NORTH CAROLINA

2013 North Carolina HIV/STD Epidemiologic Profile

HIV/STD Surveillance Unit

dhhs

Division of Public Health
North Carolina Department of Health and Human Services

Please direct any comments or questions to:

HIV/STD Surveillance Unit
North Carolina Communicable Disease Branch
1902 Mail Service Center
Raleigh, North Carolina 27699-1902
919-733-7301

http://epi.publichealth.nc.gov/cd/stds/figures.html

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See the last page of this document for a map of North Carolina regional and geographic designations.

2013 North Carolina HIV/STD Epidemiologic Profile

March 2015

North Carolina
Department of Health and Human Services
Division of Public Health
Epidemiology Section

Communicable Disease Branch

Evelyn Foust, CPM, MPH, Head
Jacquelyn Clymore, MS, State HIV/STD Director

Contributing Editors:

Nicole Dzialowy

Janet Alexander	Vicki Mobley
John Barnhart	Pete Moore
Nicole Beckwith	Rob Pace
Christy Crowley	Erika Samoff
Jenna Donovan	Lynne Sampson
Douglas Griffin	Jasmine Stringer
Anne Hakenwerth	Heidi Swygard
Kitty Herrin	Mark Turner
Kearston Ingraham	Holly Watkins
Mara Larson	Jenni Wheeler
Jason Maxwell	

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TABLE OF CONTENTS

List of Tables (In Text)

List of Figures (In Text)

LIST OF ABBREVIATIONS

ACIP	Advisory Committee for Immunization Practices
ACP	AIDS Care Program
ADAP	AIDS Drug Assistance Program
AIDS	Acquired Immunodeficiency Syndrome
AIN	Anal Intraepithelial Neoplasia
APP	ADAP Pharmacy Program
ART	Antiretroviral Treatment
ARTAS	Antiretroviral Treatment and Access to Services
ATEC	AIDS Training and Education Center
BED	BED HIV-1 Capture Enzyme Immunoassay
CAPUS	Care and Prevention in the United States
CARE	Comprehensive AIDS Resources Emergency
CBO	Community-Based Organization
CD4	CD4+ T-lymphocyte cell
CDC	Centers for Disease Control and Prevention
CLIA	Clinical Laboratory Improvement Amendment
CTS	Counseling and Testing Site
CY	Calendar Year
DHHS	Department of Health and Human Services
DNA	Deoxyribonucleic Acid
DOC	Department of Correction
EBIS	Evidence-Based Intervention Services
eHARS	enhanced HIV/AIDS Reporting System
EIA	Enzyme Immunoassay
FDA	Food and Drug Administration
FDT	Field Delivery Therapy
FOY	Focus on Youth
FPL	Federal Poverty Level
FY	Fiscal Year
GED	General Education Development
GISP	Gonococcal Isolate Surveillance Project
GYN	Gynecology
HAB	HIV/AIDS Bureau
HBV	Hepatitis B
HCV	Hepatitis C
HIV	Human Immunodeficiency Virus
HOPWA	Housing Opportunities for Persons with AIDS
HPV	Human Papillomavirus
HRSA	Health Resources and Services Administration
HSV-2	Genital Herpes Simplex Virus Type 2
HUD	United States Department of Housing and Urban Development
IA	Immunoassay
IDU	Injection Drug Use
ITTS	Integrated Targeted Testing Services
LGV	Lymphogranuloma Venereum

LTBI	Latent Tuberculosis Infection
MAI	Minority AIDS Initiative
MSA	Metropolitan Statistical Area
MSM	Men Who Have Sex With Men
NAAT	Nucleic Acid Amplification Test
NC EDSS	North Carolina Electronic Disease Surveillance System
NGU	Nongonococcal Urethritis
NHAS	National HIV/AIDS Strategy
NIR/NRR	No Identified Risk/No Risk Reported
OB	Obstetrics
OMB	Office of Management and Budget
PCP	Pneumocystis pneumonia
PCR	Polymerase Chain Reaction
PCSI	Program Coordination and Service Integration
PID	Pelvic Inflammatory Disease
PLWA	People Living with AIDS
PLWH	People Living with HIV (non-AIDS)
PLWHA	People Living with HIV/AIDS
QM	Quality Management
RBC	Regional Bridge Counselor
RIDR	Routine Interstate Duplicate Review
RNA	Ribonucleic Acid
RNCP	Regional Network of Care and Prevention
RWY	Ryan White Year
SAMHSA	Substance Abuse and Mental Health Services Administration
SBC	State Bridge Counselor
SISTA	Sisters Informing Sisters About Topics on AIDS
SLPH	State Laboratory of Public Health
SPAP	State Pharmaceutical Assistance Program
SPNS	Special Projects of National Significance
STARHS	Serologic Testing Algorithm for Recent HIV Seroconversion
STAT	Screening and Tracing Active Transmission
STD	Sexually Transmitted Diseases
STD*MIS	Sexually Transmitted Diseases Management Information System
STRMU	Short-Term Rent, Mortgage, and Utility Assistance
TB	Tuberculosis
TBRA	Tenant-Based Rental Assistance
TGA	Transitional Grant Area
TTH	Testing and Treatment History
US	United States
UNC-Chapel Hill	University of North Carolina at Chapel Hill
VOICES/VOCES	Video Opportunities for Innovative Condom Education and Safer Sex

EXECUTIVE SUMMARY

The 2013 North Carolina HIV/STD Epidemiologic Profile describes the epidemiology of sexually transmitted diseases (STD), including human immunodeficiency virus (HIV), in North Carolina. As in previous versions, the majority of data presented are drawn from surveillance systems maintained by the North Carolina Department of Health and Human Services (North Carolina DHHS), Division of Public Health, Communicable Disease Branch. Throughout the profile, the following questions are addressed.

1. What are the sociodemographic characteristics of the general population in North Carolina?
2. What is the scope of HIV burden in North Carolina?
3. What are the indicators of risk for HIV infection in the North Carolina population?
4. What is the impact of Ryan White HIV/AIDS Program care and treatment services on the health of HIV infected persons in North Carolina?
5. What is the scope of disease of chlamydia, gonorrhea, syphilis, and other sexually transmitted diseases in North Carolina?

The North Carolina HIV/STD Epidemiologic Profile also reflects a broad spectrum of information about prevention and integrated service activities across the state. Public health activities at the state level aimed at controlling HIV infection and STDs throughout North Carolina have long been integrated.

A summary of key points for each topic discussed in the Epidemiologic Profile are presented by chapter below.

CHAPTER 1: SOCIODEMOGRAPHIC CHARACTERISTICS OF NORTH CAROLINA

- In 2013, North Carolina was the 10th most populous state in the nation, with an estimated population of 9,861,952 (page 1).

  o North Carolina's population increased 18.5 percent from 2000 to 2010 (among the top five states with fastest growing population growth rate) (page 1).
  o The North Carolina foreign-born population increased 56 percent from 2002 to 2012 (page 4).
  o North Carolina has the 7th largest non-White/Caucasian population in the nation (page 3).
  o North Carolina has the 8th highest percentage of Black/African American population in the nation (page 2).
  o From 2002 to 2012, the estimated Hispanic/Latino population in North Carolina increased by 88.6 percent (page 3).

- In 2013, North Carolina's per capita income of $38,683 was 38th in the nation or 86.4 percent of the national average of $44,765 (page 6).

- In 2013, 19 percent of North Carolinians were living at or below the federal poverty level (FPL); 40 percent of the overall population is considered low income (living at or below 199% FPL) (page 6).

- In 2013, 24 percent of adults aged 19 to 64 years were uninsured in North Carolina (page 7).

- In 2012, approximately 70.8 percent of the state's population lived in urban areas (page 5).

CHAPTER 2: SCOPE OF HIV INFECTION EPIDEMIC IN NORTH CAROLINA

- The cumulative number of individuals first diagnosed with HIV infection in North Carolina, which includes those diagnosed with AIDS, was 42,889, of whom 28,101 were living as of December 31, 2013 (page 13).

- An estimated 36,300 people were living with HIV infection in North Carolina (including 6,500 individuals who may not be aware of their HIV infection), as of December 31, 2013 (page 14).

- The total number of new HIV infections diagnosed in North Carolina in 2013 was 1,525 (15.6 per 100,000 population), while the number of new diagnoses among the adult/adolescent population was 1,513 (18.7 per 100,000 adult/adolescent population) in North Carolina. Please note that this number is likely to be artificially inflated due to incomplete interstate deduplication for 2013 (page 18).

- Among the newly diagnosed adult/adolescent HIV infections, Black/African American (non-Hispanic/Latino) males had the highest rate at 92.3 per 100,000 adult/adolescent population, which is nearly nine times higher than that for White/Caucasians (non-Hispanic/Latino) (12.0 per 100,000 adult/adolescent population). For females, the highest rate by race/ethnicity was among Black/African Americans (non-Hispanic/Latina) females (24.7 per 00,000 adult/adolescent population), followed by Hispanic/Latina females at 8.1 per 100,000 adult/adolescent population, and White/Caucasian females at 1.9 per 100,000 population (page 18).

- The majority of newly diagnosed HIV infections occurred among the 20-29 year old age group (N = 495, 32.5%). Roughly 20 percent of all newly diagnosed HIV infections in 2013 were among adolescent (13-24 years of age) males (page 20).

- After redistributing the unknown hierarchical risk of HIV exposure category (includes persons who report sex with an opposite sex partner and do not report injection drug use [IDU], men who have sex with men [MSM], or any other potential high risk behaviors, no identified risk [NIR] and no reported risk [NRR]), MSM accounted for 60.5 percent of newly diagnosed adult/adolescent cases in 2013. Heterosexual exposure accounted for roughly 33 percent of adult/adolescent cases in 2013, followed by IDU at 4 percent (page 22).

- In 2013, Mecklenburg (31.0 per 100,000 population), Edgecombe (31.0 per 100,000 population), Cumberland (26.0 per 100,000 population), Durham (25.7 per 100,000 population), and Guildford (23.5 per 100,000 population) counties had the highest rates of newly diagnosed HIV infections among the 100 counties in North Carolina (page 30).

- In 2013, HIV and AIDS were diagnosed at the same visit ("late testers") for 29 percent of newly diagnosed HIV infections (page 33).

- Overall, HIV-related deaths ranked as the 23rd most common leading cause of death in North Carolina in 2013 (page 38).

- The Medical Monitoring Project (MMP) provides additional information, such as health insurance information, education, and housing status that standard surveillance data collection does not capture. Of those living in North Carolina with an HIV infection in 2011, who were in care and participated in interviews, the majority were male, identify as heterosexual, were Black/African American, aged 45-54 years, had more than a high school diploma or general education development (GED) credential, and had known their HIV status for more than 10 years (page 40).

CHAPTER 3: HIV TESTING IN NORTH CAROLINA

- Starting in November 2013, the North Carolina State Laboratory of Public Health (North Carolina SLPH) adopted a new HIV testing algorithm that incorporates a 4th generation HIV test (page 45).

- In 2013, a total of 228,938 HIV tests were performed through state-sponsored programs in North Carolina. Of these, 1,032 tests were confirmed positive (0.4%). These programs identified 431 newly identified HIV-positive individuals (out of the 1,032 confirmed positive tests), which is 28.3 percent of newly diagnosed HIV cases reported to surveillance in 2013 (page 47).

- In 2013, positivity rates were much higher among North Carolina males (1.0%) than females (0.2%) (page 48).

- In 2013, 53.8 percent (N = 232) of all new HIV infections found through state-supported testing programs were from sexually transmitted disease (STD) clinics (page 48).

- In 2013, the largest age group tested through North Carolina state-sponsored HIV testing programs were those aged 20 to 29 years (N=106,698, 46.6%). The highest positivity rate was seen among those aged 40 to 49 years (N= 23,222, 0.9%) (page 50).

- Regarding hierarchical risk of HIV exposure, the highest positivity rate for new HIV infections were among MSM (5.1% positive) and MSM/IDU (2.8% positive) (page 50).

- HIV is most transmissible during acute infection. North Carolina attempts to identify acute cases and link these cases to medical care as soon as possible.
  - In 2013, 23 acute (or recent) infections were identified through the North Carolina screening and tracing active transmission (STAT) program. Since 2003, 259 HIV-infected individuals have been identified in the state through this program (page 52).
  - Twenty-five acute or recent cases were identified in 2013 through follow-up and additional information collected during field investigations conducted by North Carolina disease intervention specialists (DIS) (page 53).

CHAPTER 4: HIV INFECTION CARE AND TREATMENT IN NORTH CAROLINA

- During the Ryan White Year (RWY) 2013-2014 (April 1, 2013 to March 31, 2014), the Ryan White Part B program served a total of 7,972 clients living with HIV infection in North Carolina (page 57).

- Overall, 69.3 percent of Ryan White Part B clients were virally suppressed, 16.7 percent were not suppressed, and 14.1 percent of clients did not have any viral load tests recorded in CAREWare during RWY 2013-2014 (page 60).

- The AIDS Drug Assistance Program (ADAP) had 7,470 HIV clients enrolled during the RWY 2013-2014 (page 63).

- Overall, 74.4 percent of ADAP enrollees were virally suppressed (page 64).

- In total, 73.9 percent of persons living in North Carolina with HIV infection were estimated to have "met need" during calendar year 2013. The remaining 26.1 percent were estimated to represent those with "unmet need" (page 66).

- North Carolina is designing its own strategy to follow-up with people who are potentially out of care, based in part upon the Center for Disease Control and Prevention's (CDC) toolkit, which will initially be implemented in fall 2014/winter 2015. State bridge counselors (SBC) will follow-up and attempt to re-engage these persons in care (page 71).

- Surveillance and care data are routinely assessed to describe the proportion of HIV-infected residents who are receiving medical care and who have very low to undetectable viral loads (virally suppressed).
    - Please note that data for this assessment are incomplete.
    - Among cases diagnosed and reported through December 31, 2012 and evaluated during 2013, an estimated 36.4 percent of the total cases were virally suppressed, compared to 25.3 percent nationally in 2009 (the most recent data available). However, current viral load data are not available from many care settings. This may be an underestimate of the proportion of patients virally suppressed (page 70).
    - Approximately two-thirds of the people receiving at least one care visit during a given evaluation year also had a second care visit three or more months apart during the same evaluation year (page 70).
    - Roughly half the people who have been diagnosed and reported with HIV infection whose last known address was in North Carolina did not have documentation in surveillance data showing that they received care during the evaluation year. However, data are not provided by all care settings. This may be an underestimate of the proportion of patients in care (page 70).

- North Carolina is part of a Special Project of National Significance (SPNS-LINK) and Care and Prevention in the United States (CAPUS) initiative, two federally funded, time-limited, multi-site projects designed to enhance linkage, retention, and re-engagement in HIV care (pages 72 and 112 for SPNS-LINK; pages 72 and 109 for CAPUS).

- In 2013, approximately 1,654 clients received services from the state-run housing opportunities for persons with AIDS (HOPWA) program (page 73).

CHAPTER 5: BACTERIAL AND OTHER SEXUALLY TRANSMITTED DISEASES IN NORTH CAROLINA

- STDs are more frequently reported among Black/African American (non-Hispanic/Latino) males and females in North Carolina (pages 79, 83, and 88).

- Per 2012 and 2013 screening data, the number of chlamydia and gonorrhea screening tests submitted for testing by publicly-funded clinics is declining (page 80).

- The highest chlamydia rates in 2013 were among 20 to 24 year olds for females, which can be attributed to the screening programs targeted at women under 25 years of age (page 79).

- Six hundred seventy-seven (677) cases of early syphilis were diagnosed and reported in 2013, compared to 598 cases in 2012. Please note that a significant syphilis outbreak occurred in North Carolina in 2009 with 873 cases reported that year (page 86).

- The overall early syphilis rate in 2013 was 6.9 cases per 100,000 population. Males represented approximately 86 percent of all reported early syphilis cases (page 86).

- The six most populous counties (Mecklenburg, Guilford, Wake, Forsyth, Cumberland, and Durham) accounted for 65.8 percent (13.2 per 100,000 population) of 2013 early syphilis reports in North Carolina (page 89).

- In 2013, Black/African American (non-Hispanic/Latino) males represented 56 percent of all early syphilis cases, with a rate of 37.7 per 100,000. The syphilis rate among Black/African American (non-Hispanic/Latino) males was more than 7 times the rate for White/Caucasian (non-Hispanic/Latino) males (4.9 per 100,000), and the rate of syphilis among Hispanic/Latino males (5.5 per 100,000) was 1.1 times the rate for White/Caucasian (non-Hispanic/Latino) males (page 88).

- Congenital syphilis cases in North Carolina remain unacceptably high. Early and complete prenatal care for the pregnant woman is the best tool for prevention. Birthing hospitals act as a safety net to ensure that pregnant women who are positive for syphilis and their newborns receive the appropriate post-delivery prophylaxis (page 90).

CHAPTER 6: HIV COMORBIDITIES IN NORTH CAROLINA

- In 1999, the proportion of individuals with an early syphilis diagnosis who also had an HIV diagnosis (either prior to or within six months of syphilis diagnosis) was 5.1 percent (N=1,207). In 2013, this proportion increased to 40.3 percent (N=677) (page 95).

- Among males infected with syphilis, 46.3 percent (N=585) were also diagnosed with HIV in 2013. The female proportion of comorbid infections was 2.2 percent (N=92) (page 95).

- Since 2003, the race/ethnicity proportions of comorbid male infections have fluctuated between 67.2 and 77.1 for Black/African American males and between 14.7 and 27.1 for White/Caucasian males (page 97).

- Tuberculosis (TB) incidence in North Carolina decreased 35.5 percent between 2008 and 2013, down from 335 cases to 216 cases. While fewer cases of TB are reported in the United States (US) than ever before, TB rates have decreased much faster in North Carolina than in the nation as a whole (page 98).

- In 2013, every acute TB cases who were alive at diagnosis were tested for HIV (page 100).

- Of 216 known acute TB cases in North Carolina in 2013, 13 (6.0%) cases also tested positive for HIV (page 100).

- Between 2009 and 2013, the percent of persons tested for latent TB infection (LTBI) who also tested positive for HIV and who were started on treatment increased from 16.0 percent to 60.9 percent (page 102).

- Eighty-four acute hepatitis B (HBV) and 1,029 chronic HBV cases were reported in North Carolina in 2013. While acute HBV infection is more likely to result from sexual transmission, chronic HBV cases in North Carolina represent a mix of perinatal and sexual transmission. The majority of infections due to perinatal transmission diagnosed in North Carolina are found in persons born in other countries, primarily Asian and African countries, who are now North Carolina residents (page 103).

- In 2013, three acute HBV cases (3.6%) had a previous diagnosis of HIV, while 102 cases (9.9%) diagnosed with chronic HBV had a previous HIV diagnosis (page 103).

- Due to the narrow case definition for acute hepatitis C (HCV) infection, North Carolina surveillance data do not provide a representative picture of acute or chronic HCV comorbidity and possible sexual transmission. This will not change until chronic HCV becomes reportable. Therefore, the number of HCV cases that have also been diagnosed with HIV is unknown at this time (page 103).

CHAPTER 7: INTEGRATED PROGRAM ACTIVITIES IN NORTH CAROLINA

- North Carolina has a fully integrated HIV and STD program, with collaboration on prevention, surveillance, and education strategies for both HIV and STD cases (page 105).

- The *Get Real. Get Tested. Get Treatment.* campaign, started in 2006, aims to test for and educate people about HIV and STDs, identify persons living with HIV/AIDS (PLWHA) who need care, and link HIV-positive patients to care. Each commercial has targeted a different group of people and encourages them to get tested for HIV and other STDs. The *Get Real. Get Tested. Get Treatment*. commercials have been nominated for three Emmy awards (page 105).

- Evidence-based intervention services (EBIS) had approximately 1,300 participants at the end of 2013. The primary mission of EBIS is to target persons at increased risk of becoming infected with HIV in order to reduce their risk or, if already infected, prevent the transmission of the virus to others. There were eight specific interventions utilized by 11 different agencies in North Carolina in 2013 (page 105).

- Regional Minority AIDS Initiative (MAI)/MSM Task Force teams work throughout the state to improve the health outcomes of HIV-positive individuals and minority MSM in an atmosphere free from stigma and discrimination. The Regional MAI/MSM Task Force teams are extremely important to the success of the state's prevention strategy (page 107).

- In North Carolina, partner notification, counseling, and referral services for HIV and syphilis are performed by a specialized group within the North Carolina DHHS, known as the Field Services Unit. Disease intervention specialists (DIS) are the backbone of the Field Services Unit. The DIS are highly skilled in contact tracing and other activities aimed at interrupting disease transmission networks (page 108).

- North Carolina was one of only eight states to be awarded with Care and Prevention in the United States (CAPUS) funding. The project started in North Carolina in September 2012. The primary goals of the project are to increase the proportion of racial and ethnic minorities who have HIV infection who are linked to and retained or re-engaged in care. Eight CAPUS-specific interventions were selected for the three-year project in North Carolina (page 109).

- Special Projects of National Significance (SPNS-LINK) and the North Carolina DHHS have implemented NC-LINK: Systems Linkage and Access to HIV Care in North Carolina. This program is in collaboration with Duke University and the University of North Carolina-Chapel Hill (UNC-Chapel Hill). The goal of NC-LINK is to increase the number of people living with HIV infection who are engaged in consistent care by creating a system to link out-of-care persons to providers (page 112).

- North Carolina was one of six health departments in the US awarded funds from the CDC for the Program Coordination and Services Integration (PCSI) project in September 2010. The goal of PCSI is to provide prevention services that are holistic, evidence-based, comprehensive, and high quality to appropriate populations at every interaction with the health care system (page 113).

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INTRODUCTION

The North Carolina Epidemiologic Profile is divided into four sections. Part I describes the general population demographics and social characteristics of our state, the human immunodeficiency virus (HIV) infection epidemic, and indicators of HIV exposure or risk in North Carolina. Part II describes HIV testing and HIV care and treatment, while part III describes other sexually transmitted diseases (STD) and HIV comorbidities in the state. Part IV describes North Carolina's integrated program activities, including special projects the state is conducting to reduce the number of HIV infections in North Carolina.

Several appendices are included with this document: Appendix A: Maps, Appendix B: Data Sources, Appendix C: Technical Notes, Appendix D: Tables, and Appendix E: References (starting on page A-1). Readers may find it beneficial to review the information in the appendices first, especially Appendix B: Data Sources, which contains information about the data sources used in creating this report (page B-1) and Appendix C: Technical Notes, which has information on the definitions used, HIV infection surveillance reporting issues, HIV exposure categories, and rate calculations (page C-1).

Readers should note the following:

- HIV infection is defined as a diagnosis of HIV infection, regardless of the stage of infection (1, 2, 3, or unknown). In this document, use of the term acquired immunodeficiency syndrome (AIDS) refers to HIV infection Stage 3. AIDS is classified based on either CD4+ T-lymphocyte (CD4) cell count results (CD4 cell count of less than 200 or a T-lymphocyte percentage of total lymphocytes of less than 14) or documentation of an AIDS-defining condition.

- AIDS (Stage 3) classification is based on lab test or opportunistic infection and can be at the same time as HIV or later, but once a person is classified as AIDS (Stage 3) (for surveillance purposes) they are always AIDS (Stage 3).

- HIV infection and syphilis data are summarized by date of diagnosis. Chlamydia, gonorrhea, tuberculosis (TB), hepatitis B (HBV), and hepatitis C (HCV) data are presented by date of report. This categorization represents a change in data presentation from previous publications.

- References to race/ethnicity in this document may be different from those found in documents from other agencies. Unless otherwise noted, Hispanics/Latinos are considered a separate racial/ethnic group. Thus, White/Caucasian refers to White/Caucasian non-Hispanic/Latinos; Black/African American refers to Black/African American non-Hispanics/Latinos, etc.

- The HIV infection case totals and rates discussed in this document are restricted to adults/adolescents only for comparability across states and with national data reported by the Centers for Disease Control and Prevention (CDC). All county totals and references to cumulative cases and persons living with HIV infection do include those younger than 13 years.

- All calculated rates in this document are based on the United States (US) Census Bureau bridged-race population estimates. All rates are presented as per 100,000 population.

- Please note that all references are separated out by chapter.

Note: The portable document format or PDF version of this document contains hyperlinks to related topics in other sections of the document. To navigate to the related topic, click the hyperlink.

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CHAPTER 1: SOCIODEMOGRAPHIC CHARACTERISTICS OF NORTH CAROLINA

Knowledge of sociodemographic characteristics is paramount to fully understanding the health of a population. Sociodemographics can be used to identify certain populations that may be at greater risk for morbidity and mortality. This knowledge can also assist in identifying underlying factors that may contribute to a health condition. This chapter will discuss the relevant health indicators and sociodemographic characteristics of the population of North Carolina, including age, gender, race/ethnicity, geography, income, poverty, health insurance, Medicaid, and education.

POPULATION

According to the 2010 United States (US) Census, North Carolina was the 10th most populous state and one of the most rapidly expanding states during the previous decade.[1] From 2000 to 2010, North Carolina's population grew by 18.5 percent, from 8,049,313 to 9,535,483 residents. Only four other states (Texas, California, Florida, and Georgia) had a faster population growth rate.[2]

The 2013 North Carolina *provisional* population estimate was 9,861,952, with county populations ranging from 4,142 (Tyrrell County) to 991,970 (Mecklenburg County).[1] More than one-half of North Carolina's population lived in only 16 counties (Mecklenburg, Wake, Guilford, Forsyth, Cumberland, Durham, Buncombe, Gaston, New Hanover, Union, Onslow, Cabarrus, Johnston, Pitt, Davidson and Iredell).[1] In 2013, there were 118,983 births and 83,317 deaths in the state, and the average life expectancy for North Carolinians was 78.1 years.[3]

Age and Gender

The most updated gender- and age-specific population estimates available at time of analysis were for the year 2012, so the 2012 population is used as a substitute for 2013 to analyze the HIV infection rates in this profile.[4]

Age and gender play an important role in public health planning and in understanding the health of a community. These characteristics are significant indicators in the prevalence of certain diseases, especially human immunodeficiency virus (HIV) and other sexually transmitted diseases (STDs), as shown in previous North Carolina HIV/STD *Epidemiologic Profiles*.

In 2012, the median age for people living in North Carolina was 38 years old, with 33.4 percent 18 years and younger, and 13.8 percent 65 years and older. Approximately 48.7 percent of the population was male and 51.3 percent was female (Table 1.1).

Table 1.1. North Carolina Bridged-Race Population Estimates by Age Group, 2012

Age (Year)	Male		Female		Total	
	Population	%	Population	%	Population	%
Less than 13	844,893	8.7	809,731	8.3	1,654,624	17.0
13-14	131,038	1.3	125,140	1.3	256,178	2.6
15-19	333,894	3.4	316,767	3.2	650,661	6.7
20-24	358,340	3.7	338,887	3.5	697,227	7.1
25-29	314,920	3.2	317,764	3.3	632,684	6.5
30-34	312,161	3.2	322,589	3.3	634,750	6.5
35-39	307,521	3.2	319,016	3.3	626,537	6.4
40-44	337,597	3.5	348,270	3.6	685,867	7.0
45-49	333,433	3.4	347,450	3.6	680,883	7.0
50-54	331,693	3.4	353,786	3.6	685,479	7.0
55-59	301,875	3.1	332,534	3.4	634,409	6.5
60-64	266,087	2.7	298,818	3.1	564,905	5.8
65 and older	579,446	5.9	768,423	7.9	1,347,869	13.8
Total	4,752,898	48.7	4,999,175	51.3	9,752,073	100.0

Data Source: National Center for Health Statistics, Bridged-Race Population Estimates (Accessed January 2, 2014).

Race/Ethnicity Populations in North Carolina

American Indian/Alaska Natives

American Indian/Alaska Natives represent 1.2 percent of the state population and are one of the largest American Indian/Alaska Native populations in the US. About 44.0 percent of American Indian/Alaska Natives in North Carolina live in Robeson, Cumberland, Hoke, Scotland, Swain, Mecklenburg, and Jackson counties.[4] In Appendix A: Maps, Map 1 displays the proportion of American Indian/Alaska Native population in North Carolina by county for 2012 (page A-2).

Asian/Pacific Islander

Asian/Pacific Islanders represent 2.6 percent of the state population. Over half (57.1 percent) of Asian/Pacific Islanders in North Carolina live in Wake, Mecklenburg, Guilford, and Durham counties.[4] In Appendix A: Maps, Map 1 displays the proportion of Asian/Pacific Islander population in North Carolina by county for 2012 (page A-2).

Black/African Americans

In 2012, North Carolina ranked 8th highest in percentage of Black/African Americans nationwide. North Carolina has eight counties in which Black/African American comprise more than half of the total population (Bertie: 62.2%; Hertford: 60.6%; Northampton: 58.4%; Edgecombe: 57.7%; Halifax: 53.3%; Warren: 52.2%; and Vance: 50.3%).[4] In Appendix A: Maps, Map 1 displays the proportion of Black/African American population in North Carolina by county for 2012 (page A-2).

Hispanic/Latinos

From 2002 to 2012, the estimated Hispanic/Latino population in North Carolina increased by 88.6 percent, from 451,095 to 850,853 residents. Hispanic/Latinos represented 8.7 percent of the population of the state. Among North Carolina counties, Duplin County had the highest proportion of Hispanic/Latino residents (21.2%), followed by Lee County (19.4%), Sampson County (17.5%), and Montgomery County (14.6%).[4] In Appendix A: Maps, Map 1 displays the proportion of Hispanic/Latino population in North Carolina by county for 2012 (page A-2).

White/Caucasian

White/Caucasian individuals represent 65.2 percent of the state population. Almost one-third (30.3 percent) of White/Caucasians in North Carolina live in Wake, Mecklenburg, Guilford, Forsyth, Buncombe, and New Hanover counties.[4] In Appendix A: Maps, Map 1 displays the proportion of White/Caucasian population in North Carolina by county for 2012 (page A-2).

Race/Ethnicity and Physiographic Region

North Carolina has the nation's 7th largest non-White/Caucasian population (2,934,632 people in 2012), with noticeable variations in the demographic composition from region to region. The racial and ethnic differences within the state's population play an important role in interpreting gaps in access to health care among groups. These health and health care differences are documented using public health surveillance and are shown to be especially large in terms of HIV infection morbidity and intervention. Previous HIV infection surveillance has shown that HIV disproportionately affects ethnic minorities in North Carolina.

Race/ethnicity also varies by physiographic region with a larger proportion of White/Caucasian in the Western region, American Indian/Alaska Natives in the Eastern region, and Black/African American non-Hispanics in the Eastern region (Table 1.2). A state map showing the physiographic regions is displayed on the last page.

Table 1.2. North Carolina Race/Ethnicity Proportions by Gender and Physiographic Region[a], 2012

Gender	Race/Ethnicity	Western	Piedmont	Eastern	North Carolina
		%	%	%	%
Male	American Indian/Alaska Native[b]	0.5	0.2	1.4	0.6
	Asian/Pacific Islander[b]	0.5	1.7	0.6	1.2
	Black/African American[b]	2.4	10.4	13.4	10.3
	Hispanic/Latino	3.2	5.0	4.4	4.6
	White/Caucasian[b]	42.4	31.2	29.3	32.0
	Total	48.9	48.5	49.1	48.7
Female	American Indian/Alaska Native[b]	0.5	0.2	1.5	0.6
	Asian/Pacific Islander[b]	0.6	1.8	0.8	1.3
	Black/African American[b]	2.2	12.1	14.8	11.7
	Hispanic/Latino	2.6	4.5	3.8	4.1
	White/Caucasian[b]	45.1	32.9	30.0	33.5
	Total	51.1	51.5	50.9	51.3
Total	American Indian/Alaska Native[b]	1.0	0.4	2.9	1.2
	Asian/Pacific Islander[b]	1.1	3.5	1.4	2.6
	Black/African American[b]	4.6	22.5	28.2	22.0
	Hispanic/Latino	5.8	9.6	8.2	8.7
	White/Caucasian[b]	87.6	64.0	59.3	65.5
	Total	100.0	100.0	100.0	100.0

[a]The North Carolina state demographer and the geographic information systems lab at the State Center for Health Statistics have produced a Geographic Regional Classification scheme based on "physiographic" qualities.
[b]Non-Hispanic/Latinos.
Data Source: National Center for Health Statistics, Bridged-Race Population Estimates (Accessed January 2, 2014).

Foreign-born Population

According to the US Census Bureau's Annual American Community Survey, North Carolina's foreign-born population increased by 56.0 percent from 2002 to 2013 (480,248 to 749,426).[5] In 2013, naturalized citizens represented 31.9 percent of the foreign-born populations in North Carolina, while 68.1 percent were non-citizens. The various regions of birth are displayed in Table 1.3.

Table 1.3. North Carolina Foreign-Born Population by Region of Birth, 2013

Region	2013	
	Estimated Number of People	%
Africa	44,432	5.9
Asia	183,109	24.4
Europe	78,811	10.5
Latin America	422,725	56.4
North America	16,867	2.3
Oceania	3,482	0.5
Total	749,426	100.0

Data Source: U.S. Census Bureau, 2013 American Community Survey (Accessed October 29, 2014).[4]

METROPOLITAN STATISTICAL AREAS

Metropolitan statistical areas (MSAs) are population areas that represent the social and economic linkages and commuting patterns between urban cores and outlying integrated areas. These geographic designations are managed by the Office of Management and Budget (OMB) in order to have nationally consistent areas for developing federal statistics. These areas are collectively referred to as core based statistical areas with a metropolitan area containing a core urban area population of 50,000 or more.[6] In the *HIV/AIDS Surveillance Supplemental Report, Volume 13 Number 2*, the Centers for Disease Control and Prevention (CDC) divides urban/metropolitan areas into large- (population greater than or equal to 500,000) and medium-sized urban/metropolitan areas (population 50,000 to 499,999), which are all defined as urban areas. Areas other than metropolitan areas are defined as rural areas.[7] Eleven North Carolina counties (Anson, Cabarrus, Franklin, Gaston, Guilford, Johnston, Mecklenburg, Randolph, Rockingham, Union and Wake) are classified as large urban/metropolitan areas. Twenty-nine North Carolina counties (Alamance, Alexander, Brunswick, Buncombe, Burke, Caldwell, Catawba, Chatham, Cumberland, Currituck, Davie, Durham, Edgecombe, Forsyth, Greene, Haywood, Henderson, Hoke, Madison, Nash, New Hanover, Onslow, Orange, Pender, Person, Pitt, Stokes, Wayne, and Yadkin) are classified as medium urban/metropolitan areas. The remaining 60 counties are classified as rural. More information on the urban and rural counties in North Carolina can be found in Appendix A: Maps, Map 2 (page A-3).

Data from the US Census showed that in 2010, 80.7 percent of the general population of the US was living in urban areas and 19.3 percent in rural areas.[8] For North Carolina in 2010, 66.1 percent of North Carolinians lived in urban areas, while 33.9 percent lived in rural areas.[8] Using the most current estimate for 2012, North Carolina remains more rural than the US as a whole, with 70.8 percent living in urban areas, and 29.2 percent in rural areas (Table 1.4).

In North Carolina, a majority of Asian/Pacific Islanders (57.9%) live in large metropolitan areas, followed by Hispanic/Latinos (41.8%) and Black/African Americans (39.3%). A majority of American Indian/Alaska Natives (70.2%) live in rural areas (Tables 1.4).

Table 1.4. North Carolina Population by Race/Ethnicity for Urban and Rural Areas, 2012

Race/Ethnicity	Urban				Rural		North Carolina	
	Large Metro[a]		Medium Metro[b]					
	Population	%	Population	%	Population	%	Population	%
American Indian/Alaska Native[c]	13,863	0.4	21,217	0.6	82,526	2.9	117,606	1.2
Asian/Pacific Islander[c]	146,030	4.1	77,233	2.3	28,628	1	251,891	2.6
Black/African American[c]	842,424	23.9	723,811	21.4	576,180	20.2	2,142,415	22
Hispanic/Latino	355,955	10.1	296,010	8.7	198,888	7	850,853	8.7
White/Caucasian[c]	2,162,806	61.4	2,266,447	67	1,960,055	68.9	6,389,308	65.5
Total	**3,521,078**	**36.1**	**3,384,718**	**34.7**	**2,846,277**	**29.2**	**9,752,073**	**100.0**

[a]Population greater than or equal to 500,000 people.

[b]Population between 50,000 and 499,999 people.

[c]Non-Hispanic/Latino.

Data Source: National Center for Health Statistics, Bridged-Race Population Estimates (Accessed January 2, 2014).

HEALTH INDICATORS

Household Income

Contextual factors such as poverty, income, and education, as well as racial segregation, discrimination, and incarceration rates, influence sexual behavior and sexual networks. These factors contribute substantially to the persistence of marked racial disparities in STD rates.[9]

According to the US Department of Commerce's Bureau of Economic Analysis, the 2013 per capita income for North Carolina was $38,683 or 86.4 percent of the national average ($44,765). This figure represents a 6.9 percent increase from 2011, placed North Carolina 38th in the nation for personal per capita income and 4th in the Southeast region (includes Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee, Virginia, and West Virginia).[10] The 2013 annual unemployment rate in North Carolina was 8.0, down from a rate of 9.2 in 2012.[11,12] In 2013, the median household income in North Carolina was $45,906, lower than the national median of $52,250.[13]

In 2013, 19.0 percent of North Carolinians were below the federal poverty level (FPL), which is slightly higher than the national percent below the FPL.[14] Children (less than 18 years of age) and the elderly had higher percentages below the FPL than the US. Approximately 43.0 percent of the Hispanic/Latino population in the state were living below the FPL through 2013, which is higher than the national proportion (Table 1.5).[15] North Carolina also has an overall total of 40.0 percent of the population considered low income (199% FPL or below).[16]

**Table 1.5. North Carolina and United States Individual Poverty Rate
by Age and Race/Ethnicity, 2013**

Demographics	North Carolina %	United States %
Age (Years)		
Children (0 - 18 years)	27.0	20.0
Adults (19 - 64 years)	16.0	13.0
Elderly (65 and older)	15.0	10.0
Race/Ethnicity		
Black/African American*	27.0	27.0
Hispanic/Latino	43.0	24.0
White/Caucasian*	12.0	27.0
Unknown*	21.0	14.0
Total	19.0	15.0

*Non-Hispanic/Latino.

Data Source: Kaiser Family Foundation and Urban Institute: State Health Facts (based on U.S. Census March 2014 current population survey: annual social and economic supplements (Accessed December 17, 2014).

Health Insurance

The percentage of the non-elderly without health insurance in North Carolina has been increasing over the years. In 2013, 24.0 percent of adults (aged 19 to 64 years) in North Carolina were uninsured.[17] Of that 24.0 percent, roughly 45.0 percent were White/Caucasian, 20.0 percent Black/African American, 24.0 percent were Hispanic/Latino, and 11.0 percent were other (including American Indian/Alaska Natives, Asian/Pacific Islanders, and persons of two or more races).[18] Rates of uninsured among all racial/ethnic groups in North Carolina were higher than those in the nation. Although White/Caucasians comprise the greatest proportion of the uninsured population, minorities have the highest uninsured rates. Among adults uninsured with health insurance in North Carolina in 2013, around 44.0 percent had a low income 199% FPL or below.[19]

Medicaid

Medicaid serves low-income parents, children, seniors, and people with disabilities in North Carolina. For the North Carolina State Fiscal Year (FY) 2013, Medicaid served 1.7 million low-income families and persons with disabilities, which is an estimated 17.2 percent of the overall state population.[1,20] The majority of people living with HIV infection in North Carolina do not fall into these categories; they are generally older and male, while the newly diagnosed HIV infections are among younger men; many are not currently supporting children (Chapter 2: Scope of HIV Infection Epidemic, pages 13 and 17 through 20). Medicaid, as expanded by the federal government, does cover these populations in some states. In North Carolina, these populations are not covered by Medicaid and must obtain medical care by other means or go without care.

For more information on Medicaid and its services, contact the Division of Medical Assistance (http://www.ncdhhs.gov/dma/medicaid/ and http://www.ncdhhs.gov/dma/sectioncontacts.htm).

Education

For those North Carolinians aged 25 years or older, 85.7 percent had a high school diploma or higher, and 28.4 percent had a bachelor's degree or higher.[21] In the most current *North Carolina Public Schools Statistical Profile,* 2.5 percent of high school students in North Carolina (grades 9–13) dropped out during the 2012-2013 school year, down from 4.9 percent in the 2003-2004 school year.[22]

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CHAPTER 2: SCOPE OF THE HIV INFECTION EPIDEMIC IN NORTH CAROLINA

SPECIAL NOTES

- *Human immunodeficiency virus (HIV) infection includes all initial diagnoses of HIV as well as those diagnosed and classified as acquired immunodeficiency syndrome (AIDS) as their initial diagnosis. More information about the designation of HIV infection can be found on page 10 and in Appendix C (page C-2).*

- *The HIV infection case totals and rates discussed in this document are restricted to adults/adolescents only for comparability across states and with national data reported by the Centers for Disease Control and Prevention (CDC). All county totals and references to cumulative cases and persons living with HIV infection do include the 0 to 12 age group.*

- *Unless otherwise noted, "year" refers to year of diagnosis for HIV cases, not year of report that was used in previous publications.*

- *State public health staff determine whether potentially duplicative pairs of HIV infection represent one person and, if so, that person's residence at the time of diagnosis. This is done through a process called routine interstate duplicate review (RIDR), which is coordinated by the CDC (see Appendix C: Technical Notes for further information, page C-2).[1] RIDR is usually processed by the time data is closed for the calendar year, however there was a delay in 2013, and this process was not completed by the time the 2013 data was closed on July 1, 2014. This, in turn, could potentially artificially inflate the HIV infection numbers for 2013. North Carolina typically determines that 150 to 200 duplicate HIV infection cases per year were previously diagnosed in other states to this process. Once the duplicates are removed, the newly diagnosed HIV infection case counts for 2013 should be in line with the overall decreasing trend seen since 2008.*

BACKGROUND ON HIV INFECTION AND SURVEILLANCE IN NORTH CAROLINA

The first acquired immunodeficiency syndrome (AIDS) case reported in North Carolina was in 1982.[2] In North Carolina, AIDS became a reportable disease in 1984, and a diagnosis of human immunodeficiency virus (HIV) infection was made reportable in the state in 1990.[2] State law requires reporting of HIV infection as well as associated laboratory tests. Starting July 1, 2013, all viral load and CD4+ T-lymphocyte (CD4) cell counts became reportable to the state. While the proportion of tests that are reported is increasing, reporting of these tests is still incomplete. Data regarding morbidity reports of HIV and AIDS from health providers are collected by health department staff on confidential case report forms. These case reports include demographic and clinical information for the patient, as well as questions regarding mode of exposure.

Prior to 2012, HIV infection surveillance data were managed directly in the enhanced HIV/AIDS reporting system (eHARS), while the field investigation information, such as interviews and contact information, were managed through the Sexually Transmitted Disease Management Information System (STD*MIS). Since 2012, HIV case report data (surveillance) and field investigations have been entered into the North Carolina Electronic Disease Surveillance System (NC EDSS), the statewide disease reporting system, and then exported for reporting to the Centers for Disease Control and Prevention (CDC) into eHARS. Data used in this chapter were obtained from eHARS on July 1, 2014. National data used in this chapter were compiled by the CDC and represent de-identified HIV infection case report information from each of the 50 states, the District of Columbia, and six United States (US) territories. More information about the data sources used in this chapter can be found in Appendix B: Data Sources (page B-4). Rates were calculated using bridged-race population estimates for 2012 as the denominator, as the 2013 estimates were not available at time of data analysis. More information concerning denominator or rate calculation information can be found in Appendix B: Data Sources (page B-2) and Appendix C: Technical Notes (page C-5).

HIV SURVEILLANCE CASE DEFINITION

In 2008, the CDC revised the existing surveillance case definitions for HIV/AIDS and combined them into a single case definition using a staging system in order to monitor the epidemic. This staging system is based on CD4 cell counts or percentages and includes four different stages of HIV infection (stages 1, 2, 3, and unknown).[3] HIV infection is categorized based on the person's age: adults and adolescents greater than 13 years of age, children at least 18 months but under 13 years of age, and children under 18 months of age. In this chapter, HIV infection is defined as a diagnosis of HIV infection, regardless of the stage, for persons diagnosed in 2013 and earlier. HIV infection Stage 3 represents the traditional definition of AIDS based on having a CD4 cell count of less than 200, a T-lymphocyte percentage of total lymphocytes of less than 14, or documentation of an AIDS-defining condition.[3] In this document, use of the term AIDS refers to HIV infection Stage 3. AIDS (Stage 3) is defined as persons who were diagnosed with HIV infection and classified as Stage 3 in 2013 or earlier (used for prevalence and number of deaths).

OVERALL HIV INFECTION TRENDS IN NORTH CAROLINA

Figure 2.1 displays the rates of people living with HIV infection and the rates of newly diagnosed HIV infection from 2000 to 2013 in North Carolina, by the year of HIV diagnosis for the individual. While the rate of people living with HIV infection has steadily increased as new diagnoses continue and people survive longer, the rate of newly diagnosed HIV infections has been decreasing since 2008. Newly diagnosed HIV infection peaks occurring in 2007 and 2008 may be attributed to the Communicable Disease Branch's effort to increase HIV testing, including the *Get Real. Get Tested. Get Treatment.* campaign and may not necessarily represent an increase in cases. In 2013, the rate for new diagnoses of HIV infection did increase from 2012. This rate is likely to be inflated, as interstate deduplication review was not conducted before the data was closed (see "Special Notes" and Appendix C: Technical Notes for more information, pages 9 and C-2 respectively).

Figure 2.1. HIV Infection[a] Rates Diagnosed in North Carolina, 2000–2013[b]
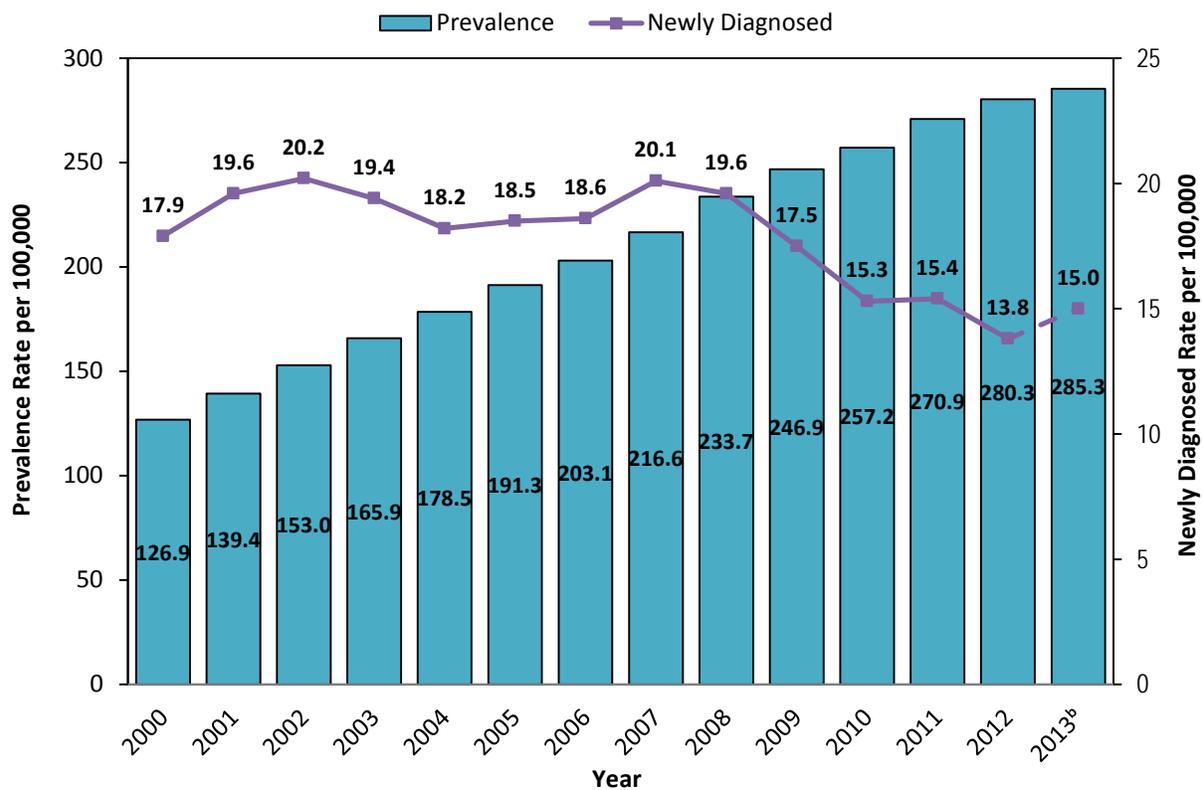
[a]HIV infection includes all newly reported HIV infected individuals by the year of first diagnosis, regardless of the stage of infection (HIV or AIDS).

[b]2013 values are likely to be artificially inflated due to incomplete interstate deduplication (see "Special Notes" for more information, page 9).

Data Source: enhanced HIV/AIDS Reporting System (eHARS) (data as of July 1, 2014).

Please note the numbers in Figure 2.1 (above) are periodically updated as additional information is received. Readers are encouraged to use the numbers for previous years that appear in this profile, as opposed to prior publications.

HIV INFECTION TRENDS IN NORTH CAROLINA AND THE REST OF THE UNITED STATES

All states require name-based HIV infection case reporting by law in order to provide data that are useable for state-to-state and state-to-national comparisons. Comparing North Carolina data to national data is limited to earlier years because national surveillance data are released later than state data (usually about a two-year delay). Comparisons made between other states, North Carolina, and the US are based on counts and rates calculated by the CDC and have been statistically adjusted for delays in reporting; these numbers slightly differ from North Carolina's unadjusted case counts and rates published in 2013. According to the CDC, the national newly diagnosed HIV infection rate in 2012 was 15.4 per 100,000 population. During the same time period, North Carolina's newly diagnosed HIV infection rate was 15.1 per 100,000 population.[4] North Carolina ranked 8th overall among all states, District of Columbia, and US dependent territories in the number of newly diagnosed HIV infections in 2012 (Table 2.1). Similarly in 2012, North Carolina ranked for overall population (10th in country).[5]

Table 2.1 Top 10 United States (including District of Columbia and Six Dependent Territories) for Newly Diagnosed HIV Infections, 2012

State	Number of New HIV Diagnoses
1. Florida	4,937
2. California	4,894
3. Texas	4,234
4. New York	3,845
5. Georgia	2,089
6. Illinois	1,741
7. Pennsylvania	1,434
8. North Carolina	1,389
9. New Jersey	1,355
10. Maryland	1,347

Data Source: Centers for Disease Control and Prevention, *HIV Surveillance Report 2012*.[5]

The rate of HIV infection in the South continues to be a concern. In 2012, the South (Alabama, Arkansas, Delaware, District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia) had 48.8 percent of all new HIV diagnoses in the US (including District of Columbia and US dependent territories), including five states in the top ten areas of residence reporting the highest number of new HIV diagnoses in 2012 (Table 2.1). Eight of the top ten US areas (including District of Columbia and US dependent territories) by newly diagnosed HIV infection rates were also in the South (Top 10 were District of Columbia, Georgia, Maryland, Louisiana, Florida, Puerto Rico, US Virgin Islands, New York, New Mexico, Texas, and Illinois). North Carolina had the 17th highest rate overall.[4]

HIV INFECTION PREVALENCE IN NORTH CAROLINA

Individuals living with HIV infection in North Carolina communities are referred to as prevalent cases. Information about persons living with HIV infection is critical for case follow-up, AIDS care provision, and strategic intervention and testing activities. While reporting to the North Carolina Division of Public Health started in 1982, we report HIV data starting in 1983, as it is the first complete year for HIV infection reporting to the state. From January 1, 1983 through December 31, 2013, the cumulative number of HIV infection cases diagnosed in North Carolina is 42,889, of whom 28,101 are currently living in North Carolina and 14,788 have moved out of the state or have died. This number includes some HIV-positive individuals who died of non HIV-related causes (see page 35 for HIV-related deaths). Figure 2.2 displays the numbers of people living with HIV infection, which represent prevalent cases at the end of each year from 2007 to 2013. The number of people living with HIV infection in North Carolina has been increasing every year, indicating that the number of newly diagnosed HIV infection cases exceeds the number of people who died (Figure 2.2). Due to the advancement of antiretroviral treatment (ART) and opportunistic infection control, people with HIV infections can and are living longer and healthier lives.

Figure 2.2. Persons Living with HIV Infection Classification[a] in North Carolina, 2009-2013[b]
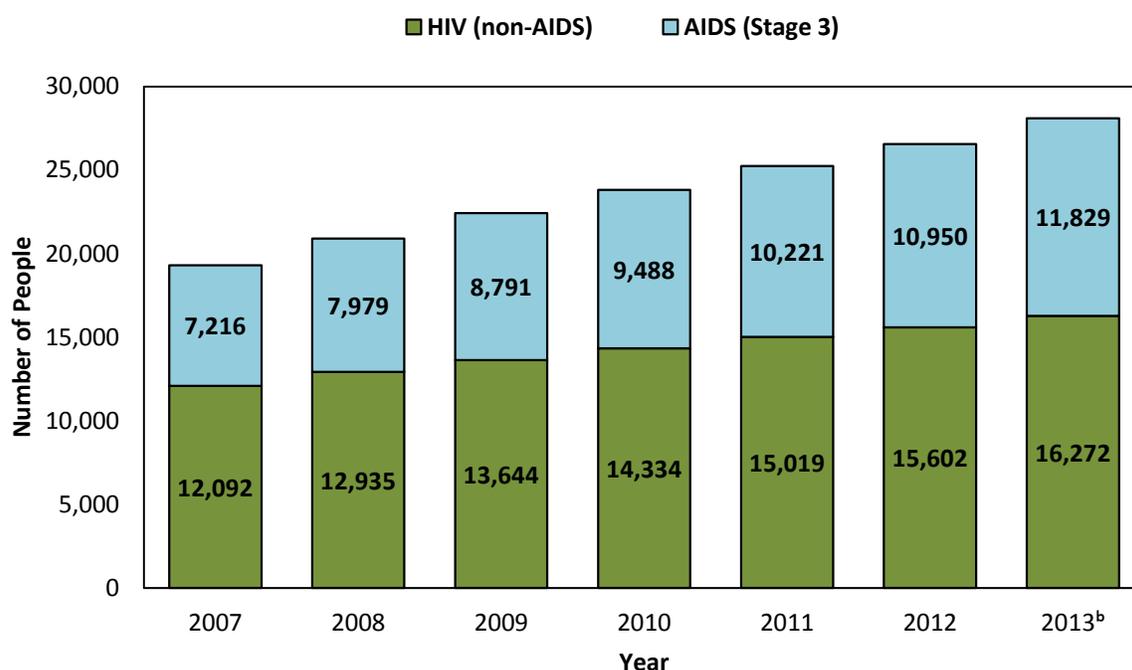
Note: Represents data through December 31 of each year.

[a]HIV (non-AIDS) includes those living in North Carolina and have never been diagnosed with AIDS (HIV infection Stage 3). An individual is classified as having AIDS (Stage 3) if they were diagnosed with HIV infection during the year of diagnosis and were classified as AIDS (Stage 3) within a year or who have ever been diagnosed with ever having a CD4+ T-lymphocyte count of less than 200 or a CD4+ T-lymphocyte percentage of total lymphocytes of less than 14, while living in North Carolina.

[b]2013 values are likely to be artificially inflated due to incomplete interstate deduplication (see "Special Notes" for more information, page 9). Data Source: enhanced HIV/AIDS Reporting System (eHARS) (data as of July 1, 2014).

Please note HIV infection reports are periodically updated with vital status data available from the State Center for Health Statistics; thus "living totals" for earlier years, especially for the last two years, have been revised since the previous report.

Persons living with HIV are individuals who have been diagnosed and subsequently reported to the North Carolina public health surveillance system. Case counts are affected by some amount of underreporting by clinicians as well as the lack of information on people who are infected with HIV but have not been tested and reported. Efforts to identify the unaware positive population will increase the number of new diagnoses in the future. The current number of total living cases in Figure 2.2 underrepresents true HIV prevalence and must be adjusted to account for those who have been diagnosed but not reported and those who are unaware of their positive status. One method for estimating the number of people who are unaware they are HIV positive is based on the CDC estimate that 81.9 percent of people living with HIV have been tested and know their status.[6] Evaluation of the completeness of the 2013 HIV infection reporting in North Carolina suggested that North Carolina surveillance captures 90 to 95 percent of HIV diagnoses (Appendix B: Data Sources, page B-4). If we apply these two proportions (81.9% awareness of status and the 90-95% completeness) to the number of persons living with HIV in North Carolina from our current surveillance data, we can estimate the total number of individuals who are infected with HIV, including those that are unaware of their HIV status, as approximately 36,300 people.

Demographics of Persons Living with HIV Infection

Gender, race/ethnicity, and age distribution

Table 2.1 displays the demographics of people living with HIV infection in North Carolina as of December 31, 2013. Males living with HIV infection were the majority of the total (71.0%) and more than double the female prevalence (29.0%). Black/African Americans comprised the majority (65.4%) of cases, followed by White/Caucasians (25.2%) and Hispanic/Latinos (6.2%). Older individuals represented a larger percentage of people living with HIV, as people can live for many years on ART after an HIV diagnosis. The large percentages of males and Black/African Americans living with HIV infection indicates that these groups are most affected by the HIV epidemic in North Carolina (Table 2.2).

Table 2.2. All Persons Living with HIV Infection[a] as of 12/31/2013 in North Carolina by Selected Demographics

Demographics	Males			Females			Total		
	Cases	%	Rate[b]	Cases	%	Rate[b]	Cases	%	Rate[b]
Race/Ethnicity									
American Indian/Alaska Native[c]	144	0.7	253.9	62	0.8	101.8	206	0.7	175.2
Asian/Pacific Islander[c]	103	0.5	85.4	48	0.6	36.6	151	0.5	59.9
Black/African American[c]	12,160	60.9	1,210.8	6,217	76.4	546.3	18,377	65.4	857.8
Hispanic/Latino	1,385	6.9	306.2	371	4.6	93.1	1,756	6.2	206.4
White/Caucasian[c]	5,772	28.9	185.1	1,299	16.0	39.7	7,071	25.2	110.7
Unknown[d]	398	2.0	--	142	1.7	--	540	1.9	--
Current Age (Year)									
Less than 13	47	0.2	5.6	30	0.4	3.7	77	0.3	4.7
13-14	--[e]	--	--	--[e]	--	--	16	0.1	6.2
15-19	96	0.5	28.8	71	0.9	22.4	167	0.6	25.7
20-24	956	4.8	266.8	182	2.2	53.7	1,138	4.0	163.2
25-29	1,649	8.3	523.6	418	5.1	131.5	2,067	7.4	326.7
30-34	1,717	8.6	550.0	617	7.6	191.3	2,334	8.3	367.7
35-39	1,759	8.8	572.0	950	11.7	297.8	2,709	9.6	432.4
40-44	2,515	12.6	745.0	1,308	16.1	375.6	3,823	13.6	557.4
45-49	3,303	16.5	990.6	1,406	17.3	404.7	4,709	16.8	691.6
50-54	3,385	17.0	1,020.5	1,286	15.8	363.5	4,671	16.6	681.4
55-59	2,253	11.3	746.3	953	11.7	286.6	3,206	11.4	505.4
60-64	1,316	6.6	494.6	526	6.5	176.0	1,842	6.6	326.1
65 and older	948	4.7	163.6	380	4.7	49.5	1,328	4.7	98.5
Unknown[d]	--[e]	--	--	--[e]	--	--	14	0.0	--
Total	19,962	100.0	420.0	8,139	100.0	162.8	28,101	100.0	288.2

[a]All persons living with HIV infection, regardless of stage of infection (HIV or AIDS).

[b]Rate is expressed per 100,000 population.

[c]Non-Hispanic/Latino.

[d]Rates are not available due to the lack of overall population data for the unknown groups.

[e]Cell counts, percentages, and rates have been suppressed to avoid identification of cells that have counts less than five through direct or indirect means.
Data Source: enhanced HIV/AIDS Reporting System (eHARS) (data as of July 1, 2014).

Hierarchical Risk of Exposure for HIV Prevalent Cases

Information about risk or exposure categories of HIV is very useful for disease prevention efforts focusing on behavior change. Successful behavior change reduces HIV transmission. Without effective behavioral interventions for people living with HIV infection, they may continue to transmit HIV to others. Exposure categories (referred to by the CDC as modes of transmission) are determined using a presumed hierarchical order of probability of potential risk factors as defined by the CDC.[5] If a person's exposure category was unknown (not identified or reported), we used a percent redistribution method to estimate exposure category and reclassify these cases. Reassigning these cases to an exposure category allows for a more complete picture of trends over time. More information on this methodology can be found in Appendix C: Technical Notes (page C-4 through C-6).

After reassigning the unknown risk of exposure group among persons living with HIV infection in North Carolina as of 12/31/2013, 43.8 percent were likely infected through men who have sex with men (MSM) activities, 38.6 percent through heterosexual contact, 10.0 percent through injection drug use practices (IDU), and 2.8 percent reported both MSM and IDU; these risks are considered to be equal and this category is referred to as MSM/IDU (Appendix D: Table B, page D-4).

HIV INCIDENCE ESTIMATES IN NORTH CAROLINA

North Carolina is one of 25 jurisdictions funded by the CDC as part of a cooperative agreement to participate in the HIV incidence or serologic testing algorithm for recent HIV seroconversion (STARHS) program. Data obtained from the STARHS project generate timely and relevant estimates of the annual number of new HIV infections and help to focus prevention efforts and evaluate progress toward reducing the spread of HIV.[7] New infections are slightly different than new diagnoses. New infection estimates are recent infections, among people who know and who do not know their HIV status. New diagnoses reflect only recent tests, not the actual date of infection, which could be many years prior to the diagnosis. Persons could have been infected years before being diagnosed.[8] The HIV incidence program builds upon the existing HIV infection case reporting system by combining additional data collected about HIV testing history with supplemental laboratory testing on remnant diagnostic specimens to identify specimens from people recently infected with HIV. The estimate only looks at the adolescent and adult population (those over the age of 13).[9] For more information on the methodology behind the HIV incidence estimate calculation, refer to Appendix C: Technical Notes (page C-4).

Multiple elements are needed to calculate the HIV incidence for any given year, including a testing and treatment history (TTH) questionnaire and laboratory test results; therefore, a slight delay occurs in getting current data. Due to this delay, HIV incidence estimates were calculated for the adult and adolescent population through 2012 for this profile. North Carolina has revised the incidence estimate for 2007 through 2012 utilizing the revised methodology and additional data. The estimate released in 2014 indicates that the estimated HIV incidence has declined since 2007 (Figure 2.3).

Figure 2.3. North Carolina HIV Incidence Estimates[a] among Adults/Adolescents, 2007-2012
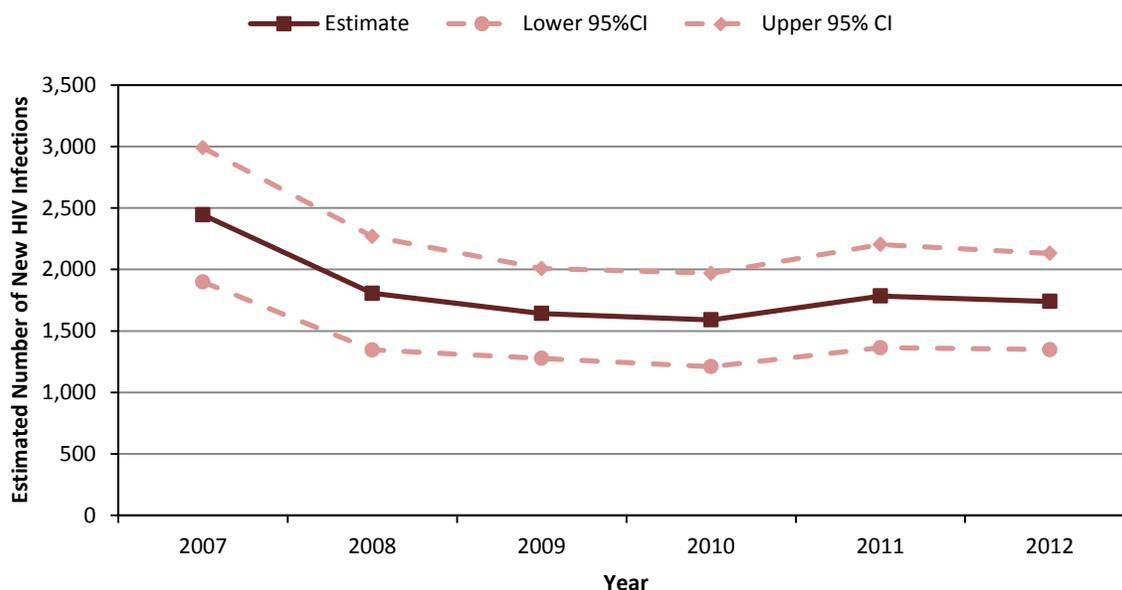
[a]Incidence estimates account for all newly infected individuals ,both those who are aware and are not aware of their HIV-positive status.
  Data Source: enhanced HIV/AIDS Reporting System (eHARS) (data as of July 1, 2014).

The HIV incidence estimate for North Carolina is limited to stratification by gender, race/ethnicity, age groups, and categories of hierarchical risk of exposure. The state-specific estimate is limited to this level of stratification due to the large amount of data required for presenting additional stratifications.

In 2012, the estimated number of new HIV infections per 100,000 population (incidence rate) was 1,740 (95% confidence intervals: 1,348-2,131). This estimate includes infections that have not been reported to North Carolina surveillance and is higher than the number of newly diagnosed and reported HIV infections in North Carolina for 2012 (N=1,347). The national HIV incidence rate is estimated at 21.5 per 100,000 population (95% confidence intervals: 16.6-26.3 per 100,000 population), which is slightly higher than the most current CDC estimate of 18.8 per 100,000 population (95% confidence intervals: 16.6-20.9 per 100,000) from 2010.[10]

The highest estimated HIV incidence rates are among males at 35.1 per 100,000 population (95% confidence intervals: 26.4 - 43.9 per 100,000), Black/African Americans at 60.8 per 100,000 population (95% confidence intervals: 44.1 - 77.4 per 100,000), and the 13 to 24 and 25 to 34 age groups at 34.2 per 100,000 population (95% confidence intervals: 22.2 - 46.3 per 100,000) and 36.7 per 100,000 population (95% confidence intervals: 23.6 - 49.9 per 100,000), respectively (Table 2.3).

Table 2.3. North Carolina HIV Incidence Estimates[a] by Gender, Race/Ethnicity, Age, and Hierarchical Risk of HIV Exposure, 2012

	Estimate (95% CI*)	% (95% CI*)	Rate[b] (95% CI*)
Gender			
Male	1,373 (1,032 - 1,714)	78.9 (59.3 - 98.5)	35.1 (26.4 - 43.9)
Female	367 (206 - 528)	21.1 (11.8 - 30.3)	8.8 (4.9 - 12.6)
Race/Ethnicity			
Black/African American[c]	1,055 (766 - 1,343)	60.6 (44.0 - 77.2)	60.8 (44.1 - 77.4)
White/Caucasian[c]	496 (300 - 692)	28.5 (17.2 - 39.8)	9.1 (5.5 - 12.6)
Other[d]	189 (81 - 298)	10.9 (4.7 - 17.1)	21.3 (9.1 - 33.5)
Age			
13-24	549 (356 - 743)	31.6 (20.5 - 42.7)	34.2 (22.2 - 46.3)
25-34	465 (299 - 632)	26.7 (17.2 - 42.7)	36.7 (23.6 - 49.9)
35-44	332 (172 - 492)	19.1 (9.9 - 36.3)	25.3 (13.1 - 37.5)
45 and older	393 (213 - 573)	22.6 (12.2 - 32.9)	10.0 (5.4 - 14.6)
Exposure Category			
Heterosexual/Other[e]	376 (208 - 543)	21.6 (12.0 - 31.2)	N/A[h]
IDU[f]	120 (21 - 219)	6.9 (1.2 - 12.6)	N/A[h]
MSM[g]	1,244 (921 - 1,567)	71.5 (52.9 - 90.1)	N/A[h]
Total	1,740 (1,348 - 2,131)	100.0	21.5 (16.6 - 26.3)

*95% confidence intervals

[a]Incidence estimates account for individuals who are aware and are not aware of their HIV-positive status (newly infected).

[b]Rate is expressed per 100,000 population; population numbers for each strata and overall total taken from 2012 United States Census estimate for 2012.

[c]Non-Hispanic/Latino.

[d]Other includes: Hispanic/Latinos, Asian/Pacific Islanders, and American Indian/Alaska Natives.

[e]Other includes: blood product and adult hemophilia.

[f]IDU=injection drug use.

[g]MSM=men who have sex with men and includes MSM who inject drugs.

[h]HIV incidence rates could not be calculated by exposure category, due to lack of population data for specific exposure groups.

Data Source: enhanced HIV/AIDS Reporting System (eHARS) (data as of July 1, 2014).

Accurately measuring HIV incidence will help us better understand how HIV is spreading, where to more effectively focus prevention efforts, and evaluate our progress in reducing the spread of HIV in North

Carolina. The new HIV incidence estimates illustrate the critical need for adequate funding of HIV prevention efforts in North Carolina. Additionally, these findings confirm the need to provide focused HIV prevention efforts tailored for youth, MSM, and minority populations (including Black/African Americans and Hispanic/Latinos) that are disproportionally impacted by HIV.

NEWLY DIAGNOSED HIV INFECTION CASES IN NORTH CAROLINA

Newly diagnosed HIV infections include all HIV cases diagnosed and reported to North Carolina in 2013. In 2013, 1,525 (15.6 per 100,000 population) individuals were newly diagnosed with HIV infection in North Carolina (Appendix D: Table D, page D-10). Of the newly diagnosed persons, 1,513 of them were over 13 years old, which makes the rate of newly diagnosed HIV infection among adults/adolescents 18.7 per 100,000 adult/adolescent population (Appendix D: Table F, page D-14).

Demographics of Adult/Adolescent Newly Diagnosed HIV Infection Cases

Gender and Race/Ethnicity

Among individuals newly diagnosed with HIV infection in 2013, the majority of cases were reported among males, specifically Black/African American males. Among the adult/adolescent newly diagnosed population in 2013, Black/African Americans made up the majority of cases (64.0%), followed by White/Caucasians (24.5%), Hispanic/Latinos (8.3%), Asian/Pacific Islanders (1.1%), and American Indian/Alaska Natives (0.7%) (Appendix D: Table G, page D-16).

The highest rate of newly diagnosed HIV cases was among Black/African American males (92.3 per 100,000 adult/adolescent population), which was nearly 8 times that for White/Caucasian males (12.0 per 100,000 adult/adolescent population; see Figure 2.4 and Appendix D: Table G, page D-16). The newly diagnosed HIV infection rate among adult/adolescent Black/African American females (24.7 per 100,000 adult/adolescent population) was 13 times the rate for adult/adolescent White/Caucasian females (1.9 per 100,000), which represented the largest disparity noted between gender and race/ethnicity categories (Figure 2.4 and Appendix D: Table G, page D-16).

Disparities also existed for Hispanic/Latinos as compared to White/Caucasians. The rate for adult/adolescent Hispanic/Latino males (32.5 per 100,000 adult/adolescent population) was almost 3 times that for White/Caucasian males, and Hispanic/Latino males ranked third highest among the gender and race/ethnicity rates. The rate for adult/adolescent Hispanic/Latina females (8.1 per 100,000 adult/adolescent population) was more than 3 times that for White/Caucasian females. The newly diagnosed HIV infection rate for American Indian/Alaska Native males (15.4 per 100,000 adult/adolescent population) was higher than that for White/Caucasian males, while the rate among Asian/Pacific Islander males (10.5 per 100,000 adult/adolescent population) was slightly lower than that for White/Caucasians (Figure 2.4 and Appendix D: Table G, page D-16).

Figure 2.4 shows newly diagnosed HIV infection rates for 2009-2013 by gender and race/ethnicity. In 2013, newly diagnosed HIV infection rates appear higher for all groups. This increase is likely due to incomplete deduplication analysis for 2013 ("Special Notes" and Appendix C: Technical Notes pages 9 and C-2, respectively). **We are still in the process of evaluating all 2013 HIV reports for potential**

interstate duplicate resolution. Once this analysis is complete, we will have a better understanding of the epidemic in 2013.

Figure 2.4. Newly Diagnosed Adult/Adolescent HIV Infection[a] Rates by Gender and Race/Ethnicity, 2009-2013[b]
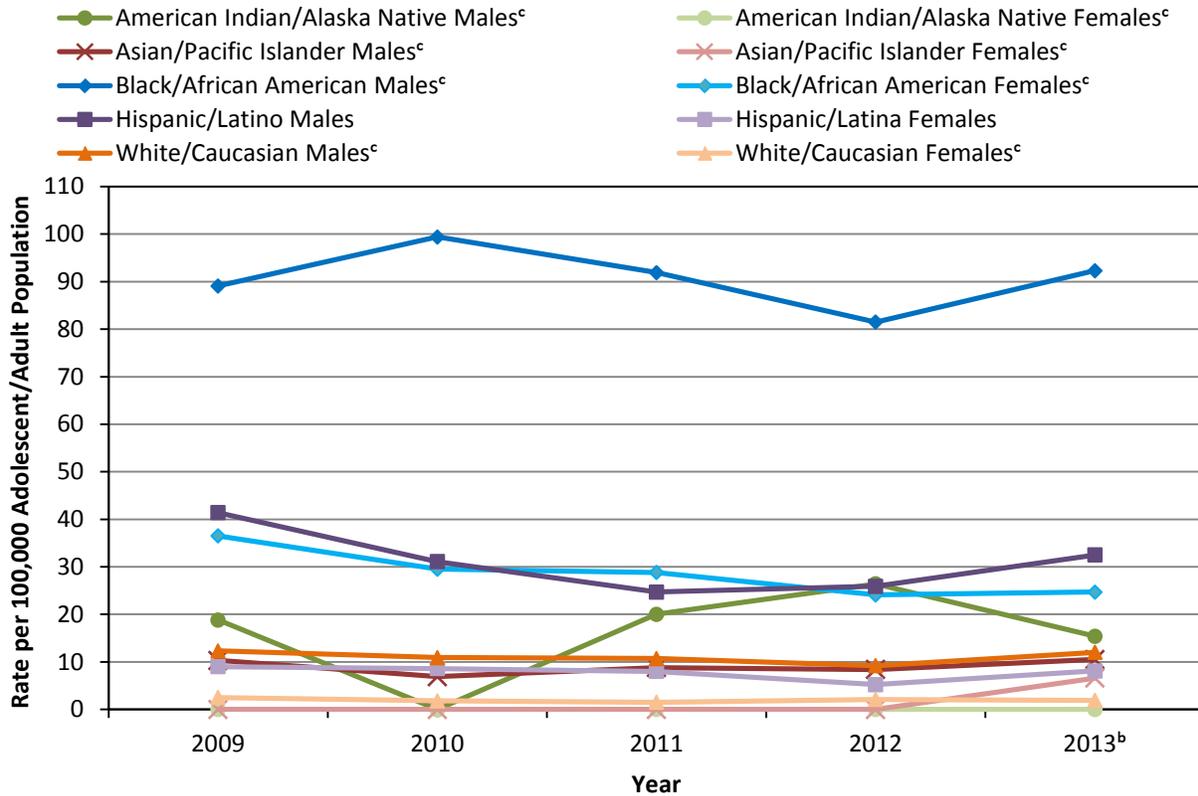
Note: Rates for unknown and other race/ethnicity categories are not calculated due to lack of population data.

[a]HIV infection includes all newly reported HIV infected individuals by the year of first diagnosis, regardless of the stage of infection (HIV or AIDS).

[b]2013 values are likely artificially inflated due to incomplete interstate deduplication (see "Special Notes" for more information, page 9).

[c]Non-Hispanic/Latino.

Data Source: enhanced HIV/AIDS Reporting System (eHARS) (data as of July 1, 2014).

Age distribution

Diagnoses in adults and adolescents represent most HIV diagnoses in 2013, with less than one percent (N=12) of newly diagnosed case patients younger than 13 years of age (not in Table 2.4). Overall, adults ages 20 to 49 years accounted for the greatest proportion (56.4%) of individuals diagnosed in 2013 (Table 2.4).

Table 2.4. North Carolina Newly Diagnosed Adult/Adolescent HIV Infection[a] Cases by Age Group and Gender, 2013

Age at Diagnosis (Year)	Males			Females			Total		
	Cases	%	Rate[b]	Cases	%	Rate[b]	Cases	%	Rate[b]
13-14	--[c]	--	--	--[c]	--	--	--[c]	--	--
15-19	52	4.4	15.6	7	2.2	2.2	59	3.9	9.1
20-24	249	20.9	69.5	24	7.4	7.1	273	18	39.2
25-29	190	16	60.3	32	9.9	10.1	222	14.7	35.1
30-34	128	10.8	41	32	9.9	9.9	160	10.6	25.2
35-39	108	9.1	35.1	38	11.7	11.9	146	9.6	23.3
40-44	130	10.9	38.5	51	15.7	14.6	181	12	26.4
45-49	137	11.5	41.1	46	14.2	13.2	183	12.1	26.9
50-54	85	7.1	25.6	42	13	11.9	127	8.4	18.5
55-59	47	4	15.6	30	9.3	9	77	5.1	12.1
60-64	31	2.6	11.7	14	4.3	4.7	45	3	8
65 and older	--[c]	--	--	--[c]	--	--	--[c]	--	--
Total	1,189	100.0	30.4	324	100.0	7.7	1,513	100.0	18.7

[a]HIV infection includes all newly reported HIV infected individuals diagnosed in 2013, regardless of stage of infection (HIV or AIDS).

[b]Rate is expressed per 100,000 population.

[c]Cell counts, percentages, and rates have been suppressed to avoid identification of cells that have counts less than five through direct or indirect means.

Data Source: enhanced HIV/AIDS Reporting System (eHARS) (data as of July 1, 2014).

Figure 2.5 displays the age differences between males and females newly diagnosed with HIV infection in 2013. Diagnoses in males were highest between ages 20 through 29 years (36.6% total), while the proportion of female diagnoses was highest for ages 40 through 49 (29.9% total). The difference in age at diagnosis reflects the difference in exposure risk for male and females. In recent years, new HIV infection cases have been increasing among younger males in North Carolina, unlike previous years when the HIV epidemic was primarily increasing among an older population. Young Black/African American males (ages 13-24 years) represented 16.3% of new cases in 2013 compared to 8.0% in 2004 and 13.0% in 2009 (Appendix D: Table H, page D-17). The relatively higher proportion of diagnoses among older females compared to males may represent existing infections that have gone undiagnosed for longer periods of time (Figure 2.5).

Figure 2.5. Newly Diagnosed HIV Infection[a] Cases by Age and Gender, 2013

[a]HIV infection includes all newly reported HIV infected individuals diagnosed in 2013, regardless of stage of infection (HIV or AIDS).
Data Source: enhanced HIV/AIDS Reporting System (eHARS) (data as of July 1, 2014).

Hierarchical Risk of Exposure for HIV Infection in Adults/Adolescents

As part of HIV surveillance activities, a great deal of importance is placed on determining the key HIV risk factors associated with each case. Interviewing the patient, their partners, and the treating physician are all methods used to determine risk/exposure factors. Ultimately, each case is assigned to one primary risk category based on a hierarchy of disease exposure developed by the CDC and others. More information on this methodology can be found in Appendix C: Technical Notes (pages C-4 through C-6).

Table 2.5 displays the most likely modes of exposure (as defined by the CDC) of 2013 newly diagnosed adult/adolescent HIV infections. The principal categories are: MSM, IDU, and heterosexual-high risk sex with a high-risk partner (MSM, IDU, or HIV-infected partner). The proportion of cases for which the risk is unknown was substantial (45.1%). A portion of these unknown risk cases were classified as unknown because the reported risk(s) did not meet one of the CDC-defined risk classifications. In particular, persons reporting heterosexual partners who are not aware of their partners' risk may be classified as having an unknown exposure.

In the following tables, a broader grouping is used: MSM, IDU, heterosexual. Rather than being limited to high-risk heterosexual encounters, the heterosexual-other category includes all women reporting sex

with men only and all men reporting sex with women only. Even with these categories, the likely route of exposure to HIV remains unknown for a substantial proportion (33.8%) of cases (Table 2.5).

Table 2.5. Adult/Adolescent Newly Diagnosed HIV Infection[a] Cases by Hierarchical Risk of HIV Exposure, 2013

Exposure Category	Males		Females		Total	
	Cases	%	Cases	%	Cases	%
Heterosexual-high risk[b]	41	3.4	70	21.6	111	7.3
Heterosexual-other[c]	106	8.9	65	20.1	171	11.3
IDU[d]	22	1.9	14	4.3	36	2.4
MSM[d]	656	55.2	--	--	656	43.4
MSM/IDU[d]	27	2.3	--	--	27	1.8
Unknown[e]	337	28.3	175	54.0	512	33.8
Other risk[f]	0	--[g]	0	--	0	--
Total	**1,189**	**78.6**	**324**	**21.4**	**1,513**	**100.0**

[a]HIV infection includes all newly reported HIV infected individuals diagnosed in 2013, regardless of the stage of infection (HIV or AIDS).

[b]Heterosexual-high risk is defined as a person who does not report IDU or MSM, but does report sexual contact with a partner of opposite sex, who is IDU, MSM, or known HIV-positive status. Also, if a person is a victim of sexual assault, exchanges sex for drugs/money, has had a recent STD or has sexual contact while using drugs, they are classified as high risk. For more information, please see Appendix C: Technical Notes (page C-4).

[c]Heterosexual-other is defined as a person who reports sex with an opposite sex partner and does not report IDU, MSM, or any other potential high risk behaviors.

[d]IDU = injection drug use; MSM = men who have sex with men.

[e]Unknown risk includes individuals classified as no identified risk (NIR) and no reported risk (NRR).

[f]Other risks include blood products (adult hemophilia) and pediatric risk.

[g]Percentages are only calculated if the case count is higher than five.

Data Source: enhanced HIV/AIDS Reporting System (eHARS) (data as of July 1, 2014).

To better describe the overall changes, the remaining unknown risk cases have been assigned a risk based on the proportionate representation of the various risk groups within the surveillance data. More explanation of this general risk reassignment of unknown risk cases can be found Appendix C: Technical Notes (pages C-4 through C-6). Table 2.6 displays the redistributed hierarchical risk of newly diagnosed HIV infections in North Carolina for 2013. MSM were estimated to represent about 60.5 percent of all newly diagnosed HIV infection cases. Heterosexual risk of exposure represented about 33.0 percent of all HIV infection cases, IDU about 4.0 percent and MSM/IDU at 2.5 percent.

Please note all further discussions of risk or exposure categories in this document will be based on the fully redistributed risk of all cases as described above.

Table 2.6. Adult/Adolescent Newly Diagnosed HIV Infection[a] Cases by Hierarchical Risk of HIV Exposure (Unknown Risk[b] Redistributed), 2013

Exposure Category	Males		Females		Total	
	Cases	%	Cases	%	Cases	%
Heterosexual-All[c]	205	17.2	294	90.7	499	33.0
IDU[d]	31	2.6	30	9.3	61	4.0
MSM[d]	915	77.0	--	--	915	60.5
MSM/IDU[d]	38	3.2	--	--	38	2.5
Other risk[e]	0	--	0	--	0	--
Total	**1,189**	**78.6**	**324**	**21.4**	**1,513**	**100.0**

[a]HIV infection includes all newly reported HIV infected individuals diagnosed in 2013, regardless of the stage of infection (HIV or AIDS).

[b]Unknown risk includes individuals classified as no identified risk (NIR) and no reported risk (NRR). For distribution calculations, see Appendix C: Technical Notes for more information (page C-5).

[c]Heterosexual-All includes those individuals reporting heterosexual contact with a known HIV-positive or high risk individual and cases redistributed into the heterosexual classification from the unknown group.

[d]IDU = injection drug use; MSM = men who have sex with men.

[e]Other risks include blood products (adult hemophilia) and pediatric risk.

Data Source: enhanced HIV/AIDS Reporting System (eHARS) (data as of July 1, 2014).

The majority of newly diagnosed HIV infections among adults and adolescents were likely exposed to HIV via sex, either homosexual or heterosexual. Over the period from 2009 to 2013, persons who identified as MSM and MSM/IDU exposures made up the largest proportion of newly diagnosed North Carolina HIV infections, increasing from 52.6 percent in 2009 to 63.0 percent in 2013. During this same time period, the proportion of people reporting heterosexual exposure declined around 9.1 percent. IDU exposure was reported by the smallest group (4.0% in 2013) and has not fluctuated drastically in the past five years. However, IDU remains an important mode of exposure for new HIV infection cases (Figure 2.6).

Figure 2.6. Newly Diagnosed Adult/Adolescent HIV Infection[a] Cases by Hierarchical Risk of HIV Exposure (Unknown Risk[b] Redistributed), 2009-2013[c]
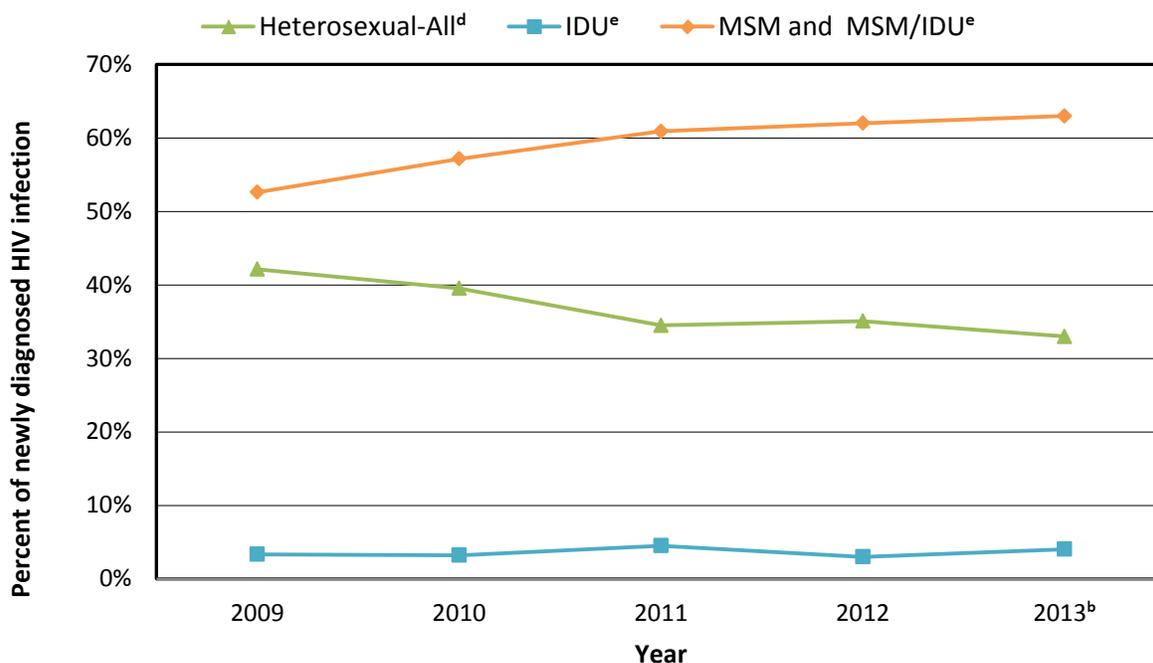
[a]HIV infection includes all newly reported HIV infected individuals diagnosed in 2013, regardless of stage of infection (HIV or AIDS).

[b]Unknown risk includes individuals classified as no identified risk (NIR) and no reported risk (NRR). For distribution calculations, see Appendix C: Technical Notes for more information (page C-5).

[c]2013 values are likely artificially inflated due to incomplete interstate deduplication (see "Special Notes" for more information, page 9).

[d]Heterosexual-All includes cases those individuals reporting heterosexual contact with a known HIV-positive or high risk individual and cases redistributed into the heterosexual classification from the unknown group .

[e]IDU= injection drug use; MSM=men who have sex with men.

Data Source: enhanced HIV/AIDS Reporting System (eHARS) (data as of July 1, 2014).

Gender and Hierarchical Risk of Exposure

Differences exist in the reported exposures for males and females. For males, sex with men (MSM) was reported by for 77.0 percent of people diagnosed with HIV in 2013; sex with women only was reported by 17.2 percent of the newly diagnosed; and IDU was reported by 2.6 percent (Figure 2.7). The proportion of diagnoses among men reporting sex with men has risen in recent years, from 73.1 percent in 2009 to 80.1 percent in 2013. The proportion of men reporting IDU has remained the same (around 3.0%) over the five-year time period.

Heterosexual contact was reported for 90.7 percent of newly diagnosed HIV women, while IDU was reported for 9.3 percent of women in North Carolina for 2013 (Figure 2.7). For women, the proportion of heterosexual contact reports has fluctuated between 89.9 and 95.2 percent, and proportion of IDU exposure varied between 4.9 and 9.3 percent during the last five years (Figure 2.7).

Figure 2.7. Adult/Adolescent Newly Diagnosed HIV Infections[a] by Gender and Hierarchical Risk of HIV Exposure (Unknown Risk[b] Redistributed), 2013

[a]HIV infection includes all newly reported HIV infected individuals diagnosed in 2013, regardless of the stage of infection (HIV or AIDS).
[b]Unknown risk includes individuals classified as no identified risk (NIR) and no reported risk (NRR). For distribution calculations, see Appendix C: Technical Notes for more information (page C-5).
[c]Heterosexual-All includes those individuals reporting heterosexual contact with a known HIV-positive or high risk individual and cases redistributed into the heterosexual classification from the unknown group.
[d]IDU = injection drug use; MSM = men who have sex with men.
Data Source: enhanced HIV/AIDS Reporting System (eHARS) (data as of July 1, 2014).

Gender, Race/Ethnicity, and Hierarchical Risk of Exposure

For Black/African American males diagnosed with HIV, MSM represented about 79.8 percent of cases, heterosexual exposure represented about 18.1 percent of cases, and IDU exposure about 2.2 percent of cases. The modes of exposure for minority races/ethnicities (American Indian/Alaska Natives, Asian/Pacific Islanders, and Hispanic/Latinos) were grouped together because of low case numbers. Within this aggregated group, MSM exposure represented 68.9 percent of male cases, heterosexual exposure 27.4 percent of cases, and IDU exposure 3.7 percent of cases. Among White/Caucasian males, MSM (including MSM/IDU) represented 85.5 percent of cases, heterosexual exposure represented 11.0 percent of cases, and IDU exposure represented 3.1 percent of cases (Figure 2.8).

The proportion of HIV cases attributed to heterosexual exposure among males, who are Black/African Americans and of other minority race/ethnic groups, is higher than the proportion among White/Caucasian males. Although some portion of this observed difference may be due to underreporting of MSM activity among minority males, some can be attributed to the difference in disease prevalence for each racial/ethnic group and the subsequent effect on HIV exposure (Figure 2.8).

Figure 2.8. Hierarchical Risk of HIV Exposure among Adult/Adolescent Male HIV Infection[a] Cases Diagnosed (Unknown Risk[b] Redistributed), 2013

aHIV infection includes all newly reported HIV infected individuals diagnosed in 2013, regardless of the stage of infection (HIV or AIDS).
bUnknown risk includes individuals classified as no identified risk (NIR) and no reported risk (NRR). For distribution calculations, see Appendix C: Technical Notes for more information (page C-5).
cNon-Hispanic/Latino.
dOthers include American Indian/Alaska Natives and Asian/Pacific Islanders.
eHeterosexual-All includes those individuals reporting heterosexual contact with a known HIV-positive or high risk individual and cases redistributed into the heterosexual classification from the unknown group.
fIDU = injection drug use; MSM = men who have sex with men.
Data Source: enhanced HIV/AIDS Reporting System (eHARS) (data as of July 1, 2014).

As with males, the majority of all newly diagnosed HIV infections among females, regardless of race/ethnicity, are attributed to sex with men. Heterosexual sex is the primary mode of exposure to HIV infection for women of all race/ethnicity groups. A greater proportion of White/Caucasian females report injecting drug use (26.4%) than Black/African American females (5.6%) (Figure 2.9).

Figure 2.9. Hierarchical Risk of HIV Exposure among Adult/Adolescent Female HIV Infection[a] Cases Diagnosed (Unknown Risk[b] Redistributed), 2013
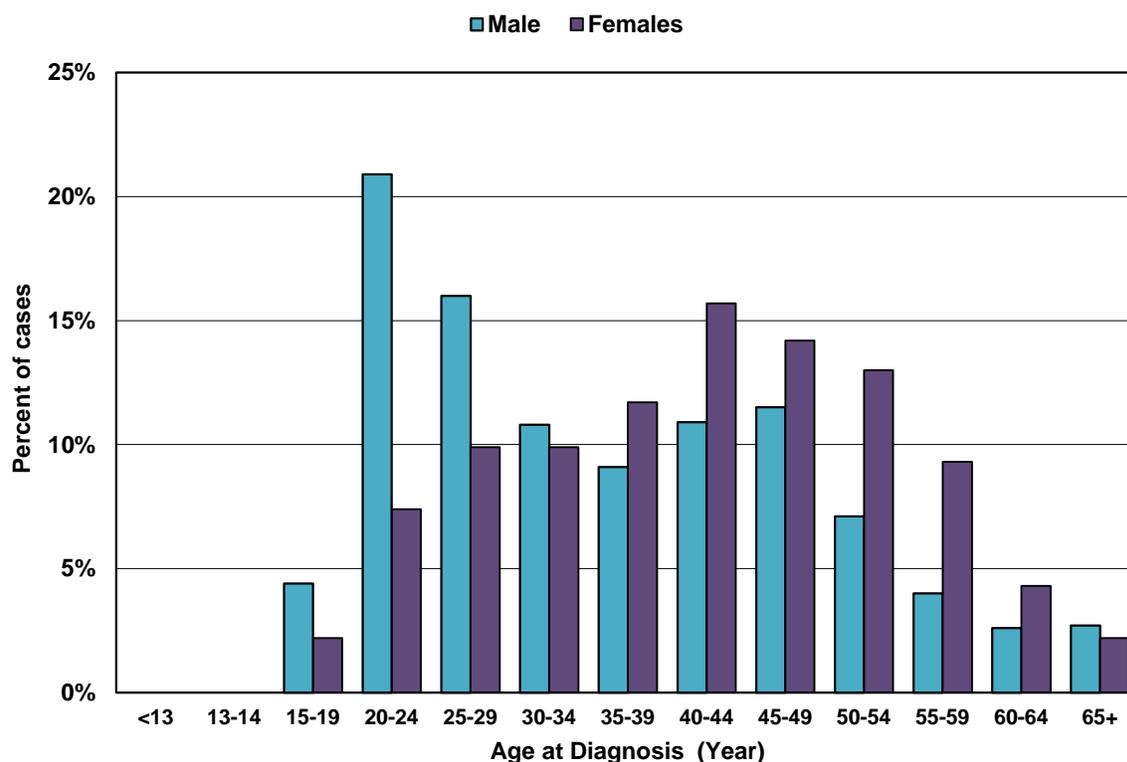

aHIV infection includes all newly reported HIV infected individuals diagnosed in 2013, regardless of the stage of infection (HIV or AIDS).
bUnknown risk includes individuals classified as no identified risk (NIR) and no reported risk (NRR). For distribution calculations, see Appendix C: Technical Notes for more information (page C-5).
cNon-Hispanic/Latino.
dOthers include American Indian/Alaska Natives and Asian/Pacific Islanders.
eHeterosexual-All includes those individuals reporting heterosexual contact with a known HIV-positive or high risk individual and cases redistributed into the heterosexual classification from the unknown group.
fIDU = injection drug use; MSM = men who have sex with men.
Data Source: enhanced HIV/AIDS Reporting System (eHARS) (data as of July 1, 2014).

Adolescent Newly Diagnosed HIV Infection Cases

Figures 2.10 and 2.11 display the percentage of newly diagnosed HIV infection cases by race/ethnicity and hierarchical risk of exposure categories for each gender for individuals ages 13 to 24 years diagnosed with HIV in 2013. Significant delays may occur between infection and subsequent testing and reporting; therefore, the age group of 13 to 24 years describes infections that likely occurred during adolescence. In 2013, just 3.9 percent of total cases diagnosed were found among teenagers from 13 to 19 years. This percentage increased to 17.9 percent when 20 to 24 year olds were included. From 2012 to 2013, the rate of newly diagnosed cases of HIV infections among adolescents (13 to 24 years old) has increased from 19.8 percent to 20.8 percent of all reports (Appendix D: Table H, page D-17). The proportion of cases among each racial group in adolescents is similar to that of HIV cases overall, with minorities disproportionally affected. Black/African Americans represented the majority of newly diagnosed HIV infection diagnoses for both men and women among 13 to 24 year olds at 84.2 percent and 68.8 percent, respectively (Figure 2.10). Although adolescent cases do not represent the majority of HIV cases diagnosed in each year, adolescence is the critical age for health education and HIV prevention.

Figure 2.10. New HIV Diagnoses[a] among Adolescent (13-24 years) by Gender and Race/Ethnicity, 2013
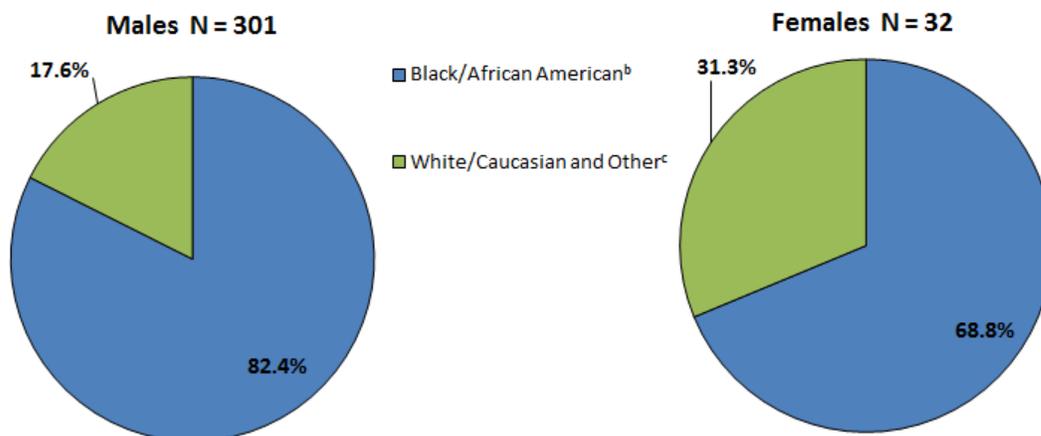
[a]HIV infection includes all newly reported HIV infected individuals diagnosed in 2013, regardless of the stage of infection (HIV or AIDS).
[b]Non-Hispanic/Latinos.
[c]Other includes American Indian/Alaska Native, Asian/Pacific Islander, Hispanic/Latinos, and unspecified race/ethnic populations.
Data Source: enhanced HIV/AIDS Reporting System (eHARS) (data as of July 1, 2014).

The hierarchical HIV exposure categories for male and female adolescents are very different (Figure 2.11). For adolescent males in 2013, 93.7 percent of new HIV infection cases were classified as MSM exposure (including MSM/IDU), an increase from 90.3 percent reported in 2009 (Appendix D: Table N, page D-23). In 2013, 96.9 percent of new HIV infection cases among adolescent females were exposed to HIV through heterosexual contact. Compared to newly diagnosed adult HIV infections for 2013, newly diagnosed adolescents are slightly less likely to report IDU, at 3.1 percent (4.0% for adults) (Figure 2.11).

Figure 2.11. Hierarchical Risk of HIV Exposure among Adolescent (13-24 years) HIV Infection[a] Cases Diagnosed (Unknown Risk[b] Redistributed), 2013

Males N = 301
- 2.3%
- 6.3%
- 91.4%

Females N = 32
- 3.1%
- 96.9%

Legend:
- ■ Heterosexual-All[c]
- ■ IDU[d]
- ■ MSM[d]
- ■ MSM/IDU[d]

[a]HIV infection includes all newly reported HIV infected individuals diagnosed in 2013, regardless of the stage of infection (HIV or AIDS).
[b]Unknown risk includes individuals classified as no identified risk (NIR) and no reported risk (NRR). For distribution calculations, see Appendix C: Technical Notes for more information (page C-5).
[c]Heterosexual-All includes those individuals reporting heterosexual contact with a known HIV-positive or high risk individual and cases redistributed into the heterosexual classification from the unknown group.
[d]IDU = injection drug use; MSM = men who have sex with men.
Data Source: enhanced HIV/AIDS Reporting System (eHARS) (data as of July 1, 2014).

Females of Child-Bearing Age and Perinatal HIV Infection

Perinatal transmission of HIV is generally preventable if mothers receive appropriate drugs during pregnancy and delivery. For this reason, special emphasis is placed on follow-up with HIV-infected pregnant women in North Carolina. Table 2.7 displays the proportion of newly diagnosed women who are of child-bearing age (15-44) and older. In the last five years, an average of 348 women of child-bearing age were diagnosed with HIV each year in North Carolina (approximately 60% of total female HIV cases). Note that the number and proportion of HIV diagnoses among North Carolina females has decreased in recent years. For females under 15 years of age (not included in Table 2.7), the total number of annual cases of perinatal HIV infection from 2009 to 2013 was fewer than five each year. Readers should keep in mind that delays in testing and diagnosis can significantly affect the assessment of the actual number of very young women with HIV.

Table 2.7. Adult/Adolescent Female Newly Diagnosed HIV Infections[a] During and After Child-Bearing Age, 2009-2013

Age at Diagnosis	2009		2010		2011		2012		2013	
	Total	%	Total	%	Total	%	Total	%	Total	%
15-44	261	62.6	213	59.5	199	58.5	193	63.3	184	57.0
45 and older	156	37.4	145	40.5	141	41.5	112	36.7	139	43.0
Total	417	100.0	358	100.0	340	100.0	305	100.0	323	100.0

[a]HIV infection includes all newly reported HIV infected individuals by the year of first diagnosis, regardless of the stage of infection (HIV or AIDS).
Data Source: enhanced HIV/AIDS Reporting System (eHARS) (data as of July 1, 2014).

In November 2007, North Carolina implemented new HIV testing statutes that require every pregnant woman be offered HIV testing by her attending physician both at her first prenatal visit and in the third trimester. If there is no HIV result test on record for the current pregnancy, the pregnant woman will be tested at labor and delivery and the infant will be tested as well.

Figure 2.12 displays the numbers of likely perinatal HIV transmissions that have occurred from 2004 to 2013 by year of birth. These numbers represent pediatric reports that indicate likely perinatal transmission based on exposure categories in HIV surveillance data. Confirming HIV in perinatal cases takes time, so case totals for recent years should be considered preliminary. Before the new testing statutes in 2007, the average annual number of perinatal cases was five (95% confidence interval: 4.3-5.7 births). After the implementation of the law, the average annual number of perinatal cases dropped to 1.6 (95% confidence interval: 0.8-2.4).

Figure 2.12. Likely Perinatal HIV Infection[a] Cases by Year of Birth, 2004-2013
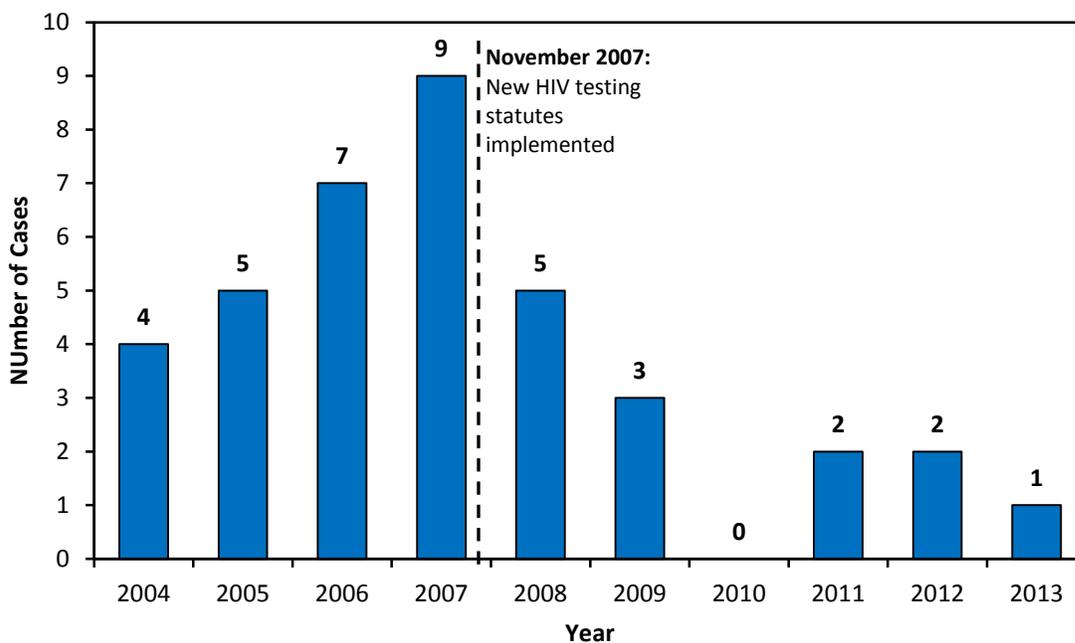
[a]HIV infection includes all newly reported HIV infections by year of first diagnosis.
Data Source: enhanced HIV/AIDS Reporting System (eHARS) (data as of July 1, 2014).

GEOGRAPHIC DISTRIBUTION OF HIV INFECTION IN NORTH CAROLINA

Geographic areas can be defined in many ways. In this profile, data are presented in three geographic categories for the convenience of readers: rural/urban areas, physiographic regions, and regional networks of care and prevention (RNCP). Cases are assigned to the county of residence at first diagnosis. People may move to other areas in the years after diagnosis. Assuming no significant difference between the numbers of HIV infection cases moving in and out of the original residence county, the statistics still indicate roughly the number and rate of living HIV infection cases in the corresponding counties. The distribution of HIV infection is uneven across North Carolina. This uneven distribution can

be partly explained by the population distribution, as the epidemic tends to be concentrated in urban areas.

Tables 1 through 6 of the *North Carolina 2013 HIV/STD Surveillance Report* give county totals of HIV infection, including AIDS diagnoses, cases living at the end of 2013, and a ranking of case rates (per 100,000 population) based on a three-year average.[11] Both Mecklenburg and Edgecombe Counties ranked highest with a newly diagnosed HIV infection three-year average rate of 31.0 per 100,000 population in 2013. They were followed by Cumberland County (26.0 per 100,000), Durham County (25.7 per 100,000), and Guilford County (23.5 per 100,000).[11] Readers are cautioned to view rates carefully, as rates based on small numbers (generally less than 20 cases) are considered unreliable. Persons diagnosed in long-term institutions, such as prisons, are removed from county totals for a better comparison of HIV impact among communities.

HIV Prevalence Cases in Urban/Rural Areas

More than half of the HIV-infected persons diagnosed in North Carolina were from six counties, Mecklenburg (18.5%), Wake (10.6%), Guilford (7.5%), Durham (5.6%), Forsyth (4.9%), and Cumberland (4.8%).[11] Among the HIV infection cases living at the end of 2013, 19.2 percent were diagnosed and reported from rural areas, 75.0 percent were from urban areas, and the remaining 5.8 percent of newly diagnosed HIV infection cases counties of residence were unknown or unassigned (Appendix D: Table D, pages D-8 through D-10). Prevalence rates for Asian/Pacific Islanders, Hispanic/Latinos, and White/Caucasians were higher in urban than in rural areas; American Indian/Alaska Natives and Black/African Americans experienced higher prevalence rates in rural areas (Table 2.8).

Table 2.8. HIV Infection[a] Prevalence as of 12/31/2013 by Rural/Urban Areas and Race/Ethnicity

Race/Ethnicity	Rural			Urban			North Carolina Total[b]		
	Total	%	Rate[c]	Total	%	Rate[c]	Total	%	Rate[c]
American Indian/Alaska Native[d]	129	2.4	156.3	63	0.3	179.6	206	0.7	175.2
Asian/Pacific Islander[d]	26	0.5	90.8	123	0.6	55.1	151	0.5	59.9
Black/African American[d]	3,515	65.0	610.1	13,587	64.5	867.5	18,377	65.4	857.8
Hispanic/Latino	330	6.1	165.9	1,346	6.4	206.5	1,756	6.2	206.4
White/Caucasian[d]	1,302	24.1	66.4	5,548	26.3	125.3	7,071	25.2	110.7
Unknown[e]	102	1.9	--	408	1.9	--	540	1.9	--
Total	**5,404**	**100.0**	**189.9**	**21,075**	**100.0**	**305.2**	**28,101**	**100.0**	**288.2**

[a]All persons living with HIV infection, regardless of stage of infection (HIV or AIDS).
[b]North Carolina totals include 1,622 HIV infection cases unassigned to an area.
[c]Rate is expressed per 100,000 population.
[d]Non-Hispanic/Latino.
[e]Rates are not available due to the lack of overall population data for the unkonwn race/ethnic group.
Data Source: enhanced HIV/AIDS Reporting System (eHARS) (data as of July 1, 2014).

Prevalent and Newly Diagnosed HIV Infection Cases by Physiographic Regions

The North Carolina state demographer and the geographic information systems lab at the State Center for Health Statistics have produced a Geographic Regional Classification scheme based on "physiographic" qualities. According to this scheme, North Carolina has three regions, the Western

region, the Piedmont region, and the Eastern region (Table 2.9 and 2.10). The Western region includes counties west of (and including) Surry, Wilkes, Caldwell, Burke, and Rutherford, and the Eastern region includes everything east of (and including) Northampton, Halifax, Nash, Johnston, Harnett, Cumberland, Hoke, and Scotland. The Piedmont region includes the counties in between the Western region and the Eastern region; the majority of the North Carolina population lives in the Piedmont region. More information on the overall population breakdown can be found in Chapter 1: Sociodemographic Characteristics of North Carolina for more information on overall population breakdown of the state (page 3).

Among the newly diagnosed HIV-infected persons living at the end of 2013, the majority of Black/African Americans (62.4%), Hispanic/Latinos (67.0%), and White/Caucasians (58.9%) were diagnosed and reported from Piedmont region, followed by the Eastern region (Table 2.9). The Western region had fewer HIV cases and rates for both prevalent cases and new diagnoses in 2013 (Table 2.9 and 2.10).

Table 2.9. HIV Infection[a] Prevalence as of 12/31/2013 by Physiographic Areas and Race/Ethnicity

Race/Ethnicity	Eastern		Piedmont		Western		North Carolina Total[b]	
	Total	Rate[c]	Total	Rate[c]	Total	Rate[c]	Total	Rate[c]
American Indian/Alaska Native[d]	143	174.6	35	148.1	14	115.9	206	175.2
Asian/Pacific Islander[d]	--[e]	--	--[e]	--	--[e]	--	151	59.9
Black/African American[d]	5,341	678.4	11,480	882.7	281	515.6	18,377	857.8
Hispanic/Latino	425	185.8	1,177	212.7	74	107.7	1,756	206.4
White/Caucasian[d]	1,495	90.4	4,542	122.9	813	78.1	7,701	110.7
Unknown[f]	--[e]	--	--[e]	--	--[e]	--	540	--
Total	**7,574**	**271.5**	**17,701**	**306.6**	**1,204**	**101.3**	**28,101**	**288.2**

[a]All persons living with HIV infection, regardless of stage of infection (HIV or AIDS).
[b]North Carolina totals include 1,622 HIV infection cases unassigned to an area.
[c]Rate is expressed per 100,000 population.
[d]Non-Hispanic/Latino.
[e]Cell counts, percentages, and rates have been suppressed to avoid identification of cells that have counts less than five through direct or indirect means.
[f]Rates are not available due to the lack of overall population data for the unknown race/ethnic group.
Data Source: enhanced HIV/AIDS Reporting System (eHARS) (data as of July 1, 2014).

The most prominent region for new HIV infection diagnoses was the Piedmont region (Table 2.10). For Black/African Americans, Hispanic/Latinos, and White/Caucasians, the majority of newly diagnosed HIV infections were diagnosed in the Piedmont region in 2013, followed by the Eastern region. Due to our data release policy regarding rates with small numbers, we cannot provide regional information on newly diagnosed HIV infections for American Indian/Alaska Natives and Asian/Pacific Islanders.

Table 2.10. Newly Diagnosed Adult/Adolescent HIV Infection[a] Cases by Physiographic Regions and Race/Ethnicity, 2013

Race/Ethnicity	Eastern		Piedmont		Western		North Carolina Total[b]	
	Total	Rate[c]	Total	Rate[c]	Total	Rate[c]	Total	Rate[c]
American Indian/Alaska Native[d]	--[e]	--	--[e]	--	--[e]	--	11	11.5
Asian/Pacific Islander[d]	--[e]	--	--[e]	--	--[e]	--	17	8.5
Black/African American[d]	277	43.3	644	61.2	14	31.4	968	55.8
Hispanic/Latino	29	18.2	79	20.5	7	14.7	126	21.3
White/Caucasian[d]	82	5.8	236	7.5	44	4.8	371	6.8
Unknown[f]	--[e]	--	--[e]	--	--[e]	--	20	--
Total	405	17.5	987	20.7	68	6.7	1,513	18.7

[a]All persons living with HIV infection, regardless of stage of infection (HIV or AIDS).

[b]North Carolina totals include 53 HIV infection cases unassigned to an area.

[c]Rate is expressed per 100,000 population.

[d]Non-Hispanic/Latino.

[e]Cell counts, percentages, and rates have been suppressed to avoid identification of cells that have counts less than five through direct or indirect means.

[f]Rates are not available due to the lack of overall population data for the unknown race/ethnic group.

Data Source: enhanced HIV/AIDS Reporting System (eHARS) (data as of July 1, 2014).

HIV Infections by Regional Networks of Care and Prevention (RNCP), including Charlotte Transitional Grant Area (TGA)

Ninety-five counties in North Carolina are divided into 10 RNCPs, with the remaining five counties making up the Charlotte Transitional Grant Area (TGA). These areas ensure that HIV care, support, and prevention services are available in an integrated fashion to all individuals who qualify for the Ryan White Part B program. For more information regarding the RNCP and Charlotte TGA, please refer to Chapter 4: HIV Infection Care and Treatment in North Carolina (pages 58 and 61).

A table displaying the newly diagnosed HIV infection by RNCP for the past five years can be found in Appendix D (Table R, page D-29). A table displaying the persons living with HIV infection (non-AIDS) and AIDS (Stage 3) by RNCP (including county numbers) is also included in Appendix D (Table S, page D-30). A list of the counties that comprise each RNCP and Charlotte TGA are located both in Chapter 4: HIV Infection Care and Treatment in North Carolina (page 58) and Appendix D: Table S through Table AD, (pages D-30 through D-43). The TGA, Region 6, and Region 4 had the highest number of persons living with HIV infection as of 12/31/2013 (Appendix D: Table S, pages D-30). The highest rate of newly diagnosed HIV infection in 2013 was found in the Charlotte TGA, followed by Region 6 and Region 5. Tables T through AD, in Appendix D, describe disease frequencies and rates in each region demographically, by gender, age, race/ethnicity, and hierarchical risk of exposure, for all persons living in the region as of 12/31/2013 (pages D-33 through D-43).

NEWLY DIAGNOSED HIV INFECTION CASES DIAGNOSED LATE IN NORTH CAROLINA

Persons who are diagnosed with AIDS (Stage 3) within six months of the initial HIV-positive screening (concurrent diagnosis) are generally referred to as "late testers." "Late testers" represent a significant proportion of new HIV diagnoses in North Carolina, indicating the need for increased HIV testing and

linkage to medical care. People who test late in the course of HIV infection may already have serious HIV-associated complications and are not able to benefit fully from antiretroviral therapy to remain healthy and to prevent opportunistic infections. Late testing also results in missed opportunities for preventing new HIV infections, as research has shown that knowledge of positive HIV status promotes adoption of safer sex practices and ART adherence.[12] The approximately 18.1 percent of people in the US who have HIV and do not know their status are estimated to account for 54.0 percent of new transmissions.[5,13]

Table 2.11 shows the proportion of individuals diagnosed as AIDS (Stage 3) when they were first diagnosed as HIV infected (late HIV diagnosis or concurrent AIDS [Stage 3]) in 2013. Overall, 29.0 percent of newly diagnosed individuals had a concurrent AIDS (Stage 3) or late HIV diagnosis in 2013, indicating that they had probably had HIV for at least five to seven years.[14] Hispanic/Latinos, both male and females had the highest proportion (35.7%) of "late testers", reflecting possible cultural and language barriers to testing and access to care (Table 2.11). The largest increase was seen among Black/African American females newly diagnosed with HIV infection in 2013 of whom 36.3 percent were "late testers"; this proportion has roughly doubled since 2012.

Table 2.11. Proportion of Newly Diagnosed HIV Infections Classified as AIDS (Stage 3)[a] within Six Months ("Late Testers"[b]), 2013[c]

Race/Ethnicity	Males	Females	Total
	%	%	%
Black/African American[d]	26.5	36.3	28.9
Hispanic/Latino	38.5	22.7	35.7
White/Caucasian[d]	27.6	25.5	27.3
Other[e]	35.5	11.1	26.5
Total	28.1	32.2	29.0

[a]AIDS classification is defined as those who were diagnosed with HIV infection during the year of diagnosis and were classified as HIV infection, Stage 3 that year or who have ever been diagnosed with HIV infection, Stage 3. Stage 3 classification is having a CD4+ T-lymphocyte count of less than 200 or a T-lymphocyte percentage of total lymphocytes of less than 14.

[b]Positive HIV infection and AIDS diagnosed within six months of testing; also referenced as late testers.

[c]2013 values (in italics) are likely to be artificially inflated due to incomplete interstate deduplication (see "Chapter 2: Special Notes" for more information, page 9).

[d]Non-Hispanic/Latino.

[e]Other includes American Indian/Alaska Native and Asian/Pacific Islander populations.

Data Source: enhanced HIV/AIDS Reporting System (eHARS) (data as of July 1, 2014).

As shown in Table 2.12, roughly 24.5 to 29.7 percent of individuals newly diagnosed with HIV infection each year represented an AIDS (Stage 3) case or "late tester" over the last ten years. The percent of late testers in 2013 is higher than observed for 2012. This increase could be due to our reporting guidelines changing mid-2013, requiring all CD4 cell counts and viral loads to be reported to the state. Before this time, laboratory reporting was incomplete. The significant proportions of late diagnoses indicate the need for methods to encourage people to get tested for HIV within North Carolina. These figures support the US Preventative Services Task Force recommendation to include voluntary HIV testing as part of routine medical examinations for all US residents, ages 13 to 64 years.[14,15]

Table 2.12. Proportion of Newly Diagnosed HIV Infections and Concurrent AIDS (Stage 3)[a], 2004–2013[b]

Year of Diagnosis	HIV Infection Classification	
	HIV (non-AIDS)	AIDS (Stage 3)[c]
	%	%
2004	70.3	29.7
2005	70.3	29.7
2006	71.1	28.9
2007	75.4	24.6
2008	73.7	26.3
2009	72.0	28.0
2010	74.1	25.9
2011	73.5	26.5
2012	75.5	24.5
2013[b]	*71.0*	*29.0*

[a]Positive HIV infection and AIDS (Stage 3) diagnosed within six months of testing; also referenced as "late testers".

[b]2013 values (in italics) are likely to be artificially inflated due to incomplete interstate deduplication (see "Chapter 2: Special Notes" for more information, page 9).

[c]AIDS (HIV infection Stage 3) classification is having a CD4+ T-lymphocyte count of less than 200 or a T-lymphocyte percentage of total lymphocytes of less than 14. AIDS (Stage 3) classification is defined as those who were diagnosed with HIV infection during the year of diagnosis and were classified as AIDS (Stage 3) that year or who have ever been diagnosed with AIDS (Stage 3).
Data Source: enhanced HIV/AIDS Reporting System (eHARS) (data as of July 1, 2014).

Table 2.13 displays the gender and race specific proportions of all "late testers" (concurrent AIDS [Stage 3] cases) diagnosed from 2004 to 2013. Over the last ten years, around three-fourths of all "late testers" were males. Of those males, the majority were Black/African Americans followed by White/Caucasians and Hispanic/Latinos, which reflects the overall distribution of cases in North Carolina. While the remaining one-fourth of "late testers" were female, a similar pattern is seen among females, with the majority of "late testers" being in the Black/African American race/ethnic demographic group. This pattern also represents the general distribution of newly diagnosed HIV infections in the state.

Table 2.13. Late HIV Diagnoses[a] by Gender and Race/Ethnicity, 2004–2013[b]

Gender	Race/Ethinicity	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013[b]
		%[c]	%[c]	%[c]	%[c]	%[c]	%[c]	%[c]	%[c]	%[c]	%[c]
Male	Black/African American[d]	46.0	42.8	41.0	40.4	39.5	46.6	42.7	42.5	47.9	44.3
	Hispanic/Latino and Other[e]	6.0	8.9	14.4	11.1	13.2	11.3	12.9	11.6	12.1	11.5
	White/Caucasian[d]	21.8	22.2	21.3	22.2	23.6	20.0	23.0	21.0	18.5	19.9
	Subtotal[c]	73.9	73.8	76.8	73.8	76.2	77.9	78.6	75.2	78.5	75.8
Female	Black/African American[d]	21.4	19.8	16.7	18.7	19.2	17.1	17.4	20.0	15.5	19.5
	Hispanic/Latino and Other[e]	1.5	1.9	3.6	2.2	1.5	1.5	1.6	2.8	1.2	1.6
	White/Caucasian[d]	3.2	4.4	2.9	5.3	3.1	3.5	2.4	2.0	4.8	3.2
	Subtotal[c]	26.1	26.2	23.2	26.2	23.8	22.1	21.4	24.8	21.5	24.2
Total	Black/African American[d]	67.4	62.7	57.7	59.1	58.7	63.8	60.2	62.5	63.3	63.8
	Hispanic/Latino and Other[e]	7.6	10.8	18.0	13.3	14.6	12.8	14.5	14.4	13.3	13.1
	White/Caucasian[d]	25.1	26.6	24.3	27.6	26.7	23.4	25.3	24.3	23.3	23.1
	Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

[a]Positive HIV infection and AIDS (HIV infection Stage 3) diagnosed within six months of testing; also referenced as late testers.

[b]2013 values (in italics) are likely to be artificially inflated due to incomplete interstate deduplication (see "Chapter 2: Special Notes" for more information, page 9).

[c]Percentages are calculated out of the overall total for the year (column percent).

[d]Non-Hispanic/Latino.

[e]Other includes American Indian/Alaska Native and Asian/Pacific Islander.

Data Source: enhanced HIV/AIDS Reporting System (eHARS) (data as of July 1, 2014).

In general, significant proportions of late HIV diagnoses indicate a need for increased HIV testing in North Carolina. The North Carolina Division of Public Health is actively pursuing new policies and guidelines aimed at making HIV testing part of routine medical care settings. We continue to work with HIV-infected persons and their partners to reduce transmission. Rapid HIV tests have also created new opportunities to expand HIV testing into nontraditional and high prevalence settings (e.g., emergency departments, correctional facilities, community settings and mobile testing sites). In addition, specific initiatives such as the statewide *Get Real. Get Tested. Get Treatment.* campaign have been designed to encourage North Carolinians to get educated about, and tested for, HIV. As a result of the implementation of the CDC HIV testing recommendations, statewide testing initiatives like the *Get Real. Get Tested. Get Treatment.* campaign and expanded HIV testing in nontraditional settings, HIV testing has been increasing steadily. More information on HIV testing, please refer to Chapter 3: HIV Testing (page 43), and more information on outreach and prevention programs can be found in Chapter 7: Integrated Program Activities (page 105).

AIDS (STAGE 3) PREVALENCE IN NORTH CAROLINA

In 2012, North Carolina was ranked 15th in the nation, including the District of Columbia and US dependent areas, for the estimated number of persons living with an AIDS (Stage 3) diagnosis.[5] Table 2.14 shows HIV infection prevalence in North Carolina by HIV infection classification, demographic characteristics, and hierarchical risk of exposure categories. AIDS (Stage 3) cases were notably higher, proportionately, than HIV infection (non-AIDS) cases for males, persons aged 45 or older, Black/African American and Hispanic/Latino populations, and heterosexual and IDU hierarchical risk exposure categories (Table 2.14).

Table 2.14. North Carolina Persons Living with HIV Infection by HIV Infection Classification[a] as of 12/31/2013

Demographics	HIV Infection Classification[a]				Total	
	HIV (non-AIDS)		AIDS (Stage 3)			
	Cases	%	Cases	%	Cases	%
Gender						
Male	11,348	69.7	8,614	72.8	19,962	71.0
Female	4,924	30.3	3,215	27.2	8,139	29.0
Current Age						
Less than 13	72	0.4	5	0.0	77	0.3
13-24	1,108	6.8	213	1.8	1,321	4.7
25-44	6,899	42.4	4,034	34.1	10,933	38.9
45-64	7,484	46.0	6,944	58.7	14,428	51.3
65 and older	695	4.3	633	5.4	1,328	4.7
Unknown	14	0.1	0	--	14	0.0
Race/Ethnicity						
American Indian/Alaska Native[b]	119	0.7	87	0.7	206	0.7
Asian/Pacific Islander[b]	109	0.7	42	0.4	151	0.5
Black/African American[b]	10,568	64.9	7,809	66.0	18,377	65.4
Hispanic/Latino	956	5.9	800	6.8	1,756	6.2
White/Caucasian[b]	4,201	25.8	2,870	24.3	7,071	25.2
Unknown	319	2.0	221	1.9	540	1.9
Exposure Category						
Heterosexual-high risk[c]	2,313	14.2	2,054	17.4	4,367	15.5
IDU[d]	937	5.8	1,069	9.0	2,006	7.1
MSM[d]	6,210	38.2	3,982	33.7	10,192	36.3
MSM/IDU[d]	318	2.0	283	2.4	601	2.1
Unknown[e]	6,246	38.4	4,311	36.4	10,557	37.6
Other Risks[f]	248	1.5	130	1.1	378	1.3
Total	16,272	100.0	11,829	100.0	28,101	100.0

[a]All persons living with HIV infection, separated by HIV (non-AIDS) and AIDS (HIV infection Stage 3). AIDS classification is defined ever diagnosed with having a CD4+ T-lymphocyte count of less than 200 or a T-lymphocyte percentage of total lymphocytes of less than 14.

[b]Non-Hispanic/Latino.

[c]Heterosexual-high risk is defined as a person who does not report IDU or MSM, but does report sexual contact with a partner of opposite sex, who is IDU, MSM, or known HIV-positive status. Also, if a person is a victim of sexual assault, exchanges sex for drugs/money, has had a recent STD or has sexual contact while using drugs, they are classified as high risk. More information can be found in Appendix C: Technical Notes (page C-4).

[d]IDU = injection drug use; MSM = men who have sex with men.

[e]Unknown risk includes individuals classified as no identified risk (NIR) and no reported risk (NRR).

[f]Other risks include blood products (adult hemophilia) and pediatric risk.

Data Source: enhanced HIV/AIDS Reporting System (eHARS) (data as of July 1, 2014).

SURVIVAL AND HIV-RELATED DEATHS IN NORTH CAROLINA

Advances in treatment of HIV with ARTs have been associated with a major increase in life expectancy for people diagnosed with HIV infection. Between 1996 and 2005, average life expectancy after HIV diagnosis increased from 10.5 to 22.5 years.[16] Individuals diagnosed with AIDS (Stage 3) have also experienced increases in life expectancy; among individuals diagnosed with AIDS within six months of their initial HIV diagnosis, the average survival time nearly quadrupled from 1996 to 2005 (5.5 years in 1996 to 19.4 years in 2005).[15] Death among patients diagnosed with AIDS (Stage 3) mostly occurs from opportunistic infections or malignancies associated with the progressive failure of the immune system.[17]

In North Carolina, survival (the estimated proportion of persons surviving a given length of time after diagnosis) was highest for those diagnosed with HIV infection in 2009 (determined by those living

greater than 36 months after diagnosis), although year-to-year differences were small (Table 2.15). Survival was longest for persons aged under 13 and ages 13 to 24 and shortest for those in the unknown age group and aged 65 and older. The 25 to 44 age group experienced the largest number of HIV-related deaths (roughly 244 individuals). Survival was lowest among American Indian/Alaska Natives. Among males, survival was greater among persons with MSM exposure and lowest among IDU exposure. For females, survival was greatest among those persons exposed through heterosexual contact and lowest through IDU exposure (Table 2.15). Vital status may not be determined or reported for all cases; however, the reporting of deaths for persons reported as having AIDS (Stage 3) is estimated to be more than 90.0 percent complete.

Table 2.15. Survival for More Than 12, 24, and 36 Months after Initial HIV Diagnosis, 2005–2009

Demographics	Number of Persons	Percent Survived			
		<=12 months	>12 months	>24 months	>36 months
Year of HIV Diagnosis					
2005	1,594	93.5	92.0	90.5	90.5
2006	1,652	95.0	93.5	92.2	92.2
2007	1,827	96.3	94.7	93.3	93.3
2008	1,819	95.1	93.8	92.4	92.4
2009	1,646	95.9	94.9	93.9	93.9
Age at Diagnosis (Year)					
Less than 13	--[a]	100.0	100.0	100.0	100.0
13-24	1,467	99.2	99.0	98.9	98.9
25-44	4,449	96.5	95.5	94.5	94.5
45-64	2,431	91.5	88.9	86.7	86.7
65 and older	143	75.5	69.9	61.5	61.5
Unknown	--[a]	0.0	0.0	0.0	0.0
Race/Ethnicity					
American Indian/Alaska Native[b]	58	87.9	87.9	87.9	87.9
Asian/Pacific Islander[b]	52	98.1	92.3	92.3	92.3
Black/African American[b]	5,403	94.8	93.2	91.8	91.8
Hispanic/Latino	718	96.0	95.3	94.6	94.6
White/Caucasian[b]	2,158	96.1	94.9	93.6	93.6
Unknown	149	96.0	95.3	94.6	94.6
Male Hierarchical Risk of Exposure					
Heterosexual-high risk[c]	471	94.3	92.4	89.6	89.6
IDU[d]	169	91.7	89.9	85.8	85.8
MSM[d]	3,343	97.9	97.2	96.5	96.5
MSM/IDU[d]	89	96.6	96.6	94.4	94.4
Unknown[e]	2,122	91.1	89.3	89.5	87.8
Other Risks[f]	28	100.0	100.0	100.0	100.0
Female Hierarchical Risk of Exposure					
Heterosexual-high risk[c]	642	96.7	95.5	94.2	94.2
IDU[d]	108	95.4	91.7	88.0	87.9
Unknown[e]	1,539	94.7	92.7	91.2	91.2
Other Risks[f]	27	100.0	100.0	100.0	100.0
Total	8,538	95.2	93.8	92.5	92.5

[a]Cell counts, percentages, and rates have been suppressed to avoid identification of cells that have counts less than five through direct or indirect means.

[b]Non-Hispanic/Latino.

[c]Heterosexual-high risk is defined as a person who does not report IDU or MSM, but does report sexual contact with a partner of opposite sex, who is IDU, MSM, or known HIV-positive status. Also, if a person is a victim of sexual assault, exchanges sex for drugs/money, has had a recent STD or has sexual contact while using drugs, they are classified as high risk. More information can be found in Appendix C: Technical Notes (page C-4).

[d]IDU = injection drug use; MSM = men who have sex with men.

[e]Unknown risk includes individuals classified as no identified risk (NIR) and no reported risk (NRR).

[f]Other risks include blood products (adult hemophilia) and pediatric risk.

Data Source: enhanced HIV/AIDS Reporting System (eHARS) (data as of July 1, 2014).

The North Carolina State Center for Health Statistics reported 266 HIV-related deaths in 2013 (2.7 per 100,000 population), making it the 23rd leading cause of death in North Carolina for 2013.[18] The latest national vital statistics report for deaths, from 2010, ranks HIV-related deaths as the 15th leading cause of death in the US.[19] According to the North Carolina State Center for Health Statistics, the crude HIV-related death rate for males (4.1 per 100,000 population) is almost 3 times that for females (1.4 per 100,000 population). With regards to race/ethnicity, Black/African American males had the highest crude death rate for 2013 at 14.2 per 100,000 population, nearly 9 times that for White/Caucasian males (1.6 per 100,000 population). Black/African American females had the second highest crude death rate for 2013, 9 times the rate for White/Caucasian females (Table 2.16).

Table 2.16. North Carolina HIV-Related Deaths[a] by Race/Ethnicity and Gender, 2013

Race / Ethnicity	Males			Females			Total		
	Cases	%	Rate[b]	Cases	%	Rate[b]	Cases	%	Rate[b]
Black/African American[c]	144	74.6	14.2	52	76.5	4.5	196	75.1	9.1
Hispanic/Latino	--[d]	--	--	--[d]	--	--	--[d]	--	--
White/Caucasian[c]	49	25.4	1.6	16	23.5	0.5	65	24.9	1.0
Other[e]	--[d]	--	--	--[d]	--	--	--[d]	--	--
Total	193	100.0	4.1	68	100.0	1.4	261	100.0	2.7

[a]HIV-related deaths include cases that were classified as AIDS (Stage 3).

[b]Rate is expressed per 100,000 population.

[c]Non-Hispanic/Latino.

[d]Cell counts, percentages, and rates have been suppressed to avoid identification of cells that would have counts less than five through direct or indirect means.

[e]Other includes American Indians/Alaska Natives and Asian/Pacific Islanders.

Data Source: North Carolina State Center for Health Statistics (generated October 13, 2014).

In 2013, HIV-related deaths ranked 11th among 25 to 44 year olds, accounting for 24.6 percent of all HIV-related deaths in North Carolina. For individuals in the 45 to 64 age group, HIV-related deaths ranked 15th for overall leading cause of death in North Carolina, accounting for 63.9 percent of all HIV-related deaths for 2013.[18]

MEDICAL MONITORING PROJECT (MMP)

Introduction/Background

The Medical Monitoring Project (MMP) is an ongoing locally and nationally representative supplemental surveillance system, supported by the CDC. MMP collects data on a probability sample of HIV-diagnosed adults who are in care in the US. MMP also monitors sociodemographic variables, behavioral and clinical characteristics, supportive service needs, use of healthcare and prevention services, and adherence to clinical care guidelines among HIV-diagnosed persons. The project describes "met and unmet needs" for HIV care and prevention services, through patients indicating during interviews what services they utilize, as well as medical record abstractions.

Locally, North Carolina MMP functions as a secondary evaluation tool to ensure that physicians, medical facilities, and applicable laboratories continue to report HIV-positive cases and HIV-related lab results. North Carolina MMP ensures that the randomly selected patients are documented in our HIV surveillance systems. MMP data are a valuable addition to eHARS, providing information on those in

care on factors such as health insurance, education, and housing status that are not captured in standard surveillance data.

Methods

MMP uses a three-stage sampling design resulting in annual cross-sectional probability samples of adults in the US who are receiving outpatient care for HIV infection. In the first stage, North Carolina was randomly selected as one of 23 participating sites across the US, including Puerto Rico. In the second stage, randomly selected health care facilities were selected across North Carolina that provide on-going medical care to HIV-positive adults. Finally, in the third stage, all MMP eligible patients seen during the first four months of the year at participating randomly selected facilities are randomized to produce the North Carolina patient sample (N= 400). This sample is designed to represent all HIV-positive patients in care over the age of 18 who live in North Carolina.

At each of the three sampling stages, data used to generate North Carolina estimates are weighted for the probability of selection based on known variables. These data are also weighted to adjust for nonresponse using predictors of patient level response, including facility size, race/ethnicity, time since HIV diagnosis, and age group. More information on the methodology of MMP can be found in Appendix B: Data Sources (page B-4).

Results

Of the 22 facilities randomly selected to participate in North Carolina MMP during the 2011 to 2012 data collection cycle, two were ineligible (the facility no longer provides HIV care or does see HIV-infected individuals, but not specifically for HIV care) and 12 participated, yielding a 60.0 percent (N= 20) facility participation rate. Of the 400 patients randomly selected to participate, 11 were ineligible (not an actual HIV case or not seen at the facility during the timeframe in question) and 173 patients completed a patient interview and medical record abstraction, yielding a 44.5 percent (N=389) patient participation rate. Data collected from the 173 North Carolina MMP respondents is a representative sample of all adults (aged 18 and older) living with HIV infection who received HIV-related medical care in North Carolina during January 1, 2011 to April 30, 2011 (Table 2.17).

Table 2.17. Proportion of All Persons Living with HIV Infection[a] as of 12/31/2011 and Weighted North Carolina Medical Monitoring Project (MMP) data

Demographic	Persons Living with HIV Infection as of 12/31/2011	North Carolina Medical Monitoring Project 2011
	%	weighted %
Gender		
Male	70.3	62.3
Female	29.7	36.0
Transgender	--	1.2
Unknown/Missing	--	0.5
Sexual orientation[b]		
Heterosexual or straight[c]	37.4	64.6
Homosexual, gay, or Lesbian	50.4	24.6
Bisexual	--	8.2
Other/Unclassified[d]	12.2	2.6
Race/Ethnicity		
American Indian/Alaska Native[e]	0.7	1.8
Asian/Pacific Islander[e]	0.5	0.5
Black/African American[e]	65.5	65.9
Hispanic/Latino	6.1	2.9
White/Caucasian[e]	25.3	25.8
Multi-racial	--	3.2
Missing	1.9	--
Age at Time of Interview (Years)		
18-24	2.5	1.9
25-34	13.9	15.8
35-44	22.8	21.3
45-54	35	36.0
55 and older	25.4	25.0
Education[f]		
Less than High School		21.8
High School diploma or GED[g] credential	N/A	37.9
More than High School diploma or GED[g]		40.3
Time since HIV Diagnosis[f]		
Less than 10 years		37.1
10 or more years	N/A	46.2
Unknown/Missing		16.7

[a]All persons living with HIV infection, regardless of the stage of infection (HIV or AIDS).

[b]Sexual orientation is based on the redistributed hierarchical risk of exposure categories . For more information, see Appendix C: Technical Notes (page C-4) for surveillance data (persons living with HIV infection); based on interviews for Medical Monitoring Project (MMP) data.

[c]Heterosexual or straight variable from include those classified as presumed heterosexual.

[d]Other/Unspecified category for the suveillance data (persons living with HIV infection) includes individuals classified as injection drug use (IDU), blood product, and pediatric exposure, as sexual orientation cannot be determined from the surveillance data.

[e]Non-Hispanic/Latino.

[f]Data for "Education" and "Time since HIV Diagnosis" variables are not available in the surveillance data.

[g]GED = General Education Development

Data Sources: Persons living-enhanced HIV/AIDS Reporting System (eHARS) (data as of July 1, 2014), MMP- weighted interview data (data from June 24, 2014).

Medical Monitoring Project (MMP) Limitations

North Carolina surveillance data from eHARS (persons living with HIV infection) are based on the number of HIV infected individuals currently alive, including those in care and out-of-care. North Carolina MMP data presented are based solely on persons living with HIV infection in North Carolina and who are in care. Finally, North Carolina surveillance data includes pediatric and adult cases, whereas North Carolina MMP data represents only persons over the age of 18. Please note that North Carolina MMP data may include some bias based on respondent participation.

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CHAPTER 3: HIV TESTING IN NORTH CAROLINA

BACKGROUND

The information in this chapter focuses on state-supported HIV testing programs. In North Carolina, human immunodeficiency virus (HIV) testing is offered at no charge to clients in all local health departments and in a number of community-based organizations (CBO). In addition, the North Carolina Department of Health and Human Services (North Carolina DHHS) provides resources and technical support to community health centers, emergency departments, health departments, and state prisons to expand HIV testing in clinical and jail settings.

History of State-Sponsored HIV Testing in North Carolina

The North Carolina State Laboratory of Public Health (North Carolina SLPH) has been processing blood samples for HIV testing since 1987. When the state-sponsored program began, testing was available anonymously at all 85 local health departments. In September 1991, North Carolina began to evaluate the use of confidential (i.e., client's name obtained), rather than anonymous HIV testing. All 85 sites offered confidential tests, and 18 of these sites continued to offer anonymous testing as an option. Effective in May 1997, anonymous testing in North Carolina was eliminated through a ruling made by the North Carolina Commission of Health Services.

The North Carolina Commission for Health Services' ruling raised some concern that, by removing the anonymous test option, testing among people with high risk for HIV infection would be reduced. Prior to the rule change, North Carolina implemented procedures to increase access to HIV testing by making testing available in nontraditional testing sites. Some nontraditional testing sites are operated by CBOs or local health departments and offer HIV testing in venues outside of traditional health department clinics. Other sites are physically located in a local health department but operate outside the normal working hours.

Changes in policy, HIV testing technology, and funding have enabled North Carolina to expand the number of people tested for HIV over time. In 2006, the Centers for Disease Control and Prevention (CDC) published revised HIV testing guidelines that encouraged HIV testing for adults as part of their routine healthcare.[1] Screening for HIV infection was recommended to be performed routinely for all patients aged 13 to 64 years and to be included in the routine panel of prenatal screening tests for all pregnant women. The CDC further recommended that separate written consent for HIV testing should not be required (general consent for medical care is considered sufficient to encompass consent for HIV testing). These recommendations also stated that prevention counseling should not be required with HIV diagnostic testing or as part of screening programs in clinical settings. In response to these new guidelines, North Carolina changed the state administrative code on November 1, 2007. This rule change stated that for tests done in clinical settings, a written HIV consent form and pre-test counseling were no longer required, thereby removing some of the barriers to routine HIV testing (10A NCAC 41A.0202(10); 10A NCAC 41A.0202(16)).[2] Additionally, pregnant women are offered HIV tests at the first prenatal visit and in the third trimester (10A NCAC 41A.0202(14)).[2] In total, these policy changes have resulted in increased testing in prenatal/obstetric (OB) clinics, sexually transmitted disease (STD) clinics,

and jails/prisons in North Carolina. They also facilitated the establishment of new testing programs in emergency departments and community health centers.

Rapid testing technology has helped to make HIV testing easier, more accessible and less invasive than conventional HIV testing. North Carolina initiated a rapid testing program in 2004 that has provided new opportunities for improving access to testing in both clinical and outreach settings. The North Carolina DHHS distributes rapid HIV test kits to CBOs, community health centers, and other agencies. The project started with just a handful of sites participating, but by 2013 had grown to 34 agencies performing over 20,000 tests. Rapid HIV testing technology was first approved by the United States (US) Food and Drug Administration (FDA) in 2002. Rapid tests with a Clinical Laboratory Improvement Amendment (CLIA) waiver can be processed outside of a clinical setting, which allows HIV testing to be done more easily in outreach settings. Clients undergoing rapid HIV testing can receive their preliminary HIV test result the same day they were tested, therefore making the test useful in settings where clients tend not to return for conventional HIV test results.

North Carolina receives funding from both state and federal sources to pay for a variety of programs, including HIV testing. Most of this funding comes from the CDC, but the federal Substance Abuse and Mental Health Services Administration (SAMHSA) has also supplied funding for testing in substance abuse centers. North Carolina uses this funding to support health departments and CBOs that test the public for HIV. Increases in this funding have allowed for the expansion of HIV testing efforts. An example of this expansion is the North Carolina Integrated Targeted Testing Services (ITTS), which receives federal funding through the CDC. The program (formerly known as nontraditional testing sites) started out small and became more formalized in 1999. Funding has increased steadily since then. In 1999, the project did about 3,000 tests at a handful of sites. In 2013, ITTS had grown to incorporate 22 sites and conducted over 24,000 tests.

The CDC launched the Syphilis Elimination Effort to combat syphilis in the US in 1999. In 1998, syphilis disease rates were at an all-time low, but the distribution of cases in the US was highly variable geographically. Funding was awarded to enhance syphilis prevention efforts in 28 counties in the US in 1999. Five of these 28 counties were in North Carolina, with a sixth added later (Durham, Forsyth, Guildford, Mecklenburg, Robeson, and Wake counties). The project performed syphilis screening in a variety of settings and policies were instituted to test those same subjects for HIV whenever possible. This effort led to increased HIV testing in those areas.

Funding for the Syphilis Elimination Effort was dramatically reduced in 2007, but many of the programs remained in place with the addition of new expanded HIV testing funding from the CDC. The Expanded HIV Testing project specifically funded testing in clinical settings such as STD clinics, community health centers, hospital emergency departments, and jails/prisons. Some testing in these settings was already underway but many new sites were added as a direct result of this funding.

Testing programs supported by the North Carolina DHHS have integrated HIV/STD prevention efforts. For 2013, the North Carolina DHHS funded 16 CBOs and 13 county health departments to conduct testing in a variety of outreach settings. In addition to community outreach, these agencies conduct testing in 26 county jails and 82 substance abuse centers. In addition to providing HIV testing, many of these agencies also test for syphilis, gonorrhea, chlamydia, and hepatitis C (HCV).

HIV TESTING PROTOCOL AT THE NORTH CAROLINA STATE LABORATORY OF PUBLIC HEALTH STARTING IN NOVEMBER 2013

The North Carolina SLPH conducts HIV screening assays as a service for public health agencies and for designated counseling and testing sites. Beginning November 1, 2013, the North Carolina SLPH adopted a new HIV testing algorithm that incorporates a 4th generation HIV test. Two HIV serologic assays are utilized as part of this algorithm. Initial screening for HIV-1 p24 antigen and antibodies to HIV-1 and HIV-2 is performed using an immunoassay (IA). All repeatedly reactive IA tests (two or more reactive) are tested by a HIV-1/HIV-2 type differentiation assay. Patients who test HIV-1 positive on the type differentiation assay should be considered HIV infected. If the test result indicates HIV-2 reactivity, the sample is sent to the CDC for HIV-2 confirmation.

Patients who test negative for HIV p24 antigen and HIV-1/HIV-2 antibodies by the IA screening assay are considered to be negative for both acute and established HIV infection. Samples that test repeatedly reactive on the screening assay but test as either nonreactive, HIV-positive (undifferentiated), HIV-1 indeterminate, or invalid by type differentiation assay are further tested for HIV-1 ribonucleic acid (RNA) by nucleic acid amplification test (NAAT) to detect possible acute infection.

HIV TESTING PROTOCOL PRIOR TO OCTOBER 2013

Prior to October 31, 2013, the North Carolina SLPH used three serologic assays for the detection of HIV antibodies. An enzyme immunoassay (EIA) was used as a screening test for HIV antibodies. All repeatedly reactive EIA tests (two or more reactive) were confirmed by the HIV-1 western blot assay. Samples that repeatedly tested reactive on the EIA screening assay but failed to test as reactive by HIV-1 western blot (either indeterminate or nonreactive) were further tested for HIV-1 RNA. Samples negative for HIV-1 RNA were then tested by a third serologic assay to differentiate HIV-1 and HIV-2. All HIV specimens that tested non-reactive for HIV antibodies by the EIA screening assay were also tested for HIV-1 RNA using molecular methodology in order to detect acute HIV infections.

HIV TESTING AT THE NORTH CAROLINA STATE LABORATORY OF PUBLIC HEALTH RESULTS FROM 1991 TO 2013

A full-fledged HIV testing program was in place at the North Carolina SLPH by May of 1991. A total of 32,747 tests were done that year, primarily in HIV counseling and testing sites (CTS) and STD clinics (Figure 3.1). New positivity rates were high at that time (2.0% overall) because testing was highly targeted to those at high risk for HIV. The volume of HIV testing increased steadily over the next five years and the proportion of tests from family planning and prenatal/OB clinics increased as well. As more low risk women were added to the testing pool, the positivity rates declined. HIV testing levels remained relatively stable from 1996 to 2003 and then began to increase from 2004 to 2009 due to changes in testing guidelines and due to increased funding that supported projects, such as the Syphilis Elimination Effort, nontraditional testing sites, and expanded HIV testing sites. HIV testing capacity at the North Carolina SLPH was reached in 2009. With the new testing algorithm starting in November 2013, the overall testing capacity has increased by around 50,000 tests, despite the overall decline, since 2011, in total tests conducted. In 2013, 210,411 HIV tests were performed at the North Carolina SLPH (Figure 3.1).

HIV positivity rates have been higher for males than females for the entire testing period (Figure 3.1). While the rate among females tested has declined modestly over the time period, among men the decline has been rather dramatic because the testing in the early years was much more targeted than today. The ratio of females to males among the tested population has increased over time from 1.4 in 1991 to 2.1 in 2013 (data not shown). The overall HIV positive rate more closely follows the trend of the female rates because women constitute a higher proportion of the tested population (Figure 3.1).

Figure 3.1. Conventional HIV Tests Performed and Overall HIV Positivity Rates, North Carolina State Laboratory of Public Health, 1991-2013
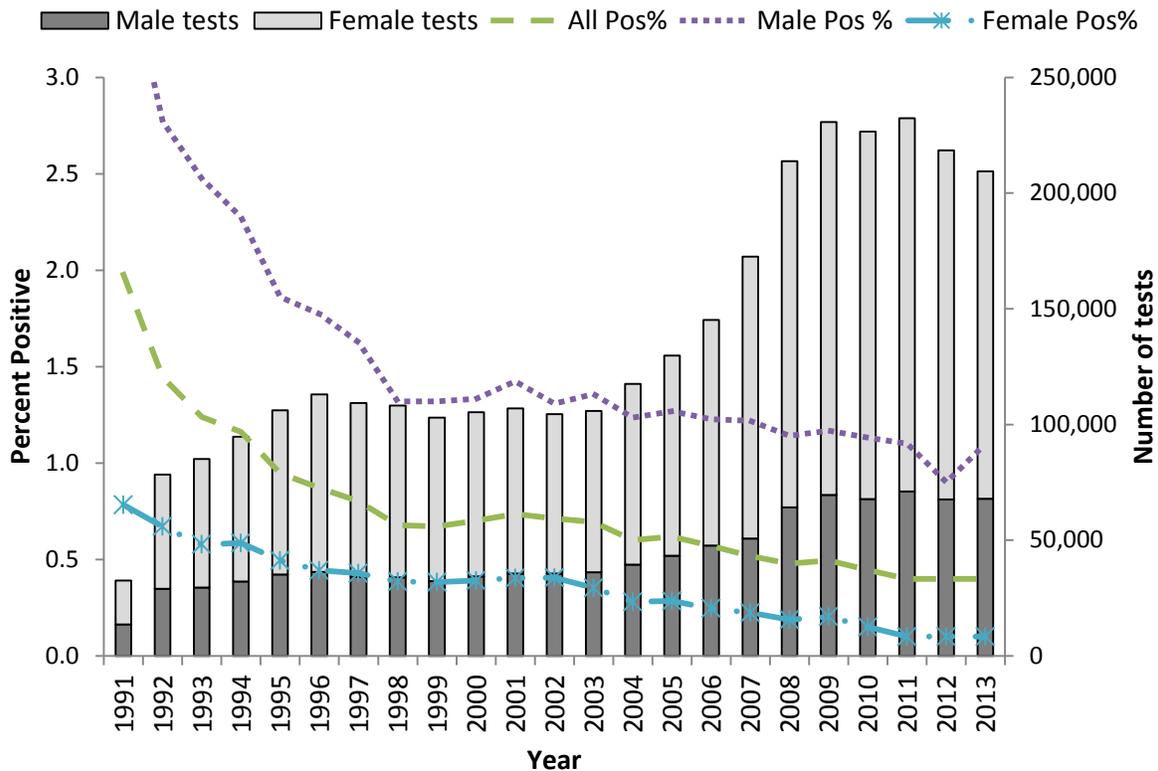
Data Source: North Carolina State Laboratory for Public Health data (data as of January 29, 2014).

STATE-SUPPORTED HIV TESTING OUTCOMES 2013

In 2013, a total of 228,938 HIV tests were performed through state-sponsored programs. Of these, 1,032 tests were confirmed positive (0.4%). These numbers include HIV tests submitted to the North Carolina SLPH, rapid HIV tests conducted by health departments and CBOs, and tests conducted through the expanded testing program in emergency departments and community health centers. Some duplication of the number of persons tested is inevitable because an individual may be tested multiple times throughout the year, and therefore counted more than one time.

Of the 1,032 positive tests, 431 were newly identified cases of HIV (not previously reported to the North Carolina HIV surveillance program). During this same time period, there were 1,525 new HIV cases reported to the North Carolina DHHS (please note that this number is likely to be artificially inflated due to incomplete interstate deduplication in 2013; refer to Chapter 2: Scope of HIV Infection Epidemic in North Carolina, Special Notes for more information, page 9). In other words, 28.3 percent of all new cases reported to surveillance in 2013 were identified through state-sponsored testing programs.

Gender

Of the persons tested for HIV in 2013, 150,431 (65.7%) were female, 76,940 (33.6%) were male, and 83 were transgender (0.04%). The remaining 1,484 (0.6%) had no information on gender. The positivity rate of new HIV cases was higher for males compared to females (1.0% versus 0.2%). Since a majority of the women were tested in family planning clinics (24.6%) and prenatal/OB clinics (18.9%) as part of their routine or prenatal healthcare, they represented a lower risk group than the men who were tested. Most of the men were tested in an STD clinic (46.4%) or in jail/prison (18.1%) and represented a population at higher risk for HIV (Table 3.1).

Test Setting

Over two-thirds of the state-sponsored HIV tests in 2013 were performed in local health department clinics (37.9% in STD clinics, 16.2% in family planning clinics, 12.4% in prenatal/OB clinics, and 0.9% in tuberculosis [TB] clinics). Another 7.4 percent of tests were conducted in jail/prison settings, 10.7 percent during community outreach activities, 3.6 percent in community health centers, 3.1 percent in drug treatment facilities, and 2.3 percent in HIV CTS. The remaining HIV testing occurred at other settings (1.4%) or was missing site type information (4.0%) (Table 3.1).

The highest positivity rate of new HIV cases (5.6%) was observed among the tests conducted through disease intervention specialist (DIS) field visits. These tests were done by state or county DIS as part of partner notification, counseling, and referral services. For more information on partner notification, counseling, and referral services can be found in Chapter 7: Integrated Program Activities (pages 108 and 109). This high positivity rate is expected because DIS test partners and other contacts. HIV positivity rates were also elevated for those tested in HIV CTS (0.9% positivity). Most of the new cases identified were tested in STD clinics (232 new positives), in outreach testing (57 new positives), in HIV CTS (45 new positives), and in jails/prisons (37 new positives) (Table 3.1).

Table 3.1 North Carolina HIV Testing Positivity Rates by Setting and Gender, 2013

Setting	Male					Female					Total[a]				
	Tested	Positive	New Positive	% Positive	% Newly Positive	Tested	Positive	New Positive	% Positive	% Newly Positive	Tested	Positive	New Positive	% Positive	% Newly Positive
HIV CTS[b]	2,958	86	39	2.9	1.3	2,174	27	5	1.2	0.2	5,190	115	45	2.2	0.9
STD[b] clinic	35,673	359	189	1.0	0.5	50,761	85	41	0.2	0.1	86,902	450	232	0.5	0.3
Drug treatment	4,200	17	4	0.4	0.1	2,847	13	0	0.5	0.0	7,098	31	4	0.4	0.1
Family planning	162	0	0	0.0	0.0	37,005	9	7	0.0	0.0	37,199	9	7	0.0	0.0
Prenatal/OB[b]	28	0	0	0.0	0.0	28,398	7	2	0.0	0.0	28,446	7	2	0.0	0.0
TB[b] Clinic	1,057	4	3	0.4	0.3	1,024	4	4	0.4	0.4	2,090	8	7	0.4	0.3
CHC/PHC[b]	3,072	16	5	0.5	0.2	5,011	4	3	0.1	0.1	8,128	20	8	0.2	0.1
Jail/Prison	13,929	87	25	0.6	0.2	2,791	22	12	0.8	0.4	16,905	114	37	0.7	0.2
Hospital	1,051	38	6	3.6	0.6	992	14	0	1.4	0.0	2,422	53	6	2.2	0.2
Field visit	159	26	11	16.4	6.9	67	3	2	4.5	3.0	232	29	13	12.5	5.6
Outreach	11,769	133	50	1.1	0.4	12,643	35	7	0.3	0.1	24,638	168	57	0.7	0.2
Student health	164	0	0	0.0	0.0	313	0	0	0.0	0.0	478	0	0	0.0	0.0
Missing	2,718	22	11	0.8	0.4	6,405	6	2	0.1	0.0	9,210	28	13	0.3	0.1
Total	76,940	788	343	1.0	0.4	150,431	229	85	0.2	0.1	228,938	1,032	431	0.5	0.2

[a]Total includes 83 tests from individuals who identify as transgender and 1,484 tests that had missing gender information.

[b]Abbreviations: CTS = counseling and testing services; STD = sexually transmitted diseases; OB = obstetrics; TB = tuberculosis; CHC = community health centers; PHC = Primary Health Centers.

Table includes North Carolina supported HIV testing data from 3 sources:

(1) Conventional HIV testing data from the North Carolina State Laboratory of Public Health.

(2) Rapid HIV testing data from health departments and community based organizations.

(3) Self-reported conventional and rapid testing data from community health centers and hospital emergency departments.

Data Source: North Carolina supported HIV testing data (data as of October 2, 2014).

Age

Persons aged 20 to 29 years represented the largest group of people tested through state-sponsored HIV testing programs in 2013 (N=106,698, 46.6%). The next largest group were those slightly older (age 30-39, N=49,587, 21.7%). The highest positivity rate for those newly positive was for men ages 20 to 29 years (0.6%) (Table 3.2).

Race/Ethnicity

Overall, 47.9 percent of those persons tested for HIV were Black/African American, 27.4 percent were White/Caucasian, 16.8 percent Hispanic/Latino, 1.4 percent American Indian/Alaskan Native, 1.4 percent Asian/Pacific Islander, and 0.1 percent were unknown or multi-racial. A larger proportion of the women tested were Hispanic/Latino (20.5% for females compared to 9.8% for males). Looking at race/ethnicity and gender together, new HIV positivity rates were highest for Black/African American men (0.6%). The positivity rate for Black/African Americans was 3 times the rate for White/Caucasians (0.3% versus 0.1%) (Table 3.2). Of the 431 new cases identified through state-sponsored testing, 297 were among Black/African American persons (Table 3.2).

Hierarchical Risk for HIV Exposure

Each person tested is categorized with a single risk based on hierarchical risk categories. These categories assign the risk with the highest likelihood of exposure to HIV. For example, a woman reporting both sexual contact with a male and injection drug use (IDU) will be assigned to the IDU category because that route of infection is more efficient and more likely to cause the exposed person to become infected. Note that this hierarchy distinguishes between high risk heterosexual sex and other heterosexual sex. High risk heterosexual sex includes persons who report any of the following personal risks: victim of sexual assault, trade sex for drugs or money, recent STD diagnosis, sex while using non-injecting drugs, and those persons who report partners with the following risks: men who have sex with men (MSM), IDU, HIV-positive, and other HIV risk. Another category includes those who were potentially exposed via blood tissue, health care exposure, or mother-to-child transmission. Individuals not meeting any of the above criteria were classified as having an unknown risk. For more information on hierarchical risk, please see Appendix C: Technical Notes (pages C-4 through C-6).

Overall, 57.0 percent of those tested were classified as heterosexual-other, 24.4 percent as unknown risk, 12.8 percent as heterosexual-high risk, 2.9 percent as MSM, 1.5 percent as other risk, 1.2 percent as IDU, 0.1 percent was classified as blood/medical/neonatal exposure, and the remaining 0.05 percent as MSM/IDU (Table 3.2). The highest newly positive rates were among the MSM (5.1% positive) and the MSM/IDU (2.8% positive) populations (Table 3.2).

Table 3.2 North Carolina HIV Testing Positivity Rates by Gender, Age, Race/Ethnicity, and Hierarchical Risk of HIV Exposure, 2013

Demographics	Male					Female					Total[a]				
	Tested	Positive Tests	New Positive	% Positive	% Newly Positive	Tested	Positive Tests	New Positive	% Positive	% Newly Positive	Tested	Positive Tests	New Positive	% Positive	% Newly Positive
Age (Year)															
Less than 15	470	0	0	0.0	0.0	913	--[b]	--[b]	--[b]	--[b]	1,392	--[b]	--[b]	--[b]	--[b]
15 to 19	6,992	--[b]	--[b]	--[b]	--[b]	19,624	--[b]	--[b]	--[b]	--[b]	26,753	48	24	0.2	0.1
20 to 29	33,168	333	189	1.0	0.6	72,987	56	32	0.1	0.0	106,698	394	223	0.4	0.2
30 to 39	15,642	153	64	1.0	0.4	33,694	59	20	0.2	0.1	49,587	215	85	0.4	0.2
40 to 49	9,883	129	45	1.3	0.5	13,218	45	14	0.3	0.1	23,222	177	59	0.8	0.3
50 and older	8,154	91	19	1.1	0.2	6,193	41	14	0.7	0.2	14,453	134	33	0.9	0.2
Missing	2,631	46	6	1.7	0.2	3,802	16	0	0.4	0.0	6,833	63	6	0.9	0.1
Total	**76,940**	**788**	**343**	**1.0**	**0.4**	**150,431**	**229**	**85**	**0.2**	**0.1**	**228,938**	**1,032**	**431**	**0.5**	**0.2**
Race and Ethnicity															
American Indian/Alaska Native[c]	1,532	--[b]	--[b]	--[b]	--[b]	1,713	--[b]	--[b]	--[b]	--[b]	3,256	13	7	0.4	0.2
Asian/Pacific Islander[c]	1,216	--[b]	--[b]	--[b]	--[b]	2,000	--[b]	--[b]	--[b]	--[b]	3,232	--[b]	--[b]	--[b]	--[b]
Black/African American[c]	41,879	560	240	1.3	0.6	67,414	161	55	0.2	0.1	109,847	730	297	0.7	0.3
Hispanic/Latino	7,503	52	29	0.7	0.4	30,829	11	7	0.0	0.0	38,443	64	36	0.2	0.1
White/Caucasian[c]	20,748	98	42	0.5	0.2	41,732	29	11	0.1	0.0	62,695	127	53	0.2	0.1
Unspecified or Multi-race	94	--[b]	--[b]	--[b]	--[b]	126	--[b]	--[b]	--[b]	--[b]	222	--[b]	--[b]	--[b]	--[b]
Missing race/ethnicity	3,968	59	26	1.5	0.7	6,617	13	5	0.2	0.1	11,243	77	32	0.7	0.3
Total	**76,940**	**788**	**343**	**1.0**	**0.4**	**150,431**	**229**	**85**	**0.2**	**0.1**	**228,938**	**1,032**	**431**	**0.5**	**0.2**
Exposure Category															
Blood/HC/neonatal[d]	78	--[b]	--[b]	--[b]	--[b]	172	--[b]	--[b]	--[b]	--[b]	257	--[b]	--[b]	--[b]	--[b]
Heterosexual-high risk[e]	14,206	58	27	0.4	0.2	15,130	49	20	0.3	0.1	29,336	107	47	0.4	0.2
Heterosexual-other[f]	34,010	153	56	0.4	0.2	96,527	102	38	0.1	0.0	130,537	255	94	0.2	0.1
IDU[g]	1,586	--[b]	--[b]	--[b]	--[b]	1,182	--[b]	--[b]	--[b]	--[b]	2,790	--[b]	--[b]	--[b]	--[b]
MSM[g]	6,660	342	186	5.1	2.8	--	--	--	--	--	6,660	342	186	5.1	2.8
MSM/IDU[g]	106	--[b]	--[b]	--[b]	--[b]	--	--	--	--	--	106	--[b]	--[b]	--[b]	--[b]
Other[h]	269	16	60	5.9	22.3	2,566	1	26	0.0	1.0	3,486	23	91	0.7	2.6
Missing/Unknown[i]	20,025	208	8	1.0	0.0	34,854	73	0	0.2	0.0	55,766	290	6	0.5	0.0
Total	**76,940**	**788**	**343**	**1.0**	**0.4**	**150,431**	**229**	**85**	**0.2**	**0.1**	**228,938**	**1,032**	**431**	**0.5**	**0.2**

[a]Total includes 83 individuals who identify as transgender and 1,484 had missing gender information.

[b]Cell counts and percentages have been suppressed to avoid identification of cells that have counts less than five through direct or indirect means.

[c]Non-Hispanic/Latino.

[d]HC = health care exposure.

[e]Heterosexual-high risk is defined as a person who does not report IDU or MSM, but does report sexual contact with a partner of opposite sex, who is IDU, MSM, or known HIV-positive status. Also, if a person is a victim of sexual assault, exchanges sex for drugs/money, has had a recent STD or has sexual contact while using drugs, they are classified as high risk. More information can be found in Apendix C: Technical Notes (page C-4).

[f]Heterosexual-Other is defined as a person who reports sex with an opposite sex partner and does not report IDU, MSM, or any other potential high risk behaviors.

[g]IDU = injection drug use; MSM = men who have sex with men; MSM/IDU = have possible exposure through men who have sex with men and injection drug use.

[h]Other risk includes missing sex, sex partner risk w/o knowing sex of partner, etc.

[i]Missing/Unknown risk includes individuals classified as no identified risk (NIR), no reported risk (NRR), and missing information.

Table includes North Carolina supported HIV testing data from 3 sources:

(1) Conventional HIV testing data from the North Carolina State Laboratory of Public Health.

(2) Rapid HIV testing data from health departments and community based organizations.

(3) Self-reported conventional and rapid testing data from community health centers and hospital emergency departments.

Data Source: North Carolina supported HIV testing data (data as of October 2, 2014).

ADDITIONAL HIV TESTING PROJECT

Screening and Tracing Active Transmission (STAT) Program

The Screening and Tracing Active Transmission (STAT) program is an initiative designed to detect individuals who are recently infected with HIV or who have an **acute** HIV infection (i.e., before they begin to produce antibodies to the virus), compared to those with **established** infection (i.e., detectable antibody levels).

In North Carolina, the STAT concept was implemented as a cooperative arrangement between North Carolina DHHS, the North Carolina SLPH, and the University of North Carolina at Chapel Hill (UNC-Chapel Hill). This initiative began in May 2002 as a two-month pilot program through the research laboratory of Dr. Chris Pilcher at the UNC-Chapel Hill School of Medicine. For the pilot, aliquots of serum with undetectable levels of HIV antibody by EIA and western blot testing (i.e., seronegative) were sent from the North Carolina SLPH to Dr. Pilcher's laboratory for further testing. These sera were tested for the presence of the virus (not the antibody) using the polymerase chain reaction (PCR) to detect viral RNA. Due to the large number of specimens that were seronegative (more than 100,000 per year) and for the purposes of cost containment, the serum aliquots were pooled such that up to 100 sera were tested together. If a pool of 100 sera tested positive, the researchers worked backwards in the dilution scheme to identify which individual specimen(s) contained viral nucleic acid. Following the demonstration of feasibility through the pilot program, STAT was implemented as a routine program at the North Carolina SLPH in November of 2002.

Since November 2002 (referenced as 2003 in the table), STAT identified 259 people with acute HIV infection. Information derived from this project is used along with routine HIV surveillance data by public health officials in developing and implementing treatment and prevention programs. Recently infected individuals can receive counseling and treatment earlier with the goals of better health outcomes and preventing inadvertent exposure to partners. The case follow-up protocol for DIS is to contact individuals with acute HIV infection within 72 hours of receipt of the case. The DIS interview and counsel individuals and their partners (sexual or needle sharing) and offer HIV and STD testing. Patients are encouraged to have a repeat HIV-antibody test within two weeks (and at four and twelve weeks, if necessary).

Demographics for Cases Identified through STAT, from 2003 to 2013

Case numbers for acute HIV are small; therefore, assessing meaningful demographic trends is difficult. Additionally, the use of social networks to identify cases may bias the data toward certain groups. However, results from the pilot and ongoing testing activity showed a demographic distribution that reflects what has been seen with western blot/EIA testing.

In 2013, 23 acute or primary HIV infections were identified through the STAT program. Of those 23, the majority were males (87.0%), aged 20 to 29 (52.2%), and Black/African American (65.2%). Similar proportions have been observed since 2009. Cumulative data from 2003 to 2013 (N=259) indicate that Black/African Americans (69.1% of all cases) and males (83.0% of all cases) are disproportionately identified as acute cases. The median age of acute HIV infection is 26 years (range: 18-60 years). Roughly 66 percent of all acute cases, from 2003 to 2013, were diagnosed among persons younger than 30 years of age, and 45.9 percent were younger than 25 years.

In addition to the laboratory initiated STAT cases, North Carolina DHHS field staff work with medical providers throughout the state to identify any new HIV acute (primary infection) cases that were diagnosed through private care providers. The DIS attempt to identify newly diagnosed people who had a recently documented HIV-negative antibody test. These cases are collectively referred to as community acute (or recent) cases. In 2013, a total of 25 community acute (or recent) cases were identified based on follow-up and additional information collected during field investigations. These cases and associated social networks are being studied to enhance field intervention efforts.

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CHAPTER 4: HIV INFECTION CARE AND TREATMENT IN NORTH CAROLINA

In the earliest days of the human immunodeficiency virus (HIV) epidemic, there were no treatments to combat the virus, and the care provided was primarily supportive and palliative therapy. Beginning in the 1990s, antiretroviral therapy (ART) became available and with the advent of highly active ART, HIV-associated death rates decreased dramatically. The federally funded Ryan White HIV/AIDS Program began in the early 1990s, and today, continues to be a source of HIV-related care and treatment for people who otherwise would be unable to afford care.

ART has continued to improve over the years, to the current situation in which HIV infection for someone on a well-maintained ART regimen is a manageable, chronic condition. In recent years, treatment has been a strong focus for HIV infection. In 2011, Cohen et al. published a landmark paper on the HPTN 052 study, in which the authors showed that in serodiscordant couples (i.e., one partner infected, the other partner uninfected) early treatment of the infected partner not only resulted in improved clinical outcomes for the infected partner, but also greatly reduced the likelihood of HIV transmission to the uninfected partner.[1] Based on this study and others, current HIV treatment guidelines recommend all HIV-infected individuals receive ART.[2]

Since publication of the HPTN 052 study, there has been a growing emphasis on projects seeking to help as many HIV-infected people as possible get linked to HIV care, retained in care, and re-engaged if they have fallen out-of-care. The Centers for Disease Control and Prevention (CDC) and others have highlighted the importance of using surveillance data to inform such care-related activities.[3,4] North Carolina's existing integrated surveillance and partner services program form the ideal framework for such efforts. North Carolina is participating in several such projects.

This chapter starts with a description of the federally funded Ryan White programs in North Carolina, followed by an analysis highlighting some of the remaining statewide gaps in care, a description of recent efforts to improve linkage, retention, and re-engagement in HIV care (including uses of HIV surveillance data), and finally a description of the federally funded program to provide stable housing for people with HIV infection.

RYAN WHITE

The Ryan White HIV/AIDS Program is a federally funded program designed to provide HIV care, treatment, and supportive services to people who lack health insurance or the financial resources needed for HIV care. The program began following the Congressional passage of the Ryan White Comprehensive AIDS Resources Emergency (CARE) Act. This act has been reauthorized several times, most recently in 2009. The United States Department of Health and Human Services (US DHHS), Health Resources and Services Administration (HRSA), HIV/AIDS Bureau (HAB) administers the program at the federal level.[5] The program has five components:

- **Part A:** directly funds selected metropolitan areas based on the severity of the HIV epidemic in the given locality to support a variety of services, including medical care;

- **Part B:** directly funds the US, US territories, and the District of Columbia to support a variety of services, including medical care and medication assistance;
- **Part C:** directly funds clinics and hospitals, primarily to support primary care for people living with HIV/AIDS (acquired immunodeficiency syndrome);
- **Part D:** directly funds individual organizations to provide family-centered care for women, infants, children and youth with HIV infection; and
- **Part F:** funds the following different programs:
  - Special Projects of National Significance (SPNS);
  - AIDS Education and Training Centers;
  - Dental Programs; and
  - Minority AIDS Initiative (MAI).

More information about the federal program is available at HRSA's website:
http://hab.hrsa.gov/abouthab/aboutprogram.html.

North Carolina receives funding under each of the five parts listed above. Following the 2006 reauthorization, the Charlotte metropolitan area was recognized as a Transitional Grant Area (TGA) under Part A. HRSA directly funds the TGA to provide care and support services in five North Carolina counties and one county in South Carolina. The state directly receives funds under Part B. North Carolina has two main programs under Part B: (1) the Ryan White Part B base grant program, which provides care and support services in the remaining 95 counties in North Carolina; and (2) the AIDS Drug Assistance Program (ADAP), which provides medication assistance to low-income residents of all 100 North Carolina counties. Table 4.1 compares demographic distributions for the Ryan White Part B base program and the ADAP program to persons living with HIV/AIDS (PLWHA) in North Carolina as of 12/31/2013. The two Part B programs are described in greater detail below and in Appendix B: Data Sources (page B-6).

Table 4.1. Proportion of North Carolina Ryan White Part B Clients, AIDS Drug Assistance Program (ADAP) Clients, and Persons Living with HIV Infection by Selected Demographics, 2013

Demographics	Ryan White Part B Clients N=7,972	ADAP Enrollees N=7,470	Persons Living with HIV Infection N=28,101
Gender			
Male	68.2%	72.0%	71.0%
Female	31.0%	27.5%	29.0%
Transgender[a]	0.7%	0.4%	--
Race/Ethnicity			
American Indian/Alaska Native[b]	0.8%	1.0%	0.7%
Asian/Pacific Islander[b]	0.5%	0.5%	0.5%
Black/African American[b]	64.4%	62.8%	65.4%
Hispanic/Latino	6.3%	7.2%	6.2%
White/Caucasian[b]	24.4%	27.0%	25.2%
Unknown	3.6%	1.4%	1.9%
Age Group (Year)			
Less than 13	0.6%	0.3%	0.3%
13-24	5.7%	5.3%	4.7%
25-44	39.7%	44.1%	38.9%
45-64	50.5%	46.9%	51.3%
65 and older	3.4%	3.6%	4.7%

[a]Transgender available for Ryan White Part B and ADAP data only; not recorded for persons living with HIV infection.

[b]Non-Hispanic/Latino.

Data Sources: CAREWare (Ryan White Part B clients) (data from Ryan White Year (RWY): April 1, 2013 to March 31, 2014), ADAP (RWY 2013-2014, data as of March 31, 2014), and enhanced HIV/AIDS Reporting System (eHARS) (data as of July 1, 2014).

Ryan White Part B Base Grant Program

The North Carolina Department of Health and Human Services (North Carolina DHHS), AIDS Care Program (ACP) administers the Ryan White Part B base grant program in North Carolina. The 95 counties supported by the Part B base program are grouped into 10 Regional Networks of Care and Prevention (RNCP) as shown in Figure 4.1. ACP funds each RNCP to provide services to the Part B clients who live in their region. To be eligible for Ryan White Part B services in North Carolina, an individual must be a resident of one of the 95 counties and have an annual gross family income that is less than or equal to 300 percent of the federal poverty level (FPL). HRSA requires that 75 percent of services provided be core services, such as direct medical care, while the remaining 25 percent of services can be supportive services, such as transportation assistance.

Figure 4.1. HIV Service Provision in North Carolina: 10 Regional Networks of Care and Prevention (RNCP) and Charlotte Metropolitan Transitional Grant Area (TGA)
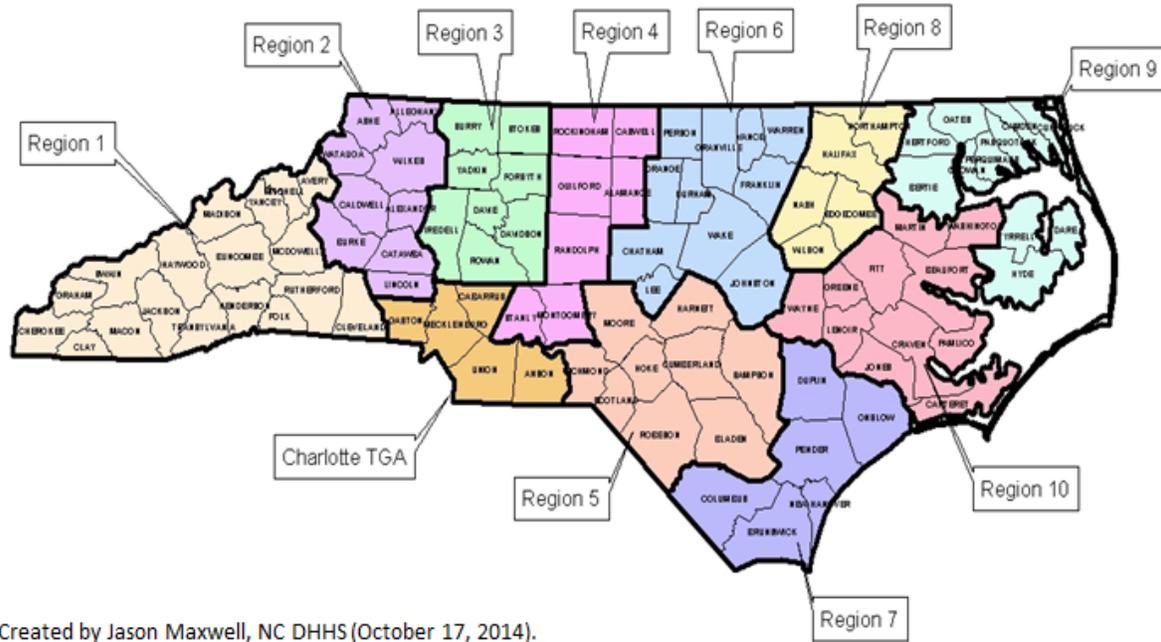
Created by Jason Maxwell, NC DHHS (October 17, 2014).

Table 4.2 shows the types of core and support services provided by North Carolina's Ryan White Part B base program during Ryan White Year (RWY) 2013-2014 (April 1, 2013 – March 31, 2014). Medical care and medical case management were the most common core services provided, while food and transportation assistance were the most common support services provided. Data for the Ryan White Part B program are managed using CAREWare, a free software program provided by HRSA.[6] For a more detailed description of CAREWare and the Ryan White Part B data, see Appendix B: Data Sources (page B-6).

Table 4.2. Services[a] Provided to Ryan White Part B Program Clients,
Ryan White Year (RWY) 2013-2014

Services[a]	N	%
Core Services[a]		
Medical Case Management	31,599	50.2
Outpatient/Ambulatory Medical Care	14,756	23.5
Oral Health Care	2,016	3.2
Mental Health Services	1,553	2.5
Outpatient Substance Abuse Services	670	1.1
Medical Nutrition Therapy	456	0.7
Health Insurance Program (HIP)	379	0.6
Home and Community-based Health Services	11	0.0
Support Services[a]		
Food Bank/Home-delivered Meals	3,115	5.0
Medical Transportation Services	2,136	3.4
Treatment Adherence Counseling	1,754	2.8
Health Education/Risk Reduction/Prevention	1,500	2.4
Psychosocial Support Services	849	1.3
Emergency Financial Assistance (EFA)	717	1.1
Service Outreach	521	0.8
Referral: Health Care/Supportive	317	0.5
Legal Services	263	0.4
Housing (EFA)	248	0.4
Linguistics Services	52	0.1
Housing Services	6	0.0
TOTAL	**62,918**	**100.0**

[a]Ryan White Part B clients may receive more than one service during the year; in RWY 2013-2014, there were 7,972 RW Part B clients.

Data Source: CAREWare (Ryan White Part B clients) (data from Ryan White Year (RWY): April 1, 2013 to March 31, 2014).

During RWY 2013-2014, 7,972 clients received care and support services through the Ryan White Part B base program. The demographics of Ryan White Part B clients served during RWY 2013-2014 were similar to the demographics of PLWHA in North Carolina as of December 31, 2013 (Table 4.1). The most common risk factor for HIV among male Ryan White Part B clients was male-to-male sexual contact, while the most common risk factor for HIV among female Ryan White Part B clients was heterosexual contact (Figure 4.2).

Figure 4.2. Distribution of HIV Risk Factors among North Carolina Ryan White Part B Clients by Gender, Ryan White Year (RWY) 2013-2014
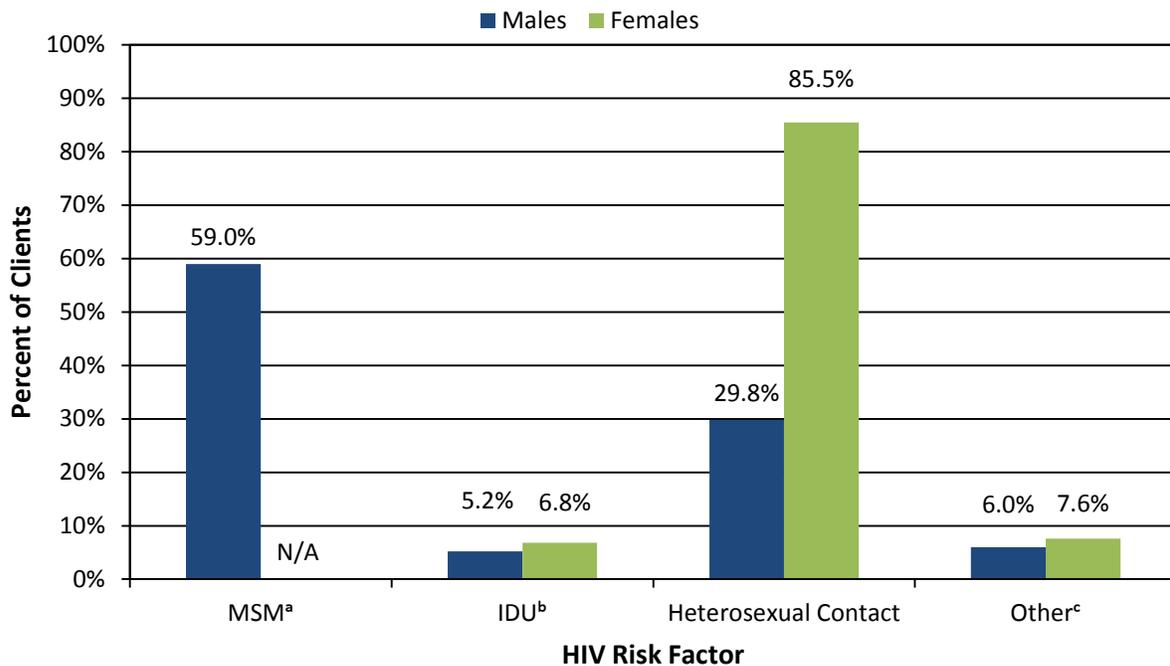
[a]MSM: men who have sex with men. Includes MSM/IDU.

[b]IDU: injection drug use.

[c]Other includes perinatal, transfusion, hemophilia, other, and unknown risk factors (including no risk reported).

Data Source: CAREWare (Ryan White Part B clients) (data from Ryan White Year (RWY): April 1, 2013 to March 31, 2014).

Figure 4.3 shows that the proportion of virally suppressed clients varies by race/ethnicity. Black/African American clients are less likely to be virally suppressed than White/Caucasian, Hispanic/Latino, or American Indian/Alaska Native clients. An important marker of quality clinical care is HIV viral load suppression. Overall, 69.3 percent of Ryan White Part B clients were virally suppressed, 16.7 percent were not suppressed, and 14.1 percent of clients did not have any viral load tests recorded in CAREWare during RWY 2013-2014.

Figure 4.3. Viral Load Suppression among North Carolina Ryan White Part B Clients Ages Two Years and Older[a] by Race/Ethnicity, Ryan White Year (RWY) 2013-2014
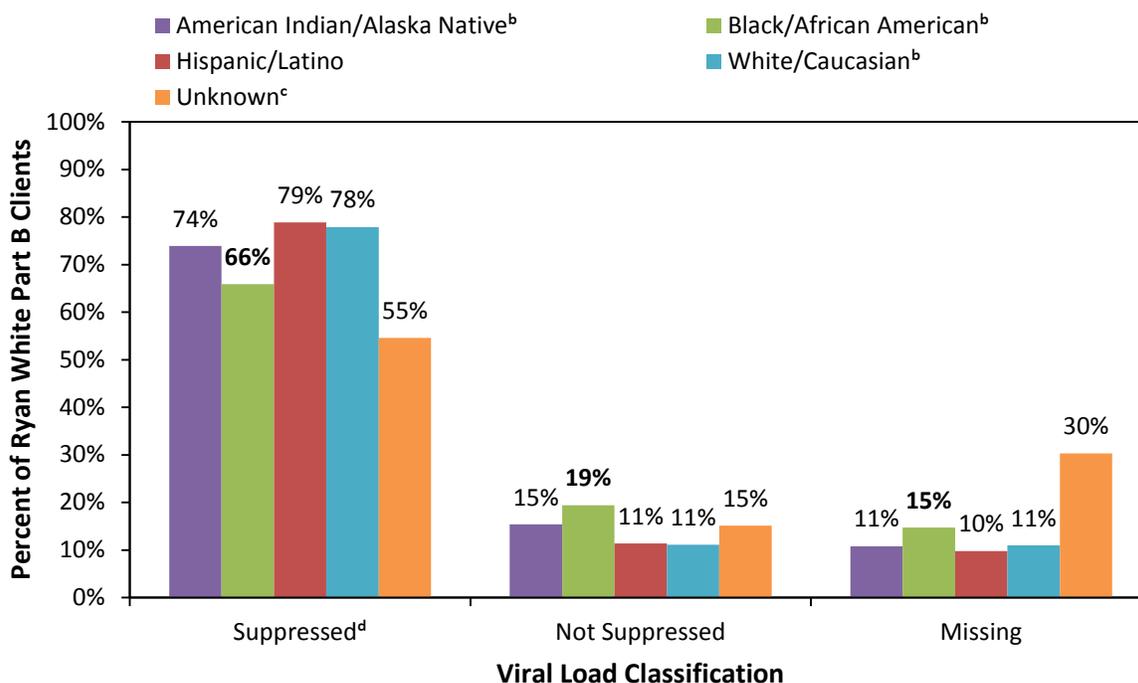
[a]Clients younger than two years old excluded due to volatility in viral load values in this population.

[b]Non-Hispanic/Latino.

[c]Unknown includes Asian/Pacific Islanders, multi-race, other, not specified, and unknown (non-Hispanic/Latino).

[d]Viral load suppression calculated as less than 200 copies per milliliter at last viral load test during the Ryan White Year (RWY).

Data Source: CAREWare (Ryan White Part B clients) (data from RWY: April 1, 2013 to March 31, 2014).

Appendix D contains a series of tables showing PLWHA and new diagnoses of HIV infection by RNCP which may be used to approximate actual and anticipated care needs within a given region. Appendix D: Table S (pages D-30 through D-32) shows that the number of PLWHA varies by region. The Charlotte TGA has the most PLWHA (6,238), closely followed by Region 6 (6,002). Regions 3, 4, and 5 all have more than 2,000 PLWHA (2,142, 2,921, and 2,760, respectively). Regions 2 and 9 have the fewest with 526 and 405 PLWHA, respectively (Appendix D: Table S, pages D-30 through D-32). For the first time this year, tables displaying the demographic breakdown of PLWHA for each region are included in this profile (Appendix D: Tables T through Table AD, pages D-33 through D-43). Also new this year is Appendix D: Table R, which shows the number of new HIV diagnoses by region for the years 2009-2013 (page D-29).

Clinical Quality Management

The Ryan White Part B Clinical Quality Management (QM) Program systematically monitors and evaluates the RNCPs to ensure that the quality and appropriateness of services to PLWHA are continually improved. Quality-related expectations are written into contracts between North Carolina DHHS and every RNCP. Each RNCP develops and implements a local QM plan and provides updates on the quality management and quality improvement projects they implement in quarterly reports.

HRSA/HAB has developed a number of quality measures covering all phases of program activities, which are routinely calculated from Ryan White Part B base program data recorded in CAREWare. North Carolina's Ryan White Part B QM program consists of eight of the HRSA/HAB performance measures, and one measure developed by the In+Care campaign:

- **HAB 01**: two medical visits with a prescribing provider in the measurement year at least 90 days apart;
- **HAB 02:** two CD4+ T-lymphocyte (CD4) cell count tests in the measurement year at least 90 days apart;
- **HAB 03:** Pneumocystis pneumonia (PCP) prophylaxis prescribed in the measurement year;
- **HAB 04:** highly active ART prescribed in the measurement year for individuals with CDC-defined AIDS;
- **HAB 07:** cervical cancer screening in the measurement year;
- **HAB 09:** hepatitis C (HCV) screening test recorded;
- **HAB 13:** annual syphilis screening;
- **HAB 17:** hepatitis B (HBV) screening test recorded; and
- **INC 04:** viral load suppression (viral load less than 200 copies per milliliter at last test in the measurement year).

Figure 4.4 shows North Carolina's progress toward meeting each of the nine performance measures as compared to the state-defined goals for each measure. In RWY 2013-2014, North Carolina met or exceeded five of the nine performance measures. For the two lowest-performing measures, HAB 02 and HAB 07, key data challenges affect our ability to measure whether we are meeting the goals. In the case of HAB 07, cervical cancer screening (Pap smears) is often not documented in CAREWare for female clients who receive those services from outside providers because those records are not available for entry to CAREWare. The low performance on HAB 02 -- CD4 cell tests performed within the measurement year -- reflects recent trends in clinical care away from CD4 testing and toward more frequent viral load testing that are supported by federal clinical treatment guidelines.[2] In the coming year, North Carolina will update the required performance measures; one change will be to require two viral load tests within the year instead of two CD4 tests. Syphilis screening (HAB 13), will be the focus of quality improvement projects across the state in RWY 2014-2015.

Figure 4.4. North Carolina Progress toward Meeting Statewide Goals for Nine Performance Measures for Quality, Ryan White Year (RWY) 2013-2014
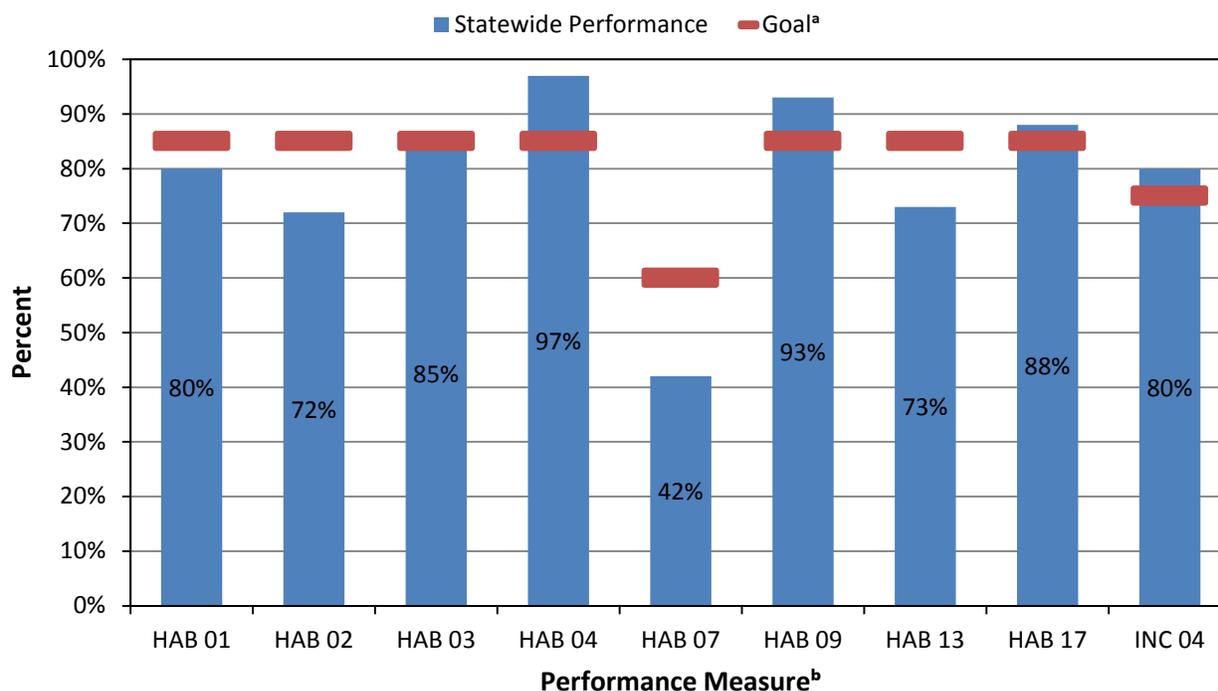
[a]All goals are set at 85.0% except for HAB 07 (60.0%) and INC 04 (75.0%).

[b]See text for descriptions of the performance measures.

Data Source: CAREWare (Ryan White Part B clients) (data from Ryan White Year (RWY): April 1, 2013 to March 31, 2014).

AIDS Drug Assistance Program (ADAP)

North Carolina ADAP uses a combination of state and federal funds to provide medications to low income North Carolinians living with HIV/AIDS. To be eligible for ADAP in North Carolina, an individual must be HIV positive, be a state resident, have a prescription for any drug on the ADAP formulary, have no other third-party insurance coverage (e.g., private insurance or Medicaid), and have an annual gross family income that is equal to or less than 300 percent of the FPL.[7] ADAP serves clients through two different programs: the ADAP Pharmacy Program (APP), which serves the majority of North Carolina's ADAP clients using a pharmacy network, and the State Pharmaceutical Assistance Program (SPAP), which serves clients who are enrolled in Medicare's Part D program using a Pharmacy Benefits Manager.

In RWY 2013-2014 (April 1, 2013 to March 31, 2014), 7,470 individuals were enrolled in ADAP, of whom 6,068 were on APP and 1,402 were on SPAP. The gender distribution of ADAP enrollees (72.0% male and 27.5% female) is in line with the overall gender distribution of PLWHA in North Carolina (71.0% male and 29.0% female). The racial/ethnic distributions of ADAP enrollees and PLWHA are also similar (Table 4.1). Some small differences exist in the age distributions of ADAP enrollees and PLWHA in North Carolina (Table 4.1). Of the ADAP enrollees, 77.3 percent had net family incomes at or below 150 percent of FPL, 13.4 percent had net family incomes between 151 percent and 200 percent of FPL and 9.2 percent had net family income between 200 percent and 300 percent of FPL.

Figure 4.5. Gross Family Income among North Carolina AIDS Drug Assistance Program (ADAP) Clients by Program, Ryan White Year (RWY) 2013-2014
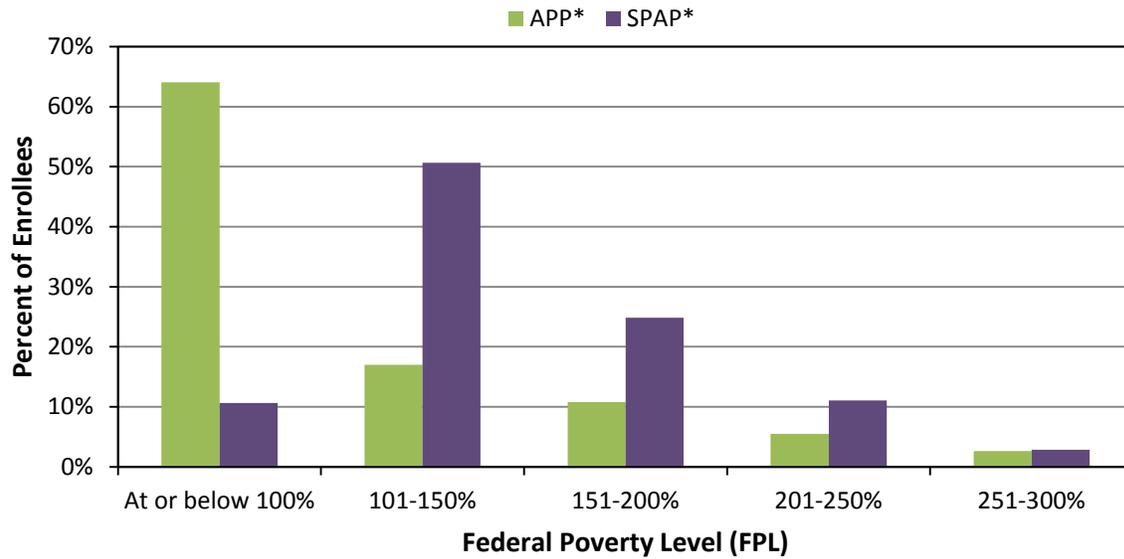
*APP: ADAP Pharmacy Program; SPAP: State Pharmaceutical Assistance Program.
Data Source: North Carolina AIDS Drug Assistance Program (ADAP) (data as of March 31, 2014).

Overall, 74.4 percent of ADAP enrollees were virally suppressed. Compared to APP clients, SPAP enrollees were more likely to be male (77.4% versus 70.8%), White/Caucasian (38.4% versus 27.6%), and older (69.2% of SPAP enrollees were ages 45-64 years, versus 41.8% of APP enrollees). SPAP clients were also more likely to have higher gross family incomes (Figure 4.5) and be virally suppressed (Figure 4.6).

Figure 4.6. Viral Load Suppression among North Carolina AIDS Drug Assistance Program (ADAP) Clients by Program, Ryan White Year (RWY) 2013-2014
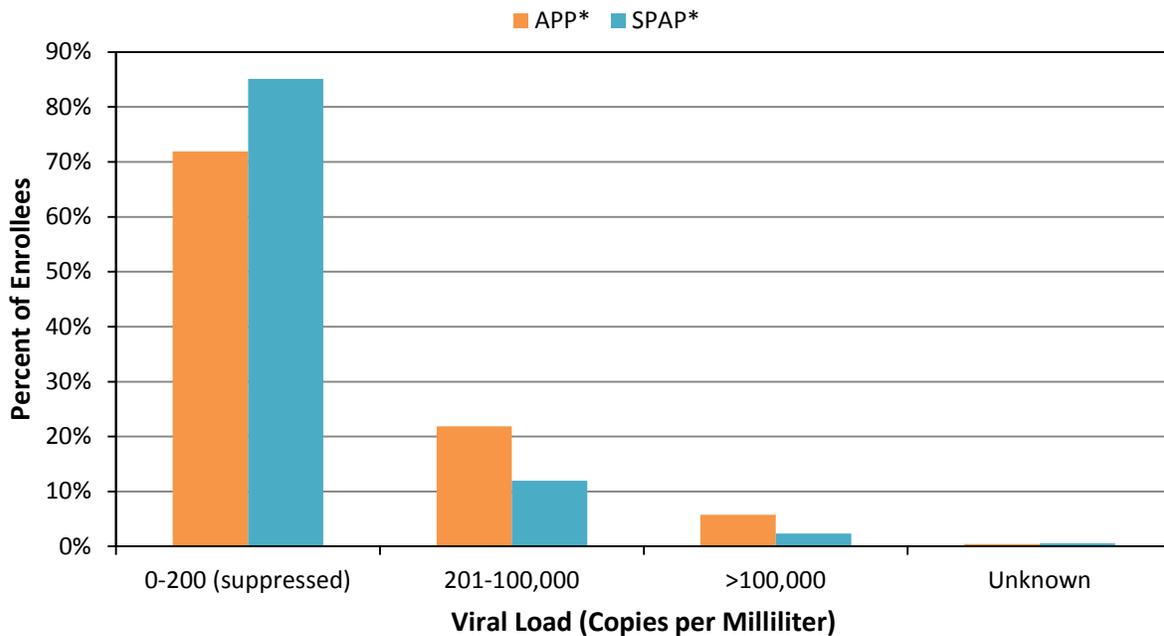
*APP: ADAP Pharmacy Program; SPAP: State Pharmaceutical Assistance Program.
Data Source: North Carolina AIDS Drug Assistance Program (ADAP) (data as of March 31, 2014).

NORTH CAROLINA "UNMET NEEDS" ESTIMATE, 2013

Background

Specific information about the disparities in access and services among HIV-affected subpopulations and underserved communities guides state and national planning and resource allocations. HRSA requires that each Ryan White Part A and Part B program determine the size and demographics of the population of individuals with HIV infection and determine the needs of such populations. The program also pays particular attention to individuals who know their positive HIV status and are not receiving HIV-related primary health care. Primary health care includes medical evaluation and clinical care that is consistent with US Public Health Service guidelines for the treatment of HIV/AIDS and must include access to ARTs and other drug therapies as well as treatment of opportunistic infections.[8,9] HRSA's term "unmet need" is used only to describe the unmet need for HIV-related primary health care. An individual with HIV/AIDS is considered to have an "unmet need" for care when there is no evidence of any of the following three components of HIV primary health care during a defined 12-month time frame: (1) viral load testing, (2) CD4 cell count, or (3) provision of ART. A person is considered to have "met need" when there is evidence of any one or more of these three measured during the specified 12-month time frame. Please note that the terms "unmet need" and "met need" are similar, but not identical, to the terms "out of care" and "in care", respectively.

Data Sources and Methodology

The North Carolina DHHS maintains the public health surveillance system for all morbidity and laboratory reports for HIV infection in North Carolina. Individuals meeting the definition of "met need" were initially identified based on the available laboratory information collected within the surveillance data. As of July 1, 2013, North Carolina mandated laboratory reporting of all viral load and CD4 cell count test results in addition to the already required reporting of positive antibody, polymerase chain reaction (PCR), ribonucleic acid (RNA), and deoxyribonucleic acid (DNA) results indicating HIV infection. All cases that had a CD4 cell count or viral load test reported to the surveillance system in 2013 were considered to be receiving care. These data were then linked to CAREWare, ADAP, and Medicaid data to assess "unmet need." (NOTE: Medicaid data used for 2013 analysis consisted of medical claims data between January 1, 2013 and June 30, 2013 only). Estimates of unmet need were adjusted to account for the proportion of North Carolinians living with HIV infection who were likely receiving HIV-related primary health care that was privately funded, but for whom viral load and CD4 laboratory tests were not reported to the surveillance system.

Results

In total, 73.9 percent of persons living in North Carolina with HIV infection were estimated to have "met need" during calendar year (CY) 2013. The remaining 26.1 percent were estimated to represent those with "unmet need." The estimated number of persons living with HIV non-AIDS (PLWH) with "unmet need" was 30.1 percent, as compared to 21.3 percent of persons living with an AIDS (Stage 3) diagnosis (PLWA). The proportion of PLWH estimated to have "met need" in North Carolina has decreased from 73.7 percent in CY 2009 to 69.9 percent in CY 2013. The proportion of PLWA estimated to have "met need" in CY 2013 (78.7%) is very similar to the proportion of PLWA estimated to be in care in CY 2009 (78.6%).

To further describe the subpopulations that have "unmet need" for HIV primary medical care, Table 4.3 presents "unmet need" by age, race/ethnicity, gender, and hierarchical risk of HIV exposure. There are proportionately more males with unmet need for HIV primary care (27.3%) than females (22.9%). By race and ethnicity, the highest proportion of unmet need was among Hispanic/Latinos (40.9%), compared with 24.3 percent of non-Hispanic White/Caucasians, 25.8 percent of non-Hispanic Black/African Americans and 17.3 percent of other non-Hispanic racial groups (including individuals of multiple races, American Indian/Alaska Natives and Asian/Pacific Islanders). The proportion of Hispanic/Latinos with "unmet need" has steadily increased over the past five years. Among PLWH, the proportion of Hispanic/Latinos with "unmet need" for HIV primary medical care rose from 30.2 percent in CY 2009 to 40.4 percent in CY 2012 and 43.4 percent in CY 2013. This figure represents a 43.7 percent relative increase over the past five years in the estimated proportion of Hispanic/Latino PLWH who lack primary HIV medical care. Similarly for Hispanic/Latino PLWA, the proportion with estimated "unmet need" rose from 27.3 percent in CY 2009 to 36.9 percent in CY 2012 and 38.4 percent in CY 2013, representing a relative increase over five years of 40.7 percent.

In CY 2013, some differences by HIV risk factor occurred, with the highest proportion of "unmet need" among IDU (31.1%) and MSM/IDU (30.3%). The proportion with "unmet need" was also relatively high among PLWHA with unknown risk (28.6%) and other risk (44.7%).

**Table 4.3. Proportion of Persons Living with HIV Infection in North Carolina with
"Unmet Need" for HIV Care by Selected Demographics, 2013[a]**

Demographics	PLWH[b] % Unmet Need	PLWA[b] % Unmet Need	PLWHA (Total)[b] %Unmet Need
Gender			
Male	31.2	23.0	27.3
Female	27.5	16.8	22.9
Current Age (Year)			
Less than 13	14.8	12.4	14.7
13-24	20.9	14.1	19.5
25-44	31.9	21.8	27.8
45-64	29.6	21.2	25.3
65 and older	33.2	21.9	27.5
Race/Ethnicity			
Black/African American[c]	31.3	19.3	25.8
Hispanic/Latino	43.4	38.4	40.9
White/Caucasian[c]	25.3	22.9	24.3
Other/Unknown[d]	21.1	12.3	17.3
Exposure Category			
Heterosexual-high risk[e]	27.4	16.8	22.1
IDU[f]	37.4	26.4	31.1
MSM[f]	26.1	20.8	23.8
MSM/IDU[f]	33.6	27.3	30.3
Perinatal	19.8	18.4	19.3
Unknown[g]	34.0	21.8	28.6
Other	44.8	44.7	44.7
TOTAL	**30.1**	**21.3**	**26.1**

[a]Estimates are adjusted for private payer sources; Veteran's Affairs cases are excluded.

[b]PLWH: People living with HIV infection (non-AIDS); PLWA: People living with AIDS (Stage 3); PLWHA: People living with HIV infection, regardless of stage of infection (HIV or AIDS).

[c]Non-Hispanic/Latino.

[d]Other/Unknown includes American Indian/Alaska Natives, Asians/Pacific Islanders, multi-race, and unknown (non-Hispanic/Latino).

[e]Heterosexual-high risk is defined as a person who does not report IDU or MSM, but does report sexual contact with a partner of opposite sex, who is IDU, MSM, or known HIV-positive status. Also, if a person is a victim of sexual assault, exchanges sex for drugs/money, has had a recent STD or has sexual contact while using drugs, they are classified as high risk. More information can be found in Appendix C: Technical Notes (page C-4).

[f]IDU = injection drug use; MSM = men who have sex with men.

[g]Unknown risk includes individuals classified as no identified risk (NIR) and no reported risk (NRR).

Data Sources: CAREWare (Ryan White Part B clients) (data from Ryan White Year (RWY): April 1, 2013 to March 31, 2014), ADAP (RWY 2013-2014, data as of March 31, 2014), and enhanced HIV/AIDS Reporting System (eHARS) (data as of July 1, 2014).

Table 4.4 presents unmet need by RNCPs (see Figure 4.1 for a map of the RNCPs). Compared to CY 2012, the estimated proportion of PLWHA with "unmet need" increased in Region 9 and slightly decreased in the Charlotte TGA and Regions 2 and 4. For all other regions, the CY 2013 estimate was within 0.5 percent of the CY 2012 estimated proportion with "unmet need." The relative decreases may be due to improved data quality, while the increase in Region 9 is likely due to variation caused by the relatively small population in that region. Differences between CY 2012 and CY 2013 may reflect actual changes in the proportion of persons accessing HIV care.

Table 4.4. Proportion of Persons Living with HIV Infection in North Carolina with "Unmet Need" for HIV Care by Regional Networks of Care and Prevention, 2013[a]

Regional Networks of Care and Prevention (RNCP)	PLWH[b] % Unmet Need	PLWA[b] % Unmet Need	PLWHA (Total)[b] %Unmet Need
Charlotte TGA[c]	28.0	18.4	23.8
Region 1	24.1	17.0	20.4
Region 2	17.7	13.2	15.5
Region 3	23.9	20.1	22.3
Region 4	25.0	19.2	22.8
Region 5	39.8	23.8	32.5
Region 6	34.2	25.4	30.2
Region 7	33.2	21.8	27.8
Region 8	27.0	15.0	21.0
Region 9	49.2	44.6	46.6
Region 10	26.7	19.3	22.8
TOTAL	30.1	21.3	26.1

[a]Estimates are adjusted for private payer sources; Veteran's Affairs cases are excluded.

[b]PLWH: People living with HIV infection (non-AIDS); PLWA: People living with AIDS (Stage 3); PLWHA: People living with HIV infection, regardless of stage of infection (HIV or AIDS).

[c]TGA: transitional grant area.

Data Sources: CAREWare (Ryan White Part B clients) (data from Ryan White Year (RWY): April 1, 2013 to March 31, 2014), ADAP (RWY 2013-2014, data as of March 31, 2014), and enhanced HIV/AIDS Reporting System (eHARS) (data as of July 1, 2014).

DATA TO CARE

Treatment of HIV infection that is sustained and ongoing has now been clearly shown to be a key public health intervention to prevent HIV transmission to a person's uninfected partners. As a result, state health departments and federal partners, such as HRSA and CDC, are focusing more resources than ever to identify proven strategies to ensure people are linked to care as soon as possible after diagnosis with HIV and, once in care, are retained in care. HIV surveillance data play a key role for such programs by identifying gaps in care. In addition, surveillance data provide a means to follow-up with people who have dropped out of care and to address barriers that may keep the person from being in care.

HIV Continuum of Care

The HIV continuum of care is a concept developed within the past few years that describes the various stages of engagement for a person receiving HIV medical care.[10,11] The HIV care continuum addresses the question, "What proportion of the population diagnosed and reported with HIV infection in my state are believed to be in care during a given year?" Variations on the continuum include different stages, but major stages often include: undiagnosed HIV infection, diagnosed HIV infection, linked to HIV care, in care (measured various ways), prescribed ART, and virally suppressed. The HIV continuum serves as a useful framework for conceptualizing progress made toward achieving the National HIV/AIDS Strategy (NHAS) goal of increasing access to care and optimizing health outcomes, such as ensuring that people

with HIV infection are virally suppressed.[12] In 2013, President Barack Obama issued an executive order establishing the HIV Care Continuum Initiative, which highlights the important role the HIV care continuum plays in national HIV/AIDS policy.[13,14]

There are several key points that should be considered when interpreting the North Carolina HIV continuum of care (Figure 4.7):

- The North Carolina HIV care continuum is based on surveillance data only, in accordance with CDC protocols. CDC protocols:
  - Use reported laboratory tests for CD4 cell counts and viral loads as surrogate markers for evidence of HIV care;
  - Calculate the number of people diagnosed and reported with HIV infection between the beginning of the HIV epidemic and a given end date (e.g., December 31, 2008) and then evaluate whether the person received care during the subsequent calendar year (e.g., January 1, 2009 – December 31, 2009); and
  - Recommend states allow 12-18 months after the end of the evaluation period before presenting results in order to account for reporting delays and linkage to vital statistics records. For cases diagnosed and reported through December 31, 2008 and evaluated for evidence of care during 2009, CDC recommends waiting until June 2011 to include the data in the HIV care continuum.

- The North Carolina HIV care continuum has been calculated based on the number of people with last known residence in North Carolina, regardless of where the person was initially diagnosed with HIV infection. As a result, the total population diagnosed and reported through the end of 2012 presented in Figure 4.7 is 14.3 percent larger than the HIV prevalence reported elsewhere in this profile for CY 2012.This increased prevalence represents an estimated net migration of HIV cases into North Carolina following their HIV diagnosis in other states.

- The North Carolina HIV care continuum shows data for five years, enabling a look at trends over time.

Figure 4.7. Continuum of HIV Care among People with Last Known Residence in North Carolina, 2009-2013
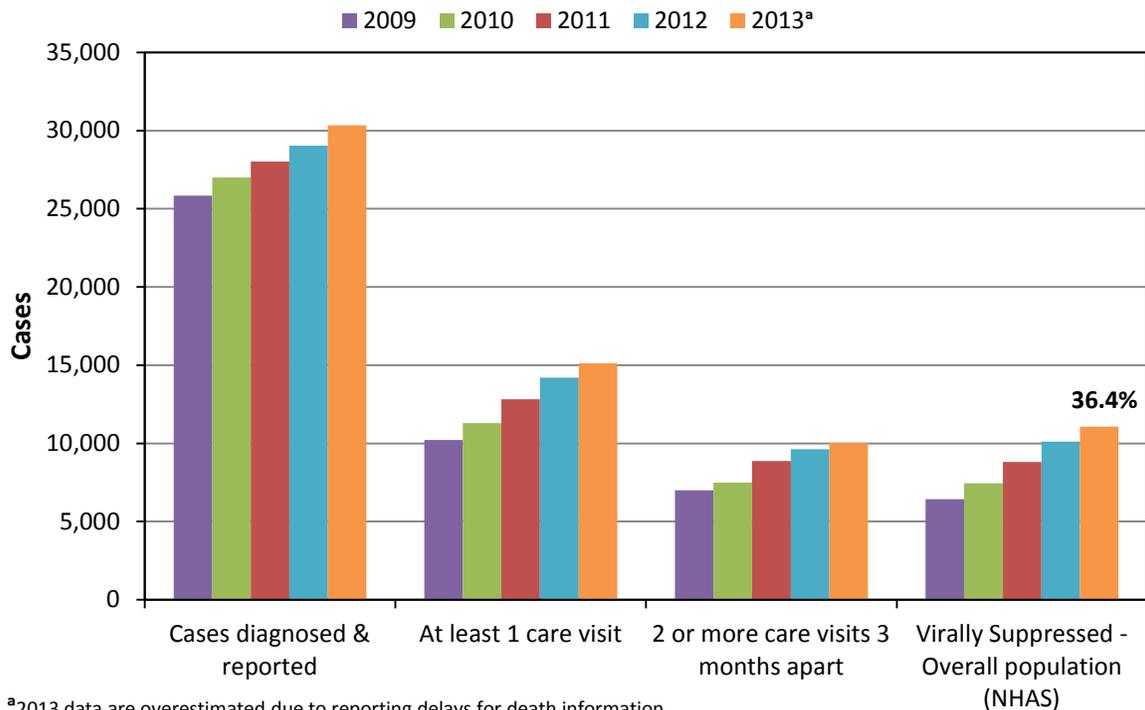
[a]2013 data are overestimated due to reporting delays for death information.

[b]Legend: year shown refers to the year in which care measures were evaluated; cases were diagnosed and reported between the beginning of the epidemic and the end of the prior year. For example, the data labeled "2009" represent all cases diagnosed and reported through 12/31/2008, and had care visits or were virally suppressed during calendar year 2009.

Data Sources: enhanced HIV/AIDS Reporting System (eHARS) (data as of 7/1/2014).

North Carolina HIV Care Continuum: Key Results

- Roughly half of the people diagnosed and reported with HIV infection whose last known address was in North Carolina did not have documentation in surveillance data showing that they received care during the evaluation year. As a result, Figure 4.7 overestimates the population out-of-care. The overestimation is likely due to migration out of North Carolina or deaths that have not been accounted for by surveillance data, as well as incomplete laboratory reporting during the evaluation year.

- Among cases diagnosed and reported through December 31, 2012 and evaluated during 2013, viral suppression could be documented for an estimated 36.4% of the total cases. This number compares to 25.3% nationally.[15]

- Approximately two-thirds of the people receiving at least one care visit during a given evaluation year also had a second care visit three or more months apart during the same evaluation year (66.3% for evaluation year 2013).

North Carolina HIV Care Continuum Limitations

- North Carolina law did not require laboratory reporting of all CD4 cell count and viral load laboratory tests until halfway through the final evaluation year (2013) shown in Figure 4.7. Consequently, all measures of care (at least one care visit during the evaluation year, two or more care visits during the evaluation year, and viral suppression) are underestimates of what would be observed if North Carolina had full laboratory reporting during the evaluation time period.

- Data for 2013 are provisional only and should be interpreted with extra caution because they were calculated only six months after the end of the evaluation year, which is six to 12 months prior to the full time CDC recommends before calculation.

- A recent study by Dombrowski et al. suggests that reliance on surveillance data only, even if the surveillance data are complete, may underestimate the true measure of the population in care.[16]

Out-of-Care Investigations

HIV surveillance data are also an integral part of activities designed to follow-up with people who may have fallen out of HIV care. In April 2014, CDC released a new toolkit, "Data to Care: A Public Health Strategy Using HIV Surveillance Data to Support the HIV Care Continuum", which can be found under the "Public Health Strategies" section of the website, www.effectiveinterventions.org.[4] North Carolina is designing a strategy, based in part upon CDC's toolkit, to follow-up with people who are potentially out of care. This strategy will initially be implemented in fall 2014/winter 2015. Both CDC and North Carolina protocols utilize laboratory reports for recent CD4 cell count or viral load testing as a marker that an individual is in care.

In accordance with CDC "Data to Care" protocols, North Carolina DHHS staff will ascertain which surveillance data records lack laboratory reports. The results of the surveillance data analysis will be augmented by comparisons to CAREWare and ADAP data to supplement surveillance records that may lack documentation of laboratory reporting. This process is similar to the process used for the "unmet need" analysis. The resulting records will be distributed to state bridge counselors (SBC), who will follow-up and attempt to re-engage the person in care. SBC activities will be documented in CAREWare and surveillance data using existing, standardized protocols. The out-of-care investigation process will be repeated periodically to continually enhance re-engagement activities across the state.

Federally Funded Projects to Enhance Linkage, Retention, and Re-engagement in Care in North Carolina

North Carolina is currently part of two different federally funded, time-limited, multi-site projects that have interventions designed to enhance linkage, retention, and re-engagement in HIV care. Both are described in greater detail in Chapter 7: Integrated Program Activities (pages 109 to 113), however, they are briefly described below.

The first of the two projects, funded by HRSA through Part F of the Ryan White Program, is a Special Project of National Significance (SPNS), called SPNS-LINK. In North Carolina, SPNS-LINK has two interventions designed to strengthen and enhance linkage and re-engagement in care. First, SPNS-LINK has developed a Regional Bridge Counselor (RBC) program, whereby staff in a given RNCP work directly with clinics to determine which clients have not had a medical appointment within the past six to nine months. The RBCs then attempt to locate the patient and work with the patient to schedule another appointment and overcome any barriers to care that are ascertained while talking with the client. Secondly, SPNS-LINK has worked to enhance the SBC program through the development of standard protocols used by the SBCs in the field. Finally, SPNS-LINK has also developed protocols using CAREWare for communication between RBCs and SBCs, so that the efforts will work synergistically to bring people back into care. More information can be found in Chapter 7: Integrated Program Activities (pages 112 and 113).

The second federally funded project is called Care and Prevention in the United States (CAPUS) and is supported by five separate federal agencies. In North Carolina, five of the eight CAPUS interventions play a role in enhancing linkage, retention, and re-engagement in HIV care:

- Special Populations Bridge Counselor: CAPUS supports an SBC who specifically works with soon to be released prisoners in the state prison system to help them establish linkages to HIV care upon their release.

- Patient Navigators: CAPUS patient navigators work with minority clients to overcome and manage challenges that could potentially cause the person to drop out of HIV care.

- Men's Clinic: The CAPUS Men's Clinic, located in Raleigh, is intended to provide a welcoming environment especially for men of color to seek care. The clinic offers an array of services and extended hours of operation.

- Tele-Health: The CAPUS Tele-Health intervention uses innovative technology to foster mentoring and training of health care providers in more rural settings by infectious disease specialists. For clients living in rural areas who lack transportation to major medical centers, having trained providers in their local area could be an integral component to ensuring that they are retained in care.

- Provider Cultural Competency Trainings: CAPUS funds provision of cultural competency trainings for providers around the state. This program combats the issue of clients dropping out of care because they did not feel welcomed or supported by the staff at their provider's office.

For more information on the CAPUS program and other intervention strategies, please refer to Chapter 7: Integrated Program Activities (pages to 109 through 112).

HOUSING OPPORTUNITIES FOR PERSONS WITH AIDS (HOPWA)

The purpose of the housing opportunities for persons with AIDS (HOPWA) Program is to devise long-term comprehensive strategies for meeting the housing needs of individuals and their families who are living with HIV/AIDS.[17] The US Department of Housing and Urban Development (HUD) directly funds three Metropolitan Statistical Areas (MSA) in North Carolina, Charlotte MSA, Wake County, and Greensboro MSA. HUD provides these three MSAs with HOPWA services for their residents, and HUD

funds the state's HOPWA program to serve the remaining 88 counties. For someone to be eligible for HOPWA, he or she must be HIV-positive and have an individual or family income that does not exceed 80 percent of the area median income for the state of North Carolina and the county of residence. The services provided include, but are not limited to, short-term rent, mortgage and utility payments, tenant-based rental assistance, operating costs for licensed facilities, resource identification, housing information, and supportive services (e.g., case management, nutrition, and transportation). The ACP continues to seek opportunities to work with providers and organizations to provide housing services for those who are triply diagnosed (HIV infection, mental illness, and substance abuse issues). Additional information about HOPWA can be found in Appendix B: Data Sources (page B-7).

In CY 2013, approximately 1,654 clients received HOPWA services from the state-run HOPWA program. North Carolina's Tenant-Based Rental Assistance (TBRA) program served 232 clients, and the Short-term Rent, Mortgage, and Utility Assistance (STRMU) program served 785 clients. The clients served by the HOPWA program are able to improve their access to health care supportive services. The HOPWA program continues to collaborate with the Consolidated Plan Partners, Department of Community Assistance (CDBG Program), Office of Economic Opportunity (ESG Program), and the North Carolina Housing Finance Agency (HOME Investment Program), to assess the housing and community development needs and priorities of low- to- moderate-income individuals throughout the state. Also, the HOPWA program will continue as an active participant on the Inter-agency Council for Coordinating Homeless Programs.

CONCLUSION

Much work is being done in North Carolina to provide HIV positive residents with care, treatment, and housing. Multiple ongoing efforts are designed to identify gaps and room for improvement in HIV care provided statewide. Now and in the future, North Carolina DHHS is focused on continuing to address the identified gaps in care, with the goal of ensuring availability of care for as many North Carolinians living with HIV infection as possible.

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CHAPTER 5: BACTERIAL AND OTHER SEXUALLY TRANSMITTED DISEASES IN NORTH CAROLINA

SPECIAL NOTES

- *Syphilis cases in previous North Carolina HIV/STD Epidemiologic Profiles were reported to Centers for Disease Control and Prevention (CDC) based on the date the disease was reported to the local health department. In 2013, syphilis reporting changed to reflect the earliest date of diagnosis of the case; therefore, the case numbers for syphilis in the current profile will not match previous North Carolina HIV/STD Epidemiologic Profiles.*

REPORTABLE SEXUALLY TRANSMITTED DISEASES IN NORTH CAROLINA

In North Carolina, eight bacterial sexually transmitted diseases (STD) are reportable by law to the North Carolina Department of Health and Human Services (North Carolina DHHS). Statewide surveillance information is collected by the local health departments and sent to the North Carolina Division of Public Health. Reportable bacterial STDs in North Carolina are required to be reported to the local health department following the schedule below:

Within 24 hours	Within seven days
Chancroid	Chlamydia
Gonorrhea	Lymphogranuloma venereum
Granuloma inguinale	Nongonococcal urethritis (NGU)
Syphilis	Pelvic inflammatory disease (PID)

This chapter describes and provides statistics for chlamydia, gonorrhea, and syphilis, which are the three most frequently reported STDs in North Carolina. This chapter also includes other reportable STDs and four important but non-reportable STDs (human papillomavirus [HPV], genital herpes, trichomoniasis, and opthalmia neonatorum).

Table 5.1 displays STD cases in North Carolina in 2013. The majority of STDs reported were chlamydia, gonorrhea, and syphilis. These diseases are described in detail later in this chapter.

Table 5.1. North Carolina Reportable Bacterial Sexually Transmitted Diseases, 2013

Bacterial STDs	Gender		
	Male	Female	Total[a]
Chlamydia	11,256	37,144	48,417
Gonorrhea	6,115	7,541	13,665
Syphilis[b]	986	265	1,251
Primary Syphilis	*136*	*5*	*141*
Secondary Syphilis	*249*	*33*	*282*
Early Latent Syphilis	*200*	*54*	*254*
Latent Syphilis	*83*	*24*	*107*
Late Latent Syphilis	*311*	*149*	*460*
Late Syphilis with symptoms	*6*	*0*	*6*
Congenital Syphilis	*1*	*0*	*1*
Chancroid	0	0	0
Granuloma Inguinale	0	0	0
Lymphogramuloma Venereum	0	0	0
Total	**19,343**	**45,215**	**64,584**

Bacterial Syndromic Conditions			
Nongonococcal Urethritis (NGU)	4,799	N/A	4,799
Pelvic Inflammatory Disease (PID)	N/A	567	567
Total	**4,799**	**567**	**5,366**

[a]Total includes cases with unknown gender (N=26).

[b]All syphilis data is reported by date of diagnosis.

Data Source: North Carolina Electronic Disease Surveillance System (NC EDSS) (data as of May 5, 2014).

The other two reportable STDs in North Carolina in 2013, nongonococcal urethritis (NGU) and pelvic inflammatory disease (PID), are syndromic in nature. NGU and PID are diagnosed by symptom presentation and exclusion of other causative organisms. NGU is a diagnosis of exclusion that requires specific physical characteristics and the documented absence of *Neisseria gonorrhoeae*, the causative agent in gonorrheal urethritis. Although NGU is caused by several different organisms, *Chlamydia trachomatis* may be responsible for many; however, these NGU cases are not tested for chlamydia.[1] In 2013, a total of 4,799 cases of NGU were reported in North Carolina (Table 5.1).

Similarly, PID is a syndromic diagnosis with multiple possible causes. Many different types of microorganisms can cause PID; therefore, this STD is considered a polymicrobial infection. Most cases of PID are caused by gonorrhea and chlamydia. Sexually transmitted pathogens *N. gonorrhoeae* and *C. trachomatis* have frequently been identified among women with PID infection (one third to half of cases).[2] In 2013, 567 PID cases were reported in North Carolina (Table 5.1).

Three other rare bacterial STDs are reportable in North Carolina. In 2013, there were no reported cases for chancroid, lymphogranuloma venereum, or granuloma inguinale (Table 5.1). Chancroid is caused by *Haemophilus ducreyi*. Symptoms are a painful genital ulcer and tender suppurative inguinal adenopathy.[3] Lymphogranuloma venereum (LGV) is caused by a variant of *C. trachomatis.* The physical symptoms can include tender inguinal and or femoral lymphadenopathy, a lesion, proctocolitis, and other symptoms. The diagnostic criteria for LGV include *C. trachomatis* culture and serology.[3]

Granuloma inguinale is caused by *Klebsiella granulomatis*, and the symptom is a genital ulcer.[3] North Carolina DHHS investigates less than 10 possible cases of these conditions each year. Because these STDs are so rare, most clinicians have little experience in diagnosis and reporting. Therefore, it is possible that they are underreported.

CHLAMYDIA

Chlamydia Disease

Chlamydia is the most frequently reported bacterial STD both nationally and in North Carolina and is easily treated with antibiotics. Infections are caused by *C. trachomatis*, and when symptoms occur, they usually include discharge and painful urination. Most individuals have no symptoms at all.[4] Chlamydia and other STDs appear to increase susceptibility to human immunodeficiency virus (HIV) infection via inflammation, which increases the concentration of cells targeted by HIV in genital regions.[5] In addition, the infection can cause severe damage to the female reproductive tract, including infertility and PID.[4] Chlamydia in untreated pregnant women can result in problems during pregnancy; including preterm labor, premature rupture of the membranes surrounding the baby in the uterus, and low birth weight. The newborn may also become infected during delivery as the baby passes through the birth canal, leading primarily to eye and lung infections.[6] For this reason, CDC and North Carolina DHHS recommend that all sexually active females age 25 years and younger, as well as all pregnant women and older women with risk factors, such as new or multiple sex partners, be screened for chlamydia. No comparable screening programs exist for young men. For this reason, chlamydia reporting is always highly biased with respect to gender, with a higher number of cases detected and reported among women.

Chlamydia Reporting

North Carolina law states that all cases of chlamydial infection must be reported to the local health department within seven days. Laboratory confirmation of chlamydia takes place at a number of labs. Most public clinics send their samples to the North Carolina State Laboratory of Public Health (North Carolina SLPH). Laboratory-confirmed chlamydia results are returned to the provider, who reports them to the local health department. Infected patients are treated and encouraged to bring their partners in for treatment, but there is no formal partner notification procedure. Chlamydia cases for males are severely underreported due to the lack of screening in men. Data for females is more complete, although cases are still underreported and may be biased toward public clinics, which are more likely to screen and report cases. Morbidity reports of chlamydia are entered into the North Carolina Electronic Disease Surveillance System (NC EDSS). In 2013, 48,417 chlamydia cases were reported in North Carolina, a 4 percent decrease from 2012 (Table 5.1).

Chlamydia Trend Analysis

Gender

Women 24 years old and younger are routinely tested for chlamydia in some settings. This practice is referred to as screening. Due to this screening bias, the vast majority (consistently between 70% to 80%) of reported chlamydia cases are among females. Male cases are often detected when a female partner tests positive through screening and refers the male for testing and treatment. In previous years, the number of male cases reported increased along with female cases, however the proportions of each remained relatively consistent. Again, this increase was likely a factor of screening practices and surveillance reporting, not an alteration in morbidity. Comparing case rates from 2011-2013, male rates remained relatively stable but the rate of female cases decreased from 852.5 to 743.0.[7] This decrease is possibly due to a reduction in screening, not necessarily a decrease in morbidity.

Age

Due to screening practices, chlamydia is predominantly found in younger age groups. Since 2009, the highest rates for males are consistently found in the 20 to 24 year old age group, followed by 15 to 19 year olds. In 2013, the highest male rates were in 20-24 and 25-29 year olds. For females, the highest rates are in 15 to 19 year olds and 20 to 24 year olds. In 2013, the rate for females 20 to 24 years of age was the highest rate across all demographic groups (4,560.5 per 100,000 population).[7] For 2013, 20 to 24 year olds represented 41.6 percent of all cases reported in North Carolina.[7]

Race/Ethnicity

For 2013, roughly one-third of chlamydia reports were missing race/ethnicity information.[7] Chlamydia case reports reflect severe racial disparities that have remained relatively consistent during the past seven years. Historically, the rates among Black/African American males have been 9 to 12 times the rates for White/Caucasians. The rates for Hispanic/Latinos have been 3 to 4 times the rates for White/Caucasians. In 2013, the rate among Black/African American males (438.9 per 100,000 population) decreased to 9 times the rate for White/Caucasian (44.3 per 100,000 population), and the rate for Hispanic/Latino males (128.9 per 100,000 population) was approximately 3 times the rate for White/Caucasian.[7] The rate for American Indian/Alaskan Native males (158.7/100,000) was around 3 times greater than that for White/Caucasian.[7] The disparity for females is nearly as severe, with the Black/African American female rate (1,324.6 per 100,000 population) roughly 6 times the White/Caucasian female rate (217.5 per 100,000 population). The rate for American Indian/Alaskan Native females (926.1 per 100,000 population) was about 4 times the rate for White/Caucasian females, while the Hispanic/Latina female rate (581.6 per 100,000 population) was about 3 times the rate for White/Caucasian females.[7] These disparities are likely due to proportionally more use of public clinics by Black/African Americans and Hispanic/Latinos.

Geography

In North Carolina, chlamydia case reports are generally localized to urban communities. In 2013, 45.8 percent of chlamydia cases were reported from the six most populous counties in North Carolina (Mecklenburg, Wake, Forsyth, Guilford, Cumberland, and Durham Counties), the same percentage as

2012.[7] The highest rates of chlamydia cases for 2013 were found in Edgecombe (966.9 per 100,000 population) and Cumberland Counties (1,104.1 per 100,000 population).[7]

Chlamydia Prevalence Data

Since most county health departments in North Carolina do not have adequate laboratory facilities to process chlamydia samples, samples are sent to the North Carolina SLPH for testing. Information collected on both positive and negative tests from 95 counties is used for estimating prevalence as well as for program evaluation. County health clinics (STD, family planning, and obstetrics/gynecology [OB/Gyn]) in the 95 counties screen all sexually active women ages 24 and younger, all pregnant women, and women ages 25 and older with certain risk factors such as having multiple sexual partners. These data do not include tests from the five counties with the largest health departments (Durham, Forsyth, Guilford, Mecklenburg, and Wake), which follow the same screening practices, but conduct in-house testing. Figure 5.1 illustrates our public screening programs by comparing the number of chlamydia and gonorrhea tests performed at the North Carolina SLPH (for 95 counties) with the number of chlamydia and gonorrhea cases reported for the whole state (all 100 counties).

In 2004, the North Carolina SLPH switched from enzyme immunoassay (EIA) testing to the more sensitive nucleic acid amplification test (NAAT). The North Carolina SLPH tests for chlamydia and gonorrhea at the same time through a dual NAAT test. The testing data in Figure 5.1 indicates the dual testing performed at the North Carolina SLPH. This change to a more sensitive test caused an immediate increase in chlamydia positivity (from 5.4% to 8.8% among women within a single year). Positivity rates have remained fairly stable since 2004. While rates vary between clinic type, positivity rates are stable across each clinic type with the highest rates found in STD clinics at approximately 15 percent.

Figure 5.1. Chlamydia and Gonorrhea Tests Performed at North Carolina State Laboratory of Public Health and New Cases Reported, 2000-2013
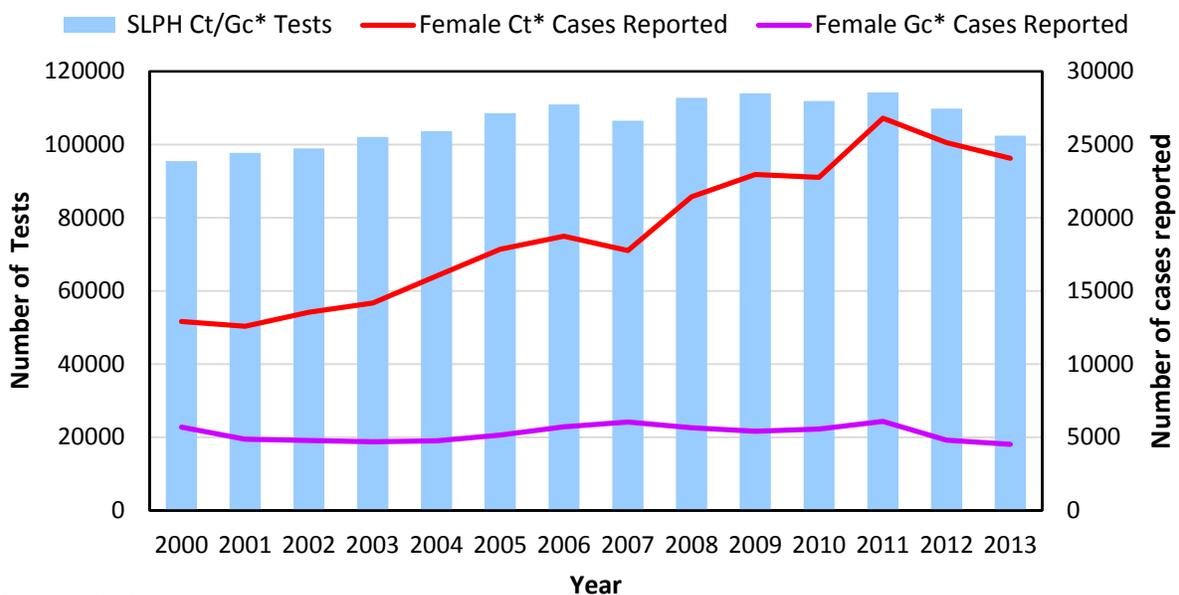
*Ct=chlamydia; Gc=gonorrhea.
Data Source: North Carolina State Laboratory of Public Health testing data (data as of January 29, 2014).

Determining whether the prevalence of chlamydial infection is changing is difficult because chlamydia reporting is dependent on screening practices. The North Carolina SLPH screening data provide an opportunity to examine this question by plotting the positivity rates over time among stable, screened populations. Figure 5.2 shows women screened in STD, family planning, and OB/Gyn clinics in the 85 county health departments. All sexually active women under 25 years of ages are offered testing. Positivity rates are highest among STD clinic patients and lowest among OB/Gyn patients, but overall positivity has not changed in the past five years.

Figure 5.2. Chlamydia Testing Positivity Rates among Females by Age and Clinic Type, 2009-2013
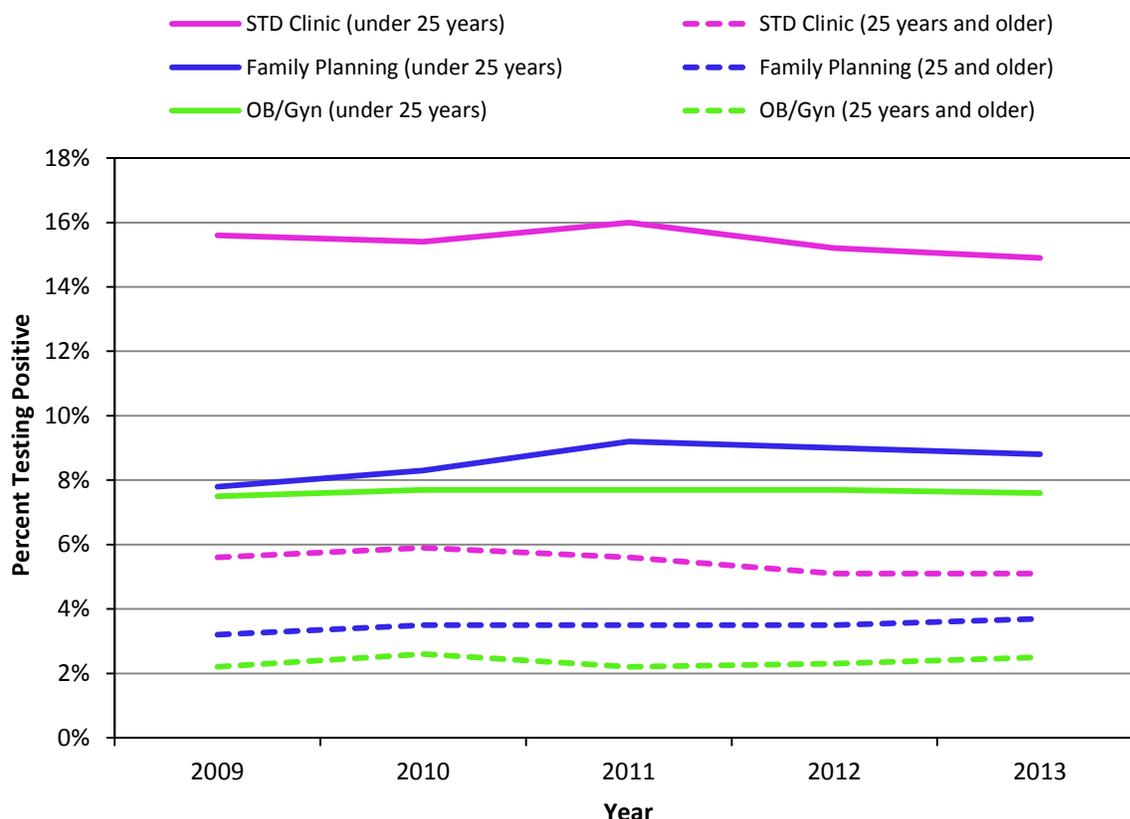
Data Source: North Carolina State Laboratory of Public Health testing data (data as of January 29, 2014).

GONORRHEA

Gonorrhea Disease

Gonorrhea is caused by the bacterium *N. gonorrhoeae.* Nearly all infected males experience symptoms of a gonorrheal infection, including discharge and burning on urination.[8] Many women also experience symptoms, although they may be mild. Like chlamydia, untreated gonorrhea can cause severe damage to the female reproductive tract, including PID and infertility, and facilitates the acquisition of HIV in both men and women.[9]

Gonorrhea Reporting

North Carolina law states that all cases of gonorrhea must be reported to the local health department within 24 hours. Laboratory confirmation of gonorrhea cases takes place at private or public labs, with most public clinics sending their samples to the North Carolina SLPH. Results are returned to the provider, who reports them to the local health department. Infected patients are treated and encouraged to bring their partners in for treatment, but like with chlamydia infection, no formal partner notification procedure is required. Morbidity reports of gonorrhea are then entered into NC EDSS. In 2013, 13,665 gonorrhea cases were reported in North Carolina (Table 5.1). In 2013, gonorrhea rates decreased slightly from 148.3 to 140.1 per 100,000 population.[7]

The majority of males experience symptoms associated with gonorrhea; therefore, they are relatively likely to seek care and be reported as cases. Public clinics and local health departments that screen young women for chlamydia also screen for gonorrhea since a single laboratory test (NAAT) is used for both infections. This combination testing contributes greatly to the detection of asymptomatic cases. For these reasons, gonorrhea surveillance data are far more complete and representative than data for chlamydial infection.[10]

Gonorrhea Trend Analysis

From 2007 to 2013, rates for gonorrhea ranged from 140.1 to 183.9 per 100,000 population.[7,11] The highest overall rate (183.9 per 100,000 population) was observed in 2007.[11] The slight fluctuations between years are likely the result of reporting issues and do not represent a discernible change in disease morbidity trend. Nationally, gonorrhea rates have remained fairly stable since 1996.[12] In North Carolina, from 2007-2013, the proportion of cases among women has ranged between 54.0 percent and 58.9 percent.[7] True increases (or decreases) may be masked by changes in screening practices, use of diagnostic tests with differing test performance, population shifts, and changes in reporting practices.

Gender

The gender bias in gonorrhea reporting is not as severe as that for chlamydia reporting. From 2004 to 2006, rates for males were consistently a bit higher than rates for females, with a stable male-to-female case ratio.[13] Since 2007, the female rate has gradually increased.[7,11,13]

Site of infection

Gonorrhea infection can also occur in the rectum and pharynx. Consistent testing of rectal and pharyngeal sites would assist in understanding total gonorrhea prevalence; however, the current diagnostic test of choice for gonorrheal infection (NAAT) has not been approved by the United States (US) Food and Drug Administration (FDA) for the diagnosis of extragenital gonorrhea.[14]

Age

Like chlamydia, gonorrhea is predominantly found in younger age groups, and rates by age group mirror those for chlamydia. For males, the highest rates are consistently found in the 20 to 24 year old age group, followed by 25 to 29 year olds and 15 to 19 year olds. In 2013, the rates for males were highest in

the 20 to 24 year old age group (630.1per 100,000 population). The rates for 25 to 29 year olds (382.3 per 100,000 population) were higher than the rates for 15 to 19 year olds (263.6 per 100,000 population).[7] Female gonorrhea rates in 2013 were also highest for 20 to 24 year olds (870.5 per 100,000 population), closely followed by the rates for 15-19 year olds (687.9 per 100,000 population).[7] The rates for 25 to 29 year old females were considerably less (396.2 per 100,000 population).[7] For the past seven years (2007-2013), individuals ages 15 to 24 represented 60.0 percent or more of all gonorrhea cases reported.[7,11,13] Targeted screening campaigns focused on this population may be responsible for the high percentage of reported cases in this age group.

Race/Ethnicity

Trends over time for racial/ethnic groups are difficult to determine because, in recent years, more reports are missing racial/ethnic information. The number of case reports with an unknown race/ethnicity increased from 24.5 percent in 2010 to 29.9 percent in 2013, so conclusions based on race/ethnicity are becoming increasingly questionable because the complete demographic picture is not submitted with every case.[7] Nonetheless, gonorrhea case reports, that include information on race/ethnicity, reflect severe racial/ethnic disparities, which have historically been most dramatic in males. In 2013, the gonorrhea rate among Black/African American males (333.8 per 100,000 population) was more than 15 times that of White/Caucasians (21.0 per 100,000 population). The rate among American Indian/Alaska Natives was 4 times (111.1per 100,000 population) greater than that of White/Caucasians (21.0 per 100,000 population).[7] Among women, the trends are similar but less pronounced; in 2013, the Black/African American rate (356.6 per 100,000 population) was 12 times the rate for White/Caucasians (30.0 per 100,000 population) and was the highest rate across all racial/ethnic groups. The rate for American Indian/Alaskan Native females (175.7 per 100,000 population) was 6 times the rate for White/Caucasians.[7]

Geography

As with chlamydia cases, gonorrhea cases are generally localized within urban communities. In 2012 and 2013, 52 percent of gonorrhea cases were reported from the six most populous counties (large metro communities) in North Carolina (Mecklenburg, Wake, Forsyth, Guilford, Cumberland, and Durham Counties).[7] In 2013, the highest rate of reported gonorrhea was in Cumberland County (369.1 per 100,000 population), and the second highest rate was in Scotland County (343.5 per 100,000 population).[7]

Gonorrhea Prevalence Data

When the North Carolina SLPH switched chlamydia testing from EIA to NAAT in 2004, North Carolina gained a comprehensive gonorrhea screening program. Up to that point, gonorrhea screening had place in county health departments. The culture tests were performed locally and with varying levels of expertise. The NAAT test is a combined chlamydia and gonorrhea test, so all women screened for chlamydia are also tested for gonorrhea. Reported gonorrhea cases are less dependent upon screening practices than chlamydia, but examining the screened populations over time is still useful. Positivity rates by clinic type are shown in Figure 5.3 and reflect sexually active women under age 25, screened in 95 county health departments. As with chlamydia, rates are highest among STD clinic patients and

lowest among OB/Gyn patients. Positivity rates of patients seen at STD clinics have been decreasing since 2011.

Figure 5.3. Gonorrhea Testing Positivity Rates among Females by Age and Clinic Type, 2009-2013
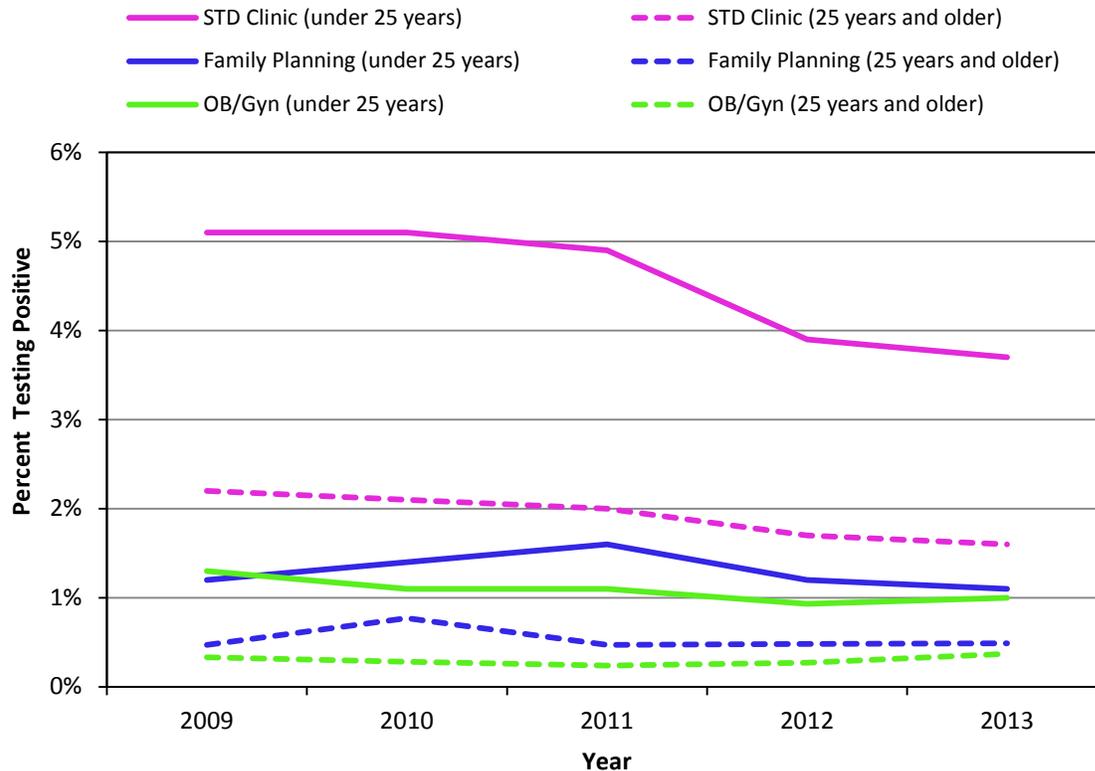
Data Source: North Carolina State Laboratory of Public Health testing data (data as of January 29, 2014).

Gonococcal Isolate Surveillance Project

The Gonococcal Isolate Surveillance Project (GISP) is a collaborative project between CDC, selected health departments, and five regional laboratories. The project was established in 1986 to monitor trends in antimicrobial susceptibilities of strains of *N. gonorrhoeae* in the US in order to establish a rational basis for the selection of gonococcal therapies. *N. gonorrhoeae* isolates are collected from the first 25 men with urethral gonorrhea attending STD clinics each month in 29 cities in the US The men are asked a number of behavioral questions and the samples are tested for resistance to a variety of antibiotics at one of the five regional laboratories. The project includes one site in North Carolina, originally located at Fort Bragg from 1998 to 2001. In mid-2002, the participating clinic was changed to a location in Greensboro, North Carolina. More information about the GISP can be found in Appendix B: Data Sources (page B-10).

The most recent data provided by the CDC are 2012 data based on men tested at the Greensboro site. Ninety-one percent of the men tested were Black/African American; 44 percent were age 20 to 24 years with another 16 percent age 25 to 29 years. Six percent of participants reported identifying as men who had sex with men. Gonococcal resistance to penicillin, ciprofloxacin, and/or tetracycline was detected in 36 percent of the samples, an increase from 21 percent of samples in 2011.[15]

SYPHILIS

Please note the numbers of syphilis diagnoses are periodically updated due to completion of case information, as these are reported by date of diagnosis (not date of report, like chlamydia or gonorrhea). Readers are encouraged to use this profile for the numbers for previous years, as opposed to prior publications.

Syphilis Disease

Syphilis is a complex disease with a natural history encompassing a number of different stages and caused by the spirochete bacterium *Treponema pallidium*.[16] Early stages are the most infectious and the focus of public health activity; however, six stages   are reportable to CDC. This report will describe the early stages of syphilis.

Early Syphilis	Late Syphilis
Primary Syphilis	Latent Syphilis of unknown duration
Secondary Syphilis	Late Latent Syphilis
Early Latent Syphilis	Late Syphilis with symptoms

The different stages of syphilis have different implications for transmission of the disease. Patients in the primary or secondary stages of syphilis are most likely to have noticeable symptoms, such as a chancre or rash, and to present for treatment. These stages are also the most infectious and, therefore, of the greatest concern for sexual transmission. Early latent syphilis does not have symptoms. Patients in the asymptomatic early latent stage are also infectious to their sexual partners, although less so than in the primary or secondary stages of disease.[16] Such cases are generally found through screening or partner notification. Primary, secondary, and early latent stages all occur within the first year of infection. These stages are often grouped together when discussing infectious syphilis and are collectively called early syphilis or PSEL. If a case progresses past the early latent stage, the infection moves into a stage known as late syphilis. Late syphilis cases are detected and reported in several different ways. Some patients with late syphilis develop symptoms, while others are detected through screening or partner notification. Patients of either sex are not likely to be infectious to their sexual partners beyond the early latent stage, but finding these cases is still important, as long term outcomes of syphilis can be severe.[16] In addition, pregnant women can pass congenital syphilis to their infants at any stage.[17]

Syphilis Reporting

North Carolina law states that all cases of syphilis must be reported to the local health department within 24 hours, and patients are generally treated quickly. However, syphilis testing and case investigation can take several weeks. Each individual with a reactive syphilis test must be investigated thoroughly to determine (a) if the infection is new or failed treatment of an old infection, and if new, (b) the stage of the disease. The investigation, conducted by local or regional health department personnel, can take days or weeks. Contact tracing and partner notification are also initiated for probable syphilis cases, and partner information often helps with diagnosing the stage of the infection.

Syphilis reporting, even from private providers, is believed to be quite good, likely due to the severity and rarity of syphilis compared to other STDs. Data on primary and secondary syphilis cases are particularly complete because diagnosis of these stages of syphilis requires documentation of specific physical symptoms (such as chancre for primary syphilis and a rash on palms of hands and soles of feet for secondary syphilis). Reporting is not as complete for latent cases because many are asymptomatic and are only found through screening. Latent syphilis case reporting may be biased toward groups that receive syphilis screening (pregnant women, jail inmates, and others). Distinguishing between the various latent stages of syphilis (early latent, late latent, latent of unknown duration) is slightly more difficult than distinguishing between primary and secondary stages, so the stage of the infection may be misdiagnosed in some cases. In North Carolina, the case classification is reviewed carefully by expert staff. Thorough contact tracing and partner notification activities greatly reduce reporting bias by locating and reporting partners with asymptomatic infections who may not have otherwise been found.

Until late 2012, North Carolina DHHS syphilis morbidity data management and reporting occurred in the Sexually Transmitted Disease Management Information System (STD*MIS) statewide database, and partner service investigations were stored separately in regional databases. During December 2012, all syphilis morbidity, reporting, and partner data were integrated into one statewide surveillance system, NC EDSS. Extensive person and event deduplication efforts took place as STD*MIS data were merged into NC EDSS. The change to NC EDSS introduced new procedures for staff to learn and transition time from one system to the next. Syphilis data from late 2012 and early 2013 should be interpreted with the knowledge that normal operating procedures were interrupted during data conversion. For more information about NC EDSS, please see Appendix B: Data Sources (page B-8).

Syphilis Trend Analysis

In 2009, North Carolina experienced a significant outbreak of new syphilis cases. Eight hundred seventy-three (873) new cases of early syphilis (primary, secondary, and early latent) were reported. The 2009 syphilis morbidity represented a 58.4 percent increase in reported cases compared to 551 in 2008.[7] Increases in morbidity were noted for almost all demographic groups as well as among persons infected with HIV. In 2010 and 2011, 708 cases of early syphilis were reported in North Carolina each year.[7] In 2012, 561 cases of early syphilis were reported in North Carolina, a 20.7 percent decrease from 2011. In 2013, North Carolina reported 677 early syphilis cases, and the overall rate was 6.9 per 100,000 population (Figure 5.4).[7]

Gender

Early syphilis rates among males began to rise substantially in 2004 and continues to rise. This gender-specific increase is indicative of increasing transmission among men who have sex with men (MSM). In 2013, male cases represented roughly 86 percent of the 677 early syphilis reports. The male-to-female ratio (based on rate) was 6.8.[7] The rate of male early syphilis cases in 2013 increased from 10.5 in 2012 to 12.3 per 100,000 males in 2013. The rate of female early syphilis cases increased from 1.3 in 2012 to 1.8 cases per 100,000 in 2013.[7] Figure 5.4 represents the number of early syphilis cases in North Carolina from 2007 to 2013 by gender.

Figure 5.4. North Carolina Early Syphilis (Primary, Secondary, and Early Latent Syphilis) Infections by Gender, 2007-2013
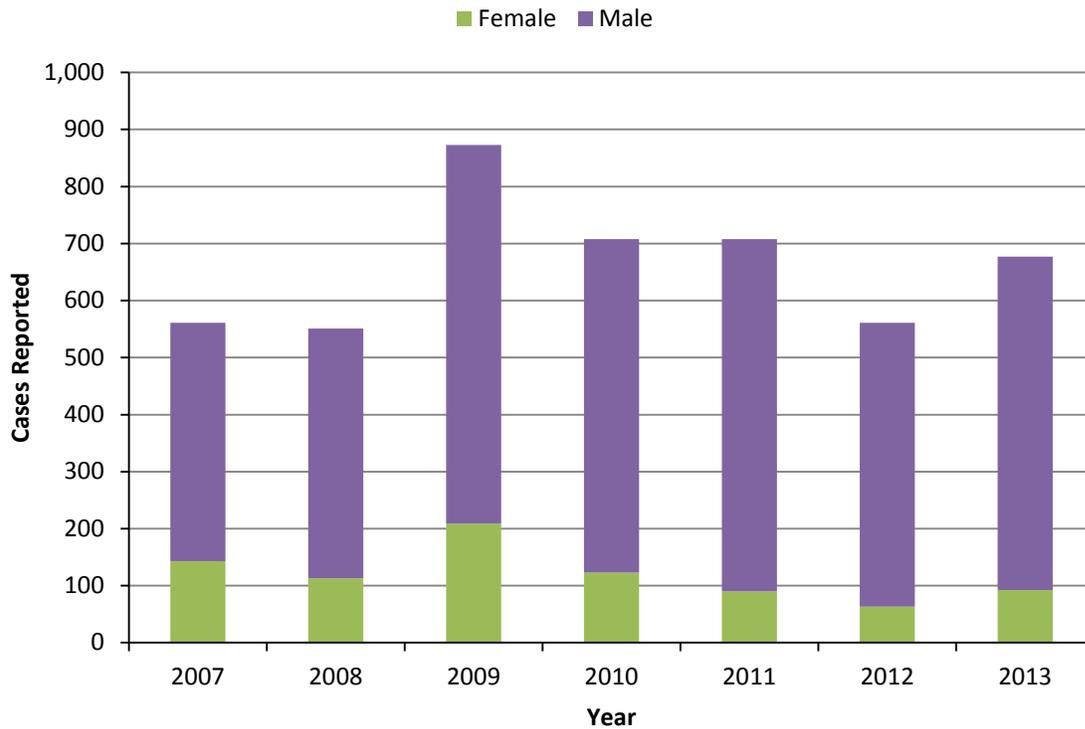
Data Source: North Carolina Electronic Disease Surveillance System (NC EDSS) (data as of May 5, 2014).

Age

In 2013, 20 to 24 year old males had the highest syphilis rate (43.8 per 100,000 population) across all age and gender groups followed closely by 25 to 29 year old males (38.4 per 100,000 population) and 30 to 34 year old males (24.0 per 100,000 population).[7] The highest rate for females was among those ages 20-24 (9.7 per 100,000 population). Chlamydia and gonorrhea rates are highest in young adults and then quickly drop off as patient age increases. With early syphilis, the trend is different. Males aged 40 years and older have a combined rate of 32.5 per 100,000 population.[7] Figure 5.5 represents the number of cases of early syphilis infections reported in North Carolina among males by age group.

Figure 5.5. North Carolina Early Syphilis (Primary, Secondary and Early Latent Syphilis) Infections among Males by Age at Diagnosis (Year), 2007-2013
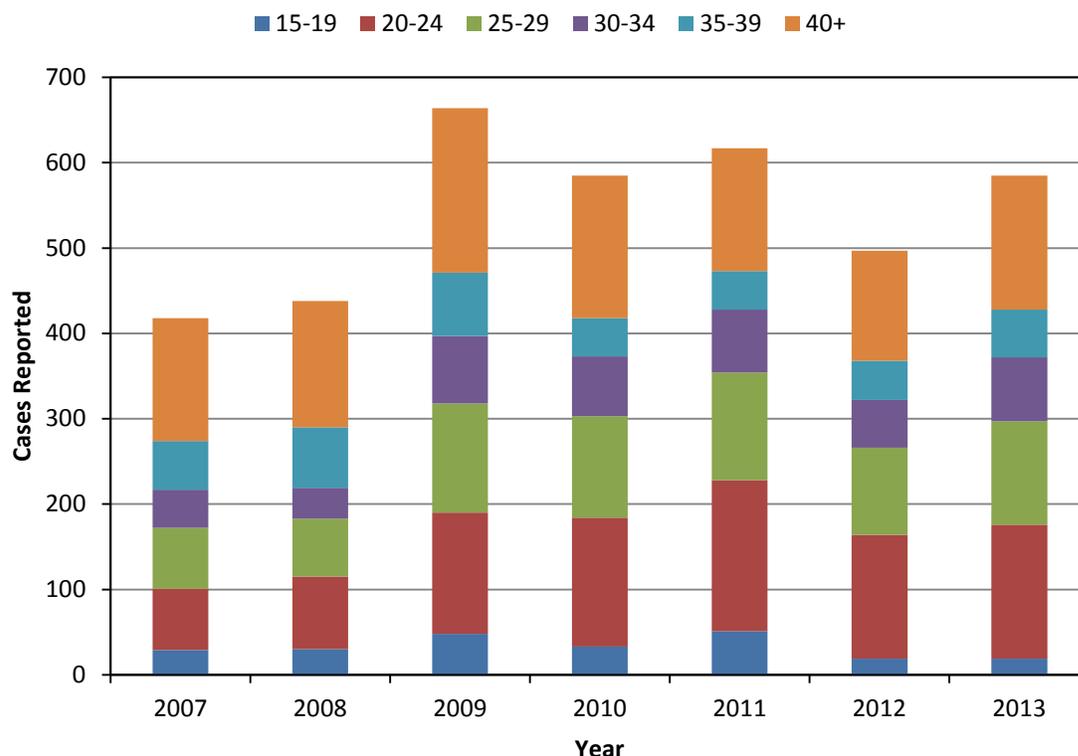
Data Source: North Carolina Electronic Disease Surveillance System (NC EDSS) (data as of May 5, 2014).

Race/Ethnicity

During the 2009 syphilis outbreak, increases in early syphilis rates were observed for almost all racial/ethnic groups. Overall, however, syphilis disproportionately affects minority populations in North Carolina, especially the Black/African American population. Syphilis rates for Black/African American and Hispanic/Latinos are many times higher than for White/Caucasians. Syphilis reporting is generally very good in North Carolina, so this disparity is probably not due to reporting or testing biases. Racial and ethnic disparities in syphilis rates are likely the result of a complex combination of poor access to health care, poverty, and the dynamics of sexual networks.[18]

For Black/African American males, the rate was 37.7 per 100,000 population (about 8 times the White/Caucasian rate of 4.9 per 100,000 population), and for Hispanic/Latino males the rate was 5.5 per 100,000 population.[7] For females, the 2013 early syphilis rate for Black/African females was 5.9 per 100,000 population, nearly 20 times the rate in White/Caucasian females (0.3 per 100,000 population).[7]

In 2013, Black/African Americans represented 65.8 percent of early syphilis case reports, while reports for White/Caucasians comprised 24.1 percent, and Hispanic/Latino reports comprised 4.7 percent.[7] The trend since 2009 indicates that overall Black/African American case reports are decreasing. While White/Caucasians slowly decreased from 20.0 to 16.9 percent from 2009 to 2010, in 2013, the trend returned to 2009 percentages, mirroring trends seen in throughout the US.[7,19] Additional changes in racial/ethnic breakdown are mostly likely due to better reporting practices and the ability to capture

persons who identify as multi-racial.[7] As seen below, in Figure 5.6, the majority of early syphilis infections in men since 2007 have been reported among Black/African American and White/Caucasian populations.

Figure 5.6. North Carolina Early Syphilis (Primary, Secondary and Early Latent Syphilis) Infections among Males by Race/Ethnicity, 2007-2013
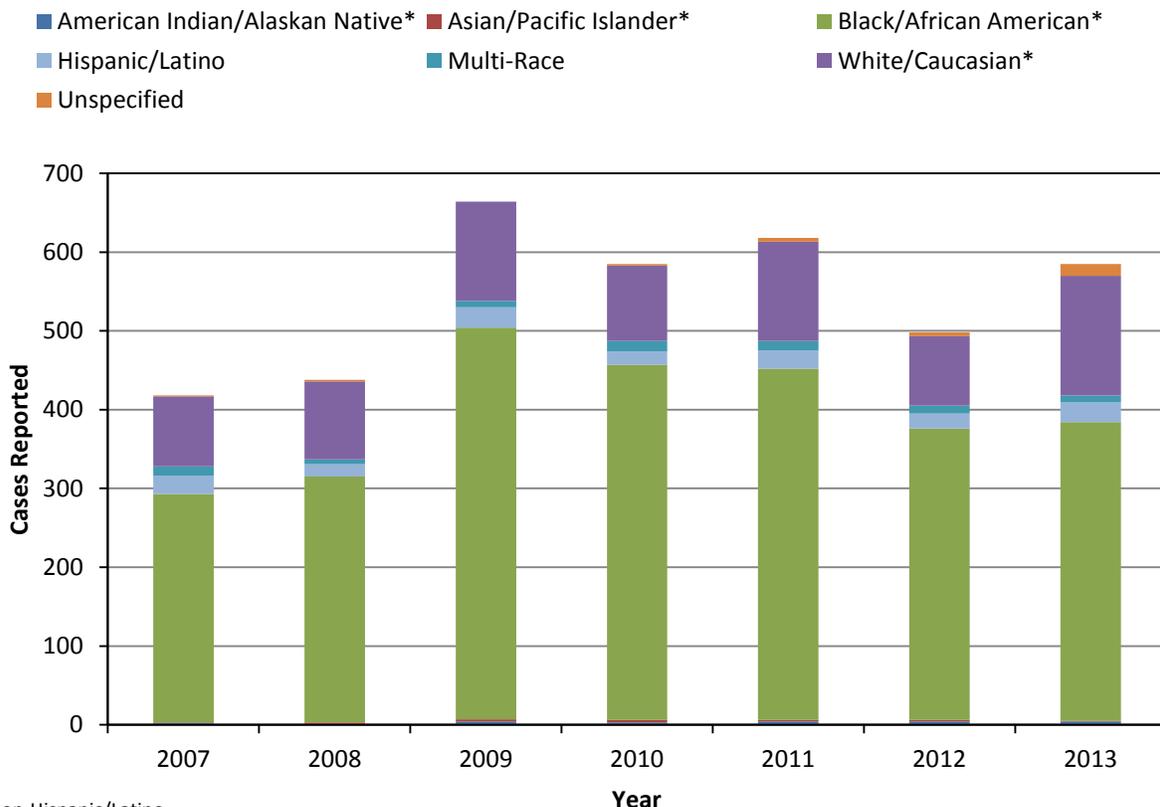
*Non-Hispanic/Latino.
Data Source: North Carolina Electronic Disease Surveillance System (NC EDSS) (data as of May 5, 2014).

Geography

The increase in syphilis cases in 2009 occurred throughout the state and included many counties along Interstate Highways 40 and 85 and several eastern counties. In 2009, the counties of Forsyth, Mecklenburg, Wake, Guilford, Wayne, and Durham each contributed at least 40 or more new early syphilis cases to the overall morbidity of the state.[7] Most counties reported fewer early syphilis cases in 2010 compared to 2009, with further declines in 2011. Notable exceptions include Guilford (63 cases in 2009, 102 in 2011) and Mecklenburg (165 cases in 2009, 174 in 2011) counties.[7] In 2013, 65.8 percent of early syphilis cases were reported from the six most populous counties (large metro communities) in North Carolina (Mecklenburg, Wake, Forsyth, Guilford, Cumberland, and Durham counties).[7] Durham County had the highest rate at 16.1 per 100,000 population, and Mecklenburg County had the second highest rate at 15.6 per 100,000 population.[7]

Congenital Syphilis

Untreated syphilis in pregnant women results in infant death in up to 40 percent of cases.[17,20] An infected baby born alive may not have any signs or symptoms of disease. However, if not treated immediately, the baby may develop serious problems within a few weeks. Untreated babies may become developmentally delayed, have seizures, or die.[17] Women with early syphilis are most likely to infect their fetuses in uteri or during delivery, but women with late latent syphilis can also have congenitally infected infants.[20] An estimated 60 to 80 percent of pregnant women with early syphilis will pass syphilis on to their baby via the placenta if left untreated.[21]

Children can be diagnosed with congenital syphilis within two age categories: early congenital syphilis (diagnosed under age 2) and late congenital syphilis (diagnosed over age 2).[21] Under current CDC case definitions, infants whose mothers receive treatment for syphilis less than 30 days prior to delivery are still classified as congenital syphilis cases, regardless of whether the child displays symptoms.[3]

North Carolina currently reports few cases of congenital syphilis. In 2012, two infants were born to mothers who had active or inadequately treated cases of syphilis. In 2013, one infant was diagnosed with congenital syphilis (Figure 5.7). Due to delays in reporting and confirming congenital syphilis diagnoses, this number should be considered preliminary. Ten cases of congenital syphilis were reported in 2010 and five cases in 2011 (Figure 5.7). While the trend is decreasing, congenital syphilis reporting must be watched closely to ensure pregnant women are receiving appropriate prenatal care and no congenital syphilis case is left undetected.

Figure 5.7. North Carolina Congenital Syphilis Infections by Year of Birth and Race/Ethnicity, 2004-2013
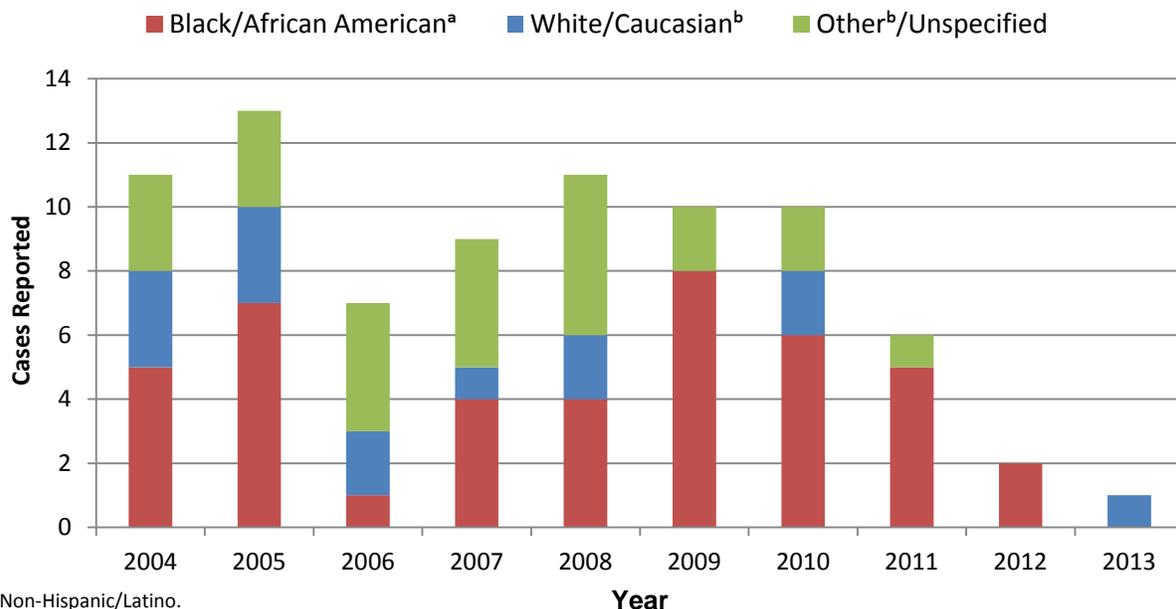
[a]Non-Hispanic/Latino.
[b]Includes American Indian/Alaska Natives, Asian/Pacific Islanders, and Hispanic/Latinos.
Data Source: North Carolina Electronic Disease Surveillance System (NC EDSS) (data as of May 5, 2014).

North Carolina law states that medical providers are to test all pregnant women for syphilis between 28-30 weeks gestation and again at delivery for women at high risk for syphilis. Women who do not receive adequate prenatal care services often miss these opportunities for screening. Mothers of infants with congenital syphilis in North Carolina either lack access to treatment that can prevent the transmission of syphilis or they are not accessing prenatal care. These women pose a special challenge to public health and the goal of eliminating congenital syphilis in North Carolina. In an effort to prevent congenital syphilis cases, the HIV/STD Surveillance Unit has recently initiated an in depth review of all congenital syphilis cases to better understand risk factors and determine if missed screening is the main factor in North Carolina cases.

NON-REPORTABLE SEXUALLY TRANSMITTED DISEASES IN NORTH CAROLINA

Some additional common or important sexually transmitted infections are tracked when reported in North Carolina, although reporting is not required by law. The following section will explain the significance of four non-reportable STDs: HPV, genital herpes, trichomoniasis, and opthalmia neonatorum.

Human Papillomavirus (HPV)

Genital HPV is the most common sexually transmitted infection.[22] More than 40 strains of HPV can be sexually transmitted. Most strains produce no symptoms in infected individuals, but there are a few strains associated with genital warts and others associated with the development of cancer in both females and males.[23] Since most infected people are asymptomatic, extensive screening would be required to diagnose the majority of infections. Screening is costly and most infected people have no detectable health outcomes associated with HPV infection. However, virtually all cervical cancers are caused by high-risk genotypes of HPV.[22] Several professional organizations strongly recommend cervical cancer screening, although those recommendations vary slightly by organization. Current screening efforts focus on the detection of cancer, in particular cervical cancer in females, rather than on HPV infection. The most recent data available shows that roughly 350 cases of cervical cancer are reported in North Carolina, annually.[24] Specific screening guidelines for HIV-positive women exist. Providers caring for HIV-positive women should make themselves familiar with those recommendations.

Currently, there are two vaccines licensed by the US FDA to protect against HPV infection. One vaccine protects against four HPV strains, two that cause roughly 90percent of genital warts (types 6 and 11), and two that cause 70 percent of cervical cancer (types 16 and 18). This vaccine is recommended for use in females ages 9 to 26 years.[25,26] Pap smear and HPV deoxyribonucleic acid (DNA) or antibody testing is not required prior to immunization; however, immunization against HPV is NOT curative for existing disease or infection. HPV vaccination with the quadrivalent vaccine is protective against genital warts and anogenital cancers in females.[25]

HPV infection is also associated with anal intraepithelial neoplasia (AIN); high-grade AIN is a precursor lesion for anal cancer analogous to lesions observed in the cervix. Currently, the Advisory Committee for Immunization Practices (ACIP) recommends the quadrivalent HPV vaccination series for males ages 11 to 21 for the prevention of HPV-associated anal and oropharyngeal cancers.[27]

Genital Herpes

The CDC estimates that one out of six people in the US, ages 14 to 49, have a genital herpes simplex virus 2 (HSV-2) infection.[28] Currently in North Carolina, herpes is not reportable for a number of reasons. Historically, good diagnostic tests have not been available. Reporting requirements may change in the future, given that testing procedures have improved and new evidence indicates that HSV-2 infection may increase susceptibility to HIV infection. HSV-2 infection is more common in women than in men, but transmission from an infected male to a female partner is more likely than from an infected female to a male partner.[28] Symptoms are most severe immediately following the initial infection and subsequent outbreaks decrease in severity. A rare but extreme consequence of genital herpes is transmission to newborns during birth.[28]

An estimated 16.1 percent of the US population has serological evidence of herpes infection.[29] Asymptomatic shedding of the virus is not uncommon. Many infected patients are unaware of being infected and represent a source of transmission in the community.[28]

Since active disease causes ulcerative lesions, herpes infection is believed to increase the risk of HIV transmission and acquisition.[28] However, the US Preventive Services Task Force recommends against routine serological screening for herpes in asymptomatic persons.[30]

The diagnosis of HSV infection can be confirmed by viral culture, polymerase chain reaction (PCR), direct fluorescence antibody, Tzanck preparation, and type-specific serologic tests. The choice of test varies with the clinical presentation. Treatment and prophylaxis options are available.[27]

Trichomoniasis

Trichomoniasis is caused by the protozoan *Trichomonas vaginalis* that affects about 3.7 million patients annually in the US.[31] Symptoms can include urethritis in males and diffuse malodorous vaginal discharge with vulvar irritation in females; asymptomatic infection also occurs. Diagnosis is most commonly made in women using wet mount microscopy, antigen testing, or culture of vaginal discharge. Among men, microscopy performs poorly. PCR of urine samples is approved by the US FDA.[32]

Some studies have suggested that vaginal trichomoniasis is a risk factor for HIV acquisition.[33] In pregnant women, adverse pregnancy outcomes are associated with infection including premature rupture of membranes and low birth weight infants. Trichomoniasis usually responds to a single dose of metronidazole or tinidazole, although resistance to treatment can occur. Partner treatment is necessary to prevent re-infection.[31]

Ophthalmia Neonatorum

Ophthalmic infection (also known as neonatal conjunctivitis) with *N. gonorrhoeae* or *C. trachomatis* can occur in infants when a pregnant woman has an untreated case of gonorrhea or chlamydia. During delivery, the infant's eyes can become infected with either bacterium.[34] In the past, ophthalmia neonatorum was reportable by law in North Carolina. Currently, cases are reported because positive lab tests for *N. gonorrhoeae* and *C. trachomatis* are reportable. Cases are reviewed to detect repeated ophthalmia neonatorum in a delivery hospital, which may indicate imperfect practice.

CHAPTER 6: HIV COMORBIDITIES IN NORTH CAROLINA

Comorbidity refers to two or more disorders or illnesses occurring within the same person at the same time. Our measurement of comorbidity is subject to imperfect reporting, and we measure comorbidity differently for each disease, as detailed in the sections below. Due to behaviors and environmental conditions that increase risk for multiple diseases, individuals infected with human immunodeficiency virus (HIV) are at increased risk for comorbid infections such as viral hepatitis, syphilis and tuberculosis (TB). The presence of comorbid infections can detrimentally impact both the health and life expectancy of HIV-positive individuals. HIV-positive persons with comorbidities may need special care and treatment. Therefore, surveillance of HIV comorbidities is very important.[1] The North Carolina Division of Public Health has a fully integrated electronic disease surveillance system, North Carolina Electronic Disease Surveillance System (NC EDSS), which allows for the rapid identification of HIV-positive individuals experiencing or at risk for overlapping epidemics. This chapter will explore HIV comorbidities of syphilis, TB, hepatitis B (HBV), and hepatitis C (HCV).

SYPHILIS AND HIV

Background

Syphilis is a complex disease, caused by the bacterium *Treponema palladium*, with a natural history encompassing a number of different stages (primary, secondary, early latent, latent with unknown duration, late latent, and late with symptoms).[2] The different stages of syphilis have different implications for transmission of the disease. Patients in the primary or secondary stages of syphilis are most likely to have noticeable symptoms, such as a chancre or rash. These stages are also the most infectious and, therefore, of the greatest concern for sexual transmission. Early latent syphilis does not have symptoms. Patients in the asymptomatic early latent stage are also infectious to their sexual partners, although less so than in the primary or secondary stages of disease.
These symptoms can manifest differently in HIV-positive individuals and can increase the chances of developing neurological manifestations.[2] For more information about syphilis, please see Chapter 5: Bacterial and Other Sexually Transmitted Diseases (pages 85 through 91).

When an individual has syphilis, there is an estimated two- to five-fold increase risk of becoming infected with HIV, if exposed to the virus.[3] This increase is due to ulcers, associated with a syphilis infection, that can disrupt barriers that provide protection against infection. These ulcers can then bleed, which increases susceptibility to HIV, when in contact with oral or rectal mucosa.[2] In 2013, there were 56,471 reported syphilis cases in the United States (US), with 17,535 of those cases being primary and secondary syphilis (the earliest and more infectious stages of syphilis). The majority of primary and secondary syphilis cases were reported among men who have sex with men (MSM) and men aged 20 to 29 years old.[2] This young MSM population is where we are seeing the majority of new HIV diagnoses each year in North Carolina. For more information about young MSM and HIV, please see Chapter 2: Scope of HIV Infection Epidemic in North Carolina (pages 27 and 28).

Treatment of syphilis in an HIV-infected individual depends on the stage of syphilis. If the HIV-positive individual is infected with early syphilis (primary, secondary, or early latent syphilis), treatment guidelines recommend treating as if the person is HIV-negative.[4] For one with a latent stage of syphilis, it

is important to examine the cerebrospinal fluid before treatment. The most common treatment for syphilis in those that are HIV-positive is a penicillin G regimen.[4]

Syphilis and HIV in North Carolina

The North Carolina Communicable Disease Branch supports free and confidential testing for HIV and other sexually transmitted diseases (STD). Because of shared risk behaviors and modes of transmission, the Communicable Disease Branch mandates that all local health departments provide comprehensive on-site STD diagnostic and treatment services to all clients seeking STD services. This service includes ensuring that clients are evaluated and screened for all possible STDs at the time of their clinic visit. For example, clients who present to the clinic requesting HIV testing will also be evaluated and tested for other related STDs, such as syphilis, gonorrhea, and chlamydia.

We defined HIV and early syphilis co-infection as having an HIV diagnosis prior to (prevalent) or within six months (newly diagnosed) of the syphilis diagnosis. The total early syphilis infections over the last 14 years are shown in Figure 6.1. The proportions of early syphilis cases in North Carolina noted in this section were calculated from the overall totals of early syphilis cases presented in the figure below (Figure 6.1).

Figure 6.1. North Carolina Early Syphilis (Primary, Secondary, and Early Latent Syphilis) Infections by Gender, 1999-2013
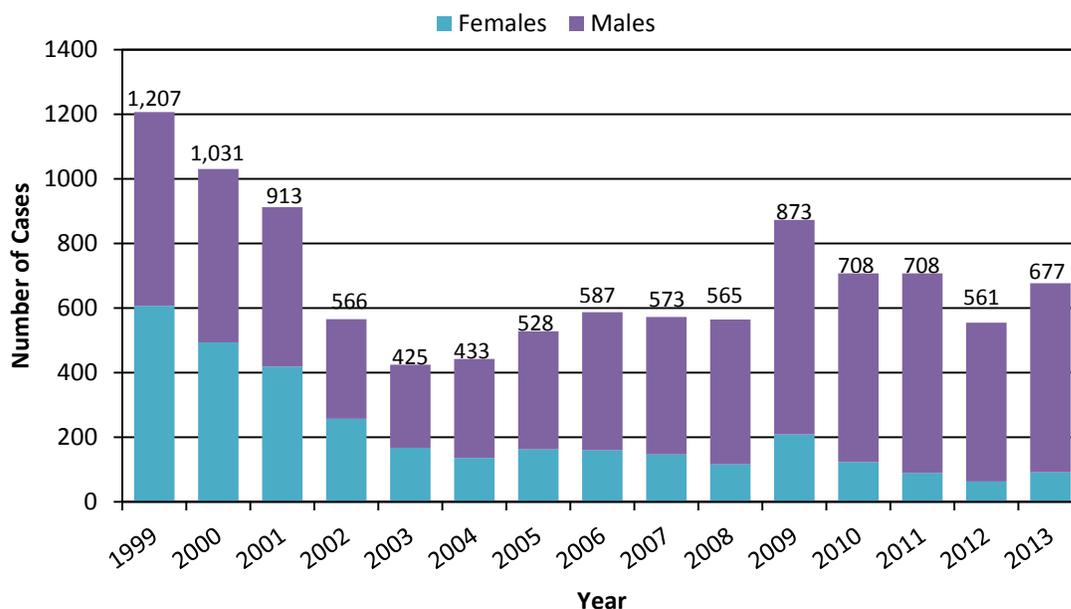
Data sources: North Carolina Electronic Disease Surveillance System (NC EDSS) (data as of May 5, 2014)

The proportion of individuals infected with both syphilis and HIV has increased in North Carolina in recent years. In 1999, the proportion of all individuals diagnosed with early syphilis who were co-infected with HIV was 5.1 percent (N=1,207). While the number of individuals with early syphilis reported in 2003 was less than half of the number reported in 1999, the overall percent of early syphilis cases co-infected with HIV rose to 13.9 percent (N = 425). Since that time the proportion of early syphilis

cases that were co-infected with HIV has continued to rise, at 30.5 percent in 2007 and 40.3 percent in 2013 (N=573 and N=677, respectively) (Figure 6.2).

Figure 6.2. North Carolina Early Syphilis (Primary, Secondary, and Early Latent Syphilis) Co-Infections with HIV*, 1999-2013
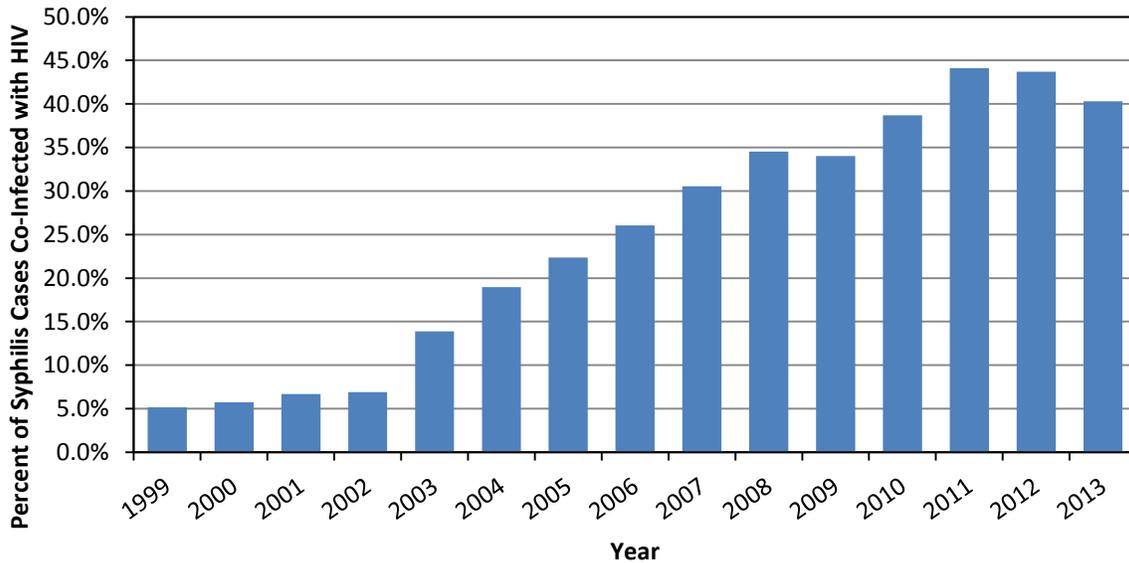
*Co-infection defined as having a syphilis diagnosis and having an HIV diagnosis prior to or within six months of the syphilis diagnosis. Data sources: North Carolina Electronic Disease Surveillance System (NC EDSS) (data as of May 5, 2014) and enhanced HIV/AIDS Reporting System (eHARS) (data as of July 1, 2014).

The increasing proportion of early syphilis cases co-infected with HIV is especially pronounced among males. In 1999, the proportion of males co-infected with early syphilis and HIV infections was 6.5 percent (N=600) compared to only 3.8 percent (N=607) among females. By 2003, these percentages had increased to 19.5 percent (N=257) for males compared to 5.4 percent (N=168) for females. In 2011, the proportion of early syphilis cases co-infected with HIV rose to 49.5 percent (N=618) among males and 9.5 percent (N=90) among females. Whereas the proportion of early syphilis cases co-infected with HIV among women significantly decreased to 2.2 percent (N=92) in 2013, among males the proportion has decreased only slightly to 46.3 percent (N=585) (Figure 6.3).

Figure 6.3. North Carolina Early Syphilis (Primary, Secondary, and Early Latent Syphilis) Co-Infections with HIV* by Gender, 1999-2013
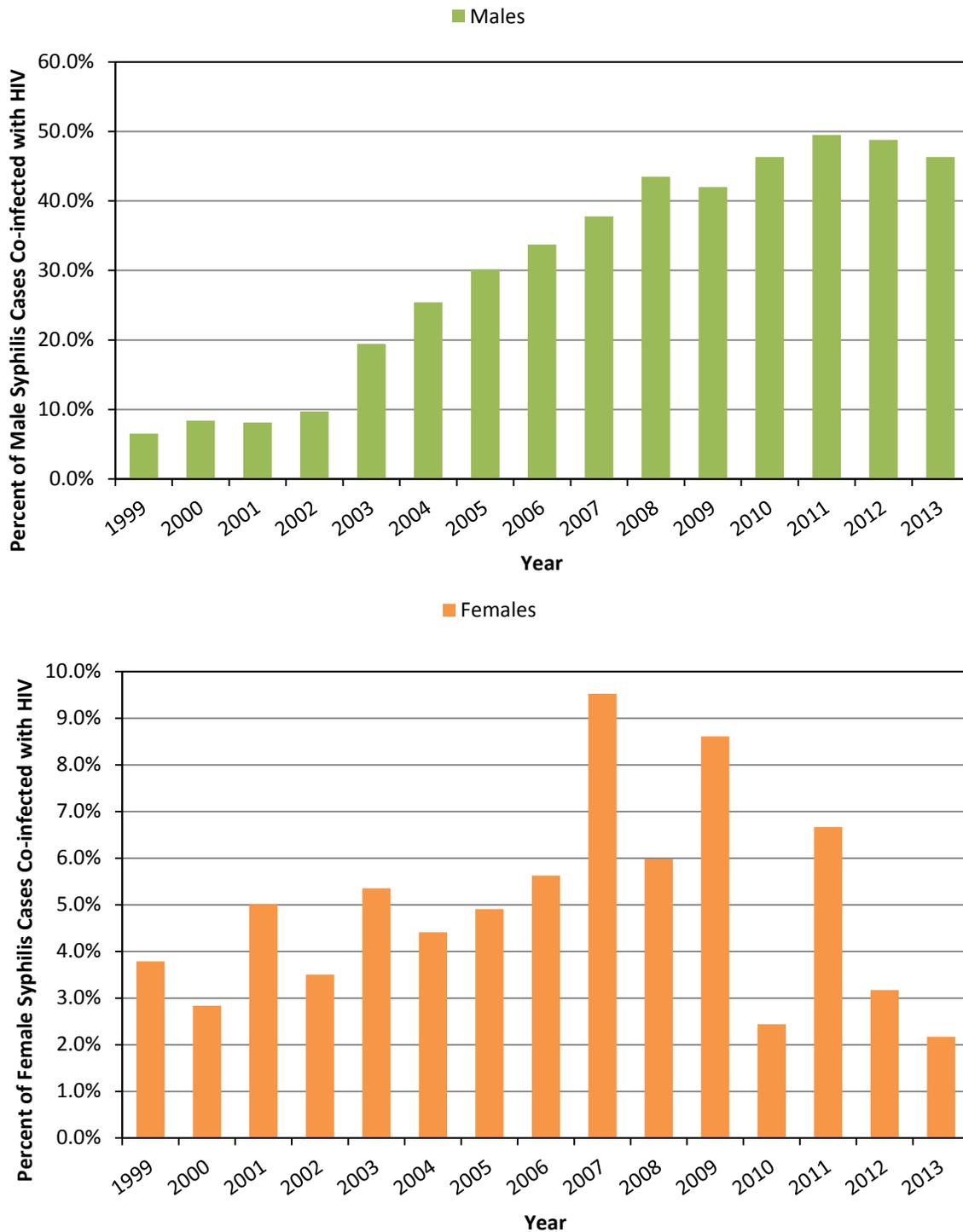
*Co-infection defined as having a syphilis diagnosis and having an HIV diagnosis prior to or within six months of the syphilis diagnosis. Data sources: North Carolina Electronic Disease Surveillance System (NC EDSS) (data as of May 5, 2014) and enhanced HIV/AIDS Reporting System (eHARS) (data as of July 1, 2014).

In 1999, Black/African Americans represented 92.3 percent and White/Caucasians represented 5.1 percent of comorbid early syphilis and HIV infection (N=62). In 2003, 72.0 percent of the male population infected with both syphilis and HIV were Black/African American, while 22.0 percent were White/Caucasian (N=59). Since 2003, roughly two-thirds of the male population with comorbid HIV and early syphilis were Black/African American (Figure 6.4). In the last five years in North Carolina, Hispanic/Latino male syphilis cases have comprised between 2.4 and 3.7 percent of all reported syphilis cases and between 1.2 and 2.1 percent of comorbid cases. In North Carolina, HIV comorbidity among male early syphilis cases is overwhelmingly associated with the men who have sex with men (MSM) risk group, mirroring a trend reported across the US.[5]

Figure 6.4. North Carolina Early Syphilis (Primary, Secondary, and Early Latent Syphilis) Co-Infections with HIV [a] among Males by Race/Ethnicity, 2007-2013
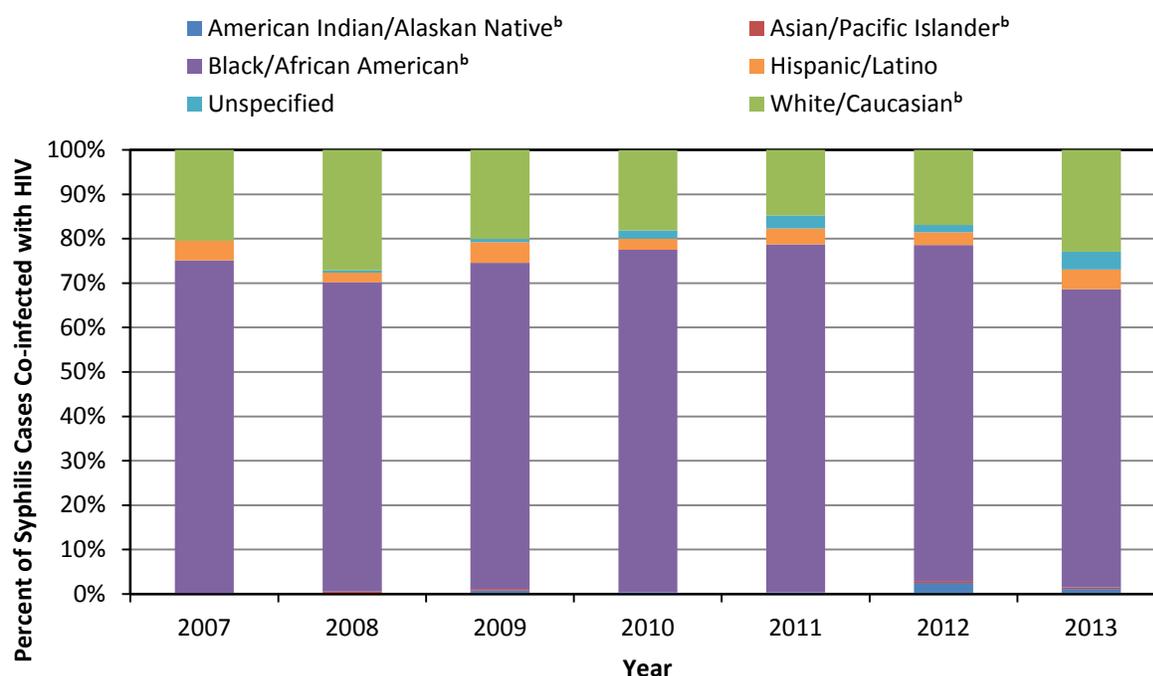
[a]Co-infection defined as having a syphilis diagnosis and having an HIV diagnosis prior to or within six months of the syphilis diagnosis.

[b]Non-Hispanic/Latino.

Data sources: North Carolina Electronic Disease Surveillance System (NC EDSS) (data as of May 5, 2014) and enhanced HIV/AIDS Reporting System (eHARS) (data as of July 1, 2014).

In response to the syphilis outbreak among MSM seen in 2009, the North Carolina Department of Health and Human Services (North Carolina DHHS) created a MSM Taskforce which was a joint collaboration of community leaders and public health professionals aimed at developing and implementing HIV/STD prevention efforts in this high-risk population. The MSM Taskforce was especially focused on developing a "safe space" for the MSM community to meet and discuss concerns and barriers to and questions that may be causing hesitance to access care or affecting risk behaviors. For more information about the MSM Task Force, please see Chapter 7: Integrated Program Activities (pages 107 and 111).

TUBERCULOSIS AND HIV

Background

TB is a bacterial infection caused by *Mycobacterium tuberculosis*, which can be deadly if not treated. However, in healthy individuals, this infection tends to remain dormant, referred to as a latent infection. Persons with latent TB infection (LTBI) do not manifest symptoms of infection, and infection can only be identified by a positive tuberculin skin or blood test. Persons with LTBI are not infectious and cannot spread TB to others.[6] Without treatment, approximately 5 to 10 percent of individuals with LTBI will go on to develop TB disease at some point in their lives with about half of those developing active disease within the first two years of becoming infected.[7]

TB remains a serious health threat, especially among persons living with HIV. Individuals living with HIV are estimated to be 26 to 31 times more likely to develop TB than those not infected with HIV.[8] Worldwide, co-infection with HIV and TB is the single largest contributor to mortality for persons with HIV. HIV infection is the strongest known risk factor for progression to TB disease, and TB disease accelerates HIV disease progression.[9] Additionally, people with HIV are more likely to develop extra-pulmonary TB (TB outside of the lungs) that may involve multiple organs and is harder to diagnose.[10] The annual risk of developing active TB among HIV-positive individuals ranges between 5 and 15 percent.[11] TB is the most common opportunistic infection among persons living with HIV worldwide and is an acquired immunodeficiency syndrome (AIDS) defining opportunistic infection. Despite being preventable and treatable, TB disease is also the most common cause of death in HIV-positive adults living in developing countries.[12]

Without antiretroviral treatment (ART) or proper TB treatment, nearly 90 percent of those living with HIV die within months of contracting TB.[13] Effective, affordable treatment for both HIV and TB infections is available throughout the US and most of the developed world. All persons living with HIV should be tested for LTBI and TB disease and treated if found positive.

In conclusion, TB is the leading immediate cause of death worldwide among HIV-infected patients. TB accelerates HIV-related immunosuppression, and HIV is the greatest risk factor for progression to active TB disease.

Tuberculosis and HIV in North Carolina

Throughout the US, as in most of the developed world, effective, affordable treatment for both HIV infection and TB disease is available. People living with HIV should always be tested for TB infection, and if found positive for either LTBI or TB disease, encouraged to start and complete treatment.

While TB is preventable and in most cases curable, the disease maintains a grim historical notoriety as one of the leading infectious causes of death in North Carolina. In 1980, North Carolina was ranked third in the nation for TB case rates. Since that time the number of new TB cases has declined, on average, 4 percent per year. TB incidence in North Carolina decreased 35.5 percent between 2008 and 2013, dropping from 335 cases to 216 cases. While fewer cases of TB are being reported in the US than ever before, TB rates have decreased more quickly in North Carolina than in the nation as a whole. Consequently, North Carolina now ranks 22nd in the nation for TB case rates.[14]

An individual with TB is considered to have co-infection with HIV if they have an HIV diagnosis prior to, or have an HIV-positive test at time of, the TB diagnosis. Figure 6.5 shows the number and percentage of North Carolina TB cases reported between 2004 and 2013 that were known to have TB and HIV comorbidity.

Figure 6.5. North Carolina Tuberculosis Cases with HIV Infection*, 2004-2013
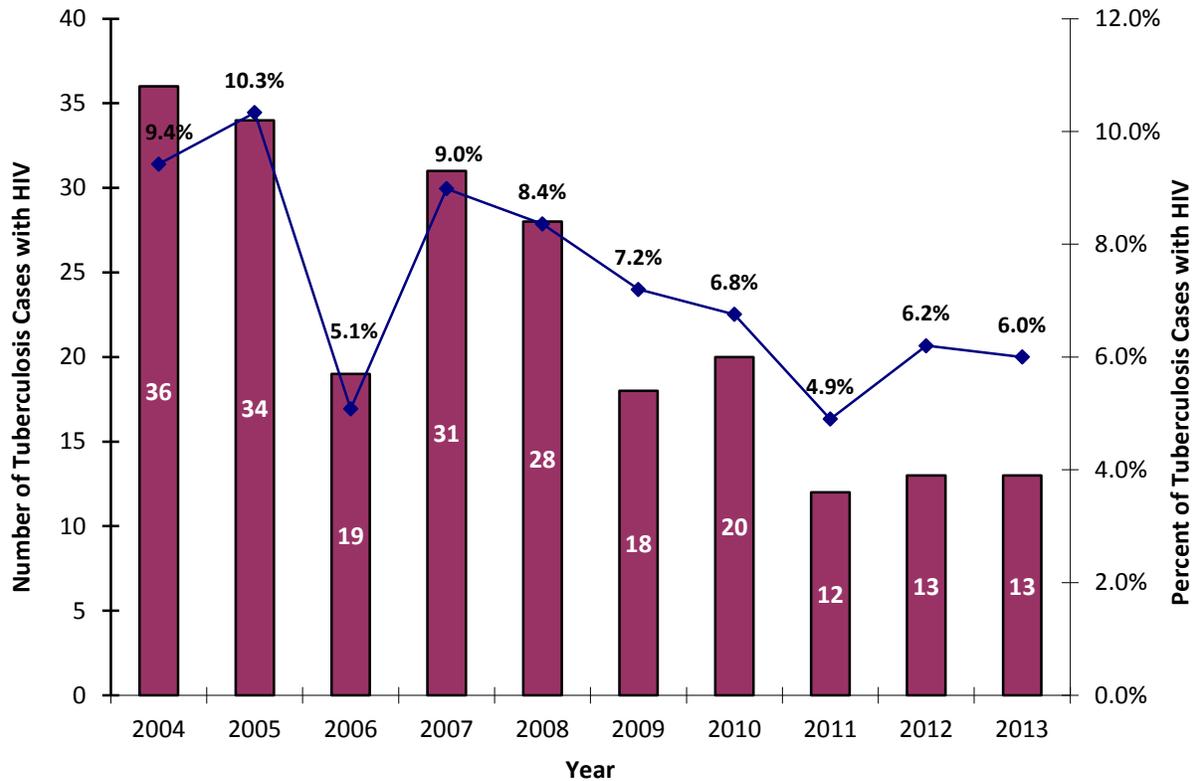
*Co-infection is defined as having an HIV diagnosis prior to or having an HIV-positive test at time of the TB diagnosis.
Data Source: North Carolina Electronic Disease Surveillance System (NC EDSS) (data as of March 2014).

Table 6.1 presents the distribution of TB and HIV comorbidity by age. In 2013, all individuals identified as having comorbid infection were between the ages of 23 and 64 with the exception of a baby that was foreign-born and began treatment overseas.

Table 6.1. North Carolina Tuberculosis Cases with HIV Infection* by Age Group, 2009-2013

Age Group (Years)	2009	2010	2011	2012	2013
0-4	0	0	0	0	1
5-14	0	0	0	0	0
15-24	0	0	0	0	2
25-44	8	12	5	6	4
45-64	10	7	7	7	6
65 and older	0	1	0	0	0

*Comorbidity is defined as having an HIV diagnosis prior to the onset of tuberculosis (TB) or having a positive test following a TB diagnosis.

Data Source: North Carolina Electronic Disease Surveillance System (NC EDSS) (data as of March 2014).

Since November 2007, the standard of care has been to offer HIV testing as part of routine screening for all individuals diagnosed with LTBI or TB disease. Patients are informed that HIV testing is part of the screening and may decide to "opt-out" of that test. Before this practice went into effect, the state TB nurse consultants spent much time training local health department staff to encourage HIV testing. Table 6.2 and Figure 6.5 show the progress that has been made in North Carolina with respect to standard of care and HIV status. In 2013, every acute TB case (N=216, 100.0%) who was alive at diagnosis was treated for HIV.

Table 6.2. North Carolina Reported HIV Results for Tuberculosis Cases, 2009-2013

Status	2009	2010	2011	2012	2013
Negative	217	266	226	188	196
Positive	18	20	12	13	13
Refused	5	5	0	2	0
Not Offered	6	1[a]	0	3[a]	0
Tested No Result	0	0	0	1[b]	0
Unknown	1	0	1[a]	0	0
Deceased at Tuberculosis Diagnosis and HIV Status Unknown	4	4	5	4	7

[a]These patients died shortly after starting treatment or while still in hospital, and there was not an opportunity to offer HIV testing.

[b]An attempt was made to test, but they were unable to obtain blood for testing.

Data Source: North Carolina Electronic Disease Surveillance System (NC EDSS) (data as of March 2014).

The number of TB cases where HIV status is unknown has greatly decreased over the past 10 years (Figure 6.6). Fewer patients refuse testing (down from 18.1 % in 2000 to none in 2013) and there are fewer patients who are not being offered testing (down from 10.7% in 2000 to none in 2013).

Figure 6.6. **North Carolina Tuberculosis Cases with Unknown HIV Status at Time of Tuberculosis Diagnosis, 2001-2013**
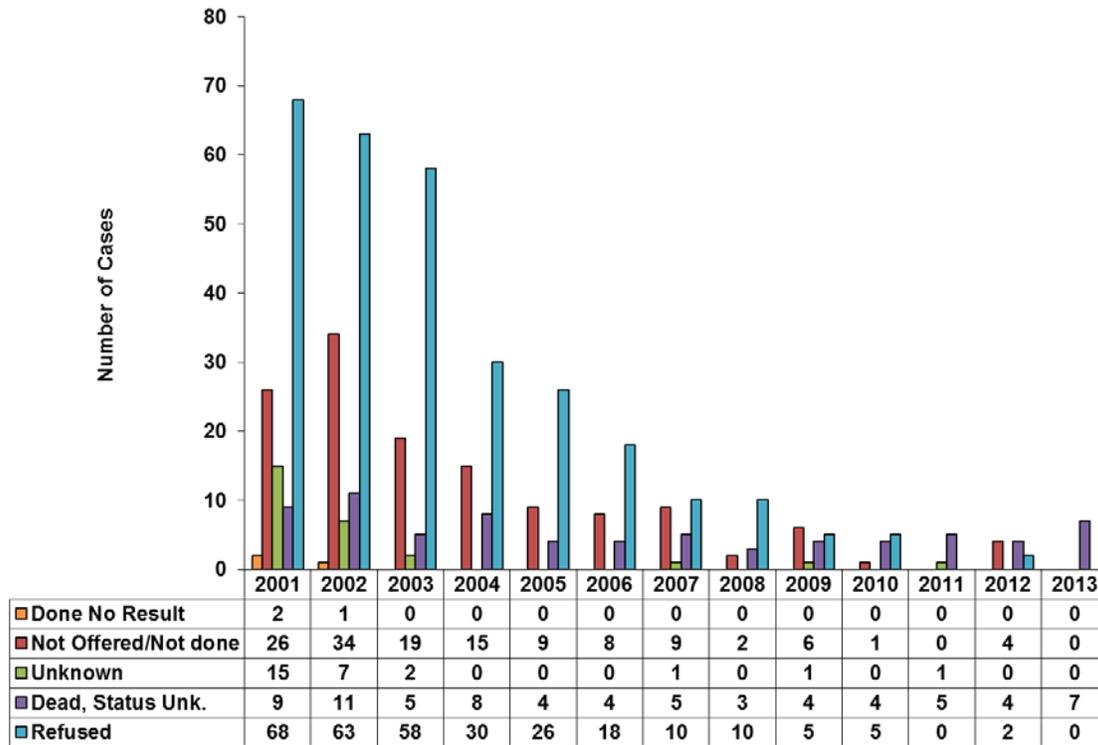
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Done No Result	2	1	0	0	0	0	0	0	0	0	0	0	0
Not Offered/Not done	26	34	19	15	9	8	9	2	6	1	0	4	0
Unknown	15	7	2	0	0	0	1	0	1	0	1	0	0
Dead, Status Unk.	9	11	5	8	4	4	5	3	4	4	5	4	7
Refused	68	63	58	30	26	18	10	10	5	5	0	2	0

Data Source: North Carolina Electronic Disease Surveillance System (NC EDSS) (data as of March 2014).

Latent Tuberculosis Infection and HIV

While North Carolina emphasized HIV testing for all patients alive at diagnosis of TB disease, HIV testing among individuals diagnosed with LTBI has also increased significantly. This testing increase is important because medical treatment of persons with LTBI can prevent subsequent development of active TB disease.

NC EDSS data shows that for cases reported during the past five years[*], North Carolina has increased HIV testing among persons being screened for LTBI. Table 6.3 shows that while the total proportion of people with LTBI tested for HIV is low, the percentage of persons with LTBI for whom we have records of testing for HIV almost doubled between 2009 and 2013.

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[*]Not all counties enter all of their LTBI tests into NC EDSS. This is not required but many counties do this for convenience. Consequently, the percentages in the database may be different from percentage of the total persons tested for LTBI/TB.

**Table 6.3. Proportion of Latent Tuberculosis Infection Cases Tested for
HIV in North Carolina, 2009-2013**

2009	2010	2011	2012	2013
6.9%	6.5%	8.0%	10.0%	11.2%

Data Source: North Carolina Electronic Disease Surveillance System (NC EDSS) (data as of September 2014).

For persons testing positive for HIV, increased emphasis is placed on treating the latent infection. Between 2009 and 2013, the percent of persons tested for LTBI who also tested positive for HIV and began TB treatment went from 16.0 to 60.9 percent (Table 6.4).

**Table 6.4. North Carolina Latent Tuberculosis and HIV-Positive Cases
Initiated on Tuberculosis Treatment, 2009-2013**

Treatment Initiated	2009	2010	2011	2012	2013
HIV-positive (%)	16.0	21.1	58.3	51.3	60.9

Data Source: North Carolina Electronic Disease Surveillance System (NC EDSS) (data as of September 2014).

HEPATITIS B AND HIV IN NORTH CAROLINA

HBV infection can be prevented by vaccination, and the vaccine is readily available. Therefore, every new case of HBV in a previously diagnosed HIV-positive individual represents a missed opportunity for prevention, since all individuals diagnosed with HIV should be tested and vaccinated if susceptible for HBV at the time of their HIV diagnosis.[15] For this reason, surveillance of comorbid HBV identifies not only the public disease burden but also opportunities for education.

Both the acute and chronic stages of HBV are reportable to local and state health departments. The majority of adults and children over the age of five develop symptoms from acute HBV infection which can include fever, fatigue, nausea, vomiting, abdominal pain, jaundice and dark urine. However, as many as 30 percent of adults and the majority of young children under age five will have no symptoms or only mild symptoms of acute HBV infection.[16] Because acute infection can be asymptomatic and diagnosis criteria for chronic infection are relatively non-specific, some portion of the reported chronic cases may actually be acute cases, in which symptoms were not recognized or supporting information, such as liver enzyme tests, were not available to meet the case definition.[17] North Carolina does not track the proportion of people infected with HIV who are tested for HBV, but it is believed that less than 100% of people with HIV are tested for HBV. Therefore, this analysis likely underestimates the proportion of comorbidity.

Sexual transmission is the primary mode of transmission for HBV in the US, however, worldwide, perinatal transmission accounts for the majority of HBV infection.[18] The majority of infections due to

perinatal transmission diagnosed in North Carolina are found in persons born in other countries, primarily Asian and African countries, who are now North Carolina residents.

Eighty-four cases of acute HBV reported in North Carolina during 2013 were linked to sexual activity, indicating ongoing sexual transmission of HBV in the state (Table 6.5). Since symptoms may not be present and a history of negative testing is not available, the number reported here is likely an underestimate of the true number of acute cases in North Carolina. The CDC believes the actual number of acute cases is 6.5 times higher than the number reported.[18]

Table 6.5 North Carolina Hepatitis B Infections Reported, including HIV Comorbidity Infections, 2013

Disease	Reported	Reported Hepatitis with any Previous Diagnosis of HIV (prior to 2013)	Reported Hepatitis with HIV Diagnosed in 2013
Hepatitis B Acute	84	3	1
Hepatitis B Chronic	1,029	102	32

Data Source: North Carolina Electronic Disease Surveillance System (NC EDSS) (data as of September 2014).

Research shows that only 20 to 70 percent of HIV-positive individuals develop protective antibodies after receiving the normal three-dose vaccination series, suggesting that some of the new HBV infections among the HIV-positive population are due to vaccine failure.[19] This research has led to the recommendation that all HIV-positive individuals receive a test for immunity one to two months following the completion of the HBV vaccination series, and be revaccinated if found not to have developed protective antibodies. If the titer indicates immunity from HBV, the vaccination series is considered complete and successful.[20]

HEPATITIS C AND HIV IN NORTH CAROLINA

Similar to HBV, HCV has two stages: acute and chronic. The primary mode of transmission is through large or repeated percutaneous exposure to infected blood, through transfusions or injection drug use (IDU). Sexual contact is not considered to be a primary mode of transmission of HCV, although multiple sexual partners and some sexual practices are thought to place an individual at risk for transmission.[21]

Acute, but not chronic, HCV is reportable in North Carolina. Most cases of HCV are not identified in the acute stage or the first six months of infection and therefore, are never reported. While there were 122 acute HCV cases reported in 2013, at this time, North Carolina surveillance data cannot provide a representative picture of acute or chronic HCV comorbidity with HIV.

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CHAPTER 7: INTEGRATED PROGRAM ACTIVITIES

North Carolina has a fully integrated disease surveillance system, where multiple programs collaborate on prevention, surveillance, and education strategies for not only human immunodeficiency virus (HIV) cases, but for other sexually transmitted diseases (STDs) as well. This chapter describes the programs in North Carolina working together for the common goal of HIV/STD awareness and prevention. The programs described in this chapter are: HIV/STD prevention programs, partner notification, counseling and referral services, Care and Prevention in the United States (CAPUS), Special Projects of National Significance (SPNS-LINK), and Program Collaboration and Service Integration (PCSI).

HIV/STD PREVENTION PROGRAMS IN NORTH CAROLINA

The *Get Real. Get Tested. Get Treatment.* Campaign

The goals of the *Get Real. Get Tested. Get Treatment.* campaign, which began in 2006, are to test for and educate people about HIV and STDs, identify persons living with HIV infection who need care, and link HIV-positive patients to care. The campaign's messages are consistent with the Centers for Disease Control and Prevention (CDC) HIV counseling and testing guidelines and consist of television commercials and testing events. Each commercial has targeted a different group of people and encourages them to get tested for HIV and other STDs, and to stay in care. The *Get Real. Get Tested. Get Treatment.* commercials have been nominated for three Emmy awards. The television commercials air at various times throughout the year on television stations statewide. Viewers are encouraged to call the phone number highlighted during the commercial if they or someone they know needs assistance in getting HIV medications. The campaign has been successful in linking many HIV positive patients who have fallen out of care back into an HIV care and treatment plan.

Throughout the year, the *Get Real. Get Tested. Get Treatment.* campaign hosts community testing events. In the past, these events were very large and teams would go door-to-door to offer testing. With the current epidemiological profile, smaller events that better target the intended populations are taking place.

Evidence-Based Intervention Services

In 2013, 1,301 people participated in evidence-based intervention services (EBIS) that were supported by North Carolina Department of Health and Human Services (North Carolina DHHS). The primary mission of EBIS is to target persons at increased risk of becoming infected with HIV or, if already infected, prevent transmission of the virus to others. Activities are directed towards persons whose behaviors or personal circumstances place them at risk for infection. EBIS activities contribute to the reduction of HIV infection by increasing the ability of individuals living with HIV infection to better manage their health. This is done through the provision of services that educate people with HIV about HIV transmission and how to reduce the risk of transmitting the virus to others.

HIV-positive individuals and their partners were identified as the priority population within each proposed targeted population, and specific strategies were identified and thoroughly described for this population. All EBIS activities related to HIV infection contributed to the overall goal of reducing high-risk behaviors amongst the population to be served. The primary objective was to identify and recruit

members of the population early in the process, to ensure appropriate care. Early recruitment ensures that decisions are made, purposes are defined, and intervention messages are developed that specifically cater to the population served.

The overall goal of the HIV/STD Prevention Program is to reduce the rate of HIV and STDs in targeted populations and areas. Based on the current North Carolina Comprehensive HIV Prevention Plan, prevention services are prioritized for: (1) persons living with HIV infection; (2) persons exposed to HIV or STDs through heterosexual contact; (3) men who have sex with men (MSM); and (4) injection drug users (IDU).

The North Carolina HIV/STD Prevention Program funds community-based organizations (CBO) and local health departments to provide EBIS services in selected communities. EBIS programs are encouraged to choose evidence-based interventions that have been rigorously evaluated and have shown to reduce or eliminate the rate of new HIV infections and sex and drug-related risk behaviors.[1,2] Currently, 11 agencies (seven CBOs, two local health departments, and two historically Black/African American colleges and universities) are funded to conduct effective interventions throughout North Carolina. Specific interventions utilized in North Carolina during 2013 are described below.

- **Choosing Life: Empowerment! Action! Results! (CLEAR):** an evidence-based, health promotion intervention for males and females ages 16 and older either living with HIV infection or high-risk HIV-negative individuals. CLEAR is a client-centered program delivered one-on-one using cognitive behavioral techniques to change risk behavior. The intervention provides clients with the skills necessary to make healthy choices for their lives (two agencies conducted this intervention).
- *Antiretroviral Treatment and Access to Services (ARTAS)*: an individual-level, multi-session, time-limited intervention with the goal of linking recently diagnosed persons with HIV to medical care soon after receiving their positive test result (one agency conducted this intervention).
- *Healthy Relationships*: a five-session, small-group intervention for men and women living with HIV infection. The program focuses on developing skills and building self-efficacy and positive expectations about new behaviors through modeling behaviors and practicing new skills (two agencies conducted this intervention).
- *Focus on Youth (FOY)*: a community-based, eight session group intervention that provides youth with the skills and knowledge they need to protect themselves from HIV and other STDs (one agency conducted this intervention).
- *Mpowerment:* a community-level intervention for young gay and bisexual men of diverse backgrounds. The intervention mobilizes men to reduce sexual risk taking, encourages regular HIV testing, builds positive social connections, and supports peers to have safer sex (one agency conducted this intervention).
- *Sisters Informing Sisters about topics on AIDS (SISTA):* a social-skills training intervention for Black/African American women. The intervention is aimed at reducing HIV sexual risk behavior and is comprised of five two-hour sessions, delivered by peer facilitators in a community-based setting. The sessions are gender specific, culturally relevant, and include behavioral skills practice, group discussions, lectures, role-playing, prevention video viewing, and take-home exercises (one agency conducted this intervention).
- *Video Opportunities for Innovative Condom Education & Safer Sex (VOICES/VOCES):* a group-level, single-session video-based intervention designed to increase condom use among

heterosexual Black/African American and Hispanic/Latino men and women who visit STD clinics (one agency conducted this intervention).

- **Peer-led intervention**: an intervention led by peers in the target community to spread knowledge about HIV/STDs, raise risk awareness, and promote safer sex strategies, particularly the use of condoms. The main objective is to reduce sexual risk behavior and promote sexual health (two historically Black/African American colleges and universities conducted this intervention).

Minority AIDS Initiative/Men Who Have Sex with Men Task Force Teams

In an effort to address the disproportionate impact of HIV infection on racial and ethnic minorities, North Carolina received funding through the United States Department of Health and Human Services Secretary's Minority AIDS Initiative (MAI), for the Care and Prevention in the United States (CAPUS) Demonstration Project. More information on the CAPUS program in North Carolina can be found later in this chapter (pages 109 to 112).

To assist in reaching the goals of CAPUS, the North Carolina DHHS has created Regional MAI/MSM (men who have sex with men) Task Force teams to work throughout the state to improve the health outcomes of HIV-positive individuals and minority MSM in an atmosphere free from stigma and discrimination.

The Regional MAI/MSM Task Force teams are extremely important to the success of the state's prevention strategy, specifically through the CAPUS interventions. The Task Force is made up of members from the Regional Networks of Care and Prevention (RNCP), and community members who represent different levels, layers and segments of the larger community, including minorities and MSM.

Task Force members work to:
- Identify opportunities to educate minority, MSM, and transgender communities on matters related to their health.
- Distribute important life-saving and sexual health information within each Task Force member's own social circle/network.
- Assist with the coordination and logistics for events and activities that target the minority MSM and transgender community.
- Participate in community meetings, conferences, and symposia on matters related to the minority MSM and transgender community.
- Identify private, local, and community partners to support CAPUS events and community outreach activities (vendors, merchants, businesses).
- Support the North Carolina version of the Greater Than AIDS campaign.
- Assist, when appropriate, with efforts to test, treat, care for, inform, and educate individuals who are HIV-positive or at risk for HIV/STDs.
- Act as a resource or subject matter expert for the local health department, the North Carolina Communicable Disease Branch, CBOs, and AIDS Service Organizations on matters related to the community.
- Support activities and events related to "Safe Spaces" (identifying venues, finding speakers, providing resources, recruiting, etc.).
- Plan fun events and activities that engage the larger community and the minority MSM and transgender communities.

PARTNER NOTIFICATION, COUNSELING, AND REFERRAL SERVICES

In North Carolina, partner notification, counseling, and referral services for HIV and syphilis are performed by a specialized group within the North Carolina DHHS, known as the Field Services Unit. This unit strives to control the spread of HIV and STDs by:

1) Interviewing all newly diagnosed HIV and early syphilis cases to elicit partner names and linking newly diagnosed individuals to care;
2) Notifying the partners of HIV-positive and early syphilis cases of their exposure and ensuring that appropriate testing and treatment occur;
3) Counseling patients who are infected or exposed to HIV or STDs on how to reduce their risk of transmitting or acquiring other STDs;
4) Coordinating with local health departments and CBOs to target high risk groups for prevention and control efforts; and
5) Providing education and outreach services to clinicians statewide and promoting adherence to the CDC's STD screening and treatment guidelines.

Disease intervention specialists (DIS) are the backbone of the Field Services Unit. The DIS are highly skilled in contact tracing and other activities aimed at interrupting disease transmission networks. Additionally, this unit has nine state bridge counselors (SBC) spread across the state, whose primary responsibility is to assist out-of-care HIV-positive individuals with reengaging in HIV medical care (Figure 7.1). The Field Services Unit's work is highly sensitive and governed directly by several North Carolina public health laws and regulations (10A NCAC 41A.0202 & 10A NCAC 41A.0204).

Figure 7.1 Field Services Role in Partner Notification, Counseling, and Referral Services

Newly diagnosed HIV clients are referred to Disease Intervention Specialist (DIS) for Partner Notification Counseling and Referral Services

Services provided:
- Risk reduction counseling
- Elicit partners
- Link to medical care
- Refer to State Bridge Counselor (SBC)

State Bridge Counselors (SBC) Ensure:
1) Newly diagnosed HIV clients attend their first medical appointment
2) A follow-up appointment was scheduled

Previous HIV clients who are out of care can be referred to SBCs by:
1) DIS
2) Clinic/Clinician
3) Regional Networks of Care & Prevention (RNCP)

Barriers include:
- Transportation
- Substance abuse
- Mental health

Address the social and structural barriers that prevent linkage or continuous engagement in HIV medical care, including:
1) Transportation
2) Substance abuse issues
3) Mental health needs

Created by Dr. Victoria Mobley, NC DHHS (October 9, 2014)

CARE AND PREVENTION IN THE UNITED STATES (CAPUS)

The CAPUS Demonstration Project is a three year cross-agency demonstration project led by the CDC. North Carolina was one of only eight states to be awarded CAPUS funding, and the project started in North Carolina in September 2012.[3] The purpose of the project is to reduce HIV-related morbidity and mortality among racial and ethnic minorities living in the US The primary goal of the project is to increase the proportion of racial and ethnic minorities who aware of their HIV-positive status. CAPUS accomplishes this by expanding and improving HIV testing capacity, optimizing linkage to care for newly diagnosed individuals, retention in care, and re-engagement with care and prevention services for both newly diagnosed and previously diagnosed individuals. The program's goals also address social, economic, clinical, and structural factors influencing HIV health outcomes.[3]

In North Carolina, eight CAPUS interventions were selected to help reduce HIV-related morbidity and mortality among racial and ethnic minorities. Figure 7.2 provides a schematic of the interventions.

Figure 7.2 Care and Prevention in the United States (CAPUS) Interventions in North Carolina
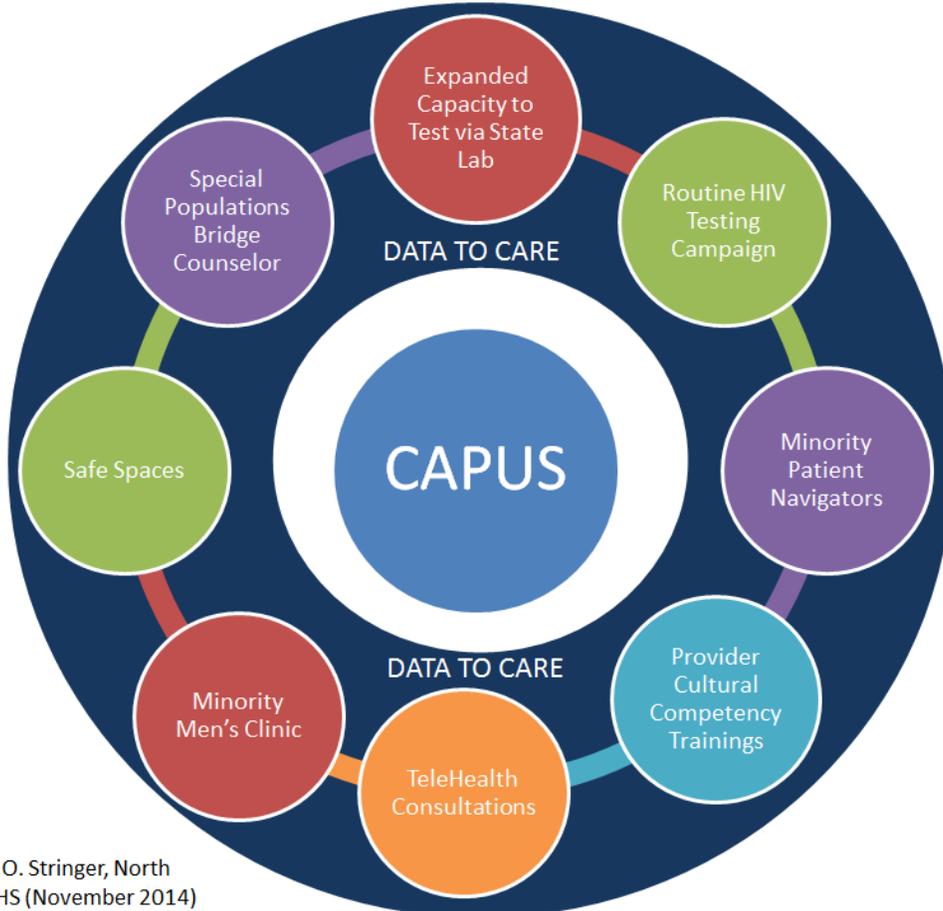
Expanded Capacity to Test via North Carolina State Laboratory for Public Health

The procurement of the 4th generation assay lab equipment has allowed for an additional 20,000 HIV and 20,000 hepatitis C (HCV) tests to be conducted annually. Prior to CAPUS, the North Carolina State Laboratory of Public Health (North Carolina SLPH) was at capacity for HIV testing and did not offer HCV testing. The 4th generation lab equipment gave the North Carolina SLPH the potential to increase the number of individuals tested, particularly in nontraditional testing sites (now called Integrated Targeted Testing Services or ITTS), thus increasing the number of individuals who can be tested for HIV and HCV and linked into treatment.

Routine HIV Testing Campaign

The Provider Routine Testing Campaign is a collaborative effort with the Greater Than AIDS campaign to educate primary care providers on the importance and implementation of routine HIV screening according to CDC recommendations. This campaign seeks to ensure that individuals seeking primary medical care are also made aware of the need for regular HIV screening and is designed to increase the number of HIV-positive people who learn their status.

Minority Patient Navigators

Patient navigators are placed in each RNCP to act as "acute needs" case managers for minority clients who are newly diagnosed or who are at risk or have fallen out of care. These patient navigators attempt to identify their clients' needs and greatest barriers and then provide guidance on how to overcome those basic issues. They strive to help their clients know their HIV status, see their doctors, and both access and adhere to the medication that will radically improve their health and simultaneously prevent the spread of HIV to any partners. After the clients meet with the patient navigators, clients are referred to a case manager for further follow-up. These patient navigators are a further tool used to build a better and stronger safety net to provide support for the most vulnerable clients.

Provider Cultural Competency Trainings

North Carolina is conducting cultural competency trainings for providers to ensure their knowledge, sensitivity, and comfort levels in working with minority and transgender populations. Sessions provide education and training to providers on how to (1) create environments that are comfortable for racial/ethnic minorities and sexual minority populations, and (2) increase the their sensitivity, in order to improve retention in care. The trainings will discuss the importance of offering testing to the partners of both MSM and heterosexual patients. This program is designed to increase provider competence and sensitivity when discussing sexual matters, sexual orientation, and possible risks that patients may be experiencing, with an attitude of non-judgment.

Tele-health Consultations

The Tele-health intervention is a remote provider education initiative that increases the clinical competency of clinics with low HIV-positive patient populations (less than 20% of patients are HIV-positive) to serve the needs of their HIV clients. The Tele-health training project is an exercise in provider-to-provider education led by the North Carolina AIDS Training and Education Center (ATEC).

Tele-health trainings are geared toward clinical providers who have limited experience managing HIV infections in their local communities, particularly in rural areas.

Minority Men's Clinic

The Men's Health Clinic serves the following populations: persons living with HIV infection, Black/African American men, and MSM. The clinic is a pilot project and will be guided by the input of the Men's Health Clinic Community Steering Committee. The goal is to create a more comfortable, MSM-friendly place to get care and expand the range of health and social services for young Black/African American men beyond the traditional medical services model.

Safe Spaces

Safe Spaces is a locally developed, culturally competent group intervention designed to provide social support and educational services to HIV-positive Black/African American and Latino/Hispanic MSM in order to enhance services that improve linkage to and retention in medical care, so that viral suppression is achieved and maintained. Safe Spaces is a concept which may be the most effective means of sharing important health information with minority MSM and HIV-positive MSM. This intervention is also a way to learn first-hand factors that are important to these individuals. This concept has allowed us to introduce minority MSM and HIV-positive MSM to valuable information, programs, and services of which they might otherwise be unaware of.

Special Populations Bridge Counselor

With CAPUS, an additional SBC has been hired to focus attention on Department of Correction (DOC) releasees. Our goal with this dedicated SBC is to establish a relationship with the DOC discharge nurses and the client, in order to ensure that prisoners are linked into one of our RNCPs and see a medical provider upon their release. In addition, this SBC works with other designated special populations to inform them of testing opportunities, provide prevention information, and link them into care if they are HIV-positive, especially pregnant women.

SPECIAL PROJECTS OF NATIONAL SIGNIFICANCE (SPNS-LINK)

The SPNS program is federally funded by the Health Research and Service Administration (HRSA) and supports the development of innovative models of HIV care to quickly respond to the emerging needs of clients served by the Ryan White HIV/AIDS programs. As part of SPNS and the greater multistate project SPNS-LINK, North Carolina DHHS has implemented NC-LINK: Systems Linkage and Access to HIV Care in North Carolina. This program is in collaboration with Duke University and the University of North Carolina at Chapel Hill and consists of interventions conducted in seven sites around the state. The goal of NC-LINK is to increase the number of people living with HIV infection who are engaged in consistent care by creating a system to link them to providers along the HIV continuum of care.

The main intervention is the implementation of regional bridge counselors (RBC) and SBCs to link patients to care as well as retain them in care. NC-LINK funded the hiring of several much needed SBCs, as well as developed protocols by which to train both RBCs and SBCs. SBCs work directly with newly

diagnosed HIV patients to ensure they are rapidly linked to care. The counselors follow-up with recently diagnosed patients to ensure that he or she attended his or her first care appointment. At this point, a patient will continue to receive care; however, if a patient is identified by a local clinic as being out of care, an RBC will then work to find and reengage this patient in care. An RBC will work to locate this patient for thirty days, at which point, if the patient has still not returned to care, a referral will be made to the SBCs.

SBCs will work to find and reengage in care those patients who have been identified as out of care at a state-level, including those referred by RBCs. Patients are referred to the SBC through the CAREWare system (more information about CAREWare can be found in Appendix B: Data Sources, page B-6). All of the SBCs are trained in using CAREWare and also the North Carolina Electronic Disease Surveillance System (NC EDSS) for service documentation to aid in providing coordinated care for patients using multiple providers around the state (more information about NC EDSS can be found in Appendix B: Data Sources, page B-8). This highly interactive approach attempts to ensure that patients not only enter into care shortly following an HIV diagnosis, but also that they maintain regular care throughout their lifetimes.

Some NC-LINK study sites are also conducting testing interventions. Free, rapid HIV testing is offered to people accompanying HIV-positive patients to clinic appointments at two of the seven participating sites. This intervention aims to identify the infection status of individuals who are in the social network of someone who has been previously diagnosed to thereby reduce the number of people who are unaware of their infection status.

Seven sites are participating in the interventions: Wake Forest, Moses Cone Hospital, New Hanover Regional Medical Center, East Carolina University, Robeson County Health Department, Fayetteville Area Health Education Foundation Inc., and CommWell Health. All participants are performing the retention intervention, while only Moses Cone and Wake Forest are participating in the testing intervention.

Data are collected from each site to measure the time it takes to link patients to care, as well as their retention in care. Both care and surveillance data are collected on patients to monitor progression of the disease at baseline and over the course of the intervention. This data collection allows for program evaluation and assessment of the effectiveness of the interventions.

NC-LINK is also working at the procedural level on a variety of projects designed to aid the ultimate goal of linkage to and retention in care. These programs are:

- ONE CALL is a toll-free, statewide nursing call center for patients and providers. Trained nurses assess callers for barriers to receiving treatment and link callers directly with a provider or a SBC.

- At the policy level, a working group develops standards for the state CAREWare server and its users. This group completed CAREWare user registration and confidentiality forms as well as a CAREWare User Guide.

- A system is in development to integrate multiple North Carolina HIV data sources into one single data repository. This project will create an out-of-care database, which will draw information from NC EDSS, enhanced HIV/AIDS Reporting System (eHARS), the AIDS Drug Assistance Program (ADAP), and CAREWare data sources to eventually facilitate easier follow-up of out of

care patients across the state (more information on these databases can be found in Appendix B: Data Sources (pages B-2 and B-6 through B-9). This repository will serve as a tool for a limited number of North Carolina Department of Health and Human Services staff.

PROGRAM COLLABORATION AND SERVICE INTEGRATION (PCSI)

Program Collaboration and Service Integration (PCSI) has been a major strategic priority for the CDC. North Carolina was one of six health departments awarded funds from the CDC for this project in September 2010.[4] PCSI's focus is to improve collaboration between programs in order to enhance integrated service delivery at the client level or point of service delivery. The goal of PCSI is to provide prevention services that are holistic, evidence-based, comprehensive, and high quality to appropriate populations during every interaction with the health care system. Making small changes in the way services are delivered, such that prevention opportunities can be maximized and made more efficient, can improve cost-effectiveness and health outcomes. The partnerships of PCSI support the development of structural interventions that provide comprehensive and evidence-based care and prevention services.

Health departments in Pitt, Buncombe, Mecklenburg, and Wake, counties were the participating partners of the North Carolina PCSI project. The purpose of this demonstration project was to plan, scale-up, and support the implementation of a syndemic approach to the prevention of HIV infection, viral hepatitis, STDs, and tuberculosis (TB) through PCSI activities. Each of the PCSI counties provided integrated services for HIV, STD, TB, and hepatitis testing within their STD clinics and in the community. The level of services offered by each local health department varied greatly due to the size, location and staff of the department.

The PCSI demonstration sites focused first on conducting assessments and registry matches for co-related diseases. Secondly, sites used the results from the assessments and matches to plan and develop pilot programs that would best integrate existing programs and services. Finally, four sites were selected for the implementation and modification of the pilot PCSI demonstration programs in order to scale up service integration and delivery. During this program, each site implemented their proposed plan and evaluated it to ensure its effectiveness.

Pitt County Health Department

The overall goals for Pitt County were to: (1) increase the number of STD appointments; (2) assess the rate of chlamydia in asymptomatic clients; (3) compare the rate of chlamydia in college students versus the community population; (4) screen all high risk clients for HCV; and (5) validate the cost savings of using Quantiferon Testing instead of Tuberculin Skin Testing when evaluating populations at high risk for latent TB infection. They achieved these objectives with the implementation of a STD Express Clinic in 2011. This plan was modified in 2013 for increased efficiency and effectiveness. The health department also established a collaborative relationship with East Carolina University to offer chlamydia testing to women. Most importantly, the PCSI project inspired agency staff to analyze and evaluate not only STD service counts but also the quality and efficiency of the processes involved in the provision of clinical services.

Buncombe County Health Department

The Buncombe County implemented an STD Express Clinic in 2012 that decreased the service time for STD clinic services from two hours to less than an hour. They also integrated HCV screening for at-risk patients seen in the family planning and cervical/breast cancer clinics, and extragenital nucleic acid amplification test (NAAT) testing for MSM into other clinics at the health department. The county also added HCV testing and prevention education in addition to already-existing HIV testing of inmates at the local jail and at a local methadone clinic.

Mecklenburg County Health Department

The Mecklenburg County expanded screening efforts in their clinics and also in community-based ITTS, such as substance abuse treatment centers and homeless shelters to offer HCV screening, education, and referral services to at-risk persons.

Wake County Human Services

Wake County has been able to report notable increases in TB and HCV cases as a result of expanded screening efforts at the ITTS. HCV and TB testing are now performed at the ITTS, along with already-existing testing for HIV, syphilis, gonorrhea, and chlamydia. In addition, Field Delivery Therapy (FDT) was rolled out by the DIS nurse in November 2011. In March 2012, HIV/STD counselors began providing FDT at the ITTS to reduce gonorrhea and chlamydia infections among selected individuals, specifically youths, in Wake County.

APPENDIX A: MAPS

Map 1: North Carolina Population Demographics, 2012

American Indian/Alaska Native
N= 117,606
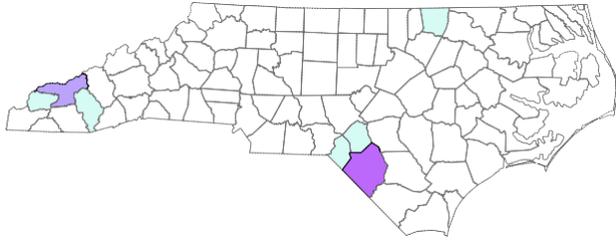
Asian/Pacific Islander
N= 251,891

Black/African American
N= 2,142,415
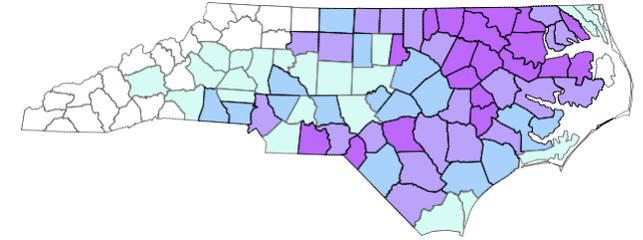
Hispanic/Latino
N= 850,853
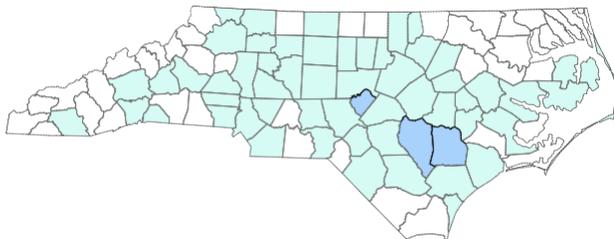
White/Caucasian
N= 6,389,308

% of Population

0% - 5%

6% - 15%

16% - 25%

26% - 35%

>35%
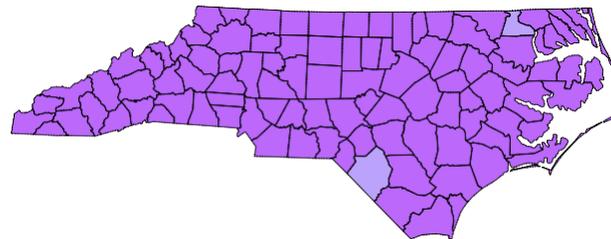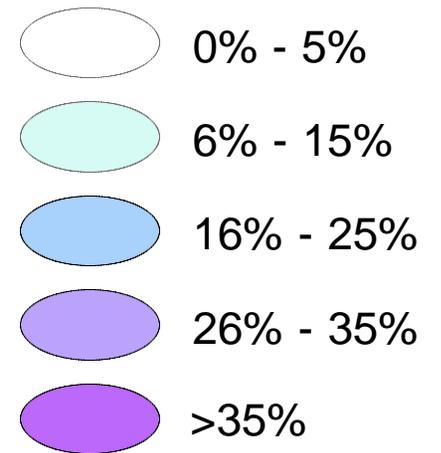
Map 2: North Carolina Metropolitan Designations
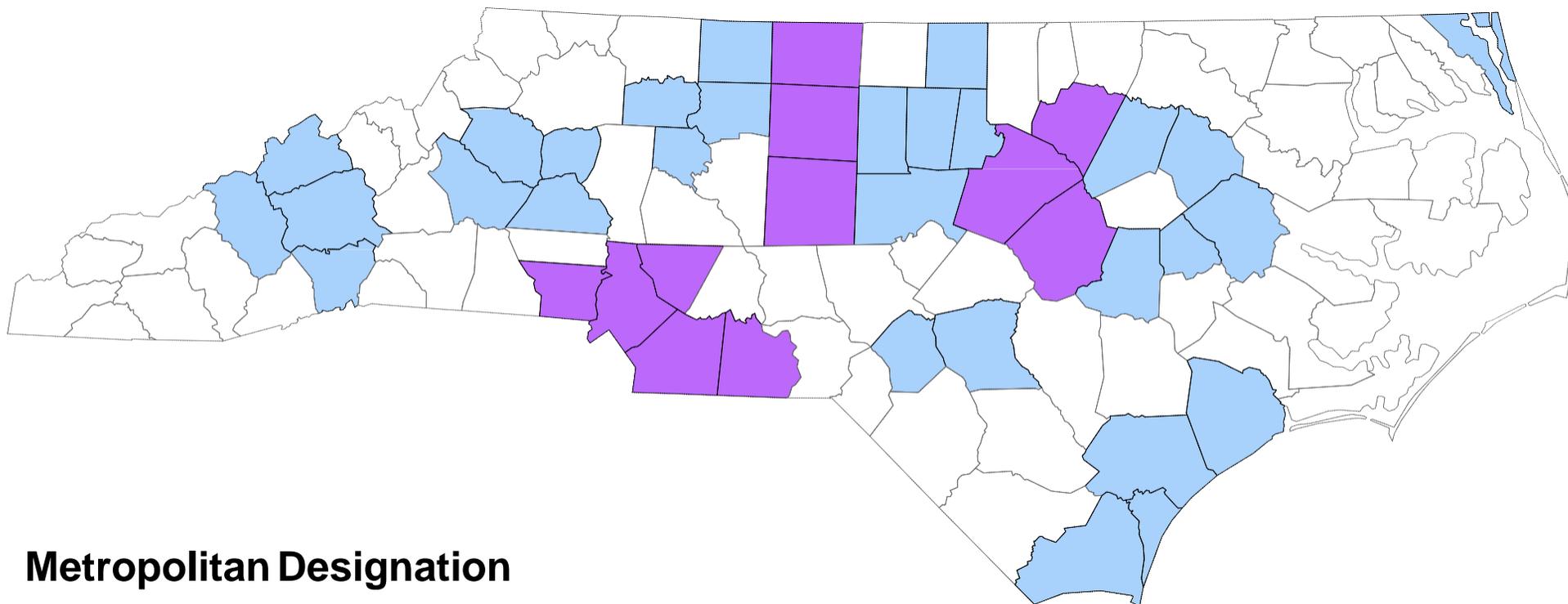
Metropolitan Designation

Rural (population less than 50,000 people)
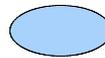
Medium Metropolitan (population of 50,000 to 499,999 people)
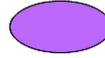
Large Metropolitan (population greater than 500,000 people)

Map 3: North Carolina Per Capita Income, 2012
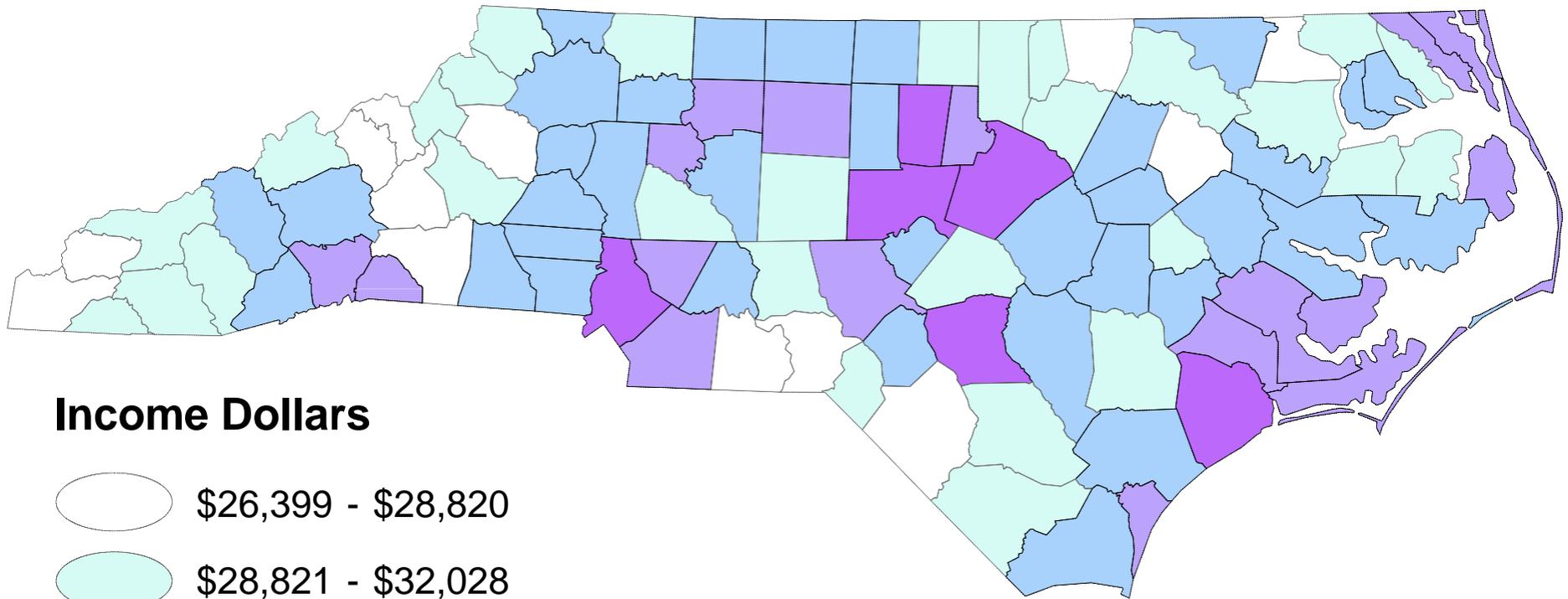
Income Dollars
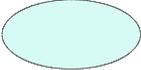
- $26,399 - $28,820
- $28,821 - $32,028
- $32,029 - $36,980
- $36,981 - $42,239
- $42,240 - $51,702

Data Source: United States Bureau of Economic Analysis (Retrieved from http://www.bea.gov/. Accessed October 10, 2014).

Map 4: North Carolina Medicaid Eligibles, 2013

Percent

- ⬭ 0% - 10%
- ⬭ 11% - 15%
- ⬭ 16% - 20%
- ⬭ 21% - 25%
- ⬭ >25%
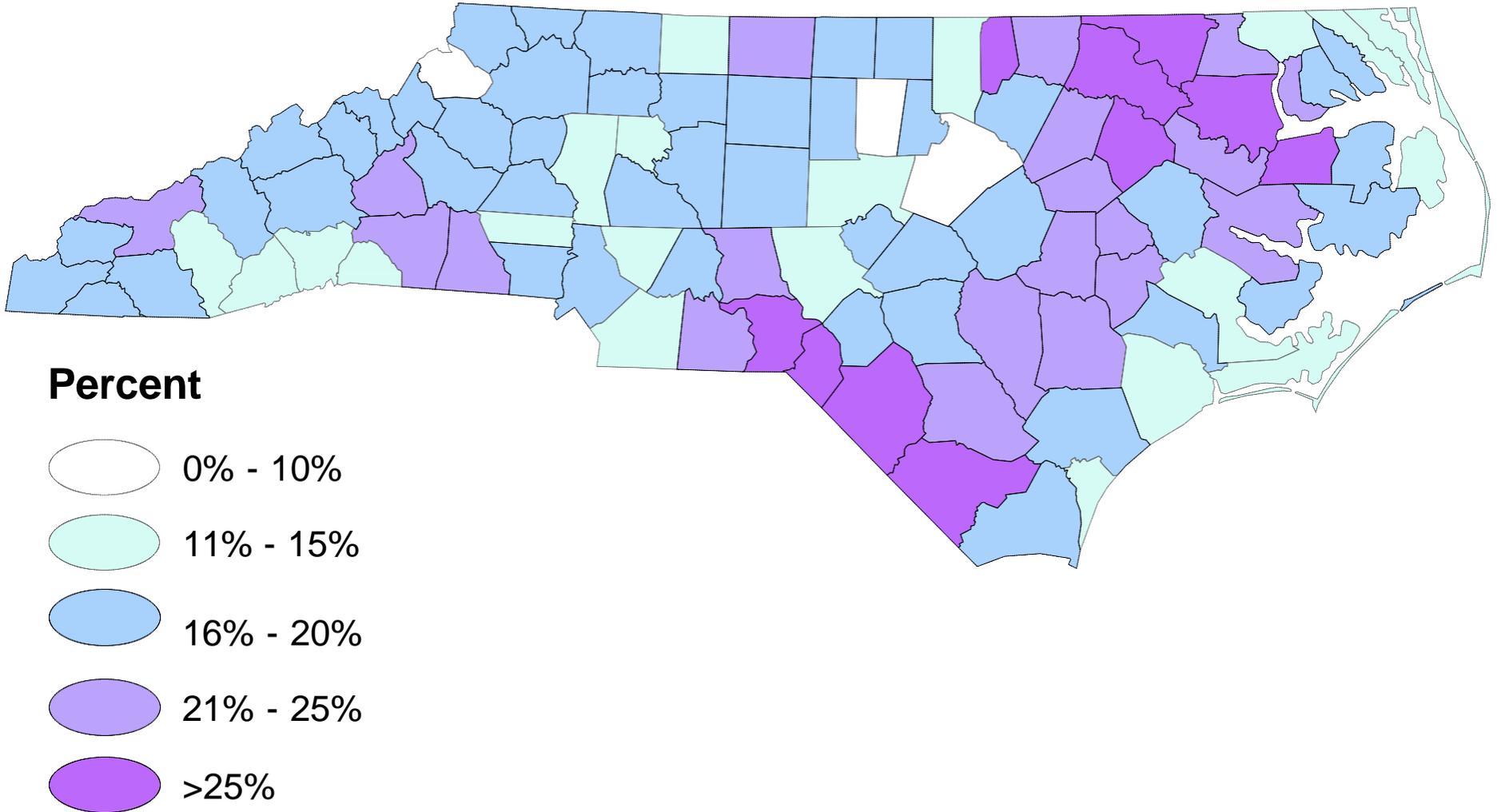
Data Source: North Carolina Department of Health and Human Services (North Carolina DHHS) Division of Medical Assistance (Retrieved from http://www.ncdhhs.gov/dma; Accessed October 14, 2014).

Map 5: North Carolina Newly Diagnosed HIV Infection Cases
by County of Residence, 2013
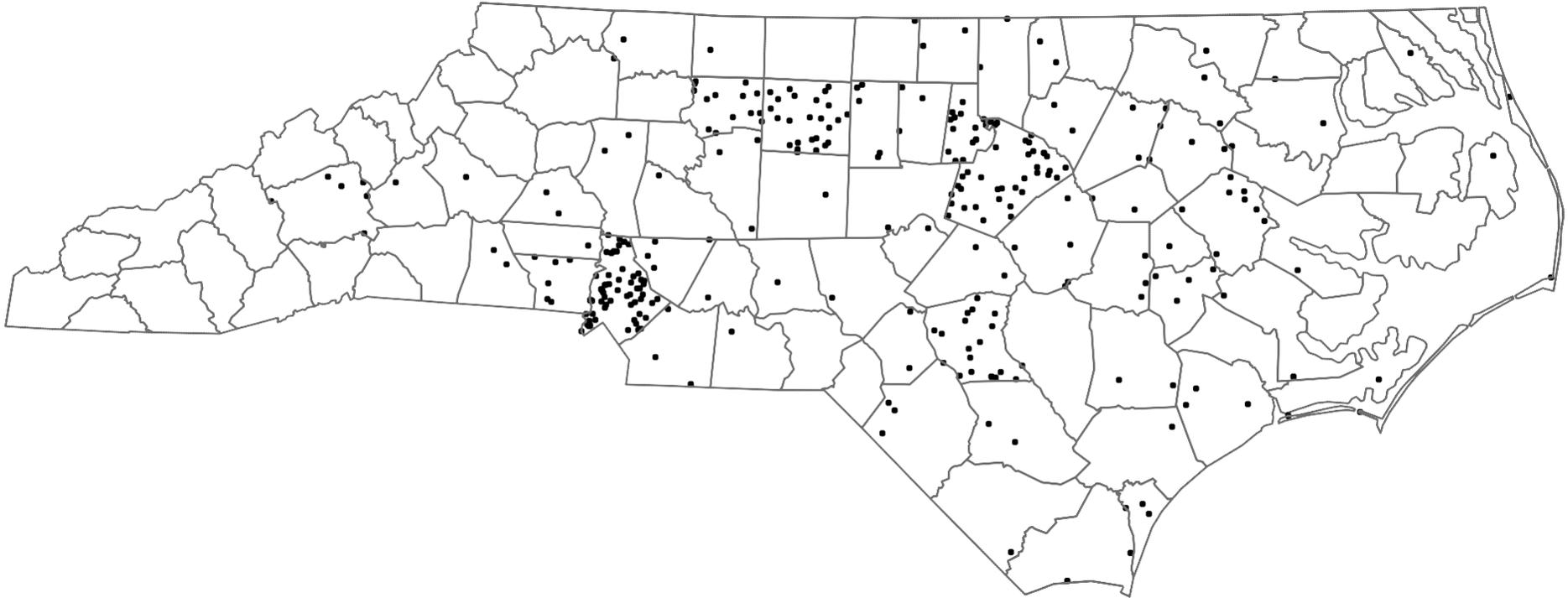
1 Dot = 5 Cases
Note that the dots do not represent actual locations of HIV cases, but reflect the number of cases in each county.
Counties with less than 5 cases will not have a dot.

Map 6: North Carolina Newly Diagnosed HIV Infection Rates by County of Residence, 2013

Rate per 100,000 population

- 0.0
- 0.1 - 10.0
- 10.1 - 20.0
- 20.1 - 30.0
- >30
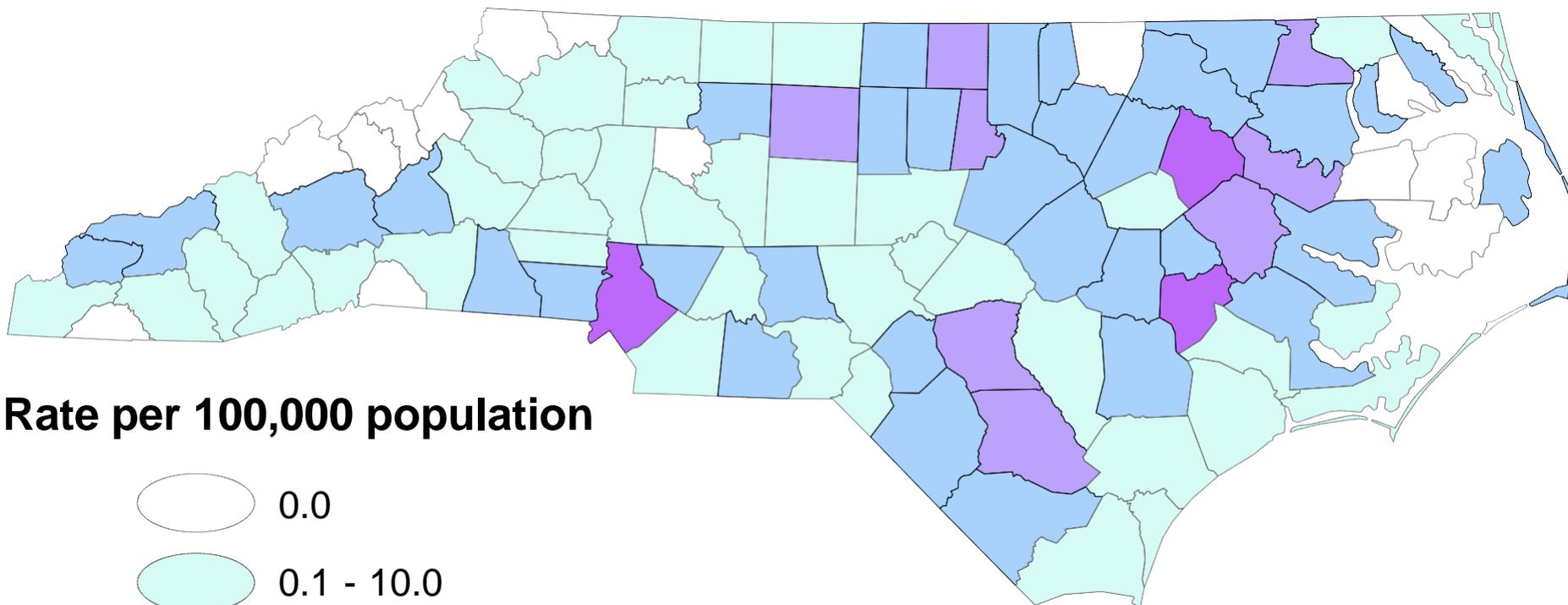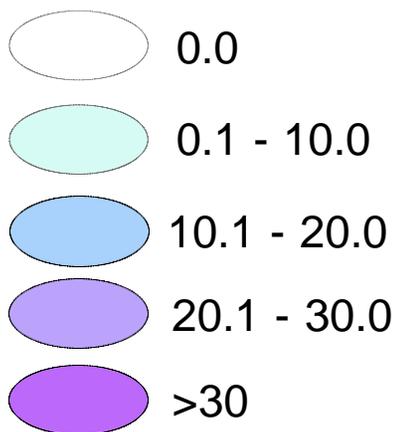
Map 7: North Carolina Newly Reported Chlamydia Cases
by County of Residence, 2013
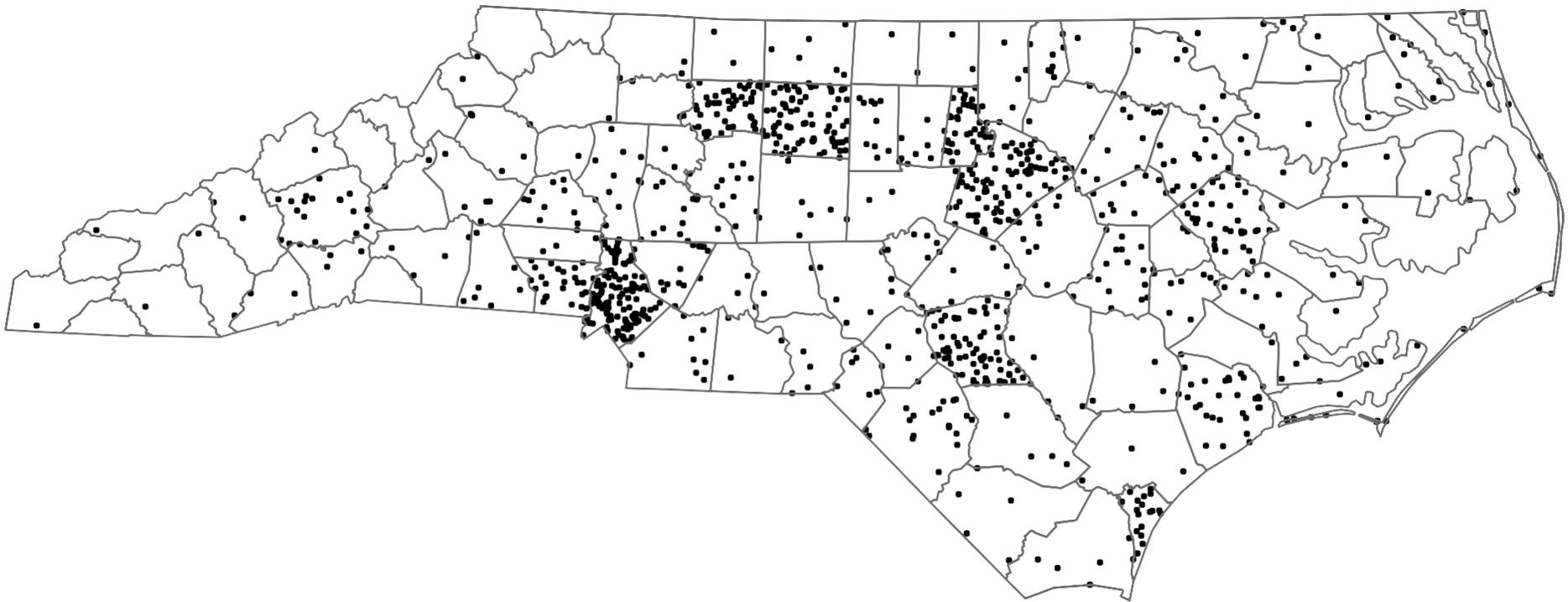
1 Dot = 50 Cases
Note that the dots do not represent actual locations of Chlamydia cases, but reflect the number of cases in each county.

Map 8: North Carolina Newly Reported Chlamydia Rates by County of Residence, 2013

Rate per 100,000 population

- 40.6 - 200.0
- 200.1 - 300.0
- 300.1 - 500.0
- 500.1 - 900.0
- >900
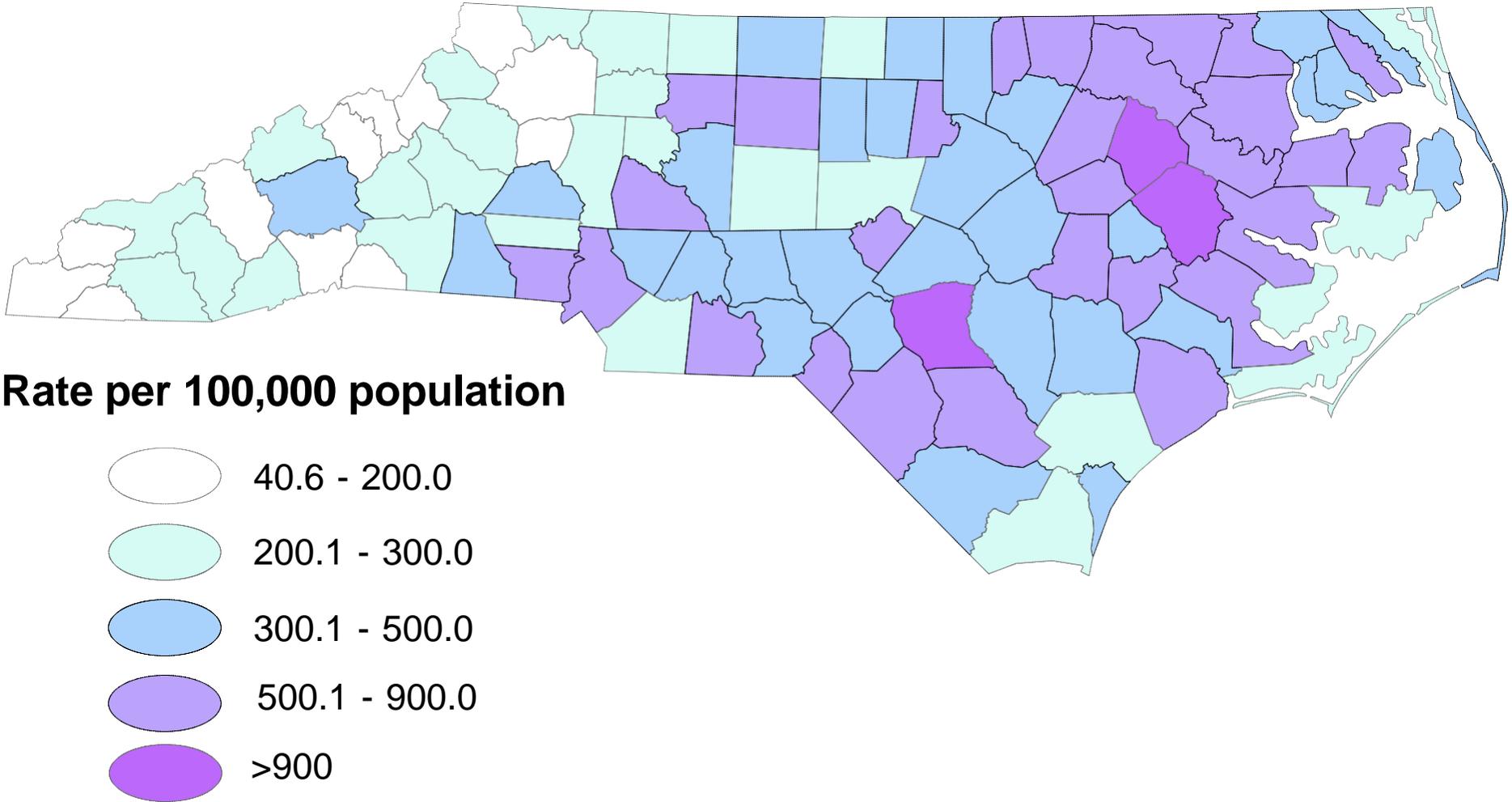
Map 9: North Carolina Newly Reported Gonorrhea Cases
by County of Residence, 2013
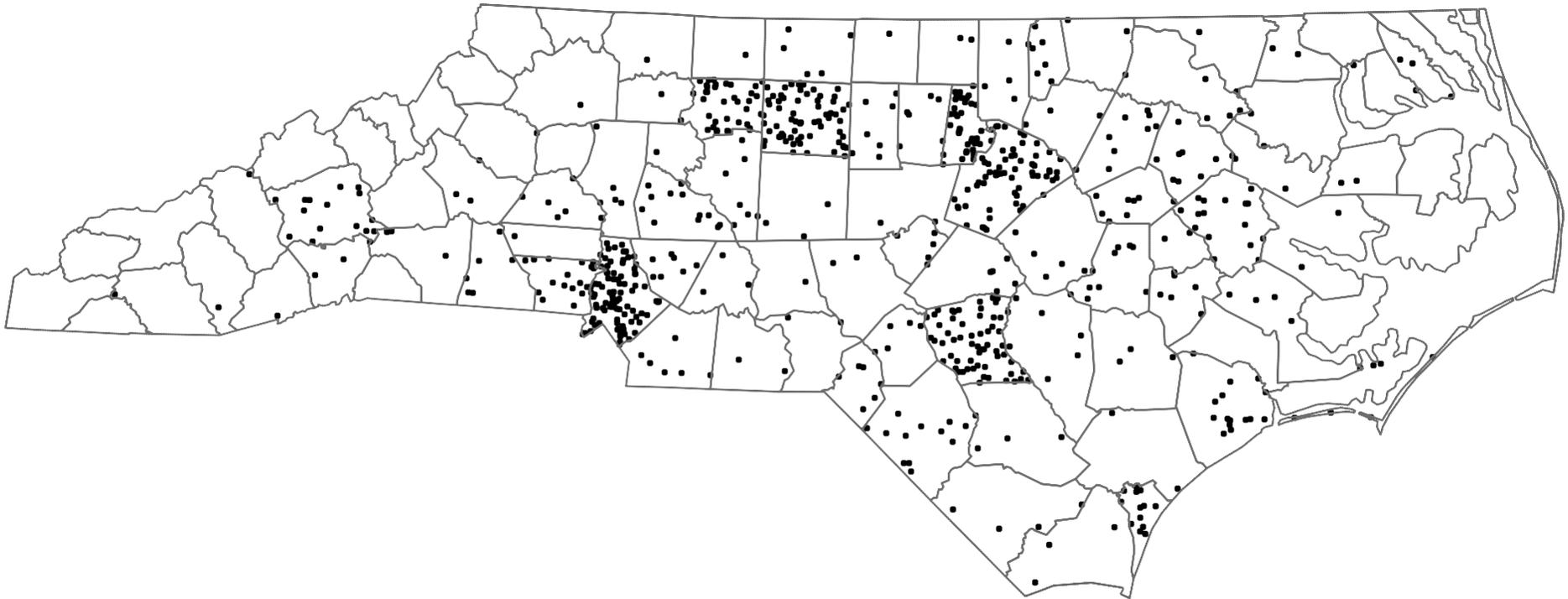
1 Dot = 20 Cases
Note that the dots do not represent actual locations of Gonorrhea cases, but reflect the number of cases in each county.

Map 10: North Carolina Newly Reported Gonorrhea Rates
by County of Residence, 2013

Rate per 100,000 population

0.0 - 25.0

25.1 - 100.0

100.1 - 200.0

200.1 - 300.0

>300
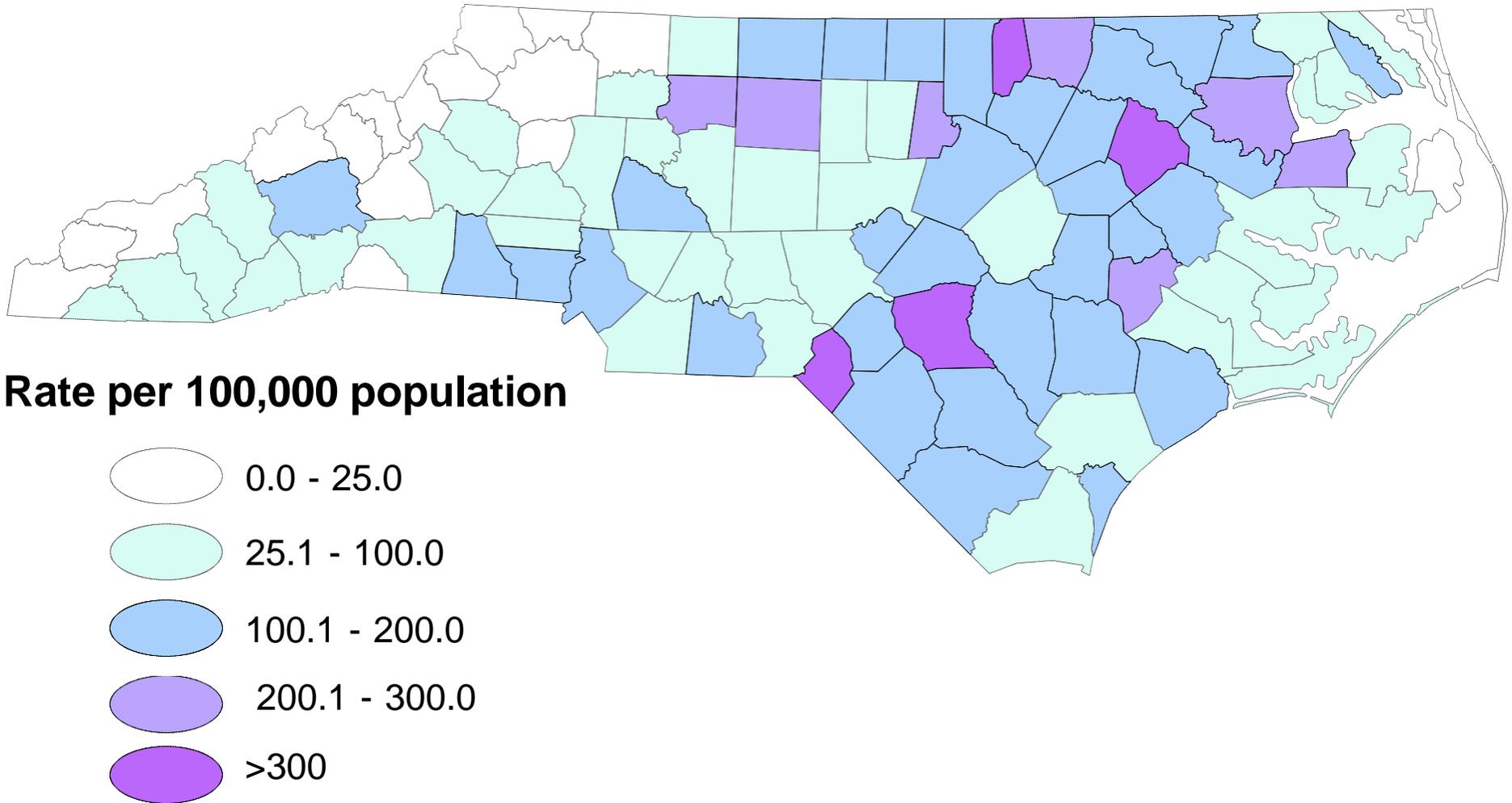
Map 11: North Carolina Newly Diagnosed Early Syphilis Cases
(Primary, Secondary, and Early Latent) by County of Residence, 2013
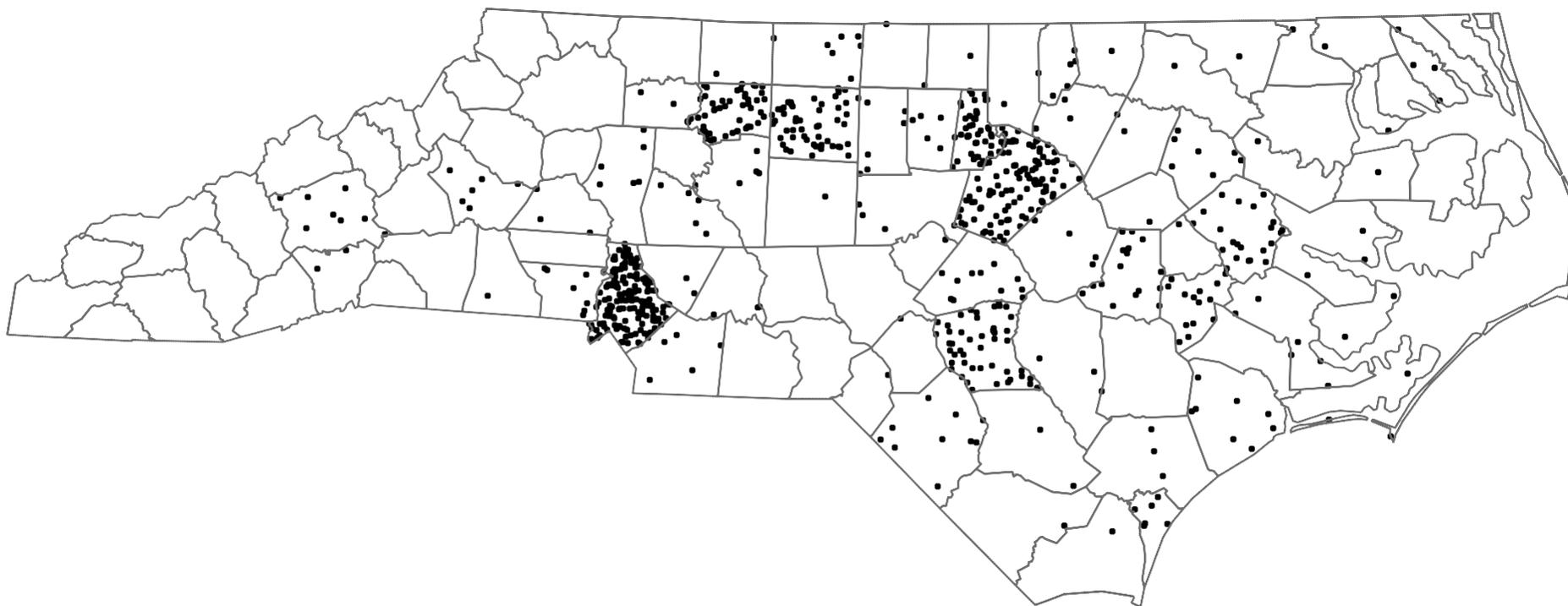
1 Dot = 1 Cases
 Note that the dots do not represent actual locations of Early Syphilis cases, but reflect the number of cases in each county.

Map 12: North Carolina Newly Diagnosed Early Syphilis Rates
(Primary, Secondary, and Early Latent) by County of Residence, 2013

Rate per 100,000 population

0.0 - 2.0

2.1 - 5.0

5.1 - 10.0

10.1 - 20.0

>20
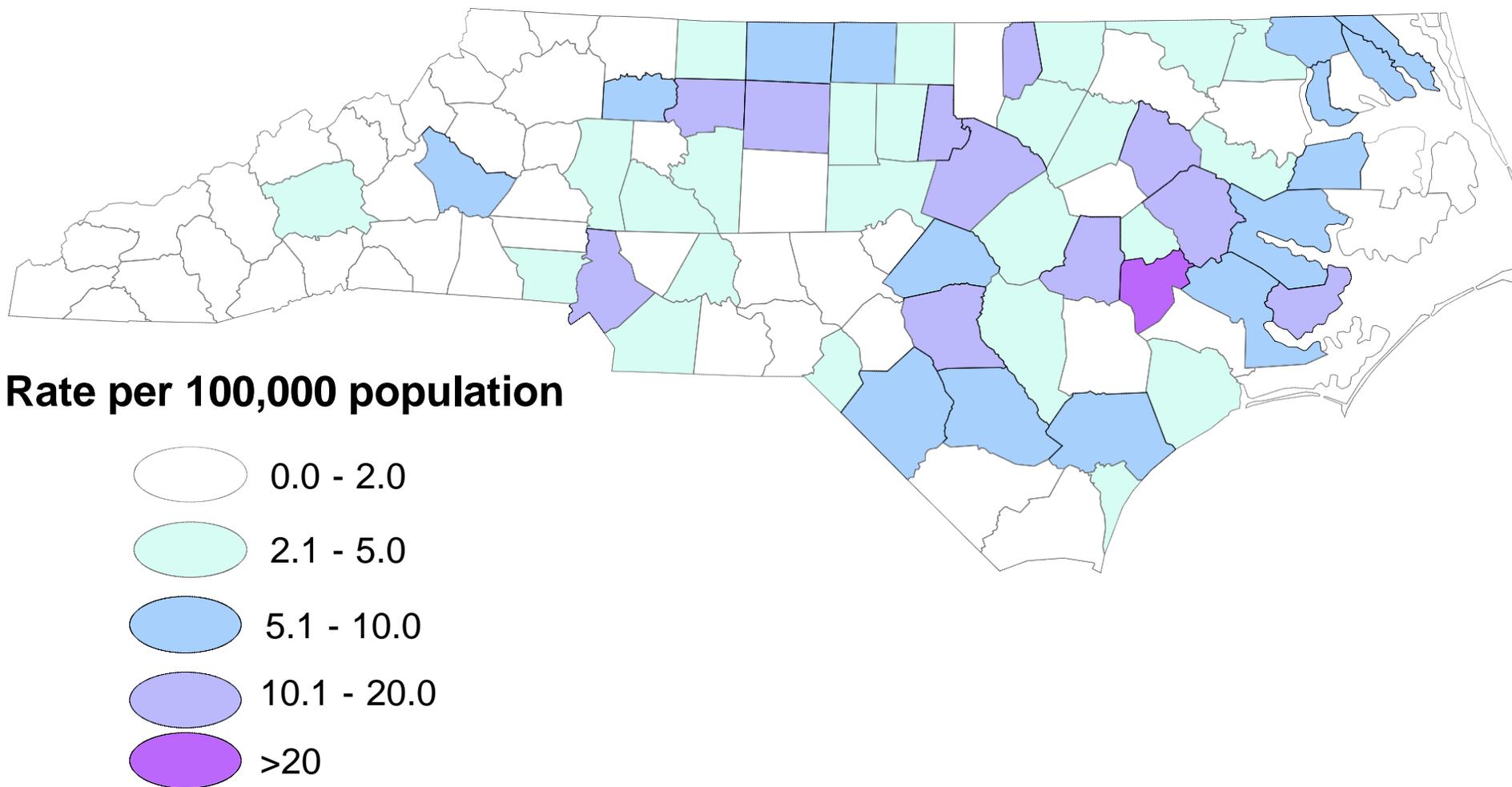
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APPENDIX B: DATA SOURCES

SOCIODEMOGRAPHIC INFORMATION

NATIONAL CENTER FOR HEALTH STATISTICS: BRIDGED-RACE POPULATION ESTIMATES

For this profile, the bridged-race population estimates available at time of data analysis for this profile were 2012 estimates. Therefore, the 2012 population is used as a substitute for 2013 to analyze the human immunodeficiency virus (HIV) infection rates in this profile.

Bridged-race population estimates are available as separate online databases. The data files used for the 2013 North Carolina HIV/STD Epidemiologic Profile were "*The vintage 2012 bridged-race postcensal population estimates files contain estimates of the resident population of the United States as of April 1, 2010 to July 1, 2012.*" These files are based on the 2010 United States (US) Census.

More information can be found at: http://www.cdc.gov/nchs/nvss/bridged_race.htm and http://wonder.cdc.gov/wonder/help/populations/bridged-race/VitalHealthStatistics-Series2No135.pdf.

UNITED STATES (US) CENSUS BUREAU: AMERICAN COMMUNITY SURVEY

The US Census Bureau is responsible for providing the leading source of quality data about the nation's people and economy. They conduct a population and housing census every 10 years, supplying projections for the years in between census years. The American Community Survey is conducted on an annual basis, supplying communities, state governments, and federal programs with information about basic demographics (age, sex, and race/ethnicity), income, health insurance, education, residential, and employment information.

More information can be found at: http://www.census.gov/en.html and http://www.census.gov/acs/www/about_the_survey/american_community_survey/.

KAISER FAMILY FOUNDATION AND URBAN INSTITUTE: STATE HEALTH FACTS

The Henry J. Kaiser Family Foundation (KFF) is an independent philanthropy focusing on the major health care issues facing the nation. The KFF provides information and analysis on a broad range of policy issues, emphasizing those that most affect low-income and vulnerable populations. Data presented on State Health Facts Online are a selection of key health and health policy issues collected from a variety of public and private sources, including original Kaiser Family Foundation reports, data from public websites, and information purchased from private organizations.

More information can be found at: http://kff.org/statedata/.

Additional North Carolina state and federal data sources and websites were used in Chapter 1: Sociodemographic Characteristics of North Carolina. For more information on those data sources, please refer to Appendix E: References, Chapter 1: Sociodemographic Characteristics of North Carolina (pages E-2 through E-4).

CORE HIV INFECTION SURVEILLANCE

ENHANCED HIV/AIDS REPORTING SYSTEM (eHARS)

The North Carolina Electronic Disease Surveillance System (NC EDSS) collects electronic and paper-based lab reports, case report forms from providers, and patient interviews from individuals with HIV infection. The information is collected state-wide and electronically submitted to the state's Communicable Disease Branch through the application (for more information about NC EDSS, please refer to page B-8). These surveillance reports include demographic and clinical information for the patient, as well as mode of exposure and vital status. Next, the reports are transferred to the enhanced HIV/AIDS Reporting System (eHARS), which is the mechanism by which we de-identified data is reported to the Centers for Disease Control and Prevention (CDC). Morbidity surveillance data represent the most complete and comprehensive single source of information available about HIV and AIDS in the state.

These data provide estimates of HIV infection. As with other disease surveillance, reporting is not complete. (Some people infected with HIV have not been tested for the infection, and these cases remain undiagnosed and are not included in surveillance data.) An internal evaluation (using a program created by the CDC) was conducted to examine the completeness of HIV infection reporting data in North Carolina. The 2013 analysis indicated that reporting completeness was approximately 90 to 95 percent statewide. This estimate is used to adjust prevalence estimates.

For more information, please refer to the Communicable Disease Branch surveillance and reporting website: http://epi.publichealth.nc.gov/cd/report.html.

NATIONAL HIV/AIDS SURVEILLANCE DATA (CDC)

The CDC compiles de-identified HIV and AIDS case-report information from each of the 50 states, the District of Columbia and six US territories. This information is published in aggregate form annually as the "HIV/AIDS Surveillance Report." These data are also reported in other publications from the CDC. The surveillance report contains tabular and graphic information about national HIV infection cases (regardless of stage of infection), including data by state, metropolitan statistical area, mode of exposure to HIV, sex, race/ethnicity, age group, vital status and case definition category. In 2008, all states, the District of Columbia, and six US dependent territories fully implemented name-based HIV infection reporting. General references to CDC information in this publication are usually from CDC surveillance reports.

These reports and other publications are available at:
http://www.cdc.gov/hiv/resources/reports/index.htm and
http://www.cdc.gov/hiv/library/reports/surveillance/.

NORTH CAROLINA STATE CENTER FOR HEALTH STATISTICS: LEADING CAUSE OF DEATH DATA

All deaths and fetal deaths that occur in North Carolina are reported to the state by the State Center for Health Statistics. The process involves a statewide system of hospitals, funeral directors, registers of deeds, local health department staff and others who register vital events. Statewide vital events are registered and maintained by the North Carolina Department of Public Health Vital Records Unit. Death

information includes the primary cause and underlying causes of death, but some causes of deaths, including HIV-related deaths, may be under-reported.

More information concerning the leading cause of death can be found at:
http://www.schs.state.nc.us/schs/data/lcd/lcd.cfm.

MEDICAL MONITORING PROJECT: INTERVIEW AND MEDICAL RECORD ABSTRACTION DATASETS

The Medical Monitoring Project (MMP) is a supplemental surveillance endeavor designed to learn more about the experiences and needs of adults receiving care for HIV in the US and Puerto Rico. The project is supported by several government agencies and conducted by state and local health departments, along with the CDC. MMP describes met and unmet needs for HIV care and prevention services through patient interviews and medical record abstractions. It provides comprehensive clinical and behavioral information from patient samples randomly selected to represent the health status of people living with HIV infection. This information is used to evaluate healthcare services and guide policy and funding decisions aimed at improving the quality of care for people living with HIV infection throughout the US.

Since MMP's estimates are nationally representative, data collected from MMP are used to evaluate the White House Office of National AIDS Policy indicators. In addition, MMP data are used by prevention planning groups, policy leaders, health care providers, and people living with HIV infection to highlight care and services disparities, as well as to advocate for additional resources.

Data Collection

Interview

A trained interviewer conducted a computer-assisted personal interview. Two versions of the questionnaire (in English and Spanish) were used in 2009: a standard questionnaire and a short questionnaire. The short questionnaire was administered when a patient was too ill to complete the longer standard interview or when translation to a language other than Spanish was required. Only standard questionnaire data are included in this report.

Persons who agreed to participate were interviewed in a private location (e.g., at home or in a clinic). The standard interview contained 10 modules and took approximately 45 minutes to complete. Nationally, participants were reimbursed approximately $40 in a cash equivalent for participation. Reimbursement amounts differed slightly by project area, as North Carolina reimbursed participants with a $25 gift card. Modules included questions on demographics, access to and use of health care, met and unmet needs for supportive services, sexual behavior, depression, gynecologic and reproductive history (women only), drug and alcohol use, and use of HIV prevention services.

Medical Record Abstraction

Patients' medical records were abstracted after the patients were interviewed. Medical records were accessed by MMP staff using an electronic application provided by CDC. Information obtained by MMP staff from medical records included diagnoses of conditions that, when they occur in HIV-infected

persons, meet the definition for AIDS (Stage 3); prescription of antiretroviral medications; laboratory results; and health-care use in the 12 months before the interview.

Data Weighting

Data used to generate national estimates were weighted for the probability of selection based on known probabilities of selection at each sampling stage. In addition, data were weighted to adjust for nonresponse using predictors of patient- level response, including facility size, race/ethnicity, time since HIV diagnosis, and age group.

Please see the following website for additional information:
http://www.cdc.gov/hiv/statistics/systems/mmp/index.html .

HIV TESTING DATA

STATE-SUPPORTED HIV TESTING DATA

The Communicable Disease Branch receives funding from both federal and state sources to pay for a variety of HIV testing programs. Most of this funding comes from the CDC, but the State of North Carolina supplies additional HIV prevention monies and the federal Substance Abuse and Mental Health Services Administration (SAMHSA) supports testing in substance abuse centers. The Communicable Disease Branch then distributes money and resources (rapid test kits) to partners across the state that test the public for HIV. The Expanded HIV Testing program supports HIV testing in clinical settings such as community health centers and hospital emergency departments. These entities conduct their own tests and provide self-reported data to the CDB describing the number of tests performed and the number of positives. However, the majority of the HIV testing budget is allocated to HIV testing in public settings. These include more than 150 traditional test sites in local health department clinics, university health centers, community-based organizations (CBO), and 22 Integrated and Targeted Testing Services (ITTS). The purpose of the ITTS program is to serve difficult to reach populations through mobile outreach or extended office hours. Most of the tests conducted are processed by the North Carolina State Laboratory of Public Health (North Carolina SLPH) in Raleigh, North Carolina.

The Communicable Disease Branch collects data on HIV tests conducted through this effort on the counseling, testing and referral (CTR) form, which includes information on client demographics, risk factors, reasons for HIV testing, and setting of HIV test. A much smaller number of tests are conducted using point of care (rapid) HIV tests for which data similar to that found on the CTR form are collected on a separate form.

Data collected on the CTR form are analyzed regularly and are used to improve HIV testing programs. It cannot be used to estimate statewide HIV incidence or prevalence for a number of reasons. The data cover only publicly-funded clinics and therefore do not reflect all the HIV tests done in the state. In fact, only about 30 percent of new HIV cases reported to the state come from the CTR. Patients tested are either self-selected for HIV testing, agree to testing after presentation to a counselor at a CTR site, or have been approached by the DIS through contact tracing and therefore do not constitute a population-based survey. Despite these limitations, the data are useful in monitoring testing trends and positivity rates among key subpopulations reached through public testing venues.

HIV CARE AND TREATMENT DATA

RYAN WHITE CARE ACT AND PART B BASE PROGRAM DATA

Congress enacted the Ryan White Comprehensive AIDS Resources Emergency (CARE) Act in 1990 to provide funding for states and territories, eligible metropolitan areas (EMAs), and individual providers to offer primary medical care and support services for people living with HIV disease who lack health insurance and financial resources for care. At the federal level, the program is administered by the US Department of Health and Human Services (US DHHS), Health Resources and Services Administration (HRSA), HIV/AIDS Bureau (HAB). It has five main parts: Part A (directly funds selected metropolitan areas), Part B (directly funds US states, territories, and the District of Columbia), Part C (directly funds clinics and hospitals), Part D (directly funds individual organizations to provide family-centered care for women, infants, children and youth with HIV infection), and Part F (funds several different targeted programs). Part F funding streams include: Special Projects of National Significance (SPNS), AIDS Education and Training Centers (ATEC), Dental Programs, and Minority AIDS Initiative (MAI). Congress reauthorized the Ryan White CARE Act in 1996 and in 2000. The Ryan White Modernization Act of 2006 (which superseded the CARE Act) made significant changes to the HIV/AIDS care system in the United States and had a major impact on services in North Carolina. While the Parts (formerly Titles) of the Act remained essentially the same as the old CARE Act, new definitions adopted for Part A created North Carolina's first direct-funded locality: the Charlotte Transitional Grant Area (TGA). The Charlotte TGA consists of five North Carolina counties in the Charlotte-Gastonia-Concord metropolitan area, including Mecklenburg County, and one county in South Carolina. In 2009, Congress reauthorized the Ryan White program once again.

In North Carolina, the Ryan White Part B base program is administered by the North Carolina Department of Health and Human Services (DHHS), Communicable Disease Branch, AIDS Care Program (ACP). North Carolina's Ryan White Part B base program organizes 95 of the state's 100 counties into 10 Regional Networks of Care and Prevention (RNCP). The remaining five counties are part of the TGA. Within each RNCP, groups of partnering agencies coordinate with each other to provide a range of necessary services, such as medical care, oral health care, case management, and other core and support services.

ACP uses a HRSA-sponsored computer software program called CAREWare to store and manage data for the Ryan White Part B base program. Ryan White Part B providers across the state input their data to a server maintained by ACP. CAREWare's data sharing feature allows providers serving the same client to access information on the client that another provider has entered. As a result, providers have a more comprehensive understanding of the services the client receives, and what potential gaps may exist in the person's care. While ACP mandates use of CAREWare for Part B program data, a number of providers also use CAREWare to store data for their Part C or Part D clients.

CAREWare data are an invaluable resource used in many ways. CAREWare facilitates the completion of annual reports required by HRSA, and it can be used to measure markers of clinical quality management. Four times a year, the ACP extracts data from CAREWare that are used for routine analyses, such as demographic reports, eligibility analyses, and the unmet need analysis. The dataset extracted each quarter includes information for clients who received at least one service during a one-year period. Data are extracted one month following the completion of the one year period. Data are extracted in May, August, November, and February. For example, data for April 1, 2013 – March 30, 2014 were extracted

at the beginning of May 2014 and are the basis of the Ryan White Part B base data shown in Chapter 4: HIV Infection Care and Treatment in North Carolina (starting on page 55).

Ryan White Part B base program data maintained in CAREWare are subject to limitations that make the data an incomplete representation of the population receiving care in North Carolina. First, only the Part B program recipients are required to be reported to the state, so clients served through other HRSA funded programs (such as the TGA and Part C and Part D programs) are not included. As a result, the data do not represent all clients receiving Ryan White services statewide. Second, Ryan White Part B eligibility is restricted to low-income residents of the 95 covered counties, so higher income individuals who are in care are not represented in the CAREWare data.

AIDS DRUG ASSISTANCE PROGRAM (ADAP)

North Carolina's ADAP provides assistance for low-income HIV-positive residents to obtain selected medications. The *ADAP Fact Sheet*, available from the program's website (see link below), is the most up-to-date and comprehensive description of the program. The fact sheet includes information on eligibility, the application process, ADAP pharmacy locations, federal poverty level guidelines, a list of medications covered by the ADAP formulary, and contact information for ADAP program staff. In addition, the website contains the forms and manual for the ADAP application process, which requires documentation of income, residency, HIV-related laboratory values, and prescription for at least one medication on the ADAP formulary. ADAP clients are required to renew their eligibility every six months, and ongoing documentation is a required component. ADAP has two different programs to serve clients: the ADAP Pharmacy Program (APP), which serves the majority of North Carolina's ADAP clients; and the State Pharmaceutical Assistance Program (SPAP), which serves clients who are enrolled in Medicare's Part D program. According to the *ADAP Fact Sheet,* "APP uses a model that requires ADAP to purchase medications from a wholesaler and distributes medications through a pharmacy network. SPAP uses a cost sharing model where SPAP clients pay their Medicare Part D premiums and then ADAP pays all their out of pocket costs for ADAP formulary medications through a Pharmacy Benefits Manager." ADAP program data are maintained at the state level using several different electronic systems, which are linked together as needed. ADAP data are a good source of information for the population of low-income HIV-positive North Carolinians needing medication assistance, and are also one source used to describe the population of people receiving HIV care.

More information can be found at: http://epi.publichealth.nc.gov/cd/hiv/adap.html.

HOUSING OPPORTUNITIES FOR PERSONS WITH AIDS (HOPWA)

The Housing Opportunities for Persons with AIDS (HOPWA) Program was established by the US Department of Housing and Urban Development (HUD) to address the specific housing needs of persons living with HIV/AIDS and their families. Since the beginning of the HOPWA Program in 1992, the federal government has made available over $5.4 billion in HOPWA funds to support community efforts to create and operate HIV/AIDS housing initiatives throughout the US.

The HOPWA formula grant was first funded for the State of North Carolina in 1992 and served the entire state until 1998. In that year, the Charlotte and Raleigh metropolitan statistical areas (MSAs) became eligible for HOPWA formula allocations directly from HUD and the State's service area was reduced. In 2011, the City of Greensboro also became eligible for direct federal HOPWA formula funding and the state funding and service area was further reduced. In addition, clients living in Currituck County are

served by the Virginia Beach, Virginia MSA. As of June 2011, the State's HOPWA program covers 88 of the 100 counties in North Carolina. In addition to core medical and support services for individuals living with HIV/AIDS, each of the 10 RNCPs provides HOPWA services for individuals living within their respective RNCP.

The North Carolina HOPWA Grantee (AIDS Care Program) is required to report annual information on program accomplishments that supports program evaluation. They are also required to report on the ability to measure program beneficiary outcomes as related to maintaining housing stability, preventing homelessness, and improving access to care and support. We gather the data from our HOPWA-funded Project Sponsors via HOPWA Quarterly Reports and Individual HOPWA consolidated performance and evaluation report (CAPER). These data are then compiled and documented in the North Carolina Consolidated Performance and Evaluation Report (CAPER) on client outputs and outcomes that enable an assessment of grantee performance in achieving the housing stability outcome measure. HUD uses these data to obtain essential information on grant activities, project sponsors, sub-recipient organizations, housing sites, units and households, which includes racial and ethnic data on program participants.

More information can be found at: https://www.hudexchange.info/hopwa/.

MEDICAID

Medicaid specifically serves low-income parents, children, seniors, and people with disabilities in North Carolina and financial support is provided through both state and federal funds (more information on Medicaid in North Carolina can be found in Chapter 1: Sociodemographic Characteristics of North Carolina, page 7). Data used for this profile (January 1, 2013 through June 30, 2013) were obtained through internal health department agreements.

More information can be found at: http://www.ncdhhs.gov/dma/medicaid/ and http://medicaid.gov/.

SEXUALLY TRANSMITTED DISEASES AND COMORBDITY SURVEILLANCE

NORTH CAROLINA ELECTRONIC DISEASE SURVEILLANCE SYSTEM (NC EDSS)

All North Carolina local health departments use NC EDSS to communicate new diagnoses of reportable conditions to the Communicable Disease Branch. The Communicable Disease Branch fully integrated sexually transmitted disease (STD) and HIV infection reporting into NC EDSS in December 2012. Integration of all nationally notifiable diseases in NC EDSS makes identification of comorbidities much easier. Electronic systems also allow for quicker communication of data between the state and local health departments, which may reduce reporting delay. While a few diseases or conditions are still reported using other CDC required reporting systems, such as the National Electronic Telecommunications System for Surveillance (NETSS) for animal rabies reporting, NC EDSS is a powerful tool for disease surveillance.

The transition to NC EDSS also included the integration of partner counseling and referral services data and referral data into NC EDSS. Therefore, NC EDSS includes not only morbidity information but also

patient interviews of persons newly diagnosed with HIV infection or syphilis and information on care referrals and attendance.

Chlamydia Case Reporting

North Carolina law requires that all cases of chlamydial infection be reported to the local health department within seven days. Laboratory confirmation of chlamydia cases takes place at a number of private labs. Most public clinics send their samples to the North Carolina SLPH. Results are returned to the provider, who reports them to the local health department. Infected patients are treated and encouraged to bring their partners in for treatment but there is no statewide partner notification procedure. When a new case is diagnosed, the local health department sends a morbidity report via NC EDSS to the Communicable Disease Branch, where information on patient demographics and disease diagnosis is compiled for analysis.

Chlamydia is often asymptomatic in both males and females. This infection is also a major cause of pelvic inflammatory disease (PID) in females. For this reason, North Carolina DHHS recommends that all sexually active young women be screened for chlamydia during any pelvic exam. Originally this screening recommendation included only women age 22 and younger. However, since 2008, the screen was expanded to include women age 25 and younger. It is also recommended that all pregnant women should be tested for chlamydia as part of standard prenatal care. No comparable screening programs for young men. For this reason, chlamydia case reports are highly biased with respect to gender.

Gonorrhea Case Reporting

North Carolina law requires that all cases of gonorrhea be reported to the local health department within 24 hours. Laboratory confirmation of cases generally takes place at the local level and is reported directly to the local health department. Infected patients are treated and encouraged to bring their partners in for treatment, but there is no formal partner notification procedure. When a new case is diagnosed, a morbidity report is sent via NC EDSS to the Communicable Disease Branch, where information on patient demographics and disease diagnosis is compiled for analysis.

Gonorrhea is often symptomatic in males and slightly less so in females. Females entering publicly-funded prenatal care, family planning, and STD clinics are screened for asymptomatic gonorrhea. Males are screened at STD clinics only. Since males are more likely to have symptoms that would bring them to the STD clinic, the gender bias in gonorrhea reporting is not as severe as that for chlamydia reporting. Required laboratory reporting may also reduce some private vs. public provider bias in reporting.

Syphilis Case Reporting

North Carolina law requires that all cases of syphilis be reported to the local health department within 24 hours. When a new case is diagnosed, a morbidity report is sent in to the Communicable Disease Branch where information on patient names, demographics and disease diagnoses are compiled for analysis and for reporting to CDC.

Thorough contact tracing and partner notification activities greatly reduce bias in reporting by locating and reporting partners with asymptomatic infections who may not otherwise have been found. Due to the severity and comparative rarity of syphilis compared to other STDs, it is believed that syphilis

reporting is very good. Because syphilis cases are reported to the North Carolina DHHS by name, accidental duplicates in the database are unlikely.

Many latent cases of syphilis are asymptomatic and hence are found only through screening. Latent syphilis case reporting may be biased towards groups that receive syphilis screening, such as pregnant women and jail or prison inmates. It is also slightly more difficult to distinguish between the various latent stages of syphilis (early latent, late latent, latent of unknown duration), so the stage may be misdiagnosed in some cases.

GONOCOCCAL ISOLATE SURVEILLANCE PROJECT

The Gonococcal Isolate Surveillance Project (GISP) is a collaborative project between selected state or territory health departments, STD clinics, five regional laboratories, and the CDC. It was established in 1986 to monitor trends in antimicrobial susceptibilities of strains of *Neisseria gonorrhoeae* in the US in order to provide information for the selection of gonococcal therapies. *N. gonorrhoeae* isolates are collected from the first 25 men with urethral gonorrhea attending STD clinics each month in 29 cities in the US. The men are asked a number of behavioral questions and the samples are tested for resistance to a variety of antibiotics. The project includes one site in North Carolina. From 1998-2001 the North Carolina site was located at Fort Bragg. In 2002, the participating clinic was moved to the Guilford County Health Department which has two STD clinics that collect samples, one in Greensboro and one in High Point. Random sampling design allows for good estimates for the target population.
The survey covers a relatively small sample of men from two specific clinics in an urban area. Although the national sample (combining data from states) provides nationally representative data, North Carolina survey results likely cannot be generalized to other populations in the state.

More information on this project can be found at http://www.cdc.gov/STd/gisp/default.htm.

NORTH CAROLINA SYPHILIS ELIMINATION EFFORT

The North Carolina Syphilis Elimination Project (NCSEP) is a collaborative effort of the Communicable Disease Branch and six local health departments across the state. The project began in 1998, when 28 counties across the nation were identified as reporting more than 50 percent of the nation's morbidity for infectious syphilis. The project is now called the North Carolina Syphilis Elimination Effort (NC SEE) and includes Durham, Forsyth, Guilford, Mecklenburg, Robeson, and Wake counties**.** The NC SEE strives to reduce syphilis through community involvement, surveillance, prevention, rapid outbreak response, targeted testing, health promotion and education. The primary purpose of the NC SEE is to provide syphilis testing and awareness to those individuals most at risk for contracting the disease. Targeted testing is made available through community screening events. Funding for the NC SEE Project concluded with the close out of the CSPS grant at the end of 2013.

More information on this project can be found at http://epi.publichealth.nc.gov/cd/syphilis/sep.html.

APPENDIX C: TECHNICAL NOTES

HIV INFECTION

Human immunodeficiency virus (HIV) infection case reports represent persons who have a confirmed diagnosis of HIV, regardless of the stage of the disease. HIV infection was referred to as "HIV disease" in previous versions of the profile. Cases are counted by the date of the initial HIV diagnosis. Acquired immunodeficiency syndrome (AIDS) (Stage 3) case reports, by contrast, represent only persons with HIV infection who have progressed to this later, more advanced stage of HIV infection. AIDS (Stage 3) cases are counted by the date of AIDS (Stage 3) diagnosis. Most AIDS (Stage 3) case reports represent persons who were diagnosed with HIV infection previously. However, in North Carolina, about one-fourth to one-third of the newly diagnosed HIV infection reports represent persons who are initially diagnosed with HIV infection and AIDS (Stage 3) at or very near the same time (or with AIDS [Stage 3] within six months of HIV diagnosis). Once a case is classified as AIDS (Stage 3), it will always be classified as AIDS (Stage 3), regardless of their most recent CD4+ T-lymphocyte (CD4) cell count test results.

New HIV and AIDS (Stage 3) infections are currently diagnosed and presented separately. HIV infection reports, presented by diagnosis year, include those AIDS (Stage 3) cases that were diagnosed concurrently in that same year (e.g., a person diagnosed with both HIV and AIDS [Stage 3] in 2010). Prior to 1990, case reports were only collected for persons with AIDS (Stage 3); for people diagnosed prior to 1990, the AIDS (Stage 3) diagnosis date is also used for the HIV infection diagnosis date. Because these diagnoses can overlap, HIV and AIDS (Stage 3) case reports should be considered separately and should never be combined to estimate an infected population.

The HIV infection definition is used in North Carolina to provide the most comprehensive look at the epidemic over time because all infected individuals are counted. AIDS (Stage 3) case reports, on the other hand, are counted by the date of AIDS (Stage 3) diagnosis and include only cases of HIV infection that also have an AIDS (Stage 3) diagnosis. Prior to 2008, a national comparison of HIV diagnosis rates was not possible since not every state had implemented confidential name-based reporting for HIV.

HIV INFECTION SURVEILLANCE REPORTING ISSUES

The number of HIV infection case reports for the years 2003 and 2007 were higher than the number of reports expected. This increase in case reports may be the result of more intensive surveillance efforts involving follow-up of laboratory reports. In 2013, newly diagnosed HIV infections are slightly higher than expected. For the 2013 data, this increase is most likely a result of incomplete interstate deduplication.

The Centers for Disease Control and Prevention (CDC) conducts Routine Interstate Duplicate Review (RIDR) to ensure accurate counts of diagnoses of HIV infection by identifying and merging duplicative records at the national level.[1] Through RIDR, state public health staff determine whether potentially duplicative pairs represent one person and, if so, that person's residence at the time of diagnosis. In the event that the pair represents one person, previously unlinked records in more than one state database are linked and corrected in state and national databases.[1] RIDR was not completed at the time the 2013 data closed, and therefore is likely contributing to the increased number of newly diagnosed HIV infections seen in 2013 compared to 2012.

Please note that the assignment of residency for some cases may change as additional information is received. HIV cases are counted by the residency at earliest HIV diagnosis, while AIDS (Stage 3) cases are counted by the residency at earliest AIDS (Stage 3) diagnosis. Changes in residency can cause disease totals for previous years to change. For the most comprehensive and accurate data, readers should refer to the latest publications on the North Carolina Department of Health and Human Services (North Carolina DHHS) website located at: http://epi.publichealth.nc.gov/cd/stds/figures.html.

HIV INCIDENCE ESTIMATION

The goal of HIV incidence surveillance is to provide an estimate of the number of new HIV infections per year in North Carolina as well as in the US. In order to estimate HIV incidence, the program combines routine case surveillance data with additional data collected about HIV testing and treatment history along with supplemental laboratory testing known as Serologic Testing Algorithm for Recent HIV Seroconversion (STARHS). Estimates of HIV incidence are used to identify current trends in HIV transmission, target programs for HIV prevention, and better allocate resources. Additional information regarding the complex methodology used for generating HIV incidence estimates is described in *Estimated HIV Incidence in The United States, 2006-2009* by Prejean et al. (2011) and *Estimating HIV Incidence in the United States from HIV/AIDS Surveillance Data and Biomarker HIV Test Results* by Karon, Song, Brookmeyer, Kaplan, & Hall (2008).[2,3] North Carolina implemented HIV incidence surveillance beginning in the summer of 2005 for all newly diagnosed and reported cases by routinely collecting remnant diagnostic specimens for STARHS and collecting Testing and Treatment History (TTH) information.

The HIV incidence program in North Carolina collaborates with the North Carolina State Laboratory of Public Health (North Carolina SLPH) and several commercial laboratories (Laboratory Corporation of America, Associated Regional University Pathologists [ARUP], Quest Diagnostics, University of North Carolina Hospitals, Duke University Medical Center, and Mayo Laboratories) to obtain specimens for STARHS testing. Remnant samples of confirmed HIV antibody–positive sera are sent to the CDC STARHS designated laboratory in New York for testing. Specimens are retained in the North Carolina SLPH until staff from the HIV incidence program, using routine HIV/AIDS surveillance reporting procedures, determines that the specimen represents the person's first reported positive HIV test result. HIV positive sera for persons who have been previously reported or diagnosed are not considered eligible for additional STARHS testing. Testing from commercial labs, along with the North Carolina SLPH, accounts for more than three-quarters of the new HIV/AIDS cases reported each year to the North Carolina Communicable Disease Branch. The use of specimens from commercial laboratories, as well as from the North Carolina SLPH, helps ensure that data used to create the HIV incidence estimate is representative of the HIV epidemic in North Carolina.

All newly reported HIV-positive persons in North Carolina undergo a review of medical records to complete case report information, which is used to determine if the case is STARHS eligible. People with a positive HIV test result will be considered STARHS-eligible if they meet the following requirements:

- They have not been reported previously as HIV-infected.
- The serum specimen held in the laboratory represents an eligible confirmatory positive HIV test result.

Due to the variability in antibody development in the individuals, the predictive value of an individual's STARHS result is low. The data reliably support using STARHS only for estimating incidence at the population level. The United States (US) Food and Drug Administration (FDA) has labeled the lab test (BED HIV-1 Capture EIA) methodology being used as, "*For surveillance use. Not for diagnostic or clinical use*."[4] Consequently, STARHS results are not returned to individuals or to care providers.

Testing and Treatment History (TTH) Questionnaire

As part of HIV incidence surveillance, information on prior HIV testing and treatment with antiretroviral drugs is needed for all eligible persons reported in order to ensure incidence estimates can be accurately calculated. Testing and Treatment History (TTH) information is collected routinely as part of follow-up for all new cases. However, not all of the required elements were uniformly collected prior to the implementation of the program. Therefore, a standard set of questions and corresponding data elements was developed for the project.

In North Carolina, TTH information is collected when the individual returns to receive test results or during HIV counseling. Obtaining HIV testing history requires the individual to recall information about previous HIV testing. Local surveillance personnel use their best judgment in each instance regarding when to approach individuals for their testing history. Standard HIV investigation procedures are followed in contacting individuals to prevent them from becoming lost to follow-up. Data, such as the date of any previous negative HIV test(s) and the use of antiretroviral medications, may be obtained from care providers or from other data systems in addition to, or instead of, the patient interview. The data management system for the HIV incidence surveillance program allows for the collection of information for each data element from multiple sources to be identified in the database.

HIV EXPOSURE RISK CATEGORIES AND DISTRIBUTION

The assignment of HIV exposure risk category (also referred to as mode of transmission by the CDC) to individual cases is hierarchical. The CDC has developed this hierarchy based on information about the epidemic during early investigations. All possible exposure information is collected for each case and the exposure considered most likely to have transmitted HIV is assigned as the risk category for the case. This assignment does not mean that the HIV exposure is known to have occurred via the risk category assigned for a single case, but it implies that this was the most likely mode of exposure. This assigned risk or mode of exposure is not absolute. First, the hierarchy was developed using methodologies formed early in the epidemic and may under- or over-represent certain groups because the epidemic has evolved since the early years. Second, not all cases are reported with adequate information to assign risk. Many HIV cases are classified as no identified risk (NIR) or no risk reported (NRR), not because of missing or incomplete information, but because reported risks do not meet one of the CDC-defined risk classifications. For this report, NIR and NRR are combined into one category called unknown risk, which occurs frequently with heterosexual cases. The CDC risk category, heterosexual contact-high risk, requires that index cases know either their partners' HIV-positive status or their partner's most likely risk for HIV. If a person does not know their sexual partners' HIV status, these cases are categorized as unknown risk. The Communicable Disease Branch has reevaluated and reassigned some of these cases to a presumed heterosexual risk category, based on information from patient interviews. When newly diagnosed individuals report having sex partners of the opposite gender as well as any additional risk factors, such as the exchange of sex for drugs or money, previous sexually transmitted diseases (STDs)

diagnoses, or multiple sexual partners—these unknown risk cases are reassigned as likely heterosexual transmission. Reassignment of presumed heterosexual cases gives a more accurate description of HIV infection in the state, especially among females. For more information on HIV risk (CDC refers to this as "transmission category"), refer to
http://www.cdc.gov/hiv/surveillance/resources/reports/2008report/technicalnotes.htm.

Even with the reassignment of cases to presumed heterosexual risk of HIV exposure category, North Carolina still has a number of cases with insufficient information to determine risk. In 2013, only 11.3 percent of the 683 unknown risk patients were reassigned to presumed heterosexual (Chapter 2: Score of HIV Infection Epidemic in North Carolina, page 22).To simplify the discussion and better describe the overall changes over time, these remaining cases are assigned to a risk category based on the proportionate representation of the various risk groups within the surveillance data. These remaining cases do not appear to differ substantially from the overall risk profile of all HIV disease cases, and risk reassignment is done separately for males and females because risk differs by gender. Further, this risk reassignment by gender is also done separately by race/ethnicity group (if the group represents a sufficient number of cases).

For example, if 20-in-100 male HIV cases do not have risk information (classified as unknown risk), proportions are calculated for the remaining HIV infection cases and the proportions are applied to those with unknown risk. Of the 80 male cases with risk, 60.0 percent (48/80) were MSM, 5.0 percent (4/80) were IDU, 2.5 percent (2/80) were MSM/IDU, and 32.5 percent (26/80) were heterosexual contact. These fractions are then applied to the 20 NIR cases. For example, MSM: (20) x (.60) = 12; thus 12 of the 20 NIR cases are reassigned to MSM, after the redistribution calculation. For heterosexual contact, (20) x (.325) = 6.5 or 7 (rounded). Therefore, 7-of-20 unknown cases are assigned to heterosexual contact, after the redistribution calculation. Actual reassignment takes into account the differences of racial/ethnic, age and gender distributions for each risk group.

RATE CALCULATION AND DENOMINATOR DETERMINATION

Rates are presented throughout the *2013 North Carolina HIV/STD Epidemiological Profile* for several demographic categories including gender, race/ethnicity, and age. Rates are also presented for counties and geographic regions across the state. Rates are expressed as cases per 100,000 population. Unless otherwise noted, all rate denominators were derived using bridged-race category estimates for North Carolina for the referenced year, available. Estimates for 2013 were not available at time of analysis; thus rates for 2013 were calculated using 2012 estimates. The bridged-race estimates are published by the National Center for Health Statistics and are based on census counts. These estimates result from bridging the 31 race categories used by the 2000 Census to the four race categories specified by the Office of Management and Budget (OMB). More information about bridged-race categories and the OMB standards for the collection of data on race and ethnicity is available in Appendix B: Data Sources (page B-2), http://www.cdc.gov/nchs/nvss.htm, and
http://www.cdc.gov/nchs/nvss/bridged_race/data_documentation.htm#vintage2013.

In general, rates should be viewed with caution, particularly for rates that are based on small numbers of cases (generally fewer than 20) because these rates have large standard errors and confidence intervals that can be wider than the rates themselves. For a more complete discussion of rates based on small numbers, please see the North Carolina Center for Health Statistics' publication, *Statistical Primer*

No. 12: "Problems with Rates Based on Small Numbers," by Paul Buescher. This publication is available at http://www.schs.state.nc.us/SCHS/pdf/primer12_2.pdf.

In order to reliably describe county rates for HIV infection, the county rankings in Appendix D: Tables, Table D (page D-8 through D-10) are based on three-year averages. The averaging of three years takes care resolves the erratic annual rates for counties with small numbers of cases or small population sizes, and this provides a better statewide comparison.

APPENDIX D: TABLES

Table A: All Persons Living in North Carolina with HIV Infection[a] as of 12/31/2013 by Gender and Race/Ethnicity

Gender	Race/Ethnicity	Cases	%	Rate[b]
Male	American Indian/Alaska Native[c]	144	0.7	253.9
	Asian/Pacific Islander[c]	103	0.5	85.4
	Black/African American[c]	12,160	60.9	1,210.8
	Hispanic/Latino	1,385	6.9	306.2
	White/Caucasian[c]	5,772	28.9	185.1
	Unknown[d]	398	2.0	--
	Total	19,962	100.0	420.0
Female	American Indian/Alaska Native[c]	62	0.8	101.8
	Asian/Pacific Islander[c]	48	0.6	36.6
	Black/African American[c]	6,217	76.4	546.3
	Hispanic/Latino	371	4.6	93.1
	White/Caucasian[c]	1,299	16.0	39.7
	Unknown[d]	142	1.7	--
	Total	8,139	100.0	162.8
Total	American Indian/Alaska Native[c]	206	0.7	175.2
	Asian/Pacific Islander[c]	151	0.5	59.9
	Black/African American[c]	18,377	65.4	857.8
	Hispanic/Latino	1,756	6.2	206.4
	White/Caucasian[c]	7,071	25.2	110.7
	Unknown[d]	540	1.9	--
	Total	28,101	100.0	288.2

[a]All persons living with HIV infection, regardless of the stage of infection (HIV or AIDS).

[b]Rate is expressed per 100,000 population.

[c]Non-Hispanic/Latino.

[d]Rates are not available due to the lack of overall population data for the unknown race/ethnicity group.

Data Source: enhanced HIV/AIDS Reporting System (eHARS) (data as of July 1, 2014).

Table B: All Persons Living in North Carolina with HIV Infection[a] as of 12/31/2013 by Gender and Hierarchical Risk of HIV Exposure (Unknown Risk[b] Redistributed)

Gender	Exposure Category	Cases	%
Male	Heterosexual-All[c]	4,307	21.6
	IDU[d]	1,642	8.2
	MSM[d]	12,992	65.1
	MSM/IDU[d]	766	3.8
	Other Risks[e]	255	1.3
	Total	19,962	100.0
Female	Heterosexual-All[c]	6,711	82.5
	IDU[d]	1,144	14.1
	Other Risks[e]	284	3.5
	Total	8,139	100.0
Total[f]	Heterosexual-All[c]	10,860	38.6
	IDU[d]	2,818	10.0
	MSM[d]	12,309	43.8
	MSM/IDU[d]	773	2.8
	Other Risks[e]	546	1.9
	Total	28,101	100.0

[a]All persons living with HIV infection, regardless of the stage of infection (HIV or AIDS).

[b]Unknown risk includes individuals classified as no identified risk (NIR) and no reported risk (NRR). For more information on distribution calculations, see Appendix C: Technical Notes (page C-5).

[c]Heterosexual-All includes cases those individuals reporting heterosexual contact with a known HIV-positive or high risk individual and cases redistributed into the heterosexual classification from the unknown group.

[d]IDU = injection drug use; MSM = men who have sex with men; MSM/IDU = men who have sex with men and injection drug user.

[e]Other risks include exposure to blood products (adult hemophilia) and pediatric risk.

[f]Totals may not correspond to cases listed above due to redistribution of unknown cases.

Data Source: enhanced HIV/AIDS Reporting System (eHARS) (data as of July 1, 2014).

Table C: Cumulative HIV Infection[a] Cases by County of Residence and Year of Diagnosis in North Carolina, 1983-2013[b]

COUNTY	83-90 Cases	91-96 Cases	97-04 Cases	2005 Cases	2006 Cases	2009 Cases	2010 Cases	2011 Cases	2012 Cases	2013[b] Cases	CUMULATIVE CASES
ALAMANCE	50	136	189	22	34	16	21	20	17	*25*	530
ALEXANDER	2	10	22	1	1	2	1	3	0	*1*	43
ALLEGHANY	0	0	0	2	0	0	0	0	0	*0*	2
ANSON	9	44	27	0	4	3	3	4	4	*4*	102
ASHE	1	1	3	4	1	0	1	1	1	*0*	13
AVERY	3	2	1	0	0	2	0	0	0	*0*	8
BEAUFORT	33	52	69	10	10	5	4	8	3	*6*	200
BERTIE	9	26	66	4	5	3	7	3	2	*3*	128
BLADEN	12	32	59	6	5	6	7	8	2	*10*	147
BRUNSWICK	25	52	90	11	11	10	8	5	13	*10*	235
BUNCOMBE	96	284	240	31	31	19	13	25	29	*31*	799
BURKE	16	37	34	9	9	4	2	1	3	*3*	118
CABARRUS	32	103	129	10	26	20	9	17	15	*22*	383
CALDWELL	9	33	18	4	6	2	2	1	6	*2*	83
CAMDEN	1	7	13	1	1	2	1	1	0	*0*	27
CARTERET	23	32	25	2	5	4	2	2	4	*4*	103
CASWELL	4	16	16	3	6	4	3	1	2	*3*	58
CATAWBA	36	85	111	20	16	15	13	9	15	*10*	330
CHATHAM	9	42	53	9	4	5	5	3	3	*5*	138
CHEROKEE	3	9	7	3	2	1	0	0	0	*1*	26
CHOWAN	8	18	10	0	3	0	1	0	1	*2*	43
CLAY	0	1	5	1	1	1	2	0	0	*0*	11
CLEVELAND	35	98	137	15	12	13	12	12	9	*10*	353
COLUMBUS	26	84	113	13	10	9	13	11	6	*6*	291
CRAVEN	46	117	142	19	14	11	10	11	10	*11*	391
CUMBERLAND	224	565	709	90	83	83	80	97	69	*87*	2,087
CURRITUCK	6	7	9	2	1	1	1	1	0	*1*	29
DARE	7	14	26	3	2	1	2	0	1	*4*	60
DAVIDSON	44	102	128	12	19	12	10	11	10	*14*	362
DAVIE	7	16	18	2	0	0	2	1	2	*0*	48
DUPLIN	22	71	121	6	5	11	11	5	5	*9*	266
DURHAM	316	763	914	68	96	82	86	68	71	*75*	2,539
EDGECOMBE	30	132	188	18	17	25	21	19	14	*19*	483
FORSYTH	242	482	896	81	72	89	59	80	54	*69*	2,124
FRANKLIN	20	39	64	4	4	9	5	5	4	*8*	162
GASTON	81	329	304	24	30	39	30	31	30	*31*	929
GATES	1	1	7	0	1	1	1	0	0	*1*	13
GRAHAM	0	2	2	0	0	0	0	0	0	*1*	5
GRANVILLE	26	63	82	7	14	11	10	4	15	*9*	241
GREENE	3	33	34	2	2	2	2	1	3	*3*	85
GUILFORD	313	804	1,204	160	145	129	113	128	100	*123*	3,219
HALIFAX	26	107	100	10	17	6	4	13	12	*9*	304
HARNETT	22	91	108	8	13	22	14	10	11	*12*	311
HAYWOOD	11	32	23	5	1	5	1	2	0	*2*	82
HENDERSON	22	48	44	9	4	4	7	1	4	*2*	145

Continued

[a]HIV infection includes all newly reported HIV infected individuals by the year of first diagnosis, regardless of the stage of infection (HIV or AIDS).

[b]2013 values (in italics) are likely to be artificially inflated due to incomplete interstate deduplication (see Chapter 2: Special Notes or more information, page 9).

Data Source: enhanced HIV/AIDS Reporting System (eHARS) (data as of July 1, 2014).

Table C (continued): Cumulative HIV Infection[a] Cases by County of Residence and Year of Diagnosis in North Carolina, 1983-2013[b]

COUNTY	83-90 Cases	91-96 Cases	97-04 Cases	2005 Cases	2006 Cases	2009 Cases	2010 Cases	2011 Cases	2012 Cases	2013[b] Cases	CUMULATIVE CASES
HERTFORD	17	30	51	5	4	2	5	4	1	*5*	124
HOKE	8	45	70	9	7	11	11	12	8	*10*	191
HYDE	0	4	6	0	0	0	3	0	0	*0*	13
IREDELL	27	58	86	10	13	7	12	5	8	*11*	237
JACKSON	4	8	11	2	3	0	4	1	2	*2*	37
JOHNSTON	45	161	208	17	23	10	10	10	11	*18*	513
JONES	1	13	12	0	1	2	2	1	1	*1*	34
LEE	19	55	99	9	7	2	14	9	4	*5*	223
LENOIR	38	159	181	19	12	9	10	7	3	*19*	457
LINCOLN	7	21	39	3	3	3	5	3	6	*5*	95
MACON	6	11	14	0	1	4	1	0	0	*2*	39
MADISON	1	9	11	0	0	0	0	0	0	*0*	21
MARTIN	7	39	57	7	1	0	1	0	4	*6*	122
MCDOWELL	6	12	8	1	2	2	2	2	0	*5*	40
MECKLENBURG	683	1,899	2,802	405	394	339	312	323	270	*300*	7,727
MITCHELL	2	5	3	1	3	3	0	0	0	*0*	17
MONTGOMERY	6	20	23	1	2	1	2	2	1	*3*	61
MOORE	24	60	104	7	11	7	3	9	8	*7*	240
NASH	39	144	181	14	23	16	17	13	20	*13*	480
NEW HANOVER	98	262	430	35	29	29	17	22	25	*14*	961
NORTHAMPTON	14	37	36	2	11	6	2	4	5	*3*	120
ONSLOW	50	81	132	11	11	11	14	11	19	*16*	356
ORANGE	71	139	147	18	18	13	8	13	15	*17*	459
PAMLICO	5	8	12	1	2	1	1	0	3	*1*	34
PASQUOTANK	15	41	50	6	8	3	4	7	4	*7*	145
PENDER	20	30	37	3	5	2	2	4	2	*3*	108
PERQUIMANS	1	11	24	0	2	2	1	0	0	*0*	41
PERSON	8	41	42	6	3	4	3	4	6	*8*	125
PITT	90	276	302	38	35	31	29	33	35	*38*	907
POLK	5	12	10	1	2	0	1	1	1	*0*	33
RANDOLPH	24	50	93	9	10	10	6	8	7	*5*	222
RICHMOND	11	84	74	17	7	6	7	8	3	*1*	218
ROBESON	39	185	254	40	30	26	14	29	24	*21*	662
ROCKINGHAM	15	77	78	9	12	6	3	11	5	*2*	218
ROWAN	39	118	128	25	11	14	15	11	10	*7*	378
RUTHERFORD	19	30	40	1	4	2	3	6	1	*1*	107
SAMPSON	24	92	93	7	6	9	13	6	7	*5*	262
SCOTLAND	15	73	74	4	8	4	5	3	7	*1*	194
STANLY	10	34	48	9	2	5	4	5	5	*4*	126
STOKES	2	11	23	3	1	0	2	0	1	*3*	46
SURRY	8	25	35	2	3	6	2	0	4	*7*	92
SWAIN	8	6	11	0	0	0	0	2	1	*2*	30
TRANSYLVANIA	9	18	18	0	1	3	2	3	1	*1*	56

Continued

[a]HIV infection includes all newly reported HIV infected individuals by the year of first diagnosis, regardless of the stage of infection (HIV or AIDS).

[b]2013 values (in italics) are likely to be artificially inflated due to incomplete interstate deduplication (see Chapter 2: Special Notes or more information, page 9).

Data Source: enhanced HIV/AIDS Reporting System (eHARS) (data as of July 1, 2014).

Table C (continued): Cumulative HIV Infection[a] Cases by County of Residence and Year of Diagnosis in North Carolina, 1983-2013[b]

COUNTY	83-90 Cases	91-96 Cases	97-04 Cases	2005 Cases	2006 Cases	2009 Cases	2010 Cases	2011 Cases	2012 Cases	2013[b] Cases	CUMULATIVE CASES
TYRRELL	2	2	2	2	0	0	0	0	0	*0*	8
UNION	17	79	93	19	14	18	12	13	11	15	291
VANCE	31	94	114	8	10	6	11	9	10	*9*	302
WAKE	450	943	1,541	205	204	185	168	139	144	*186*	4,165
WARREN	5	12	32	2	5	2	5	0	3	*0*	66
WASHINGTON	8	34	41	6	4	2	0	0	1	*0*	96
WATAUGA	5	5	15	3	4	2	1	1	1	*2*	39
WAYNE	66	157	189	17	15	16	14	23	20	*20*	537
WILKES	5	12	27	4	6	0	3	2	5	*4*	68
WILSON	54	199	213	19	18	33	18	24	19	*8*	605
YADKIN	5	6	21	2	2	0	1	1	1	*1*	40
YANCEY	3	8	3	0	1	2	0	1	0	*0*	18
UNASSIGNED[c]	146	538	903	72	62	80	59	62	44	*53*	2,019
NORTH CAROLINA	**4,248**	**11,60**	**15,91**	**1,827**	**1,819**	**1,646**	**1,463**	**1,490**	**1,347**	***1,525***	**42,881**

[a]HIV infection includes all newly reported HIV infected individuals by the year of first diagnosis, regardless of the stage of infection (HIV or AIDS).

[b]2013 values (in italics) are likely to be artificially inflated due to incomplete interstate deduplication (see Chapter 2: Special Notes for more information, page 9).

[c]Unassigned includes cases with unknown county of residence at diagnosis or cases that were diagnosed at a long-term care facility, including prisons; rates are not available due to the lack of overall population data in the unassigned area.

Data Source: enhanced HIV/AIDS Reporting System (eHARS) (data as of July 1, 2014).

Table D: North Carolina Newly Diagnosed HIV Infection[a] Rates by County of Residence, Year of Diagnosis, and Rank Order[b], 2011-2013[c]

COUNTY	2011 CASES	2011 RATE	2012 CASES	2012 RATE	2013[c] CASES	2013[c] RATE	2011-2013 AVG RATE[b,c]	RANK
MECKLENBURG	323	34.2	270	27.9	300	31.0	31.0	1
EDGECOMBE	19	33.9	14	25.0	19	34.0	31.0	1
CUMBERLAND	97	30.0	69	21.3	87	26.8	26.0	3
DURHAM	68	24.8	71	25.4	75	26.8	25.7	4
GUILFORD	128	25.8	100	20.0	123	24.6	23.5	5
HALIFAX	13	23.9	12	22.2	9	16.7	20.9	6
WILSON	24	29.5	19	23.2	8	9.8	20.8	7
VANCE	9	19.9	10	22.2	9	19.9	20.7	8
PITT	33	19.3	35	20.3	38	22.0	20.5	9
HOKE	12	24.2	8	15.8	10	19.8	20.0	10
BLADEN	8	22.9	2	5.7	10	28.6	19.1	11
FORSYTH	80	22.6	54	15.1	69	19.3	19.0	12
NORTHAMPTON	4	18.2	5	23.3	3	14.0	18.5	13
ROBESON	29	21.5	24	17.7	21	15.5	18.2	14
WAYNE	23	18.6	20	16.1	20	16.1	16.9	15
WAKE	139	15.0	144	15.1	186	19.5	16.5	16
LENOIR	7	11.8	3	5.1	19	32.1	16.3	17
NASH	13	13.6	20	20.9	13	13.6	16.0	18
GRANVILLE	4	6.7	15	24.8	9	14.9	15.5	19
PERSON	4	10.1	6	15.3	8	20.4	15.3	20
ANSON	4	15.1	4	15.2	4	15.2	15.1	21
PASQUOTANK	7	17.3	4	9.9	7	17.2	14.8	22
GASTON	31	15.0	30	14.4	31	14.9	14.8	22
MARTIN	0	0.0	4	16.7	6	25.0	13.9	24
HERTFORD	4	16.3	1	4.1	5	20.5	13.6	25
ALAMANCE	20	13.1	17	11.0	25	16.2	13.5	26
COLUMBUS	11	19.0	6	10.4	6	10.4	13.3	27
BERTIE	3	14.3	2	9.7	3	14.5	12.8	28
BEAUFORT	8	16.8	3	6.3	6	12.6	11.9	29
SWAIN	2	14.3	1	7.1	2	14.1	11.8	30
BUNCOMBE	25	10.4	29	11.9	31	12.7	11.6	31
ORANGE	13	9.6	15	10.9	17	12.3	10.9	32
GREENE	1	4.6	3	14.0	3	14.0	10.9	32
CLEVELAND	12	12.3	9	9.2	10	10.3	10.6	34
DUPLIN	5	8.4	5	8.3	9	15.0	10.6	34
PAMLICO	0	0.0	3	22.9	1	7.6	10.2	36
CRAVEN	11	10.5	10	9.5	11	10.5	10.2	36
LEE	9	15.4	4	6.7	5	8.4	10.1	38
SCOTLAND	3	8.3	7	19.4	1	2.8	10.1	38
CABARRUS	17	9.4	15	8.1	22	11.9	9.8	40

Continued

[a]HIV infection includes all newly reported HIV infected individuals by the year of first diagnosis, regardless of the stage of infection (HIV or AIDS).

[b]Rank is based on a three-year average rate per 100,000 population for newly diagnosed HIV infections in the county of interest.

[c]2013 values (in italics) are likely to be artificially inflated due to incomplete interstate deduplication (see Chapter 2: Special Notes for more information, page 9).

Data Source: enhanced HIV/AIDS Reporting System (eHARS) (data as of July 1, 2014).

Table D (continued): North Carolina Newly Diagnosed HIV Infection[a] Rates by County of Residence, Year of Diagnosis, and Rank Order[b], 2011-2013[c]

COUNTY	2011 CASES	2011 RATE	2012 CASES	2012 RATE	2013[c] CASES	2013[c] RATE	2011-2013 AVG RATE[b,c]	RANK
NEW HANOVER	22	10.7	25	11.9	*14*	*6.7*	*9.8*	40
JONES	1	9.8	1	9.7	*1*	*9.7*	*9.7*	42
SAMPSON	6	9.4	7	10.9	*5*	*7.8*	*9.4*	43
FRANKLIN	5	8.2	4	6.5	*8*	*13.0*	*9.2*	44
HARNETT	10	8.4	11	9.0	*12*	*9.8*	*9.1*	45
MOORE	9	10.1	8	8.9	*7*	*7.8*	*8.9*	46
CASWELL	1	4.2	2	8.6	*3*	*12.9*	*8.6*	47
RICHMOND	8	17.1	3	6.4	*1*	*2.1*	*8.6*	47
ONSLOW	11	6.2	19	10.4	*16*	*8.7*	*8.4*	49
BRUNSWICK	5	4.5	13	11.6	*10*	*8.9*	*8.3*	50
STANLY	5	8.3	5	8.3	*4*	*6.6*	*7.7*	51
JOHNSTON	10	5.8	11	6.3	*18*	*10.3*	*7.5*	52
CATAWBA	9	5.8	15	9.7	*10*	*6.5*	*7.3*	53
MONTGOMERY	2	7.2	1	3.6	*3*	*10.8*	*7.2*	54
DAVIDSON	11	6.7	10	6.1	*14*	*8.6*	*7.1*	55
CHOWAN	0	0.0	1	6.8	*2*	*13.5*	*6.8*	56
ROWAN	11	8.0	10	7.2	*7*	*5.1*	*6.8*	56
ROCKINGHAM	11	11.8	5	5.4	*2*	*2.2*	*6.5*	58
UNION	13	6.3	11	5.3	*15*	*7.2*	*6.3*	59
LINCOLN	3	3.8	6	7.6	*5*	*6.3*	*5.9*	60
CHATHAM	3	4.6	3	4.5	*5*	*7.6*	*5.6*	61
PENDER	4	7.5	2	3.7	*3*	*5.5*	*5.6*	61
WILKES	2	2.9	5	7.2	*4*	*5.8*	*5.3*	63
MCDOWELL	2	4.4	0	0.0	*5*	*11.1*	*5.2*	64
TRANSYLVANIA	3	9.1	1	3.0	*1*	*3.0*	*5.1*	65
SURRY	0	0.0	4	5.4	*7*	*9.5*	*5.0*	66
CARTERET	2	3.0	4	5.9	*4*	*5.9*	*4.9*	67
IREDELL	5	3.1	8	4.9	*11*	*6.8*	*4.9*	67
WARREN	0	0.0	3	14.6	*0*	*0.0*	*4.9*	67
DARE	0	0.0	1	2.9	*4*	*11.6*	*4.8*	70
RANDOLPH	8	5.6	7	4.9	*5*	*3.5*	*4.7*	71
JACKSON	1	2.5	2	4.9	*2*	*4.9*	*4.1*	72
RUTHERFORD	6	8.9	1	1.5	*1*	*1.5*	*4.0*	73
GRAHAM	0	0.0	0	0.0	*1*	*11.5*	*3.8*	74
CALDWELL	1	1.2	6	7.3	*2*	*2.4*	*3.7*	75
ALEXANDER	3	8.1	0	0.0	*1*	*2.7*	*3.6*	76
CAMDEN	1	9.9	0	0.0	*0*	*0.0*	*3.3*	77
POLK	1	4.9	1	4.9	*0*	*0.0*	*3.3*	77
STOKES	0	0.0	1	2.1	*3*	*6.4*	*2.9*	79
GATES	0	0.0	0	0.0	*1*	*8.4*	*2.8*	80
CURRITUCK	1	4.2	0	0.0	*1*	*4.2*	*2.8*	80

Continued

[a]HIV infection includes all newly reported HIV infected individuals by the year of first diagnosis, regardless of the stage of infection (HIV or AIDS).

[b]Rank is based on a three-year average rate per 100,000 population for newly diagnosed HIV infections in the county of interest.

[c]2013 values (in italics) are likely to be artificially inflated due to incomplete interstate deduplication (see Chapter 2: Special Notes for more information, page 9).

Data Source: enhanced HIV/AIDS Reporting System (eHARS) (data as of July 1, 2014).

Table D (continued): North Carolina Newly Diagnosed HIV Infection[a] Rates by County of Residence, Year of Diagnosis, and Rank Order[b], 2011-2013[c]

COUNTY	2011 CASES	2011 RATE	2012 CASES	2012 RATE	2013[c] CASES	2013[c] RATE	2011-2013 AVG RATE[b,c]	RANK
YADKIN	1	2.6	1	2.6	*1*	*2.6*	*2.6*	82
WASHINGTON	0	0.0	1	7.9	*0*	*0.0*	*2.6*	82
BURKE	1	1.1	3	3.3	*3*	*3.3*	*2.6*	82
WATAUGA	1	1.9	1	1.9	*2*	*3.9*	*2.6*	82
ASHE	1	3.7	1	3.7	*0*	*0.0*	*2.5*	86
DAVIE	1	2.4	2	4.8	*0*	*0.0*	*2.4*	87
HAYWOOD	2	3.4	0	0.0	*2*	*3.4*	*2.3*	88
HENDERSON	1	0.9	4	3.7	*2*	*1.8*	*2.2*	89
MACON	0	0.0	0	0.0	*2*	*5.9*	*2.0*	90
YANCEY	1	5.6	0	0.0	*0*	*0.0*	*1.9*	91
CHEROKEE	0	0.0	0	0.0	*1*	*3.7*	*1.2*	92
ALLEGHANY	0	0.0	0	0.0	*0*	*0.0*	*0.0*	93
AVERY	0	0.0	0	0.0	*0*	*0.0*	*0.0*	93
CLAY	0	0.0	0	0.0	*0*	*0.0*	*0.0*	93
HYDE	0	0.0	0	0.0	*0*	*0.0*	*0.0*	93
MADISON	0	0.0	0	0.0	*0*	*0.0*	*0.0*	93
MITCHELL	0	0.0	0	0.0	*0*	*0.0*	*0.0*	93
PERQUIMANS	0	0.0	0	0.0	*0*	*0.0*	*0.0*	93
TYRRELL	0	0.0	0	0.0	*0*	*0.0*	*0.0*	93
NORTH CAROLINA	**1,490**	**15.4**	**1,347**	**13.8**	***1,525***	***15.6***	***15.0***	**N/A**

[a]HIV infection includes all newly reported HIV infected individuals by the year of first diagnosis, regardless of stage of infection (HIV or AIDS).

[b]Rank is based on a three-year average rate per 100,000 population for newly diagnosed HIV infections in the county of interest.

[c]2013 values (in italics) are likely to be artificially inflated due to incomplete interstate deduplication (see Chapter 2: Special Notes for more information, page 9).

Data Source: enhanced HIV/AIDS Reporting System (eHARS) (data as of July 1, 2014).

Table E: Cumulative AIDS (HIV Infection Stage 3) Cases[a] by County of Residence, 1983-2013

COUNTY	83-90 Cases	91-96 Cases	97-06 Cases	2007 Cases	2008 Cases	2009 Cases	2010 Cases	2011 Cases	2012 Cases	2013[b] Cases	CUMULATIVE CASES
ALAMANCE	25	66	89	8	12	12	13	8	5	*13*	251
ALEXANDER	2	4	12	0	2	2	2	0	2	*0*	26
ALLEGHANY	0	0	0	0	0	0	0	0	0	*0*	0
ANSON	4	13	31	0	5	0	2	1	2	*1*	59
ASHE	0	2	1	0	0	0	0	0	0	*0*	3
AVERY	2	0	1	2	0	1	1	0	0	*1*	8
BEAUFORT	20	34	45	4	7	6	1	6	2	*4*	129
BERTIE	8	17	46	3	3	3	1	5	1	*1*	88
BLADEN	8	13	40	3	7	1	7	8	1	*5*	93
BRUNSWICK	15	30	48	8	10	6	6	6	3	*4*	136
BUNCOMBE	30	170	174	11	13	3	10	21	22	*26*	480
BURKE	8	27	21	1	5	4	2	1	1	*2*	72
CABARRUS	18	48	63	7	6	4	5	5	7	*11*	174
CALDWELL	5	16	16	2	3	1	2	1	2	*1*	49
CAMDEN	0	3	10	0	1	1	1	1	0	*0*	17
CARTERET	11	21	17	1	4	2	3	3	2	*3*	67
CASWELL	1	10	4	2	2	1	1	1	0	*1*	23
CATAWBA	23	40	79	11	10	14	7	2	10	*1*	197
CHATHAM	5	14	26	5	1	1	4	4	1	*1*	62
CHEROKEE	1	6	4	1	1	0	0	0	0	*0*	13
CHOWAN	5	8	10	0	4	1	0	0	0	*1*	29
CLAY	0	0	2	0	0	0	1	2	0	*0*	5
CLEVELAND	19	26	77	12	8	8	5	9	6	*12*	182
COLUMBUS	16	36	78	9	6	6	8	6	8	*7*	180
CRAVEN	24	55	87	11	10	15	8	3	2	*3*	218
CUMBERLAND	89	233	358	46	47	44	37	48	32	*36*	970
CURRITUCK	3	6	6	0	1	2	2	0	0	*0*	20
DARE	5	9	15	1	1	2	1	2	0	*2*	38
DAVIDSON	29	49	49	9	13	9	2	5	8	*3*	176
DAVIE	3	7	9	0	1	0	3	2	2	*1*	28
DUPLIN	14	45	79	5	4	5	5	6	2	*7*	172
DURHAM	142	451	384	31	43	33	36	23	25	*19*	1,187
EDGECOMBE	19	67	131	9	15	18	12	17	12	*10*	310
FORSYTH	132	243	368	32	29	48	26	40	26	*34*	978
FRANKLIN	11	15	41	2	2	5	8	5	1	*2*	92
GASTON	28	137	184	11	12	21	23	33	16	*16*	481
GATES	0	0	3	0	0	2	0	0	0	*0*	5
GRAHAM	0	1	2	0	0	0	0	0	0	*1*	4
GRANVILLE	13	26	47	3	4	6	6	2	7	*8*	122
GREENE	3	13	27	1	1	2	4	0	1	*2*	54
GUILFORD	159	467	464	52	66	61	48	51	38	*45*	1,451
HALIFAX	15	52	74	6	11	9	3	9	8	*3*	190
HARNETT	11	45	70	6	13	12	11	10	7	*6*	191
HAYWOOD	5	22	20	0	2	3	1	3	1	*1*	58
HENDERSON	9	28	42	8	2	4	4	3	1	*1*	102
HERTFORD	12	14	33	4	3	4	1	4	3	*2*	80
HOKE	3	12	41	6	6	4	7	7	5	*4*	95

Continued

[a]AIDS (HIV infection Stage 3) is classified by a CD4+ T-lymphocyte cell count of less than 200 or a T-lymphocyte percentage of total lymphocytes of less than 14. AIDS (Stage 3) classification is defined as those who were diagnosed with HIV infection during the year of diagnosis and were classified as AIDS that year or who have ever been diagnosed with AIDS (Stage 3). For the newly diagnosed AIDS (Stage 3) cases, there is a possibility that the individual was diagnosed with HIV in a previous year (or another state). Therefore, adding new AIDS (Stage 3) diagnoses and new HIV diagnoses WILL NOT equal the total number of new HIV diagnoses in North Carolina. For more information, see Appendix C: Technical Notes (page C-2).

[b]2013 values (in italics) are likely to be artificially inflated due to incomplete interstate deduplication (see Chapter 2: Special Notes for more information, page 9).

Data Source: enhanced HIV/AIDS Reporting System (eHARS) (data as of July 1, 2014).

Table E (continued): Cumulative AIDS (HIV Infection Stage 3) Cases[a] by County of Residence, 1983-2013

COUNTY	83-90 Cases	91-96 Cases	97-06 Cases	2007 Cases	2008 Cases	2009 Cases	2010 Cases	2011 Cases	2012 Cases	2013[b] Cases	CUMULATIVE CASES
HYDE	0	3	5	0	0	0	1	0	0	0	9
IREDELL	12	31	54	1	8	5	3	1	8	4	127
JACKSON	2	7	7	0	0	1	1	2	2	0	22
JOHNSTON	26	59	121	11	14	9	12	12	12	4	280
JONES	0	5	6	1	0	3	3	1	1	3	23
LEE	5	20	30	5	3	8	6	1	2	5	85
LENOIR	15	79	124	7	14	15	11	2	8	14	289
LINCOLN	2	8	21	0	2	0	5	1	3	3	45
MACON	0	11	9	0	1	2	1	1	0	2	27
MADISON	0	6	4	0	0	0	0	2	1	0	13
MARTIN	5	16	35	2	1	6	1	1	2	3	72
MCDOWELL	3	5	14	0	0	1	0	1	1	1	26
MECKLENBURG	288	665	1,262	158	161	174	128	134	212	259	3,441
MITCHELL	1	3	3	0	1	2	0	1	0	1	12
MONTGOMERY	2	7	14	0	1	1	2	2	0	2	31
MOORE	11	23	53	5	6	3	4	10	8	6	129
NASH	23	79	104	10	11	13	14	7	11	11	283
NEW HANOVER	50	122	241	19	18	11	8	12	10	10	501
NORTHAMPTON	5	28	29	1	3	5	2	3	3	3	82
ONSLOW	33	49	67	4	6	5	10	9	8	8	199
ORANGE	43	60	51	2	7	2	2	3	2	7	179
PAMLICO	5	4	7	0	0	1	0	1	0	1	19
PASQUOTANK	8	16	31	2	3	3	6	3	2	2	76
PENDER	10	24	28	0	2	3	0	3	1	1	72
PERQUIMANS	1	4	13	1	0	2	1	0	0	1	23
PERSON	3	15	15	3	4	4	5	1	1	1	52
PITT	40	170	200	18	21	24	25	21	26	22	567
POLK	2	10	8	1	0	1	0	1	1	1	25
RANDOLPH	12	30	43	4	3	4	8	6	6	5	121
RICHMOND	5	33	34	9	6	4	4	8	5	2	110
ROBESON	19	76	181	21	17	11	19	17	21	13	395
ROCKINGHAM	8	36	32	6	4	1	0	9	3	2	101
ROWAN	21	59	66	9	10	6	6	3	7	4	191
RUTHERFORD	10	26	19	2	1	0	1	5	2	1	67
SAMPSON	14	34	61	7	5	8	4	6	3	3	145
SCOTLAND	9	30	39	5	6	2	4	4	4	1	104
STANLY	5	8	19	3	1	2	1	2	2	11	54
STOKES	1	8	8	1	0	1	2	0	0	1	22
SURRY	6	12	15	0	3	1	1	0	2	2	42
SWAIN	5	8	9	0	0	0	0	0	0	2	24
TRANSYLVANIA	5	7	10	1	0	1	0	3	0	2	29
TYRRELL	1	1	1	0	0	0	0	0	1	0	4
UNION	14	23	58	4	9	8	5	15	7	14	157

Continued

[a]AIDS (HIV infection Stage 3) is classified by a CD4+ T-lymphocyte cell count of less than 200 or a T-lymphocyte percentage of total lymphocytes of less than 14. AIDS (Stage 3) classification is defined as those who were diagnosed with HIV infection during the year of diagnosis and were classified as AIDS (Stage 3) that year or who have ever been diagnosed with AIDS. For the newly diagnosed AIDS (Stage 3) cases, there is a possibility that the individual was diagnosed with HIV in a previous year (or another state). Therefore, adding new AIDS (Stage 3) diagnoses and new HIV diagnoses WILL NOT equal the total number of new HIV diagnoses in North Carolina. For more information, see Appendix C: Technical Notes (page C-2).

[b]2013 values (in italics) are likely to be artificially inflated due to incomplete interstate deduplication (see Chapter 2: Special Notes for more information, page 9). Data Source: enhanced HIV/AIDS Reporting System (eHARS) (data as of July 1, 2014).

Table E (continued): Cumulative AIDS (HIV Infection Stage 3) Cases[a] by County of Residence, 1983-2013

COUNTY	83-90 Cases	91-96 Cases	97-06 Cases	2007 Cases	2008 Cases	2009 Cases	2010 Cases	2011 Cases	2012 Cases	2013[b] Cases	CUMULATIVE CASES
VANCE	15	40	79	4	4	3	5	3	7	*7*	167
WAKE	218	471	940	116	119	110	83	76	69	*77*	2,279
WARREN	2	6	14	0	0	0	2	1	0	*1*	26
WASHINGTON	5	23	23	5	2	1	2	2	3	*1*	67
WATAUGA	4	4	8	0	1	3	0	0	0	*1*	21
WAYNE	42	87	136	10	10	9	9	17	11	*13*	344
WILKES	3	6	12	2	2	0	2	1	1	*1*	30
WILSON	28	73	169	16	13	20	8	10	12	*9*	358
YADKIN	3	3	13	3	1	0	1	1	0	*0*	25
YANCEY	1	5	4	0	0	2	0	0	0	*0*	12
UNASSIGNED[c]	57	290	726	48	40	68	49	27	26	*45*	1,376
NORTH CAROLINA	**2,063**	**5,529**	**8,703**	**860**	**940**	**955**	**797**	**815**	**789**	***894***	**22,345**

[a]AIDS (HIV infection Stage 3) is classified by a CD4+ T-lymphocyte cell count of less than 200 or a T-lymphocyte percentage of total lymphocytes of less than 14. AIDS (Stage 3) classification is defined as those who were diagnosed with HIV infection during the year of diagnosis and were classified as AIDS that year or who have ever been diagnosed with AIDS (Stage 3). For the newly diagnosed AIDS (Stage 3) cases, there is a possibility that the individual was diagnosed with HIV in a previous year (or another state). Therefore, adding new AIDS (Stage 3) diagnoses and new HIV diagnoses WILL NOT equal the total number of new HIV diagnoses in North Carolina. For more information, see Appendix C: Technical Notes (page C-2).

[b]2013 values (in italics) are likely to be artificially inflated due to incomplete interstate deduplication (see Chapter 2: Special Notes for more information, page 9).

[c]Unassigned includes cases with an unknown county of residence at diagnosis or cases that were diagnosed at a long-term care facility, including prisons.

Data Source: enhanced HIV/AIDS Reporting System (eHARS) (data as of July 1, 2014).

Table F: North Carolina Adult/Adolescent Newly Diagnosed HIV Infection[a] Rates by Gender and Age, 2009-2013

Gender	Age at Diagnosis (Year)	2009			2010			2011			2012			2013[b]		
		Cases	%	Rate[c]	Cases	%	Rate[c]	Cases	%	Rate[c]	Cases	%	Rate[c]	Cases	%	Rate[c]
Male	13-14	--[d]	--	--	--[d]	--	--	--[d]	--	--	--[d]	--	--	--[d]	--	--
	15-19	67	5.5	20.2	65	5.9	19.3	82	7.2	24.4	53	5.1	15.9	52	4.4	15.6
	20-24	202	16.5	57.4	226	20.6	66.4	223	19.5	64.6	222	21.5	62.0	249	20.9	69.5
	25-29	160	13.1	50.2	167	15.2	53.2	173	15.2	55.3	163	15.8	51.8	190	16.0	60.3
	30-34	127	10.4	42.6	111	10.1	36.1	103	9.0	33.2	105	10.2	33.6	128	10.8	41.0
	35-39	129	10.6	39.2	97	8.8	30.0	101	8.9	32.3	69	6.7	22.4	108	9.1	35.1
	40-44	154	12.6	47.5	120	10.9	36.4	118	10.3	35.2	115	11.2	34.1	130	10.9	38.5
	45-49	176	14.4	52.3	122	11.1	35.8	129	11.3	38.3	112	10.9	33.6	137	11.5	41.1
	50-54	103	8.4	33.0	84	7.7	25.9	98	8.6	29.8	88	8.5	26.5	85	7.1	25.6
	55-59	56	4.6	20.4	58	5.3	20.2	60	5.3	20.4	39	3.8	12.9	47	4.0	15.6
	60-64	24	2.0	10.1	23	2.1	8.9	30	2.6	11.2	38	3.7	14.3	--[d]	--	--
	65 and older	--[d]	--	--	--[d]	--	--	--[d]	--	--	--[d]	--	--	32	2.7	5.5
	Total	1,222	100.0	32.7	1,098	100.0	28.8	1,141	100.0	29.6	1,031	100.0	26.4	1,189	100.0	30.4
Female	13-14	--[d]	--	--	--[d]	--	--	--[d]	--	--	--[d]	--	--	--[d]	--	--
	15-19	23	5.5	7.3	16	4.5	5.0	11	3.2	3.5	14	4.6	4.4	7	2.2	2.2
	20-24	40	9.6	12.7	30	8.4	9.2	31	9.1	9.3	28	9.2	8.3	24	7.4	7.1
	25-29	37	8.9	11.9	36	10.0	11.4	39	11.5	12.3	39	12.7	12.3	32	9.9	10.1
	30-34	41	9.8	13.4	39	10.9	12.3	31	9.1	9.7	35	11.4	10.8	32	9.9	9.9
	35-39	58	13.9	17.4	58	16.2	17.4	44	12.9	13.6	36	11.8	11.3	38	11.7	11.9
	40-44	62	14.8	18.7	34	9.5	10.1	43	12.6	12.5	41	13.4	11.8	51	15.7	14.6
	45-49	67	16.0	19.0	57	15.9	16.0	52	15.3	14.8	38	12.4	10.9	46	14.2	13.2
	50-54	43	10.3	12.9	34	9.5	9.8	37	10.9	10.5	28	9.2	7.9	42	13.0	11.9
	55-59	28	6.7	9.3	29	8.1	9.1	29	8.5	8.9	23	7.5	6.9	30	9.3	9.0
	60-64	12	2.9	4.5	19	5.3	6.6	14	4.1	4.7	13	4.2	4.4	14	4.3	4.7
	65 and older	--[d]	--	--	--[d]	--	--	--[d]	--	--	--[d]	--	--	--[d]	--	--
	Total	418	100.0	10.5	359	100.0	8.8	340	100.0	8.2	306	100.0	7.3	324	100.0	7.7

Continued

[a] HIV infection includes all newly reported HIV infected individuals by the year of first diagnosis, regardless of the stage of infection (HIV or AIDS).

[b] 2013 values (in italics) are likely to be artificially inflated due to incomplete interstate deduplication (see Chapter 2: Special Notes for more information, page 9).

[c] Rate is expressed per 100,000 population.

[d] Cell counts, percentages, and rates have been suppressed to avoid identification of cells that have counts less than five through direct or indirect means.

Data Source: enhanced HIV/AIDS Reporting System (eHARS) (data as of July 1, 2014).

Table F (continued): North Carolina Adult/Adolescent Newly Diagnosed HIV Infection[a] Rates by Gender and Age, 2009-2013

Gender	Age at Diagnosis (Year)	2009			2010			2011			2012			2013[b]		
		Cases	%	Rate[c]	Cases	%	Rate[c]	Cases	%	Rate[c]	Cases	%	Rate[c]	Cases	%	Rate[c]
Total	13-14	--[d]	--	--	--[d]	--	--	--[d]	--	--	--[d]	--	--	--[d]	--	--
	15-19	90	5.5	13.9	81	5.6	12.3	93	6.3	14.2	67	5.0	10.3	*59*	*3.9*	*9.1*
	20-24	242	14.8	36.2	256	17.6	38.4	254	17.2	37.4	250	18.7	35.9	*273*	*18.0*	*39.2*
	25-29	197	12.0	31.2	203	13.9	32.2	212	14.3	33.6	202	15.1	31.9	*222*	*14.7*	*35.1*
	30-34	168	10.2	27.8	150	10.3	24	134	9.0	21.2	140	10.5	22.1	*160*	*10.6*	*25.2*
	35-39	187	11.4	28.2	155	10.6	23.6	145	9.8	22.8	105	7.9	16.8	*146*	*9.6*	*23.3*
	40-44	216	13.2	32.9	154	10.6	23.1	161	10.9	23.7	156	11.7	22.7	*181*	*12.0*	*26.4*
	45-49	243	14.8	35.3	179	12.3	25.7	181	12.2	26.3	150	11.2	22	*183*	*12.1*	*26.9*
	50-54	146	8.9	22.6	118	8.1	17.6	135	9.1	19.8	116	8.7	16.9	*127*	*8.4*	*18.5*
	55-59	84	5.1	14.5	87	6.0	14.4	89	6.0	14.4	62	4.6	9.8	*77*	*5.1*	*12.1*
	60-64	36	2.2	7.2	42	2.9	7.7	44	3.0	7.8	51	3.8	9.0	*45*	*3.0*	*8.0*
	65 and older	--[d]	--	--	--[d]	--	--	--[d]	--	--	--[d]	--	--	--[d]	--	--
	Total	1,640	100.0	21.3	1,457	100.0	18.4	1,481	100.0	18.5	1,337	100.0	16.5	*1,513*	*100.0*	*18.7*

[a]HIV infection includes all newly reported HIV infected individuals by the year of first diagnosis, regardless of the stage of infection (HIV or AIDS).

[b]2013 values (in italics) are likely to be artificially inflated due to incomplete interstate deduplication (see Chapter 2: Special Notes for more information, page 9).

[c]Rate is expressed per 100,000 population.

[d]Cell counts, percentages, and rates have been suppressed to avoid identification of cells that have counts less than five through direct or indirect means.

Data Source: enhanced HIV/AIDS Reporting System (eHARS) (data as of July 1, 2014).

Table G: North Carolina Adult/Adolescent Newly Diagnosed HIV Infection[a] Rates by Gender and Race/Ethnicity, 2009-2013

Gender	Race/Ethnicity	2009 Cases	2009 %	2009 Rate[c]	2010 Cases	2010 %	2010 Rate[c]	2011 Cases	2011 %	2011 Rate[c]	2012 Cases	2012 %	2012 Rate[c]	2013[b] Cases	2013[b] %	2013[b] Rate[c]
Male	American Indian/Alaska Native[d]	--[e]	--	--	--[e]	--	--	--[e]	--	--	--[e]	--	--	--[e]	--	--
	Asian/Pacific Islander[d]	--[e]	--	--	--[e]	--	--	--[e]	--	--	--[e]	--	--	10	0.8	10.5
	Black/African American[d]	747	61.1	99.4	689	62.8	89.1	721	63.2	91.9	650	63.0	81.5	736	61.9	92.3
	Hispanic/Latino	113	9.2	41.4	95	8.7	31.1	77	6.7	24.7	83	8.1	25.9	104	8.7	32.5
	White/Caucasian[d]	319	26.1	12.3	285	26.0	10.9	280	24.5	10.7	243	23.6	9.2	318	26.7	12.0
	Unknown[f]	27	2.2	--	21	1.9	--	--[e]	--	--	--[e]	--	--	--[e]	--	--
	Total	1,222	100.0	32.7	1,098	100.0	28.8	1,141	100.0	29.6	1,031	100.0	26.4	1,189	100.0	30.4
Female	American Indian/Alaska Native[d]	--[e]	--	--	--[e]	--	--	--[e]	--	--	--[e]	--	--	--[e]	--	--
	Asian/Pacific Islander[d]	--[e]	--	--	--[e]	--	--	--[e]	--	--	--[e]	--	--	7	2.2	6.6
	Black/African American[d]	322	77.0	36.5	269	74.9	29.5	266	78.2	28.8	226	73.9	24.1	232	71.6	24.7
	Hispanic/Latino	18	4.3	9	22	6.1	8.6	21	6.2	8	14	4.6	5.2	22	6.8	8.1
	White/Caucasian[d]	69	16.5	2.5	51	14.2	1.8	42	12.4	1.5	60	19.6	2.1	53	16.4	1.9
	Unknown[f]	6	1.4	--	13	3.6	--	--[e]	--	--	--[e]	--	--	--[e]	--	--
	Total	418	100.0	10.5	359	100.0	8.8	340	100.0	8.2	306	100.0	7.3	324	100.0	7.7
Total	American Indian/Alaska Native[d]	9	0.5	10.2	--[e]	--	--	13	0.9	13.8	12	0.9	12.6	11	0.7	11.5
	Asian/Pacific Islander[d]	10	0.6	6.3	--[e]	--	--	11	0.7	5.7	12	0.9	6	17	1.1	8.5
	Black/African American[d]	1,069	65.2	65.4	958	65.8	56.9	987	66.6	57.8	876	65.5	50.5	968	64.0	55.8
	Hispanic/Latino	131	8.0	27.7	117	8.0	20.9	98	6.6	17.1	97	7.3	16.4	126	8.3	21.3
	White/Caucasian[d]	388	23.7	7.2	336	23.1	6.2	322	21.7	5.9	303	22.7	5.5	371	24.5	6.8
	Unknown[f]	33	2.0	--	34	2.3	--	50	3.4	--	37	2.8	--	20	1.3	--
	Total	1,640	100.0	21.3	1,457	100.0	18.4	1,481	100.0	18.5	1,337	100.0	16.5	1,513	100.0	18.7

[a]HIV infection includes all newly reported HIV infected individuals by the year of first diagnosis, regardless of the stage of infection (HIV or AIDS).

[b]2013 values (in italics) are likely to be artificially inflated due to incomplete interstate deduplication (see Chapter 2: Special Notes for more information, page 9).

[c]Rate is expressed per 100,000 population.

[d]Non-Hispanic/Latino.

[e]Cell counts, percentages, and rates have been suppressed to avoid identification of cells that have counts less than five through direct or indirect means.

[f]Rates are not available due to the lack of overall population data for the unknown race/ethnicity group.

Data Source: enhanced HIV/AIDS Reporting System (eHARS) (data as of July 1, 2014).

Table H: North Carolina Adolescent (13-24 years) Newly Diagnosed HIV Infection[a] Rates by Gender and Race/Ethnicity, 2009-2013

Gender	Race/Ethnicity	2009			2010			2011			2012			2013[b]		
		Cases	%	Rate[c]	Cases	%	Rate[c]	Cases	%	Rate[c]	Cases	%	Rate[c]	Cases	%	Rate[c]
Male	Black/African American[d]	214	79.6	104.7	235	80.2	115.8	245	79.8	118.9	207	75.3	98.8	*248*	*82.4*	*118.4*
	White/Caucasian[d]	--[f]	--	--	--[f]	--	--	--[f]	--	--	--[f]	--	--	*--f*	*--*	*--*
	Other[e]	--[f]	--	--	--[f]	--	--	--[f]	--	--	--[f]	--	--	*--f*	*--*	*--*
	Total	269	100.0	33.3	293	100.0	36.4	307	100.0	37.9	275	100.0	33.4	*301*	*100.0*	*36.6*
Female	Black/African American[d]	49	76.6	24.3	38	80.9	18.6	36	85.7	17.5	33	76.7	15.9	*22*	*68.8*	*10.6*
	White/Caucasian[d]	--[f]	--	--	--[f]	--	--	--[f]	--	--	--[f]	--	--	*--f*	*--*	*--*
	Other[e]	--[f]	--	--	--[f]	--	--	--[f]	--	--	--[f]	--	--	*--f*	*--*	*--*
	Total	64	100.0	8.6	47	100.0	6.1	42	100.0	5.4	43	100.0	5.5	*32*	*100.0*	*4.1*
Total	Black/African American[d]	263	79.0	64.8	273	80.3	67	281	80.5	68.2	240	75.5	57.5	*270*	*81.1*	*64.7*
	White/Caucasian[d]	44	13.2	4.6	33	9.7	3.5	41	11.7	4.4	39	12.3	4.1	*39*	*11.7*	*4.1*
	Other[e]	26	7.8	14.1	34	10.0	14.9	27	7.7	11.7	39	12.3	16.5	*24*	*7.2*	*10.1*
	Total	333	100.0	21.4	340	100.0	21.6	349	100.0	22	318	100.0	19.8	*333*	*100.0*	*20.8*

[a]HIV infection includes all newly reported HIV infected individuals by the year of first diagnosis, regardless of the stage of infection (HIV or AIDS).

[b]2013 values (in italics) are likely to be artificially inflated due to incomplete interstate deduplication (see Chapter 2: Special Notes for more information, page 9).

[c]Rate is expressed per 100,000 population.

[d]Non-Hispanic/Latino.

[e]Other includes American Indian/Alaska Natives, Asian/Pacific Islanders, and Hispanic/Latinos.

[f]Cell counts, percentages, and rates have been suppressed to avoid identification of cells that have counts less than five through direct or indirect means.

Data Source: enhanced HIV/AIDS Reporting System (eHARS) (data as of July 1, 2014).

Table I: North Carolina Adult/Adolescent Newly Diagnosed HIV Infection[a] Rates by Gender and Hierarchical Risk of Exposure, 2009-2013

Gender	Exposure Category	2009		2010		2011		2012		2013[b]	
		Cases	%	Cases	%	Cases	%	Cases	%	Cases	%
Male	Heterosexual-high risk[c]	109	8.9	67	6.1	60	5.3	57	5.5	*41*	*3.4*
	IDU[d]	--[g]	--	--[g]	--	--[g]	--	--[g]	--	--[g]	--
	MSM[d]	707	57.9	660	60.1	704	61.7	640	62.1	*656*	*55.2*
	MSM/IDU[d]	--[g]	--	--[g]	--	--[g]	--	--[g]	--	--[g]	--
	Unknown[e]	366	30.0	336	30.6	330	28.9	307	29.8	*443*	*37.3*
	Other Risks[f]	--[g]	--	--[g]	--	--[g]	--	--[g]	--	--[g]	--
	Total	1,222	100.0	1,098	100.0	1,141	100.0	1,031	100.0	*1,189*	*100.0*
Female	Heterosexual- high risk[c]	133	31.8	117	32.6	77	22.6	99	32.4	*70*	*21.6*
	IDU[d]	--[g]	--	--[g]	--	--[g]	--	--[g]	--	--[g]	--
	Unknown[e]	271	64.8	232	64.6	247	72.6	193	63.1	*240*	*74.1*
	Other Risks[f]	--[g]	--	--[g]	--	--[g]	--	--[g]	--	--[g]	--
	Total	418	100.0	359	100.0	340	100.0	306	100.0	*324*	*100.0*
Total	Heterosexual- high risk[c]	242	14.8	184	12.6	137	9.3	156	11.7	*111*	*7.3*
	IDU[d]	41	2.5	34	2.3	47	3.2	26	1.9	*36*	*2.4*
	MSM[d]	707	43.1	660	45.3	704	47.5	640	47.9	*656*	*43.4*
	MSM/IDU[d]	--[g]	--	--[g]	--	--[g]	--	--[g]	--	--[g]	--
	Unknown[e]	637	38.8	568	39.0	577	39.0	500	37.4	*683*	*45.1*
	Other Risks[f]	--[g]	--	--[g]	--	--[g]	--	--[g]	--	--[g]	--
	Total	1,640	100.0	1,457	100.0	1,481	100.0	1,337	100.0	*1,513*	*100.0*

[a]HIV infection includes all newly reported HIV infected individuals by the year of first diagnosis, regardless of the stage of infection (HIV or AIDS).

[b]2013 values (in italics) are likely to be artificially inflated due to incomplete interstate deduplication (see Chapter 2: Special Notes for more information, page 9).

[c]Heterosexual-high risk is defined as a person who does not report IDU or MSM, but does report sexual contact with a partner of opposite sex, who is IDU, MSM, or known HIV-positive status. Also, if a person is a victim of sexual assault, exchanges sex for drugs/money, has had a recent STD or has sexual contact while using drugs, they are classified as high risk. For more information, see Appendix C: Technical Notes (page C-4).

[d]IDU = injection drug use; MSM = men who have sex with men; MSM/IDU = men who have sex with men and injection drug user.

[e]Unknown risk includes individuals classified as persons who reports sex with an opposite sex partner (heterosexual-not high risk) and does not report IDU, MSM, or any other potential high risk behaviors, as well as no identified risk (NIR) and no reported risk (NRR) individuals.

[f]Other risks include blood products (adult hemophilia) and pediatric risk.

[g]Cell counts, percentages, and rates have been suppressed to avoid identification of cells that have counts less than five through direct or indirect means.

Data Source: enhanced HIV/AIDS Reporting System (eHARS) (data as of July 1, 2014).

Table J: North Carolina Adult/Adolescent Newly Diagnosed HIV Infections[a] by Gender and Hierarchical Risk of Exposure (Unknown Risk[b] Redistributed), 2009-2013

Gender	Exposure Category	2009		2010		2011		2012		2013[c]	
		Cases	%	Cases	%	Cases	%	Cases	%	Cases	%
Male	Heterosexual-All[d]	294	24.1	234	21.3	199	17.4	187	18.1	*205*	*17.2*
	IDU[e]	35	2.9	30	2.7	39	3.4	15	1.5	*31*	*2.6*
	MSM[e]	878	71.8	821	74.8	883	77.4	810	78.6	*915*	*77.0*
	MSM/IDU[e]	--[g]	--	--[g]	--	--[g]	--	19	1.8	*38*	*3.2*
	Other Risks[f]	--[g]	--	--[g]	--	--[g]	--	0	--	*0*	*--*
	Total[h]	1,222	100.0	1,098	100.0	1,141	100.0	1,031	100.0	*1,189*	*100.0*
Female	Heterosexual-All[d]	396	94.7	342	95.3	312	91.8	281	91.8	*294*	*90.7*
	IDU[e]	--[g]	--	--[g]	--	--[g]	--	25	8.2	*30*	*9.3*
	Other Risks[f]	--[g]	--	--[g]	--	--[g]	--	0	--	*0*	*--*
	Total[h]	418	100.0	359	100.0	340	100.0	306	100.0	*324*	*100.0*
Total	Heterosexual-All[d]	691	42.1	576	39.5	511	34.5	469	35.1	*499*	*33.0*
	IDU[e]	55	3.4	47	3.2	67	4.5	40	3.0	*61*	*4.0*
	MSM[e]	878	53.5	821	56.3	883	59.6	810	60.6	*915*	*60.5*
	MSM/IDU[e]	--[g]	--	--[g]	--	--[g]	--	19	1.4	*38*	*2.5*
	Other Risks[f]	--[g]	--	--[g]	--	--[g]	--	0	--	*0*	*--*
	Total[h]	1,640	100.0	1,457	100.0	1,481	100.0	1,337	100.0	*1,513*	*100.0*

[a]HIV infection includes all newly reported HIV infected individuals by the year of first diagnosis, regardless of the stage of infection (HIV or AIDS).

[b]Unknown risk includes individuals classified as no identified risk (NIR) and no reported risk (NRR). For more information on distribution calculations, see Appendix C: Technical Notes (page C-5).

[c]2013 values (in italics) are likely to be artificially inflated due to incomplete interstate deduplication (see Chapter 2: Special Notes for more information, page 9).

[d]Heterosexual-All includes those individuals reporting heterosexual contact with a known HIV-positive or high risk individual and cases redistributed into the heterosexual classification from the unknown group (from Table I).

[e]IDU = injection drug use; MSM = men who have sex with men; MSM/IDU = men who have sex with men and injection drug user.

[f]Other risks include exposure to blood products (including adult hemophilia) and pediatric risk.

[g]Cell counts, percentages, and rates have been suppressed to avoid identification of cells that have counts less than five through direct or indirect means.

[h]Totals correspond to totals in Table I.

Data Source: enhanced HIV/AIDS Reporting System (eHARS) (data as of July 1, 2014).

Table K: North Carolina Adult/Adolescent Newly Diagnosed Male HIV Infections[a] by Race/Ethnicity and Hierarchical Risk of Exposure (Unknown Risk[b] Redistributed), 2009-2013

Race/Ethnicity	Exposure Category	2009		2010		2011		2012		2013[c]	
		Cases	%	Cases	%	Cases	%	Cases	%	Cases	%
Black/African American[d]	Heterosexual-All[e]	222	29.7	170	24.7	155	21.5	148	22.8	133	18.1
	IDU[f]	--[h]	--	19	2.8	22	3.1	10	1.5	16	2.2
	MSM[f]	496	66.4	494	71.7	534	74.1	487	74.9	577	78.4
	MSM/IDU[f]	--[h]	--	--[h]	--	--[h]	--	--[h]	--	10	1.4
	Other Risks[g]	0	--[h]	--[h]	--	--[h]	--	0	--	0	--
	Total	747	100.0	689	100.0	721	100.0	650	100.0	736	100.0
White/Caucasian[d]	Heterosexual-All[e]	24	7.5	25	8.8	17	6.1	20	8.2	35	11.0
	IDU[f]	--[h]	--	5	1.8	12	4.3	1	0.4	10	3.1
	MSM[f]	280	87.8	246	86.3	241	86.1	209	86.0	248	78.0
	MSM/IDU[f]	--[h]	--	--[h]	--	--[h]	--	--[h]	--	24	7.5
	Other Risks[g]	0	--	--[h]	--	--[h]	--	0	--	0	--
	Total	319	100.0	285	100.0	280	100.0	243	100.0	318	100.0
Other[i]	Heterosexual-All[e]	48	30.8	39	31.5	26	18.6	20	14.5	37	27.4
	IDU[f]	--[h]	--	6	0.7	5	0.6	4	0.5	5	0.5
	MSM[f]	103	66.0	79	63.7	109	77.9	113	81.9	88	65.2
	MSM/IDU[f]	--[h]	--	--[h]	--	--[h]	--	--[h]	--	5	3.7
	Other Risks[g]	0	--	--[h]	--	--[h]	--	0	--	0	--
	Total	156	100.0	124	100.0	140	100.0	138	100.0	135	100.0
Total[j]	Heterosexual-All[e]	294	22.0	234	19.1	198	18.1	187	16.4	206	18.9
	IDU[f]	35	2.6	30	2.5	39	3.6	15	1.3	31	2.8
	MSM[f]	879	65.6	820	67.0	884	80.7	810	71.2	914	84.0
	MSM/IDU[f]	15	1.1	--[h]	--	--[h]	--	19	1.7	38	3.5
	Other Risks[g]	0	--	--[h]	--	--[h]	--	0	--	0	--
	Total	1,223	100.0	1,096	100.0	1,140	100.0	1,031	100.0	1,189	100.0

[a]HIV infection includes all newly reported HIV infected individuals by the year of first diagnosis, regardless of the stage of infection (HIV or AIDS).

[b]Unknown risk includes individuals classified as no identified risk (NIR) and no reported risk (NRR). For more information on distribution calculations, see Appendix C: Technical Notes (page C-5).

[c]2013 values (in italics) are likely to be artificially inflated due to incomplete interstate deduplication (see Chapter 2: Special Notes for more information, page 9).

[d]Non-Hispanic/Latino.

[e]Heterosexual-All includes those individuals reporting heterosexual contact with a known HIV-positive or high risk individual and cases redistributed into the heterosexual classification from the unknown group (from Table I).

[f]IDU = injection drug use; MSM = men who have sex with men; MSM/IDU = men who have sex with men and injection drug user.

[g]Other risks include exposure to blood products (adult hemophilia) and pediatric risk.   [i]Other includes American Indian/Alaska Natives, Asian/Pacific Islanders, and Hispanic/Latinos.

[h]Cell counts, percentages, and rates have been suppressed to avoid identification of cells that have counts less than five through direct or indirect means; percentages not given for counts less than five.

[j]Totals may not correspond to totals in Table I.   Data Source: enhanced HIV/AIDS Reporting System (eHARS) (data as of July 1, 2014).

Table L: North Carolina Adult/Adolescent Newly Diagnosed Female HIV Infections[a] by Race/Ethnicity and Hierarchical Risk of HIV Exposure (Unknown Risk[b] Redistributed), 2009-2013

Race/Ethnicity	Exposure Category	2009		2010		2011		2012		2013[c]	
		Cases	%	Cases	%	Cases	%	Cases	%	Cases	%
Black/African American[d]	Heterosexual-All[e]	311	96.6	262	97.4	249	93.6	215	95.1	*219*	*94.4*
	IDU[f]	--[h]	--	--[h]	--	--[h]	--	11	4.9	*13*	*5.6*
	Other Risks[g]	--[h]	--	--[h]	--	--[h]	--	0	--	*0*	*--*
	Total	322	100.0	269	100.0	266	100.0	226	100.0	*232*	*100.0*
White/Caucasian[d]	Heterosexual-All[e]	61	88.4	42	82.4	35	83.3	47	78.3	*39*	*73.6*
	IDU[f]	--[h]	--	--[h]	--	--[h]	--	13	21.7	*14*	*26.4*
	Other Risks[g]	--[h]	--	--[h]	--	--[h]	--	0	--	*0*	*--*
	Total	69	100.0	51	100.0	42	100.0	60	100.0	*53*	*100.0*
Other[i]	Heterosexual-All[e]	26	96.3	37	94.9	29	90.6	20	100.0	*39*	*100.0*
	IDU[f]	--[h]	--	--[h]	--	--[h]	--	0	--	*0*	*--*
	Other Risks[g]	--[h]	--	--[h]	--	--[h]	--	0	--	*0*	*--*
	Total	27	100.0	39	100.0	32	100.0	20	100.0	*39*	*100.0*
Total[j]	Heterosexual-All[e]	397	95.0	342	95.3	313	92.1	282	92.2	*297*	*91.7*
	IDU[f]	--[h]	--	--[h]	--	--[h]	--	24	7.8	*27*	*8.3*
	Other Risks[g]	--[h]	--	--[h]	--	--[h]	--	0	--	*0*	*--*
	Total	418	100.0	359	100.0	340	100.0	306	100.0	*324*	*100.0*

[a]HIV infection includes all newly reported HIV infected individuals by the year of first diagnosis, regardless of the stage of infection (HIV or AIDS).

[b]Unknown risk includes individuals classified as no identified risk (NIR) and no reported risk (NRR). For more information on distribution calculations, see Appendix C: Technical Notes (page C-5).

[c]2013 values (in italics) are likely to be artificially inflated due to incomplete interstate deduplication (see Chapter 2: Special Notes for more information, page 9).

[d]Non-Hispanic/Latino.

[e]Heterosexual-All includes those individuals reporting heterosexual contact with a known HIV-positive or high risk individual and cases redistributed into the heterosexual classification from the unknown group (from Table I).

[f]IDU = injection drug use; MSM = men who have sex with men.

[g]Other risks include exposure to blood products (adult hemophilia) and pediatric risk.

[h]Cell counts, percentages, and rates have been suppressed to avoid identification of cells that have counts less than five through direct or indirect means.

[i]Other includes American Indian/Alaska Natives, Asian/Pacific Islanders, and Hispanic/Latinos.

[j]Totals may not correspond to totals in Table I.

Data Source: enhanced HIV/AIDS Reporting System (eHARS) (data as of July 1, 2014).

Table M: North Carolina Adolescent (13-24 years) Newly Diagnosed HIV Infections[a] by Gender and Hierarchical Risk of HIV Exposure, 2009-2013

Gender	Exposure Category	2009		2010		2011		2012		2013[b]	
		Cases	%	Cases	%	Cases	%	Cases	%	Cases	%
Male	Heterosexual-high risk[c]	6	2.2	6	2.0	--[g]	--	--[g]	--	--[g]	--
	IDU[d]	--[g]	--	--[g]	--	--[g]	--	--[g]	--	--[g]	--
	MSM[d]	217	80.7	243	82.9	259	84.4	228	82.9	246	81.7
	MSM/IDU[d]	--[g]	--	--[g]	--	--[g]	--	--[g]	--	--[g]	--
	Unknown[e]	43	16.0	40	13.7	42	13.7	41	14.9	47	15.6
	Other Risks[f]	--[g]	--	--[g]	--	--[g]	--	--[g]	--	--[g]	--
	Total	269	100.0	293	100.0	307	100.0	275	100.0	301	100.0
Female	Heterosexual- high risk[c]	24	37.5	16	34.0	--[g]	--	--[g]	--	--[g]	--
	IDU[d]	--[g]	--	--[g]	--	--[g]	--	--[g]	--	--[g]	--
	Unknown[e]	39	60.9	31	65.9	31	73.8	28	65.1	22	68.8
	Other Risks[f]	--[g]	--	--[g]	--	--[g]	--	--[g]	--	--[g]	--
	Total	64	100.0	47	100.0	42	100.0	43	100.0	32	100.0
Total	Heterosexual- high risk[c]	30	9.0	22	6.5	14	4.0	15	4.7	11	3.3
	IDU[d]	--[g]	--	--[g]	--	--[g]	--	--[g]	--	--[g]	--
	MSM[d]	217	65.2	243	71.5	259	74.2	228	71.7	246	73.9
	MSM/IDU[d]	--[g]	--	--[g]	--	--[g]	--	--[g]	--	--[g]	--
	Unknown[e]	82	24.6	71	20.9	73	20.9	69	21.7	69	20.7
	Other Risks[f]	--[g]	--	--[g]	--	--[g]	--	--[g]	--	--[g]	--
	Total	333	100.0	340	100.0	349	100.0	318	100.0	333	100.0

[a]HIV infection includes all newly reported HIV infected individuals by the year of first diagnosis, regardless of the stage of infection (HIV or AIDS).

[b]2013 values (in italics) are likely to be artificially inflated due to incomplete interstate deduplication (see Chapter 2: Special Notes for more information, page 9).

[c]Heterosexual-high risk is defined as a person who does not report IDU or MSM, but does report sexual contact with a partner of opposite sex, who is IDU, MSM, or known HIV-positive status. Also, if a person is a victim of sexual assault, exchanges sex for drugs/money, has had a recent STD or has sexual contact while using drugs, they are classified as high risk. For more information, see Appendix C: Technical Notes (page C-4).

[d]IDU = injection drug use; MSM = men who have sex with men; MSM/IDU = men who have sex with men and injection drug user.

[e]Unknown risk includes individuals classified as persons who reports sex with an opposite sex partner (heterosexual-not high risk) and does not report IDU, MSM, or any other potential high risk behaviors, as well as no identified risk (NIR) and no reported risk (NRR).

[f]Other risks include blood products (adult hemophilia) and pediatric risk.

[g]Cell counts, percentages, and rates have been suppressed to avoid identification of cells that have counts less than five through direct or indirect means.

Data Source: enhanced HIV/AIDS Reporting System (eHARS) (data as of July 1, 2014).

Table N: North Carolina Adolescent (13-24 years) Newly Diagnosed HIV Infections[a] by Gender and Hierarchical Risk of HIV Exposure (Unknown Risk[b] Redistributed), 2009-2013

Gender	Exposure Category	2009		2010		2011		2012		2013[c]	
		Cases	%	Cases	%	Cases	%	Cases	%	Cases	%
Male	Heterosexual-All[d]	22	8.2	18	6.1	19	6.2	19	6.9	*19*	*6.3*
	IDU[e]	--[f]	--	--[f]	--	--[f]	--	--[f]	--	*--f*	--
	MSM[e]	243	90.3	271	92.5	285	92.8	252	91.6	*275*	*91.4*
	MSM/IDU[e]	--[f]	--	--[f]	--	--[f]	--	--[f]	--	7	2.3
	Other Risks[g]	--[f]	--	--[f]	--	--[f]	--	--[f]	--	*--f*	--
	Total	269	100.0	293	100.0	307	100.0	275	100.0	*301*	*100.0*
Female	Heterosexual-All[d]	63	98.4	47	100.0	42	100.0	40	93.0	*31*	*96.9*
	IDU[e]	--[f]	--	0	--	0	--	--[f]	--	*--f*	--
	Other Risks[g]	--[f]	--	0	--	0	--	--[f]	--	*--f*	--
	Total	64	100.0	47	100.0	42	100.0	43	100.0	*32*	*100.0*
Total[h]	Heterosexual-All[d]	85	25.5	65	19.1	61	17.5	59	18.6	*50*	*15.0*
	IDU[e]	--[f]	--	--[f]	--	--[f]	--	--[f]	--	*--f*	--
	MSM[e]	243	73.0	271	79.7	285	81.7	252	79.2	*275*	*82.6*
	MSM/IDU[e]	--[f]	--	--[f]	--	--[f]	--	--[f]	--	7	2.1
	Other Risks[g]	--[f]	--	--[f]	--	--[f]	--	--[f]	--	*--f*	--
	Total	333	100.0	340	100.0	349	100.0	318	100.0	*333*	*100.0*

[a]HIV infection includes all newly reported HIV infected individuals by the date of year diagnosis, regardless of the stage of infection (HIV or AIDS).

[b]Unknown risk includes individuals classified as no identified risk (NIR) and no reported risk (NRR). For more information on distribution calculations, see Appendix C: Technical Notes (page C-5).

[c]2013 values (in italics) are likely to be artificially inflated due to incomplete interstate deduplication (see Chapter 2: Special Notes for more information, page 9).

[d]Heterosexual-All includes cases those individuals reporting heterosexual contact with a known HIV-positive or high risk individual and cases redistributed into the heterosexual classification from the unknown group (from Table M).

[e]IDU = injection drug use; MSM = men who have sex with men; MSM/IDU = men who have sex with men and injection drug user.

[f]Cell counts, percentages, and rates have been suppressed to avoid identification of cells that have counts less than five through direct or indirect means.

[g]Other risks include exposure to blood products (adult hemophilia) and pediatric risk.

[h]Totals may not correspond to totals in Table M.

Data Source: enhanced HIV/AIDS Reporting System (eHARS) (data as of July 1, 2014).

Table O: North Carolina Newly Diagnosed Adult/Adolescent AIDS (HIV Infection Stage 3)[a] Rates by Gender, Age, and Year of Diagnosis, 2009-2013

Gender	Age at Diagnosis (Year)	2009 Cases	2009 %	2009 Rate[c]	2010 Cases	2010 %	2010 Rate[c]	2011 Cases	2011 %	2011 Rate[c]	2012 Cases	2012 %	2012 Rate[c]	2013[b] Cases	2013[b] %	2013[b] Rate[c]
Male	13-14	--[d]	--	--	--[d]	--	--	--[d]	--	--	--[d]	--	--	--[d]	--	--
	15-19	8	1.2	2.4	--[d]	--	--	--[d]	--	--	--[d]	--	--	--[d]	--	--
	20-24	50	7.2	14.2	31	5.5	9.1	49	8.6	14.2	39	7.0	10.9	48	7.4	13.4
	25-29	81	11.7	25.4	58	10.3	18.5	58	10.2	18.5	73	13.0	23.2	78	12.1	24.8
	30-34	64	9.2	21.5	72	12.8	23.4	65	11.4	20.9	63	11.2	20.2	87	13.5	27.9
	35-39	83	11.9	25.2	58	10.3	17.9	68	11.9	21.8	43	7.7	14	55	8.5	17.9
	40-44	116	16.7	35.8	72	12.8	21.8	75	13.1	22.4	87	15.5	25.8	92	14.2	27.3
	45-49	131	18.8	38.9	110	19.6	32.3	84	14.7	24.9	84	15.0	25.2	91	14.1	27.3
	50-54	88	12.7	28.2	74	13.2	22.8	75	13.1	22.8	82	14.6	24.7	86	13.3	25.9
	55-59	51	7.3	18.5	39	7.0	13.6	37	6.5	12.6	42	7.5	13.9	54	8.4	17.9
	60-64	9	1.3	3.8	17	3.0	6.6	22	3.9	8.2	23	4.1	8.6	28	4.3	10.5
	65 and older	--[d]	--	--	20	3.6	3.8	23	4.0	4.2	21	3.7	3.6	22	3.4	3.8
	Total	695	100.0	18.6	561	100.0	14.7	571	100.0	14.8	561	100.0	14.4	646	100.0	16.5
Female	13-14	--[d]	--	--	--[d]	--	--	--[d]	--	--	--[d]	--	--	--[d]	--	--
	15-19	5	1.9	1.6	--[d]	--	--	--[d]	--	--	--[d]	--	--	--[d]	--	--
	20-24	10	3.8	3.2	12	5.1	3.7	7	2.9	2.1	6	2.6	1.8	11	4.5	3.2
	25-29	19	7.3	6.1	10	4.3	3.2	14	5.7	4.4	12	5.3	3.8	14	5.7	4.4
	30-34	29	11.2	9.5	27	11.5	8.5	34	13.9	10.6	36	15.8	11.2	26	10.5	8.1
	35-39	49	18.8	14.7	41	17.5	12.3	34	13.9	10.5	31	13.6	9.7	35	14.2	11
	40-44	41	15.8	12.4	40	17.1	11.8	45	18.4	13	28	12.3	8	38	15.4	10.9
	45-49	48	18.5	13.6	41	17.5	11.5	51	20.9	14.5	43	18.9	12.4	48	19.4	13.8
	50-54	26	10.0	7.8	21	9.0	6.1	26	10.7	7.4	33	14.5	9.3	31	12.6	8.8
	55-59	22	8.5	7.3	17	7.3	5.4	16	6.6	4.9	17	7.5	5.1	23	9.3	6.9
	60-64	9	3.5	3.4	16	6.8	5.6	9	3.7	3	10	4.4	3.3	13	5.3	4.4
	65 and older	--[d]	--	--	8	3.4	1.1	6	2.5	0.8	10	4.4	1.3	6	2.4	0.8
	Total	260	100.0	6.5	234	100.0	5.7	244	100.0	5.9	228	100.0	5.4	247	100.0	5.9

Continued

[a]AIDS (HIV infection Stage 3) is classified by a CD4+ T-lymphocyte cell count of less than 200 or a T-lymphocyte percentage of total lymphocytes of less than 14. AIDS (Stage 3) classification is defined as those who were diagnosed with HIV infection during the year of diagnosis and were classified as AIDS (Stage 3) that year or who have ever been diagnosed with AIDS (Stage 3). For the newly diagnosed AIDS (Stage 3) cases, there is a possibility that the individual was diagnosed with HIV in a previous year (or another state). Therefore, adding new AIDS (Stage 3) diagnoses and new HIV diagnoses WILL NOT equal the total number of new HIV diagnoses in North Carolina. For more information, see Appendix C: Technical Notes (page C-5).

[b]2013 values (in italics) are likely to be artificially inflated due to incomplete interstate deduplication (see Chapter 2: Special Notes for more information, page 9).   [c]Rate is expressed per 100,000 population.

[d]Cell counts, percentages, and rates have been suppressed to avoid identification of cells that have counts less than five through direct or indirect means.

Data Source: enhanced HIV/AIDS Reporting System (eHARS) (data as of July 1, 2014).

Table O (continued): North Carolina Newly Diagnosed Adult/Adolescent AIDS (HIV Infection Stage 3)[a] Rates by Gender, Age, and Year of Diagnosis, 2009-2013

Gender	Age at Diagnosis (Year)	2009			2010			2011			2012			2013		
		Cases	%	Rate[c]	Cases	%	Rate[c]	Cases	%	Rate[c]	Cases	%	Rate[c]	Cases	%	Rate[c]
Total	13-14	--[d]	--	--	--[d]	--	--	--[d]	--	--	--[d]	--	--	--[d]	--	--
	15-19	13	1.4	2.0	--[d]	--	--	--[d]	--	--	--[d]	--	--	--[d]	--	--
	20-24	60	6.3	9.0	43	5.4	6.4	56	6.9	8.3	45	5.7	6.5	*59*	*6.6*	*8.5*
	25-29	100	10.5	15.9	68	8.6	10.8	72	8.8	11.4	85	10.8	13.4	*92*	*10.3*	*14.5*
	30-34	93	9.7	15.4	99	12.5	15.9	99	12.1	15.7	99	12.5	15.6	*113*	*12.7*	*17.8*
	35-39	132	13.8	19.9	99	12.5	15.1	102	12.5	16.1	74	9.4	11.8	*90*	*10.1*	*14.4*
	40-44	157	16.4	23.9	112	14.1	16.8	120	14.7	17.6	115	14.6	16.8	*130*	*14.6*	*19*
	45-49	179	18.7	26.0	151	19.0	21.7	135	16.6	19.6	127	16.1	18.7	*139*	*15.6*	*20.4*
	50-54	114	11.9	17.7	95	11.9	14.1	101	12.4	14.8	115	14.6	16.8	*117*	*13.1*	*17.1*
	55-59	73	7.6	12.6	56	7.0	9.3	53	6.5	8.6	59	7.5	9.3	*77*	*8.6*	*12.1*
	60-64	18	1.9	3.6	33	4.2	6.1	31	3.8	5.5	33	4.2	5.8	*41*	*4.6*	*7.3*
	65 and older	--[d]	--	--	28	3.5	2.3	29	3.6	2.3	31	3.9	2.3	*28*	*3.1*	*2.1*
	Total	955	100.0	12.4	795	100.0	10.1	815	100.0	10.2	789	100.0	9.7	*893*	*100.0*	*11.0*

[a]AIDS (HIV infection Stage 3) is classified by a CD4+ T-lymphocyte cell count of less than 200 or a T-lymphocyte percentage of total lymphocytes of less than 14. AIDS (Stage 3) classification is defined as those who were diagnosed with HIV infection during the year of diagnosis and were classified as AIDS that year or who have ever been diagnosed with AIDS(Stage 3). For the newly diagnosed AIDS (Stage 3) cases, there is a possibility that the individual was diagnosed with HIV in a previous year (or another state). Therefore, adding new AIDS (Stage 3) diagnoses and new HIV diagnoses WILL NOT equal the total number of new HIV diagnoses in North Carolina. For more information, see Appendix C: Technical Notes (page C-5).

[b]2013 values (in italics) are likely to be artificially inflated due to incomplete interstate deduplication (see Chapter 2: Special Notes for more information, page 9).

[c]Rate is expressed per 100,000 population.

[d]Cell counts, percentages, and rates have been suppressed to avoid identification of cells that have counts less than five through direct or indirect means.

Data Source: enhanced HIV/AIDS Reporting System (eHARS) (data as of July 1, 2014).

Table P: North Carolina Newly Diagnosed Adult/Adolescent AIDS (HIV Infection Stage 3)[a] Rates by Gender, Race/Ethnicity, and Year of Diagnosis, 2009-2013

Gender	Race/Ethnicity	2009			2010			2011			2012			2013[b]		
		Cases	%	Rate[c]	Cases	%	Rate[c]	Cases	%	Rate[c]	Cases	%	Rate[c]	Cases	%	Rate[c]
Male	Black/African American[d]	446	64.2	59.4	343	61.1	44.4	362	63.4	46.1	374	66.7	46.9	411	63.6	51.5
	Hispanic/Latino	67	9.6	24.5	48	8.6	15.7	37	6.5	11.9	37	6.6	11.6	56	8.7	17.5
	White/Caucasian[d]	162	23.3	6.2	152	27.1	5.8	144	25.2	5.5	123	21.9	4.6	156	24.1	5.9
	Other/Unknown[f]	20	2.9	--	18	3.2	--	28	4.9	--	27	4.8	--	23	3.6	--
	Total	695	100.0	18.6	561	100.0	14.7	571	100.0	14.8	561	100.0	14.4	646	100.0	16.5
Female	Black/African American[d]	211	81.2	23.9	199	85.0	21.8	184	75.4	19.9	177	77.6	18.9	193	78.1	20.6
	Hispanic/Latino	5	1.9	2.5	6	2.6	2.4	12	4.9	4.6	14	6.1	5.2	8	3.2	2.9
	White/Caucasian[d]	38	14.6	1.4	24	10.3	0.9	40	16.4	1.4	32	14.0	1.1	35	14.2	1.2
	Other/Unknown[f]	6	2.3	--	5	2.1	--	8	3.3	--	5	2.2	--	11	4.4	--
	Total	260	100.0	6.5	234	100.0	5.7	244	100.0	5.9	228	100.0	5.4	247	100.0	5.9
Total	Black/African American[d]	657	68.8	40.2	542	68.2	32.2	546	67.0	31.9	551	69.8	31.8	604	67.6	34.8
	Hispanic/Latino	72	7.5	15.2	54	6.8	9.6	49	6.0	8.5	51	6.5	8.6	64	7.2	10.8
	White/Caucasian[d]	200	20.9	3.7	176	22.1	3.3	184	22.6	3.4	155	19.6	2.8	191	21.4	3.5
	Other/Unknown[f]	26	2.8	--	23	2.9	--	36	4.4	--	32	4.1	--	34	3.8	--
	Total	955	100.0	12.4	795	100.0	10.1	815	100.0	10.2	789	100.0	9.7	893	100.0	11.0

[a] AIDS (HIV infection Stage 3) is classified by a CD4+ T-lymphocyte cell count of less than 200 or a T-lymphocyte percentage of total lymphocytes of less than 14. AIDS (Stage 3) classification is defined as those who were diagnosed with HIV infection during the year of diagnosis and were classified as AIDS (Stage 3) that year or who have ever been diagnosed with AIDS (Stage 3). For the newly diagnosed AIDS (Stage 3) cases, there is a possibility that the individual was diagnosed with HIV in a previous year (or another state). Therefore, adding new AIDS diagnoses and new HIV diagnoses WILL NOT equal the total number of new HIV diagnoses in North Carolina. For more information, see Appendix C: Technical Notes (page C-5).

[b] 2013 values (in italics) are likely to be artificially inflated due to incomplete interstate deduplication (see Chapter 2: Special Notes for more information, page 9).

[c] Rate is expressed per 100,000 population.

[d] Non-Hispanic/Latino.

[e] Cell counts, percentages, and rates have been suppressed to avoid identification of cells that have counts less than five through direct or indirect means.

[f] Other includes American Indian/Alaska Native and Asian/Pacific Islander population; rates are not available due to the lack of overall population for the unknown race/ethnicity group.

Data Source: enhanced HIV/AIDS Reporting System (eHARS) (data as of July 1, 2014).

Table Q: HIV Testing at North Carolina Counseling and Testing Sites by County, 2013

COUNTY	Total Tested	Total Positive	% Positive	New Positive[a]	% New Positive
ALAMANCE	3,560	9	0.3	7	0.2
ALEXANDER	394	1	0.3	0	0.0
ALLEGHANY	109	1	0.9	0	0.0
ANSON	1,037	3	0.3	0	0.0
ASHE	278	0	0.0	0	0.0
AVERY	205	0	0.0	0	0.0
BEAUFORT	1,327	4	0.3	3	0.2
BERTIE	552	0	0.0	0	0.0
BLADEN	823	5	0.6	2	0.2
BRUNSWICK	1,300	2	0.2	1	0.1
BUNCOMBE	5,339	16	0.3	11	0.2
BURKE	865	0	0.0	0	0.0
CABARRUS	1,927	6	0.3	2	0.1
CALDWELL	1,101	0	0.0	0	0.0
CAMDEN	74	0	0.0	0	0.0
CARTERET	940	0	0.0	0	0.0
CASWELL	403	3	0.7	3	0.7
CATAWBA	4,493	6	0.1	4	0.1
CHATHAM	1,596	1	0.1	1	0.1
CHEROKEE	290	0	0.0	0	0.0
CHOWAN	239	2	0.8	1	0.4
CLAY	113	0	0.0	0	0.0
CLEVELAND	2,930	9	0.3	2	0.1
COLUMBUS	996	5	0.5	3	0.3
CRAVEN	2,964	5	0.2	4	0.1
CUMBERLAND	13,337	107	0.8	34	0.3
CURRITUCK	192	0	0.0	0	0.0
DARE	799	1	0.1	1	0.1
DAVIDSON	1,930	2	0.1	2	0.1
DAVIE	437	0	0.0	0	0.0
DUPLIN	2,061	1	0.0	1	0.0
DURHAM	8,563	51	0.6	23	0.3
EDGECOMBE	2,186	6	0.3	3	0.1
FORSYTH	12,127	66	0.5	15	0.1
FRANKLIN	1,369	3	0.2	1	0.1
GASTON	7,199	42	0.6	19	0.3
GATES	157	1	0.6	1	0.6
GRAHAM	58	0	0.0	0	0.0
GRANVILLE	937	1	0.1	1	0.1
GREENE	316	3	0.9	2	0.6
GUILFORD	16,516	94	0.6	49	0.3
HALIFAX	1,321	3	0.2	2	0.2
HARNETT	1,299	5	0.4	1	0.1
HAYWOOD	725	0	0.0	0	0.0
HENDERSON	1,263	1	0.1	1	0.1
HOKE	935	9	1.0	1	0.1
HYDE	1,092	2	0.2	1	0.1
IREDELL	75	1	1.3	1	1.3
JACKSON	2,237	0	0.0	0	0.0

[a]New positives are defined as never been reported to surveillance.   Continued

Data Source: North Carolina supported HIV testing data (from North Carolina State Laboratory of Public Health) (data as of October 2, 2014).

Table Q (continued): HIV Testing at North Carolina Counseling and Testing Sites, 2013

COUNTY	Total Tested	Total Positive	% Positive	New Positive[a]	% New Positive
JOHNSTON	2,456	5	0.2	1	0.0
JONES	95	1	1.1	1	1.1
LEE	894	1	0.1	0	0.0
LENOIR	1,342	7	0.5	3	0.2
LINCOLN	630	1	0.2	1	0.2
MACON	344	2	0.6	1	0.3
MADISON	206	0	0.0	0	0.0
MARTIN	624	1	0.2	1	0.2
MCDOWELL	349	1	0.3	1	0.3
MECKLENBERG	15,707	140	0.9	67	0.4
MITCHELL	108	0	0.0	0	0.0
MONTGOMERY	527	1	0.2	1	0.2
MOORE	1,254	4	0.3	2	0.2
NASH	3,988	9	0.2	5	0.1
NEW HANOVER	3,276	7	0.2	4	0.1
NORTHAMPTON	741	3	0.4	1	0.1
ONSLOW	2,607	9	0.3	5	0.2
ORANGE	1,562	1	0.1	1	0.1
PAMLICO	157	1	0.6	0	0.0
PASQUOTANK	902	2	0.2	1	0.1
PENDER	945	0	0.0	0	0.0
PERQUIMANS	176	0	0.0	0	0.0
PERSON	576	1	0.2	1	0.2
PITT	5,575	17	0.3	10	0.2
POLK	91	0	0.0	0	0.0
RANDOLPH	1,214	3	0.2	3	0.2
RICHMOND	711	2	0.3	0	0.0
ROBESON	4,374	59	1.3	10	0.2
ROCKINGHAM	1,454	2	0.1	1	0.1
ROWAN	1,781	4	0.2	2	0.1
RUTHERFORD	1,374	1	0.1	0	0.0
SAMPSON	2,297	4	0.2	2	0.1
SCOTLAND	1,560	2	0.1	0	0.0
STANLY	543	2	0.4	1	0.2
STOKES	326	0	0.0	0	0.0
SURRY	370	3	0.8	3	0.8
SWAIN	95	1	1.1	0	0.0
TRANSYLVANIA	307	0	0.0	0	0.0
TYRRELL	291	0	0.0	0	0.0
UNION	1,677	3	0.2	1	0.1
VANCE	648	1	0.2	0	0.0
WAKE	23,707	98	0.4	59	0.2
WARREN	604	1	0.2	1	0.2
WASHINGTON	437	0	0.0	0	0.0
WATAUGA	696	1	0.1	1	0.1
WAYNE	4,590	21	0.5	10	0.2
WILKES	712	1	0.1	1	0.1
WILSON	3,217	13	0.4	5	0.2
YADKIN	303	0	0.0	0	0.0
YANCEY	233	0	0.0	0	0.0
UNKNOWN[b]	148	1	0.7	0	0.0
NORTH CAROLINA	210,411	915	0.4	410	0.2

[a]New positives are defined as never been reported to surveillance.   [b]Cases with an unknown county of residence at diagnosis.
Data Source: North Carolina supported HIV testing data (from North Carolina State Laboratory of Public Health) (data as of October 2, 2014).

Table R: North Carolina Newly Diagnosed HIV Infection[a] Rates by Regional Network of Care and Prevention Regions by Year of Diagnosis, 2009-2013[b]

Regional Network of Care and Prevention (Counties)	2009		2010		2011		2012		2013[b]	
	Cases	Rate[c]	Cases	Rate[c]	Cases	Rate[c]	Cases	Rate[c]	Cases	Rate[c]
CHARLOTTE – TRANSITIONAL GRANT AREA (TGA) (*Anson, Cararrus, Gaston, Mecklenburg, and Union*)	419	27.6	366	23.8	388	24.8	330	20.7	*372*	*23.3*
REGION 1 (*Avery, Buncombe, Cherokee, Cleveland, Graham, Haywood, Henderson, Jackson, Macon, Madison, McDowell, Mitchell, Polk, Rutherford, Swain, Transylvania, and Yancey*)	61	7.2	48	5.5	56	6.4	48	5.5	*60*	*6.8*
REGION 2 (*Alexander, Alleghany, Ashe, Burke, Caldwell, Catawba, Lincoln, Watauga, and Wilkes*)	28	4.7	28	4.7	21	3.5	37	6.1	*27*	*4.5*
REGION 3 (*Davidson, Davie, Forsyth, Iredell, Rowan, Stokes, Surry, and Yadkin*)	128	12.6	103	10.2	109	10.7	90	8.8	*112*	*11.0*
REGION 4 (*Alamance, Caswell, Guilford, Montgomery, Randolph, Rockingham, and Stanly*)	171	17.5	152	15.4	175	17.6	137	13.7	*165*	*16.5*
REGION 5 (*Bladen, Cumberland, Harnett, Hoke, Moore, Richmond, Robeson, Sampson, and Scotland*)	174	20.0	154	17.3	182	20.3	139	15.4	*154*	*17.0*
REGION 6 (*Chatham, Durham, Franklin, Granville, Johnston, Lee, Orange, Person, Vance, Wake, and Warren*)	329	18.2	325	17.8	264	14.2	286	15.1	*340*	*17.9*
REGION 7 (*Brunswick, Columbus, Duplin, New Hanover, Onslow, and Pender*)	72	11.3	65	8.8	85	8.7	70	10.3	*58*	*8.6*
REGION 8 (*Edgecombe, Halifax, Nash, Northampton, and Wilson*)	86	28.7	62	20.0	73	23.6	70	22.7	*52*	*16.8*
REGION 9 (*Bertie, Camden, Chowan, Currituck, Dare, Gates, Hertford, Hyde, Pasquotank, Perquimans, and Tyrrell*)	15	7.5	26	12.7	16	7.8	9	4.4	*23*	*11.2*
REGION 10 (*Beaufort, Carteret, Craven, Greene, Jones, Lenoir, Martin, Pamlico, Pitt, Washington, and Wayne*)	83	13.4	75	11.5	86	13.1	87	13.2	*109*	*16.6*
UNASSIGNED[d]	80	--	59	--	62	--	44	--	*53*	*--*
NORTH CAROLINA	1,646	17.5	1,463	15.3	1,490	15.4	1,347	13.8	*1,525*	*15.6*

[a]HIV infection includes all newly reported HIV infected individuals by the year of first diagnosis, regardless of stage of infection (HIV or AIDS).

[b]2013 values (in italics) are likely to be artificially inflated due to incomplete interstate deduplication (see Chapter 2: Special Notes for more information, page 9).

[c]Rate is expressed per 100,000 population.

[d]Unassigned includes cases with an unknown county of residence at diagnosis or cases that were diagnosed at a long-term care facility, including prisons; rates are not available due to the lack of overall population data in the unassigned area.
Data Source: enhanced HIV/AIDS Reporting System (eHARS) (data as of July 1, 2014).

Table S: All Persons Living in North Carolina with HIV Infections[a] as of 12/31/2013 by Regional Network of Care and Prevention Regions and by County of Residence

Regional Network of Care and Prevention	County	HIV Infection Classification[a]		TOTAL
		HIV (Non-AIDS)	AIDS (Stage 3)	
CHARLOTTE-TRANSITIONAL GRANT AREA (TGA)	ANSON	31	32	63
	CABARRUS	175	92	267
	GASTON	310	214	524
	MECKLENBURG	3,191	2,004	5,195
	UNION	97	92	189
	TOTAL	**3,804**	**2,434**	**6,238**
REGION 1	AVERY	3	6	9
	BUNCOMBE	280	238	518
	CHEROKEE	9	5	14
	CLAY	5	3	8
	CLEVELAND	106	87	193
	GRAHAM	.	3	3
	HAYWOOD	22	33	55
	HENDERSON	29	53	82
	JACKSON	17	18	35
	MACON	14	15	29
	MADISON	6	7	13
	MCDOWELL	17	15	32
	MITCHELL	3	8	11
	POLK	7	13	20
	RUTHERFORD	24	28	52
	SWAIN	7	10	17
	TRANSYLVANIA	20	8	28
	YANCEY	5	7	12
	TOTAL	**574**	**557**	**1,131**
REGION 2	ALEXANDER	18	18	36
	ALLEGHANY	2	0	2
	ASHE	10	0	10
	BURKE	41	32	73
	CALDWELL	21	28	49
	CATAWBA	108	116	224
	LINCOLN	35	27	62
	WATAUGA	15	11	26
	WILKES	28	16	44
	TOTAL	**278**	**248**	**526**
REGION 3	DAVIDSON	152	84	236
	DAVIE	14	16	30
	FORSYTH	886	499	1,385
	IREDELL	79	56	135
	ROWAN	142	92	234
	STOKES	21	13	34
	SURRY	41	21	62
	YADKIN	11	15	26
	TOTAL	**1,346**	**796**	**2,142**

[a]All persons living with HIV infection (non-AIDS) have never been diagnosed or classified as having AIDS (HIV infection Stage 3). AIDS (Stage 3) classification is defined as those who were diagnosed with HIV infection and were classified as AIDS (Stage 3) that year or who have ever been diagnosed with ever having a CD4+ T-lymphocyte cell count of less than 200 or a T-lymphocyte percentage of total lymphocytes of less than 14.
Data Source: enhanced HIV/AIDS Reporting System (eHARS) (data as of July 1, 2014).

Table S (continued): All Persons Living in North Carolina with HIV Infection as of 12/31/2013 By Regional Network of Care and Prevention Regions and by County of Residence

| Regional Network of Care and Prevention | County | HIV Infection Classification[a] | | TOTAL |
		HIV (Non-AIDS)	AIDS (Stage 3)	
REGION 4	ALAMANCE	236	129	365
	CASWELL	28	13	41
	GUILFORD	1,406	705	2,111
	MONTGOMERY	17	21	38
	RANDOLPH	91	65	156
	ROCKINGHAM	85	45	130
	STANLY	47	33	80
	TOTAL	**1,910**	**1,011**	**2,921**
REGION 5	BLADEN	48	52	100
	CUMBERLAND	866	473	1,339
	HARNETT	114	104	218
	HOKE	78	63	141
	MOORE	73	67	140
	RICHMOND	66	51	117
	ROBESON	217	215	432
	SAMPSON	79	74	153
	SCOTLAND	72	48	120
	TOTAL	**1,613**	**1,147**	**2,760**
REGION 6	CHATHAM	63	36	99
	DURHAM	1,031	534	1,565
	FRANKLIN	56	55	111
	GRANVILLE	100	64	164
	JOHNSTON	157	155	312
	LEE	111	46	157
	ORANGE	210	93	303
	PERSON	54	23	77
	VANCE	102	85	187
	WAKE	1,636	1,351	2,987
	WARREN	29	11	40
	TOTAL	**3,549**	**2,453**	**6,002**
REGION 7	BRUNSWICK	81	84	165
	COLUMBUS	86	76	162
	DUPLIN	83	92	175
	NEW HANOVER	345	241	586
	ONSLOW	140	103	243
	PENDER	27	31	58
	TOTAL	**762**	**627**	**1,389**

Continued

[a]All persons living with HIV infection (non-AIDS) have never been diagnosed or classified as having AIDS (HIV infection Stage 3). AIDS (Stage 3) classification is defined as those who were diagnosed with HIV infection and were classified as AIDS (Stage 3) that year or who have ever been diagnosed with ever having a CD4+ T-lymphocyte cell count of less than 200 or a T-lymphocyte percentage of total lymphocytes of less than 14.
Data Source: enhanced HIV/AIDS Reporting System (eHARS) (data as of July 1, 2014).

Table S (continued): All Persons Living in North Carolina with HIV Infection as of 12/31/2013 by Regional Network of Care and Prevention Regions and by County of Residence

Regional Network of Care and Prevention	County	HIV Infection Classification[a]		TOTAL
		HIV (Non-AIDS)	AIDS (Stage 3)	
REGION 8	EDGECOMBE	156	160	316
	HALIFAX	83	81	164
	NASH	155	129	284
	NORTHAMPTON	30	38	68
	WILSON	180	169	349
	TOTAL	**604**	**577**	**1,181**
REGION 9	BERTIE	33	44	77
	CAMDEN	6	9	15
	CHOWAN	13	14	27
	CURRITUCK	6	9	15
	DARE	17	21	38
	GATES	8	1	9
	HERTFORD	27	61	88
	HYDE	3	7	10
	PASQUOTANK	50	42	92
	PERQUIMANS	14	15	29
	TYRRELL	3	2	5
	TOTAL	**180**	**225**	**405**
REGION 10	BEAUFORT	59	53	112
	CARTERET	27	31	58
	CRAVEN	128	108	236
	GREENE	24	32	56
	JONES	8	14	22
	LENOIR	124	135	259
	MARTIN	42	38	80
	PAMLICO	13	7	20
	PITT	280	303	583
	WASHINGTON	18	30	48
	WAYNE	158	152	310
	TOTAL	**881**	**903**	**1,784**
UNASSIGNED[b]		**771**	**851**	**1,622**
TOTAL		**16,272**	**11,829**	**28,101**

[a]All persons living with HIV infection (non-AIDS) have never been diagnosed or classified as having AIDS (HIV infection Stage 3). AIDS (Stage 3) classification is defined as those who were diagnosed with HIV infection and were classified as AIDS (Stage 3) that year or who have ever been diagnosed with ever having a CD4+ T-lymphocyte cell count of less than 200 or a T-lymphocyte percentage of total lymphocytes of less than 14.

[b]Unassigned includes cases with an unknown county of residence at diagnosis or cases that were diagnosed at a long-term care facility, including prisons.

Data Source: enhanced HIV/AIDS Reporting System (eHARS) (data as of July 1, 2014).

Table T: HIV Infection[a] Cases of All Persons Living as of 12/31/2013 in Regional Network of Care and Prevention Charlotte, Transitional Grant Area (TGA)[b] (Unknown Risk[c] Redistributed)

Demographics	Charlotte, Transitional Grant Area			North Carolina Total		
	Cases	%	Rate[d]	Cases	%	Rate[d]
Gender						
Male	4,420	70.9	570.2	19,962	71.0	420.0
Female	1,818	29.1	221.3	8,139	29.0	162.8
Current Age (Year)						
Less than 13	15	0.2	5.0	77	0.3	4.7
13-14	--[e]	--	--	16	0.1	6.2
15-19	46	0.7	43.1	167	0.6	25.7
20-24	289	4.6	282.6	1,138	4.0	163.2
25-29	537	8.6	471.0	2,067	7.4	326.7
30-34	522	8.4	439.7	2,334	8.3	367.7
35-39	594	9.5	502.9	2,709	9.6	432.4
40-44	879	14.1	692.0	3,823	13.6	557.4
45-49	1,025	16.4	877.0	4,709	16.8	691.6
50-54	1,007	16.1	918.9	4,671	16.6	681.4
55-59	680	10.9	730.5	3,206	11.4	505.4
60-64	381	6.1	483.7	1,842	6.6	326.1
65 and older	254	4.1	150.8	1,328	4.7	98.5
Unknown[f]	--[e]	--	--	14	0.0	--
Race/Ethnicity						
American Indian/Alaska Native[g]	6	0.1	97.6	206	0.7	175.2
Asian/Pacific Islander[g]	34	0.5	54.0	151	0.5	59.9
Black/African American[g]	4,204	67.4	1,044.6	18,377	65.4	857.8
Hispanic/Latino	357	5.7	203.2	1,756	6.2	206.4
White/Caucasian[g]	1,469	23.5	154.8	7,071	25.2	110.7
Unknown[f]	168	2.7	--	540	1.9	--
Exposure Category[h]						
Heterosexual-All[i]	1,442	23.1	--	10,860	38.6	--
IDU[j]	602	9.7	--	2,818	10.0	--
MSM[j]	3,921	39.2	--	12,309	43.8	--
MSM/IDU[j]	160	2.6	--	773	2.8	--
Other Risks[k]	112	1.8	--	546	1.9	--
Total	6,238	100.0	390.7	28,101	100.0	288.2

[a]All persons living with HIV infection, regardless of the stage of infection (HIV or AIDS).

[b]Includes Anson, Cabarrus, Gaston, Mecklenburg, and Union counties in North Carolina.

[c]Unknown risk includes individuals classified as no identified risk (NIR) and no reported risk (NRR). For more information on distribution calculations, see Appendix C: Technical Notes (page C-5).

[d]Rate is expressed per 100,000 population.

[e]Cell counts, percentages, and rates have been suppressed to avoid identification of cells that have counts less than five through direct or indirect means.

[f]Rates are not available due to the lack of overall population data for the unknown groups.

[g]Non-Hispanic/Latino.

[h]Rates could not be calculated for Mode of Exposure category due to the lack of population data for specific exposure groups.

[i]Heterosexual-All includes those individuals reporting heterosexual contact with a known HIV-positive or high risk individual and cases redistributed into the heterosexual classification from the unknown (originally classified as persons who reports sex with an opposite sex partner and does not report IDU, MSM, or any other potential high risk behaviors).

[j]IDU = injection drug use; MSM = men who have sex with men.

[k]Other risks include exposure to blood products (adult hemophilia) and pediatric risk.

Data Source: enhanced HIV/AIDS Reporting System (eHARS) (data as of July 1, 2014).

Table U: HIV Infection[a] Cases of All Persons Living as of 12/31/2013 in Regional Network of Care and Prevention Region 1[b] (Unknown Risk[c] Redistributed)

Demographics	Region 1[b]			North Carolina Total		
	Cases	%	Rate[d]	Cases	%	Rate[d]
Gender						
Male	858	75.9	200.4	19,962	71.0	420.0
Female	273	24.1	60.3	8,139	29.0	162.8
Current Age (Year)						
Less than 13	--[e]	--	--	77	0.3	4.7
13-14	--[e]	--	--	16	0.1	6.2
15-19	--[e]	--	--	167	0.6	25.7
20-24	31	2.7	58.3	1,138	4.0	163.2
25-29	57	5.0	119.7	2,067	7.4	326.7
30-34	74	6.5	148.7	2,334	8.3	367.7
35-39	103	9.1	203.3	2,709	9.6	432.4
40-44	151	13.4	266.0	3,823	13.6	557.4
45-49	198	17.5	335.7	4,709	16.8	691.6
50-54	215	19.0	338.7	4,671	16.6	681.4
55-59	161	14.2	250.2	3,206	11.4	505.4
60-64	69	6.1	108.6	1,842	6.6	326.1
65 and older	67	5.9	38.5	1,328	4.7	98.5
Unknown[f]	--[e]	--	--	14	0.0	--
Race/Ethnicity						
American Indian/Alaska Native[g]	--[e]	--	--	206	0.7	175.2
Asian/Pacific Islander[g]	--[e]	--	--	151	0.5	59.9
Black/African American[g]	344	30.4	604.6	18,377	65.4	857.8
Hispanic/Latino	62	5.5	131.3	1,756	6.2	206.4
White/Caucasian[g]	691	61.1	91.2	7,071	25.2	110.7
Unknown[f]	17	1.5	--	540	1.9	--
Exposure Category[h]						
Heterosexual-All[i]	216	19.1	--	10,860	38.6	--
IDU[j]	157	13.9	--	2,818	10.0	--
MSM[j]	662	58.5	--	12,309	43.8	--
MSM/IDU[j]	78	6.9	--	773	2.8	--
Other Risks[k]	18	1.6	--	546	1.9	--
Total	1,131	100.0	128.4	28,101	100.0	288.2

[a]All persons living with HIV infection, regardless of the stage of infection (HIV or AIDS).

[b]Includes Avery, Buncombe, Cherokee, Clay, Cleveland, Graham, Haywood, Henderson, Jackson, Macon, Madison, McDowell, Mitchell, Polk, Rutherford, Swain, Transylvania, and Yancey counties in North Carolina.

[c]Unknown risk includes individuals classified as no identified risk (NIR) and no reported risk (NRR). For more information on distribution calculations, see Appendix C: Technical Notes (page C-5).

[d]Rate is expressed per 100,000 population.

[e]Cell counts, percentages, and rates have been suppressed to avoid identification of cells that have counts less than five through direct or indirect means.

[f]Rates are not available due to the lack of overall population data for the unknown groups.

[g]Non-Hispanic/Latino.

[h]Rates could not be calculated for Mode of Exposure category due to the lack of population data for specific exposure groups.

[i]Heterosexual-All includes those individuals reporting heterosexual contact with a known HIV-positive or high risk individual and cases redistributed into the heterosexual classification from the unknown (originally classified as persons who reports sex with an opposite sex partner and does not report IDU, MSM, or any other potential high risk behaviors).

[j]IDU = injection drug use; MSM = men who have sex with men.

[k]Other risks include exposure to blood products (adult hemophilia) and pediatric risk.

Data Source: enhanced HIV/AIDS Reporting System (eHARS) (data as of July 1, 2014).

Table V: HIV Infection[a] Cases of All Persons Living as of 12/31/2013 in Regional Network of Care and Prevention Region 2[b] (Unknown Risk[c] Redistributed)

Demographics	Region 2[b]			North Carolina Total		
	Cases	%	Rate[d]	Cases	%	Rate[d]
Gender						
Male	398	75.7	133.4	19,962	71.0	420.0
Female	128	24.3	42.1	8,139	29.0	162.8
Current Age (Year)						
Less than 13	--[e]	--	--	77	0.3	4.7
13-14	--[e]	--	--	16	0.1	6.2
15-19	--[e]	--	--	167	0.6	25.7
20-24	17	3.2	39.2	1,138	4.0	163.2
25-29	38	7.2	121.6	2,067	7.4	326.7
30-34	42	8.0	126.7	2,334	8.3	367.7
35-39	50	9.5	139.2	2,709	9.6	432.4
40-44	60	11.4	142.0	3,823	13.6	557.4
45-49	111	21.1	251.8	4,709	16.8	691.6
50-54	90	17.1	200.3	4,671	16.6	681.4
55-59	58	11.0	137.0	3,206	11.4	505.4
60-64	41	7.8	103.3	1,842	6.6	326.1
65 and older	17	3.2	17.2	1,328	4.7	98.5
Unknown[f]	--[e]	--	--	14	0.0	--
Race/Ethnicity						
American Indian/Alaska Native[g]	--[e]	--	--	206	0.7	175.2
Asian/Pacific Islander[g]	--[e]	--	--	151	0.5	59.9
Black/African American[g]	128	24.3	356.6	18,377	65.4	857.8
Hispanic/Latino	31	5.9	83.2	1,756	6.2	206.4
White/Caucasian[g]	353	67.1	68.5	7,071	25.2	110.7
Unknown[f]	12	2.3	--	540	1.9	--
Exposure Category[h]						
Heterosexual-All[i]	93	17.7	--	10,860	38.6	--
IDU[j]	48	9.1	--	2,818	10.0	--
MSM[j]	352	67.0	--	12,309	43.8	--
MSM/IDU[j]	22	4.1	--	773	2.8	--
Other Risks[k]	11	2.1	--	546	1.9	--
Total	526	100.0	87.4	28,101	100.0	288.2

[a]All persons living with HIV infection, regardless of the stage of infection (HIV or AIDS).

[b]Includes Alexander, Alleghany, Ashe, Burke, Caldwell, Catawba, Lincoln, Watuga, and Wilkes counties in North Carolina.

[c]Unknown risk includes individuals classified as no identified risk (NIR) and no reported risk (NRR). For more information on distribution calculations, see Appendix C: Technical Notes (page C-5).

[d]Rate is expressed per 100,000 population.

[e]Cell counts, percentages, and rates have been suppressed to avoid identification of cells that have counts less than five through direct or indirect means.

[f]Rates are not available due to the lack of overall population data for the unknown groups.

[g]Non-Hispanic/Latino.

[h]Rates could not be calculated for Mode of Exposure category due to the lack of population data for specific exposure groups.

[i]Heterosexual-All includes those individuals reporting heterosexual contact with a known HIV-positive or high risk individual and cases redistributed into the heterosexual classification from the unknown (originally classified as persons who reports sex with an opposite sex partner and does not report IDU, MSM, or any other potential high risk behaviors).

[j]IDU = injection drug use; MSM = men who have sex with men.

[k]Other risks include exposure to blood products (adult hemophilia) and pediatric risk.

Data Source: enhanced HIV/AIDS Reporting System (eHARS) (data as of July 1, 2014).

Table W: HIV Infection[a] Cases of All Persons Living as of 12/31/2013 in Regional Network of Care and Prevention Region 3[b] (Unknown Risk[c] Redistributed)

Demographics	Region 3[b]			North Carolina Total		
	Cases	%	Rate[d]	Cases	%	Rate[d]
Gender						
Male	1,467	68.5	295.8	19,962	71.0	420.0
Female	675	31.5	128.3	8,139	29.0	162.8
Current Age (Year)						
Less than 13	13	0.6	7.6	77	0.3	4.7
13-14	--[e]	--	--	16	0.1	6.2
15-19	15	0.7	21.9	167	0.6	25.7
20-24	66	3.1	104.1	1,138	4.0	163.2
25-29	136	6.3	236.0	2,067	7.4	326.7
30-34	171	8.0	282.8	2,334	8.3	367.7
35-39	178	8.3	284.9	2,709	9.6	432.4
40-44	300	14.0	408.4	3,823	13.6	557.4
45-49	371	17.3	490.7	4,709	16.8	691.6
50-54	359	16.8	467.7	4,671	16.6	681.4
55-59	246	11.5	353.7	3,206	11.4	505.4
60-64	152	7.1	244.5	1,842	6.6	326.1
65 and older	131	6.1	85.4	1,328	4.7	98.5
Unknown[f]	--[e]	--	--	14	0.0	--
Race/Ethnicity						
American Indian/Alaska Native[g]	--[e]	--	--	206	0.7	175.2
Asian/Pacific Islander[g]	--[e]	--	--	151	0.5	59.9
Black/African American[g]	1,299	60.6	809.0	18,377	65.4	857.8
Hispanic/Latino	164	7.7	178.1	1,756	6.2	206.4
White/Caucasian[g]	626	29.2	83.5	7,071	25.2	110.7
Unknown[f]	39	1.8	--	540	1.9	--
Exposure Category[g]						
Heterosexual-All[i]	517	24.1	--	10,860	38.6	--
IDU[j]	216	10.1	--	2,818	10.0	--
MSM[j]	1,291	60.2	--	12,309	43.8	--
MSM/IDU[j]	65	3.0	--	773	2.8	--
Other Risks[k]	53	2.5	--	546	1.9	--
Total	2,142	100.0	209.6	28,101	100.0	288.2

[a]All persons living with HIV infection, regardless of the stage of infection (HIV or AIDS).

[b]Includes Davidson, Davie, Forsyth, Iredell, Rowan, Stokes, Surry, and Yadkin counties in North Carolina.

[c]Unknown risk includes individuals classified as no identified risk (NIR) and no reported risk (NRR). For more information on distribution calculations, see Appendix C: Technical Notes (page C-5).

[d]Rate is expressed per 100,000 population.

[e]Cell counts, percentages, and rates have been suppressed to avoid identification of cells that have counts less than five through direct or indirect means.

[f]Rates are not available due to the lack of overall population data for the unknown groups.

[g]Non-Hispanic/Latino.

[h]Rates could not be calculated for Mode of Exposure category due to the lack of population data for specific exposure groups.

[i]Heterosexual-All includes those individuals reporting heterosexual contact with a known HIV-positive or high risk individual and cases redistributed into the heterosexual classification from the unknown (originally classified as persons who reports sex with an opposite sex partner and does not report IDU, MSM, or any other potential high risk behaviors).

[j]IDU = injection drug use; MSM = men who have sex with men.

[k]Other risks include exposure to blood products (adult hemophilia) and pediatric risk.

Data Source: enhanced HIV/AIDS Reporting System (eHARS) (data as of July 1, 2014).

Table X: HIV Infection[a] Cases of All Persons Living as of 12/31/2013 in Regional Network of Care and Prevention Region 4[b] (Unknown Risk[c] Redistributed)

Demographics	Region 4[b]			North Carolina Total		
	Cases	%	Rate[d]	Cases	%	Rate[d]
Gender						
Male	2,077	71.1	430.5	19,962	71.0	420.0
Female	844	28.9	162.6	8,139	29.0	162.8
Current Age (Year)						
Less than 13	8	0.3	4.9	77	0.3	4.7
13-14	--[e]	--	--	16	0.1	6.2
15-19	15	0.5	21.6	167	0.6	25.7
20-24	141	4.8	195.4	1,138	4.0	163.2
25-29	238	8.1	390.3	2,067	7.4	326.7
30-34	264	9.0	434.8	2,334	8.3	367.7
35-39	299	10.2	487.9	2,709	9.6	432.4
40-44	426	14.6	599.8	3,823	13.6	557.4
45-49	483	16.5	673.7	4,709	16.8	691.6
50-54	463	15.9	643.3	4,671	16.6	681.4
55-59	279	9.6	416.2	3,206	11.4	505.4
60-64	180	6.2	304.1	1,842	6.6	326.1
65 and older	123	4.2	84.5	1,328	4.7	98.5
Unknown[f]	--[e]	--	--	14	0.0	--
Race/Ethnicity						
American Indian/Alaska Native[g]	11	0.4	248.1	206	0.7	175.2
Asian/Pacific Islander[g]	17	0.6	60.0	151	0.5	59.9
Black/African American[g]	1,916	65.6	784.0	18,377	65.4	857.8
Hispanic/Latino	163	5.6	197.7	1,756	6.2	206.4
White/Caucasian[g]	762	26.1	118.7	7,071	25.2	110.7
Unknown[f]	52	1.8	--	540	1.9	--
Exposure Category[g]						
Heterosexual-All[i]	624	21.4	--	10,860	38.6	--
IDU[j]	251	8.6	--	2,818	10.0	--
MSM[j]	1,896	64.9	--	12,309	43.8	--
MSM/IDU[j]	90	3.1	--	773	2.8	--
Other Risks[k]	60	2.1	--	546	1.9	--
Total	2,921	100.0	291.7	28,101	100.0	288.2

[a]All persons living with HIV infection, regardless of the stage of infection (HIV or AIDS).

[b]Includes Alamance, Caswell, Guilford, Montgomery, Randolph, Rockingham, and Stanly counties in North Carolina.

[c]Unknown risk includes individuals classified as no identified risk (NIR) and no reported risk (NRR). For more information on distribution calculations, see Appendix C: Technical Notes (page C-5).

[d]Rate is expressed per 100,000 population.

[e]Cell counts, percentages, and rates have been suppressed to avoid identification of cells that have counts less than five through direct or indirect means.

[f]Rates are not available due to the lack of overall population data for the unknown groups.

[g]Non-Hispanic/Latino.

[h]Rates could not be calculated for Mode of Exposure category due to the lack of population data for specific exposure groups.

[i]Heterosexual-All includes those individuals reporting heterosexual contact with a known HIV-positive or high risk individual and cases redistributed into the heterosexual classification from the unknown (originally classified as persons who reports sex with an opposite sex partner and does not report IDU, MSM, or any other potential high risk behaviors).

[j]IDU = injection drug use; MSM = men who have sex with men.

[k]Other risks include exposure to blood products (adult hemophilia) and pediatric risk.

Data Source: enhanced HIV/AIDS Reporting System (eHARS) (data as of July 1, 2014).

Table Y: HIV Infection[a] Cases of All Persons Living as of 12/31/2013 in Regional Network of Care and Prevention Region 5[b] (Unknown Risk[c] Redistributed)

Demographics	Region 5[b]			North Carolina Total		
	Cases	%	Rate[c]	Cases	%	Rate[d]
Gender						
Male	1,825	66.1	414.1	19,962	71.0	420.0
Female	935	33.9	201.8	8,139	29.0	162.8
Current Age (Year)						
Less than 13	--[e]	--	--	77	0.3	4.7
13-14	--[e]	--	--	16	0.1	6.2
15-19	17	0.6	27.7	167	0.6	25.7
20-24	141	5.1	200.4	1,138	4.0	163.2
25-29	253	9.2	382.7	2,067	7.4	326.7
30-34	284	10.3	462.2	2,334	8.3	367.7
35-39	289	10.5	517.6	2,709	9.6	432.4
40-44	367	13.3	637.3	3,823	13.6	557.4
45-49	405	14.7	698.7	4,709	16.8	691.6
50-54	399	14.5	679.4	4,671	16.6	681.4
55-59	329	11.9	599.1	3,206	11.4	505.4
60-64	151	5.5	314.1	1,842	6.6	326.1
65 and older	119	4.3	103.6	1,328	4.7	98.5
Unknown[f]	--[e]	--	--	14	0.0	--
Race/Ethnicity						
American Indian/Alaska Native[g]	135	4.9	189.6	206	0.7	175.2
Asian/Pacific Islander[g]	12	0.4	75.9	151	0.5	59.9
Black/African American[g]	1,915	69.4	710.4	18,377	65.4	857.8
Hispanic/Latino	156	5.7	179.0	1,756	6.2	206.4
White/Caucasian[g]	464	16.8	100.8	7,071	25.2	110.7
Unknown[f]	78	2.8	--	540	1.9	--
Exposure Category[g]						
Heterosexual-All[i]	808	29.3	--	10,860	38.6	--
IDU[j]	250	9.1	--	2,818	10.0	--
MSM[j]	1,598	57.9	--	12,309	43.8	--
MSM/IDU[j]	49	1.8	--	773	2.8	--
Other Risks[k]	55	2.0	--	546	1.9	--
Total	2,760	100.0	305.3	28,101	100.0	288.2

[a]All persons living with HIV infection, regardless of the stage of infection (HIV or AIDS).

[b]Includes Bladen, Cumberland, Harnett, Hoke, Moore, Richmond, Robeson, Sampson, and Scotland counties in North Carolina.

[c]Unknown risk includes individuals classified as no identified risk (NIR) and no reported risk (NRR). For more information on distribution calculations, see Appendix C: Technical Notes (page C-5).

[d]Rate is expressed per 100,000 population.

[e]Cell counts, percentages, and rates have been suppressed to avoid identification of cells that have counts less than five through direct or indirect means.

[f]Rates are not available due to the lack of overall population data for the unknown groups.

[g]Non-Hispanic/Latino.

[h]Rates could not be calculated for Mode of Exposure category due to the lack of population data for specific exposure groups.

[i]Heterosexual-All includes those individuals reporting heterosexual contact with a known HIV-positive or high risk individual and cases redistributed into the heterosexual classification from the unknown (originally classified as persons who reports sex with an opposite sex partner and does not report IDU, MSM, or any other potential high risk behaviors).

[j]IDU = injection drug use; MSM = men who have sex with men.

[k]Other risks include exposure to blood products (adult hemophilia) and pediatric risk.

Data Source: enhanced HIV/AIDS Reporting System (eHARS) (data as of July 1, 2014).

Table Z: HIV Infection[a] Cases of All Persons Living as of 12/31/2013 in Regional Network of Care and Prevention Region 6[b] (Unknown Risk[c] Redistributed)

Demographics	Region 6[b]			North Carolina Total		
	Cases	%	Rate[d]	Cases	%	Rate[d]
Gender						
Male	4,375	72.9	473.8	19,962	71.0	420.0
Female	1,627	27.1	167.1	8,139	29.0	162.8
Current Age (Year)						
Less than 13	20	0.3	5.9	77	0.3	4.7
13-14	--[e]	--	--	16	0.1	6.2
15-19	27	0.4	20.5	167	0.6	25.7
20-24	225	3.7	169.5	1,138	4.0	163.2
25-29	428	7.1	321.9	2,067	7.4	326.7
30-34	484	8.1	351.4	2,334	8.3	367.7
35-39	576	9.6	421.8	2,709	9.6	432.4
40-44	839	14.0	577.6	3,823	13.6	557.4
45-49	980	16.3	714.2	4,709	16.8	691.6
50-54	999	16.6	757.2	4,671	16.6	681.4
55-59	665	11.1	570.2	3,206	11.4	505.4
60-64	453	7.5	465.5	1,842	6.6	326.1
65 and older	298	5.0	143.2	1,328	4.7	98.5
Unknown[f]	--[e]	--	--	14	0.0	--
Race/Ethnicity						
American Indian/Alaska Native[g]	13	0.2	164.4	206	0.7	175.2
Asian/Pacific Islander[g]	44	0.7	51.5	151	0.5	59.9
Black/African American[g]	3,885	64.7	853.7	18,377	65.4	857.8
Hispanic/Latino	497	8.3	246.1	1,756	6.2	206.4
White/Caucasian[g]	1,475	24.6	128.6	7,071	25.2	110.7
Unknown[f]	88	1.5	--	540	1.9	--
Exposure Category[h]						
Heterosexual-All[i]	1,293	21.5	--	10,860	38.6	--
IDU[j]	597	9.9	--	2,818	10.0	--
MSM[j]	3,788	63.1	--	12,309	43.8	--
MSM/IDU[j]	183	3.0	--	773	2.8	--
Other Risks[k]	142	2.4	--	546	1.9	--
Total	6,002	100.0	316.4	28,101	100.0	288.2

[a]All persons living with HIV infection, regardless of the stage of infection (HIV or AIDS).

[b]Includes Chatham, Durham, Franklin, Granville, Johnston, Lee, Orange, Person, Vance, Wake, and Warren counties in North Carolina.

[c]Unknown risk includes individuals classified as no identified risk (NIR) and no reported risk (NRR). For more information on distribution calculations, see Appendix C: Technical Notes (page C-5).

[d]Rate is expressed per 100,000 population.

[e]Cell counts, percentages, and rates have been suppressed to avoid identification of cells that have counts less than five through direct or indirect means.

[f]Rates are not available due to the lack of overall population data for the unknown groups.

[g]Non-Hispanic/Latino.

[h]Rates could not be calculated for Mode of Exposure category due to the lack of population data for specific exposure groups.

[i]Heterosexual-All includes those individuals reporting heterosexual contact with a known HIV-positive or high risk individual and cases redistributed into the heterosexual classification from the unknown (originally classified as persons who reports sex with an opposite sex partner and does not report IDU, MSM, or any other potential high risk behaviors).

[j]IDU = injection drug use; MSM = men who have sex with men.

[k]Other risks include exposure to blood products (adult hemophilia) and pediatric risk.

Data Source: enhanced HIV/AIDS Reporting System (eHARS) (data as of July 1, 2014).

Table AA: HIV Infection[a] Cases of All Persons Living as of 12/31/2013 in Regional Network of Care and Prevention Region 7[b] (Unknown Risk[c] Redistributed)

Demographics	Region 7[b]			North Carolina Total		
	Cases	%	Rate[d]	Cases	%	Rate[d]
Gender						
Male	934	67.2	274.8	19,962	71.0	420.0
Female	455	32.8	135.1	8,139	29.0	162.8
Current Age (Year)						
Less than 13	--[e]	--	--	77	0.3	4.7
13-14	--[e]	--	--	16	0.1	6.2
15-19	7	0.5	16.6	167	0.6	25.7
20-24	42	3.0	60.9	1,138	4.0	163.2
25-29	86	6.2	170.4	2,067	7.4	326.7
30-34	106	7.6	241.8	2,334	8.3	367.7
35-39	150	10.8	381.2	2,709	9.6	432.4
40-44	156	11.2	387.3	3,823	13.6	557.4
45-49	238	17.1	588.9	4,709	16.8	691.6
50-54	243	17.5	567.8	4,671	16.6	681.4
55-59	178	12.8	422.6	3,206	11.4	505.4
60-64	104	7.5	252.4	1,842	6.6	326.1
65 and older	77	5.5	77.0	1,328	4.7	98.5
Unknown[f]	--[e]	--	--	14	0.0	--
Race/Ethnicity						
American Indian/Alaska Native[g]	5	0.4	94.9	206	0.7	175.2
Asian/Pacific Islander[g]	8	0.6	83.6	151	0.5	59.9
Black/African American[g]	790	56.9	675.9	18,377	65.4	857.8
Hispanic/Latino	112	8.1	199.9	1,756	6.2	206.4
White/Caucasian[g]	455	32.8	93.1	7,071	25.2	110.7
Unknown[f]	19	1.4	--	540	1.9	--
Exposure Category[g]						
Heterosexual-All[i]	465	33.5	--	10,860	38.6	--
IDU[j]	144	10.3	--	2,818	10.0	--
MSM[j]	715	51.5	--	12,309	43.8	--
MSM/IDU[j]	43	3.1	--	773	2.8	--
Other Risks[k]	22	1.6	--	546	1.9	--
Total	1,389	100.0	205.3	28,101	100.0	288.2

[a]All persons living with HIV infection, regardless of the stage of infection (HIV or AIDS).

[b]Includes Brunswick, Columbus, Duplin, New Hanover, Onslow, and Pender counties in North Carolina.

[c]Unknown risk includes individuals classified as no identified risk (NIR) and no reported risk (NRR). For more information on distribution calculations, see Appendix C: Technical Notes (page C-5).

[d]Rate is expressed per 100,000 population.

[e]Cell counts, percentages, and rates have been suppressed to avoid identification of cells that have counts less than five through direct or indirect means.

[f]Rates are not available due to the lack of overall population data for the unknown groups.

[g]Non-Hispanic/Latino.

[h]Rates could not be calculated for Mode of Exposure category due to the lack of population data for specific exposure groups.

[i]Heterosexual-All includes those individuals reporting heterosexual contact with a known HIV-positive or high risk individual and cases redistributed into the heterosexual classification from the unknown (originally classified as persons who reports sex with an opposite sex partner and does not report IDU, MSM, or any other potential high risk behaviors).

[j]IDU = injection drug use; MSM = men who have sex with men.

[k]Other risks include exposure to blood products (adult hemophilia) and pediatric risk.

Data Source: enhanced HIV/AIDS Reporting System (eHARS) (data as of July 1, 2014).

Table AB: HIV Infection[a] Cases of All Persons Living as of 12/31/2013 in Regional Network of Care and Prevention Region 8[b] (Unknown Risk[c] Redistributed)

Demographics	Region 8[b]			North Carolina Total		
	Cases	%	Rate[d]	Cases	%	Rate[d]
Gender						
Male	767	64.9	520.5	19,962	71.0	420.0
Female	414	35.1	256.2	8,139	29.0	162.8
Current Age (Year)						
Less than 13	--[e]	--	--	77	0.3	4.7
13-14	--[e]	--	--	16	0.1	6.2
15-19	14	1.2	68.1	167	0.6	25.7
20-24	58	4.9	295.9	1,138	4.0	163.2
25-29	86	7.3	505.1	2,067	7.4	326.7
30-34	113	9.6	645.8	2,334	8.3	367.7
35-39	98	8.3	558.9	2,709	9.6	432.4
40-44	134	11.3	684.7	3,823	13.6	557.4
45-49	198	16.8	912.6	4,709	16.8	691.6
50-54	174	14.7	751.5	4,671	16.6	681.4
55-59	146	12.4	632.3	3,206	11.4	505.4
60-64	80	6.8	389.2	1,842	6.6	326.1
65 and older	75	6.4	150.8	1,328	4.7	98.5
Unknown[f]	--[e]	--	--	14	0.0	--
Race/Ethnicity						
American Indian/Alaska Native[g]	--[e]	--	--	206	0.7	175.2
Asian/Pacific Islander[g]	--[e]	--	--	151	0.5	59.9
Black/African American[g]	1,007	85.3	705.4	18,377	65.4	857.8
Hispanic/Latino	33	2.8	182.9	1,756	6.2	206.4
White/Caucasian[g]	121	10.2	84.8	7,071	25.2	110.7
Unknown[f]	14	1.2	--	540	1.9	--
Exposure Category[g]						
Heterosexual-All[i]	408	34.5	--	10,860	38.6	--
IDU[j]	131	11.1	--	2,818	10.0	--
MSM[j]	565	47.8	--	12,309	43.8	--
MSM/IDU[j]	31	2.6	--	773	2.8	--
Other Risks[k]	46	3.9	--	546	1.9	--
Total	1,181	100.0	382.2	28,101	100.0	288.2

[a]All persons living with HIV infection, regardless of the stage of infection (HIV or AIDS).

[b]Includes Edgecombe, Halifax, Nash, Northampton, and Wilson counties in North Carolina.

[c]Unknown risk includes individuals classified as no identified risk (NIR) and no reported risk (NRR). For more information on distribution calculations, see Appendix C: Technical Notes (page C-5).

[d]Rate is expressed per 100,000 population.

[e]Cell counts, percentages, and rates have been suppressed to avoid identification of cells that have counts less than five through direct or indirect means.

[f]Rates are not available due to the lack of overall population data for the unknown groups.

[g]Non-Hispanic/Latino.

[h]Rates could not be calculated for Mode of Exposure category due to the lack of population data for specific exposure groups.

[i]Heterosexual-All includes those individuals reporting heterosexual contact with a known HIV-positive or high risk individual and cases redistributed into the heterosexual classification from the unknown (originally classified as persons who reports sex with an opposite sex partner and does not report IDU, MSM, or any other potential high risk behaviors).

[j]IDU = injection drug use; MSM = men who have sex with men.

[k]Other risks include exposure to blood products (adult hemophilia) and pediatric risk.

Data Source: enhanced HIV/AIDS Reporting System (eHARS) (data as of July 1, 2014).

Table AC: HIV Infection[a] Cases of All Persons Living as of 12/31/2013 in Regional Network of Care and Prevention Region 9[b] (Unknown Risk[c] Redistributed)

Demographics	Region 9[b]			North Carolina Total		
	Cases	%	Rate[d]	Cases	%	Rate[d]
Gender						
Male	276	68.1	272.1	19,962	71.0	420.0
Female	129	31.9	124.8	8,139	29.0	162.8
Current Age (Year)						
Less than 13	--[e]	--	--	77	0.3	4.7
13-14	--[e]	--	--	16	0.1	6.2
15-19	--[e]	--	--	167	0.6	25.7
20-24	19	4.7	153.2	1,138	4.0	163.2
25-29	21	5.2	175.8	2,067	7.4	326.7
30-34	25	6.2	209.1	2,334	8.3	367.7
35-39	20	4.9	172.1	2,709	9.6	432.4
40-44	43	10.6	325.7	3,823	13.6	557.4
45-49	69	17.0	465.5	4,709	16.8	691.6
50-54	96	23.7	585.9	4,671	16.6	681.4
55-59	44	10.9	276.1	3,206	11.4	505.4
60-64	35	8.6	258.0	1,842	6.6	326.1
65 and older	30	7.4	87.4	1,328	4.7	98.5
Unknown[f]	--[e]	--	--	14	0.0	--
Race/Ethnicity						
American Indian/Alaska Native[g]	--[e]	--	--	206	0.7	175.2
Asian/Pacific Islander[g]	--[e]	--	--	151	0.5	59.9
Black/African American[g]	302	74.6	478.5	18,377	65.4	857.8
Hispanic/Latino	18	4.4	225.9	1,756	6.2	206.4
White/Caucasian[g]	77	19.0	58.8	7,071	25.2	110.7
Unknown[f]	--[e]	--	--	540	1.9	--
Exposure Category[g]						
Heterosexual-All[i]	139	34.2	--	10,860	38.6	--
IDU[j]	61	15.0	--	2,818	10.0	--
MSM[j]	178	44.0	--	12,309	43.8	--
MSM/IDU[j]	20	4.9	--	773	2.8	--
Other Risks[k]	8	2.0	--	546	1.9	--
Total	405	100.0	197.7	28,101	100.0	288.2

[a]All persons living with HIV infection, regardless of the stage of infection (HIV or AIDS).

[b]Includes Bertie, Camden, Chowan, Currituck, Dare, Gates, Hertford, Hyde, Pasquotank, Perquimans, and Tyrrell counties in North Carolina.

[c]Unknown risk includes individuals classified as no identified risk (NIR) and no reported risk (NRR). For more information on distribution calculations, see Appendix C: Technical Notes (page C-5).

[d]Rate is expressed per 100,000 population.

[e]Cell counts, percentages, and rates have been suppressed to avoid identification of cells that have counts less than five through direct or indirect means.

[f]Rates are not available due to the lack of overall population data for the unknown groups.

[g]Non-Hispanic/Latino.

[h]Rates could not be calculated for Mode of Exposure category due to the lack of population data for specific exposure groups.

[i]Heterosexual-All includes those individuals reporting heterosexual contact with a known HIV-positive or high risk individual and cases redistributed into the heterosexual classification from the unknown (originally classified as persons who reports sex with an opposite sex partner and does not report IDU, MSM, or any other potential high risk behaviors).

[j]IDU = injection drug use; MSM = men who have sex with men.

[k]Other risks include exposure to blood products (adult hemophilia) and pediatric risk.

Data Source: enhanced HIV/AIDS Reporting System (eHARS) (data as of July 1, 2014).

Table AD: HIV Infection[a] Cases of All Persons Living as of 12/31/2013 in Regional Network of Care and Prevention Region 10[b] (Unknown Risk[c] Redistributed)

Demographics	Region 10[b]			North Carolina Total		
	Cases	%	Rate[d]	Cases	%	Rate[d]
Gender						
Male	1,171	65.6	365.7	19,962	71.0	420.0
Female	613	34.4	181.8	8,139	29.0	162.8
Current Age (Year)						
Less than 13	9	0.5	8.5	77	0.3	4.7
13-14	--[e]	--	--	16	0.1	6.2
15-19	19	1.1	43.6	167	0.6	25.7
20-24	91	5.1	154.6	1,138	4.0	163.2
25-29	132	7.4	309.5	2,067	7.4	326.7
30-34	153	8.6	387.8	2,334	8.3	367.7
35-39	180	10.1	483.8	2,709	9.6	432.4
40-44	212	11.9	537.4	3,823	13.6	557.4
45-49	272	15.2	655.0	4,709	16.8	691.6
50-54	271	15.2	592.2	4,671	16.6	681.4
55-59	223	12.5	491.8	3,206	11.4	505.4
60-64	119	6.7	291.4	1,842	6.6	326.1
65 and older	101	5.7	100.6	1,328	4.7	98.5
Unknown[f]	--[e]	--	--	14	0.0	--
Race/Ethnicity						
American Indian/Alaska Native[g]	--[e]	--	--	206	0.7	175.2
Asian/Pacific Islander[g]	--[e]	--	--	151	0.5	59.9
Black/African American[g]	1,312	73.5	673.3	18,377	65.4	857.8
Hispanic/Latino	83	4.7	184.4	1,756	6.2	206.4
White/Caucasian[g]	357	20.0	88.0	7,071	25.2	110.7
Unknown[f]	20	1.1	--	540	1.9	--
Exposure Category[g]						
Heterosexual-All[i]	602	33.8	--	10,860	38.6	--
IDU[j]	218	12.2	--	2,818	10.0	--
MSM[j]	844	47.3	--	12,309	43.8	--
MSM/IDU[j]	55	3.1	--	773	2.8	--
Other Risks[k]	65	3.6	--	546	1.9	--
Total	1,784	100.0	271.4	28,101	100.0	288.2

[a]All persons living with HIV infection, regardless of the stage of infection (HIV or AIDS).

[b]Includes Beaufort, Carteret, Craven, Greene, Jones, Lenoir, Martin, Pamlico, Pitt, Washington, and Wayne counties in North Carolina.

[c]Unknown risk includes individuals classified as no identified risk (NIR) and no reported risk (NRR). For more information on distribution calculations, see Appendix C: Technical Notes (page C-5).

[d]Rate is expressed per 100,000 population.

[e]Cell counts, percentages, and rates have been suppressed to avoid identification of cells that have counts less than five through direct or indirect means.

[f]Rates are not available due to the lack of overall population data for the unknown groups.

[g]Non-Hispanic/Latino.

[h]Rates could not be calculated for Mode of Exposure category due to the lack of population data for specific exposure groups.

[i]Heterosexual-All includes those individuals reporting heterosexual contact with a known HIV-positive or high risk individual and cases redistributed into the heterosexual classification from the unknown (originally classified as persons who reports sex with an opposite sex partner and does not report IDU, MSM, or any other potential high risk behaviors).

[j]IDU = injection drug use; MSM = men who have sex with men.

[k]Other risks include exposure to blood products (adult hemophilia) and pediatric risk.

Data Source: enhanced HIV/AIDS Reporting System (eHARS) (data as of July 1, 2014).

Table AE: North Carolina Newly Reported Chlamydia[a] Rates by Gender and Age at Time of Reporting, 2009-2013

Gender	Age Reported (Year)	2009			2010			2011			2012			2013		
		Cases	%	Rate[b]	Cases	%	Rate[b]	Cases	%	Rate[b]	Cases	%	Rate[b]	Cases	%	Rate[b]
Male	Less than 10	19	0.2	2.8	6	0.1	0.9	14	0.1	2.2	13	0.1	2.0	--[c]	--	--
	10-14	20	0.2	6.5	20	0.2	6.2	34	0.3	10.4	30	0.3	9.1	32	0.3	9.7
	15-19	1,943	23.6	585.6	1,989	24.7	590.1	2,683	23.5	799	2,491	21.9	746	2,155	19.1	645.4
	20-24	3,210	39.0	911.5	3,137	38.9	921.3	4,721	41.4	1,368.6	4,640	40.9	1,294.9	4,800	42.6	1,339.5
	25-29	1,556	18.9	488.2	1,425	17.7	454	1,960	17.2	626.3	2,127	18.7	675.4	2,137	19.0	678.6
	30-34	678	8.2	227.6	650	8.1	211.4	940	8.2	302.6	982	8.7	314.6	1,035	9.2	331.6
	35-39	375	4.6	113.9	391	4.9	120.9	470	4.1	150.5	489	4.3	159	489	4.3	159
	40-44	203	2.5	62.6	213	2.6	64.5	271	2.4	80.9	272	2.4	80.6	300	2.7	88.9
	45-54	152	1.8	23.4	168	2.1	25.3	249	2.2	37.4	239	2.1	35.9	231	2.1	34.7
	55-64	41	0.5	8	32	0.4	5.9	37	0.3	6.6	45	0.4	7.9	61	0.5	10.7
	65 and older	9	0.1	1.8	11	0.1	2.1	15	0.1	2.7	15	0.1	2.6	12	0.1	2.1
	Unknown[d]	21	0.3	--	12	0.1	--	14	0.1	--	8	0.1	--	--[c]	--	--
	Total	**8,227**	**100.0**	**179.2**	**8,054**	**100.0**	**172.8**	**11,408**	**100.0**	**242.7**	**11,351**	**100.0**	**238.8**	**11,256**	**100.0**	**236.8**
Female	Less than 10	39	0.1	6.1	17	0.1	2.7	16	0.0	2.6	16	0.0	2.6	--[c]	--	--
	10-14	424	1.2	144.8	398	1.2	129.1	463	1.1	147.4	424	1.1	133.7	385	1.0	121.4
	15-19	13,716	38.9	4,372.3	12,789	37.7	3,997.1	15,694	37.2	4,938.3	13,742	35.1	4,338.2	12,263	33.0	3,871.3
	20-24	13,319	37.8	4,222.7	13,261	39.1	4,055.6	16,858	39.9	5,056.5	15,954	40.7	4,707.8	15,455	41.6	4,560.5
	25-29	4,559	12.9	1461	4,392	12.9	1,388.7	5,375	12.7	1,691.7	5,275	13.5	1,660.0	5,267	14.2	1,657.5
	30-34	1,785	5.1	581.9	1,763	5.2	556.8	2,193	5.2	684.6	2,134	5.5	661.5	2,138	5.8	662.8
	35-39	740	2.1	222.2	746	2.2	223.9	861	2.0	266.4	854	2.2	267.7	878	2.4	275.2
	40-44	291	0.8	87.8	270	0.8	79.9	407	1.0	117.9	384	1.0	110.3	392	1.1	112.6
	45-54	182	0.5	26.5	201	0.6	28.6	255	0.6	36.3	294	0.8	41.9	286	0.8	40.8
	55-64	36	0.1	6.3	41	0.1	6.8	42	0.1	6.7	56	0.1	8.9	55	0.1	8.7
	65 and older	6	0.0	0.9	5	0.0	0.7	7	0.0	1.0	9	0.0	1.2	13	0.0	1.7
	Unknown[d]	132	0.4	--	40	0.1	--	31	0.1	--	13	0.0	--	--[c]	--	--
	Total	**35,229**	**100.0**	**735.4**	**33,923**	**100.0**	**692.3**	**42,202**	**100.0**	**852.5**	**39,155**	**100.0**	**783.2**	**37,144**	**100.0**	**743**

Continued

[a]Chlamydia cases are reported by time of report.

[b]Rate is expressed per 100,000 population.

[c]Cell counts, percentages, and rates have been suppressed to avoid identification of cells that have counts less than five through direct or indirect means.

[d]Rates are not available due to the lack of overall population data for the unknown group.

Data Source: North Carolina Electronic Disease Surveillance System (NC EDSS) (data as of May 5, 2014).

Table AE (continued): North Carolina Newly Reported Chlamydia[a] Rates by Gender and Age at Time of Reporting, 2009-2013

Gender	Age Reported (Year)	2009			2010			2011			2012			2013		
		Cases	%	Rate[b]	Cases	%	Rate[b]	Cases	%	Rate[b]	Cases	%	Rate[b]	Cases	%	Rate[b]
Total[d]	Less than 10	60	0.1	4.6	23	0.1	1.8	31	0.1	2.5	30	0.1	2.4	--[c]	--	--
	10-14	448	1.0	74.5	419	1.0	66.4	499	0.9	77.7	454	0.9	70	417	0.9	64.3
	15-19	15,720	35.9	2,435.3	14,832	35.2	2,257.4	18,444	34.2	2,822.0	16,267	32.1	2,500.1	14,423	29.8	2,216.7
	20-24	16,619	38.0	2,489.4	16,472	39.1	2,467.8	21,675	40.2	3,195.3	20,639	40.8	2,960.2	20,261	41.8	2,905.9
	25-29	6,152	14.1	975.3	5,845	13.9	927.5	7,379	13.7	1170	7,421	14.7	1,172.9	7,408	15.3	1,170.9
	30-34	2,478	5.7	409.8	2,424	5.7	388.4	3,148	5.8	498.9	3,124	6.2	492.2	3,173	6.6	499.9
	35-39	1,122	2.6	169.4	1,142	2.7	173.9	1,334	2.5	209.9	1,347	2.7	215	1,368	2.8	218.3
	40-44	497	1.1	75.8	487	1.2	72.9	682	1.3	100.3	657	1.3	95.8	693	1.4	101
	45-54	336	0.8	25.2	370	0.9	27.1	504	0.9	36.8	533	1.1	39	517	1.1	37.8
	55-64	77	0.2	7.1	73	0.2	6.4	79	0.1	6.7	101	0.2	8.4	116	0.2	9.7
	65 and older	15	0.0	1.3	16	0.0	1.3	22	0.0	1.7	24	0.0	1.8	25	0.1	1.9
	Unknown[e]	210	0.5	--	64	0.2	--	57	0.1	--	24	0.0	--	--[c]	--	--
	Total	43,734	100.0	466.2	42,167	100.0	441.1	53,854	100.0	558	50,621	100.0	519.1	48,417	100.0	496.5

[a]Chlamydia cases are reported by time of report.

[b]Rate is expressed per 100,000 population.

[c]Cell counts, percentages, and rates have been suppressed to avoid identification of cells that have counts less than five through direct or indirect means.

[d]Total includes cases of unknown gender.

[e]Rates are not available due to the lack of overall population data for the unknown group.

Data Source: North Carolina Electronic Disease Surveillance System (NC EDSS) (data as of May 5, 2014).

Table AF: North Carolina Newly Reported Chlamydia[a] Rates by Gender and Race/Ethnicity at Time of Reporting, 2009-2013

Gender	Race/Ethnicity	2009			2010			2011			2012			2013		
		Cases	%	Rate[b]	Cases	%	Rate[b]	Cases	%	Rate[b]	Cases	%	Rate[b]	Cases	%	Rate[b]
Male	American Indian/Alaska Native[c]	73	0.9	136.9	95	1.2	169.8	102	0.9	180.9	94	0.8	165.8	90	0.8	158.7
	Asian/Pacific Islander[c]	38	0.5	38.1	34	0.4	31	35	0.3	30.4	30	0.3	24.9	40	0.4	33.2
	Black/African American[c]	4,007	48.7	421.5	3,835	47.6	391.6	4,694	41.1	473.8	4,329	38.1	431	4,408	39.2	438.9
	Hispanic/Latino	523	6.4	131.4	470	5.8	109	588	5.2	133.5	607	5.3	134.2	583	5.2	128.9
	White/Caucasian[c]	958	11.6	31	945	11.7	30.6	1,210	10.6	39.1	1,246	11.0	39.9	1,381	12.3	44.3
	Unknown[d]	2,628	31.9	--	2,675	33.2	--	4,779	41.9	--	5,045	44.4	--	4,754	42.2	--
	Total	8,227	100.0	179.2	8,054	100.0	172.8	11,408	100.0	242.7	11,351	100.0	238.8	11,256	100.0	236.8
Female	American Indian/Alaska Native[c]	498	1.4	885.3	432	1.3	721.1	583	1.4	964.5	598	1.5	982	564	1.5	926.1
	Asian/Pacific Islander[c]	176	0.5	168.4	206	0.6	172.6	181	0.4	144.4	197	0.5	150.1	210	0.6	160
	Black/African American[c]	16,001	45.4	1,486.2	15,806	46.6	1,422.5	17,108	40.5	1,520.9	15,557	39.7	1,366.9	15,075	40.6	1,324.6
	Hispanic/Latino	1,990	5.6	622.7	1,777	5.2	474.3	2,244	5.3	581.2	2,214	5.7	555.5	2,318	6.2	581.6
	White/Caucasian[c]	6,024	17.1	186.3	6,316	18.6	195.2	7,250	17.2	222.8	7,053	18.0	215.7	7,114	19.2	217.5
	Unknown[d]	10,540	29.9	--	9,386	27.7	--	14,836	35.2	--	13,536	34.6	--	11,863	31.9	--
	Total	35,229	100.0	735.4	33,923	100.0	692.3	42,202	100.0	852.5	39,155	100.0	783.2	37,144	100.0	743
Total[e]	American Indian/Alaska Native[c]	572	1.3	522	527	1.2	454.9	686	1.3	587.1	695	1.4	591	654	1.4	556.1
	Asian/Pacific Islander[c]	215	0.5	105.3	241	0.6	105.2	217	0.4	90.2	227	0.4	90.1	250	0.5	99.2
	Black/African American[c]	20,090	45.9	991	19,732	46.8	944	21,860	40.6	1,033.3	19,917	39.3	929.7	19,484	40.2	909.4
	Hispanic/Latino	2,525	5.8	351.8	2,254	5.3	279.7	2,841	5.3	343.7	2,823	5.6	331.8	2,902	6.0	341.1
	White/Caucasian[c]	7,000	16.0	110.7	7,276	17.3	115.1	8,480	15.7	133.5	8,305	16.4	130	8,497	17.5	133
	Unknown[d]	13,332	30.5	--	12,137	28.8	--	19,770	36.7	--	18,654	36.9	--	16,630	34.3	--
	Total	43,734	100.0	466.2	42,167	100.0	441.1	53,854	100.0	558	50,621	100.0	519.1	48,417	100.0	496.5

[a]Chlamydia cases are reported by time of report.

[b]Rate is expressed per 100,000 population.

[c]Non-Hispanic/Latino.

[d]Rates are not available due to the lack of overall population for the unknown race/ethnicity group.

[e]Total includes cases of unknown gender.

Data Source: North Carolina Electronic Disease Surveillance System (NC EDSS) (data as of May 5, 2014).

Table AG: North Carolina Newly Reported Gonorrhea Rates by Gender and Age at Time of Reporting, 2009-2013

Gender	Age Reported (Year)	2009			2010			2011			2012			2013		
		Cases	%	Rate[b]	Cases	%	Rate[b]	Cases	%	Rate[b]	Cases	%	Rate[b]	Cases	%	Rate[b]
Male	Less than 10	--[c]	--	--	0	--[c]	--	7	0.1	1.1	--[c]	--	--	--[c]	--	--
	10-14	16	0.3	5.2	17	0.3	5.3	9	0.1	2.7	12	0.2	3.6	17	0.3	5.1
	15-19	1,218	19.4	367.1	1,079	18.8	320.1	1,279	17.8	380.9	1,011	16.4	302.8	880	14.4	263.6
	20-24	2,132	33.9	605.4	2,077	36.2	610	2,726	37.9	790.3	2,291	37.1	639.3	2,258	36.9	630.1
	25-29	1,178	18.7	369.6	1,066	18.6	339.6	1,344	18.7	429.4	1,173	19.0	372.5	1,204	19.7	382.3
	30-34	643	10.2	215.9	602	10.5	195.8	682	9.5	219.5	672	10.9	215.3	651	10.6	208.5
	35-39	391	6.2	118.7	319	5.6	98.6	389	5.4	124.6	340	5.5	110.6	365	6.0	118.7
	40-44	264	4.2	81.4	247	4.3	74.8	296	4.1	88.3	255	4.1	75.5	265	4.3	78.5
	45-54	315	5.0	48.6	229	4.0	34.4	334	4.6	50.1	310	5.0	46.6	342	5.6	51.4
	55-64	81	1.3	15.8	70	1.2	12.8	88	1.2	15.7	81	1.3	14.3	94	1.5	16.6
	65 and older	--[c]	--	--	20	0.3	3.8	--[c]	--	--	21	0.3	3.6	--[c]	--	--
	Unknown[b]	18	0.3	--	8	0.1	--	--[c]	--	--	--[c]	--	--	--[c]	--	--
	Total	6,285	100.0	136.9	5,734	100.0	123	7,187	100.0	152.9	6,173	100.0	129.9	6,115	100.0	128.7
Female	Less than 10	--[c]	--	--	8	0.1	1.3	6	0.1	1.0	--[c]	--	--	--[c]	--	--
	10-14	95	1.1	32.4	83	1.0	26.9	93	0.9	29.6	100	1.2	31.5	67	0.9	21.1
	15-19	2,940	34.9	937.2	2,838	34.0	887	3,253	32.9	1023.6	2,451	30.3	773.8	2,179	28.9	687.9
	20-24	3,113	37.0	986.9	3,191	38.3	975.9	3,892	39.4	1167.4	3,142	38.8	927.2	2,950	39.1	870.5
	25-29	1,248	14.8	399.9	1,222	14.7	386.4	1,484	15.0	467.1	1,305	16.1	410.7	1,259	16.7	396.2
	30-34	520	6.2	169.5	548	6.6	173.1	598	6.0	186.7	587	7.2	182	563	7.5	174.5
	35-39	247	2.9	74.2	253	3.0	75.9	280	2.8	86.6	261	3.2	81.8	280	3.7	87.8
	40-44	114	1.4	34.4	85	1.0	25.2	159	1.6	46.1	141	1.7	40.5	123	1.6	35.3
	45-54	77	0.9	11.2	90	1.1	12.8	104	1.1	14.8	87	1.1	12.4	96	1.3	13.7
	55-64	14	0.2	2.5	5	0.1	0.8	17	0.2	2.7	22	0.3	3.5	15	0.2	2.4
	65 and older	--[c]	--	--	0	--	--	--[c]	--	--	0	--	--	--[c]	--	--
	Unknown[b]	38	0.5	--	13	0.2	--	--[c]	--	--	--[c]	--	--	--[c]	--	--
	Total	8,416	100.0	175.7	8,336	100.0	170.1	9,890	100.0	199.8	8,102	100.0	162.1	7,541	100.0	150.8

[a]Gonorrhea cases are reported by time of report.

[b]Rate is expressed per 100,000 population.

[c]Cell counts, percentages, and rates have been suppressed to avoid identification of cells that have counts less than five through direct or indirect means.

Data Source: North Carolina Electronic Disease Surveillance System (NC EDSS) (data as of May 5, 2014).

Table AG (continued): North Carolina Newly Reported Gonorrhea Rates by Gender and Age at Time of Reporting, 2009-2013

Gender	Age Reported (Year)	2009			2010			2011			2012			2013		
		Cases	%	Rate[b]	Cases	%	Rate[b]	Cases	%	Rate[b]	Cases	%	Rate[b]	Cases	%	Rate[b]
Total[c]	Less than 10	16	0.1	1.2	9	0.1	0.7	13	0.1	1.0	8	0.1	0.6	7	0.1	0.6
	10-14	111	0.7	18.5	100	0.7	15.8	103	0.6	16.0	112	0.8	17.3	84	0.6	13.0
	15-19	4,177	28.2	647.1	3,936	27.8	599.1	4,553	26.5	696.6	3,469	24.2	533.2	3,062	22.4	470.6
	20-24	5,286	35.7	791.8	5,297	37.4	793.6	6,649	38.8	980.2	5,453	38.1	782.1	5,212	38.1	747.5
	25-29	2,441	16.5	387	2,300	16.3	365	2,839	16.5	450.1	2,485	17.3	392.8	2,465	18.0	389.6
	30-34	1,170	7.9	193.5	1,160	8.2	185.9	1,284	7.5	203.5	1,265	8.8	199.3	1,214	8.9	191.3
	35-39	640	4.3	96.6	577	4.1	87.9	670	3.9	105.4	604	4.2	96.4	645	4.7	102.9
	40-44	381	2.6	58.1	333	2.4	49.9	457	2.7	67.2	398	2.8	58	388	2.8	56.6
	45-54	393	2.7	29.4	320	2.3	23.4	441	2.6	32.2	399	2.8	29.2	438	3.2	32.1
	55-64	95	0.6	8.8	75	0.5	6.5	105	0.6	8.8	104	0.7	8.7	109	0.8	9.1
	65 and older	23	0.2	1.9	20	0.1	1.6	29	0.2	2.3	21	0.1	1.6	36	0.3	2.7
	Unknown[d]	78	0.5	--	26	0.2	--	15	0.1	--	6	0.0	--	5	0.0	--
	Total	14,811	100.0	157.9	14,153	100.0	148.0	17,158	100.0	177.8	14,324	100.0	146.9	13,665	100.0	140.1

[a]Gonorrhea cases are reported by time of report.

[b]Rate is expressed per 100,000 population.

[c]Total includes cases of unknown gender.

[d]Rates are not available due to the lack of overall population for the other race/ethnicity group.

Data Source: North Carolina Electronic Disease Surveillance System (NC EDSS) (data as of May 5, 2014).

Table AH: North Carolina Newly Reported Gonorrhea Rates by Gender and Race/Ethnicity at Time of Reporting, 2009-2013

Gender	Race/Ethnicity	2009			2010			2011			2012			2013		
		Cases	%	Rate[a]	Cases	%	Rate[a]	Cases	%	Rate[a]	Cases	%	Rate[a]	Cases	%	Rate[a]
Male	American Indian/Alaska Native[b]	68	1.1	127.5	52	0.9	92.9	54	0.8	95.8	48	0.8	84.6	63	1.0	111.1
	Asian/Pacific Islander[b]	16	0.3	16	8	0.1	7.3	9	0.1	7.8	10	0.2	8.3	12	0.2	9.9
	Black/African American[b]	3,958	63.0	416.4	3,604	62.9	368	3,913	54.4	395	3,364	54.5	335	3,352	54.8	333.8
	Hispanic/Latino	136	2.2	34.2	147	2.6	34.1	172	2.4	39.1	144	2.3	31.8	167	2.7	36.9
	White/Caucasian[b]	440	7.0	14.2	394	6.9	12.8	514	7.2	16.6	493	8.0	15.8	654	10.7	21
	Unknown[c]	1,667	26.5	--	1,529	26.7	--	2,525	35.1	--	2,114	34.2	--	1,867	30.5	--
	Total	6,285	100.0	136.9	5,734	100.0	123	7,187	100.0	152.9	6,173	100.0	129.9	6,115	100.0	128.7
Female	American Indian/Alaska Native[b]	130	1.5	231.1	116	1.4	193.6	144	1.5	238.2	111	1.4	182.3	107	1.4	175.7
	Asian/Pacific Islander[b]	27	0.3	25.8	27	0.3	22.6	23	0.2	18.3	33	0.4	25.1	22	0.3	16.8
	Black/African American[b]	4,949	58.8	459.7	5,059	60.7	455.3	5,158	52.2	458.6	4,212	52.0	370.1	4,059	53.8	356.6
	Hispanic/Latino	166	2.0	51.9	164	2.0	43.8	213	2.2	55.2	172	2.1	43.2	158	2.1	39.6
	White/Caucasian[b]	1,055	12.5	32.6	1,067	12.8	33	1,157	11.7	35.6	939	11.6	28.7	981	13.0	30.0
	Unknown[c]	2,089	24.8	--	1,903	22.8	--	3,195	32.3	--	2,635	32.5	--	2,214	29.4	--
	Total	8,416	100.0	175.7	8,336	100.0	170.1	9,890	100.0	199.8	8,102	100.0	162.1	7,541	100.0	150.8
Total[d]	American Indian/Alaska Native[b]	199	1.3	181.6	168	1.2	145	198	1.2	169.5	159	1.1	135.2	170	1.2	144.6
	Asian/Pacific Islander[b]	43	0.3	21.1	35	0.2	15.3	32	0.2	13.3	43	0.3	17.1	34	0.2	13.5
	Black/African American[b]	8,940	60.4	441	8,708	61.5	416.6	9,095	53.0	429.9	7,591	53.0	354.3	7,414	54.3	346.1
	Hispanic/Latino	304	2.1	42.4	313	2.2	38.8	387	2.3	46.8	316	2.2	37.1	325	2.4	38.2
	White/Caucasian[b]	1,503	10.1	23.8	1,463	10.3	23.2	1,674	9.8	26.4	1,435	10.0	22.5	1,636	12.0	25.6
	Unknown[c]	3,822	25.8	--	3,466	24.5	--	5,772	33.6	--	4,780	33.4	--	4,086	29.9	--
	Total	14,811	100.0	157.9	14,153	100.0	148	17,158	100.0	177.8	14,324	100.0	146.9	13,665	100.0	140.1

[a]Rate is expressed per 100,000 population.

[b]Non-Hispanic/Latino.

[c]Rates are not available due to the lack of overall population for the unknown race/ethnicity group.

[d]Total includes cases of unknown gender.

Data Source: North Carolina Electronic Disease Surveillance System (NC EDSS) (data as of May 5, 2014).

Table AI: North Carolina Newly Diagnosed Early Syphilis Rates (Primary, Secondary, Early Latent) by Gender and Age, 2009-2013

Gender	Age at Diagnosis (Year)	2009			2010			2011			2012			2013		
		Cases	%	Rate[a]	Cases	%	Rate[a]	Cases	%	Rate[a]	Cases	%	Rate[a]	Cases	%	Rate[a]
Male	Less than 10	--[b]	--	--	0	--	--	0	--	--	0	--	--	--[b]	--	--
	10-14	--[b]	--	--	--[b]	--	--	--[b]	--	--	0	--	--	0	--	--
	15-19	48	7.2	14.5	33	5.6	9.8	51	8.3	15.2	19	3.8	5.7	19	3.2	5.7
	20-24	142	21.4	40.3	151	25.8	44.3	177	28.6	51.3	145	29.1	40.5	157	26.8	43.8
	25-29	128	19.3	40.2	119	20.3	37.9	126	20.4	40.3	102	20.5	32.4	121	20.7	38.4
	30-34	79	11.9	26.5	70	12.0	22.8	74	12.0	23.8	56	11.2	17.9	75	12.8	24
	35-39	74	11.1	22.5	45	7.7	13.9	45	7.3	14.4	46	9.2	15	56	9.6	18.2
	40-44	67	10.1	20.7	61	10.4	18.5	48	7.8	14.3	41	8.2	12.1	60	10.3	17.8
	45-54	94	14.2	14.5	79	13.5	11.9	71	11.5	10.7	--[b]	--	--	66	11.3	9.9
	55-64	--[b]	--	--	19	3.2	3.5	--[b]	--	--	14	2.8	2.5	--[b]	--	--
	65 and older	--[b]	--	--	--[b]	--	--	--[b]	--	--	5	1.0	0.9	--[b]	--	--
	Unknown[c]	--[b]	--	--	0	--	--	0	--	--	0	--	--	0	--	--
	Total	664	100.0	14.5	585	100.0	12.6	618	100.0	13.1	498	100.0	10.5	585	100.0	12.3
Female	Less than 10	--[b]	--	--	0	--	--	0	--	--	0	--	--	--[b]	--	--
	10-14	--[b]	--	--	--[b]	--	--	--[b]	--	--	0	--	--	0	--	--
	15-19	22	10.5	7.0	12	9.8	3.8	10	11.1	3.1	13	20.6	4.1	10	10.9	3.2
	20-24	55	26.3	17.4	30	24.4	9.2	23	25.6	6.9	20	31.7	5.9	33	35.9	9.7
	25-29	49	23.4	15.7	17	13.8	5.4	11	12.2	3.5	8	12.7	2.5	9	9.8	2.8
	30-34	24	11.5	7.8	15	12.2	4.7	11	12.2	3.4	8	12.7	2.5	9	9.8	2.8
	35-39	24	11.5	7.2	15	12.2	4.5	9	10.0	2.8	6	9.5	1.9	10	10.9	3.1
	40-44	11	5.3	3.3	14	11.4	4.1	8	8.9	2.3	5	7.9	1.4	9	9.8	2.6
	45-54	21	10.0	3.1	18	14.6	2.6	12	13.3	1.7	--[b]	--	--	7	7.6	1.0
	55-64	--[b]	--	--	0	--	--	--[b]	--	--	0	--	--	--[b]	--	--
	65 and older	--[b]	--	--	--[b]	--	--	--[b]	--	--	0	--	--	--[b]	--	--
	Unknown[c]	--[b]	--	--	0	--	--	0	--	--	0	--	--	0	--	--
	Total	209	100.0	4.4	123	100.0	2.5	90	100.0	1.8	63	100.0	1.3	92	100.0	1.8

Continued

[a]Rate is expressed per 100,000 population.

[b]Cell counts, percentages, and rates have been suppressed to avoid identification of cells that have counts less than five through direct or indirect means.

[c]Rates are not available due to the lack of overall population for the other race/ethnicity group.

Data Source: North Carolina Electronic Disease Surveillance System (NC EDSS) (data as of May 5, 2014).

Table AI (continued): North Carolina Newly Diagnosed Early Syphilis Rates (Primary, Secondary, Early Latent) by Gender and Age[a], 2009-2013

Gender	Age at Diagnosis (Year)	2009			2010			2011			2012			2013		
		Cases	%	Rate[a]	Cases	%	Rate[a]	Cases	%	Rate[a]	Cases	%	Rate[a]	Cases	%	Rate[a]
Total	Less than 10	--[b]	--	--	0	--	--	0	--	--	0	--	--	--[b]	--	--
	10-14	--[b]	--	--	--[b]	--	--	--[b]	--	--	0	--	--	0	--	--
	15-19	70	8.0	10.8	45	6.4	6.8	61	8.6	9.3	32	5.7	4.9	29	4.3	4.5
	20-24	197	22.6	29.5	181	25.6	27.1	200	28.2	29.5	165	29.4	23.7	190	28.1	27.3
	25-29	177	20.3	28.1	136	19.2	21.6	137	19.4	21.7	110	19.6	17.4	130	19.2	20.5
	30-34	103	11.8	17	85	12.0	13.6	85	12.0	13.5	64	11.4	10.1	84	12.4	13.2
	35-39	98	11.2	14.8	60	8.5	9.1	54	7.6	8.5	52	9.3	8.3	66	9.7	10.5
	40-44	78	8.9	11.9	75	10.6	11.2	56	7.9	8.2	46	8.2	6.7	69	10.2	10.1
	45-54	115	13.2	8.6	97	13.7	7.1	83	11.7	6.1	72	12.8	5.3	73	10.8	5.3
	55-64	32	3.7	3.0	19	211.1	1.7	25	3.5	2.1	14	2.5	1.2	31	4.6	2.6
	65 and older	--[b]	--	--	--[b]	--	--	--[b]	--	--	5	0.9	0.4	--[b]	--	--
	Unknown[b]	--[b]	--	--	0	--	--	0	--	--	0	--	--	0	--	--
	Total	873	100.0	9.3	708	100.0	7.4	708	100.0	7.3	561	100.0	5.8	677	100.0	6.9

[a]Rate is expressed per 100,000 population.

[b]Cell counts, percentages, and rates have been suppressed to avoid identification of cells that have counts less than five through direct or indirect means.

Data Source: North Carolina Electronic Disease Surveillance System (NC EDSS) (data as of May 5, 2014).

Table AJ: North Carolina Newly Diagnosed Early Syphilis Rates (Primary, Secondary, Early Latent) by Gender and Race/Ethnicity, 2009-2013

Gender	Race/Ethnicity	2009			2010			2011			2012			2013		
		Cases	%	Rate[a]	Cases	%	Rate[a]	Cases	%	Rate[a]	Cases	%	Rate[a]	Cases	%	Rate[a]
Male	American Indian/Alaska Native[b]	--[c]	--	--	--[c]	--	--	--[c]	--	--	--[c]	--	--	--[c]	--	--
	Asian/Pacific Islander[b]	--[c]	--	--	--[c]	--	--	--[c]	--	--	--[c]	--	--	--[c]	--	--
	Black/African American[b]	497	74.8	52.3	451	77.1	46.1	446	72.2	45	370	74.3	36.8	379	64.8	37.7
	Hispanic/Latino	26	3.9	6.5	--[c]	--	--	23	3.7	5.2	19	3.8	4.2	25	4.3	5.5
	White/Caucasian[b]	126	19.0	4.1	96	16.4	3.1	126	20.4	4.1	88	17.7	2.8	152	26.0	4.9
	Unknown[d]	--[c]	--	--	15	2.6	--	--[c]	--	--	15	3.0	--	24	4.1	--
	Total	664	100.0	14.5	585	100.0	12.6	618	100.0	13.1	498	100.0	10.5	585	100.0	12.3
Female	American Indian/Alaska Native[b]	--[c]	--	--	--[c]	--	--	--[c]	--	--	--[c]	--	--	--[c]	--	--
	Asian/Pacific Islander[b]	--[c]	--	--	--[c]	--	--	--[c]	--	--	--[c]	--	--	--[c]	--	--
	Black/African American[b]	143	81.7	13.3	97	80.8	8.7	71	52.6	6.3	41	41.8	3.6	67	41.1	5.9
	Hispanic/Latino	14	6.7	4.4	--[c]	--	--	6	6.7	1.6	<5	--	--	7	7.6	1.8
	White/Caucasian[b]	49	23.4	1.5	24	19.5	0.7	9	10.0	0.3	10	15.9	0.3	11	12.0	0.3
	Unknown[d]	--[c]	--	--	0	--	--	--[c]	--	--	6	9.5	--	5	5.4	--
	Total	209	100.0	4.4	123	100.0	2.5	90	100.0	1.8	63	100.0	1.3	92	100.0	1.8
Total	American Indian/Alaska Native[b]	--[c]	--	--	--[c]	--	--	--[c]	--	--	--[c]	--	--	--[c]	--	--
	Asian/Pacific Islander[b]	--[c]	--	--	--[c]	--	--	--[c]	--	--	--[c]	--	--	--[c]	--	--
	Black/African American[b]	640	73.3	31.6	548	77.4	26.2	517	73.0	24.4	411	73.3	19.2	446	65.9	20.8
	Hispanic/Latino	40	4.6	5.6	18	2.5	2.2	29	4.1	3.5	23	4.1	2.7	32	4.7	3.8
	White/Caucasian[b]	175	20.0	2.8	120	16.9	1.9	135	19.1	2.1	98	17.5	1.5	163	24.1	2.6
	Unknown[d]	9	1.0	--	15	2.1	--	20	2.8	--	21	3.7	--	29	4.3	--
	Total	873	100.0	9.3	708	100.0	7.4	708	100.0	7.3	561	100.0	5.8	677	100.0	6.9

[a]Rate is expressed per 100,000 population.

[b]Non-Hispanic/Latino.

[c]Cell counts, percentages, and rates have been suppressed to avoid identification of cells that have counts less than five through direct or indirect means.

[d]Rates are not available due to the lack of overall population for the unknown race/ethnicity group.

Data Source: North Carolina Electronic Disease Surveillance System (NC EDSS) (data as of May 5, 2014).

Table AK: North Carolina Newly Diagnosed Early Syphilis Cases
(Primary, Secondary, Early Latent)
by County Rank[a] and Year of Diagnosis, 2009-2013

Rank[a]	County	Cases				
		2009	2010	2011	2012	2013
1	MECKLENBURG	165	168	174	125	151
2	WAKE	111	79	70	81	102
3	GUILFORD	63	81	102	58	51
4	FORSYTH	189	89	37	40	50
5	CUMBERLAND	15	40	32	31	47
6	DURHAM	30	23	25	24	45
7	PITT	18	15	16	34	22
8	WAYNE	59	44	15	3	17
9	LENOIR	3	3	4	12	14
10	HARNETT	3	3	3	3	11
11	ROBESON	3	7	9	6	10
12	BUNCOMBE	11	7	10	6	8
13	ONSLOW	3	4	2	1	8
14	GASTON	16	6	6	5	7
15	ROCKINGHAM	2	4	4	5	7
16	EDGECOMBE	13	7	9	4	7
17	CRAVEN	8	10	15	10	6
18	ALAMANCE	8	7	10	7	6
19	IREDELL	3	3	1	7	6
20	NEW HANOVER	9	4	8	4	6
21	VANCE	2	3	2	2	6
22	BURKE	4	1	3	1	6
23	DAVIDSON	4	4	10	7	5
24	ROWAN	7	8	11	5	5
25	ORANGE	7	1	4	3	5
26	UNION	8	3	1	3	5
27	JOHNSTON	1	3	1	2	4
28	BEAUFORT	4	1	2	5	3
29	CHATHAM	1	4	3	2	3
30	CATAWBA	1	1	2	2	3
31	PASQUOTANK	1	2	5	1	3
32	STANLY	0	1	0	1	3
33	FRANKLIN	3	3	4	0	3
34	PENDER	1	0	3	0	3
35	SAMPSON	2	1	2	5	2
36	NASH	9	7	11	4	2
37	BLADEN	4	2	1	2	2
38	CABARRUS	10	3	15	1	2
39	HENDERSON	6	0	2	1	2
40	CASWELL	0	3	1	1	2
41	YADKIN	1	0	1	1	2
42	PAMLICO	0	1	0	0	2
43	WILSON	4	7	4	5	1
44	BRUNSWICK	2	0	2	4	1
45	HOKE	1	3	0	4	1
46	HALIFAX	2	3	7	3	1
47	CLEVELAND	2	2	0	3	1
48	CARTERET	0	0	4	2	1
49	COLUMBUS	1	1	2	2	1
50	GRANVILLE	3	2	0	2	1
51	SCOTLAND	1	2	0	2	1

Continued

[a]Rank based on number of cases diagnosed in 2013. If cases are equal for 2013, then rank based on previous year's case numbers, if cases were diagnosed.
Data Source: North Carolina Electronic Disease Surveillance System (NC EDSS) (data as of May 5, 2014).

Table AK (continued): North Carolina Newly Diagnosed Early Syphilis Cases
(Primary, Secondary, Early Latent)
by County Rank[a] and Year of Diagnosis, 2009-2013

Rank[a]	County	Cases				
		2009	2010	2011	2012	2013
51	RANDOLPH	3	2	9	1	1
53	DUPLIN	2	5	4	1	1
54	LEE	6	4	4	1	1
55	HERTFORD	1	2	0	1	1
56	CHOWAN	0	0	0	1	1
57	MARTIN	1	2	3	0	1
58	GREENE	2	0	2	0	1
58	PERSON	1	0	2	0	1
60	STOKES	2	2	1	0	1
61	NORTHAMPTON	3	1	1	0	1
62	WARREN	3	1	0	0	1
63	GATES	0	1	0	0	1
63	WASHINGTON	3	0	0	0	1
65	CAMDEN	1	0	0	0	1
66	RICHMOND	1	0	0	3	0
66	MOORE	1	1	1	2	0
68	MADISON	3	0	0	2	0
68	ANSON	1	1	1	1	0
68	WATAUGA	0	1	1	1	0
71	ALEXANDER	0	0	1	1	0
72	CLAY	0	0	1	1	0
73	SURRY	0	0	1	1	0
74	CURRITUCK	1	0	0	1	0
75	TYRRELL	0	0	0	1	0
76	BERTIE	1	2	7	0	0
77	RUTHERFORD	2	2	3	0	0
78	MONTGOMERY	0	0	3	0	0
78	HAYWOOD	2	0	2	0	0
80	MACON	1	0	2	0	0
81	WILKES	0	2	1	0	0
82	CALDWELL	0	0	1	0	0
82	CHEROKEE	0	0	1	0	0
82	YANCEY	0	0	1	0	0
85	AVERY	1	1	0	0	0
86	HYDE	1	1	0	0	0
87	TRANSYLVANIA	1	1	0	0	0
88	LINCOLN	2	0	0	0	0
89	DARE	1	0	0	0	0
89	GRAHAM	1	0	0	0	0
89	MCDOWELL	1	0	0	0	0
92	ALLEGHANY	0	0	0	0	0
93	ASHE	0	0	0	0	0
93	DAVIE	0	0	0	0	0
95	JACKSON	0	0	0	0	0
95	JONES	0	0	0	0	0
95	MITCHELL	0	0	0	0	0
95	PERQUIMANS	0	0	0	0	0
95	POLK	0	0	0	0	0
95	SWAIN	0	0	0	0	0
NORTH CAROLINA TOTAL		873	708	708	561	677

[a]Rank based on number of cases diagnosed in 2013. If cases are equal for 2013, then rank based on previous year's case numbers, if cases were diagnosed.
Data Source: North Carolina Electronic Disease Surveillance System (NC EDSS) (data as of May 5, 2014).

APPENDIX E: REFERENCES BY CHAPTER

Chapter 1: Sociodemographic Characteristics of North Carolina

1. United States Census Bureau. (2013). *Population estimates 2013.* [Data file]. Revised June 26, 2014. Accessed October 9, 2014. Retrieved from http://www.census.gov/popest/data/state/asrh/2013/index.html

2. Mackun, P., Wilson, S., Fischetti, T., & Gowrowska, J. (2011). Population distribution and change: 2000 to 2010. Updated March 2011. Accessed November 5, 2014. Retrieved from http://www.census.gov/prod/cen2010/briefs/c2010br-01.pdf

3. North Carolina State Center for Health Statistics. (2014). *North Carolina vital statistics, volume 1: population, births, deaths, marriages, and divorces.* [Data file]. Updated October 8, 2014. Accessed October 7, 2014. Retrieved from http://www.schs.state.nc.us/data/vital.cfm

4. National Center for Health Statistics. *Vintage 2012 postcensal estimates of the resident population of the United States (April 1, 2010, July 1, 2010-July 1, 2012), by year, county, single-year of age (0, 1, 2, .., 85 years and over), bridged-race, Hispanic origin, and sex*. [Data file]. Updated August 11, 2014. Accessed January 2, 2014. Retrieved from http://www.cdc.gov/nchs/nvss/bridged_race.htm

5. United Census Bureau. (2014). *2013 American Community Survey 1-year estimates: place of birth for the foreign-born population of the United States.* [Data file]. Updated September 24, 2014. Accessed October 29, 2014. Retrieved from http://factfinder.census.gov/faces/nav/jsf/pages/download_center.xhtml

6. United States Census Bureau. (2013). *Metropolitan and micropolitan statistical areas main*. [Data file]. Revised May 6, 2013. Accessed October 9, 2014. Retrieved from http://www.census.gov/population/metro/

7. Centers for Disease Control and Prevention. (2006). Cases of HIV infection and AIDS in urban and rural areas of the United States, 2006. *HIV Surveillance Supplement Report*. *13*(2), 4.

8. United States Census Bureau. (2010). *2010 Census Urban and Rural Classification and Urban Area Criteria*. Revised September 9, 2014. Accessed November 6, 2014. Retrieved from https://www.census.gov/geo/reference/ua/urban-rural-2010.html

9. Adimora, A. & Schoenbach V. (2005). Social context, sexual networks, and racial disparities in rates of sexually transmitted infections. *Journal of Infection Diseases, 191 Suppl 1*, S115-122.

10. United States Department of Commerce: Bureau of Economic Analysis. (2014). *Regional data: GDP and personal income.* [Data file]. Updated September 30, 2014. Accessed October 10, 2014. Retrieved from http://www.bea.gov/itable/iTable.cfm?ReqID=70&step=1#reqid=70&step=30&isuri=1&7022=21&7023=0&7024=non-industry&7033=-1&7025=0&7026=xx&7027=2013&7001=421&7028=3&7031=0&7040=-1&7083=levels&7029=21&7090=70

11. United States Department of Labor: Bureau of Labor Statistics. (2014). *Unemployment rates for States, 2012.* [Data file].Updated February 28, 2014. Accessed October 31, 2014. Retrieved from http://www.bls.gov/lau/lastrk12.htm

12. United States Department of Labor: Bureau of Labor Statistics. (2014). *Unemployment rates for States, 2013.* [Data file].Updated February 28, 2014. Accessed October 31, 2014. Retrieved from http://www.bls.gov/lau/lastrk13.htm

13. United Census Bureau. (2014). *2013 American Community Survey 1-year estimates: median income in the past 12 months (in 2013 inflation-adjusted dollars).* [Data file]. Updated September 24, 2014. Accessed October 29, 2014. Retrieved from http://factfinder.census.gov/faces/nav/jsf/pages/download_center.xhtml

14. The Henry J. Kaiser Family Foundation. (2014). *State health facts: poverty rate by age.* [Data file]. Updated 2014. Accessed December 17, 2014. Retrieved from http://kff.org/other/state-indicator/poverty-rate-by-age/

15. The Henry J. Kaiser Family Foundation. (2014). *State health facts: poverty rate by race/ethnicity.* [Data file]. Updated 2014. Accessed December 17, 2014. Retrieved from http://kff.org/other/state-indicator/poverty-rate-by-raceethnicity/

16. The Henry J. Kaiser Family Foundation. (2014). *Distribution of the Total Population by Federal Poverty Level (above and below 200% FPL).* [Data file]. Updated 2014. Accessed December 17, 2014. Retrieved from http://kff.org/other/state-indicator/population-up-to-200-fpl/

17. The Henry J. Kaiser Family Foundation. (2014). *Health insurance coverage of adults 19-24.* [Data file]. Updated 2014. Accessed December 17, 2014. Retrieved from http://kff.org/other/state-indicator/adults-19-64/

18. The Henry J. Kaiser Family Foundation. (2014). *Distribution of the nonelderly uninsured by race/ethnicity.* [Data file]. Updated 2014. Accessed December 17, 2014. Retrieved from http://kff.org/uninsured/state-indicator/distribution-by-raceethnicity-2/

19. The Henry J. Kaiser Family Foundation. (2014). *Health insurance coverage of low income adults 19-24 (under 200% FPL).* [Data file]. Updated 2014. Accessed December 17, 2014. Retrieved from http://kff.org/other/state-indicator/low-income-adults/

20. North Carolina Division of Medical Assistance. *About DMA.* Updated May 13, 2014. Accessed October 14, 2014. Retrieved from http://www.ncdhhs.gov/dma/whoweare.htm

21. United Census Bureau. (2014). *2013 American Community Survey 1-year estimates: educational attainment.* [Data file]. Updated September 24, 2014. Accessed October 29, 2014. Retrieved from http://factfinder.census.gov/faces/nav/jsf/pages/download_center.xhtml

22. Public School of North Carolina. (2014). Report to the North Carolina General Assembly: consolidated data report 2012-2013. Updated April 15, 2014. Accessed October 31, 2014. Page 119. Retrieved from http://www.ncpublicschools.org/fbs/resources/data/ http://www.ncpublicschools.org/docs/research/discipline/reports/consolidated/2012-13/consolidated-report.pdf

Chapter 2: Scope of the HIV Infection Epidemic in North Carolina

1. Mitsch A., Tang, T., & Whitmore S. (2012, July). *Accurate monitoring of HIV in the United States - CDC's routine interstate duplicate review, 2005-2008.* Paper presented at the 19th International AIDS Conference, Washington, D.C.
Abstract retrieved from https://www.iasociety.org/Abstracts/A200743990.aspx

2. Foust, E.M. (2013). North Carolina's response to HIV: new hope, new direction leading the way [PowerPoint slides]. Retrieved from http://publichealth.nc.gov/shd/presentations/2013/NC-ResponsetoHIV-NewHopeNewDirection-2013SHDConfFoust-012413.pdf

3. Schneider, E., Whitmore, S., Glynn, M.K., Dominguez, K., Mitsch, A., & McKenna, M.T. (2008). Revised surveillance case definitions for HIV infection among adolescents, and children aged <18 months and for HIV infection and AIDS among children aged 18 months to <13 years—United States 2008. *Morbidity and Mortality Weekly Report*. *57*(RR10), 1-8.
Retrieved from http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5710a1.htm

4. Centers for Disease Control and Prevention. (2014). Diagnosis of HIV infection in the United States and Dependent Areas, 2011. *HIV Surveillance Report, 2012*. *24*, ages 15, and 67-70. Retrieved from http://www.cdc.gov/hiv/pdf/statistics_2012_HIV_Surveillance_Report_vol_24.pdf

5. United States Census Bureau. (2013). Population estimates 2013. Retrieved from http://www.census.gov/popest/data/state/asrh/2013/index.html

6. Centers for Disease Control and Prevention. (2012). Monitoring select national HIV prevention and care objectives by using HIV surveillance data-United States and 6 US dependent areas-2010. *HIV Surveillance Supplement Report. 17*(3, part A), 6 and 22. Retrieved from http://www.cdc.gov/hiv/pdf/statistics_2010_HIV_Surveillance_Report_vol_17_no_3.pdf

7. Centers for Disease Control and Prevention. (2007). CDC HIV/AIDS science facts: Using the BED HIV-1 capture EIA assay to estimate incidence using STARHS in the context of surveillance in the United States. Retrieved from http://www.cdc.gov/hiv/pdf/library_factsheet_HIV_usingTheBed_HIV-1_2007.pdf

8. Centers for Disease Control and Prevention. (2014). Terms, definitions, and calculations used in CDC HIV surveillance publications. Retrieved from http://www.cdc.gov/hiv/pdf/prevention_ongoing_surveillance_terms.pdf

9. Centers for Disease Control and Prevention. (2014). HIV surveillance supported by the Division of HIV/AIDS Prevention. Retrieved from http://www.cdc.gov/hiv/statistics/recommendations/publications.html

10. Centers for Disease Control and Prevention. (2012). Estimated HIV incidence in the United States, 2007-2010. Retrieved from http://www.cdc.gov/hiv/pdf/statistics_hssr_vol_17_no_4.pdf

11. North Carolina Communicable Disease Branch, HIV/STD Surveillance Unit. (2014). 2013 HIV/STD surveillance report. Retrieved from http://epi.publichealth.nc.gov/cd/stds/figures/std13rpt.pdf

12. Centers for Disease Control and Prevention. (2010). The role of STD detection and treatment in HIV prevention: CDC fact sheet. Retrieved from http://www.cdc.gov/std/hiv/stdfact-std-hiv.htm

13. Marks, G., Crepaz, N., & Janssen, R.S. (2006). Estimating sexual transmission of HIV from persons aware and unaware that they are infected with the virus in the USA. *AIDS*. *20*, 1447-1450. doi: 10.1097/01.aids.0000233579.79714.8d.

14. Centers for Disease Control and Prevention. (2006). Revised recommendations for HIV testing of adults, adolescents, and pregnant women in health-care settings. *Morbidity and Mortality Weekly Report Recommendations and Reports*. *55*(RR14), 1-17.

15. Centers for Disease Control and Prevention. (2006). Missed opportunities for earlier diagnosis of HIV infection-South Carolina, 1997-2005. *Morbidity and Mortality Weekly Report*. *55*(47), 1269-1272.

16. Harrison K.M., Song R., & Zhang X. (2010). Life expectancy after HIV diagnosis based on national HIV surveillance data from 25 states, United States. *Journal of Acquired Immune Deficiency Syndromes*. 53; pages 124-130. doi: 10.1097/QAI.0b013e3181b563e7.

17. University of California, San Francisco. Opportunistic infections and AIDS-related cancers. Retrieved from http://hivinsite.ucsf.edu/hiv?page=pb-diag-04-00#S5X

18. North Carolina State Center for Health Statistics. (2014). NC vital statistics volume 2: Leading causes of death-2013. Retrieved from http://www.schs.state.nc.us/data/vital.cfm

19. Heron, M. (2013). Deaths: Leading Causes for 2010. *National Vital Statistics Reports*. *62*(6), 3 and 10.

Chapter 3: HIV Testing in North Carolina

1. Centers for Disease Control and Prevention. (2006). Revised recommendations for HIV testing of adults, adolescents, and pregnant women in health-care settings. *Morbidity and Mortality Weekly Report, 55*(RR14), 1-17.

2. North Carolina General Assembly. (2007). *Control measures-HIV*. Accessed November 6, 2014. Retrieved from http://reports.oah.state.nc.us/ncac/title%2010a%20-%20health%20and%20human%20services/chapter%2041%20-%20epidemiology%20health/subchapter%20a/10a%20ncac%2041a%20.0202.pdf

Chapter 4: HIV Infection Care and Treatment in North Carolina

1. Cohen, M., Chen, Y., McCauley, M., Gamble, T. Hosseinipour, M., Kumarasamy, N., . . ., Fleming, T. (2011). Prevention of HIV-1 Infection with Early Antiretroviral Therapy. *New England Journal of Medicine*. *365*(6), 493-505. doi: 10.1056/NEJMoa1105243

2. Panel on Antiretroviral Guidelines for Adults and Adolescents .(2014). Guidelines for the use of antiretroviral agents in HIV-1 infected adults and adolescents: Initiating antiretroviral therapy in treatment-naïve patients. Department of Health and Human Services (pp. E-1). Retrieved from http://aidsinfo.nih.gov/ContentFiles/AdultandAdolescentGL.pdf

3. Cleveland, J. & Lansky, A. (2014). *Dear Colleague Letter*. Effective Interventions: HIV prevention that works website. Written April 30, 2014. Retrieved from https://www.effectiveinterventions.org/docs/default-source/data-to-care-d2c/DCL_announcing_Surveillance_Data_to_Program_Action_Resources.pdf?sfvrsn=0

4. Effective Interventions: HIV prevention that works. (2012). *Data to care*. Created 2012. Accessed October 20, 2014. Retrieved from http://www.effectiveinterventions.org/en/HighImpactPrevention/PublicHealthStrategies/DatatoCare.aspx

5. United States Department of Health and Human Services. (2014). *About the Ryan White HIV/AIDS Program*. Accessed October 21, 2014. Retrieved from http://hab.hrsa.gov/abouthab/aboutprogram.html

6. United States Department of Health and Human Services. (2014). *Ryan White CAREWare*. Accessed October 20, 2014. Retrieved from http://hab.hrsa.gov/manageyourgrant/careware.html

7. North Carolina Department of Health and Human Services. (2014). *North Carolina Division of Public Health: HIV/AIDS Care Programs and Services: AIDS Drug Assistance Program (ADAP)*. Updated November 7, 2014. Accessed October 20, 2014. Retrieved from http://epi.publichealth.nc.gov/cd/hiv/adap.html

8. Panel on Antiretroviral Guidelines for Adults and Adolescents. (2014). *Guidelines for the use of antiretroviral agents in HIV-1 infected adults and adolescents.* Department of Health and Human Services. Updated November 12, 2014. Accessed November 19, 2014. Retrieved from http://aidsinfo.nih.gov/ContentFiles/AdultandAdolescentGL.pdf

9. Panel on Antiretroviral Therapy and Medical Management of HIV-Infected Children. (2014). *Guidelines for the Use of Antiretroviral Agents in Pediatric HIV Infection.* Updated February 12, 2014. Accessed November 12, 2014. Retrieved from http://aidsinfo.nih.gov/contentfiles/lvguidelines/pediatricguidelines.pdf

10. Gardner, E., McLees, M., Steiner, J., Del Rio, C., & Burman, W. (2011). The Spectrum of engagement in HIV care and its relevance to test-and-treat strategies for prevention of HIV infection. *Clinical Infectious* Diseases. *52*(6), 793-800. doi: 10.1093/cid/ciq243

11. AIDS.gov. (2013). *HIV/AIDS care continuum*. Revised December 18, 2013. Accessed November 8, 2014. Retrieved from http://www.aids.gov/federal-resources/policies/care-continuum/

12. President Barack Obama. (2010). *National HIV/AIDS strategy for the United States*. (July 2010). Accessed November 8, 2014. Retrieved from http://aids.gov/federal-resources/national-hiv-aids-strategy/nhas.pdf

13. President Barack Obama. (2013). *Executive Order -- HIV care continuum initiative. The White House, Office of the Press Secretary*. Created July 15, 2013. Accessed November 8, 2014. Retrieved from http://www.whitehouse.gov/the-press-office/2013/07/15/executive-order-hiv-care-continuum-initiative

14. Office of National AIDS Policy. (2013). *National HIV/AIDS strategy improving outcomes: accelerating progress along the HIV care continuum*. Created December 2013. Accessed November 8, 2014. Retrieved from http://www.whitehouse.gov/sites/default/files/onap_nhas_improving_outcomes_dec_2013.pdf

15. Hall, H., Frazier, E., Rhodes, P., Holtgrave, D., Furlow-Parmley, C., Tang, T., . . ., & Skarbinski, J. (2013). Differences in human immunodeficiency virus care and treatment among subpopulations in the United States. *JAMA Internal Medicine*. *173*(14), 1337-1344. doi:10.1001/jamainternmed.2013.6841.

16. Dombrowski, J., Buskin, S., Bennett, A., Thiede, H., & Golden, M. (2014). Use of multiple data sources and individual case investigation to refine surveillance-based estimates of the HIV care continuum. *Journal of Acquired Immune Deficiency Syndromes*. *67*(3), 323-330. doi: 10.1097/QAI.0000000000000302.

17. United States Department of Housing and Urban Development. (2014). *HIV/AIDS housing*. Accessed October 17, 2014. Retrieved from http://portal.hud.gov/hudportal/HUD?src=/program_offices/comm_planning/aidshousing

Chapter 5: Bacterial and Other Sexually Transmitted Diseases in North Carolina

1. Centers for Disease Control and Prevention. (2011). *Diseases Characterized by Urethritis and Cervicitis*. Updated August 18, 2014. Accessed November 20, 2014. Retrieved from http://www.cdc.gov/std/treatment/2010/urethritis-and-cervicitis.htm

2. Centers for Disease Control and Prevention. (2014). *Pelvic inflammatory disease (PID) CDC fact sheet*. Updated July 1, 2014. Accessed November 5, 2014. Retrieved from http://www.cdc.gov/std/pid/stdfact-pid.htm

3. Centers for Disease Control and Prevention. (2010). Sexually Transmitted Diseases Treatment Guidelines, 2010. *Morbidity and Mortality Weekly Report*. *59*(RR-12), 19, and 36-37.

4. Centers for Disease Control and Prevention. (2014). *Chlamydia CDC fact sheet*. Updated June 30, 2014. Accessed November 5, 2014. Retrieved from http://www.cdc.gov/std/chlamydia/stdfact-chlamydia.htm

5. Centers for Disease Control and Prevention. (2010). *The role of STD detection and treatment in HIV prevention CDC fact sheet.* Updated September 1, 2010. Accessed November 4, 2014. Retrieved from http://www.cdc.gov/std/hiv/STDFact-STD-HIV.htm

6. Centers for Disease Control and Prevention. (2013). *STDs and pregnancy CDC fact sheet*. Updated August 1, 2013. Accessed November 4, 2014. Retrieved from http://www.cdc.gov/std/pregnancy/stdfact-pregnancy.htm

7. North Carolina HIV/STD Surveillance Unit. (2014). *2013 HIV/STD surveillance report*. North Carolina Department of Health and Human Services, Raleigh, North Carolina (pp. 11-14, 17-18, 27-32, 36-37, and 39). Accessed November 3, 2014. Retrieved from http://epi.publichealth.nc.gov/cd/stds/figures/std13rpt.pdf

8. Centers for Disease Control and Prevention. (2014). *Gonorrhea CDC fact sheet*. Updated July 1, 2014. Accessed November 10, 2014. Retrieved from http://www.cdc.gov/std/gonorrhea/stdfact-gonorrhea.htm

9. Hook, E. & Handsfield, H. (1999). Chapter 32: Gonococcal infections in the adult. In K.K. Holmes, P.F. Sparling, P.A. Mårdh, S.M. Lemon, W.E. Stamm, P. Piot & J.N. Wasserheit (eds.), *Sexually Transmitted Diseases, 3rd Edition* (pp. 1165-1189).New York: McGraw-Hill.

10. Sampson, L.A. (2006). Interpretation of sexually transmitted disease data. *North Carolina Medical Journal. 67*(5), 395-396.

11. North Carolina HIV/STD Surveillance Unit. (2012). 2011 HIV/STD surveillance report. North Carolina Department of Health and Human Services, Raleigh, North Carolina (pp. 14 and 30). Accessed November 3, 2014. Retrieved from http://epi.publichealth.nc.gov/cd/stds/figures/std13rpt.pdf

12. Centers for Disease Control and Prevention. (2014). *Sexually Transmitted Disease Surveillance 2012*. Division of STD Prevention. Atlanta: US Department of Health and Human Services (pp. 19).

13. North Carolina HIV/STD Surveillance Unit. (2007). *2006 HIV/STD surveillance report*. North Carolina Department of Health and Human Services, Raleigh, North Carolina (pp. 30). Accessed November 3, 2014. Retrieved from http://epi.publichealth.nc.gov/cd/stds/figures/std13rpt.pdf

14. Centers for Disease Control and Prevention. (2009). Clinic-based testing for rectal and pharyngeal *Neisseria gonnorrhoeae* and *Chlamydia trichomatis* infections by community-based organizations, five cities, United States, 2007. *Morbidity and Mortality Weekly Report*. *58*(26), 716-719.

15. Centers for Disease Control and Prevention. (2014). *Sexually transmitted diseases: gonococcal isolate surveillance project (GISP).* Updated November 4, 2014. Accessed November 5, 2014. Retrieved from http://www.cdc.gov/STd/gisp/default.htm

16. Centers for Disease Control and Prevention. (2014). *Syphilis CDC fact sheet*. Updated January 7, 2014. Accessed November 5, 2014. Retrieved from http://www.cdc.gov/std/syphilis/stdfact-syphilis-detailed.htm

17. Centers for Disease Control and Prevention. (2011). *Ten ways STDs impact women differently from men CDC fact sheet*. Updated April 2011. Accessed November 12, 2014. Retrieved from http://www.cdc.gov/nchhstp/newsroom/docs/STDs-Women-042011.pdf

18. California Department of Health. (2008). *Presenting on sexually transmitted disease (STD) racial health disparities: Racism and health sexual behavior: a resource guide for facilitators*. Published September 2008. Accessed November 20, 2014. Retrieved from http://www.cdph.ca.gov/programs/std/Documents/Presenting-on-STD-Racial-Disparities-FAQ-Guide-08.pdf

19. Centers for Disease Control and Prevention. (2014). Primary and Secondary Syphilis — United States, 2005–2013. *Morbidity and Mortality Weekly Report*. *63*(18), 402-406**.**

20. Radolf, J., Sanchez, P., Schulz, K., & Murphy, F. (1999). Chapter 84: Congenital Syphilis. In K.K. Holmes, P.F. Sparling, P.A. Mårdh, S.M. Lemon, W.E. Stamm, P. Piot & J.N. Wasserheit (eds.), *Sexually Transmitted Diseases, 3rd Edition* (pp. 1165-1189). New York: McGraw-Hill.

21. Merck Manuals. (2013). *Congenital syphilis*. Updated May 2013. Accessed November 12, 2014. Retrieved from http://www.merckmanuals.com/professional/pediatrics/infections_in_neonates/congenital_syphilis.html

22. Centers for Disease Control and Prevention. (2014). *Genital HPV infection fact sheet*. Updated March 20, 2014. Accessed November 12, 2014. Retrieved from http://www.cdc.gov/std/hpv/stdfact-hpv.htm

23. Centers for Disease Control and Prevention. (2013). *Human papillomavirus (HPV): what is HPV?* Updated September 9, 2014. Accessed November 12, 2014. Retrieved from http://www.cdc.gov/hpv/whatishpv.html

24. North Carolina State Center for Health Statistics. (2014). *Cancer incidence rates North Carolina*. Updated February 4, 2014. Accessed November 12, 2014. Retrieved from http://www.schs.state.nc.us/schs/CCR/reports.html

25. Centers for Disease Control and Prevention. (2013). *Human papillomavirus (HPV): HPV vaccines*. Updated September 9, 2014. Accessed November 12, 2014. Retrieved from http://www.cdc.gov/hpv/vaccine.html

26. Centers for Disease Control and Prevention. (2013). *Human papillomavirus (HPV): HPV vaccine safety*. Updated September 9, 2014. Accessed November 12, 2014. Retrieved from http://www.cdc.gov/hpv/vaccinesafety.html

27. Centers for Disease Control and Prevention. (2011). Recommendations on the use of quadrivalent human papillomavirus vaccine in males-Advisory Committee on Immunization Practices (ACIP), 2011. *Morbidity and Mortality Weekly Report*. *60*(50), 1705-1708.

28. Centers for Disease Control and Prevention. (2014). *Genital herpes CDC fact sheet (detailed)*. Updated July 1, 2014. Accessed November 12, 2014. Retrieved from http://www.cdc.gov/std/herpes/stdfact-herpes-detailed.htm

29. Centers for Disease Control and Prevention. (2013). *Sexually transmitted disease surveillance 2012*. Updated January 2014. Accessed November 12, 2014. Retrieved from http://www.cdc.gov/std/stats12/surv2012.pdf

30. United States Preventative Services Task Force. *Final recommendation statement, genital herpes: screening*. Updated October 2014. Accessed November 12, 2014. Retrieved from http://www.uspreventiveservicestaskforce.org/Page/Document/RecommendationStatementFinal/genital-herpes-screening

31. Centers for Disease Control and Prevention. (2011). *Trichomoniasis CDC fact sheet*. Updated August 3, 2012. Accessed November 12, 2014. Retrieved from http://www.cdc.gov/std/trichomonas/stdfact-trichomoniasis.htm

32. Public Health Laboratory. (2013). *Advances in laboratory detection of Trichomonas vaginalis* (Issue Brief: August 2013). Silver Springs, MD: Association of Public Health Laboratories. Retrieved from http://www.aphl.org/AboutAPHL/publications/Documents/ID_2013August_Advances-in-Laboratory-Detection-of-Trichomonas-vaginalis.pdf

33. McClelland, R., Sangaré, L., Hassan, W., Lavreys, L., Mandaliya, K., Kiarie, J., . . ., Baeten, J. (2007). Infection with *Trichomonas vaginalis* increases the risk of HIV-1 acquisition. *Journal of Infectious Diseases*. *195*, 698-702. doi: 10.1086/511278.

34. Centers for Disease Control and Prevention (2014). *Conjunctivitis (pink eye) in newborns*. Updated January 9, 2014. Accessed November 12, 2014. Retrieved from http://www.cdc.gov/conjunctivitis/newborns.html

Chapter 6: HIV Comorbidities in North Carolina

1. Samji, H., & Hogg, R. (2014). Life expectancy trends in HIV. *Physician's Weekly.* Retrieved from http://www.physiciansweekly.com/hiv-life-expectency-trends/

2. Centers Disease Control and Prevention. (2014). *Syphilis CDC fact sheet*. Updated January 7, 2014. Accessed November 5, 2014. Retrieved from http://www.cdc.gov/std/syphilis/stdfact-syphilis-detailed.htm

3. Centers for Disease Control and Prevention. (2014). *Syphilis and MSM (men who have sex with men) CDC fact sheet*. Updated December 16, 2014. Accessed December 30, 2014. Retrieved from http://www.cdc.gov/std/syphilis/STDFact-MSM-Syphilis.htm

4. Hall, C. & Bolan, G. (2006). Syphilis and HIV. *HIV InSite Knowledge Base Chapter*. Accessed December 30, 2014. Retrieved from http://hivinsite.ucsf.edu/InSite?page=kb-05-01-04#S1X.

5. Centers for Disease Control and Prevention. (2014). Primary and Secondary Syphilis-United States, 2005-2013. *Morbidity and Mortality Weekly Report*. *63*(18), 402-406.

6. Centers for Disease Control and Prevention. (2012). *Tuberculosis (TB): Basic TB facts*. Updated March 13, 2012. Accessed November 25, 2014. Retrieved from http://www.cdc.gov/tb/topic/basics/default.htm

7. World Health Organization. (2008*). Implementing the WHO stop TB strategy: a handbook for national tuberculosis control programmes.* Geneva, World Health Organization (pp. 67). (WHO/HTM/TB/2008.401). Retrieved from www.who.int/tb/publications/2008/

8. World Health Organization. (2014). *Tuberculosis and HIV.* Updated 2014. Accessed November 25, 2014. Retrieved from http://www.who.int/hiv/topics/tb/about_tb/en/

9. Centers for Disease Control and Prevention. (2009). *Program Collaboration and Service Integration: Enhancing the Prevention and Control of HIV/AIDS, Viral Hepatitis, Sexually Transmitted Diseases, and Tuberculosis in the United States.* Atlanta, Georgia (pp.3). Retrieved from http://www.cdc.gov/nchhstp/programintegration/docs/207181-C_NCHHSTP_PCSI%20WhitePaper-508c.pdf

10. World Health Organization. (2007). *Tuberculosis care with TB-HIV co-management: integrated management of adolescent and adult illness (IMAI).* Geneva, World Health Organization (pp. 10). (WHO/HTM/HIV/2007.01, WHO/HTM/TB/2007.380). Retrieved from http://www.who.int/hiv/pub/imai/TB_HIVModule23.05.07.pdf

11. Aaron, L., Saadoun, D., Calatroni, I., Launay, O., Mémmain, N., Vincent, V., . . ., Lortholary, O. (2004). Tuberculosis in HIV-infected patients: a comprehensive review. *Clinical Microbiology and Infection*. *10*(5), 388-398. doi: 10.1111/j.1469-0691.2004.00758.x

12. Centers for Disease Control and Prevention. (2012). *Tuberculosis (TB): TB and HIV co-infection*. Updated July 17, 2012. Accessed November 25, 2014. Retrieved from http://www.cdc.gov/tb/topic/TBHIVcoinfection/default.htm

13. World Health Organization. (2004). *Fight AIDS, fight TB, fight now: TB/HIV information pack*. Stop TB Partnership and UNAIDS. Geneva, World Health Organization (pp. 6). Retrieved from http://www.stoptb.org/assets/documents/resources/publications/acsm/InfoPackEnglish.pdf

14. Centers for Disease Control and Prevention. (2014). *Reported tuberculosis in the United States, 2013*. Atlanta, Georgia: United States Department of Health and Human Services, Centers for Disease Control and Prevention (p. 59). Retrieved from http://www.cdc.gov/tb/statistics/reports/2013/pdf/report2013.pdf

15. Panel on opportunistic infections in HIV-infected adults and adolescents. (2014). *Guidelines for the prevention and treatment of opportunistic infections in HIV-infected adults and adolescents: recommendations from the Centers for Disease Control and Prevention, the National Institutes of Health, and the HIV Medicine Association of the Infectious Disease Society of America* (pp. Q1-Q3). Updated October 28, 2014. Accessed December 31, 2014. Retrieved from http://aidsinfo.nih.gov/contentfiles/lvguidelines/adult_oi.pdf

16. Centers for Disease Control and Prevention (2009). *Hepatitis B FAQs for the public*. Updated June 9, 2009. Accessed November 25, 2014. Retrieved from http://www.cdc.gov/hepatitis/B/bFAQ.htm#overview

17. Centers for Disease Control and Prevention. (2012). Chapter 9: Hepatitis B - epidemiology and prevention of vaccine-preventable diseases. In W. Atkinson, S. Wolfe, & J. Hamborsky (Eds.). *The Pink Book: Course Textbook*, 12th edition, 2nd print (pp. 115-138). Washington DC: Public Health Foundation. Retrieved from http://www.cdc.gov/vaccines/pubs/pinkbook/hepb.html

18. Centers for Disease Control and Prevention. (2014). *Viral hepatitis statistics and surveillance*. Updated August 28, 2014. Accessed October 22, 2014. Retrieved from http://www.cdc.gov/hepatitis/Statistics/index.htm

19. van den Berg, R., van Hoogstraten, I., & van Agtmael, M. (2009). Non-responsiveness to hepatitis B vaccination in HIV seropositive patients; possible causes and solutions. *AIDS*. *11*(3), 154-164.

20. Centers for Disease Control and Prevention. (2010). Sexually transmitted diseases treatment guidelines, 2010: Hepatitis B. *Morbidity and Mortality Weekly Report*. *59*(RR-12), 81 and 84.

21. Centers for Disease Control and Prevention. (2014). *Hepatitis C FAQs for health professionals*. Updated November 17, 2014. Accessed November 25, 2014. Retrieved from http://www.cdc.gov/hepatitis/HCV/HCVfaq.htm#section2

Chapter 7: Integrated Program Activities

1. Centers for Disease Control and Prevention (2001). Compendium of HIV prevention interventions with evidence of effectiveness. Centers for Disease Control and Prevention's HIV/AIDS Prevention Research Synthesis Project. Created November 1999. Revised August 31, 2001. Accessed November 20, 2014. Retrieved from http://www.cdc.gov/hiv/pdf/prevention_research_compendium.pdf

2. Effective Interventions: HIV prevention that works (2012). *Public health strategies*. Created 2012. Accessed October 20, 2014. Retrieved from www.effectiveinterventions.org

3. Centers for Disease Control and Prevention. (2014). *The Care and Prevention in the United States (CAPUS) demonstration project*. Updated May 29, 2014. Accessed November 3, 2014. Retrieved from http://www.cdc.gov/hiv/prevention/demonstration/capus/

4. Centers for Disease Control and Prevention (2014). *Program collaboration and service integration at NCHHSTP*. Updated August 8, 2014. Accessed November 20, 2014. Retrieved from http://www.cdc.gov/nchhstp/programintegration/default.htm

Appendix C: Technical Notes

1. Mitsch A., Tang, T., & Whitmore S. (2012, July). *Accurate monitoring of HIV in the United States - CDC's routine interstate duplicate review, 2005-2008.* Paper presented at the 19th International AIDS Conference, Washington, D.C.
Abstract retrieved from https://www.iasociety.org/Abstracts/A200743990.aspx

2. Prejean J., Song R., Hernandez, A., Ziebell, R., Green, T., Walker, F., . . ., Hall, H. (2011). Estimated HIV incidence in the United States, 2006-2009. *PLos One. 6*(8), e17502, 1-13. doi:10.1371/journal.pone.0017502.

3. Karon J.M., Song R., Brookmeyer R., Kaplan E.H., & Hall H.I. Estimating HIV incidence in the United States from HIV/AIDS surveillance data and biomarker HIV test results. *Statistics in Medicine. 27*(23), 4617-4633. doi: 10.1002/sim.3144

4. Calypte Biomedical Corporation (2008). Aware™ BED™ EIA HIV-1 incidence test (IgG-capture HIV-EIA): enzyme immunoassay for population estimates of HIV-1 incidence (Rev. A). Portland, Oregon.
Retrieved from http://www.calypte.com/pdf/LN-20597%20A_%20Aware%20BED%20EIA%20HIV-1_2%20Incidence%20Test%20Package%20Insert.pdf

INDEX

North Carolina Geographic Regions

Piedmont Region

Western Region

Eastern Region

ALLEGHANY
ASHE
SURRY
STOKES
ROCKINGHAM
CASWELL
PERSON
VANCE
WARREN
NORTHAMPTON
GATES
CAMDEN CURRITUCK
WATAUGA
WILKES
YADKIN
FORSYTH
GRANVILLE
HERTFORD
PASQUOTANK
HALIFAX
PERQUIMANS
AVERY
MITCHELL
YANCEY
MADISON
CALDWELL
ALEXANDER
DAVIE
GUILFORD
ALAMANCE
ORANGE
DURHAM
FRANKLIN
NASH
EDGECOMBE
BERTIE
ROWAN
MARTIN
WASHINGTON
TYRRELL
DARE
IREDELL
DAVIDSON
BUNCOMBE
MCDOWELL
BURKE
CATAWBA
RANDOLPH
CHATHAM
WAKE
WILSON
PITT
BEAUFORT
HYDE
HAYWOOD
SWAIN
LINCOLN
ROWAN
LEE
JOHNSTON
GREENE
GRAHAM
RUTHERFORD
CABARRUS
LENOIR
CRAVEN
PAMLICO
JACKSON
HENDERSON
POLK
MONTGOMERY
MOORE
HARNETT
WAYNE
CHEROKEE
MACON
TRANSYLVANIA
CLEVELAND
GASTON
MECKLENBURG
STANLY
JONES
CLAY
MONTGOMERY
RICHMOND
HOKE
CUMBERLAND
SAMPSON
DUPLIN
CARTERET
UNION
ANSON
SCOTLAND
ROBESON
BLADEN
PENDER
ONSLOW
COLUMBUS
NEW HANOVER
BRUNSWICK