



COLORADO

Department of Public Health & Environment

Estimated HIV Incidence in Colorado, 2007–2012

Objective:

HIV incidence surveillance (HIS) is an expanded HIV/AIDS surveillance activity funded by the Centers for Disease Control and Prevention (CDC). The goal is to provide national and local population-based estimates of the number of new HIV infections per year.

Methods:

Incidence Surveillance applies the serological testing algorithm for recent HIV seroconversion (STARHS). Leftover serum from the HIV positive diagnostic specimen is tested with a special assay, the STARHS assay, which is based on HIV antibody characteristics. The STARHS assay measures the probability that an individual was infected with HIV recently. A person's HIV testing and treatment history is gathered in conjunction with the completion of the HIV case report. Both the result of the antibody test and the testing and treatment history of each newly diagnosed person are necessary components of the STARHS algorithm that is used to estimate HIV incidence.

HIS estimates the number of new HIV infections within a specified time period. The estimate is calculated using data that includes individual HIV test history and laboratory testing to determine recent and long-term infections among the entire Colorado population on an annual basis.

How is an HIV incidence estimate different from new diagnoses of HIV disease?

HIV case reports in Colorado only include people who test positive for HIV and whose results were reported to the Colorado Department of Public Health and Environment (CDPHE). Annual reports of HIV prevalence include both recent and long-term infections. HIS more accurately counts the number of HIV infections within a given time frame, to account for cases previously infected and those not yet reported.

CDPHE collects information on HIV testing and treatment history (TTH). CDPHE also works closely with private, public, and hospital-based laboratories to acquire leftover diagnostic blood specimens to test for recent infection among the population, using the serological testing algorithm for recent HIV seroconversion (STARHS).

Highlights of Analyses

All rates are per 100,000 population. This report describes comparisons of 2007-2009 to 2010-2012 estimates.

Overall

The estimated number of new HIV infections has decreased. Comparing 2007-2009 to 2010-2012, the estimated number of new HIV infections decreased with 1,698 new infections in 2007-2009 and 1,360 (95% CI: 1,012–1,707) in 2010-2012, representing a 20 percent decrease. The rate of new HIV infections decreased from 11.6 in 2007-2009 to 8.9 in 2010-2012.

Sex

The estimated number of new HIV infections decreased among females. Comparing 2007-2009 to 2010-2012, the number of new HIV infections among females decreased 4.5 percent, from 266 in 2007-2009 to 254 (95% CI: 77–430) in 2010-2012. In 2010-2012, the rate of new HIV infections among males (14.4) was 4.4 times that of females (3.3) (Table 1). For males, the number of new HIV infections decreased 22.8 percent, from 1,432 in 2007-2009 to 1,106 (95% CI: 817–1,395) in 2010-2012.

Race/ethnicity

Blacks/African Americans continue to be disproportionately affected by HIV infection. Blacks/African Americans have the highest overall rate of new HIV infections – 39.9 per 100,000. The rate of new HIV infections in Blacks/African Americans (39.9) was 6 times as high as the rate in Whites (6.6) (Table 1), and 3.4 times as high as the rate in Hispanic/Latinos (11.7). Overall, Whites accounted for 54 percent of the new HIV infections in 2010-2012, followed by Hispanic/Latinos (29%) and Blacks/African Americans (18%). The largest decrease in the rate of new HIV infections was observed for Hispanic/Latinos whose rate dropped from 17.8 to 11.7. (Table 1). The estimated number of new HIV infections decreased 28 percent among Hispanic/Latinos, from 521 in 2007-2009 to 375 (95% CI: 219–530) in 2010-2012. The second largest decrease in the number of new HIV infections was observed for Whites, from 831 in 2007-2009 to 704 (95% CI: 473–935) in 2010-2012, a 15.3 percent decrease.

Age at infection

Comparing 2007-2009 to 2010-2012, the estimated number of new HIV infections remained stable among the 13-24 age group and decreased in all others. In 2010-2012, the number of new infections was highest among individuals aged 25-34 years (41%, 557 [95% CI: 356–757]), followed by individuals aged 13-24 years (25%, 335 [95% CI: 186–484]). In 2010-2012, the highest rate occurred among individuals aged 25-34 years (24.9, [95% CI: 15.9–33.9]), followed by individuals aged 13-24 years (13.4, [95% CI: 7.4–19.4]). Individuals aged 45 years and older had the lowest rate (3.5, [95% CI: 1.3–5.7]) (Table 1).

The largest decrease in the number of new HIV infections occurred among the 45 and older age group, from 359 in 2007-2009 to 203 [95% CI: 77–329] in 2010-2012, a 44 percent decrease. The second largest decrease in the number of new HIV infections occurred among the 35-44 age group whose rate decreased 28.8 percent, from 17.7 in 2007-2009 to 12.6 in 2010-2012.

Transmission category

Although men who have sex with men [MSM] continue to bear the heaviest burden of HIV, the estimated number of new HIV infections among MSM decreased by 31 percent since 2007-2009.

In 2007-2009, the number of new HIV infections among MSM was 1,235 which decreased to 852 (95% CI: 630–1,075) new HIV infections in 2010-2012. The estimated number of new HIV infections among females with infection attributed to heterosexual contact increased 4.5 percent, from 266 in 2007-2009 to 254 (95% CI: 77-430) in 2010-2012. In 2010-2012, the majority of new HIV infections was attributed to male-to-male sexual contact (63% overall and 78% among males) despite the overall decrease from 2007-2012. Among females, the largest percentage of new HIV infections was attributed to heterosexual contact (84%) in 2010-2012. The estimated number of new HIV infections among persons whose transmission category was injection drug use increased 25 percent from 170 in 2007-2009 to 213 (95% CI: 68–357) in 2010-2012.

Note.

Tables present the number and rate of new HIV infections overall stratified by sex, race/ethnicity, age, and transmission category among males and females, and present stratified data for the three largest race/ethnicity groups. Additional stratifications for small race/ethnicity groups are not presented due to instability of estimates resulting from small numbers of diagnoses and limited data on HIV testing and antiretroviral use history and recency of HIV infection.

References

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- ³ Karon JM, Song R, Brookmeyer R, Kaplan EH, Hall HI. Estimating HIV incidence in the United States from HIV/AIDS surveillance data and biomarker HIV test results. *Stat Med* 2008;27(23):4617–4633.
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Table 1. Estimated incidence of HIV infection, by year of infection and selected characteristics, 2007–2009 and 2010–2012—Colorado										
	2010-2012					2007-2009				
	No.	%	(95% CI)^a	Rate	(95% CI)^a	No.	%	(95% CI)^a	Rate	(95% CI)^a
Sex										
Male	1,106	81%	(817–1,395)	14.4	(10.6–18.1)	1,432	84%	—	19.4	(14–24.9)
Female	254	19%	(77–430)	3.3	(1–5.6)	266	16%	—	3.6	(1.5–5.8)
Race/Ethnicity										
White	704	54%	(473–935)	6.6	(4.4–8.7)	831	52%	—	7.9	(5.3–10.4)
Black	233	18%	(84–381)	39.9	(14.4–65.3)	241	15%	—	41	(18–64)
Hispanic/Latin	375	29%	(219–530)	11.7	(6.8–16.6)	521	33%	—	17.8	(8.8–26.7)
Age at Infection										
13-24	335	25%	(186–484)	13.4	(7.4–19.4)	335	20%	—	13.6	(6.5–20.8)
25-34	557	41%	(356–757)	24.9	(15.9–33.9)	627	37%	—	29.6	(18.2–41)
35-44	265	19%	(124–406)	12.6	(5.9–19.3)	377	22%	—	17.7	(9.1–26.4)
45+	203	15%	(77–329)	3.5	(1.3–5.7)	359	21%	—	6.7	(3.3–10)
Transmission Category										
MSM	852	63%	—	—	—	1,235	73%	—	—	—
IDU	213	16%	—	—	—	170	10%	—	—	—
Heterosexual										
– Other ^d	294	22%	—	—	—	292	17%	—	—	—
Total^e	1,360	—	1,012–1,707	8.9	(6.6–11.1)	1,698	—	—	11.6	(8.5–14.6)

Note. Rates are per 100,000 population. 2012 rates are based on 2012 population estimates. Rates are not calculated by transmission category because of the lack of denominator data.

^a CI = Confidence Interval. Confidence intervals reflect random variability affecting model uncertainty but may not reflect model-assumption uncertainty; thus, they should be interpreted with caution.

^b Hispanics/Latinos can be of any race.

^c Heterosexual contact with a person known to have, or to be at high risk for, HIV infection.

^d Includes hemophilia, blood transfusion, perinatal exposure, and risk factor not reported or not identified.

^e Because column totals for estimated numbers were calculated independently of the values for the subpopulations, the values in each column may not sum to the column total. Similarly, because column percentages were computed using these independently calculated totals, the percentages in each column may not sum to 100%.

Figure 1. Estimated number of new HIV infections with associated 95% confidence intervals among persons aged 13 years and older – Colorado, 2007–2012

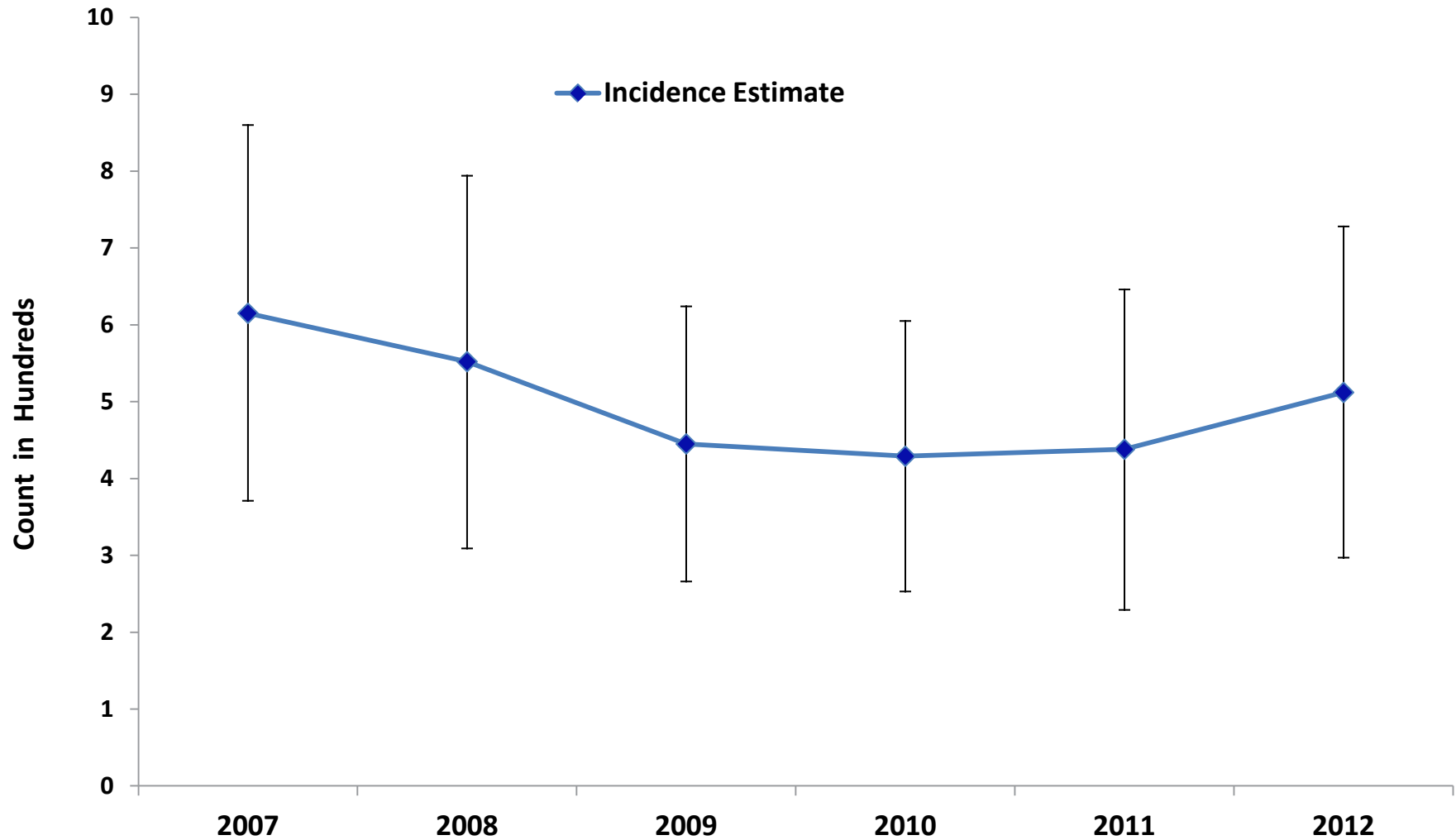


Figure 2. Percent of Colorado HIV Incidence Estimate by Race/Ethnicity, 2010–2012

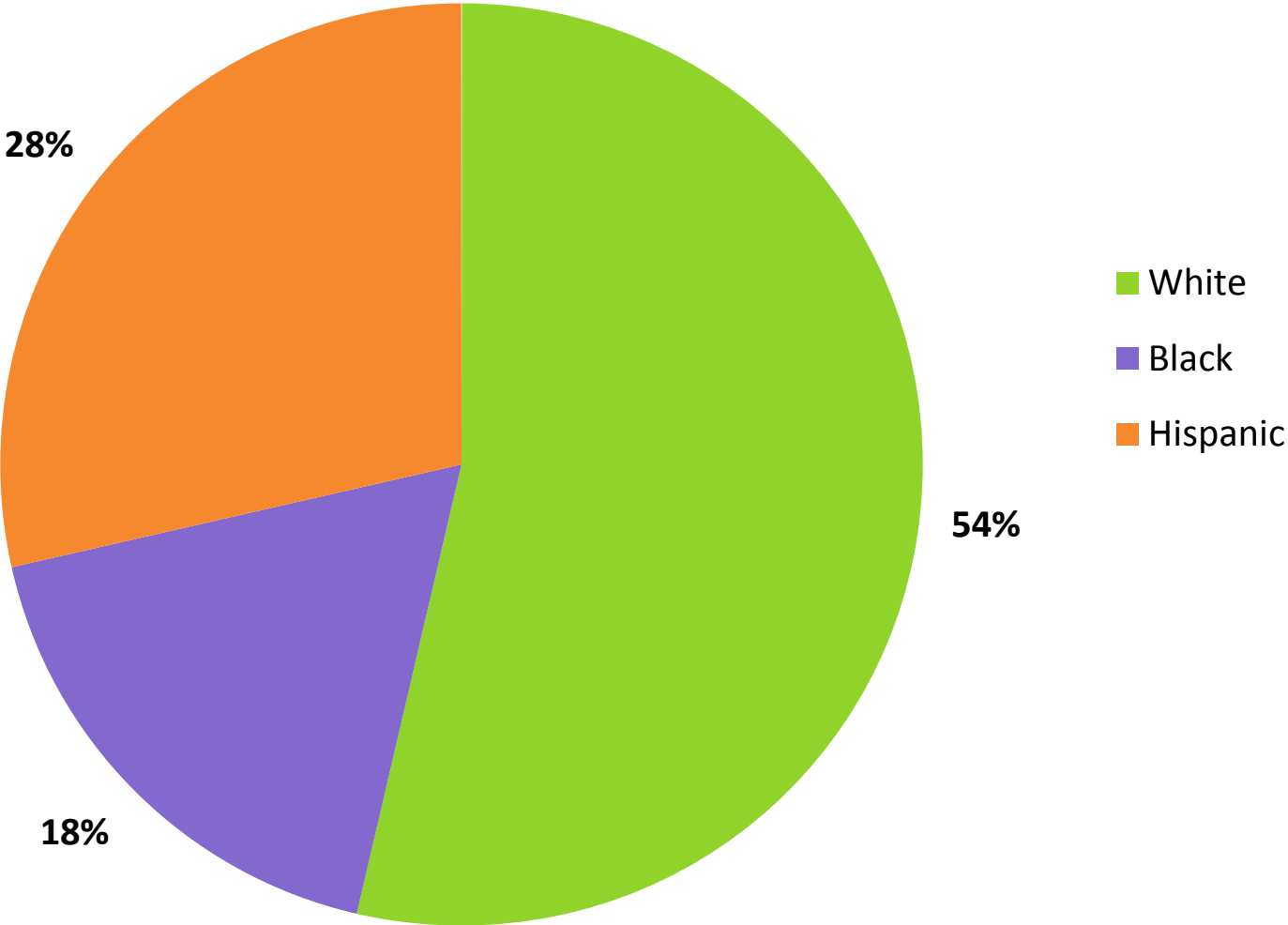


Figure 3. Percent of Colorado HIV Incidence Estimate by Age at infection, 2010–2012

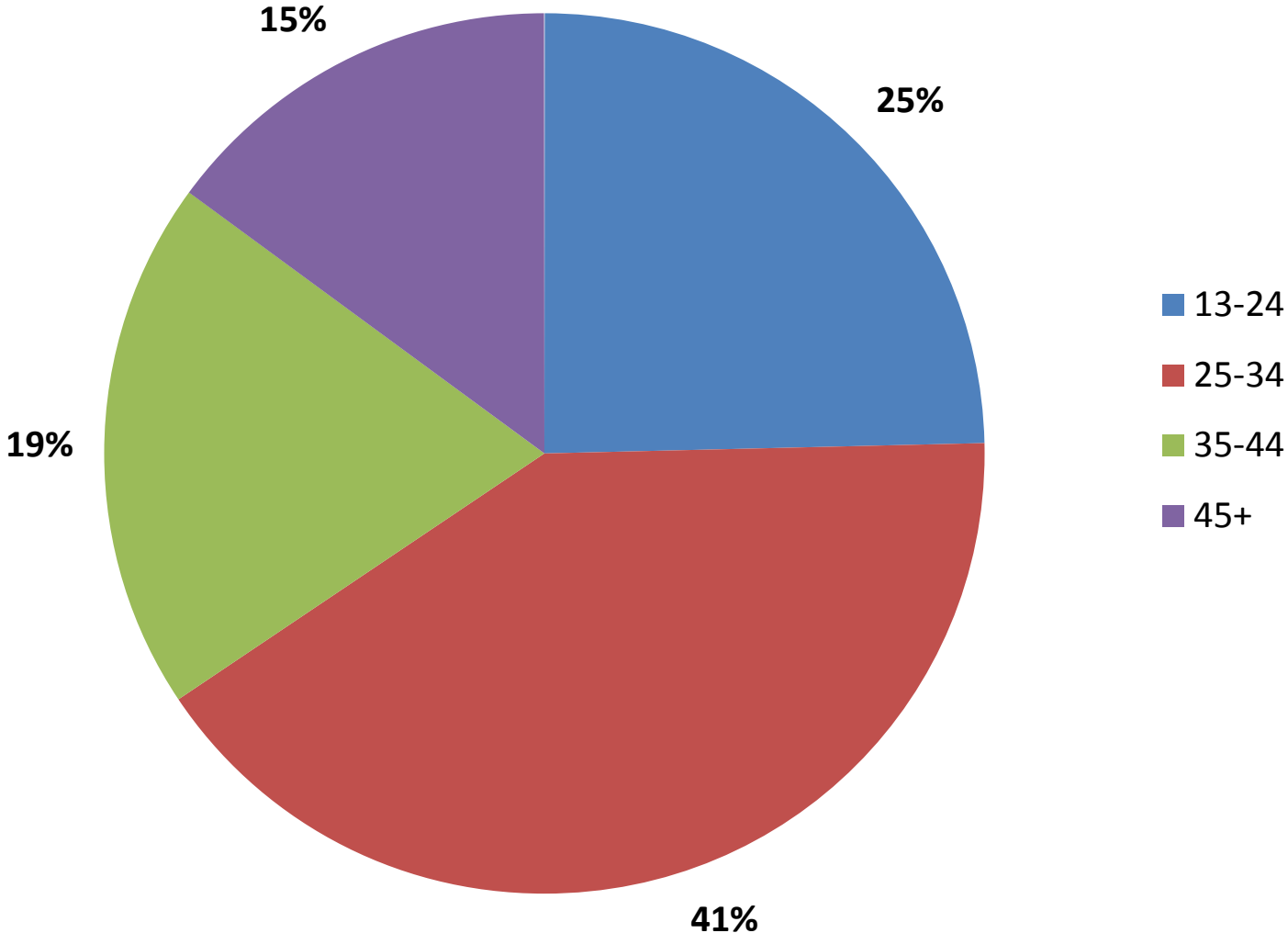
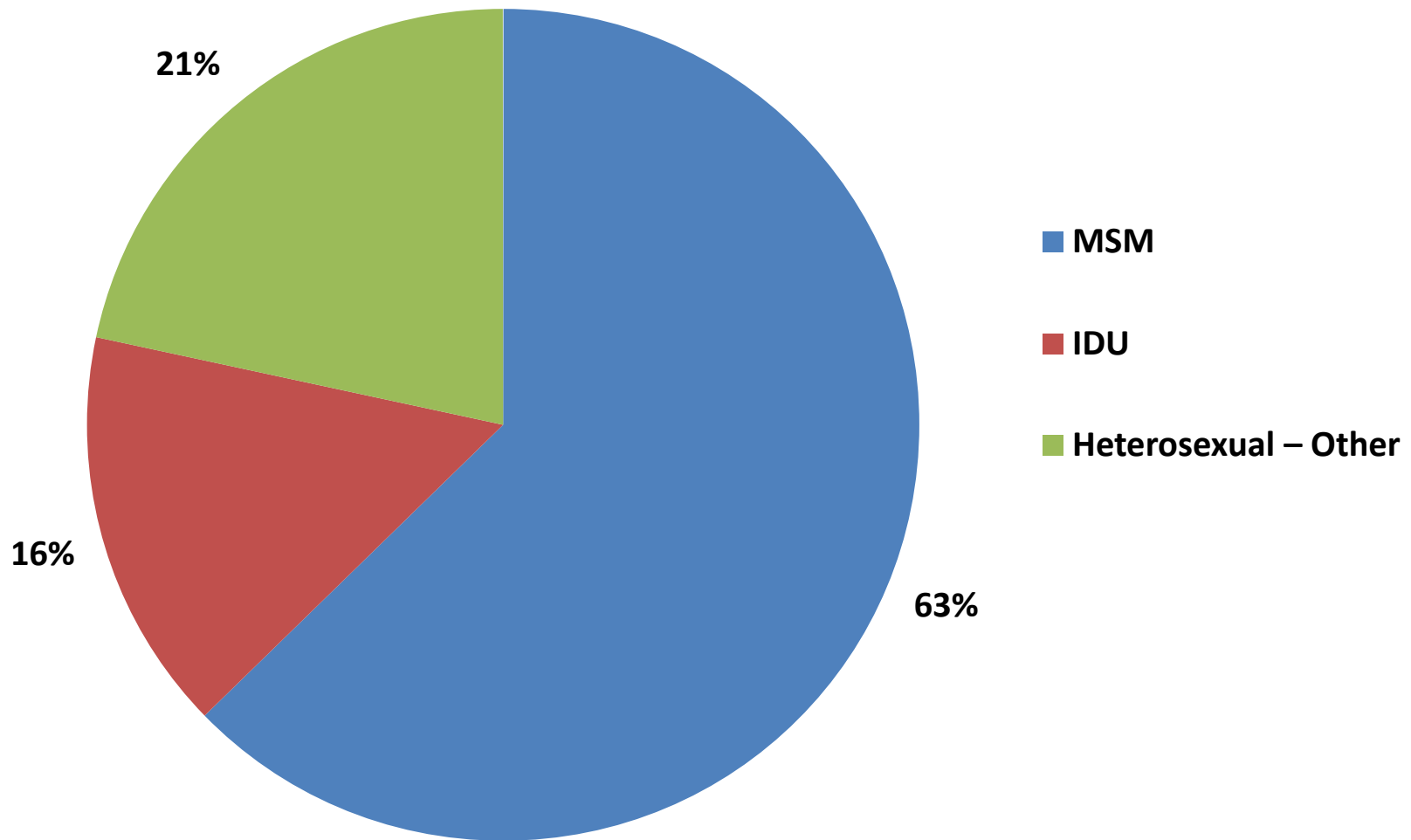


Figure 4. Percent of Colorado HIV Incidence Estimate by Transmission Category, 2010–2012



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Electronic versions of this and other HIV-related reports are available on the internet at:
<https://www.colorado.gov/pacific/cdphe/sti-and-hiv-data-and-trends>

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