2021 Sexually Transmitted Infections Annual Report

June 2023

Colorado 2021 Sexually Transmitted Infections Annual Report

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Statement on Structural Inequity

The Colorado Department of Public Health and Environment acknowledges that generations-long social, economic and environmental inequities result in adverse health outcomes. They affect communities differently and have a greater influence on health outcomes than either individual choices or one's ability to access health care. Reducing health inequities through policies, practices and organizational systems can help improve opportunities for all Coloradans.

CDPHE aspires to present data humbly, recognizing statistics and numbers never tell the complete story. The goal is to work collaboratively with individuals and communities to learn and share their stories to build a collective understanding. Knowing that people have different lived experiences and have inequitable opportunities to achieve optimal health, we commit to pair data and stories to inform programs and systems change to improve health for all (Adapted from the Denver Public Health, Health Equity Data Commitment and Principles).

Executive Summary

The 2021 Sexually Transmitted Infection Annual Report is descriptive and its purpose is to present the data in multiple ways for use by local public health agencies, healthcare professionals, non-profit organizations and the public. It is intended to be a resource to aid in prevention planning, funding applications, reports, and presentations. It presents statistics and trends for reportable sexually transmitted infections (STIs) in Colorado. These include chlamydia, gonorrhea and syphilis. STIs are one of the most commonly reported conditions in Colorado and are among the world's most common diseases. There were 39,647 STIs reported in Colorado in 2021 - 26,747 cases of chlamydia, 10,596 cases of gonorrhea, and 2,304 cases of syphilis of all stages. This year has seen the highest reported cases of gonorrhea and syphilis in Colorado, with chlamydia cases rising but still lower than pre-2020 levels. These trends mirror increases at the national level. For more information on national STI trends, please reference the CDC 2021 STD Surveillance Report.

This report describes trends in reportable STIs in Colorado by person, place, and time. STI surveillance data are used to detect outbreaks, prioritize resources, develop and tailor interventions, and evaluate the effectiveness of interventions. Some of the reasons for preventing and controlling STIs include high rates of complications and adverse health outcomes. STIs also can facilitate the transmission of HIV and are closely related to other comorbidities such as substance use and mental illness. STIs can also serve as a marker to identify health-related inequities that exist in Colorado communities.

Chlamydia

In 2021, Colorado reported 460.0 cases of chlamydia per 100,000 people, a 1.8% increase from 2020 but a 4.58% decrease from 2017. The majority of chlamydia cases are among women, 63.4%, and the highest rates were among 20-24-year-old females in 2021.

Gonorrhea

There were 182.2 cases of gonorrhea per 100,000 people reported in Colorado in 2021. This is an 8.82% increase from 2020 and a 20.36% increase since 2017. Males accounted for 60.4% of cases, and 60.1% of all cases were among those 20-34 years of age.

Syphilis

There were 39.7 cases of syphilis (all stages) per 100,000 reported in Colorado in 2021, a 29.1% increase from 2020 and a 171.2% increase from 2017. Males accounted for 64.4% of cases. However, the proportion of women diagnosed with syphilis has been increasing the past several years (12.0% in 2016 to 35.6% in 2021).

Highest rates of primary and secondary syphilis were among 25-39 year olds and highest rates of non-primary, non-secondary latent syphilis were among 25-34 year olds, with males accounted for 84.6% of all cases. There were 49.3 cases of congenital syphilis per 100,000 live births in 2021, and 44.0 per 100,000 cases syphilis among women of reproductive age (WRA), which is double the rate of this demographic in 2020.

Data Sources and Methods

Under Colorado law updated in May 2017, health care providers and laboratories must report all diagnosed cases of chlamydia and gonorrhea to the Colorado Department of Public Health and Environment (CDPHE) within four days and all syphilis cases within one workday.[1] These case reports are entered into the statewide STI reporting database. Case reports entered into this database are the primary data source for diagnosed cases of STIs in Colorado. Chlamydia, gonorrhea and syphilis cases most often require laboratory confirmation; all laboratories submit STI reports to CDPHE, and all major laboratories report STIs electronically via secure data networks.

Colorado's STI reporting system, Patient Reporting Investigating Surveillance Manager (PRISM), is an event-based relational database. This system allows for electronic disease reporting for the vast majority of reports and helps to reduce reporting delays due to a small minority of reporting still using a paper-based process. This has led to an improvement in the speed of partner management and treatment activities. Case information is updated as provider reports are received and interviews with patients are completed. Additionally, STI related reports are now geocoded, providing assurance that cases are attributed to the right jurisdiction for official reporting purposes and allowing for more accurate calculation of rates at a geographic level.

The National Electronic Telecommunications System for Surveillance (NETSS)[2] is a mechanism for state and local health jurisdictions to transmit surveillance data weekly and the finalized year-end data to the Centers for Disease Control and Prevention (CDC). This year-end data is the primary source of the official STI numbers in this report.

Rates of reported cases in this report were calculated based on cases diagnosed in the calendar year per 100,000 persons. The 2021 disease rates for all Colorado counties are calculated by dividing the number of cases diagnosed for that county in 2021 by the 2021 total population for each county estimated by the Colorado State Demography Office and multiplying by 100,000.

Age and sex-specific rates of reported cases are presented in this report. The counts presented are summations of all valid data reported in the 2021 reporting year. Rates based on a small number of cases are often statistically unreliable especially for counties with small populations or where rates are calculated for age, sex or race/ethnicity with small cell sizes.

Guidelines for Accurate Use of Data

The following guidelines are provided to ensure an accurate understanding of the use, interpretation and limitations of the data presented in this report. These guidelines can help prevent data misuse and increase understanding of the accuracy and correct use of the STI data. These guidelines may be considered when reviewing data from any source.

1. Data in this report are primarily reported for new cases of STIs diagnosed in 2021. They are not for unique persons diagnosed with disease, e.g. a person may have more than one occurrence of disease in a single year.

[1] CDPHE, DCEED, Colorado Revised Statutes § 6 CCR 1009-1, Rules and Regulations Pertaining to Epidemic and Communicable Disease Control (Promulgated by The State Board of Health). https://www.colorado.gov/pacific/cdphe/regulations-adopted-board-health-division. Effective May 2017.
[2] https://wwwn.cdc.gov/nndss/netss.html

2. Data in this report are based on cases reported to the Case Investigation and Outreach Unit, Office of STI/HIV/VH. These data represent occurrences of disease among persons seeking and receiving care for STIs.
3. Small changes in numbers from year to year can appear dramatic if the actual number of cases is small. For example, if two cases of gonorrhea are counted in a county in one year and three cases are counted the next year, this is an increase of 50%. While this may sound significant, a change of one case does not represent a meaningful increase in the burden of disease. Although disease rates were calculated for counties reporting fewer than five cases, rates based on low case counts are considered statistically unreliable. Caution is recommended in interpreting trends or comparing across counties.
4. Data are presented for all reported cases and are known not to be 100% complete. Factors that impact the completeness and accuracy of STI data include:
    a. Level of STI screening by health care providers
    b. Individual test-seeking behavior (awareness of illness often depends on whether an individual is symptomatic or not)
    c. Sensitivity of diagnostic tests
    d. Compliance with case reporting
    e. Completeness of case reporting
    f. Timeliness of case reporting
    g. COVID-19 related delays in supply shortages or reporting
5. Increases and decreases in STI rates can be due to actual changes in disease occurrence and/or changes in one or more of the above factors.
6. CDPHE does not maintain statistics for other, non-reportable STIs, e.g. herpes, HPV, genital warts, but does maintain statistics for HIV and Hepatitis C, which are reported separately and not included here.
7. Early syphilis comprises of primary and secondary syphilis, which is symptomatic, and non-primary, non-secondary latent[3] syphilis, which is asymptomatic. Syphilis infectivity varies based on its presentation; while primary and secondary syphilis is considered to be highly infective, non-primary, non-secondary latent syphilis is not. For this reason, public health programming may base interventions and evaluation methods on primary and secondary syphilis infection rate alone. That said, given the morbidity of both primary and secondary and non-primary, non-secondary latent syphilis, we have included information on both presentations.

Limitations

Due to the increasing number of STIs in Colorado, the percent of unknown race/ethnicity increased from 2012 to 2017. This was most evident in chlamydia where the percent of unknown race/ethnicity went from 28.1% in 2012 to 50.2% in 2017. There was a slight reduction in percent of unknown race/ethnicity in 2020 (35.7%) and a larger reduction in 2021 (21.2%). Gonorrhea also showed an increase in unknown race/ethnicity from 13.9% in 2012 to 35.3% in 2017, with a decrease in 2018 and 2019, followed by an increase in 2020 and a decrease to 13.3% in 2021. In primary and secondary syphilis, the percent of unknown race/ethnicity went from 9.8% to 1.6% from 2013 to 2021. Non-primary, non-secondary latent syphilis follows the same pattern as chlamydia and gonorrhea where the percent of unknown race/ethnicity was 5.1% in 2013 and increased to 6.4% in 2017 with a decrease in 2021 to 0.6%. Among the Hispanic population, there are a significant proportion of cases with an

[3] In 2017, CDC updated the case definition and naming convention for early latent syphilis to start January 1, 2018. What was referred to as early latent syphilis in the past is referred to as non-primary, non-secondary latent syphilis in this report.

unknown race - 17.7% in chlamydia, 14.1% in gonorrhea, 11.1% in primary and secondary syphilis, 9.4% in non-primary, non-secondary latent syphilis. For figures displaying race/ethnicity, these and all other racial groups in the Hispanic ethnicity are combined. Race/ethnicity data for chlamydia and gonorrhea is primarily derived from labs, which often do not report race/ethnicity and results in less data completeness. Procedures were put in place to help with race/ethnicity data ascertainment. For 2021, decreases across all STIs to below 30% unknown race/ethnicity allows race/ethnicity graphics to be included in this report for 2021 data only. However, due to the proportion of cases having unknown race/ethnicity being over 30% for both chlamydia and gonorrhea in the previous years, annual rate trends by this variable are not displayed.

This is the first year the Hispanic ethnicity is broken up by race in the tables. In all STIs, the highest rate among the Hispanic category is among Hispanic Asian/Pacific Islanders and Hispanic Blacks; however, across all STIs, these groups also make up 1% or less of all cases. Population size varies greatly across races in the Hispanic ethnicity, which has a large impact on rates for each race and the overall Hispanic rate. Among Hispanics (who represent 22.2% of the total population in 2021), the Asian/Pacific Islander population of 14,838 is 0.3% of the total population, the Black population of 33,041 is 0.6% of the total population, the Indigenous/Native American population of 60,452 is 1.9% of the total population, the White population of 1,133,555 is 19.5% of the total population, and the Multi-Race population of 49,583 is 0.9% of the total population. As mentioned above, the Hispanic Other/Unknown population represents 10% or more of the total number of cases across all STIs; however, population data for this group is not available and rates cannot be calculated in the Tables. All Hispanic race groups are still combined for overall Hispanic counts and rates shown in the Figures.

Access to STI, HIV, and Viral Hepatitis Services during the COVID-19 Pandemic were greatly impacted due to shifts in healthcare/public health infrastructure and workforce, limiting testing and identification of new diagnoses. This led to a decline in screening in 2020, but screening levels for 2021 increased back to pre-2020 levels according to Medicaid and APC data. This may be due to a return to previous practices or established new practices to reach those not seen in 2020. Additionally, due to the increasing number of STIs in Colorado, follow-up and interviews were limited in 2020 and 2021 to new HIV and syphilis diagnoses. This results in less data completeness for chlamydia and gonorrhea cases, especially for data relating to previous HIV diagnoses and risk behavior information.

Reporting in chlamydia and gonorrhea cases decreased drastically in school-based and family planning clinics. Compared to 2019, 2021 reported cases of chlamydia and gonorrhea were 38.4% and 40.0% lower, respectively, in school-based clinics. This could be attributed to a decrease in reported cases during the COVID-19 pandemic while a National Public Health Emergency was still in effect, resulting in new policies around closing and reopening schools. Reported cases from family planning clinics also started to decrease in 2020 and continued through 2021. From 2019 to 2021, chlamydia and gonorrhea reporting in these clinics decreased by 24.6% and 19.4%, respectively, which may be attributed to the COVID-19 National Public Health Emergency and, more recently, may reflect changes in policies surrounding sexual health service provision in family planning clinics. In contrast, reported cases of gonorrhea from Emergency Departments/Urgent Cares have increased by 22.5% from 2019.

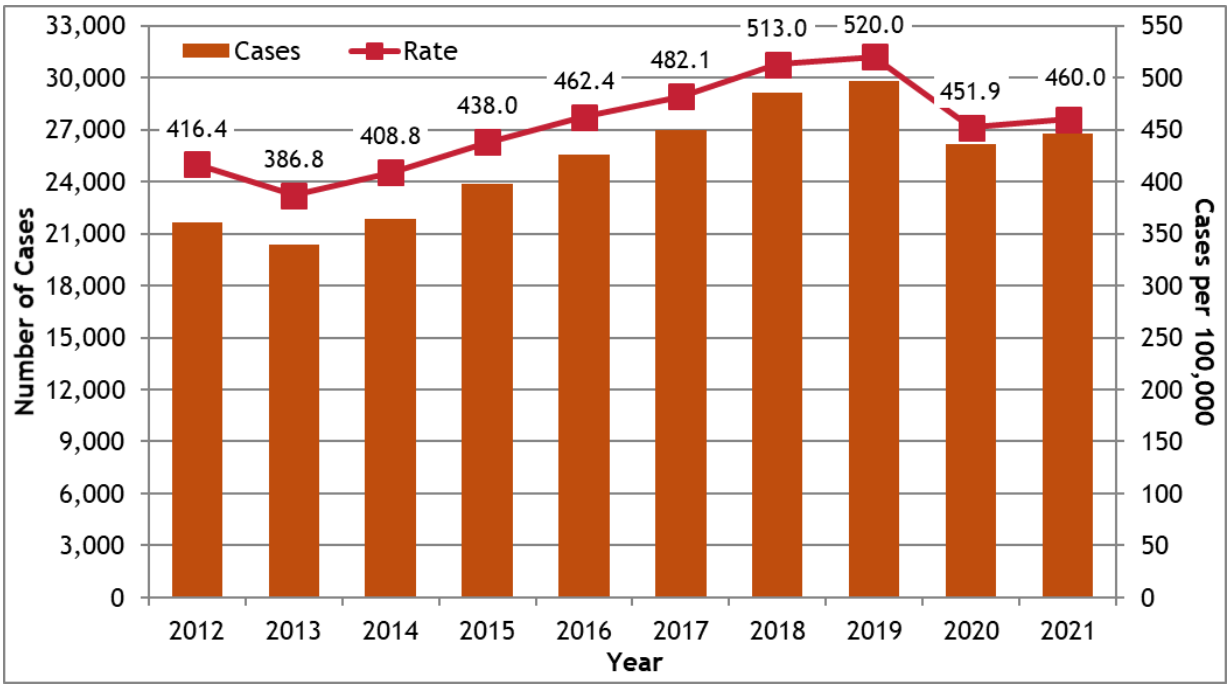
Anyone with questions about how these data should be interpreted is encouraged to contact the STI/HIV/VH Data Analytics, Program Evaluation, and SURRG Program at (303) 692-2700.

Chlamydia

In 2021, there were 26,747 reported cases of chlamydia, the most commonly reported STI in Colorado. This corresponds to a statewide rate of 460.0 cases per 100,000 people, which is a significant increase of 1.80% since 2020 (451.9 per 100,000), which is similar to the increase of 1.35% seen from 2018 to 2019. **Figure C.1** shows annual case counts and rates of chlamydia in Colorado from 2012 to 2021. Increases in rates were accelerating from 2014 to 2018, followed by a slight increase in 2019, and a significant decrease in 2020, likely due to testing barriers caused by the COVID-19 pandemic. While the increase from 2020 to 460.0 in 2021, this is still significantly lower (4.58% decrease) than the rate in 2017 but significantly higher compared to the rate in 2012 (10.47% increase).

Nationally, chlamydia is also the most common notifiable STI reported in the U.S., and there were 1,644,416 cases of chlamydia reported to the CDC in 2021, which is a rate of 495.5 cases per 100,000 people. This is a 4.1% increase in cases and a 3.9% increase in rates since 2020. Rates increased across genders and most age and race groups, and were highest among adolescents and young adults, with over half (58%) of cases being among 15-24 year olds. Nationally, cases and rates were 3.8% and 5.5% lower, respectively, compared to cases and rates in 2017[4].

Figure C.1: Reported Chlamydia Cases and Rates of Reported Cases, Colorado, 2012-2021



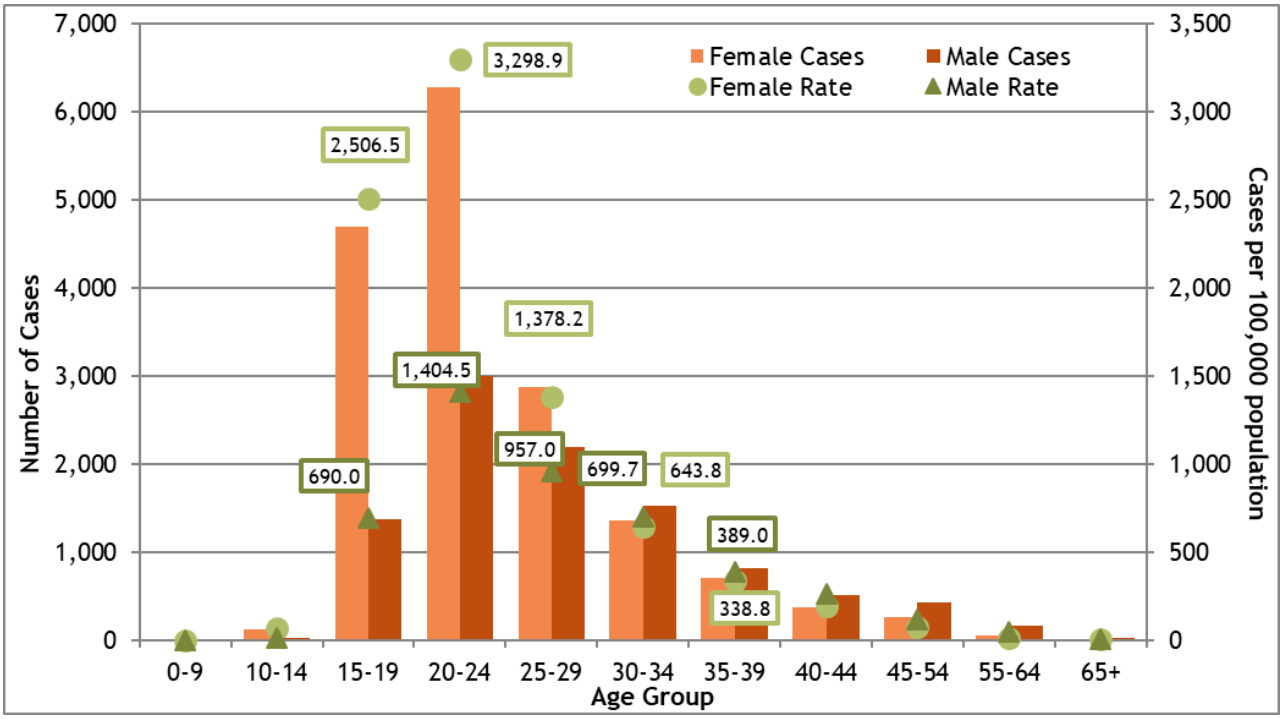
In Colorado, rates per 100,000 varied significantly by sex and age. **Figure C.2** shows age and sex counts and rates for chlamydia diagnoses in 2021 reported in Colorado. Females accounted for 62.5% of all cases and had an overall rate of 576.0, compared to the overall male rate of 344.3 (see **Table 1** in the

[4]Division of STD Prevention, National Center for HIV, Viral Hepatitis, STD, and TB Prevention, Centers for Disease Control and Prevention. 2023. "Sexually Transmitted Disease Surveillance, 2021." Centers for Disease Control and Prevention. https://www.cdc.gov/std/statistics/2021/default.htm.

appendix). The mean age at diagnosis was 25.9, with a range of 0 to 92 years. The mean age for females was 24.4 and the mean age for males was 28.5. The highest rates were among 20-24 year olds, with a rate of 2,297.4 per 100,000. Rates were also above 1,000 per 100,000 for 15-19 and 25-19 year olds. Among 20-24 year olds, the female rate was more than twice the male rate, and among 15-19 year olds, the female rate was more than four times greater than the male rate. Similarly, the national rate was also highest among 20-24 year olds, with a rate of 2,724 per 100,000, where females had more than double the rate of males (3,797.8 compared to 1,680.0)[5].

The marked difference in case rates by sex may be attributed to screening efforts which target females in reproductive health settings. To a lesser degree, this difference may also reflect the natural history of chlamydia infections. Males are less susceptible to infection, are more likely to be asymptomatic compared to females, and are less likely to access health services and receive routine screening.[6] The result of these factors is the burden of chlamydia infections among males remains largely undiagnosed, untreated and unreported.[7] Additionally, the decrease in reporting from school-based clinics and family planning clinics(see limitations section) may help explain the continued decrease compared to pre-COVID-19 numbers.

Figure C.2: Reported Chlamydia Cases and Rates of Reported Cases by Sex and Age Group, Colorado, 2021



[5]Centers for Disease Control and Prevention. 2023. "Table 4. Chlamydia — Reported Cases and Rates of Reported Cases by Age Group and Sex, United States, 2017-2021." Sexually Transmitted Disease Surveillance 2021. https://www.cdc.gov/std/statistics/2021/tables/4.htm.

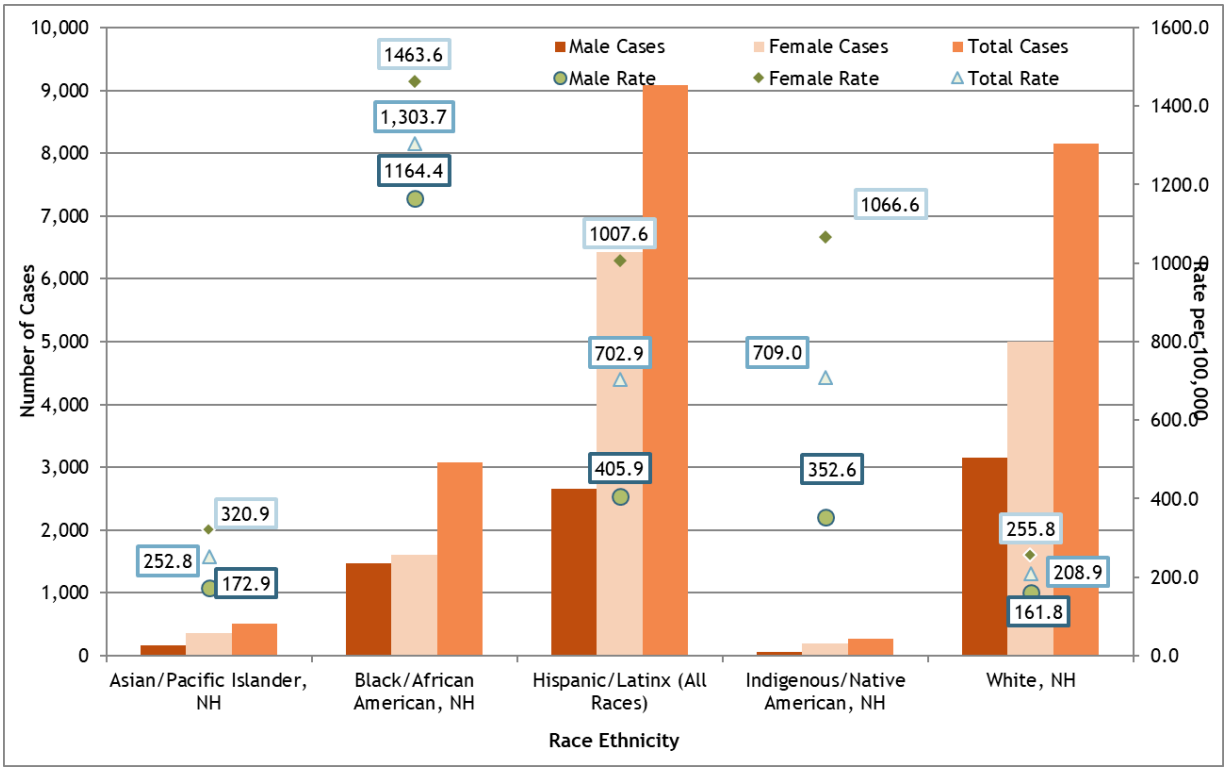
[6] Maraynes, M. E., Chao, J. H., Agoritsas, K., Sinert, R., & Zehtabchi, S. (2017). Screening for asymptomatic chlamydia and gonorrhea in adolescent males in an urban pediatric emergency department. World Journal of Clinical Pediatrics, 6(3), 154-160. http://doi.org/10.5409/wjcp.v6.i3.154

[7] Centers for Disease Control and Prevention. Sexually Transmitted Disease Surveillance 2018. Atlanta: U.S. Department of Health and Human Services; 2021. https://www.cdc.gov/std/stats18/chlamydia.htm

Figure C.3 shows cases and rates of chlamydia cases by race/ethnicity and sex. Racial and ethnic minorities continued to be disproportionately impacted by STIs. The highest rate of 1,303.7 per 100,000 was among Non-Hispanic Black/African Americans, who represented 4.1% of the population but 11.5% of all cases in 2021. The next highest rate of 709.0 per 100,000 was among Non-Hispanic Indigenous/Native Americans, who represented 0.6% of the population but 1.0% of cases. Similar to Colorado, in the US, the highest rates were among black females (US: 1,257.4 per 100,000, CO: 1,463.6 per 100,000) and black males (US: 890.4 per 100,000, CO: 1,164.4 per 100,000)[8].

The Hispanic rate of 702.9 was almost as high as the Indigenous rate; however, this rate was brought up by the high rate of 1,091.8 per 100,000 among Hispanic Asian/Pacific Islanders, which was largely impacted by small population size (14,838 - which is 0.2% of the population and less than half the population of all other races in the Hispanic population), which is more than double the rate of all other races within the Hispanic population. Please see **Table 1** in the appendix for more details.

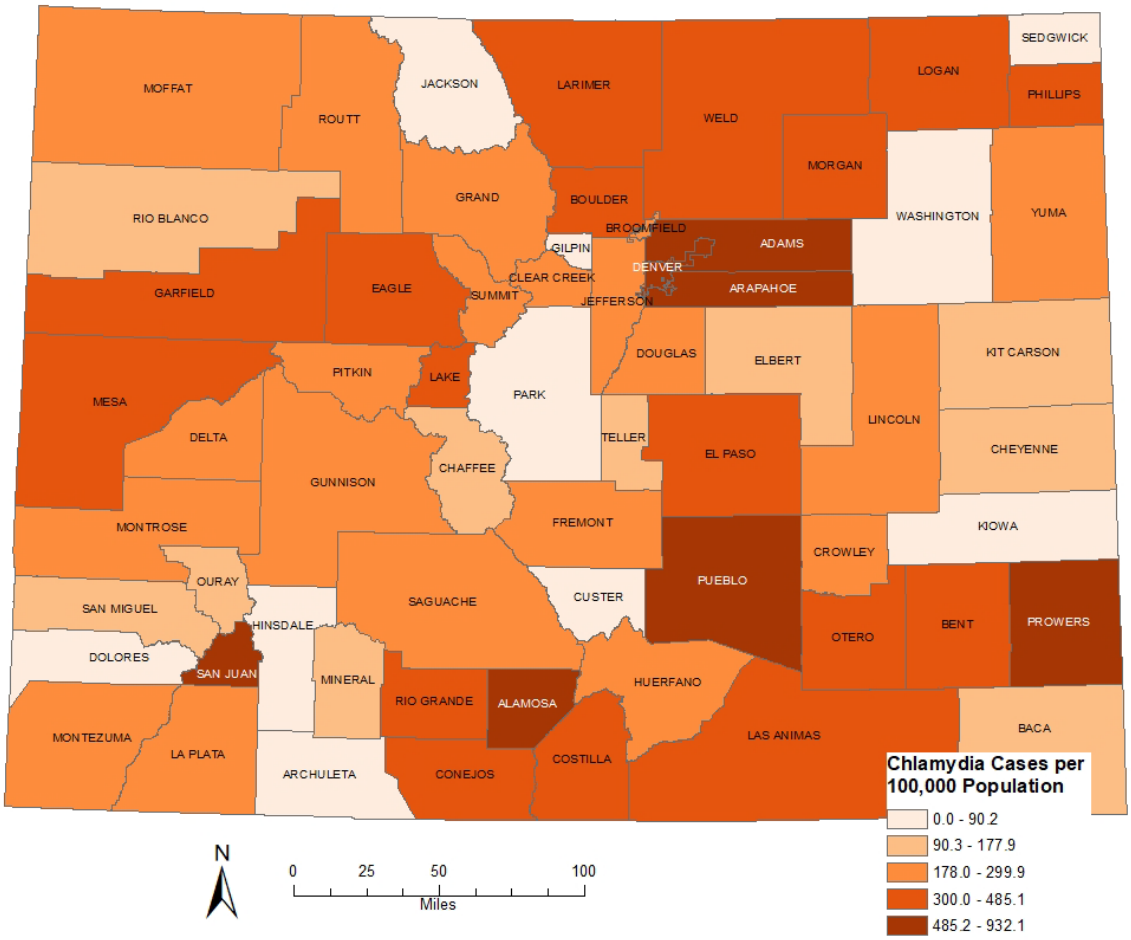
Figure C.3: Rates of Chlamydia Cases by Race/Ethnicity and Sex, Colorado, 2021



[8] Center for Disease Control and Prevention. 2023. "Chlamydia - Rates of Reported Cases by Race Hispanic Ethnicity and Sex United States 2021 .xlsx," Data Points Excel File. Sexually Transmitted Disease Surveillance 2021. https://www.cdc.gov/std/statistics/2021/default.htm.

Figures C.4 and C.5 show the geographical distribution and rankings of chlamydia rates in Colorado at the county level. Denver County represented 24.8% of cases (see **Table 2** in the appendix).

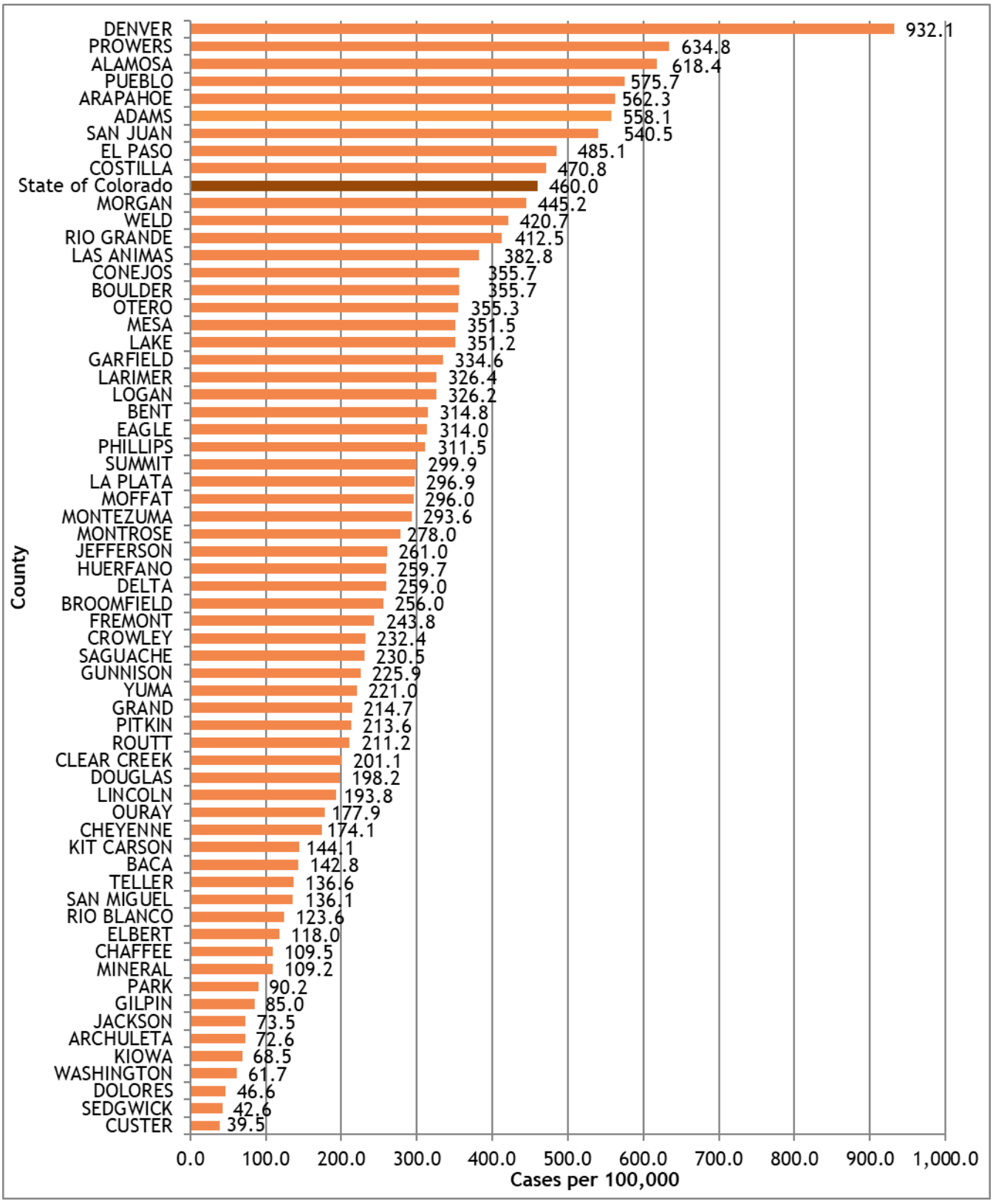
Figure C.4: Rates of Reported Chlamydia Cases by County Map, Colorado, 2021



As population varies greatly between counties, high rates do not necessarily mean high case counts. For further details, see **Figure C.5** and **Table 2**.

Figure C.5 shows chlamydia rates by county for 2021. All counties except Hinsdale had at least one case reported, and the three highest rates were among Denver, Prowers, and Alamosa counties. However, Prowers and Alamosa counties combined represented less than 1% of all cases, and their high rates are due to small population sizes.

Figure C.5: Rates of Reported Chlamydia Cases by County Chart, Colorado, 2021

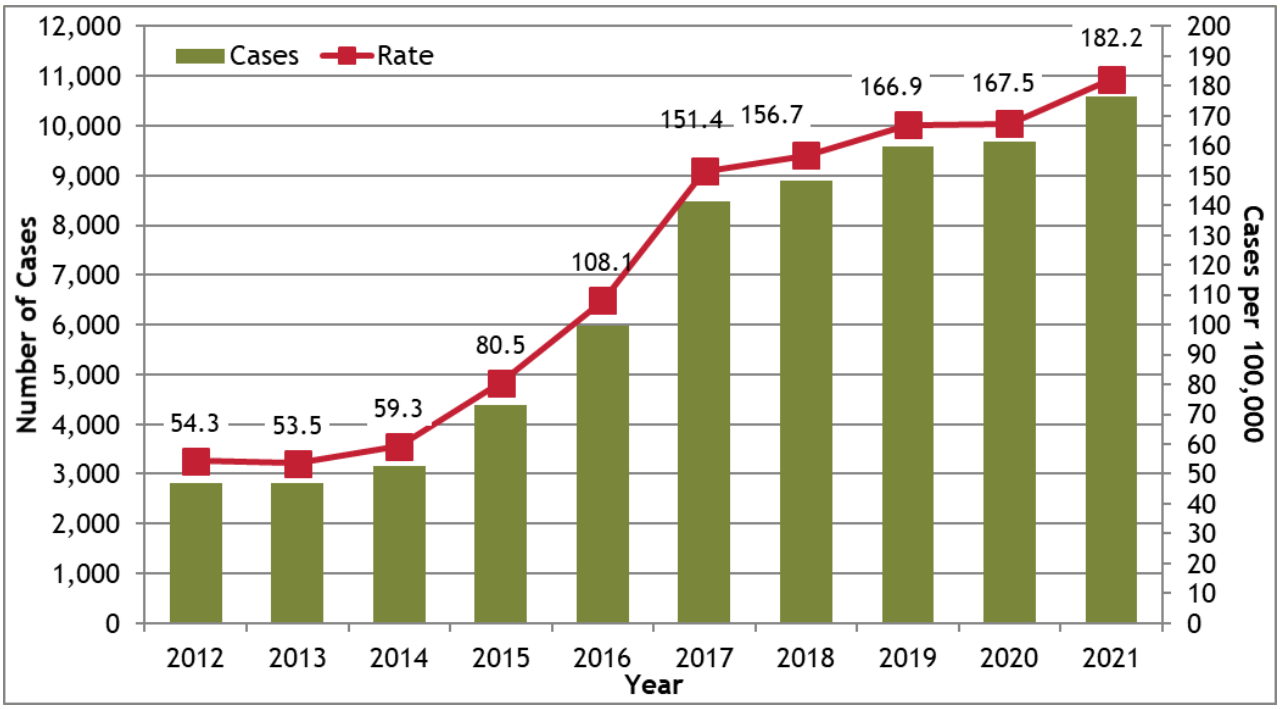


Gonorrhea

Gonorrhea remained the second most commonly reported STI in Colorado and the United States in 2021. **Figure G.1** shows cases diagnosed each year and the rate per 100,000 from 2012 to 2021. Gonorrhea rates remained relatively consistent from 2012 through 2014, followed by sharp increases from 2015-2017, a gradual increase through 2020 and a sharper increase in 2021. In Colorado, 10,596 cases were reported in 2021, yielding a rate of 182.2 per 100,000 people. The 2021 rate is significantly higher (8.8% increase) than the rate of 167.5 in 2020. Compared to 5 and 10 years ago, the rate increased by 20.4% and 235.4%, respectively, as shown in **Figure G.1**.

The rate also increased in the United States, where 710,151 cases were reported for a rate of 214.0 per 100,000 people, which was a 4.8% increase in cases since 2020 (677,769) and a 27.8% increase in cases since 2017 (555,608). Different populations had different levels of increases, with men seeing an increase of 6.3% since 2020 and women an increase of 2.4%. Gonorrhea rates have been higher among men since 2013[9].

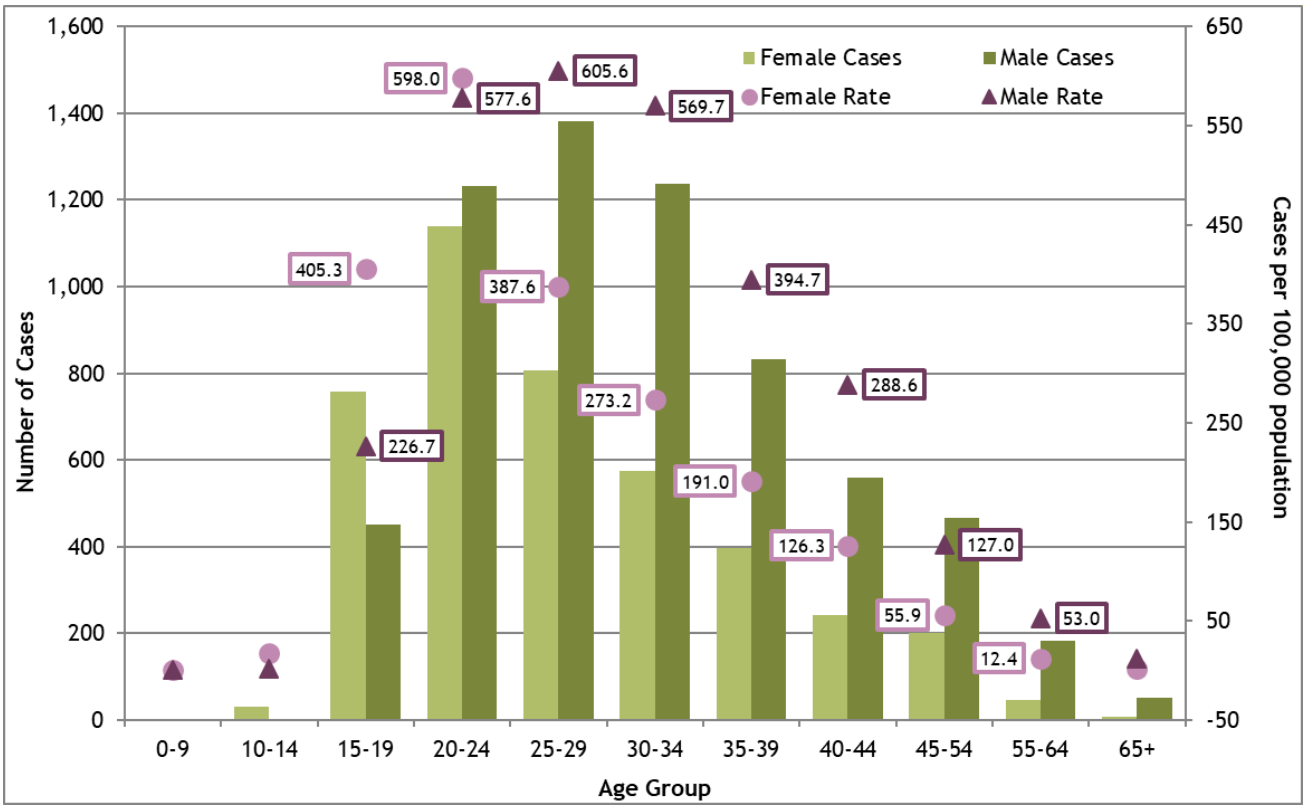
Figure G.1: Reported Gonorrhea Cases and Rates of Reported Cases, Colorado, 2012-2021



[9] Division of STD Prevention, National Center for HIV, Viral Hepatitis, STD, and TB Prevention, Centers for Disease Control and Prevention. 2023. "National Overview of STDs, 2021." Centers for Disease Control and Prevention. https://www.cdc.gov/std/statistics/2021/overview.htm.

Figure G.2 shows sex and age case counts and rates for gonorrhea reported in 2021. The mean age at diagnosis was 30.6 (28.2 for females and 32.2 for males), with a range of 0 to 83 years. Males accounted for 60.4% of all cases. From ages 30-64, males had a rate at least double that of their female counterparts. The highest rate of 605.6 was among 25-29-year-old males followed by a rate of 598.0 among 20-24-year-old females. In contrast, nationally, the highest rates were among 20-24 year old males and females and the gap between the male and female rate was smaller (844.2 for females, 873.2 for males)[10].

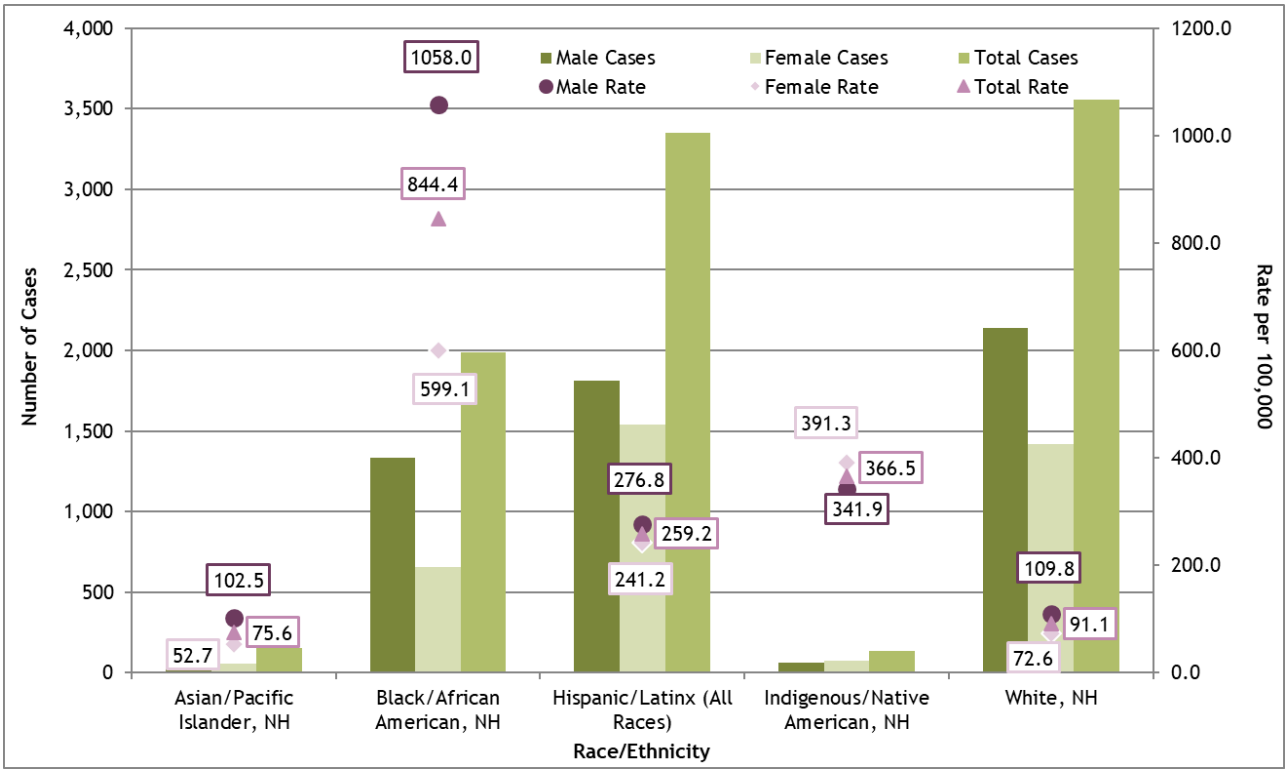
Figure G.2: Reported Gonorrhea Cases and Rates of Reported Cases by Sex and Age Group, Colorado, 2021



[10] Division of STD Prevention, National Center for HIV, Viral Hepatitis, STD, and TB Prevention, Centers for Disease Control and Prevention. 2023. "Sexually Transmitted Disease Surveillance, 2021 Tables." Centers for Disease Control and Prevention. https://www.cdc.gov/std/statistics/2021/tables.htm.

Figure G.3 shows cases and rates of gonorrhea cases by race/ethnicity and sex. As seen with chlamydia, racial and ethnic minorities continued to be disproportionately affected by STIs. In 2021, the highest rates were among Non-Hispanic Black/African Americans (844.4) followed by Non-Hispanic Indigenous populations (366.5). The third highest rate of 259.2 was among Hispanics of all races, who represented 31.6% of cases. Within the Hispanic population, the highest rate was among Black/African Americans (332.3) and Asian/Pacific Islanders (208.9). Please see the discussion of racial/ethnic breakdowns in the chlamydia section. Non-Hispanic Whites were 33.6% of cases but had the second lowest rate of 91.1. Nationally, the highest rates were among black males (800.8) and females (514.5)[11]. Please see **Table 1** in the appendix for more details.

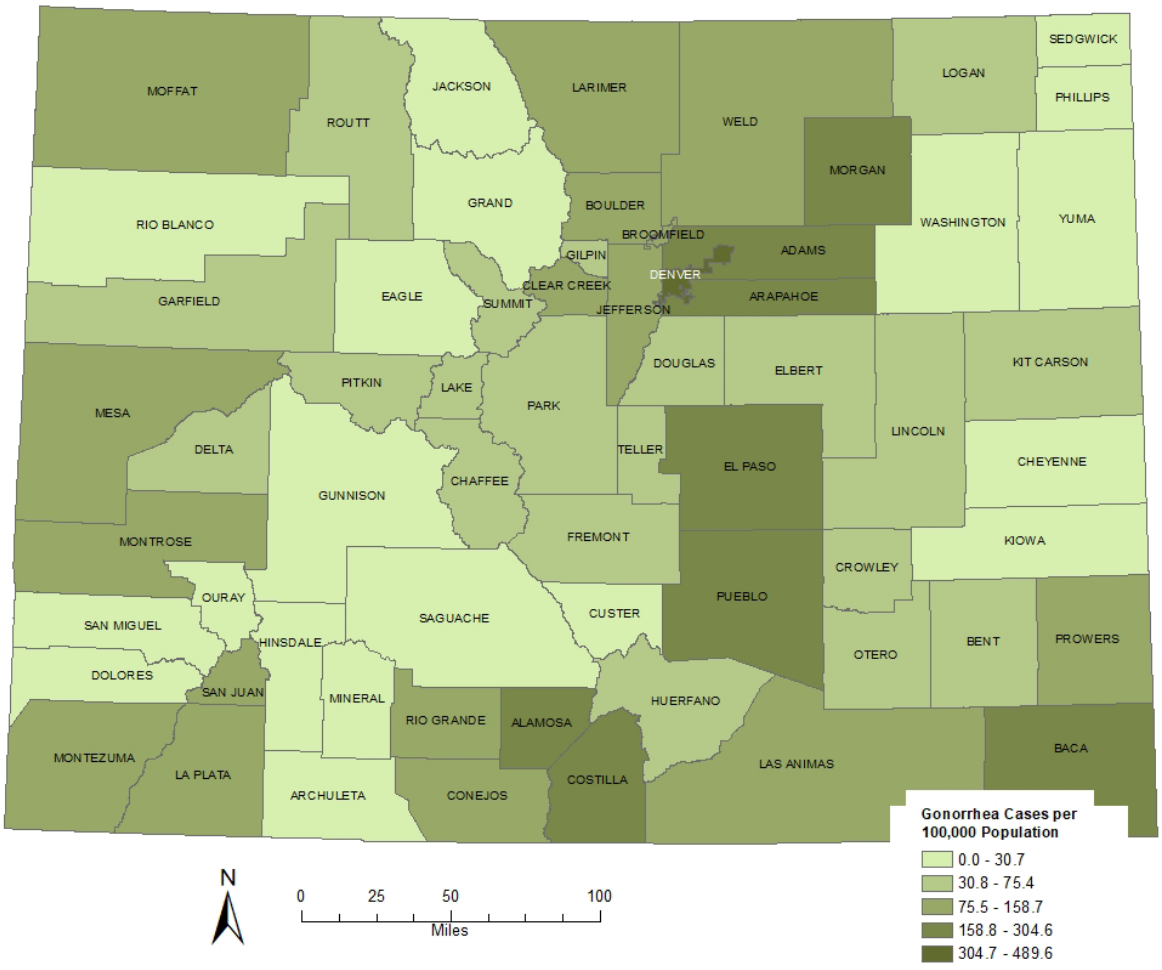
Figure G.3: Rates of Reported Gonorrhea Cases by Race/Ethnicity and Sex, Colorado, 2021



[11] Division of STD Prevention, National Center for HIV, Viral Hepatitis, STD, and TB Prevention, Centers for Disease Control and Prevention. 2023. "Gonorrhea - Rate of Reported Cases by Race Hispanic Ethnicity and Sex United States 2021 .xlsx," Data Points Excel File. Sexually Transmitted Disease Surveillance 2021. https://www.cdc.gov/std/statistics/2021/default.htm.

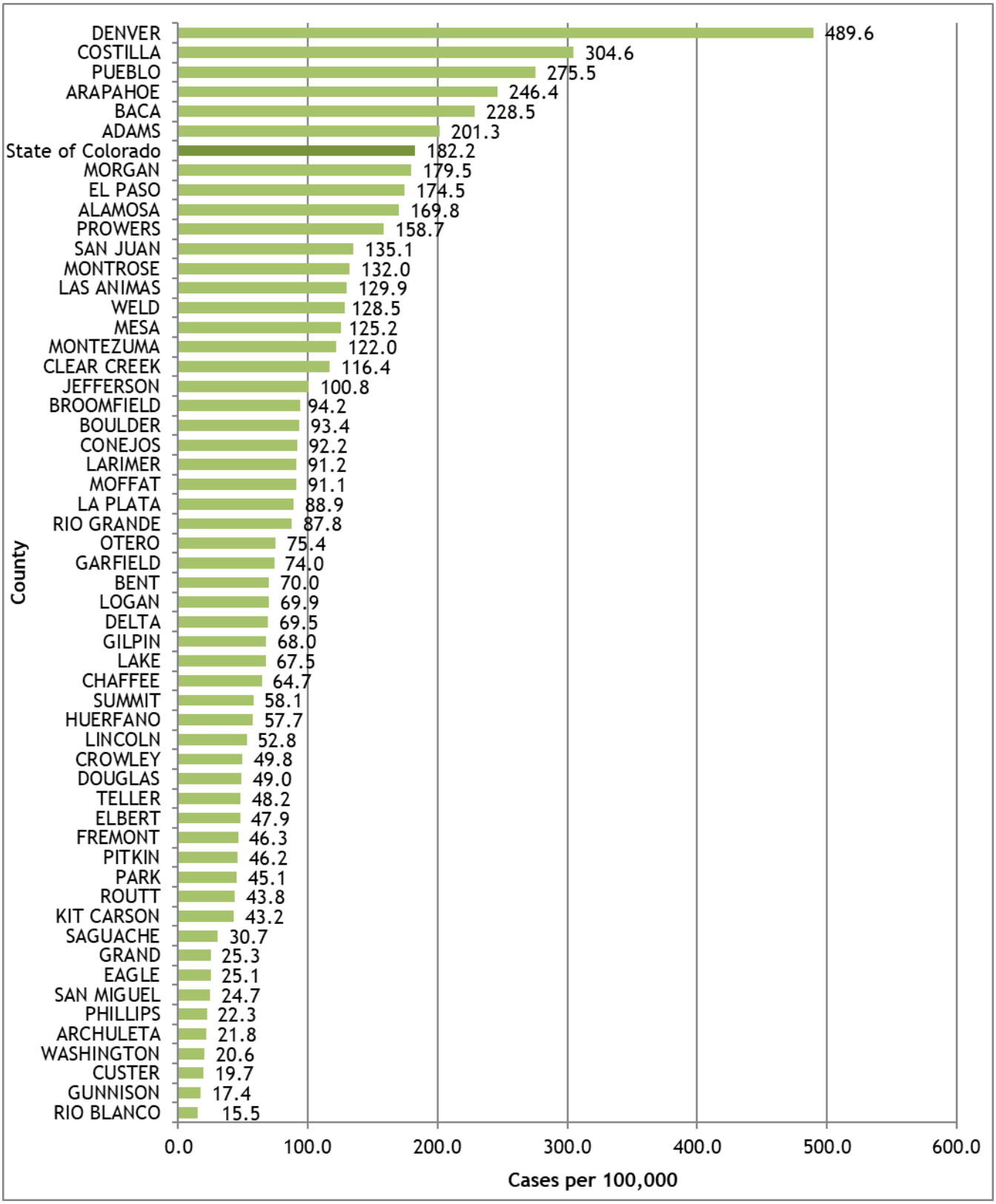
Figures G.4 and **G.5** describe the geographical distribution of gonorrhea rates in Colorado at the county level. In 2021, eight counties did not report any gonorrhea cases, and 32.9% of all cases were in Denver County. The highest rates were in Denver, Costilla, Pueblo, and Baca counties; however, the rate is largely impacted by the small population of Costilla and Baca counties, which together had a total of 19 cases.

Figure G.4: Rates of Reported Gonorrhea Cases by County Map, Colorado, 2021



High rates do not necessarily mean high case counts; for further details, see **Figure G.5** and **Table 2.**

Figure G.5: Rates of Reported Gonorrhea Cases by County Chart, Colorado, 2021



Antimicrobial Resistant Gonorrhea (ARGC)

Since 2016, CDPHE has participated in the CDC funded Epidemiology and Laboratory Capacity (ELC) Grant: Strengthening the US Response to Resistant Gonorrhea (SURRG) in partnership with the Public Health Institute at Denver Health. The SURRG project began with three goals: enhance domestic gonorrhea surveillance and infrastructure, build capacity for rapid detection and response to resistant gonorrhea through increased culturing and local antibiotic susceptibility testing, and rapid field investigation to stop the spread of resistant infections. The project also aims to gain a better understanding of the epidemiological factors contributing to resistant gonorrhea. SURRG jurisdictions collect and analyze data to help guide national recommendations for the public health response to resistant gonorrhea.[12] In December 2020, CDC gonorrhea treatment guidelines changed to eliminate dual treatment of azithromycin and ceftriaxone in uncomplicated gonorrhea cases. Treatment guidelines for gonorrhea infections are now weight-based and include a single dose of 500mg or 1g intramuscular ceftriaxone treatment.[13]

Antimicrobial susceptibility testing (AST) is performed locally through Etests on gonorrhea specimens collected from SURRG partnered clinics within the Public Health Institute at Denver Health in the Denver Metro Area. Reduced susceptibility (RS) is defined as azithromycin minimum inhibitory concentrations (MICs) ≥2 µg/mL (AZM-RS), ceftriaxone MICs ≥0.125 µg/mL (CRO-RS), or cefixime MICs ≥0.25 µg/mL (CFX-RS).[14] The MIC breakpoints for SURRG were based on Clinical and Laboratory Standards Institute (CLSI) criteria; however, breakpoints for ceftriaxone and cefixime are lower than the CLSI breakpoints and were selected to allow for detection of emerging resistance. Additionally, SURRG isolates receive AST testing at the Utah Antimicrobial Regional Laboratory Network Lab for six unique antimicrobial agents.

For CO-SURRG specimens collected between January 1, 2021 - December 31, 2021 AST by Etest was done on 613 culture-positive gonorrhea isolates for CRO, and CFX. Due to the change in treatment guidelines, in December of 2020, AST by Etest for AZM was done January 1, 2021 through July 30, 2021 (n= 329). There were 24 isolates (7.3%) identified to have reduced susceptibility to AZM. No isolates were identified as having reduced susceptibility to CFX or CRO in 2021. Cultures were collected from both genital and extragenital samples. Genital culture testing sites include urethral for all genders and endocervical samples from females. Extragenital culture testing sites include pharyngeal and rectal samples from all genders, when exposure is identified.

[12] https://www.cdc.gov/std/gonorrhea/arg/carb.htm

[13] St. Cyr S, Barbee L, Workowski KA, et al. Update to CDC's Treatment Guidelines for Gonococcal Infection, 2020. MMWR Morb Mortal Wkly Rep 2020;69:1911–1916. DOI: http://dx.doi.org/10.15585/mmwr.mm6950a6external icon

[14] Schlanger K, Learner ER, Pham CD, et al. Strengthening the U.S. Response to Resistant Gonorrhea (SURRG): An overview of a multi-site program to enhance local response capacity for antibiotic-resistant Neisseria gonorrhoeae [published online August 31, 2021].

In **Figure ARGC.1**, the CO-SURRG population is taken at a glance. The test months for this profile range from January through July of 2021 as that is when Azithromycin reduced susceptibility testing occurred at Denver Health before it was discontinued in August 2021. The highest number of isolates in 2021 came from those who self-identified as male (85.6%) and those who identified as Hispanic, all races (36.3%).

Figure ARGC.1: CO-SURRG Population at a Glance, Denver, Colorado, 2021*

CO-SURRG 2021 Overview Table

Self-Reported Gender Identity	**% of Total**
Male	85.6%
Female	12.6%
Transgender FTM	0.4%
Other	1.4%

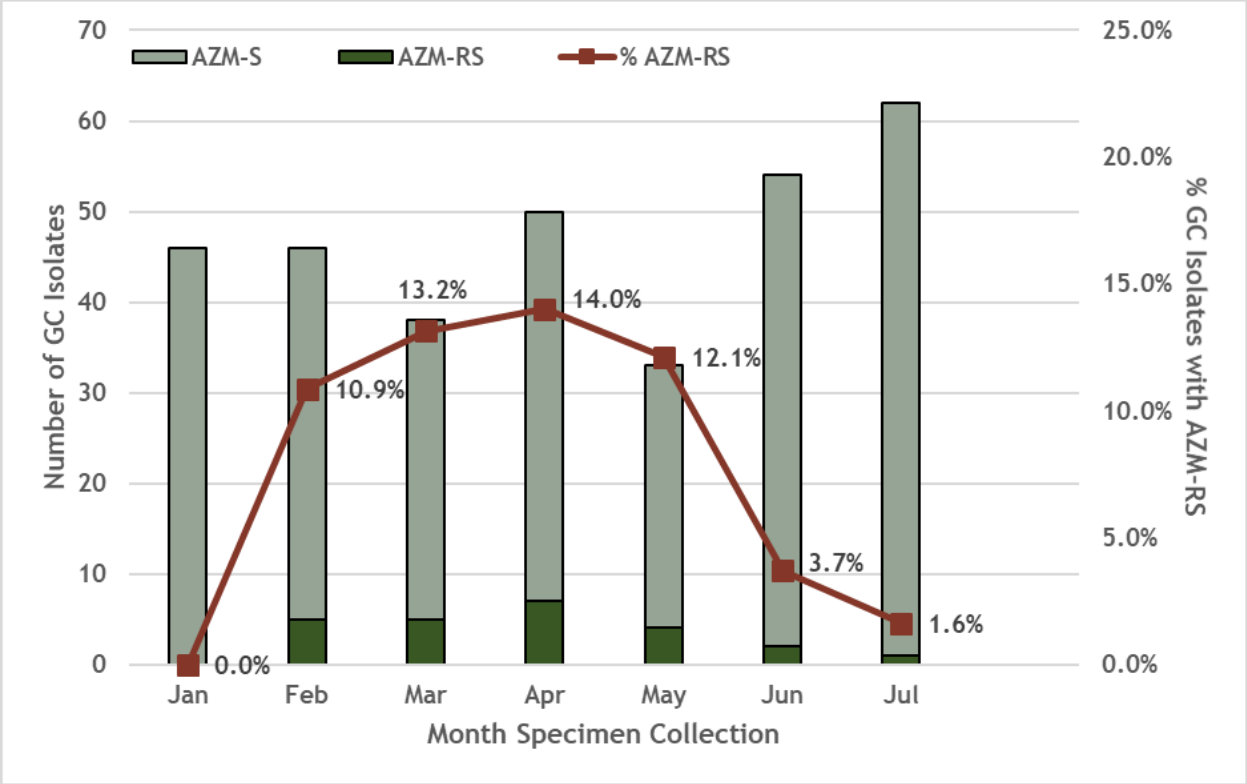
Test Site	**% of Total**
Pharyngeal	21.0%
Rectal	21.3%
Genital	57.7%

Self-Reported Race/Ethnicity	**% of Total**
NH Black/ African American	23.7%
Hispanic, All Races	36.3%
NH White	32.7%
Multirace/Other/Unknown	7.2%

*AZM testing at Denver Health was halted in August 2021 as AZM is no longer in the recommended treatment regimen for gonorrhea as of December 2020. 'Other' in self-reported gender can include unknown or non-binary.

In **Figure ARGC.2**, all gonorrhea isolates that received AZM susceptibility testing in 2021 are distributed per month with the number of AZM susceptible isolates are shown in light green and the number of AZM isolates with reduced susceptibility are shown in dark green. The percent of isolates showing AZM-RS in positive cultures is indicated by the red line.

Figure ARGC.2: Gonorrhea Isolates with AZM-RS by Month, CO-SURRG, 2021*



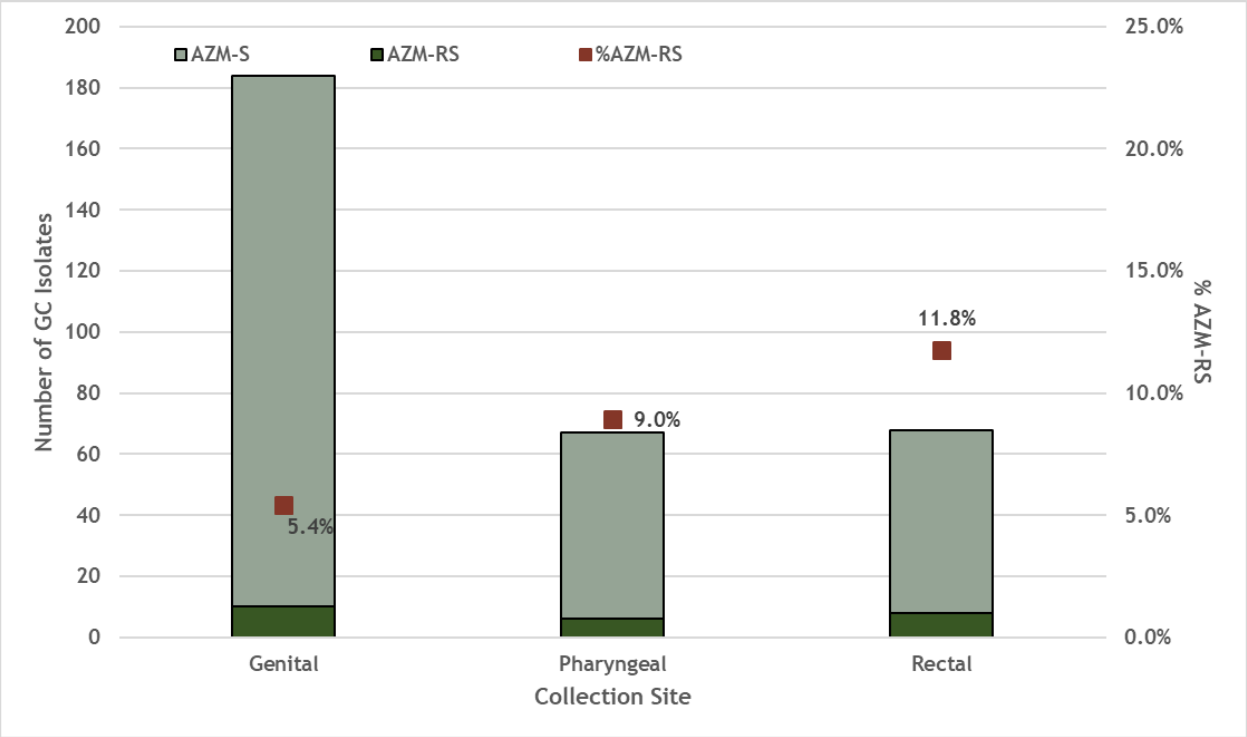
Total positive cultures per month are positive gonorrhea isolates Etest at Denver Health Labs from six clinic locations in the Colorado SURRG jurisdiction. *AZM testing at DH was halted in August 2021 as AZM is no longer in the recommended treatment regimen for gonorrhea.

By month there was a range of AZM-RS isolates from 0% of isolates in January to a high in April with 14.0%. When compared to 2020, CO SURRG saw a 14% increase in Etests performed in 2021. This is likely a rebound effect from the COVID-19 Pandemic where there was a decrease in Etests overall (see limitations section).

With increased gonorrhea rates in the US, the importance of extragenital gonorrhea testing has risen. CO-SURRG testing protocol mandates culture collection for all sites of exposure including extragenital sites (pharyngeal and rectal).

As seen in **Figure ARGC.3**, 11.8% of rectal and 9.0% of pharyngeal gonorrhea isolates Etested in the CO-SURRG jurisdiction showed reduced susceptibility to AZM in 2021. Genital testing is the most abundant site for gonorrhea antimicrobial susceptibility testing in 2021 with the lowest rate of AZM-RS (5.4%).

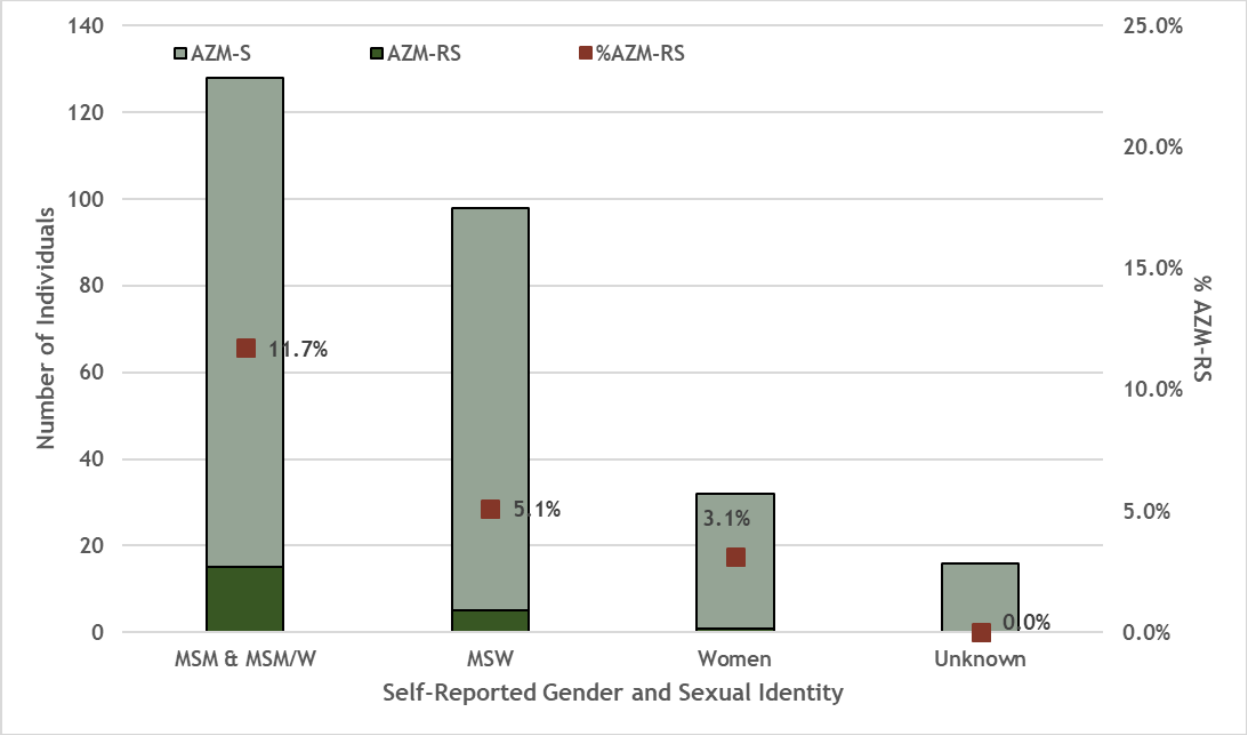
Figure ARGC.3: Percent Gonorrhea Isolates with AZM-RS by Specimen Source in CO-SURRG, 2021*



Genital site culture data includes urethral and endocervical testing sites. Extragenital site culture testing shown here only includes pharyngeal and rectal samples. *AZM Etest sampling was only performed through July 2021.

In **Figure ARGC.4**, the percent of individuals identified to have gonorrhea isolates with AZM-RS are categorized by gender and sexual identities. 11.7% of the individuals who were identified as MSM or MSM/W had gonorrhea isolates with AZM-RS. As seen below, 3.1 % of the gonorrhea isolates among women showed reduced susceptibility to AZM in 2021.

Figure ARGC.4: Percent AZM-RS in Individuals with Gonorrhea Isolates that Underwent AST by Self-Reported Gender and Sexual Identity, CO-SURRG, 2021*



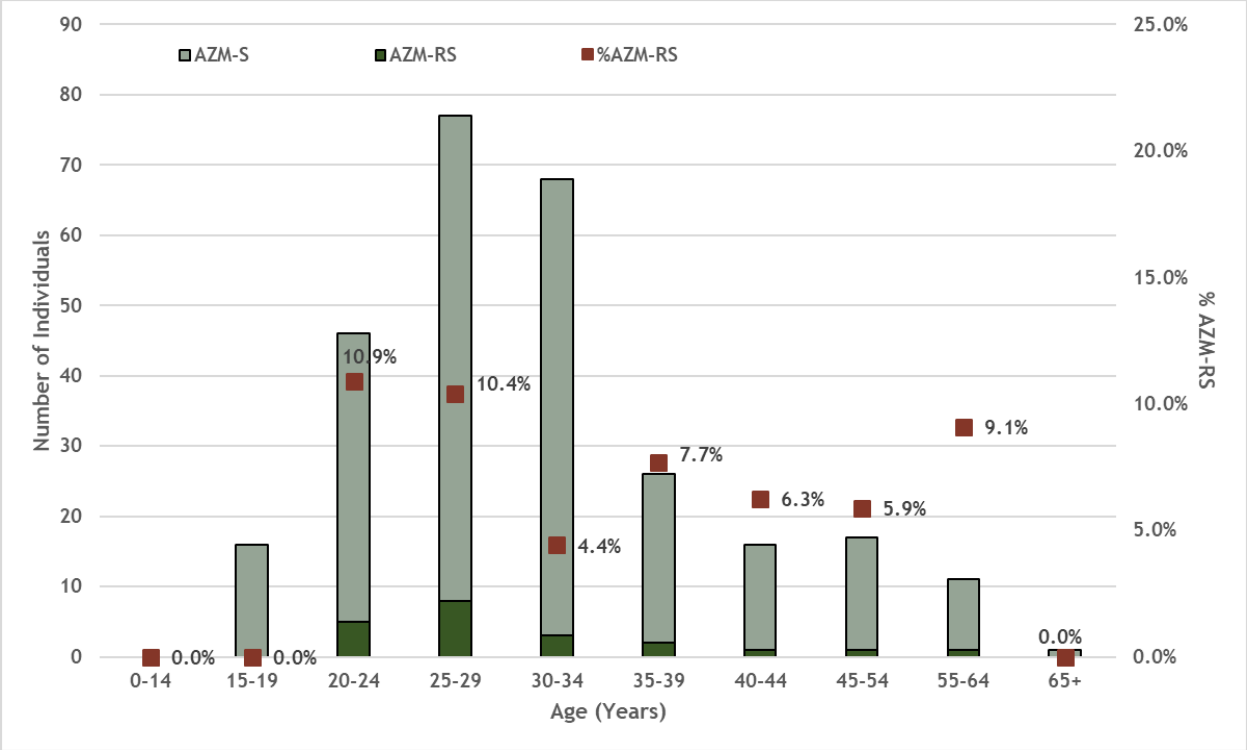
Sexual identity is created from self-reported gender identity and self-reported gender of sex partners. Unknown cases may include men with unknown gender of sex partners and transgender/nonbinary individuals. Individual data includes persons diagnosed with one or more gonorrhea isolates with reduced susceptibility to AZM at the same clinical visit. *AZM testing occurred through July 2021.

Gender identity is self-reported and sexual identity is determined through gender identity and reported gender of sex partners. In 2021, men accounted for 86.0% of the CO-SURRG isolates that underwent AST. Women only accounted for 12.5% of the CO-SURRG population in 2021 and the true burden of ARGC on women in Denver continues to be unknown.

Of those self-reporting gender identity as “Male” in 2021, men who have sex with men (MSM) were the largest portion of individuals tested at the six CO-SURRG sites (36.3%); this differed from 2020 where MSW were the majority of the CO-SURRG population. Historically, men who have sex with men (MSM) and men who have sex with men and women (MSM/W) have accounted for the largest proportion of the population. Among resistant isolates, MSM and MSM/W account for the majority of individuals identified to have AZM-RS in the Denver Metro Area (71.4%).

Figure ARGC.5 depicts the age group distribution of individuals with one or more gonorrhea isolates that underwent AST at CO-SURRG sites in 2021. The highest number of gonorrhea isolates indicating AZM-RS occurred in those 25 to 29 years old, however the highest rate of AZM-RS is among ages 20-24 (10.9%).

Figure ARGC.5: Percent AZM-RS by Age in Individuals with Gonorrhea Isolates that Underwent AST CO-SURRG, 2021*

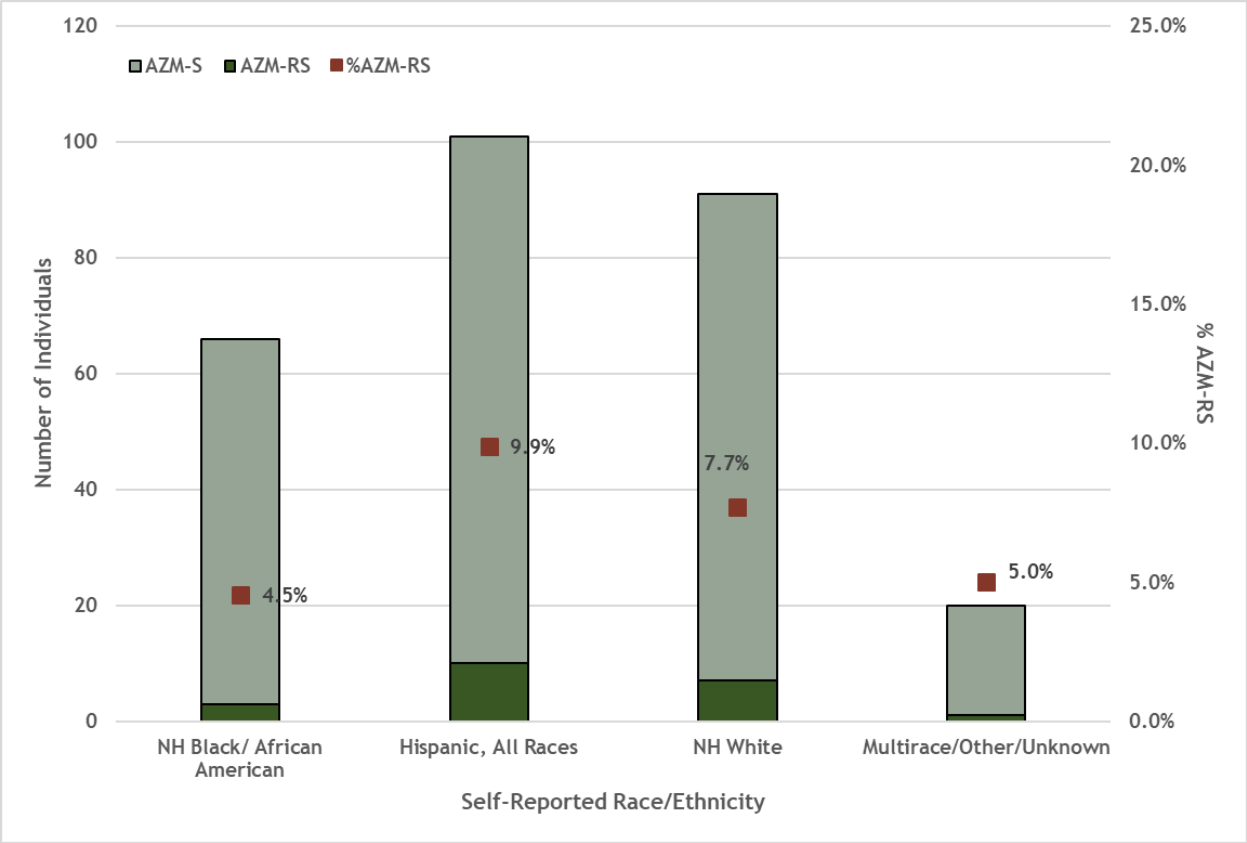


Individual data includes persons diagnosed with one or more gonorrhea isolates with reduced susceptibility to AZM at the same clinical visit. *AZM Etesting occurred through July 2021 at which point it was discontinued with AZM being removed from the recommended gonorrhea testing regime.

The largest proportion of individuals in the Colorado SURRG study in 2021 occurred in those between the ages of 20 and 34 years, accounting for 68.7% of the population. This age group also accounted for the majority of individuals identified as having gonorrhea isolates with AZM-RS (76.2%). The mean age at specimen collection date was 31.0 years with a range of 16 to 57 years of age.

Figure ARGC.6 depicts the CO-SURRG population by reported race and ethnicity in 2021. Among all racial/ethnic groups, those who identified as Hispanic (all races) had the highest percentage of individuals identified to have gonorrhea isolates with AZM-RS (9.9%). This differs from 2020 in which Hispanic (all races) only accounted for 3.9% of all AZM-RS isolates. Those who identified as Non-Hispanic White had the second highest percent of individuals with gonorrhea isolates indicating AZM-RS (7.7%). Those who identify as Non-Hispanic Black had the lowest proportion of individuals with gonorrhea isolates indicating AZM-RS (4.5%). The percent of individuals with gonorrhea isolates indicating AZM-RS categorized as Multirace/Other/Unknown should be taken with caution, as this is a very small sample and too generalized to draw definitive conclusions.

Figure ARGC.6: Percent AZM-RS by Race/Ethnicity in Individuals with Gonorrhea Isolates that Underwent AST, CO-SURRG, 2021*



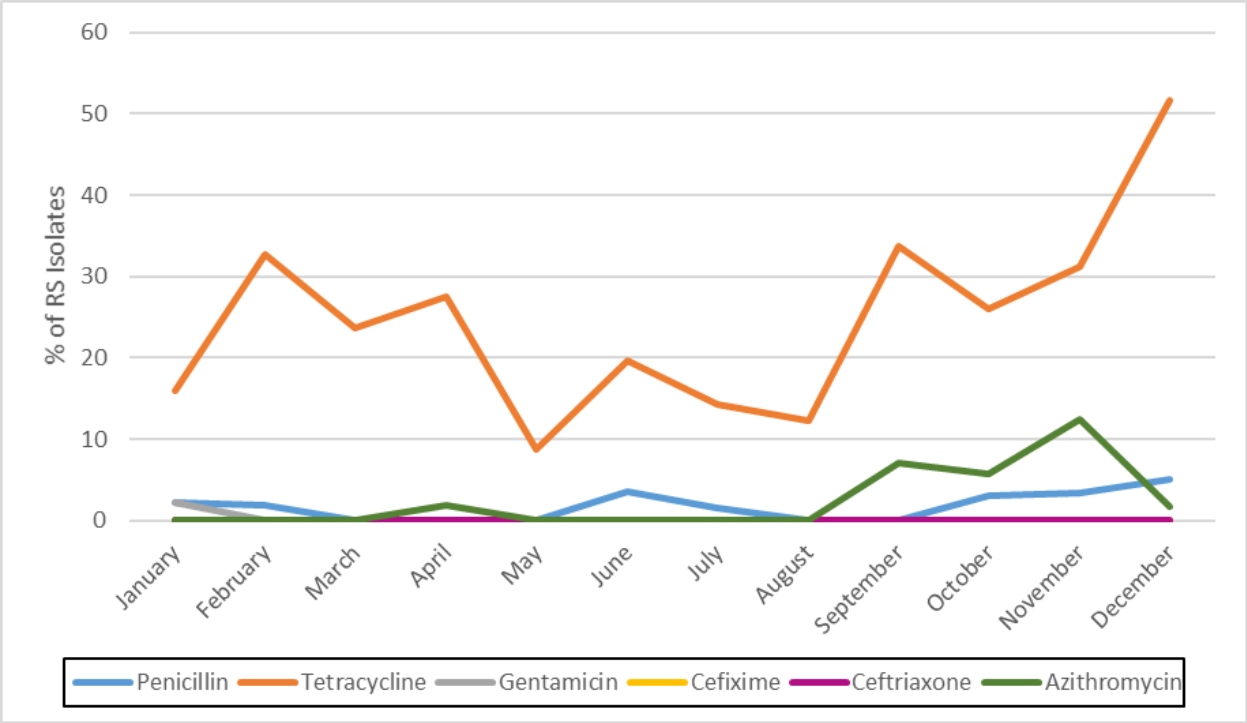
NH: Non-Hispanic. Multirace/Other/Unknown includes Non-Hispanic Asian/Pacific Islanders, and Indigenous/Alaskan Native due to small numbers, in total only accounting for 7.1% of the Colorado SURRG population in 2021. Individual data includes persons diagnosed with one or more gonorrhea isolates with reduced susceptibility to AZM at the same clinical visit. *AZM testing occurred through July 2021.

The SURRG project conducts susceptibility testing for isolates not only at the state level, but also regionally through the Antibiotic Resistance Laboratory Network (ARLN). The Utah ARLN is used for CO-SURRG isolates. Sample susceptibility conducted at the regional level includes additional AST testing for azithromycin MICs, ceftriaxone MICs, cefixime MICs, penicillin MICs, tetracycline MICs, and gentamicin MICs through the use of agar dilution. Reduced susceptibility (RS) at the ARLN is defined as azithromycin MICs ≥2 µg/mL (AZM-RS), ceftriaxone MICs ≥0.125 µg/mL (CRO-RS), cefixime MICs ≥0.25 µg/mL (CFX-RS), penicillin MICs ≥2 µg/mL (PCN-RS), tetracycline MICs ≥2 µg/mL (TET-RS), or

gentamicin MICs ≥32 µg/mL (GEN-RS).[15] These values are returned to CDPHE and ensure accuracy for testing at the local level. Agar dilution susceptibility testing is performed year-round at the Utah ARLN on all gonorrhea isolates that receive initial susceptibility testing at Denver Health.

Figure ARGC.7 illustrates the CO-SURRG population isolates which were tested via agar dilution for susceptibility at the regional level from January 2021 to December 2021. The most resistance to antimicrobials occurred with isolates that were resistant to tetracyclines with 51.7% of isolates showing resistance to tetracyclines in December of 2021. Isolates showed no reduced susceptibility to ceftriaxone or cefixime at the regional level in 2021.

Figure ARGC.7: Percent RS in Individuals with Gonorrhea Isolates that Underwent Agar Dilution Regional AST, CO-SURRG, 2021



Data includes persons with one or more gonorrhea isolates that underwent additional reduced susceptibility testing for penicillin, tetracycline, gentamicin, cefixime, ceftriaxone, and azithromycin.

As gonorrhea continues to change, the treatment guidelines also continue to be updated. A recent timeline of treatment recommendations is available on the CDC website and the CDC continues to monitor gonorrhea resistance to other drugs such as those found in **Figure ARGC.7**.[16]

[15] Wendel, K. A., Mauk, K., Amsterdam, L., McNeil, C., Pfister, J., Mobley, V., Mettenbrink, C., Nishiyama, M., Terrell, E., Baldwin, T., Pham, C. D., Nash, E. E., Kirkcaldy, R. D., & Schlanger, K. (2021, December). Enhancing Gonococcal Antimicrobial Resistance Surveillance in Cisgender Women, Strengthening the US Response to Resistant Gonorrhea, 2018 to 2019. *Sexually Transmitted Diseases*, *48*(12S), S104-S110. 10.1097/OLQ.0000000000001554

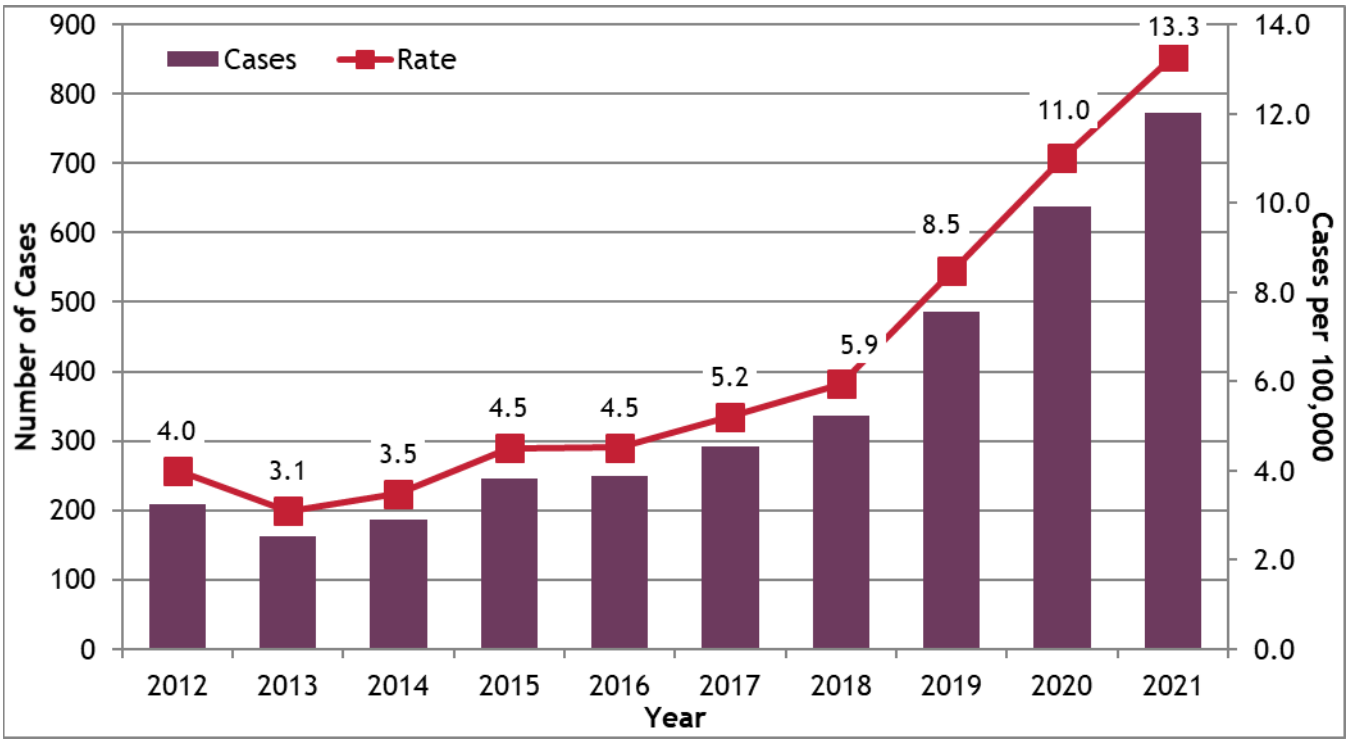
[16] Centers for Disease Control and Prevention. (2022, December 28). *Basic Information about ARG - STD information from CDC*. Centers for Disease Control and Prevention. Retrieved June 1, 2023, from https://www.cdc.gov/std/gonorrhea/drug-resistant/basic.htm

Primary and Secondary Syphilis

There were 772 cases of primary and secondary syphilis, the most infectious stages of syphilis, diagnosed and reported in Colorado in 2021, corresponding to a rate of 13.3 per 100,000. This is an increase in the rate by 20.6% since 2020, 154.6% since 2017, and 231.6% since 2012 and a historic high for Colorado as shown in **Figure PS.1**. Nationwide, 53,767 cases (16.2 per 100,000) were reported in 2021. This is a 29.1% increase in cases since 2020 (41,655) and a 75.5% increase since 2017 (40,644)[17].

Almost three quarters (74.4%) of all cases were among men and 35.1% of all cases were among men who have sex with men (MSM). Among MSM, 30.6% of cases were also living with HIV. Among all primary and secondary syphilis cases, 16.2% of all diagnoses were living with HIV (the percent of syphilis cases that were reported among people previously diagnosed with HIV or diagnosed with HIV at the same time as the syphilis diagnosis). These trends are similar to the trends seen nationwide, where 35.8% of cases were among MSM and 38.2% of whom were also living with HIV. This is a decrease compared to 2020, when 50.1% of cases were among MSM. In the US, 13.7% of reported primary and secondary syphilis cases were living with HIV[18].

Figure PS.1: Reported Primary & Secondary Syphilis Cases and Rates of Reported Cases, Colorado, 2012-2021

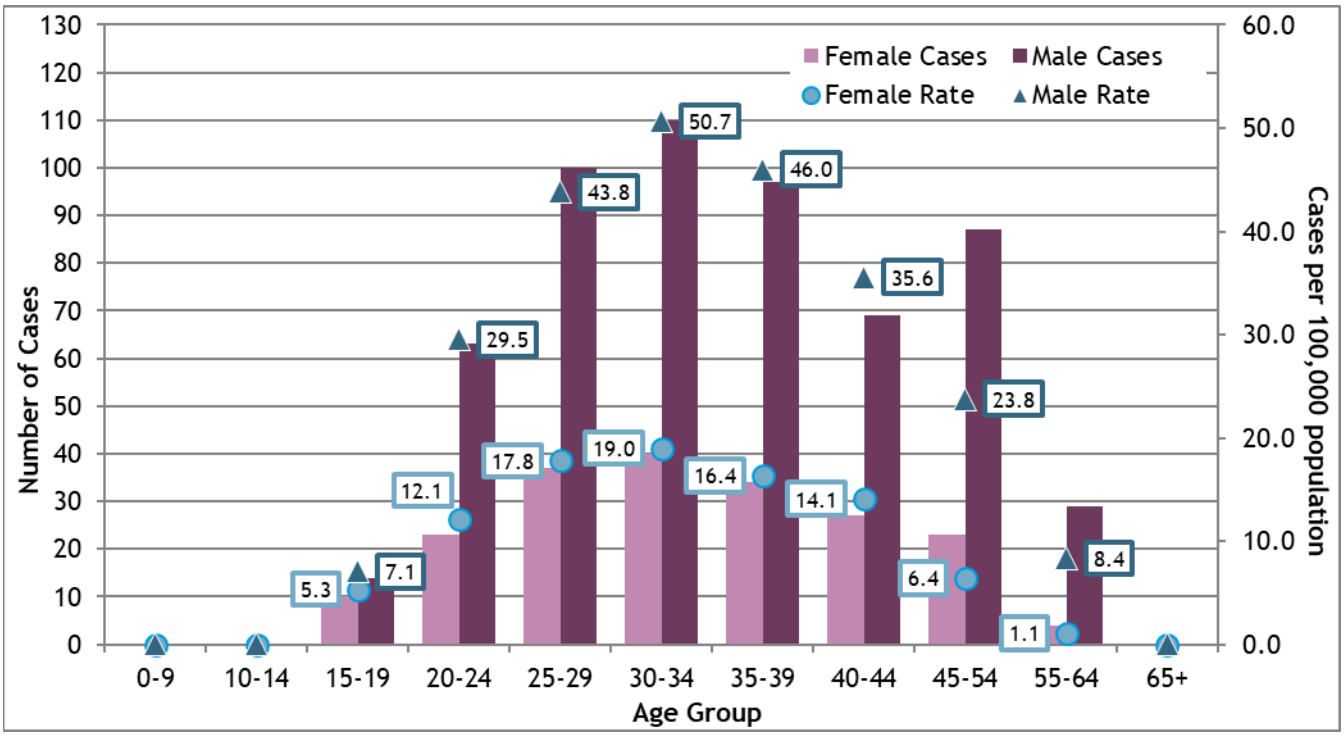


[17] Division of STD Prevention, National Center for HIV, Viral Hepatitis, STD, and TB Prevention, Centers for Disease Control and Prevention. 2023. "HomeTable 15. Primary and Secondary Syphilis — Reported Cases and Rates of Reported Cases by Age Group and Sex, 2017–2021." Sexually Transmitted Disease Surveillance 2021. https://www.cdc.gov/std/statistics/2021/tables/15.htm.

[18] Division of STD Prevention, National Center for HIV, Viral Hepatitis, STD, and TB Prevention, Centers for Disease Control and Prevention. 2023. "Primary and Secondary Syphilis - Reported Cases Among Men Who Have Sex with Men by HIV Status United.xlsx," Data Points Excel File. Sexually Transmitted Disease Surveillance 2021. https://www.cdc.gov/std/statistics/2021/default.htm.

Figure PS.2 shows age and sex case counts for primary and secondary syphilis diagnosed and reported in 2021. The mean age at diagnosis was 36.0 with a range of 16 to 69 years of age. The highest rate of 50.7 per 100,000 was reported among 30-34-year-old males, which is a change from 2020 when the highest rates were among 25-29-year-old males. The highest rate among females was also 30-34 year olds, but the rate of 19.0 is less than half the rate of males in this age group. Nationally, the highest rates were among 25-29 and 30-34-year-old males (68.1 and 67.7, respectively) and the highest female rate of 22.3 was among 25-29 year olds[14].

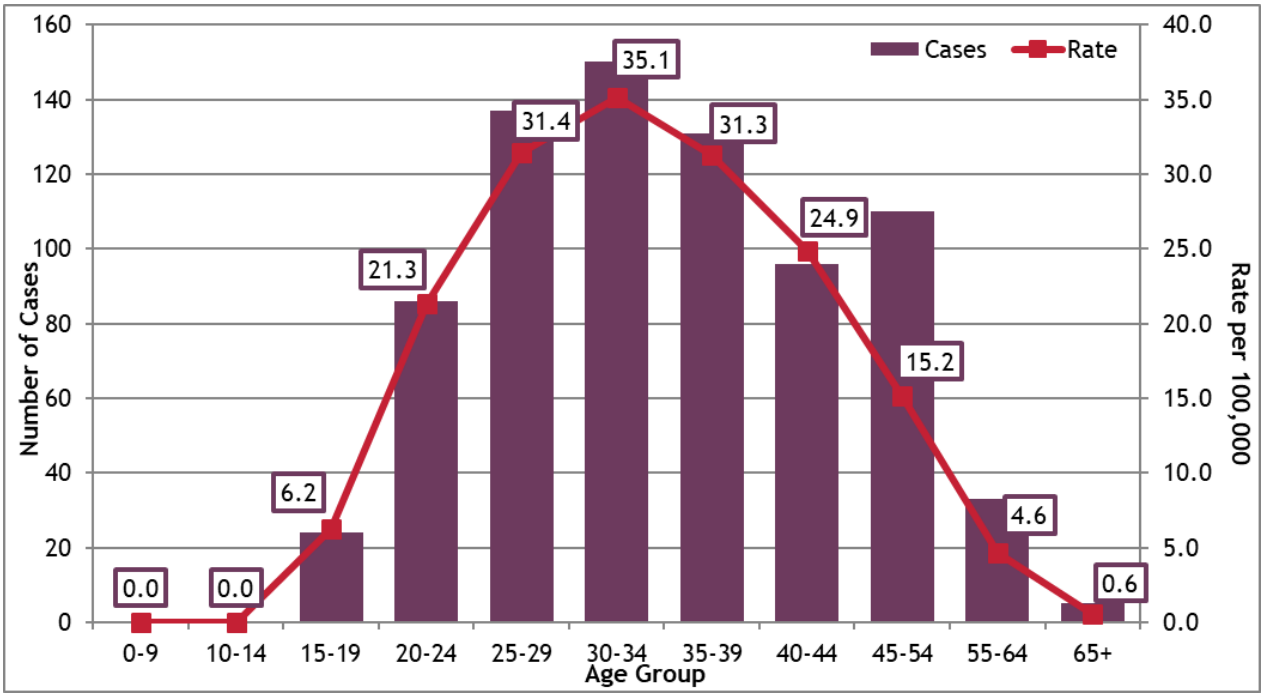
Figure PS.2: Reported Primary & Secondary Syphilis Cases and Rates of Reported Cases by Sex and Age Group, Colorado, 2021



Note: these rates use small numbers and should be interpreted with caution.

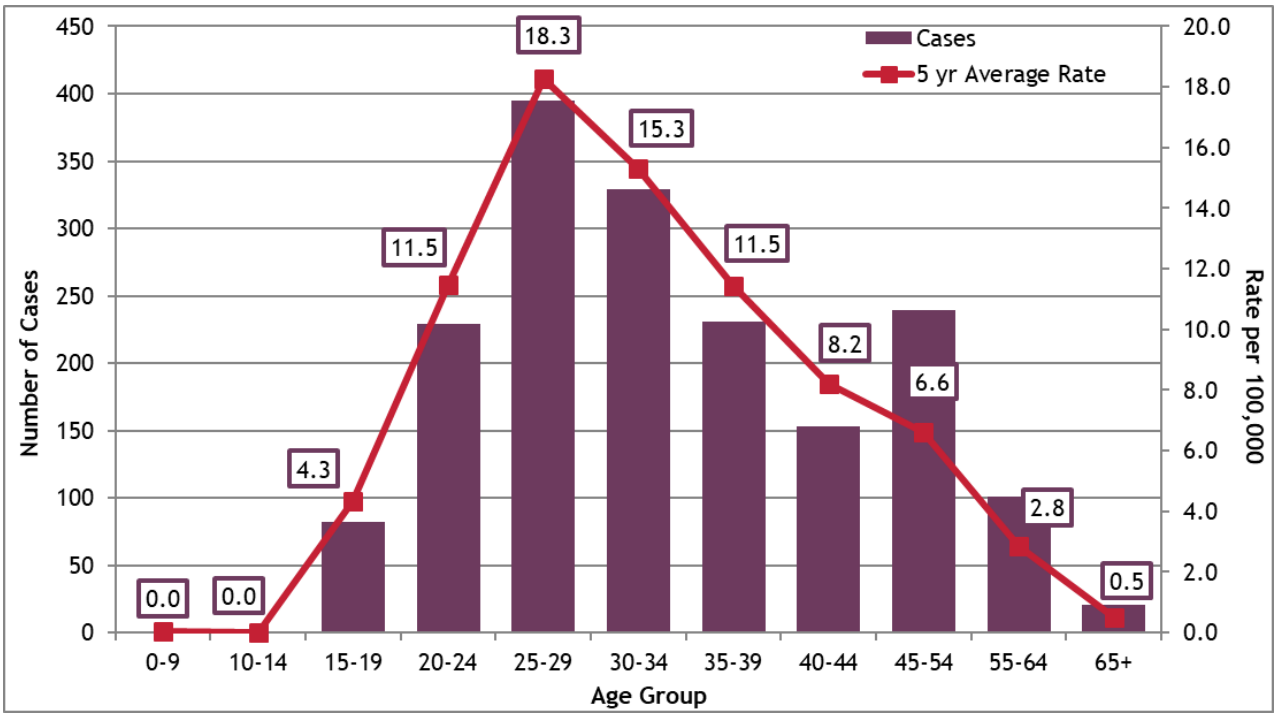
Figure PS.3 and **Figure PS.4** below depict age group case counts and rates for primary and secondary syphilis. Since numbers from one year are small, the five-year average rate in **Figure PS.4** helps to stabilize the rate and thus produces a more accurate representation of the distribution. The highest rate in 2021 was among 30-34 year olds who had a rate of 35.1 per 100,000. In contrast, the highest rate seen in the 5-year average was among 25-29 year olds.

Figure PS.3: Reported Primary and Secondary Syphilis Cases and Rates of Reported Cases by Age Group, Colorado, 2021



Note: these rates use small numbers and should be interpreted with caution.

Figure PS.4: Reported Primary & Secondary Syphilis Cases and Rates of Reported Cases by Age Group, Colorado, 2017-2021

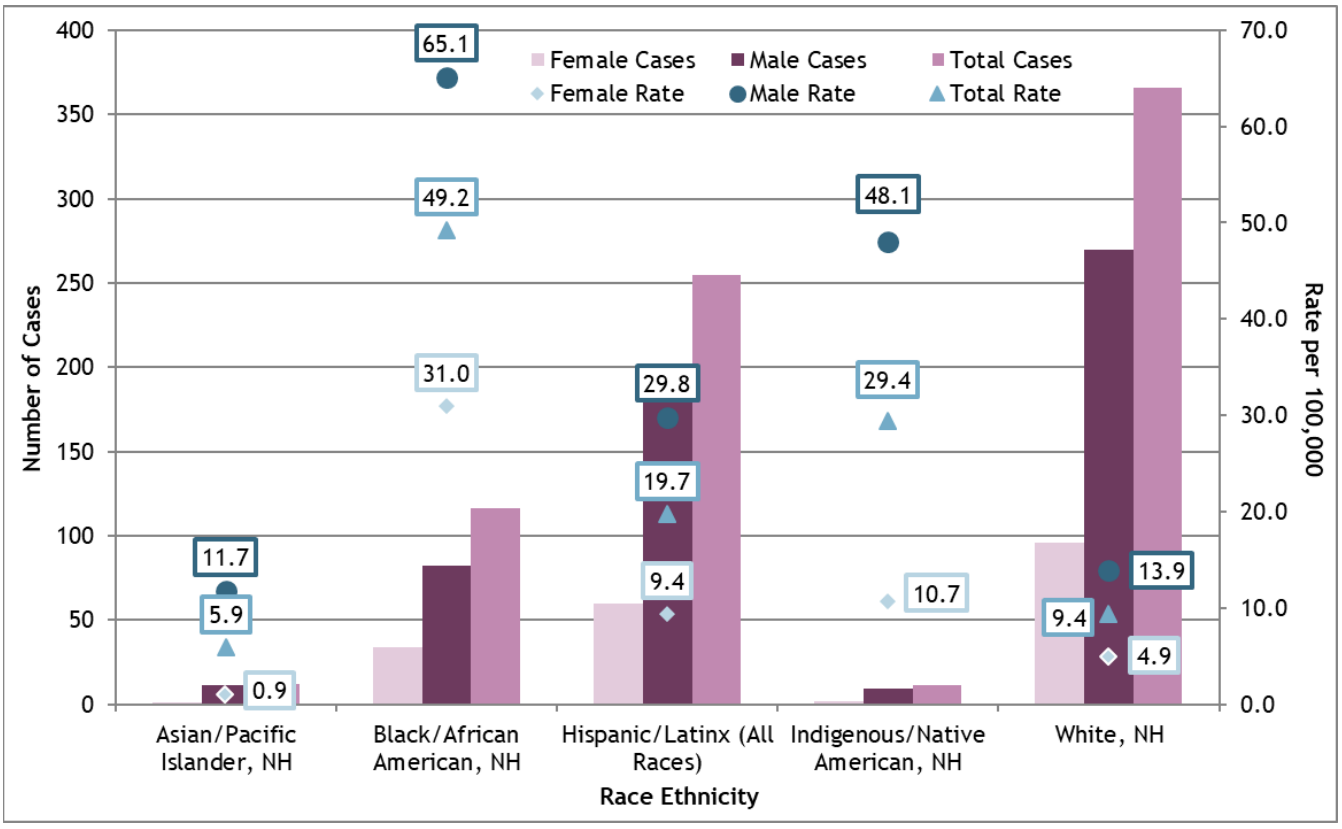


More stable than the one-year rate from **Figure PS.3.**

Figure PS.5 shows cases and rates of primary and secondary syphilis cases by race/ethnicity and sex. In 2021, the highest rates were among Non-Hispanic Black/African American males (65.1 per 100,000) and Non-Hispanic Indigenous/Native American males (48.1 per 100,000). Non-Hispanic Indigenous/Native Americans accounted for only 1.4% of cases, while Non-Hispanic Whites accounted for 47.4% of all cases and the second lowest rates across genders. This was also seen nationally, where Black/African American males had the highest rate of 68.3 per 100,000 followed by Indigenous/Native American males who had a rate of 54.9. In 2021, the highest female rate of 38.6 per 100,000 in the US was among American Indian/Alaska Natives[19].

Among Hispanics in Colorado, who had an overall rate of 19.7 per 100,000 (29.8 for males and 9.4 for females) and accounted for 33.0% of all cases, the highest rates were among Asian/Pacific Islanders and Black/African Americans; however, these groups only accounted for a total of 8 cases (1% of all cases), and the high rates are influenced by small population sizes in these groups (see **Table 1** in the appendix for Hispanic breakdowns). In this group, Whites accounted for 60% of cases among Hispanics.

Figure PS.5: Rates of Reported Primary & Secondary Syphilis Cases by Race/Ethnicity and Sex, Colorado, 2021

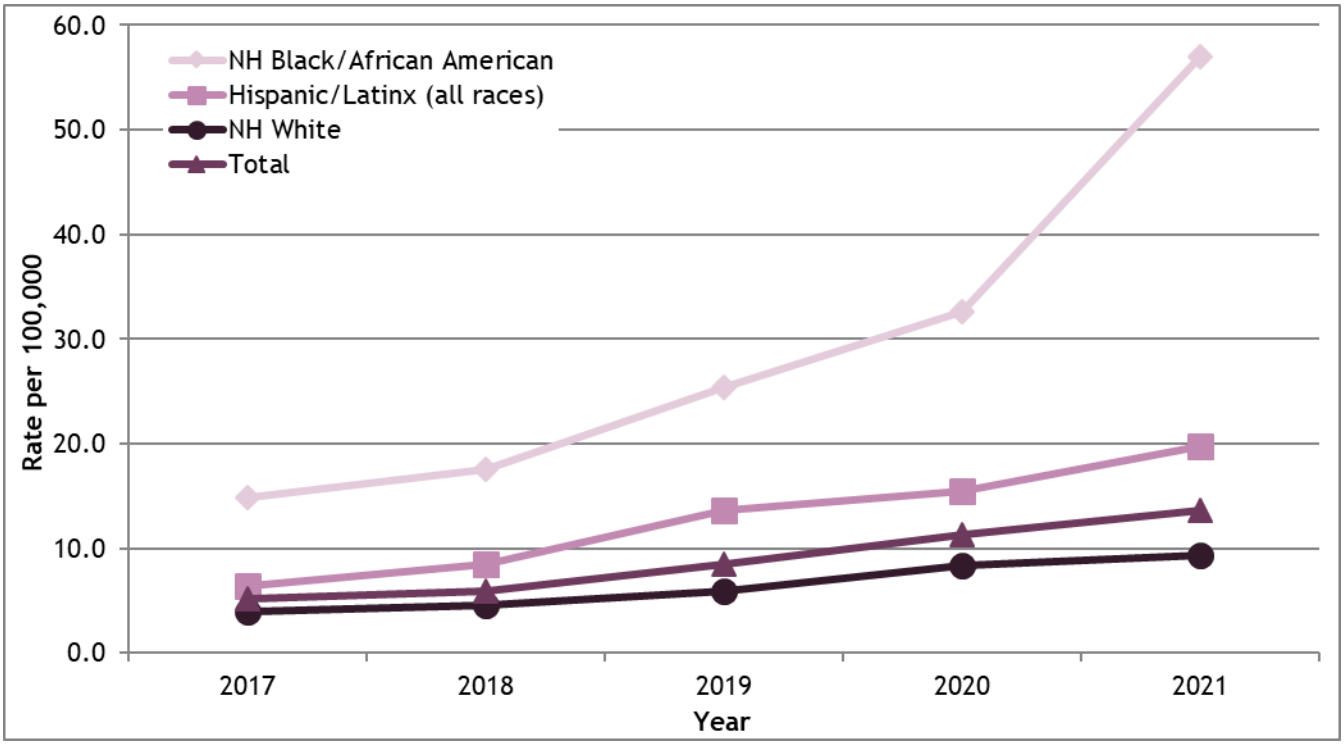


Note: these rates use small numbers and should be interpreted with caution.
NH: Non-Hispanic.

[19] Division of STD Prevention, National Center for HIV, Viral Hepatitis, STD, and TB Prevention, Centers for Disease Control and Prevention. 2023. "Home." Table 16B. Primary and Secondary Syphilis — Rates of Reported Cases* by Race/Hispanic Ethnicity, Age Group, and Sex, United States, 2021. https://www.cdc.gov/std/statistics/2021/tables/16b.htm.

Figure PS.6 shows the five-year trends in rates for Non-Hispanic Black/African Americans, Non-Hispanic Whites, and Hispanics of all races. Other races were not displayed due to small numbers (12 or fewer cases in 2021). Rates among all races were increasing from 2017-2021, with Non-Hispanic Black/African Americans seeing the sharpest increases each year since 2018. From 2020 to 2021, the rate among this group increased by 27.8%, which is the highest increase across all races shown since 2017.

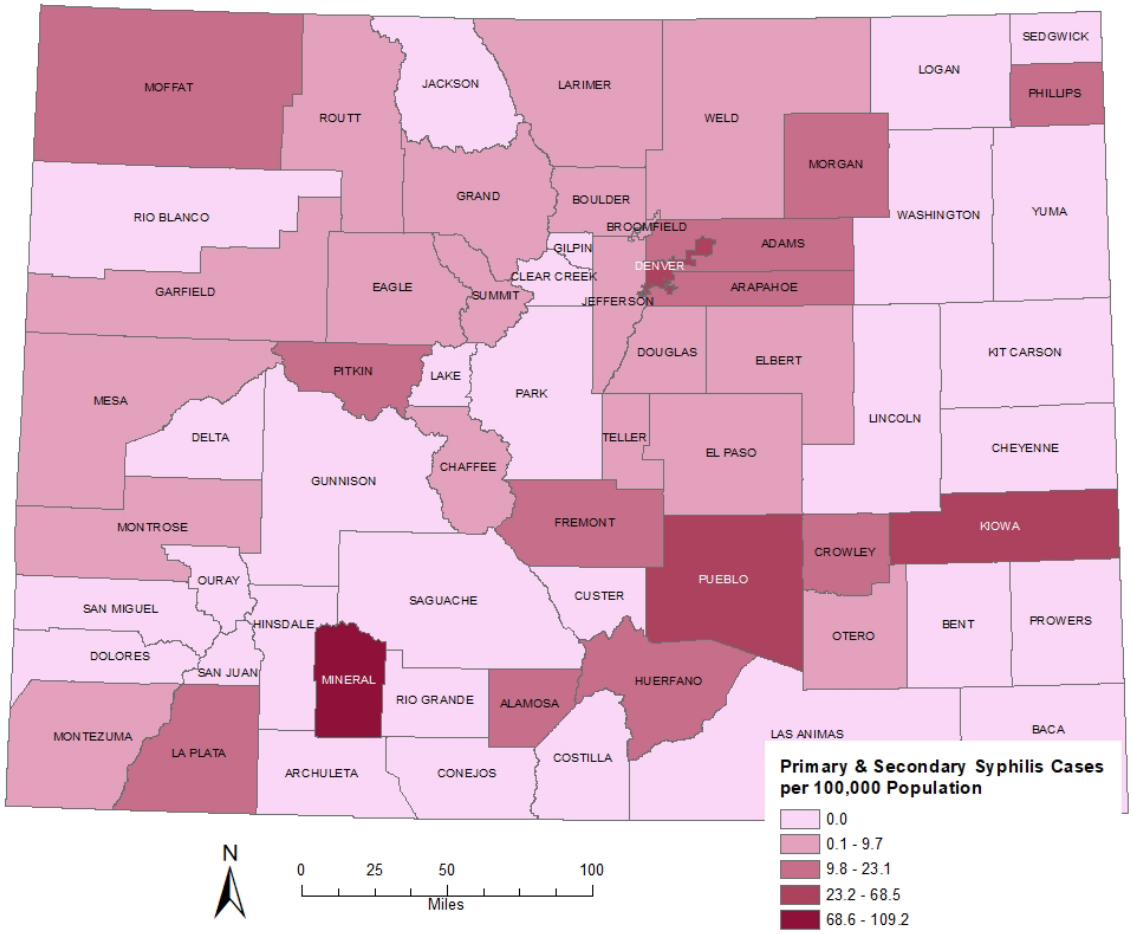
Figure PS.6: Rates of Reported Primary & Secondary Syphilis Cases by Race/Ethnicity, Colorado, 2017-2021



Note: these rates use small numbers and should be interpreted with caution.
NH: Non-Hispanic

Figures PS.7 and PS.8 describe the geographical distribution of primary and secondary syphilis cases and rates in Colorado at the county level. At least one case was reported in 35 of 64 counties in 2021, with 35.6% of cases in Denver County, 12.6% in Arapahoe County, and 11.0% in Pueblo County.

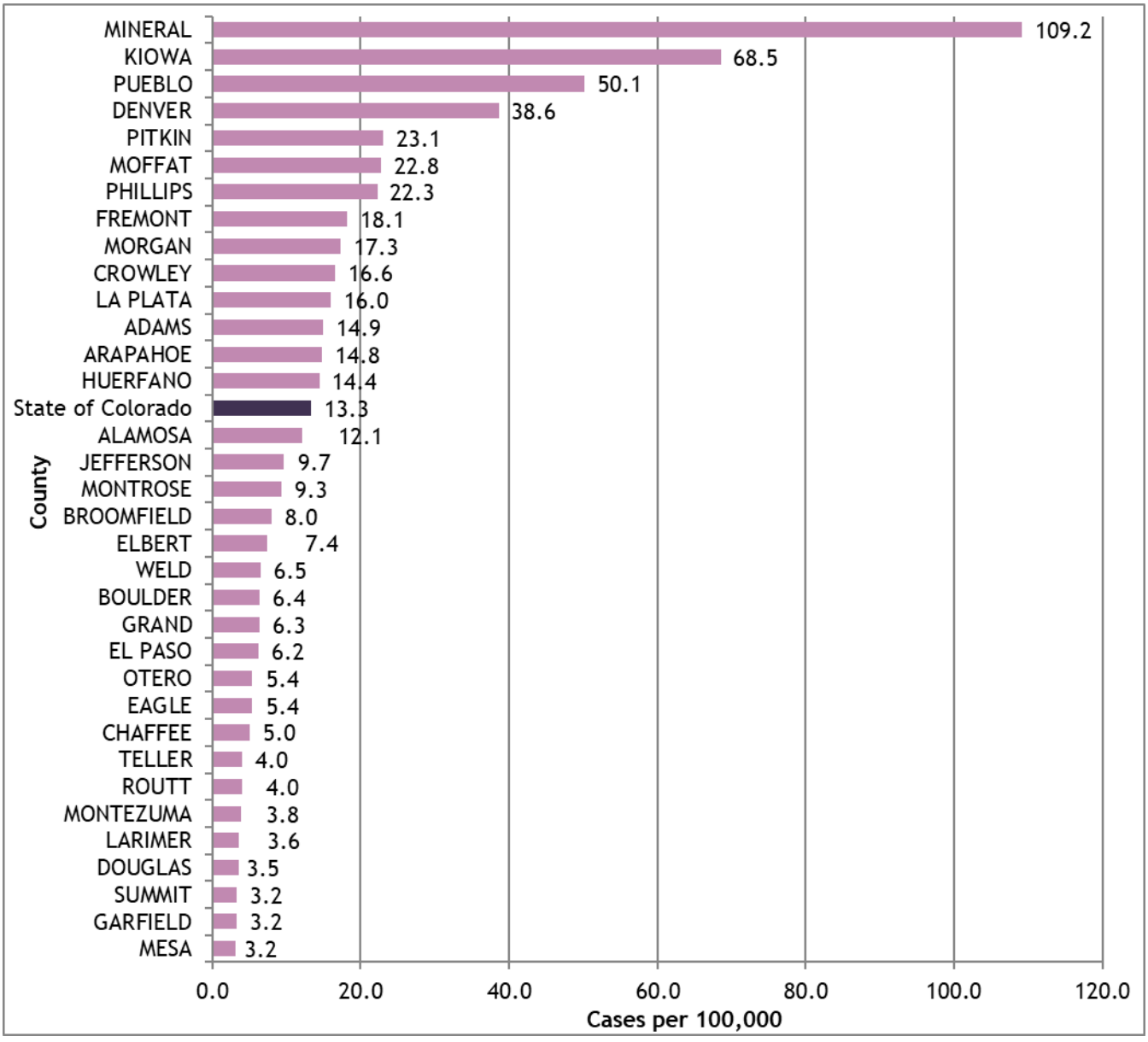
Figure PS.7: Rates of Reported Primary & Secondary Syphilis Cases by County Map, Colorado, 2021



High rates do not necessarily mean high case counts; for further details, see **Figure PS.8** and **Table 2.**

As shown in **Figure PS.8**, the three highest rates were in Mineral, Kiowa, and Pueblo counties in 2021; however, Mineral and Kiowa counties each only had 1 case and their high rates are due to small population size. Use caution when interpreting some rates as high rates may correspond to small cases numbers in counties with small populations. See **Table 2** in the appendix for more details.

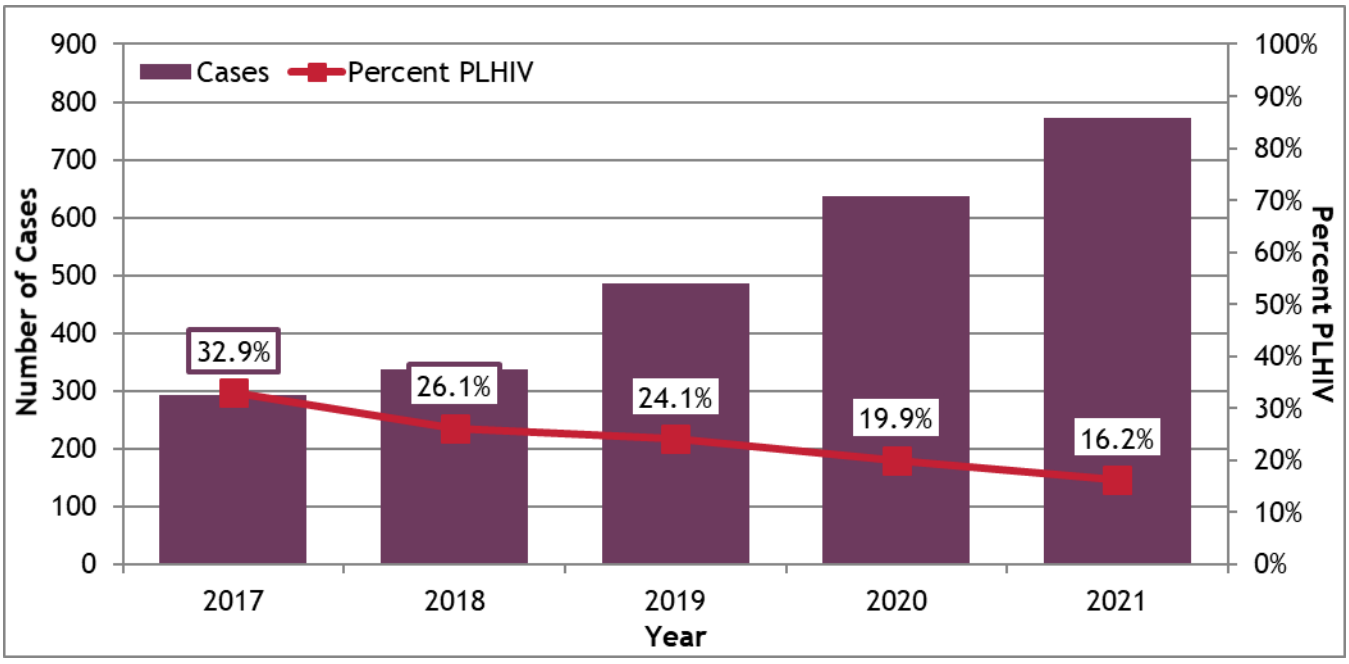
Figure PS.8: Rates of Reported Primary & Secondary Syphilis Cases by County Chart, Colorado, 2021



Note: these rates use small numbers and should be interpreted with caution. For details see **Table 2.**

Figure PS.9 shows the percent of primary and secondary syphilis cases that were also living with HIV (both previously diagnosed with HIV or diagnosed with HIV at the same time as the syphilis diagnoses) from 2017-2021. While primary and secondary syphilis cases have increased each year, the percent of cases living with HIV has decreased each year since 2017, with 16.2% in 2021 being half of the 32.9% seen in 2017. Although the percentage has decreased since 2020, there were 8 more cases living with HIV in 2021 than in 2020. The five-year average rate for primary and secondary syphilis cases living with HIV was 21.9% (553 of 2,524 cases).

Figure PS.9: Reported Primary & Secondary Syphilis Cases and Percent Living with HIV by Year of Diagnosis, Colorado, 2017-2021



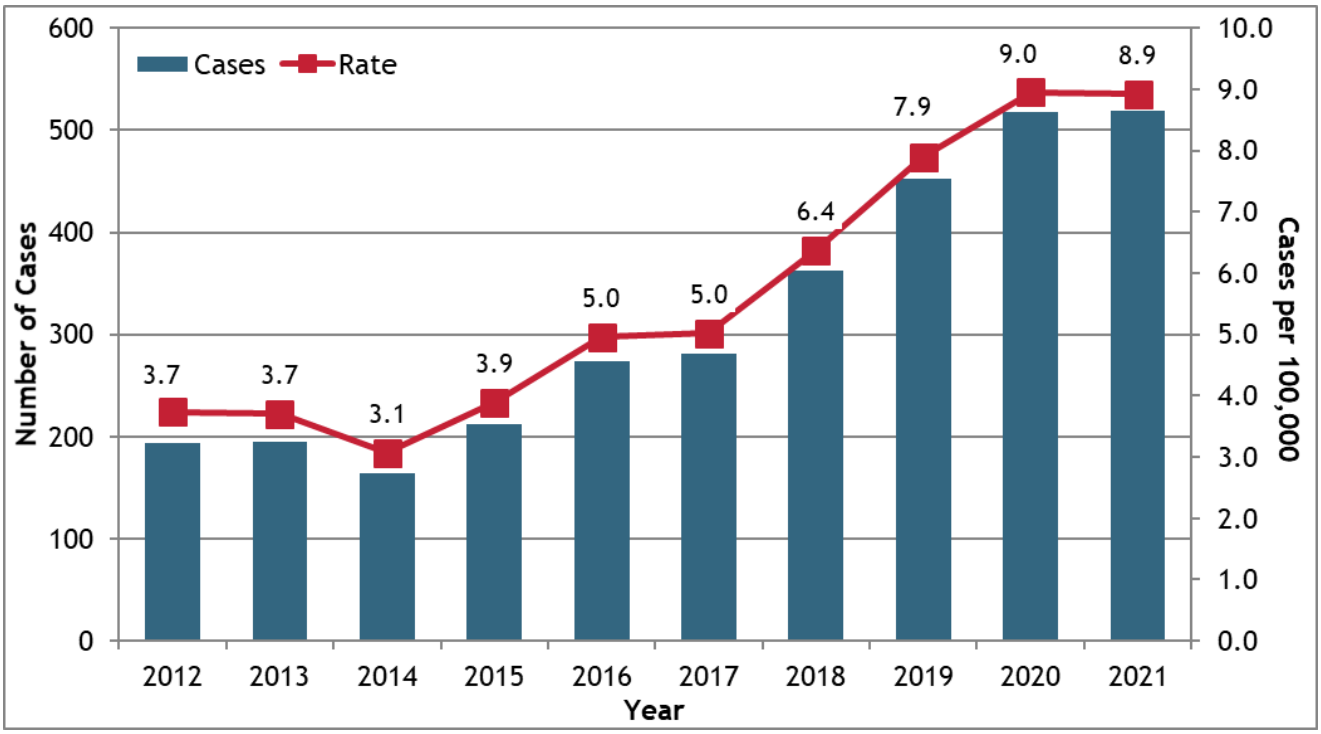
PLHIV = People Living with HIV

Non-Primary, Non-Secondary Latent Syphilis

Non-primary, non-secondary latent syphilis is latent syphilis (no visible signs or symptoms, previously referred to as early latent syphilis) in which transmission occurred within the past 12 months. There were 519 cases diagnosed and reported in Colorado in 2021, with a rate of 8.9 per 100,000. As shown in **Figure EL.1**, the 2021 rate is a 0.3% decrease since 2020 but a significant increase of 77.9% and 139.0% since 2017 and 2012, respectively. The decrease in 2021 was the first decrease since 2014 and follows steady increases each year since 2017. The increases at the national level exceeded those in Colorado. In the US, 52,247 cases were diagnosed and reported to the CDC in 2021 (15.6 per 100,000), which is a 20.1% increase in cases since 2020 (43,486), a 51.3% increase in cases since 2017 (34,540), and a 219.3% increase since 2017[20].

Males represented 84.6% of reported non-primary, non-secondary latent syphilis cases. Non-Hispanic Whites represented 46.2% and Hispanics represented 38.2% (with 25.6% of all cases from Hispanic Whites, 9.4% from Hispanics with an unknown race, and Hispanics of other races accounting for the remaining 3.2%). Men who have sex with men (MSM) accounted for 41.0% (213 cases) in 2021, and people living with HIV (both previously diagnosed with HIV or diagnosed at the same time as the syphilis diagnosis) accounted for 27.2% (141) cases. Of cases among MSM, 51.2% of those cases (109) were also living with HIV.

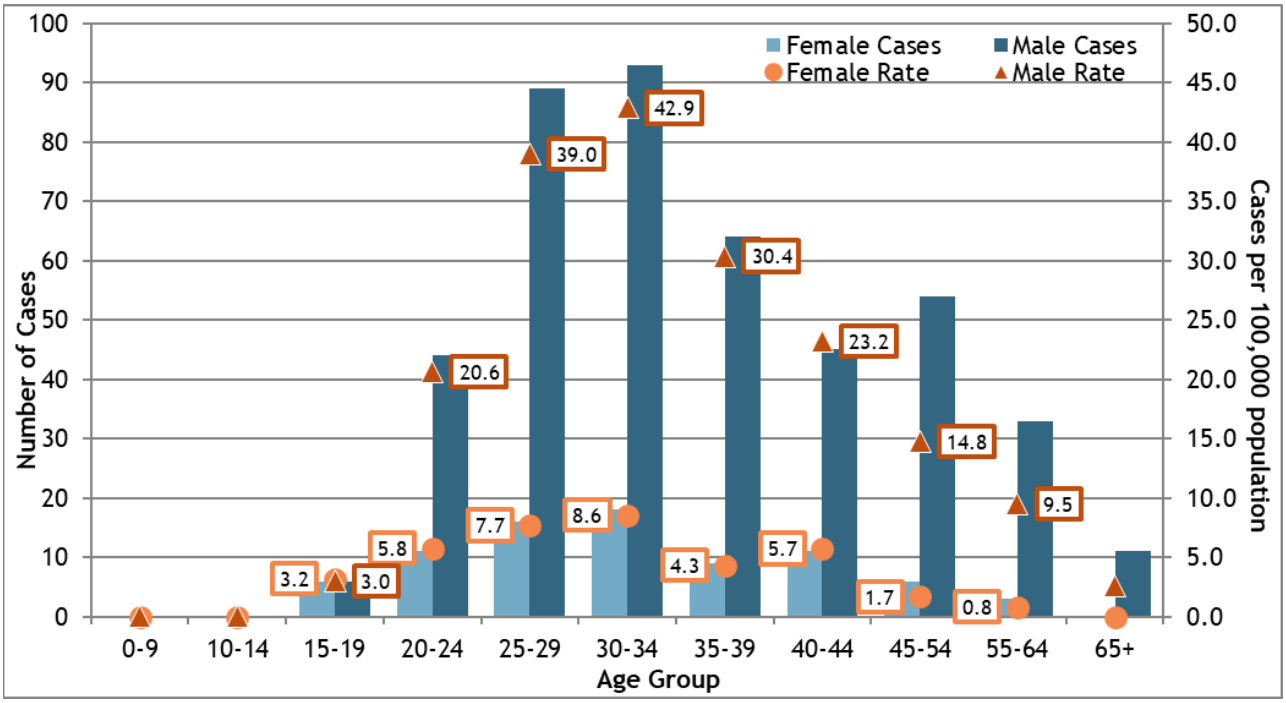
Figure EL.1: Reported Non-Primary, Non-Secondary Latent Syphilis Cases and Rates of Reported Cases, Colorado, 2012-2021



[20] Division of STD Prevention, National Center for HIV, Viral Hepatitis, STD, and TB Prevention, Centers for Disease Control and Prevention. 2023. "Syphilis - Rates of Reported Cases by Stage of Infection United States 2012-2021.xlsx," Data Points Excel File. Sexually Transmitted Disease Surveillance 2021. https://www.cdc.gov/std/statistics/2021/default.htm.

Figure EL.2 shows age and sex case counts for non-primary, non-secondary latent syphilis diagnoses in 2021. The mean age at diagnosis was 36.5 (33.2 for females, 37.1 for males), with a range of 16 to 75 years of age. The highest rate of 42.9 per 100,000 was reported among 30-34 males, who accounted for 17.9% of all cases. The highest female rate of 8.6 per 100,000, seen in 30-34 year olds, is 5 times smaller than the highest male rate and is smaller than the male rates across all age groups from 20 to 64. From 20-54, the male rate ranges from 3.5 to 8.7 times greater than the female rate.

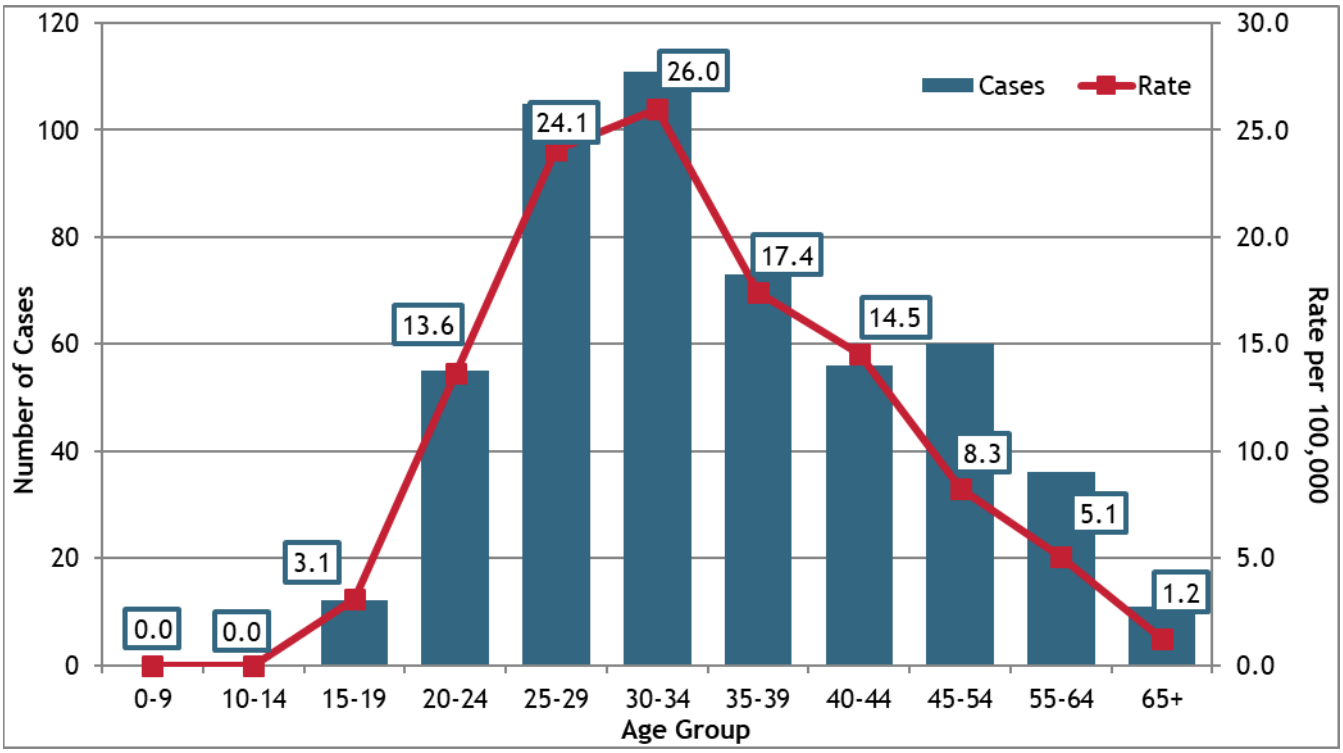
Figure EL.2: Reported Non-Primary, Non-Secondary Latent Syphilis Cases and Rates of Reported Cases by Sex and Age Group, Colorado, 2021



Note: these rates use small numbers and should be interpreted with caution.

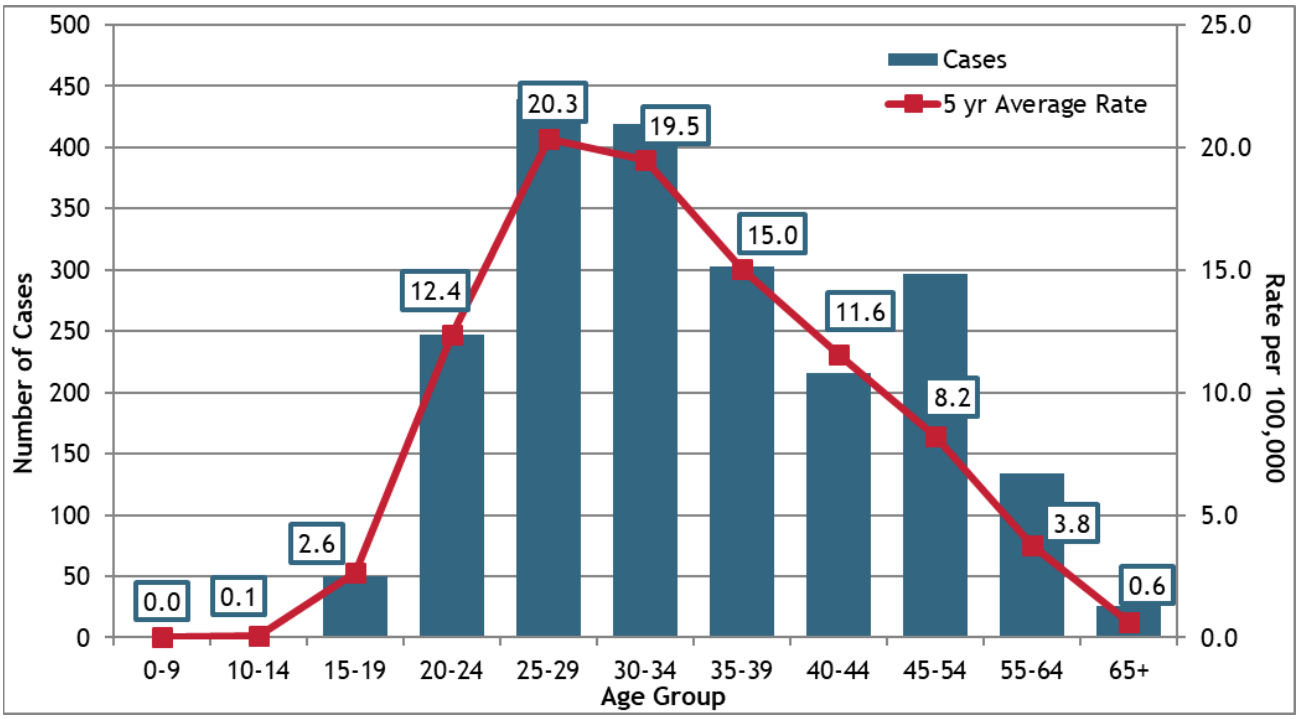
Figures EL.3 and **EL.4** below depict age group case counts and rates for non-primary, non-secondary latent syphilis for 2021 and five-year averages. This five-year average rate helps to stabilize the rate and thus produces a more accurate representation of the rate. As seen with primary and secondary syphilis, the highest rate in 2021 was among 30-34 year olds, while the highest 5-year average rate from 2017-2021 was among 25-29 year olds. While 25-29 year olds had the highest 5-year average rate of 20.3, this rate is lower than the 2021 rate of 24.1 in this age group.

Figure EL.3: Reported Non-Primary, Non-Secondary Latent Syphilis Cases and Rates of Reported Cases by Age Group, Colorado, 2021



Note: these rates use small numbers and should be interpreted with caution.

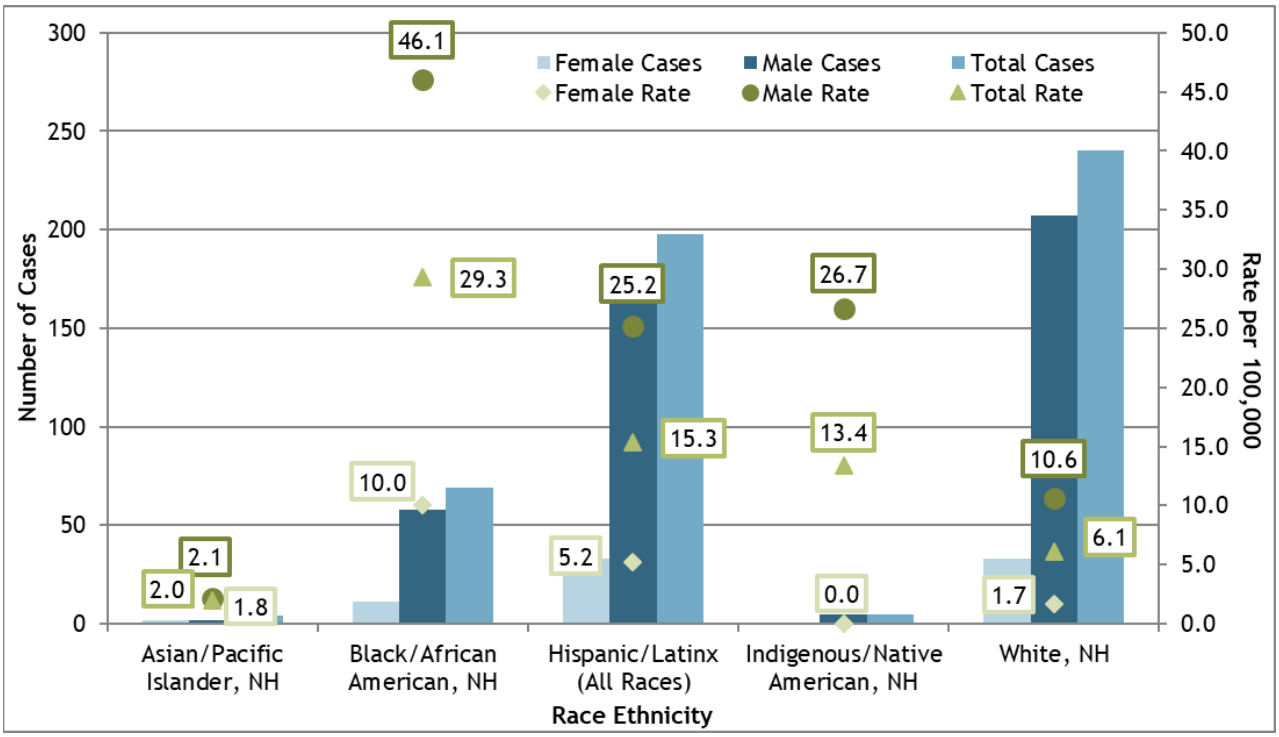
Figure EL.4: Reported Non-Primary, Non-Secondary Latent Syphilis Cases and Rates of Reported Cases by Age Group, Colorado, 2017-2021



More stable than the one-year rate from **Figure EL.3.**

Figure EL.5 shows the rates of non-primary, non-secondary latent syphilis cases by gender and race/ethnicity. Non-Hispanic Black/African Americans had the highest rates across genders, with males having the highest rate of 46.1 per 100,000 and females the second highest rate of 29.3 per 100,000. Across all races/ethnicities, males had higher rates than females. While Non-Hispanic Whites had the lowest non-zero rate, they accounted for 46.2% of all cases (see **Tables 1** in the appendix). Hispanics had the second highest total rate and accounted for 38.2% of all cases, with 25.6% coming from Hispanic Whites. However, the rate of 15.3 is largely influenced by the rates in the smaller race categories of Asian/Pacific Islanders and Black/African Americans in the Hispanic group, who combined account for less than 2% of all cases (see **Tables 1 and 6** in the appendix for Hispanic race breakdowns). Non-Hispanic Black, Non-Hispanic White, and Hispanic groups accounted for 97.7% of all cases, and across these groups the male rates were between 4.9 and 6.2 times greater than the female rates.

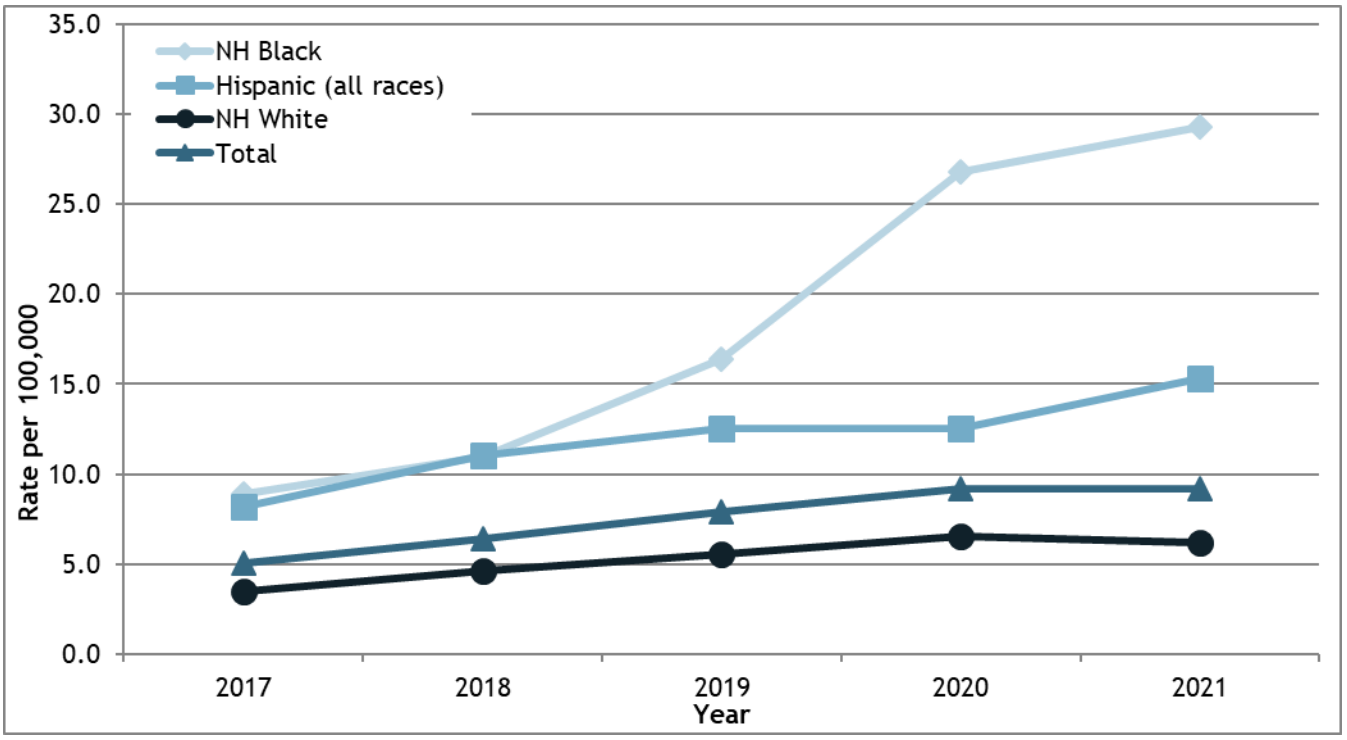
Figure EL.5: Rates of Non-Primary, Non-Secondary Latent Syphilis Cases by Race/Ethnicity and Sex, Colorado, 2021



Note: these rates use small numbers and should be interpreted with caution.
NH: Non-Hispanic.

As shown in **Figure EL.6**, the rate of non-primary, non-secondary latent syphilis has been sharply increasing among the NH Black/African American population since 2017, with a 9.3% increase from 2020-2021, but a 228.5% increase from 2017-2021. The second highest ranking population, the Hispanic/Latinx population, also saw a rise in rates from 2017-2018 which leveled off through 2020 then significantly increased by 22.1% in 2021. The Non-Hispanic White population was slightly increasing from 2017 to 2020 but decreased in 2021, along with all other racial/ethnic groups (not shown due to small (<5) cases) who saw a decline in rates from 2020 to 2021.

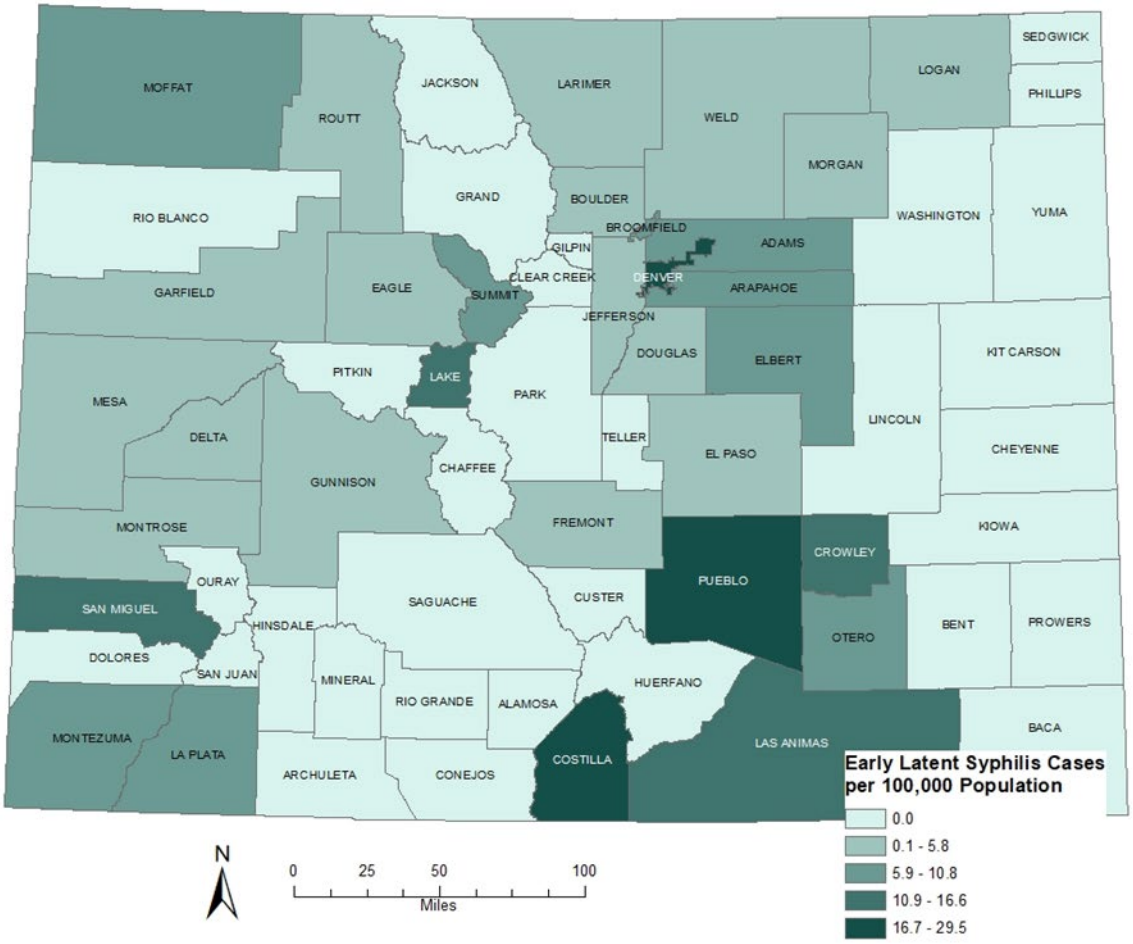
Figure EL.6: Rates of Non-Primary, Non-Secondary Latent Syphilis Cases by Race/Ethnicity, Colorado, 2017-2021



NH: Non-Hispanic.

Figures EL.7 and **EL.8** describe the geographical distribution of non-primary, non-secondary latent syphilis rates in Colorado at the county level. The map shows non-primary, non-secondary latent syphilis cases have been diagnosed in residents of 33 of 64 counties, with Denver County reporting the highest proportion and one of the highest rates of reported cases in 2021, 37.6% and 26.5, respectively. These numbers are similar to those seen in 2020, which were slight decreases since 2019, when Denver County accounted for 45.7% of non-primary, non-secondary latent syphilis and the rate was 28.4 per 100,000 people. The counties that represented the next highest proportion of cases in 2021 were Arapahoe (13.1%), Adams (9.8%), and Pueblo (9.5%) counties.

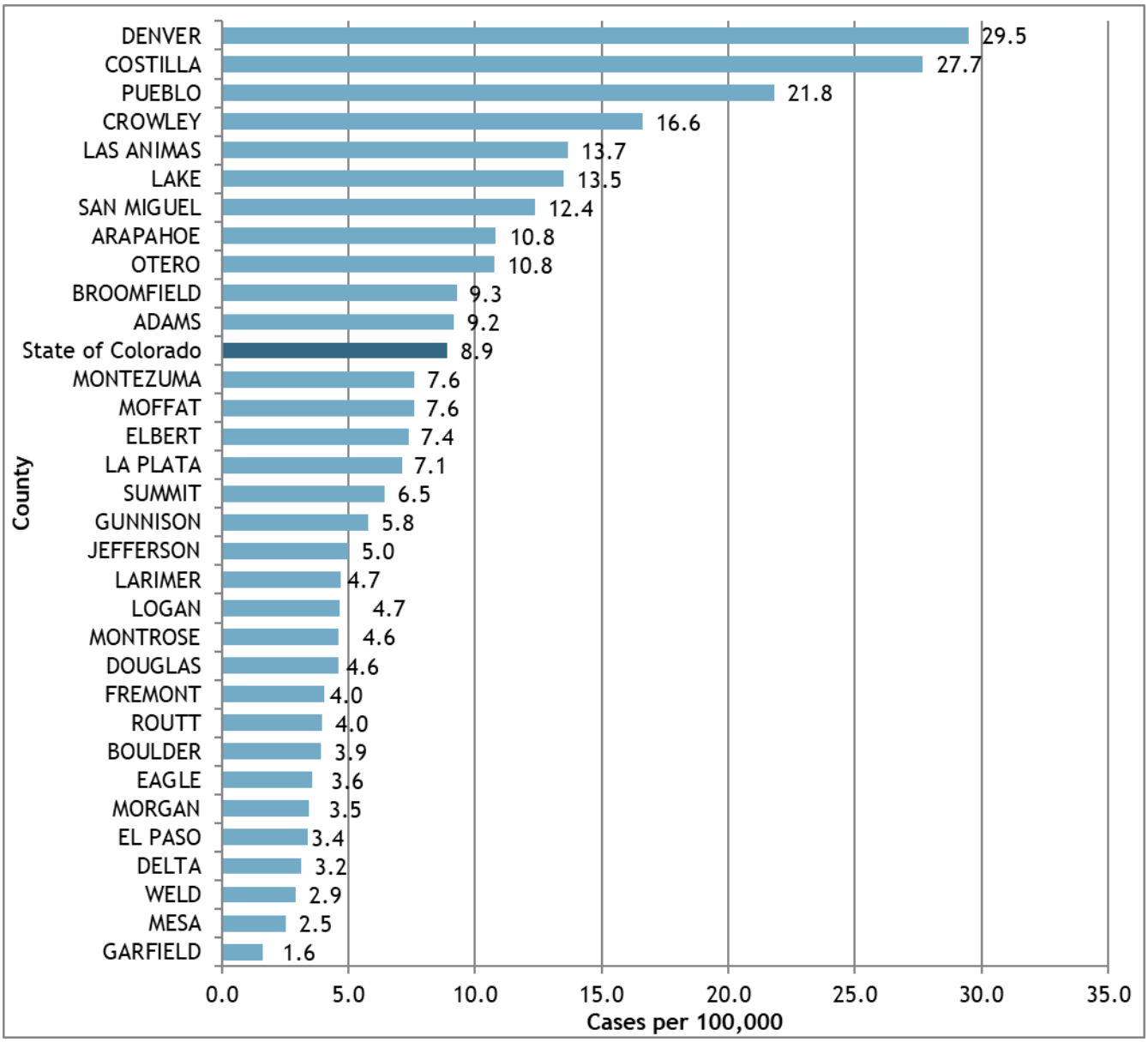
Figure EL.7: Rates of Non-Primary, Non-Secondary Latent Syphilis Cases by County Map, Colorado, 2021



High rates do not necessarily mean high case counts; for further details, see **Figure EL.8** and **Table 2.**

In 2021, Denver and Pueblo counties had the highest (29.5 per 100,000) and third highest (21.8 per 100,000) rates, respectively, of non-primary, non-secondary latent syphilis. Although Costilla, Crowley and Las Animas were among the top 5 highest rates of non-primary, non-secondary latent syphilis according to **Figure EL.8**, only one or two cases were reported in each county and these high rates are heavily impacted by small populations and are not reliable. Use caution when interpreting some of these rates as the county may have a small population and small case numbers.

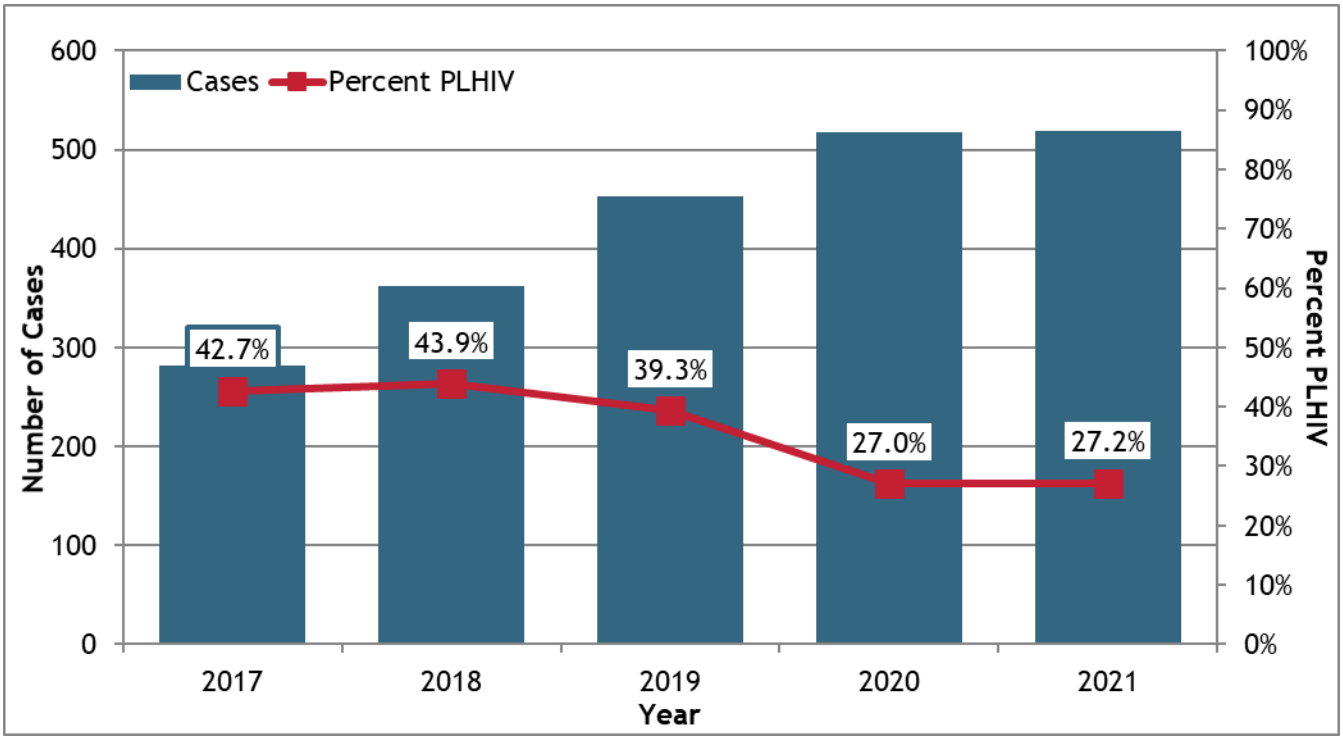
Figure EL.8: Rates of Non-Primary, Non-Secondary Latent Syphilis Cases by County Chart, Colorado, 2021



Note: these rates use small numbers and should be interpreted with caution. For details, see **Table 2.**

Figure EL.9 shows the percent of non-primary, non-secondary latent syphilis cases who were living with HIV (both previously diagnosed with HIV or diagnosed with HIV at the same time as the syphilis diagnosis), from 2017-2021. The five-year average rate for non-primary, non-secondary latent syphilis living with HIV from 2017-2021 is 34.6%.

Figure EL.9: Non-Primary, Non-Secondary Latent Syphilis Reported Cases and Percent Living with HIV by Year of Diagnosis, Colorado, 2017-2021



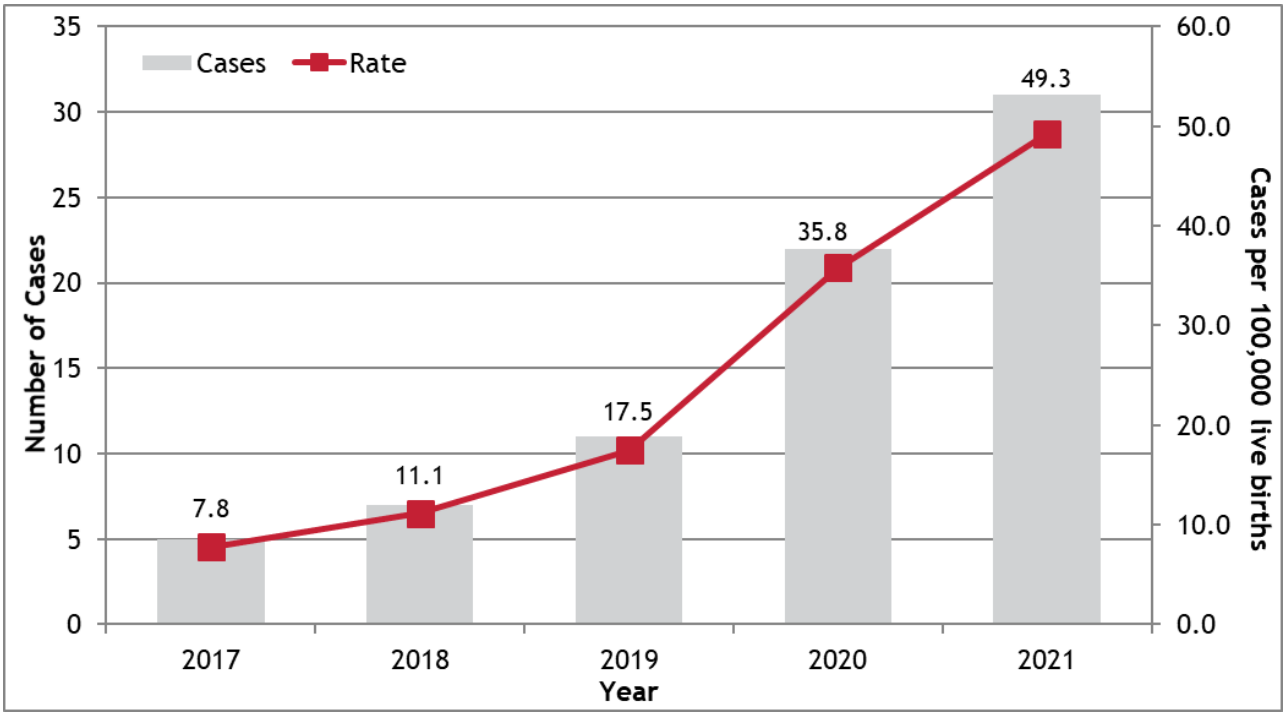
PLHIV = People Living with HIV

Congenital Syphilis

All congenital syphilis reports that meet the current case definition for "probable" or "confirmed" are considered congenital syphilis cases. There were 31 cases of congenital syphilis reported in Colorado in 2021, corresponding to a rate of 49.3 per 100,000 live births[21]. This rate is a 37.7% increase from 2020 (35.8) and a 534.4% increase from 2017 (7.8). Rates and cases have been increasing each year since 2017, as shown in **Figure CS.1**, with the highest single-year increase of 104.48% from 2019-2020.

Nationally, 2,855 cases of congenital syphilis were reported to the CDC, which is a rate of 77.9 cases per 100,000 live births and a 35.0% increase in rate since 2020. Of these cases, there were 220 syphilis-related stillbirths and infant deaths. In 2021, 37 states and D.C. saw increases in congenital syphilis cases, and 29 states reported over 100 cases[22].

Figure CS.1: Reported Congenital Syphilis Cases and Rates of Reported Cases, Colorado, 2017-2021



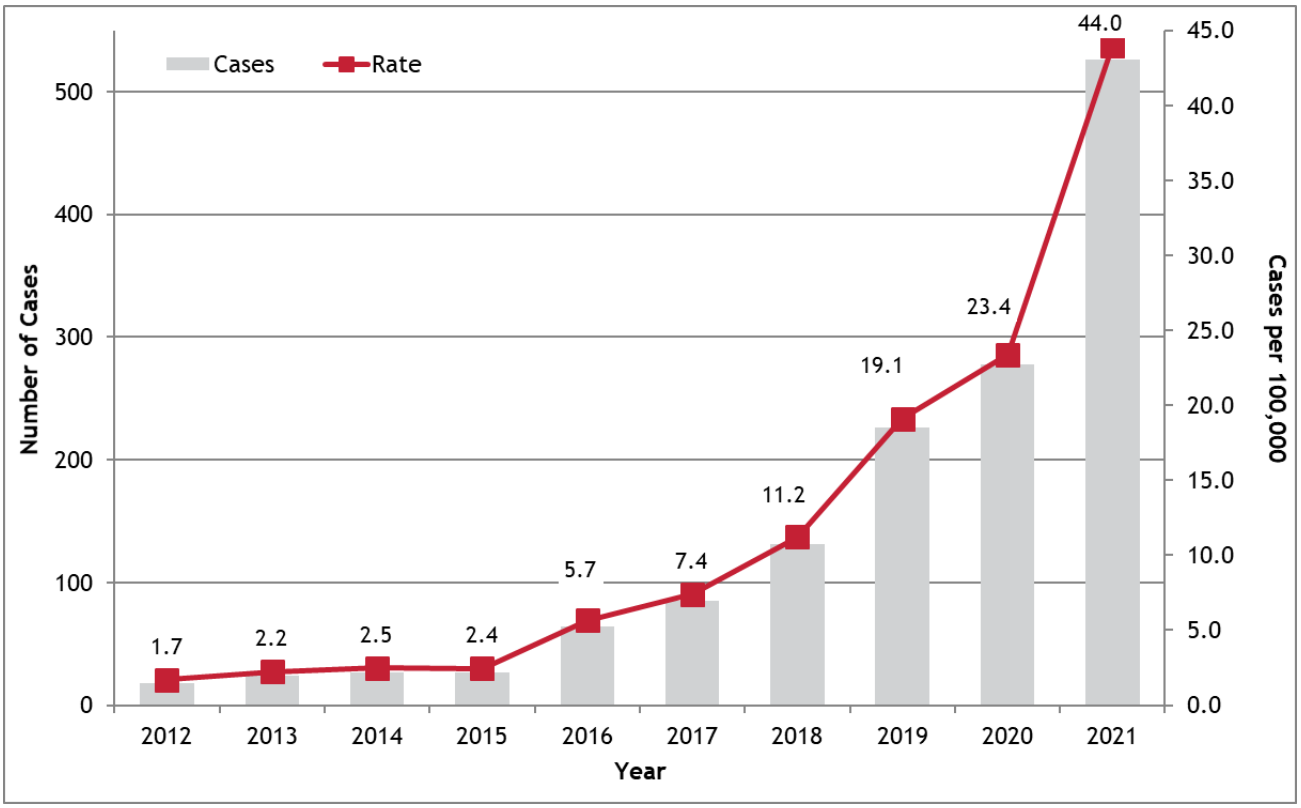
[21] Live birth data from the Colorado Health Information Dataset (COHID) managed by CDPHE. http://www.cohid.dphe.state.co.us/

[22] Division of STD Prevention, National Center for HIV, Viral Hepatitis, STD, and TB Prevention, Centers for Disease Control and Prevention. 2023. "National Overview of STDs, 2021." Centers for Disease Control and Prevention. https://www.cdc.gov/std/statistics/2021/overview.htm.

Syphilis Among Women of Reproductive Age

Trends for syphilis of all stages among women of reproductive age (WRA), which is defined as 15-44 year olds who were assigned female at birth, are similar to trends for congenital syphilis, with a sharper increase from 2020-2021. Case numbers among this cohort were stable from 2012-2015, doubled in 2016, and have increased each year since, with all increases since 2018 being statistically significant. In 2021, there were 526 cases of syphilis reported among WRA, which is a rate of 44.0 per 100,000 - 88.2% greater than the rate in 2020, 494.4% greater than the rate in 2017, and 2,484.5% greater than the rate in 2012. Increases were also seen nationally among WRA diagnosed with primary and secondary syphilis[23].

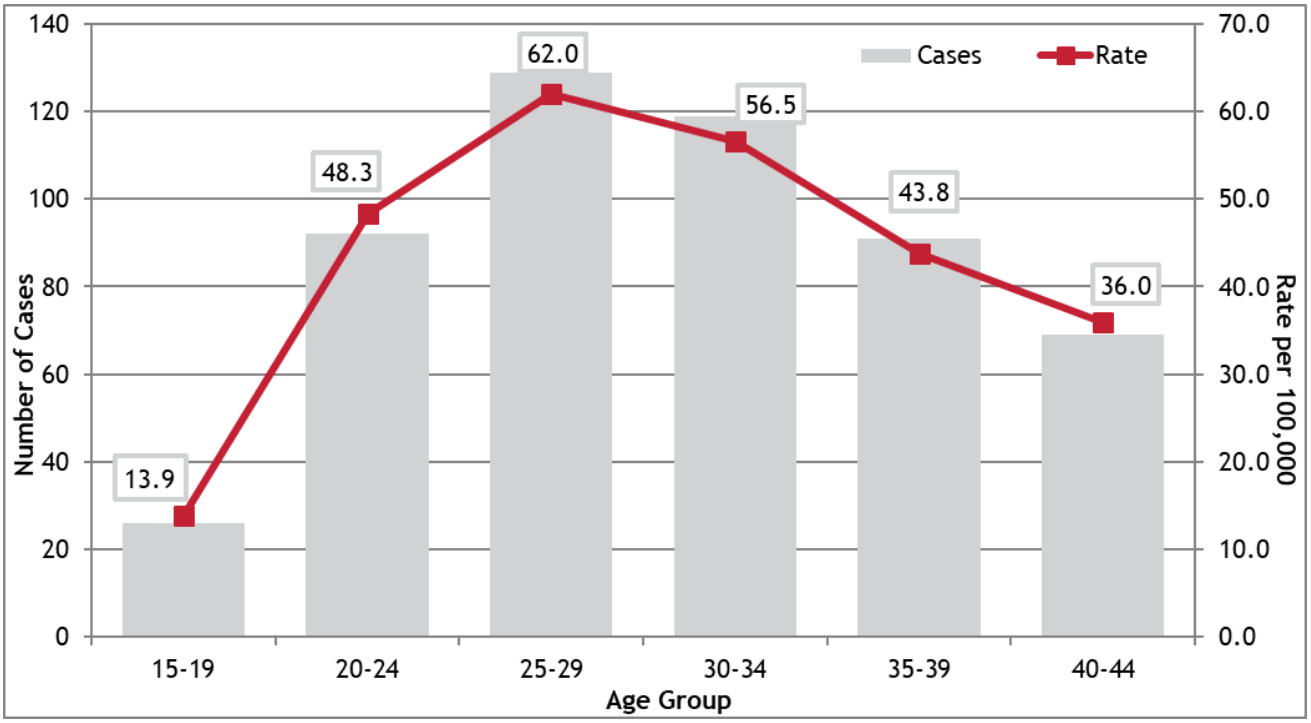
Figure CS.2: Reported Syphilis Cases Among Women of Reproductive Age and Rates of Reported Cases, Colorado, 2012-2021



[23] Division of STD Prevention, National Center for HIV, Viral Hepatitis, STD, and TB Prevention, Centers for Disease Control and Prevention. 2023. "National Overview of STDs, 2021." Centers for Disease Control and Prevention. https://www.cdc.gov/std/statistics/2021/overview.htm.

Figures CS.3 and **CS.4** show age group case counts and rates for syphilis among WRA diagnosed in 2021 and five-year averages, respectively. In 2021, the mean age at diagnosis was 31.0 with a range of 16 to 44 years of age. Among all WRA, the highest rate of 62.0 per 100,000 was reported among 25-29 year olds, which is 51.2% higher than the rate for this age group in 2020 (41.0 per 100,000). In 2021, the rates across all ages over 20 years old were higher than the highest rate of 41.0 among 25-29 year olds in 2020.

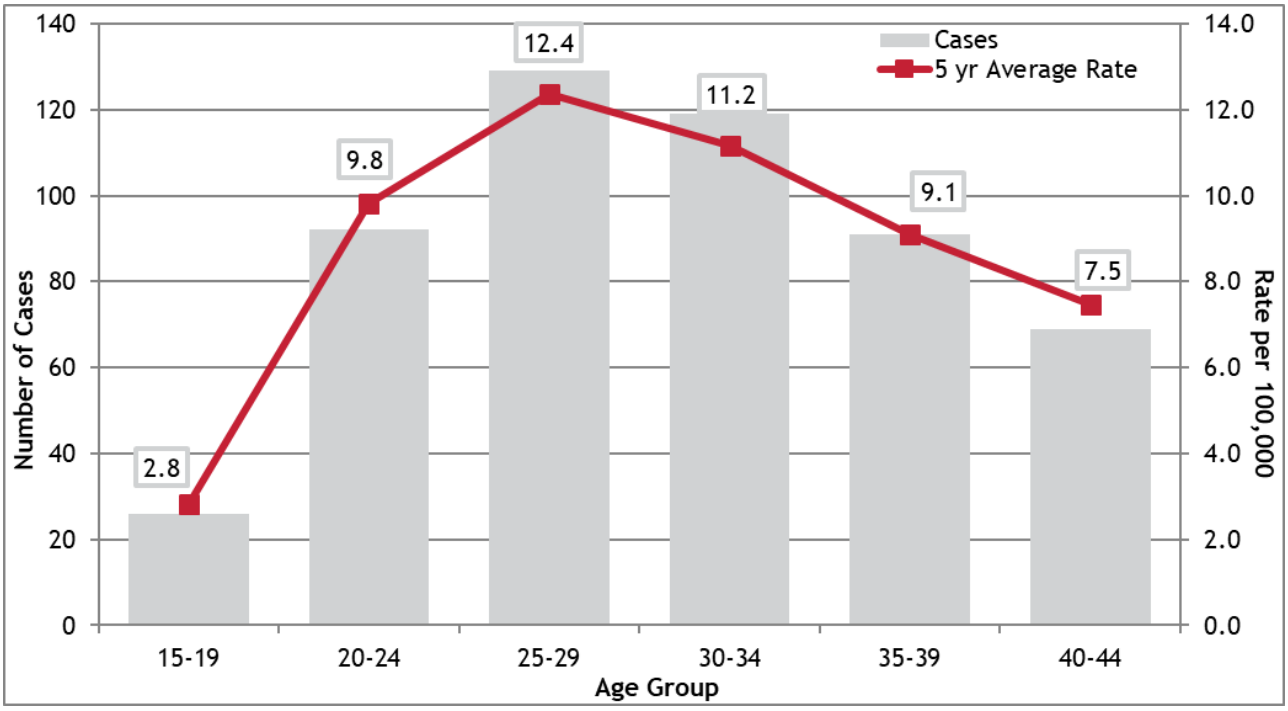
Figure CS.3: Reported Syphilis Cases Among Women of Reproductive Age and Rates of Reported Cases by Age Group, Colorado, 2021



Note: these rates use small numbers and should be interpreted with caution.

Figure CS.4 depicts age group case counts and rates for syphilis among women of reproductive age diagnosed in 2017-2021. This five-year average rate helps to stabilize the rate and thus produces a more accurate representation of the condition. The rates for each age group in 2021 were higher than each group's five-year average rate.

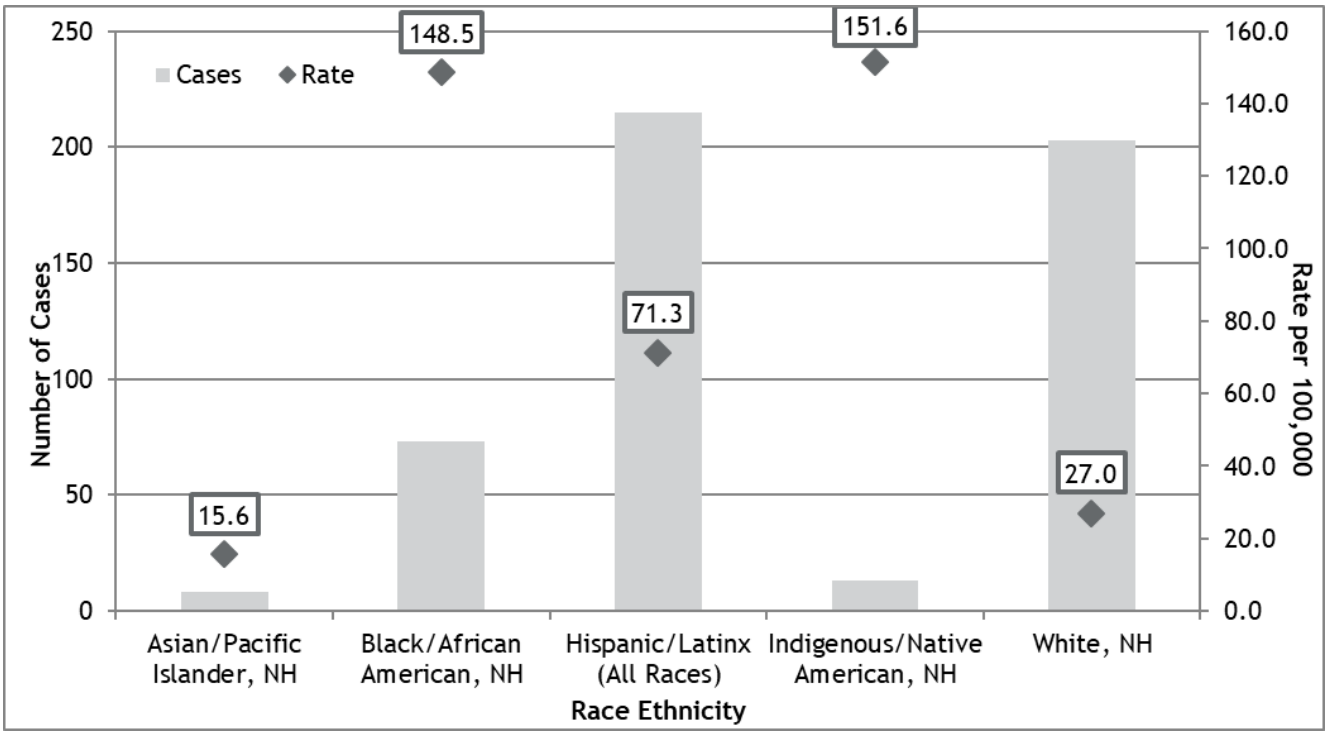
Figure CS.4: Reported Syphilis Cases Among Women of Reproductive Age and Rates of Reported Cases by Age Group, Colorado, 2017-2021



More stable than the one-year rate from **Figure CS.3.**

Figure CS.5 shows the highest rate of syphilis among WRA in 2021 was seen among NH Indigenous/Native Americans; however, this group only accounted for 2% of cases (see **Table 7** in the appendix). Non-Hispanic Black/African Americans had the next highest rate and accounted for 13.9% of cases. Hispanics accounted for the most cases (40.9%), with almost all of those coming from Hispanic White (23.6% of total cases) and Hispanic Other/Unknown (13.3% of all cases). Non-Hispanic Whites accounted for almost as many cases as Hispanics (38.6%), however they had the second lowest rate due to a larger population size.

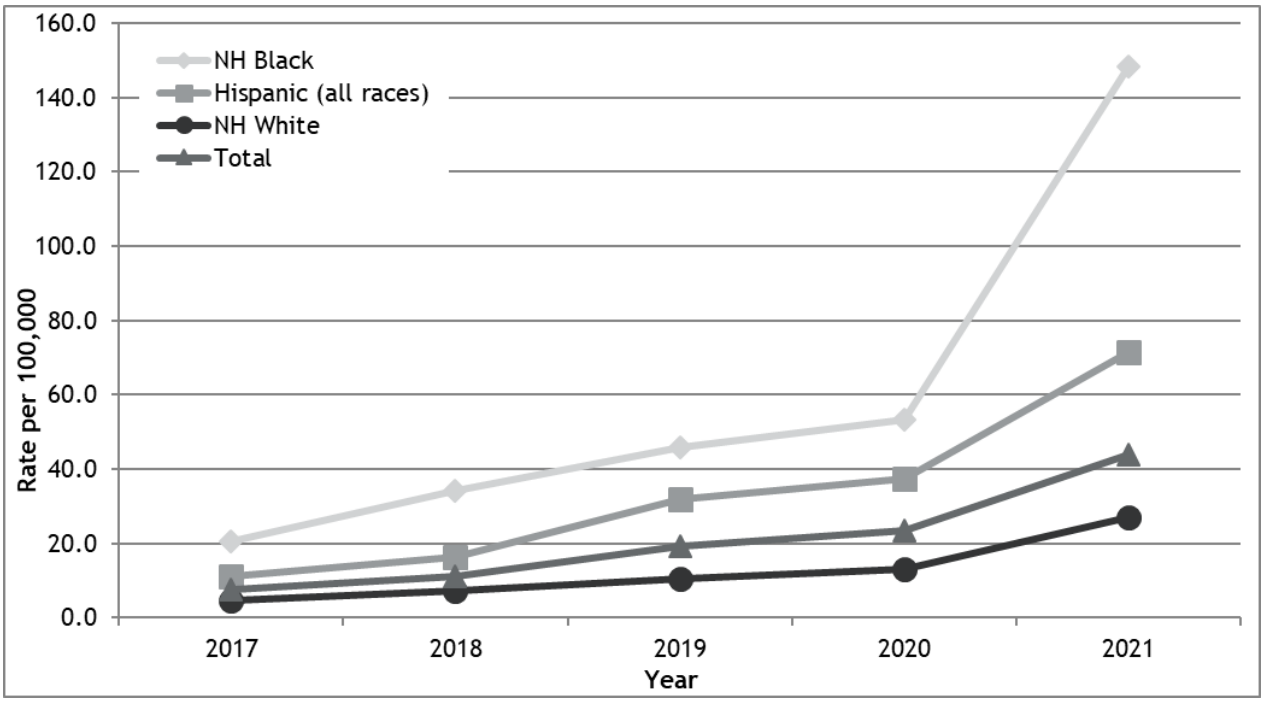
Figure CS.5: Reported Syphilis Cases Among Women of Reproductive Age and Rates of Reported Cases by Race/Ethnicity, Colorado, 2021



Note: these rates use small numbers and should be interpreted with caution.
NH: Non-Hispanic.

Figure CS.6 displays the five-year trend in rates for NH Black/African Americans, Hispanics/Latinx of all races, and NH Whites, with other races not being displayed due to small case counts. From 2017-2019, all three races showed steady increases, with the Hispanic population seeing the sharpest increase from 2018-2019. Rates continued to increase steadily across all groups through 2020, followed by the sharpest increase across all groups in 2021. Non-Hispanic Black/African Americans saw the sharpest increase of 178% from 2020-2021, followed by a 109% increase in Non-Hispanic Whites and a 91% increase in Hispanics. The rate of 148.5 per 100,000 seen in Non-Hispanic Black/African Americans in 2021 was also a 630% increase since 2017.

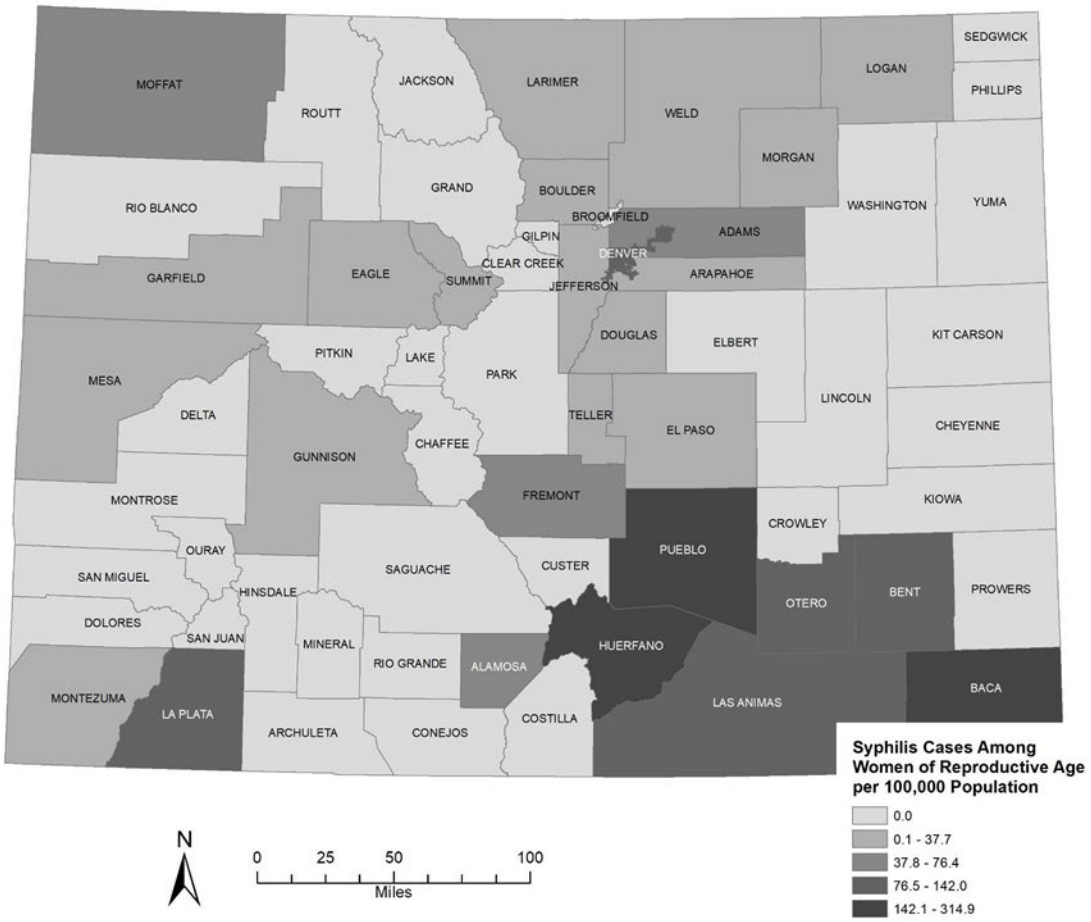
Figure CS.6: Rates of Reported Syphilis Cases Among Women of Reproductive Age by Race/Ethnicity, Colorado, 2017-2021



Note: these rates use small numbers and should be interpreted with caution.
NH: Non-Hispanic.

Figures CS.7 and **CS.8** describe the geographical distribution of syphilis rates among WRA in Colorado at the county level. The chart shows syphilis cases have been diagnosed in residents of 29 of 64 counties, with Denver County reporting the highest proportion (29.3%) of cases in 2021, followed by Pueblo (19.2%) and Adams (10.3%) counties.

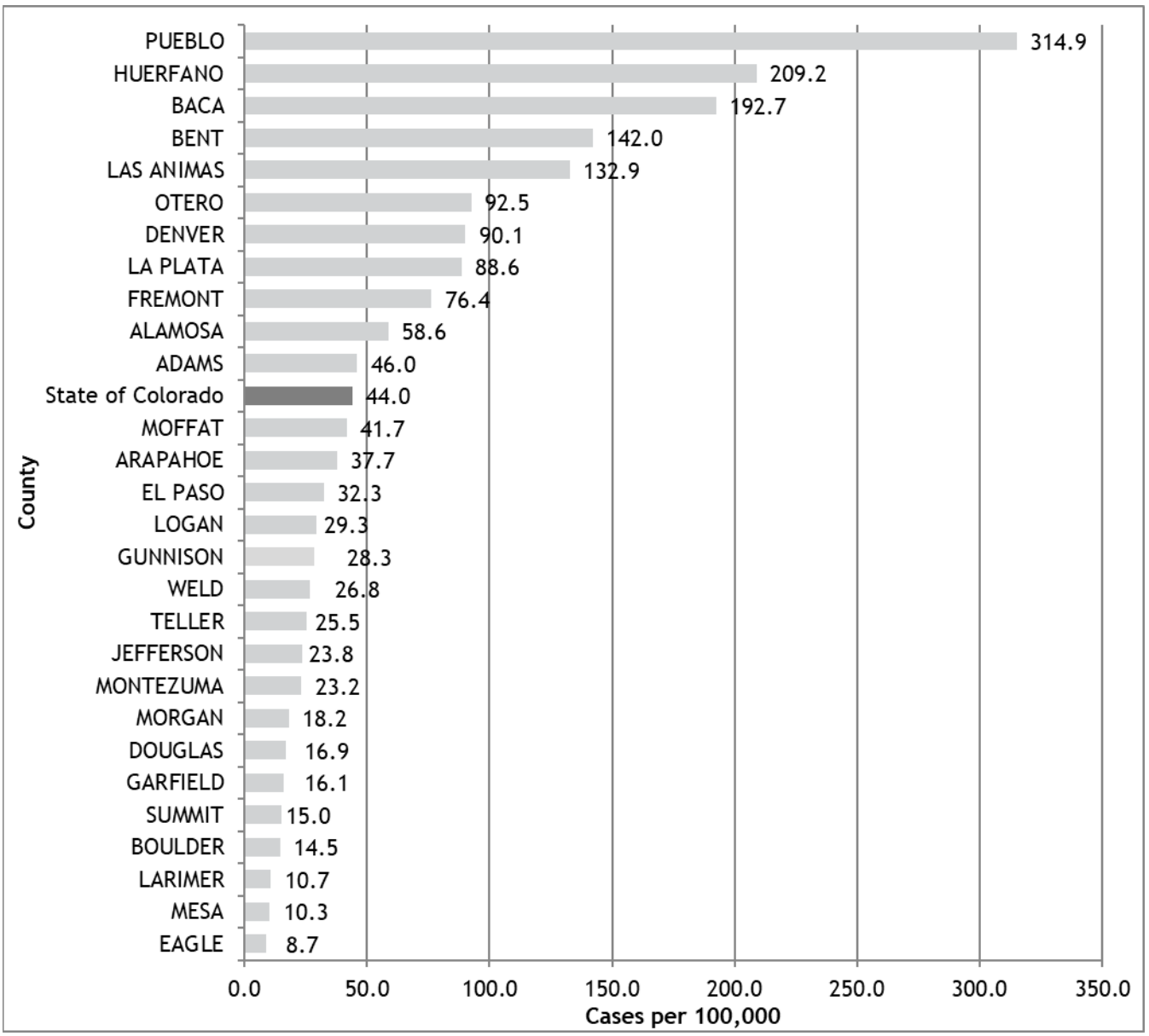
Figure CS.7: Rates of Reported Syphilis Cases Among Women of Reproductive Age by County Map, Colorado, 2021



High rates do not necessarily mean high case counts; for further details, see **Figure CS.8** and **Table 7.**

While the highest rates were seen in Pueblo, Huerfano, Baca and Bent counties, according to **Figure CS.8**, these counties had a combined total of 4 cases and these rates are not reliable due to a small number of live births in these counties.

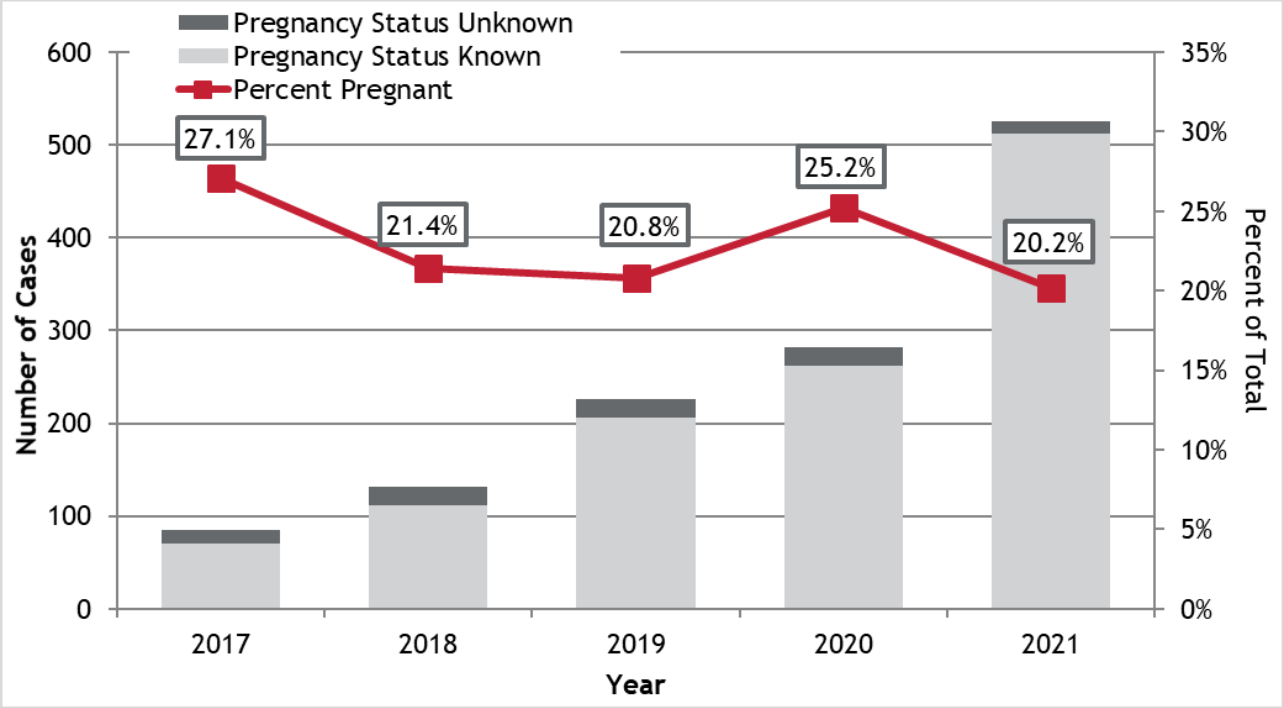
Figure CS.8: Rates of Reported Syphilis Cases Among Women of Reproductive Age by County Chart, Colorado, 2021



Note: these rates use small numbers and should be interpreted with caution. For details, see **Table 7.**

Figure CS.9 shows the percent of syphilis cases among WRA who were reported pregnant to CDPHE from 2017-2021. In 2021, 106 (20.2% of total cases) women were pregnant at the time of their syphilis diagnoses, which is a 19.8% decrease in the percent of total cases but a 51.4% increase in the amount of cases seen in 2020 (70). The five-year average percent of pregnant WRA cases from 2017-2021 is 22.0%.

Figure CS.9: Reported Syphilis Cases Among Women of Reproductive Age and Percent Pregnant by Year of Diagnosis, Colorado, 2017-2021



Data Tables

Table 1: Reported Chlamydia, Gonorrhea and Early Syphilis Cases and Rates of Reported Cases by Demographic Characteristics, 2021

		Chlamydia			Gonorrhea			Primary & Secondary Syphilis			Early Latent Syphilis		
	2021 Population ^	Cases	%	Rate†	Cases	%	Rate†	Cases	%	Rate†	Cases	%	Rate†
Total	5,814,729	26,747	100.0	460.0	10,596	100.0	182.2	772	100.0	13.3	519	100.0	8.9
Gender													
Female	2,902,213	16,718	62.5	576.0	4,200	39.6	144.7	198	25.6	6.8	80	15.4	2.8
Male	2,912,516	10,029	37.5	344.3	6,396	60.4	219.6	574	74.4	19.7	439	84.6	15.1
Race/Ethnicity													
Hispanic (all races)	1,291,829	9,080	33.9	702.9	3,349	31.6	259.2	255	33.0	19.7	198	38.2	15.3
Hispanic Asian/PI	14,838	162	0.6	1091.8	31	0.3	208.9	3	0.4	20.2	3	0.6	20.2
Hispanic Black	33,401	143	0.5	428.1	111	1.0	332.3	5	0.6	15.0	7	1.3	21.0
Hispanic Indigenous/Native	60,452	136	0.5	225.0	92	0.9	152.2	7	0.9	11.6	5	1.0	8.3
Hispanic White	1,133,555	3,887	14.5	342.9	1,603	15.1	141.4	153	19.8	13.5	133	25.6	11.7
Hispanic Multi-Race	49,583	28	0.1	56.5	14	0.1	28.2	1	0.1	2.0	1	0.2	---
Hispanic Other/Unknown	---	4,742	17.7	---	1,498	14.1	---	86	11.1	---	49	9.4	---
Non-Hispanic (NH)													
NH Asian/PI	203,697	515	1.9	252.8	154	1.5	75.6	12	1.6	5.9	4	0.8	2.0
NH Black/African American	235,561	3,071	11.5	1303.7	1,989	18.8	844.4	116	15.0	49.2	69	13.3	29.3
NH Indigenous/Native American	37,377	265	1.0	709.0	137	1.3	366.5	11	1.4	29.4	5	1.0	13.4
NH White	3,903,203	8,152	30.5	208.9	3,557	33.6	91.1	366	47.4	9.4	240	46.2	6.1
NH Multi-Race	143,062	7	0.0	4.9	6	0.1	4.2	0	0.0	0.0	0	0.0	0.0
NH Other/Unknown	---	5,657	21.2	---	1,404	13.3	---	12	1.6	---	3	0.6	---

Age Group													
0 to 9	657,686	9	0.0	1.4	2	0.0	0.3	0	0.0	0.0	0	0.0	0.0
10 to 14	360,773	144	0.5	39.9	33	0.3	9.1	0	0.0	0.0	0	0.0	0.0
15 to 19	385,578	6,058	22.6	1571.1	1,208	11.4	313.3	24	3.1	6.2	12	2.3	3.1
20 to 24	403,763	9,276	34.7	2297.4	2,371	22.4	587.2	86	11.1	21.3	55	10.6	13.6
25 to 29	436,158	5,050	18.9	1157.8	2,188	20.6	501.7	137	17.7	31.4	105	20.2	24.1
30 to 34	427,436	2,873	10.7	672.1	1,811	17.1	423.7	150	19.4	35.1	111	21.4	26.0
35 to 39	418,587	1,524	5.7	364.1	1,229	11.6	293.6	131	17.0	31.3	73	14.1	17.4
40 to 44	385,714	873	3.3	226.3	802	7.6	207.9	96	12.4	24.9	56	10.8	14.5
45 to 54	725,671	690	2.6	95.1	666	6.3	91.8	110	14.2	15.2	60	11.6	8.3
55 to 64	710,071	212	0.8	29.9	229	2.2	32.3	33	4.3	4.6	36	6.9	5.1
65+	903,292	38	0.1	4.2	57	0.5	6.3	5	0.6	0.6	11	2.1	1.2
Unknown	---		0.0	---		0.0	---		0.0	---		0.0	---

^ 2021 estimate from Colorado State Demography Office

† Rate per 100,000

Table 2: Reported Chlamydia, Gonorrhea and Early Syphilis Cases and Rate of Reported Cases with Ranking by County & Health Statistics Region (HSR), 2021

		Chlamydia				Gonorrhea				Primary & Secondary Syphilis				Early Latent Syphilis			
	2021 Population	Cases	Rate	County Rank*	HSR Rank^	Cases	Rate	County Rank*	HSR Rank^	Cases	Rate	County Rank*	HSR Rank^	Cases	Rate	County Rank*	HSR Rank^
Region 1:	**72,088**	**239**	**331.5**	**---**	**11**	**69**	**95.7**	---	**11**	**6**	**8.3**	**---**	**9**	**2**	**2.8**	**---**	**17**
Logan	21,458	70	326.2	20	---	15	69.9	24	---	0	0.0	31	---	1	4.7	17	---
Morgan	28,975	129	445.2	10	---	52	179.5	6	---	5	17.3	9	---	1	3.5	22	---
Phillips	4,494	14	311.5	23	---	1	22.3	43	---	1	22.3	7	---	0	0.0	27	---
Sedgwick	2,346	1	42.6	61	---	0	0.0	54	---	0	0.0	31	---	0	0.0	27	---
Washington	4,861	3	61.7	59	---	1	20.6	45	---	0	0.0	31	---	0	0.0	27	---
Yuma	9,954	22	221.0	37	---	0	0.0	54	---	0	0.0	31	---	0	0.0	27	---
Region 2: Larimer	**362,744**	**1,184**	**326.4**	**19**	**12**	**331**	**91.2**	**19**	**13**	**13**	**3.6**	**28**	**18**	**17**	**4.7**	**17**	**11**
Region 3: Douglas	**369,241**	**732**	**198.2**	**42**	**19**	**181**	**49.0**	**31**	**20**	**13**	**3.5**	**29**	**19**	**17**	**4.6**	**18**	**12**
Region 4: El Paso	**738,539**	**3,583**	**485.1**	**8**	**5**	**1,289**	**174.5**	**7**	**5**	**46**	**6.2**	**23**	**13**	**25**	**3.4**	**23**	**15**

Region 5:	**41,469**	**56**	**135.0**	**---**	**20**	**19**	**45.8**	**---**	**21**	**2**	**4.8**	**---**	**16**	**2**	**4.8**	**---**	**9**
Cheyenne	1,723	3	174.1	45	---	0	0.0	54	---	0	0.0	31	---	0	0.0	27	---
Elbert	27,130	32	118.0	51	---	13	47.9	33	---	2	7.4	19	---	2	7.4	12	---
Kit Carson	6,939	10	144.1	46	---	3	43.2	38	---	0	0.0	31	---	0	0.0	27	---
Lincoln	5,677	11	193.8	43	---	3	52.8	30	---	0	0.0	31	---	0	0.0	27	---
Region 6:	**68,810**	**254**	**369.1**	**---**	**8**	**71**	**103.2**	**---**	**9**	**4**	**5.8**	**---**	**15**	**5**	**7.3**	**---**	**5**
Baca	3,501	5	142.8	47	---	8	8.0	51	---	0	0.0	31	---	0	0.0	27	---
Bent	5,718	18	314.8	21	---	4	4.0	52	---	0	0.0	31	---	0	0.0	27	---
Crowley	6,024	14	232.4	34	---	3	3.0	53	---	1	16.6	10	---	1	16.6	4	---
Huerfano	6,931	18	259.7	30	---	4	4.0	52	---	1	14.4	14	---	0	0.0	27	---
Kiowa	1,459	1	68.5	58	---	0	0.0	54	---	1	68.5	2	---	0	0.0	27	---
Las Animas	14,630	56	382.8	13	---	19	19.0	47	---	0	0.0	31	---	2	13.7	5	---
Otero	18,574	66	355.3	15	---	14	14.0	50	---	1	5.4	24	---	2	10.8	8	---
Prowers	11,973	76	634.8	2	---	19	19.0	47	---	0	0.0	31	---	0	0.0	27	---
Region 7: Pueblo	**169,522**	**976**	**575.7**	**4**	**2**	**467**	**275.5**	**3**	**2**	**85**	**50.1**	**3**	**1**	**37**	**21.8**	**3**	**2**
Region 8:	**46,514**	**209**	**449.3**	**---**	**6**	**58**	**124.7**	**---**	**8**	**3**	**6.4**	**---**	**12**	**1**	**2.1**	**---**	**20**
Alamosa	16,494	102	618.4	3	---	28	169.8	8	---	2	12.1	15	---	0	0.0	27	---
Conejos	7,590	27	355.7	14	---	7	92.2	18	---	0	0.0	31	---	0	0.0	27	---
Costilla	3,611	17	470.8	9	---	11	304.6	2	---	0	0.0	31	---	1	27.7	2	---
Mineral	916	1	109.2	53	---	0	0.0	54	---	1	109.2	1	---	0	0.0	27	---
Rio Grande	11,395	47	412.5	12	---	10	87.8	22	---	0	0.0	31	---	0	0.0	27	---
Saguache	6,508	15	230.5	35	---	2	30.7	39	---	0	0.0	31	---	0	0.0	27	---
Region 9:	**99,142**	**259**	**261.2**	**---**	**14**	**86**	**86.7**	**---**	**14**	**10**	**10.1**	**---**	**6**	**6**	**6.1**	**---**	**6**
Archuleta	13,783	10	72.6	57	---	3	21.8	44	---	0	0.0	31	---	0	0.0	27	---
Dolores	2,144	1	46.6	60	---	0	0.0	54	---	0	0.0	31	---	0	0.0	27	---
La Plata	56,251	167	296.9	25	---	50	88.9	21	---	9	16.0	11	---	4	7.1	13	---
Montezuma	26,224	77	293.6	27	---	32	122.0	13	---	1	3.8	27	---	2	7.6	11	---
San Juan	740	4	540.5	7	---	1	135.1	9	---	0	0.0	31	---	0	0.0	27	---
Region 10:	**106,025**	**261**	**246.2**	**---**	**16**	**84**	**79.2**	**---**	**15**	**4**	**3.8**	**---**	**17**	**5**	**4.7**	**---**	**10**
Delta	31,661	82	259.0	31	---	22	69.5	25	---	0	0.0	31	---	1	3.2	24	---
Gunnison	17,263	39	225.9	36	---	3	17.4	48	---	0	0.0	31	---	1	5.8	15	---
Hinsdale	784	0	0.0	63	---	0	0.0	54	---	0	0.0	31	---	0	0.0	27	---
Montrose	43,173	120	278.0	28	---	57	132.0	10	---	4	9.3	17	---	2	4.6	18	---
Ouray	5,059	9	177.9	44	---	0	0.0	54	---	0	0.0	31	---	0	0.0	27	---
San Miguel	8,085	11	136.1	49	---	2	24.7	42	---	0	0.0	31	---	1	12.4	7	---
Region 11:	**46,099**	**101**	**219.1**	**---**	**17**	**24**	**52.1**	**---**	**17**	**4**	**8.7**	**---**	**8**	**2**	**4.3**	**---**	**13**
Jackson	1,361	1	73.5	56	---	0	0.0	54	---	0	0.0	31	---	0	0.0	27	---
Moffat	13,174	39	296.0	26	---	12	91.1	20	---	3	22.8	6	---	1	7.6	11	---
Rio Blanco	6,471	8	123.6	50	---	1	15.5	49	---	0	0.0	31	---	0	0.0	27	---
Routt	25,093	53	211.2	40	---	11	43.8	37	---	1	4.0	26	---	1	4.0	19	---

Region 12:	**182,064**	**547**	**300.4**	**---**	**13**	**90**	**49.4**	**---**	**19**	**11**	**6.0**	**---**	**14**	**5**	**2.7**	**---**	**18**
Eagle	55,732	175	314.0	22	---	14	25.1	41	---	3	5.4	24	---	2	3.6	21	---
Garfield	62,166	208	334.6	18	---	46	74.0	23	---	2	3.2	30	---	1	1.6	27	---
Grand	15,835	34	214.7	38	---	4	25.3	40	---	1	6.3	22	---	0	0.0	27	---
Pitkin	17,325	37	213.6	39	---	8	46.2	35	---	4	23.1	5	---	0	0.0	27	---
Summit	31,006	93	299.9	24	---	18	58.1	29	---	1	3.2	30	---	2	6.5	14	---
Region 13:	**82,186**	**171**	**208.1**	**---**	**18**	**42**	**51.1**	**---**	**18**	**10**	**12.2**	**---**	**5**	**3**	**3.7**	**---**	**14**
Chaffee	20,084	22	109.5	52	---	13	64.7	28	---	1	5.0	25	---	0	0.0	27	---
Custer	5,066	2	39.5	62	---	1	19.7	46	---	0	0.0	31	---	0	0.0	27	---
Fremont	49,632	121	243.8	33	---	23	46.3	34	---	9	18.1	8	---	2	4.0	19	---
Lake	7,404	26	351.2	17	---	5	67.5	27	---	0	0.0	31	---	1	13.5	6	---
Region 14: Adams	**522,527**	**2,916**	**558.1**	**6**	**4**	**1,052**	**201.3**	**5**	**4**	**78**	**14.9**	**12**	**3**	**48**	**9.2**	**10**	**4**
Region 15: Arapahoe	**655,566**	**3,686**	**562.3**	**5**	**3**	**1,615**	**246.4**	**4**	**3**	**97**	**14.8**	**13**	**4**	**71**	**10.8**	**8**	**3**
Region 16:	**405,189**	**1,366**	**337.1**	**---**	**10**	**379**	**93.5**	**---**	**12**	**27**	**6.7**	**---**	**10**	**20**	**4.9**	**---**	**8**
Boulder	329,801	1,173	355.7	14	---	308	93.4	17	---	21	6.4	21	---	13	3.9	20	---
Broomfield	75,388	193	256.0	32	---	71	94.2	16	---	6	8.0	18	---	7	9.3	9	---
Region 17:	**57,956**	**74**	**127.7**	**---**	**21**	**35**	**60.4**	**---**	**16**	**1**	**1.7**	**---**	**21**	**0**	**0.0**	**---**	**21**
Clear Creek	9,450	19	201.1	41	---	11	116.4	14	---	0	0.0	31	---	0	0.0	27	---
Gilpin	5,879	5	85.0	55	---	4	68.0	26	---	0	0.0	31	---	0	0.0	27	---
Park	17,736	16	90.2	54	---	8	45.1	36	---	0	0.0	31	---	0	0.0	27	---
Teller	24,891	34	136.6	48	---	12	48.2	32	---	1	4.0	26	---	0	0.0	27	---
Region 18: Weld	**340,114**	**1,431**	**420.7**	**11**	**7**	**437**	**128.5**	**11**	**6**	**22**	**6.5**	**20**	**11**	**10**	**2.9**	**25**	**16**
Region 19: Mesa	**157,326**	**553**	**351.5**	**16**	**9**	**197**	**125.2**	**12**	**7**	**5**	**3.2**	**30**	**20**	**4**	**2.5**	**26**	**19**
Region 20: Denver	**711,956**	**6,636**	**932.1**	**1**	**1**	**3,486**	**489.6**	1	**1**	**275**	**38.6**	4	**2**	**210**	**29.5**	**1**	**1**
Region 21: Jefferson	**579,652**	**1,513**	**261.0**	**29**	**15**	**584**	**100.8**	**15**	**10**	**56**	**9.7**	**16**	**7**	**29**	**5.0**	**16**	**7**
Unknown	**---**	**0**	**---**	**---**	**---**	**0**	**---**	**---**	**---**	**0**	**---**		**---**	**0**	**---**		**---**
STATEWIDE TOTAL	**5,814,729**	**26,747**	**460.0**	**---**	**---**	**10,596**	**182.2**	**---**	**---**	**772**	**13.3**	**---**	**---**	**519**	**8.9**	**---**	**---**

*****Counties ranked by STI incidence rate per 100,000 population

^ Health Statistics Regions ranked by STI incidence rate per 100,000 population

**Population estimate from the CO State Demography Office released October 2022

All STD surveillance data reported to the Colorado Department of Public Health and Environment for the year of 2021.

Table 3: Reported Chlamydia Cases and Rates of Reported Cases by Demographic Characteristics and Sex, 2021

	Chlamydia											
	Female				Male				Total			
	2021 Population ^	Cases	%	Rate†	2021 Population ^	Cases	%	Rate†	2021 Population ^	Cases	%	Rate†
Total	2,902,213	16,718	100.0	576.0	2,912,516	10,029	100.0	344.3	5,814,729	26,747	100.0	460.0
Race/Ethnicity												
Hispanic (all races)	637,678	6,425	38.4	1007.6	654,151	2,655	26.5	405.9	1,291,829	9,080	33.9	702.9
Hispanic Asian/PI	7,375	122	0.7	1654.2	7,463	40	0.4	536.0	14,838	162	0.6	1091.8
Hispanic Black/African American	16,676	88	0.5	527.7	16,725	55	0.5	328.8	33,401	143	0.5	428.1
Hispanic Indigenous/Native American	29,679	107	0.6	360.5	30,773	29	0.3	94.2	60,452	136	0.5	225.0
Hispanic White	559,163	2,657	15.9	475.2	574,392	1,230	12.3	214.1	1,133,555	3,887	14.5	342.9
Hispanic Multirace	24,785	23	0.1	92.8	24,798	5	0.0	20.2	49,583	28	0.1	56.5
Hispanic Other/Unknown	---	3,428	20.5	---	---	1,296	12.9	---	---	4,724	17.7	---
Non-Hispanic (NH)												
NH Asian/PI	110,016	353	2.1	320.9	93,681	162	1.6	172.9	203,697	515	1.9	252.8
NH Black/African American	109,661	1,605	9.6	1,463.6	125,900	1,466	14.6	1164.4	235,561	3,071	11.5	1,303.7
NH Indigenous/Native American	18,658	199	1.2	1066.6	18,719	66	0.7	352.6	37,377	265	1.0	709.0
NH White	1,954,451	4,999	29.9	255.8	1,948,752	3,153	31.4	161.8	3,903,203	8,152	30.5	208.9
NH Multi race	71,749	5	0.0	7.0	71,313	2	0.0	2.8	143,062	7	0.0	4.9
NH Other/Unknown	---	3,132	18.7	---	---	2,525	25.2	---	---	5,657	21.2	---
Age Group												
0 to 9	321,885	4	0.0	1.2	335,801	5	0.0	1.5	657,686	9	0.0	1.4
10 to 14	175,946	125	0.7	71.0	184,827	19	0.2	10.3	360,773	144	0.5	39.9
15 to 19	187,034	4,688	28.0	2,506.5	198,544	1,370	13.7	690.0	385,578	6,058	22.6	1,571.1
20 to 24	190,304	6,278	37.6	3,298.9	213,459	2,998	29.9	1,404.5	403,763	9,276	34.7	2,297.4
25 to 29	207,956	2,866	17.1	1,378.2	228,202	2,184	21.8	957.0	436,158	5,050	18.9	1,157.8
30 to 34	210,473	1,355	8.1	643.8	216,963	1,518	15.1	699.7	427,436	2,873	10.7	672.1
35 to 39	207,805	704	4.2	338.8	210,782	820	8.2	389.0	418,587	1,524	5.7	364.1
40 to 44	191,663	367	2.2	191.5	194,051	506	5.0	260.8	385,714	873	3.3	226.3
45 to 54	359,643	266	1.6	74.0	366,028	424	4.2	115.8	725,671	690	2.6	95.1
55 to 64	363,084	51	0.3	14.0	346,987	161	1.6	46.4	710,071	212	0.8	29.9
65+	486,420	14	0.1	2.9	416,872	24	0.2	5.8	903,292	38	0.1	4.2
Unknown	---	0	0.0	---	---	0	0.0	---	---	0	0.0	---

^ 2021 estimate from Colorado State Demography Office

† Rate per 100,000

Table 4: Reported Gonorrhea Cases and Rates of Reported Cases by Demographic Characteristics and Sex, 2021

	Gonorrhea											
	Female				Male				Total			
	2021 Population ^	Cases	%	Rate†	2021 Population ^	Cases	%	Rate†	2021 Population ^	Cases	%	Rate†
Total	2,902,213	4,200	100.0	144.7	2,912,516	6,396	100.0	219.6	5,814,729	10,596	100.0	182.2
Race/Ethnicity												
Hispanic (all races)	637,678	1,538	36.6	241.2	654,151	1,811	28.3	276.8	1,291,829	3,349	31.6	259.2
Hispanic Asian/PI	7,375	16	0.4	216.9	7,463	15	0.2	201.0	14,838	31	0.3	208.9
Hispanic Black/African American	16,676	49	1.2	293.8	16,725	62	1.0	370.7	33,401	111	1.0	332.3
Hispanic Indigenous/Native American	29,679	46	1.1	155.0	30,773	46	0.7	149.5	60,452	92	0.9	152.2
Hispanic White	559,163	686	16.3	122.7	574,392	917	14.3	159.6	1,133,555	1,603	15.1	141.4
Hispanic Multirace	24,785	9	0.2	36.3	24,798	5	0.1	20.2	49,583	14	0.1	28.2
Hispanic Other/Unknown	---	732	17.4	---	---	766	12.0	---	---	1,498	14.1	---
Non-Hispanic (NH)												
NH Asian/PI	110,016	58	1.4	52.7	93,681	96	1.5	102.5	203,697	154	1.5	75.6
NH Black/African American	109,661	657	15.6	599.1	125,900	1,332	20.8	1058.0	235,561	1,989	18.8	844.4
NH Indigenous/Native American	18,658	73	1.7	391.3	18,719	64	1.0	341.9	37,377	137	1.3	366.5
NH White	1,954,451	1,418	33.8	72.6	1,948,752	2,139	33.4	109.8	3,903,203	3,557	33.6	91.1
NH Multi race	71,749	3	0.1	4.2	71,313	3	0.0	4.2	143,062	6	0.1	4.2
NH Other/Unknown	---	453	10.8	---	---	951	14.9	---	---	1,404	13.3	---
Age Group												
0 to 9	321,885	1	0.0	0.3	335,801	1	0.0	0.3	657,686	2	0.0	0.3
10 to 14	175,946	30	0.7	17.1	184,827	3	0.0	1.6	360,773	33	0.3	9.1
15 to 19	187,034	758	18.0	405.3	198,544	450	7.0	226.7	385,578	1,208	11.4	313.3
20 to 24	190,304	1,138	27.1	598.0	213,459	1,233	19.3	577.6	403,763	2,371	22.4	587.2
25 to 29	207,956	806	19.2	387.6	228,202	1,382	21.6	605.6	436,158	2,188	20.6	501.7
30 to 34	210,473	575	13.7	273.2	216,963	1,236	19.3	569.7	427,436	1,811	17.1	423.7
35 to 39	207,805	397	9.5	191.0	210,782	832	13.0	394.7	418,587	1,229	11.6	293.6
40 to 44	191,663	242	5.8	126.3	194,051	560	8.8	288.6	385,714	802	7.6	207.9
45 to 54	359,643	201	4.8	55.9	366,028	465	7.3	127.0	725,671	666	6.3	91.8
55 to 64	363,084	45	1.1	12.4	346,987	184	2.9	53.0	710,071	229	2.2	32.3
65+	486,420	7	0.2	1.4	416,872	50	0.8	12.0	903,292	57	0.5	6.3
Unknown	---	0	0.0	---	---	0	0.0	---	---	0	0.0	---

^ 2021 estimate from Colorado State Demography Office

† Rate per 100,000

Table 5: Reported Primary and Secondary Syphilis Cases and Rates of Reported Cases by Demographic Characteristics and Sex, 2021

	Primary & Secondary Syphilis											
	Female				Male				Total			
	2021 Population ^	Cases	%	Rate†	2021 Population ^	Cases	%	Rate†	2021 Population ^	Cases	%	Rate†
Total	2,902,213	198	100.0	6.8	2,912,516	574	100.0	19.7	5,814,729	772	100.0	13.3
Race/Ethnicity												
Hispanic (all races)	637,678	60	30.3	9.4	654,151	195	34.0	29.8	1,291,829	255	33.0	19.7
Hispanic Asian/PI	7,375	1	0.5	13.6	7,463	2	0.3	26.8	14,838	3	0.4	20.2
Hispanic Black/African American	16,676	1	0.5	6.0	16,725	4	0.7	23.9	33,401	5	0.6	15.0
Hispanic Indigenous/Native American	29,679	4	2.0	13.5	30,773	3	0.5	9.7	60,452	7	0.9	11.6
Hispanic White	559,163	36	18.2	6.4	574,392	117	20.4	20.4	1,133,555	153	19.8	13.5
Hispanic Multirace	24,785	0	0.0	0.0	24,798	1	0.2	4.0	49,583	1	0.1	2.0
Hispanic Other/Unknown	---	18	9.1	---	---	68	11.8	---	---	86	11.1	---
Non-Hispanic (NH)												
NH Asian/PI	110,016	1	0.5	0.9	93,681	11	1.9	11.7	203,697	12	1.6	5.9
NH Black/African American	109,661	34	17.2	31.0	125,900	82	14.3	65.1	235,561	116	15.0	49.2
NH Indigenous/Native American	18,658	2	1.0	10.7	18,719	9	1.6	48.1	37,377	11	1.4	29.4
NH White	1,954,451	96	48.5	4.9	1,948,752	270	47.0	13.9	3,903,203	366	47.4	9.4
NH Multi race	71,749	0	0.0	0.0	71,313	0	0.0	0.0	143,062	0	0.0	0.0
NH Other/Unknown	---	5	2.5	---	---	7	1.2	---	---	12	1.6	---
Age Group												
0 to 9	321,885	0	0.0	0.0	335,801	0	0.0	0.0	657,686	0	0.0	0.0
10 to 14	175,946	0	0.0	0.0	184,827	0	0.0	0.0	360,773	0	0.0	0.0
15 to 19	187,034	10	5.1	5.3	198,544	14	2.4	7.1	385,578	24	3.1	6.2
20 to 24	190,304	23	11.6	12.1	213,459	63	11.0	29.5	403,763	86	11.1	21.3
25 to 29	207,956	37	18.7	17.8	228,202	100	17.4	43.8	436,158	137	17.7	31.4
30 to 34	210,473	40	20.2	19.0	216,963	110	19.2	50.7	427,436	150	19.4	35.1
35 to 39	207,805	34	17.2	16.4	210,782	97	16.9	46.0	418,587	131	17.0	31.3
40 to 44	191,663	27	13.6	14.1	194,051	69	12.0	35.6	385,714	96	12.4	24.9
45 to 54	359,643	23	11.6	6.4	366,028	87	15.2	23.8	725,671	110	14.2	15.2
55 to 64	363,084	4	2.0	1.1	346,987	29	5.1	8.4	710,071	33	4.3	4.6
65+	486,420	0	0.0	0.0	416,872	5	0.9	1.2	903,292	5	0.6	0.6
Unknown	---	0	0.0	---	---	0	0.0	---	---	0	0.0	---

^ 2021 estimate from Colorado State Demography Office

† Rate per 100,000

Table 6: Reported Non-Primary, Non-Secondary Latent Syphilis Cases and Rates of Reported Cases by Demographic Characteristics and Sex, 2021

	Early Latent Syphilis											
	Female				Male				Total			
	2021 Population ^	Cases	%	Rate†	2021 Population ^	Cases	%	Rate†	2021 Population ^	Cases	%	Rate†
Total	2,902,213	80	100.0	2.8	2,912,516	439	100.0	15.1	5,814,729	519	100.0	8.9
Race/Ethnicity												
Hispanic (all races)	637,678	33	41.3	5.2	654,151	165	37.6	25.2	1,291,829	198	38.2	15.3
Hispanic Asian/PI	7,375	1	1.3	13.6	7,463	2	0.5	26.8	14,838	3	0.6	20.2
Hispanic Black/African American	16,676	0	0.0	0.0	16,725	7	1.6	41.9	33,401	7	1.3	21.0
Hispanic Indigenous/Native American	29,679	1	1.3	3.4	30,773	4	0.9	13.0	60,452	5	1.0	8.3
Hispanic White	559,163	21	26.3	3.8	574,392	112	25.5	19.5	1,133,555	133	25.6	11.7
Hispanic Multirace	24,785	1	1.3	4.0	24,798	0	0.0	0.0	49,583	1	0.2	2.0
Hispanic Other/Unknown	---	9	11.3	---	---	40	9.1	---	---	49	9.4	---
Non-Hispanic (NH)												
NH Asian/PI	110,016	2	2.5	1.8	93,681	2	0.5	2.1	203,697	4	0.8	2.0
NH Black/African American	109,661	11	13.8	10.0	125,900	58	13.2	46.1	235,561	69	13.3	29.3
NH Indigenous/Native American	18,658	0	0.0	0.0	18,719	5	1.1	26.7	37,377	5	1.0	13.4
NH White	1,954,451	33	41.3	1.7	1,948,752	207	47.2	10.6	3,903,203	240	46.2	6.1
NH Multi race	71,749	0	0.0	0.0	71,313	0	0.0	0.0	143,062	0	0.0	0.0
NH Other/Unknown	---	1	1.3	---	---	2	0.5	---	0	3	0.6	---
Age Group												
0 to 9	321,885	0	0.0	0.0	335,801	0	0.0	0.0	657,686	0	0.0	0.0
10 to 14	175,946	0	0.0	0.0	184,827	0	0.0	0.0	360,773	0	0.0	0.0
15 to 19	187,034	6	7.5	3.2	198,544	6	1.4	3.0	385,578	12	2.3	3.1
20 to 24	190,304	11	13.8	5.8	213,459	44	10.0	20.6	403,763	55	10.6	13.6
25 to 29	207,956	16	20.0	7.7	228,202	89	20.3	39.0	436,158	105	20.2	24.1
30 to 34	210,473	18	22.5	8.6	216,963	93	21.2	42.9	427,436	111	21.4	26.0
35 to 39	207,805	9	11.3	4.3	210,782	64	14.6	30.4	418,587	73	14.1	17.4
40 to 44	191,663	11	13.8	5.7	194,051	45	10.3	23.2	385,714	56	10.8	14.5
45 to 54	359,643	6	7.5	1.7	366,028	54	12.3	14.8	725,671	60	11.6	8.3
55 to 64	363,084	3	3.8	0.8	346,987	33	7.5	9.5	710,071	36	6.9	5.1
65+	486,420	0	0.0	0.0	416,872	11	2.5	2.6	903,292	11	2.1	1.2
Unknown	---	0	0.0	---	---	0	0.0	---	---	0	0.0	---

^ 2021 estimate from Colorado State Demography Office

† Rate per 100,000

Table 7: Reported Congenital Syphilis Cases and Syphilis Cases Among Women of Reproductive Age and Rates of Reported Cases by Demographic Characteristics, 2021

	Syphilis							
	Congenital Syphilis				Syphilis Among Women of Reproductive Age			
	2021 Live Births*	Cases	%	Rate†	2021 WRA Population	Cases	%	Rate†
Total	62,928	31	100.0	49.3	1,195,235	526	100.0	44.0
Gender								
Male	32,168	16	51.6	49.7	---	---	---	---
Female	30,759	15	48.4	48.8	1,195,552	526	100.0	44.0
Race/Ethnicity								
Hispanic (all races)	18,342	16	51.6	87.2	301,411	215	40.9	71.3
Hispanic Asian/PI	89	0	0.0	0.0	3,352	3	0.6	89.5
Hispanic Black/African American	333	0	0.0	0.0	8,266	2	0.4	24.2
Hispanic Indigenous/Native American	211	2	6.5	947.9	12907	14	2.7	108.5
Hispanic White	14,625	10	32.3	68.4	264,986	124	23.6	46.8
Hispanic Multirace	572	0	0.0	0.0	11,900	2	0.4	16.8
Hispanic Other/Unknown	2,512	4	12.9	---	---	70	13.3	---
Non Hispanic (NH)								
NH Asian/PI	2,646	0	0.0	0.0	51,355	8	1.5	15.6
NH Black/African American	2,942	3	9.7	102.0	49,158	73	13.9	148.5
NH Indigenous/Native American	304	2	6.5	657.9	8,575	13	2.5	151.6
NH White	36,271	9	29.0	24.8	750,628	203	38.6	27.0
NH Multi race	1,697	0	0.0	0.0	34,108	0	0.0	0.0
NH Other/Unknown	726	1	3.2	137.7	---	14	2.7	---
Age Group								
15 to 19	2,056		---	---	185,541	26	4.9	14.0
20 to 24	9,689		---	---	189,170	92	17.5	48.6
25 to 29	16,407		---	---	212,242	129	24.5	60.8
30 to 34	20,586		---	---	215,320	119	22.6	55.3
35 to 39	11,643		---	---	204,481	91	17.3	44.5
40 to 44	2,345		---	---	188,798	69	13.1	36.5
Pregnancy Status								
Pregnant	---		---	---	---	106	20.2	---
Not Pregnant	---		---	---	---	406	77.2	---
Unknown	---		---	---	---	14	2.7	---

County of Residence								
Adams	6,808	4	12.9	58.8	117,451	54	10.3	46.0
Arapahoe	7,672	3	9.7	39.1	138,003	52	9.9	37.7
Denver	8,606	3	9.7	34.9	170,914	154	29.3	90.1
El Paso	9,255	3	9.7	32.4	154,774	50	9.5	32.3
Pueblo	1,662	12	38.7	722.0	32,073	101	19.2	314.9
Weld	4,541	2	6.5	44.0	74,503	20	3.8	26.8
Other Urban Counties‡	9,166	1	3.2	10.9	369,388	59	11.2	16.0
Rural Counties	15,218	3	9.7	19.7	138,129	36	6.8	26.1

* Live birth data from COHID. Race/Ethnicity and age based on maternal race/ethnicity

^ 2021 estimate from Colorado State Demography Office

† Rate per 100,000

‡ Includes Boulder, Broomfield, Douglas, Jefferson Larimer, and Mesa counties

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