



2022 North Carolina HIV Surveillance Report

**HIV/STD/Hepatitis Surveillance Unit
Division of Public Health
North Carolina Department of Health and Human Services
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Special Notes:

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 in the table of contents.

See the last page of this document for a map of North Carolina Regional Networks of Care and Prevention (RNCP) and regional surveillance designations.

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Summary

Notes for 2022 North Carolina HIV Surveillance Report

2020 data should be treated with caution due to reduced availability of testing and, in some settings, HIV care caused by the COVID-19 pandemic.

This document, the 2022 North Carolina HIV Surveillance Report, includes summary tables of surveillance reports and other information for HIV. Detailed data tables of HIV by county of diagnosis/residence and demographics can be found in the 2022 North Carolina HIV Surveillance Data Tables excel file. This excel file can be downloaded from the Annual Reports page (<https://epi.dph.ncdhhs.gov/cd/stds/annualrpts.html>).

HIV

- The newly diagnosed HIV infection case totals and rates discussed in this document are restricted to adults/adolescents 13 and older to match the national standard for these data. Tables showing the total population currently residing in North Carolina and living with HIV infection include the 0 to 12 age group.
- As of December 31, 2022, the number of people diagnosed and living with HIV who reside in North Carolina (including those initially diagnosed in another state) was 36,581.
- In 2022, 1,366 people were newly diagnosed with HIV population, a rate of 15.3 per 100,000 adult and adolescent population (13 and older).
- The number of people newly categorized as having Stage 3 HIV (AIDS) increased in 2022 (623) compared to the previous five years (2021: 511). This may be due to diagnoses delayed by the pandemic shutdown.
- There were 2 perinatal (mother-to-child) HIV transmissions documented in 2022.
- People aged 20 to 34 years old had the highest rate of newly diagnosed HIV in 2022 (38.5 per 100,000) and comprised 59.6% (N=814) of the newly diagnosed population.
- Among race/ethnicity groups, Black/African Americans represented a majority (56.7%) of all adult/adolescents newly diagnosed with HIV, with a rate of 41.0 per 100,000 adult/adolescent population.
- The highest rate of newly diagnosed HIV infection was among adult/adolescent Black/African American men (69.4 per 100,000).
- The rate of newly diagnosed HIV increased among Hispanic/Latinx people (26.4 per 100,000).
- For adults and adolescents newly diagnosed with HIV in 2022, the most likely route of transmission reported was male-male sex (reported by 57.8%), followed by heterosexual sex (18.7%), combined male-male sex and injection drug use (3.4%), and injection drug use (IDU) (3.4%); the most likely route of transmission was unknown for 16.6% of people newly diagnosed with HIV in 2022.

HIV in North Carolina

HIV Reporting in North Carolina

In North Carolina, the human immunodeficiency virus (HIV) and acquired immunodeficiency syndrome (AIDS) are reportable by law within 24 hours to the North Carolina Department of Health and Human Services (North Carolina DHHS). Statewide surveillance information is collected by local health departments and state staff and sent to the North Carolina Division of Public Health.

The first acquired immunodeficiency syndrome (AIDS) case reported in North Carolina was in 1982.¹ In North Carolina, AIDS became a reportable disease in 1984, and a diagnosis of HIV infection was made reportable in the state in 1990.¹ State law requires reporting of HIV/AIDS as well as associated laboratory tests. Starting July 1, 2013, all viral loads 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. Information on all reported cases of HIV and AIDS are collected from health care providers by health department staff. These case reports include demographic and clinical information for the patient, as well as questions regarding mode of exposure.

State public health staff determine whether potentially duplicative reports of HIV infection represent one person and, if so, that person's current residence. This is done through state data review and routine interstate duplicate review (RIDR).²

Background

HIV is caused by a retrovirus named the human immunodeficiency virus (HIV) and is spread through certain body fluids. HIV weakens a person's immune system by destroying important immune cells, specifically CD4 T lymphocyte cells also known as T cells, that fight disease and infection. There is no effective cure for HIV, and since the human body cannot get rid of HIV completely, HIV is considered a life-long disease. However, with proper medical care, HIV can be treated by antiretroviral therapy (ART) and controlled.^{3,4} When the disease is controlled and no virus is detectable in the bloodstream, HIV cannot be transmitted sexually. If untreated, HIV reduces the number of CD4 cells (T cells) in the body, damaging the immune system and making it hard for the body to fight infections.

Stages of HIV

If left untreated, HIV typically progresses through three stages of disease. Treatment can slow or prevent progression from one stage to the next.⁴

¹ Foust, E.M. (2013). North Carolina's response to HIV: new hope, new direction leading the way.

² 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.

³ Centers for Disease Control and Prevention (CDC) (2018). *HIV Basics*. Accessed on June 25, 2019. Retrieved from <https://www.cdc.gov/hiv/basics/index.html>.

Stage 1: Acute HIV Infection

A few weeks after infection with HIV, people can experience flu-like symptoms that can last a few weeks. When people have acute HIV, they have a large amount of virus in their blood and are very contagious.⁴ Most people with acute HIV are unaware they are infected because their symptoms may be mild or mistaken for other illnesses like the flu. The only way to detect an acute HIV infection is through an antigen/antibody test or nucleic acid test (NAT).⁴⁴

North Carolina has had statewide screening for acute HIV infection since 2002. In 2022, there were 144 acute HIV diagnoses (defined as RNA-positive and antibody-negative or documented negative HIV test within 6 months); these diagnoses comprised 10.5% of people newly diagnosed with HIV. Of these, 99 were identified as infected within the past 3 months based on HIV test results and prioritized for rapid outreach by state disease investigator staff.

Stage 2: Clinical Latency/Chronic HIV

HIV is still active during this stage, but viral replication is kept in check by the individual's immune system. Most people do not have symptoms during this stage. If someone is taking ART as prescribed, they may remain in this stage for the rest of their life. Even without treatment, this period can last a decade or longer, though some individuals progress through this stage faster.⁴

Stage 3: AIDS

At the end of Stage 2, a person's viral load starts to increase and the CD4 cell (T cell) count begins to decrease. As this happens, the person may begin to have symptoms as the virus levels increase in the body and the person progresses to Stage 3 (AIDS). People with Stage 3 HIV infection have such badly damaged immune systems that they are extremely susceptible to opportunistic infections, such as Kaposi's sarcoma, *Pneumocystis jirovecii* (commonly known as pneumocystis pneumonia), cytomegalovirus, and tuberculosis. Without treatment, people with Stage 3 (AIDS) survive about three years. Common symptoms of Stage 3 (AIDS) include chills, fever, sweats, swollen lymph glands, and weight loss. People are diagnosed with Stage 3 (AIDS) when their CD4 cell (T cell) count drops below 200 cells/mm or if they develop certain opportunistic infections. People with AIDS can have a high viral load and are very infectious.⁴ Treatment can return a person from Stage 3 (AIDS) to a healthier state.

In North Carolina, there were 272 late diagnoses (i.e., a Stage 3 diagnosis within 6 months of an initial HIV diagnosis) in 2022, which made up 19.9% of new HIV diagnoses in the state. While the rate of late diagnoses of HIV decreased from 2010 to 2016 (from 4.8 per 100,000 population to 2.7 per 100,000), the rate was relatively stable from 2017 to 2020. Following the pandemic shutdowns in 2020, the 2021 rate increased to 5.7 per 100,000. In 2022, the rate of late diagnoses was lower than 2021 and similar to 2020, at 3.4 per 100,000.

HIV Transmission and Risk

HIV is transmitted by HIV-contaminated body fluids, such as blood, semen, pre-seminal fluid, rectal fluids, vaginal fluids, and breast milk coming into contact with mucous membranes, damaged tissue, or is injected

⁴ Centers for Disease Control and Prevention (CDC) (2018). *HIV Transmission*. Accessed on June 25, 2019. Retrieved from <https://www.cdc.gov/hiv/basics/transmission.html>.

into the blood stream. In the United States, HIV is mainly spread through sex (anal or vaginal) and by sharing HIV-contaminated needles, syringes, or other equipment used to prepare drugs for injection (e.g., rinse water). HIV can live in a used needle up to 42 days.⁵ HIV can also be spread from an HIV-infected mother to her child during pregnancy, delivery, or less commonly, through breastfeeding. The estimated risk of acquiring HIV from an individual living with HIV by exposure act can be accessed [here](#). Effective treatment for HIV can result in such low levels of virus that the person living with HIV cannot transmit it through sex and much less likely to be transmitted from mother-to-child during pregnancy, at birth, or sharing injection drug equipment. It is recommended that all pregnant women should be tested for HIV and start treatment immediately have decreased the number of babies born with HIV. Use of condoms also prevents the spread of HIV. Additionally, HIV negative individuals who are at high-risk for HIV can take medications that are highly effective at preventing the acquisition of HIV, both sexually and through the sharing of contaminated injection drug equipment. Information on preventive medication can be found online at pleasepreme.org or <https://npin.cdc.gov/prelocator>.

National Trends

The CDC estimates that 1.2 million people in the United States had HIV at the end of 2021, the most recent year for which this information is available.⁵ In 2021, 36,189 people were newly diagnosed with HIV in the United States and six dependent areas, at a rate of 10.8 per 100,000 population.⁶ The southern states had the highest rate among the United States regions, with a 2021 rate of 14.7 per 100,000 population.⁷ Among adults and adolescents (aged 13 years or older), there were 36,136 people newly diagnosed with HIV, at a rate of 12.7 per 100,000, in 2021. In 2021, North Carolina's rate of newly diagnosed HIV among adults and adolescents (according to the CDC) was 15.5 per 100,000. North Carolina ranks 9th among all states and dependent areas for rate of newly diagnosed HIV.

Poverty and HIV in North Carolina

While the North Carolina surveillance data shows higher HIV rates in some racial and ethnic groups, factors such as poverty and large gaps in wealth distribution may be driving these differences.⁸ People who cannot afford basic needs may also have trouble accessing quality sexual health services, and may have had experiences with the health system that discourage their accessing of testing and care.⁸ For each person with newly diagnosed HIV in North Carolina in 2022, we calculated the proportion of the population living below the poverty line in their census tract of residence at the time of their diagnosis using 5-year (2016-2020) estimates from the American Community Survey. This calculation estimated the neighborhood poverty level experienced for people newly diagnosed with HIV in North Carolina. Figure 1 shows the rate of newly diagnosed HIV by census tract poverty rate. Figure 1 demonstrates that although people living at

⁵ Centers for Disease Control and Prevention (CDC) (2023). *Basic Statistics*. Updated May 2023. Accessed on September 8, 2023. Retrieved from <https://www.cdc.gov/hiv/basics/statistics.html>.

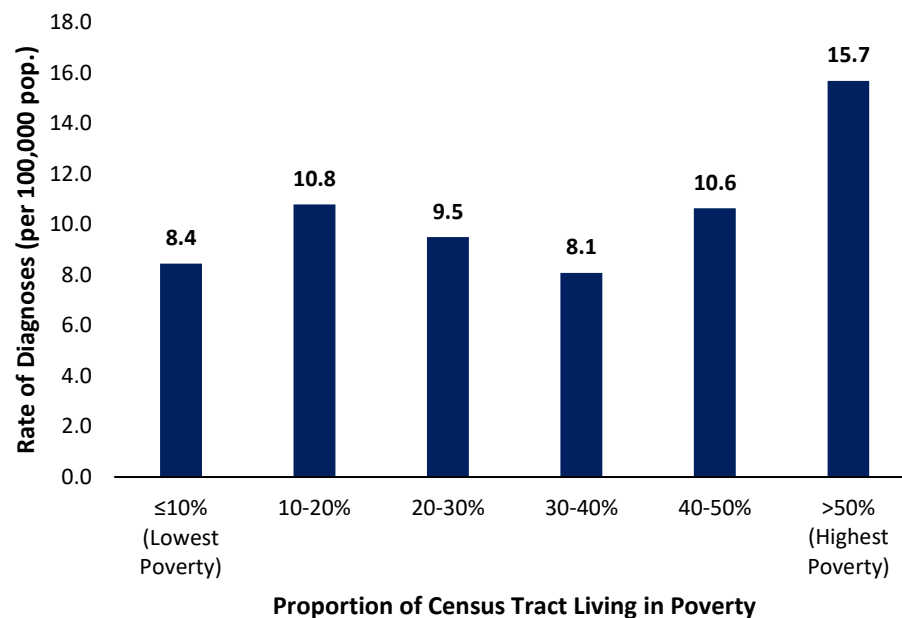
⁶ Centers for Disease Control and Prevention (CDC) (2023). *HIV Surveillance Report, 2021*. Vol 34. Published May 2023. Accessed September 8, 2023. Retrieved from <https://www.cdc.gov/hiv/library/reports/hiv-surveillance/vol-34/index.html>.

⁷ Centers for Disease Control and Prevention (CDC)(2023). *HIV in the United States and Dependent Areas*. Accessed on September 8, 2023. Retrieved from <https://www.cdc.gov/hiv/statistics/overview/ata glance.html>.

⁸ Centers for Disease Control and Prevention. (2017). STD health equity. Updated February 15, 2017. Accessed July 19, 2017. Retrieved from <https://www.cdc.gov/std/health-disparities/default.htm#ftn5>.

all levels of poverty get STIs, those living in census tracts with a higher proportion of residents residing below the federal poverty line are more likely to be diagnosed with HIV.

Figure 1. People Newly Diagnosed with HIV in North Carolina by Poverty Indicator[^], 2022



[^]Estimates of people living below the poverty line within a census tract and all population estimates obtained from the American Community Survey, 2016-2020, five-year estimate.

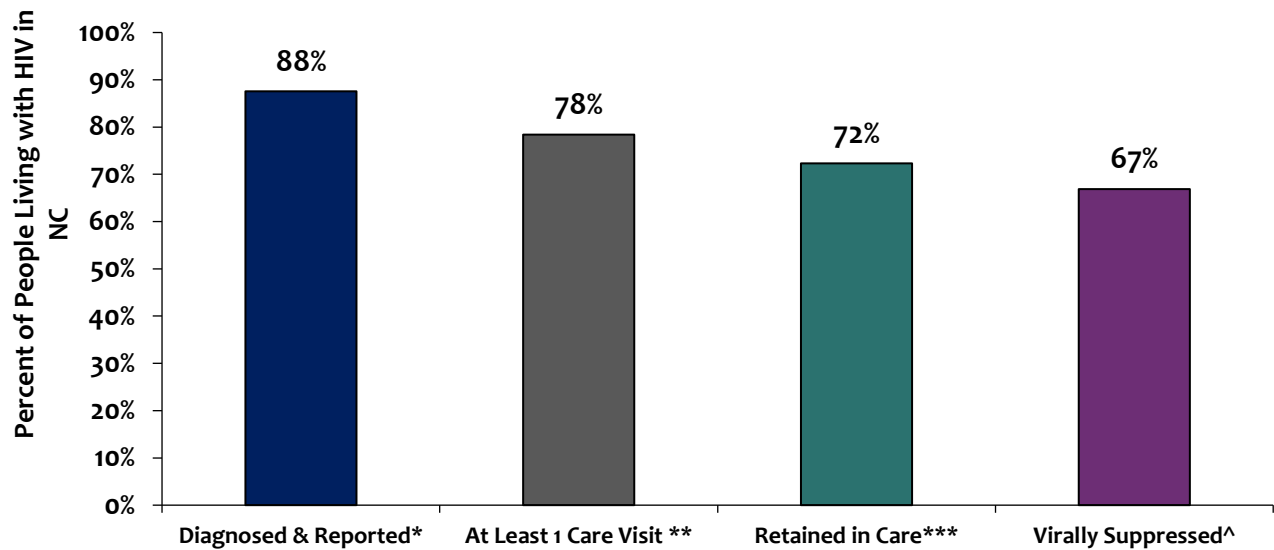
Data Sources: enhanced HIV/AIDS Reporting System (eHARS) (data as of July 2023), and 2016-2020 American Community Survey (ACS) five-year estimates (accessed from <https://data.census.gov/>).

HIV Continuum of Care in North Carolina

The estimated number of people living in North Carolina with HIV infection at the end of 2022 was 41,781 (most recent estimate, North Carolina Division of Public Health, unpublished data). Among these, a diagnosis record was available for 88%. The remaining estimated 12% had no diagnosis record; these people may be unaware that they are living with HIV. Among the people diagnosed and living with HIV through 2022, 67% were virally suppressed (viral load <200 copies/mL) (Figure 2). North Carolina's suppression rate is higher than the national rate: among US areas with complete laboratory reporting, 66% of people living with HIV are virally suppressed.⁹ Among all people living with HIV in North Carolina, people receiving medical care were more likely to be virally suppressed; 85% of people receiving medical care in 2022 were virally suppressed. Of the people receiving Ryan White Part B services, 82% were virally suppressed in 2022. Overall, 85% of the HIV Medication Assistance Program (HMAP, formerly ADAP) recipients were virally suppressed in 2022.

⁹ Centers for Disease Control and Prevention. Monitoring selected national HIV prevention and care objectives by using HIV surveillance data—United States and 6 dependent areas, 2021. HIV Surveillance Supplemental Report, 2023;28(No. 4). <http://www.cdc.gov/hiv/library/reports/hiv-surveillance.html>. Published May 2023. Accessed September 12, 2023.

Figure 2. North Carolina HIV Continuum of Care, 2022* (People Diagnosed and Living through 2022)



*People \geq 13 years of age and diagnosed and living through December 31 of each calendar year. Data includes labs and services from CAREWare (all Ryan White services excluding Part A), HIV Medication Assistance Program (HMAP), and Medicaid data sources.

Estimated proportion living in NC and undiagnosed is from 2020.

**At least 1 care marker (CD4 or VL test, HMAP dispense, or Medicaid claim) in the given calendar year.

*** Retained in care is defined as being virally suppressed within 12 months or having 2 or more care markers (CD4 or VL test, HMAP dispense, or Medicaid claim) at least 90 days apart in the given calendar year.

^Last viral load during the given calendar year <200 copies/ml.

Data Sources: enhanced HIV/AIDS Reporting System (eHARS) (June 2023) and NC ECHO (June 2023).

HIV Care in North Carolina

In the earliest days of the HIV epidemic, there were no treatments to combat the virus, and the care provided was primarily supportive and palliative therapy. Beginning in the 1990s, anti-retroviral treatment (ART) became available and with the subsequent advent of highly active ART, HIV-associated death rates decreased dramatically.

HIV treatment 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 care and prevention efforts. 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 partner living with HIV, but also greatly reduced the likelihood of HIV transmission to the uninfected partner.¹⁰ Based on this study and others, current HIV treatment guidelines recommend all HIV-infected individuals receive ART.¹¹

¹⁰ 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.

¹¹ Panel on Antiretroviral Guidelines for Adults and Adolescents (2021). 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 <https://clinicalinfo.hiv.gov/sites/default/files/guidelines/documents/adult-adolescent-arv/guidelines-adult-adolescent-arv.pdf>.

Since publication of the HPTN 052 study, there has been a growing emphasis on projects seeking to ensure all people living with HIV get linked to and retained in HIV care or re-engaged if they have fallen out of care. People taking ARTs can reduce their HIV viral load to suppressed (<200 copies/mL) or undetectable (<20 copies/mL) levels and effectively have no risk of transmitting HIV to their HIV-negative sexual partners.¹²

There are programs in North Carolina that exist to help individuals living with HIV. The federally funded Ryan White HIV/AIDS Program (RWHAP) 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. Clinics and agencies providing services as a subrecipient of North Carolina's Part B funding adhere to service standards and participate in quality improvement activities. At the end of 2022, there were over 7800 clients served by RWHAP Part B, receiving medical and support services across ten regional networks of care and prevention, (RNCP) representing 95 counties in North Carolina. More information about RWHAP can be found here: <https://epi.dph.ncdhhs.gov/cd/hiv/program.html>.

The HIV Medication Assistance Program (HMAP), formerly the AIDS Drug Assistance Program (ADAP) uses a combination of state and federal Ryan White funds to provide medications to low-income North Carolinians living with HIV in all 100 counties. At the end of 2022, there were 9,036 clients enrolled in HMAP in North Carolina. For more information about HMAP in North Carolina, visit: <https://epi.dph.ncdhhs.gov/cd/hiv/hmap.html>.

North Carolina also provides planning for HIV housing and housing-related services through the United States Department of Housing and Urban Development's Housing Opportunities for Persons with AIDS Program, or HOPWA. Information about HOPWA can be found: <https://www.hudexchange.info/programs/hopwa/>.

North Carolina Engagement in Care Database for HIV Outreach (NC ECHO)

The North Carolina Engagement in Care Database for HIV Outreach (NC ECHO) was conceptualized in 2011 and developed as a component of North Carolina's Health Resources and Services Administration HIV/AIDS Bureau (HRSA HAB) Special Projects of National Significance System Linkages demonstration project (SPNS Link). Collaborators include the NC Division of Public Health, Duke University, University of North Carolina-Chapel Hill, NC Information Technology Division, and the NC Division of Health Benefits (the NC LINK team). This secure, web-based system became operational in August 2016.

Employing probabilistic linkage methods to link common person records across five data systems, NC ECHO provides a comprehensive snapshot of person-level and population-wide HIV care patterns. The five data sources included in NC ECHO represent North Carolina's HIV surveillance programs (NC EDSS and eHARS), Ryan White Part B, C, and D HIV/AIDS Care Programs (CAREWare and HMAP), and Medicaid.

With monthly refreshes, NC ECHO is used to generate near real-time lists of NC PLWH who are out of care for linkage and re-engagement by state bridge counselors (SBCs). Additionally, extracts from the system are used to detect data gaps within the HIV surveillance system, to investigate patterns of record duplication,

¹² Centers for Disease Control and Prevention (CDC) (2018). *HIV Treatment*. Accessed on June 25, 2019. Retrieved from <https://www.cdc.gov/hiv/basics/livingwithhiv/treatment.html>.

and to generate viral suppression outcome measures for administrative groups of interest, including HMAP, HOPWA, and Medicaid recipients.

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.

Unmet HIV Medical Need

National resource and allocation planning activities require information about access to HIV medical services among HIV-affected communities to understand needs and monitor disparities. HRSA HAB requires that each Ryan White Part A and Part B program regularly estimate the need for medical services among populations of people with HIV. Central to this planning are estimates of people with HIV who do not receive 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 includes access to ARTs and other drug therapies as well as treatment of opportunistic infections.^{13,14}

Estimates of unmet need for HIV medical care are identified based on information reported to public health by laboratories and care providers for people living with HIV in North Carolina. Public health records are routinely matched to statewide Ryan White-funded care data (CAREWare), HIV Drug Assistance Program (HMAP), and Medicaid data sources to identify additional markers of care not provided through public health reporting.

Estimation Methodology

Individuals receiving care or diagnosis for HIV or AIDS and known to be living in North Carolina are selected across a five-year measurement period (2018-2022). An individual with HIV is considered to have an unmet medical need 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 ARV. Evidence of at least one of these three care markers in 2022 is classified as met HIV medical need.

Results

In total, 83.8% of people living with HIV in North Carolina were estimated to have their HIV medical needs met in 2022. 16.2% were estimated to have unmet need. Table A presents the proportion of people living with HIV with unmet need by gender, age, race/ethnicity, and hierarchical risk of HIV exposure. People identified as transgender based on self-report had similar unmet need for HIV primary care (15.2%) as people identified as female, while people identified as male had an unmet need of 16.6%. The unmet need

¹³ Panel on Antiretroviral Guidelines for Adults and Adolescents. (2021). *Guidelines for the use of antiretroviral agents in adults and adolescents with HIV*. Department of Health and Human Services. Updated August 16, 2021. Accessed November 17, 2021. Retrieved from <https://clinicalinfo.hiv.gov/sites/default/files/guidelines/documents/adult-adolescent-arv/guidelines-adult-adolescent-arv.pdf>.

¹⁴ Panel on Antiretroviral Therapy and Medical Management of Children Living with HIV. (2021). *Guidelines for the Use of Antiretroviral Agents in Pediatric HIV Infection*. Updated April 7, 2021. Accessed November 17, 2021. Retrieved from <https://clinicalinfo.hiv.gov/en/guidelines/pediatric-arv/whats-new-guidelines>.

among the various races was 13.8%-24.3% with the American Indian/Alaska Native population having the highest proportion (24.3%). The highest unmet need by age was in the 25- 34-year-old age group (20.0%).

Risk groups with the highest proportion of PLWH with unmet need were men who reported injection drug use (19.4%), people who are transgender and reported injection drug use and sex with men (21.4%), and people identified as female who had exposures other than injection drug use and heterosexual contact (23.5%). The Elizabeth City (25.6%) and the Fayetteville Regional Networks of Care and Prevention (RNCP) regions (25.5%) were the two regions with the highest estimated proportion of people with unmet need.

Table A. “Unmet Need” for People Living with HIV in North Carolina with Care Markers in the Last Five Years

Demographics	Percent “Unmet Need”
Gender	
Men	16.6
Women	15.1
Transgender ^a	15.2
Current Age	
Less than 13	5.4
13-24	13.8
25-34	20.0
35-44	18.2
45-54	15.6
55-64	13.6
65 and older	15.2
Race/Ethnicity	
American Indian/Alaska Native ^b	24.3
Asian/Pacific Islander ^b	14.5
Black/African American ^b	16.9
Hispanic/LatinX	15.5
White/Caucasian ^b	15.2
Multiple Race	13.8
HIV Exposure-Women	
Heterosexual	13.7
IDU ^c	17.5
Other	23.5
Unknown	15.6
HIV Exposure-Men	
Heterosexual	18.0
IDU ^c	19.4
MSM ^c	15.7
MSM/IDU ^c	17.5
Other	16.0
Unknown	18.3
HIV Exposure-Transgender^a	
Heterosexual	0.0
IDU ^c	0.0
MSM ^c	16.9
MSM/IDU ^c	21.4
Unknown	11.1
Regional Networks of Care and Prevention (RNCP)	
Charlotte-TGA	14.6
Region 1-Asheville	14.0
Region 2-Hickory	10.4
Region 3-Winston-Salem	13.2
Region 4-Greensboro	14.3
Region 5-Fayetteville	25.5
Region 6-Raleigh	16.4
Region 7-Wilmington	15.6
Region 8-Wilson	13.4
Region 9-Elizabeth City	25.6
Region 10-Greenville	14.4
Subpopulations of Interest	
Black/African American Women	14.5
MSM ^c of Color	17.0
Transgender	15.2
People who inject drugs	18.6

Transgender status is based on self-report. Due to historical and current stigma, the total number of transgender people is likely to be an underestimation. This variable was not routinely captured until 2015 in our surveillance system. For more information, refer to [Appendix A](#). / ^bNon-Hispanic/LatinX. / ^cIDU-injection drug use; MSM-men who report sex with men. / Data Source: enhanced HIV/AIDS Reporting System (eHARS) (data as of August 2023) and North Carolina Engagement in Care Database for HIV Outreach (NC ECHO) (data as of July 2023).

HIV Prevention in North Carolina

In North Carolina, HIV testing is available 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 provides resources and technical support to community-based organizations, community health centers, health departments, and state and local correctional facilities to expand HIV testing in clinical and jail settings.

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. 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.

In 2022, a total of 104,274 HIV tests were performed at the North Carolina State Laboratory of Public Health (NC SLPH), compared to 118,894 tests performed in 2021. This was a 14% increase in tests from 2021. Testing performed by state-sponsored counseling and testing sites increased by 12.7% in 2022; a total of 26,251 HIV tests were performed in 2022 compared to 23,297 tests performed in 2021. Among tests performed by state-sponsored counseling and testing sites, 210 tests were confirmed positive (0.8%). Of the 210 positive tests, 71 were newly identified cases of HIV (0.3%). These state-sponsored counseling and testing sites HIV tests include those conducted by agencies partnering with NC DPH and reporting testing.

Pre-Exposure Prophylaxis (PrEP) Coordinators

The North Carolina Communicable Disease Branch has implemented a statewide HIV Pre-Exposure Prophylaxis (PrEP) project. The primary goal of the PrEP Project is to work with the Communicable Disease Branch's HIV prevention partners to support access to PrEP services for eligible people at high risk for HIV, with a focus on men who have sex with men (MSM), particularly young Black/African American MSM. This partnership allows prevention partners to collaborate and develop relationships with the MSM communities to identify those at most risk for HIV and link them to qualified providers for PrEP. It also provides capacity building and technical assistance to increase the ability of providers in the regions to provide high quality, accessible PrEP services. The North Carolina Communicable Disease Branch also has convened a Statewide PrEP Advisory Committee composed of providers, consumers, academics and others interested in increasing PrEP access across NC. This body meets every other month and provides community input into our statewide PrEP plan.

In addition, The North Carolina Communicable Disease Branch supports a statewide PrEP Coordinator and four regional PrEP Coordinators to address the objectives below:

- Increase the awareness and availability of PrEP in their regions and statewide.
- Ensure that providers are aware of PrEP and make appropriate referrals and linkages to PrEP for clients who are appropriate for PrEP.
- Increase public awareness of PrEP regionally and statewide.
- Track clients referred to PrEP by Prevention funded agencies, verify PrEP initial appointments both regionally and statewide and undertake programmatic efforts to increase both of these numbers.

- Ensure that at least 50% of referred clients who start PrEP attend a medical appointment for PrEP annually in their regions and statewide.
- Provide clinical training, capacity building, and technical assistance to providers. Work to ensure collaborative relationships with clinical providers and prevention agencies across the region and provide them with ongoing support, technical assistance, and capacity building as needed.

Partner Notification, Counseling, and Referral Services

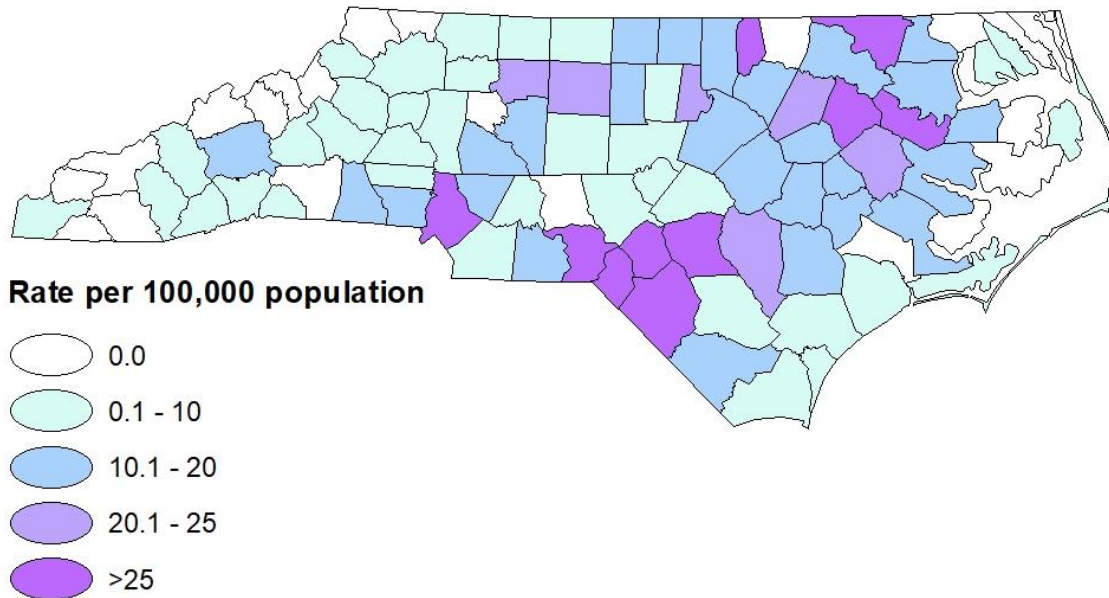
In North Carolina, partner notification, counseling, and referral services for HIV and syphilis are performed by a specialized group within the North Carolina Department of Health and Human Services, known as the Field Services Unit. This unit strives to control the spread of HIV and STIs by:

- 1) Interviewing all people newly diagnosed with HIV and early syphilis to link newly diagnosed individuals to care;
- 2) Ensuring the partners of people with HIV and early syphilis are notified of their exposure and ensuring that appropriate testing and treatment occur;
- 3) Counseling patients who are infected or exposed to HIV or STIs on how to reduce their risk of transmitting or acquiring other STIs;
- 4) Coordinating with local health departments and CBOs to offer prevention and control services for people at higher risk of being exposed to STIs; and
- 5) Providing education and outreach services to clinicians statewide and promoting adherence to the CDC's STI screening and treatment guidelines.

Disease Intervention Specialists (DIS) are the backbone of HIV and STI prevention and control. The DIS are highly skilled in case investigation, contact tracing, and other activities aimed at interrupting disease transmission networks. Additionally, this unit has 10 bridge counselors across the state who help people link to and stay in HIV care, as well as assist out-of-care HIV-positive individuals re-engage in HIV medical care. 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).

HIV Rate Map by County of Residence at Diagnosis, 2022

Figure 3. Newly Diagnosed HIV Rates in North Carolina by County of Residence at Diagnosis, 2022[^]



[^] Data Source: enhanced HIV/AIDS Reporting System (eHARS) (data as of July 2023).

APPENDIX A: Technical Notes

About the Authors

North Carolina law requires that diagnoses of certain communicable diseases, including STIs, be reported to local health departments that in turn report the information to the state. The HIV/STD/Hepatitis Surveillance Unit is the designated recipient for STI and viral hepatitis B (HBV) and hepatitis C (HCV) morbidity reports at the state level. From these reports, the HIV/STD/Hepatitis Surveillance Unit is responsible for aggregating these reports and providing county, regional, and statewide information about STIs and viral HBV and HCV to others, including the CDC. The HIV/STD/Hepatitis Surveillance Unit is part of the Communicable Disease Branch within the North Carolina Division of Public Health.

About the Content of This Report

This document, the *2022 North Carolina HIV Surveillance Report*, includes summary tables of surveillance reports and other information for all stages of HIV. In some instances, total numbers of reports may not agree between separate cross-tabulations due to missing values for some variables.

Detailed data tables of HIV by county of diagnosis/residence and demographics can be found in the 2022 North Carolina HIV Surveillance Data Tables excel file. This excel file can be downloaded from the Annual Reports page (<https://epi.dph.ncdhhs.gov/cd/stds/annualrpts.html>).

Some HIV infection (including Stage 3 [AIDS]) statistics are provided for the regional networks of care and prevention (RNCP), including the Charlotte transitional grant area (TGA), as displayed on the back cover. The 95 counties supported by the Ryan White Part B base program are grouped into 10 RNCP, while the remaining five counties make up the Charlotte TGA.

Rates are presented by race/ethnicity, age group, and gender for each disease. For the combined race/ethnicity category, we classified all cases with reported Hispanic ethnicity as Hispanic/LatinX, regardless of their race. Cases with non-Hispanic or unknown ethnicity were classified according to their reported race. Cases with a reported race of "other" were included in the unknown race category. Rates are also presented for counties across the state and are expressed as cases per 100,000 population. Beginning with the 2021 Annual Report, rate denominators were estimated using the Census demographic population estimates for 2018-2021 from the Census Bureau's Population Estimates Program (PEP). In this report, 2021 estimates were used to calculate rates for both 2021 and 2022. More information about Census Population and Housing Estimates is available on the Census website (<https://www.census.gov/programs-surveys/popest/data/special-tab/content.html>). Use of these population denominators enabled calculation of rates for the multiple race category.

Rates that are based on a small number of cases (generally fewer than 10) should be viewed with caution and are considered unreliable because these rates have large standard errors and can vary

widely with small changes in case numbers. Data is suppressed in this document according to the North Carolina Division of Public Health Communicable Disease Branch data release guidelines, which were updated in March 2018. These data are suppressed for table cells with a population denominator less than 500.

HIV Surveillance Data

HIV Case Definition

In 2014, the CDC revised the existing surveillance case definitions for HIV. There are four stages of HIV infection (0, 1, 2, and 3). A person's age is no longer part of the stage of infection criteria.¹⁵ HIV case reports represent people who have a confirmed diagnosis of HIV, regardless of the stage of infection. Stage 3 represents the traditional definition of AIDS. HIV infection is categorized as Stage 3 (AIDS) when the patient develops a CD4+ T-lymphocyte cell count (CD4) of less than 200 or an AIDS-defining condition (opportunistic infection), or a CD4 percentage of less than 14 if a CD4 cell count is not available.¹⁵ In this document, the use of the term AIDS refers to Stage 3. AIDS remains the classification of the case for surveillance purposes, even if the CD4 cell count increases or opportunistic infection is resolved.

HIV cases are counted by the initial date of diagnosis of the HIV infection, whereas AIDS cases are counted by the date of diagnosis for the initial AIDS diagnosis. Most AIDS case reports represent people who were diagnosed with HIV infection in earlier years. However, in North Carolina, about one-fourth to one-third of new HIV diagnoses are in people who are initially diagnosed with HIV infection and AIDS at, or very near, the same time. **The two categories should never be combined to estimate an infected population, as the broad category of HIV infection includes AIDS cases, except when HIV (non-AIDS) is indicated.**

All HIV and AIDS totals and rates discussed in this report are restricted to adults and adolescents (at least 13 years of age) for comparability across states and with national data reported by the CDC. Before the 2016 surveillance report, the county-level tables included people who were under 13 years of age.

Most Recently Known County of Residence

In previous versions of this report, the total number of people diagnosed and living in North Carolina with HIV were counted by the person's county of residence at diagnosis. Starting with the 2015 report, the HIV/STD/Hepatitis Surveillance Unit began to present a new geographic category called the "most recently known county of residence." This new category is based on the most recently known current address in the enhanced HIV/AIDS Reporting System (eHARS), which is the mechanism by which de-identified data is reported to the CDC. People whose most recently known state of residence is North Carolina are identified in this new category. Therefore, these tables include people diagnosed with HIV both in and outside North Carolina, but most recently known to be living here. People classified in the

¹⁵ Selik, R.M, Mokotoff, E.D., Branson, B., Owen, S.M., Whitmore, S., & Hall, H.I. Revised Surveillance Case Definition for HIV Infection-United States, 2014. MMWR 2014; 63(RR-3): pages 1-3.

“unassigned” category have a most recent address in a long-term care facility, including prisons. This category gives us a better way to examine the current burden for each county in North Carolina and will be used throughout the document (see Tables 1, 8 to 19, and 23). Data is no longer presented based on a person’s county of residence at diagnosis in the context of people diagnosed and living in North Carolina.

Gender and Binary Gender

Data are presented based on gender (male, female, or transgender) and on binary gender (male or female) recorded for all people diagnosed and living with HIV at the time of diagnosis. This information is gathered from the following data systems: the enhanced HIV/AIDS Reporting System (eHARS), North Carolina Electronic Disease Surveillance System (NC EDSS), CAREWare (Ryan White Part B data), and HIV Medication Assistance Program (HMAP). All people living with HIV, including people that self-identify as transgender, have a binary gender (male or female) recorded. At this time, we can only assign a hierarchical transmission risk based on binary gender. Therefore, for tables that display exposure category, transgender people are included and classified according to their binary gender (either male or female). We are planning to report this using all genders in the next annual report. Due to historical and current stigma, the numbers of transgender people living with HIV in North Carolina presented in this report are likely to be an underestimation. This variable was not routinely captured until 2015 in our surveillance system.

Estimation of Heterosexual and MSM Rates

In previous versions of this report, rates for the exposure categories for HIV were not calculated due to the lack of population data for specific exposure groups. In 2016, Grey et al. published a paper called *“Estimating the population sizes of men who have sex with men in US states and counties using data from the American Community Survey.”*¹⁶ They used data from the American Community Survey (ACS) 5-year summary file, from 2009 to 2013 to obtain the number of households of a male householder and male partner, and the total number of men aged 18 years and older for each county in the U.S. Grey et al. estimated that in North Carolina, an estimated 2.9% of the male population were men who report sex with men (MSM).

Estimated MSM rates were calculated using 2.9% of the male population in the state (older than 13 years of age). The estimated male heterosexual population was calculated by subtracting the overall male population, over the age of 13, by the estimated MSM population and used to calculate the estimated male heterosexual rate. The estimated female heterosexual rate was calculated using the overall female population over the age of 13 in the state. Rates for the other exposure groups (IDU, MSM/IDU, and other risks) were not calculated due to the lack of population data.

¹⁶ Grey et al. (2016). Estimating the population sizes of men who have sex with men in US states and counties using data from the American Community Survey. *JMIR Public Health Surveil.* 2016; 2(1): e14. doi:10.2196/publichealth.5365.

HIV Hierarchical “Risk of Exposure” Categories and Distribution

For Tables 28 through 30 and Table 32, we have assigned a risk to cases with an unknown risk of exposure based on the distribution of the known risk data. Up to one-third of reported cases may be missing risk information; therefore, reassigning these cases to a risk group allows for a more complete picture of trends over time. Risk redistribution is only done for data at the state level.

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.¹⁷ 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.

Hierarchical Categories

- Male-to-male sexual contact: men who have had sexual contact with men (i.e., homosexual contact) and men who have had sexual contact with both men and women (i.e., bisexual contact)
- Injection drug use (IDU): people who have injected non-prescription drugs
- Male-to-male sexual contact and injection drug use (male-to-male sexual contact and IDU): men who have had sexual contact with other men and injected non-prescription drugs
- Heterosexual contact: people who have ever had heterosexual contact with a person known to have, or to be at high risk for HIV infection
- Perinatal: people infected through perinatal transmission but aged 13 years and older at time of diagnosis of HIV infection. Prevalence data and tables of death data includes persons infected through perinatal transmission but aged 13 years and older during the specified year or at death.
- Other: all other transmission categories (e.g., blood transfusion, hemophilia, risk factor not reported or not identified).

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% (48/80) were MSM, 5.0% (4/80) were IDU, 2.5% (2/80) were MSM/IDU, and 32.5% (26/80) were heterosexual contact. These fractions are then applied to the 20 NIR cases. For example, MSM: $(20) \times (.60) = 12$; thus 12 of the 20 NIR cases are reassigned to MSM, after the redistribution calculation. For heterosexual contact, $(20) \times (.325) = 6.5$ or 7 (rounded). Therefore, 7-of-20 NIR cases are assigned to heterosexual contact, after the redistribution calculation. Actual reassignment accounts for the differences of racial/ethnic, age and gender distributions for each risk group.

¹⁷ Centers for Disease Control and Prevention (CDC). <https://www.cdc.gov/hiv/risk/estimates/riskbehaviors.html>, website accessed 10/21/2022.

North Carolina Regional Networks of Care and Prevention Map

