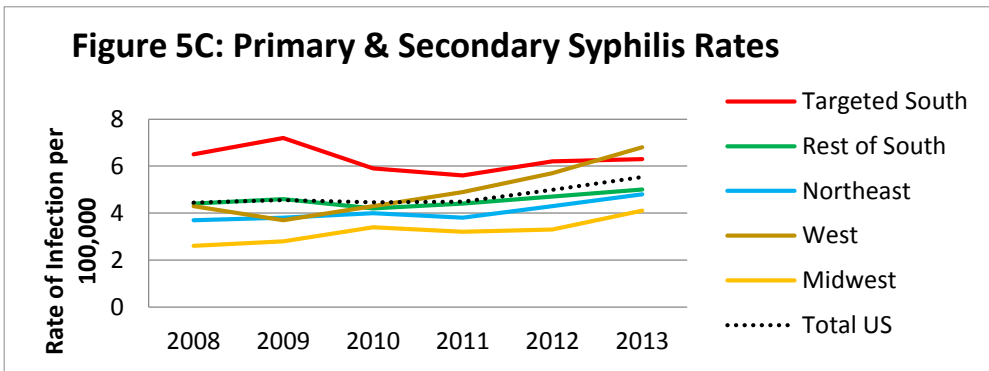
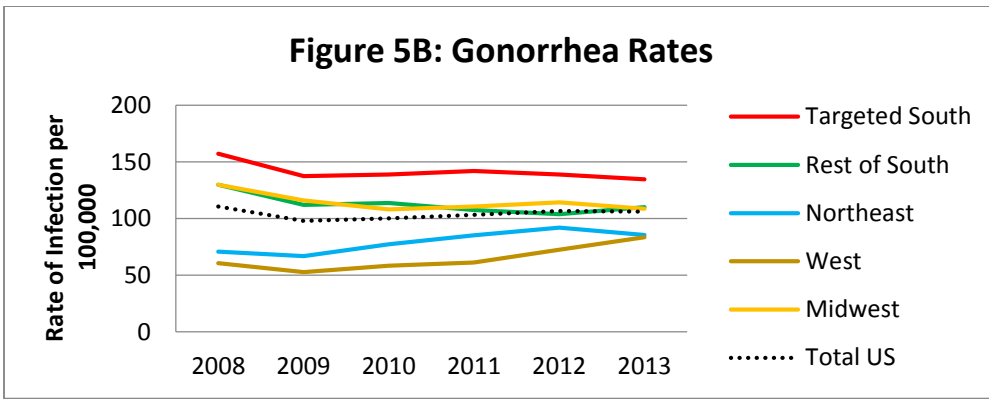
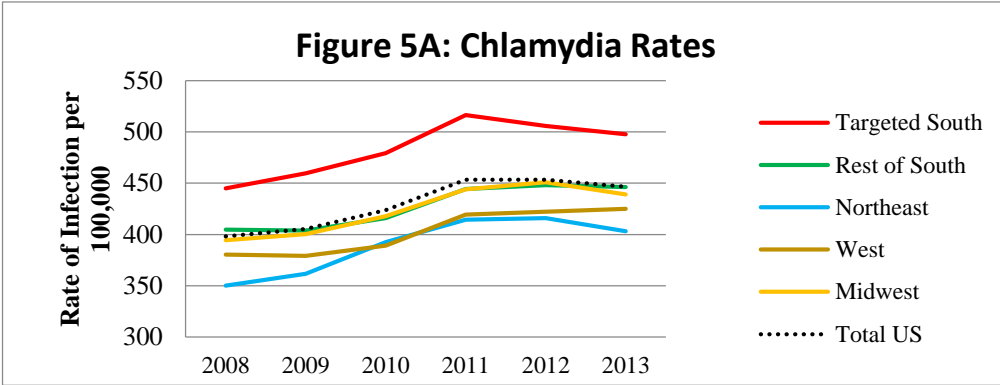


Table 1

	2008	2009	2010	2011	2012	2013
HIV Diagnosis Rates						
Targeted South	27.8	26.3	24.4	24.3	23.9	25.5
Other Southern States	24.9	21.8	21.5	19.6	20.9	22.0
Northeast	21.1	19.7	18.5	17.6	18.2	18.7
West	15.1	14.2	13.7	13.0	13.3	13.0
Midwest	10.5	10.6	10.2	10.0	10.5	10.8
Total U.S.	19.6	18.5	17.5	16.9	17.3	17.9
AIDS Diagnosis Rates						
Targeted South	18.4	17.5	15.7	15.1	14.2	15.5
Other Southern States	13.0	12.2	12.5	10.7	11.2	11.8
Northeast	15.4	14.5	12.7	11.6	10.9	10.3
West	10.0	9.9	8.5	7.5	7.3	6.9
Midwest	6.8	6.7	6.2	6.0	5.9	5.7
Total U.S.	12.9	12.3	11.2	10.3	9.9	10.1
HIV Prevalence Rates (year end)						
Targeted States	379.0	390.5	397.9	408.3	418.3	
Other Southern States	334.7	345.2	353.0	362.5	372.9	
Northeast	467.2	474.3	480.7	486.2	493.3	
West	266.2	272.6	277.9	283.4	289.0	
Midwest	169.4	175.7	181.9	187.7	194.0	
U.S. Average	319.3	327.6	334.4	341.8	349.5	
AIDS Prevalence Rates (year end)						
Targeted States	203.1	209.7	213.6	218.8	223.2	
Other Southern States	182.5	186.5	189.7	193.0	196.6	
Northeast	282.0	286.3	289.3	291.4	293.7	
West	160.1	164.1	166.5	168.5	170.2	
Midwest	88.2	91.6	94.7	97.6	100.4	
U.S. Average	180.6	185.3	188.6	191.8	194.8	
HIV Death Rates						
Targeted South	10.4	10.4	9.3	9.1	8.7	
Other Southern States	9.2	8.7	7.5	7.2	7.8	
Northeast	11.2	10.7	10.4	9.8	9.2	
West	4.9	4.6	4.4	4.4	4.4	
Midwest	3.8	3.7	3.6	3.5	3.4	
Total U.S.	7.7	7.5	7.0	6.8	6.6	

Table 1 (continued)

	2008	2009	2010	2011	2012	2013
HIV Death Rates – HIV as Underlying Cause						
Targeted South	5.1	4.8	4.0	3.6	3.4	3.2
Other Southern States	3.9	3.3	2.7	2.4	2.3	2.2
Northeast	3.9	3.5	3.1	2.8	2.4	2.3
West	2.0	1.8	1.6	1.6	1.5	1.4
Midwest	1.6	1.4	1.4	1.2	1.1	1.1
Total U.S.	3.3	3.0	3.0	2.4	2.2	2.1
Deaths among Individuals Diagnosed with HIV						
Targeted South	2.8%	2.7%	2.3%	2.2%	2.1%	
Other Southern States	2.7%	2.5%	2.1%	2.0%	2.1%	
Northeast	2.4%	2.3%	2.2%	2.0%	1.9%	
West	1.8%	1.7%	1.6%	1.6%	1.5%	
Midwest	2.2%	2.1%	2.0%	1.9%	1.8%	
Total U.S.	2.4%	2.3%	2.1%	2.0%	1.9%	

*All rates are per 100,000 except deaths among individuals diagnosed with HIV which is percent of deaths of individuals diagnosed with HIV

REFERENCES

1. Centers for Disease Control and Prevention. HIV Surveillance Report 2013, Vol 25. 2015; http://www.cdc.gov/hiv/library/reports/surveillance/2013/surveillance_report_vol_25.html.
2. US Census Bureau. United States Population Growth by Region. 2015; https://http://www.census.gov/popclock/data_tables.php?component=growth. Accessed October, 2015.
3. Reif S, Pence BW, Hall I, Hu X, Whetten K, Wilson E. HIV Diagnosis, Prevalence and Outcomes in Nine Southern States. *Journal of Community Health*. 2015;40(4):642-651.
4. Kaiser Family Foundation. State Health Facts. 2011; <http://www.statehealthfacts.org>. Accessed October, 2011.
5. Reif S, Whetten K, Lowe K. HIV and AIDS in the Deep South. *American Journal of Public Health*. 2006;96(6):970-973.
6. Reif S, Whetten K, Wilson L, Gong W. HIV/AIDS epidemic in the South reaches crisis proportions in the last decade. 2011; <http://globalhealth.duke.edu/news/2011/ResearchReportFinal3-12.pdf>. Accessed July, 2012.
7. Reif S, Safley D, Wilson E, Whetten K. *HIV/AIDS in the Southern US: Trends from 2008-2011 Show a Consistent Disproportionate Epidemic*. Southern HIV/AIDS Strategy Initiative;2014.
8. NCHHSTP Atlas. 2014. <http://www.cdc.gov/nchhstp/atlas/>. Accessed September 2015.
9. Center for Disease Control and Prevention. NCHHSTP Atlas HIV data and footnotes. 2014.
10. U.S. Census Bureau. Census Regions and Divisions of the United States. http://www.census.gov/geo/www/us_regdiv.pdf. Accessed November, 2011.
11. Centers for Disease Control and Prevention. Underlying Cause of Death 1999-2013 on CDC Wonder Online Database. 2015; <http://wonder.cdc.gov/ucd-icd10.html>.
12. US Census Bureau. Annual estimates of the resident population for the United States, regions, states, and Puerto Rico. 2011; <http://www.census.gov/popest/data/state/totals/2011/>. Accessed March, 2013.
13. Centers for Disease Control and Prevention. HIV Surveillance Report 2011, vol 23. 2013; <http://www.cdc.gov/hiv/topics/surveillance/resources/reports/>. Accessed March, 2013.
14. Wasserheit J. Epidemiological synergy. Interrelationships between human immunodeficiency virus infection and other sexually transmitted diseases. *Sexually Transmitted Diseases*. 1992;19(2):61-77.

15. Smith J, Medalia C. *Health Insurance Coverage in the United States: 2014*. US Government Printing Office: US Census Bureau;2015.
16. Snider J, Juday T, Romley J, et al. Nearly 60,000 Uninsured And Low-Income People With HIV/AIDS Live In States that are Not Expanding Medicaid. *Health Affairs*. 2014;33(3):386-393.
17. Kates J, Dawson L. *Health Insurance Coverage for People with HIV Under the Affordable Care Act: Experiences in Five States*. Kaiser Family Foundation;2014.
18. Centers for Disease Control and Prevention. The Care and Prevention in the United States (CAPUS) Demonstration Project. 2015; The Care and Prevention in the United States (CAPUS) Demonstration Project, 2015.
19. The MayaTech Corporation. Partnerships for Care. 2015; <http://www.p4chivtac.com/content/health-centers>.
20. Centers for Disease Control and Prevention. Organizations funded under PS15-1502: Comprehensive High-Impact HIV Prevention Projects for Community-Based Organizations. 2015; <http://www.cdc.gov/hiv/pdf/funding/announcements/ps15-1502/cdc-hiv-ps15-1502-funding--by-state-and-grantee.pdf>. Accessed November, 2015.
21. McAllaster C. SASI Analysis of Funds Distributed in the United States by Centers for Disease Control and Prevention (CDC) Pursuant to PS15-1502. 2015; <https://southernaids.files.wordpress.com/2011/10/sasi-analysis-of-ps15-1502-funding-distribution-final.pdf>. Accessed November, 2015.