HIV & AIDS In Colorado

Colorado's Epidemiologic Profile of HIV and AIDS Cases reported through September 2001

February 2002

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Executive Summary

AIDS cases peaked in 1993 and decreased by 21% between 1993 and 1995. However, more significant decreases in AIDS incidence and mortality have been observed both in the US and in Colorado since the introduction and use of new anti-HIV drug therapies in 1996. In Colorado, decreases in AIDS incidence were more pronounced following the introduction of these new therapies; AIDS cases decreased by 34% between 1995 and 1997. Decreases in AIDS cases are evident across all racial and risk groups.

AIDS-related mortality peaked two years after the peak in AIDS incidence, in 1995. The number of deaths related to HIV or AIDS also declined dramatically in the late 1990s: deaths decreased by 43% from 1995 to 1996, by 46% from 1996 to 1997. The rate of decrease in annual mortality related to HIV dropped 26% from 1997 to 1998, and the decrease between 1999 and 2000 was 16%.

In contrast to trends in new AIDS cases, which peaked in 1993, the trend in persons testing positive for HIV peaked in 1987.

As a result of new therapies, fewer people are dying from AIDS and fewer people with HIV are progressing to AIDS. Prevalent cases of HIV or AIDS have increased steadily and by 2000, an estimated 8,406 persons were living with HIV or AIDS in Colorado.

Compared to the eastern and southern US and to larger metropolitan areas, the epidemic in Colorado is still overwhelmingly driven by sexual exposure, primarily among men who have sex with men, which continues to be the most significant risk (at 75% of new HIV or AIDS cases) group for males. Among females, the impact of injecting drug use is undeniable, with 55% of new AIDS or HIV cases in females related either directly (30%) or indirectly, through sexual contact (25%), to the use of drugs by injection.

Racial and ethnic minorities are disproportionately effected by HIV/AIDS, especially Blacks, whose over-representation is observed in all risk groups. When more recently infected cases are scrutinized, increasing proportions of recently infected persons appear to be racial or ethnic minorities or to have acquired their infection through injecting drug use.

HIV/AIDS continues to be geographically centered in the front-range population centers of Colorado, although injecting drug users appear to be more likely than other risk groups to live in rural Colorado.

Two cases of perinatally acquired HIV infection or AIDS cases have been reported in infants born to HIV-infected mothers in Colorado the last two years. This is attributed to the widespread screening of pregnant women for HIV and the use of anti-retrovirals during and after pregnancy, labor and delivery.

Overall Findings: Priority Groups for HIV Prevention

- **Men Who Have Sex With Men (MSM)**
  As in previous years, this group continues to constitute the overwhelming majority (75%) of persons living with HIV or AIDS in Colorado.

- **Blacks**
  In 2000, this group is over represented in the cumulative epidemic of HIV/AIDS in Colorado, among recently infected persons and among all risk groups. Blacks constitute 4% of Colorado population yet account for 18% of HIV cases diagnosed in 2000.

- **Injecting Drug Users (IDU), particularly Hispanic males**
  An increasing proportion of IDU appear to be Hispanic (27% in 1995, and 44% in 2000), while the proportions of IDU who are White or Black appear to be decreasing or stable. This appears to be a male phenomenon, as Hispanic females are not significantly over-represented among IDU. Since these numbers are small, it is too early to tell if this represents a trend or is an artifact of reporting, but this may indicate an increase in risk behaviors in this group. Additionally, it is worth noting that injecting drug users appear to be more likely than other risk groups to live in rural Colorado.

- **Females who are sex partners of persons with HIV, particularly of males who are IDU**
  Even though females represent 30% of Colorado's cumulative HIV/AIDS cases among IDU, they comprise over 70% of cases of HIV or AIDS that were acquired as a result of heterosexual contact with an IDU. This data emphasizes the impact of the use of injecting drugs on females. Additionally, in 2000 women accounted for 9% of persons living with HIV or AIDS, up from 2.5% in 1985 and 5.5% in 1990.

- **Young Adults**
  MSM ages 20 to 29 are over represented among recently diagnosed HIV cases; males in this age group account for 16% of the male population but for 21% of recent epidemic.

Data Sources

The data that form the basis of this report are principally reports of HIV (infection with the Human Immunodeficiency Virus) and AIDS (the most severe clinical manifestation of HIV) among persons who were living in Colorado at the time of these diagnoses. Frequently, both HIV infections and AIDS cases are combined for purposes of characterizing the whole epidemic and for analysis of trends. When AIDS cases are presented in this report, it is to compare the presumably "older" epidemic with more recently acquired infections. To focus on more recently acquired infections, HIV cases diagnosed in Colorado during 1999–2000 that have not progressed to AIDS as of September 30, 2001, are also presented in this report.

Cases are reported to the Colorado Department of Public Health and Environment, HIV Surveillance Program and are entered into a database known as the HIV and AIDS Reporting System (HARS), which is used in all states (and in 13 cities) to enumerate AIDS and/or HIV infections in these jurisdictions. AIDS cases in this report meet the 1993 Centers for Disease Control and Prevention surveillance case definition for AIDS[1], which includes HIV-infected persons with CD4+ counts of less than 200 mm^3 or those diagnosed with one or more of 26 opportunistic infections definitive of AIDS.

HIV infection and AIDS have been reportable by name in Colorado by regulation since 1985 and by statute since 1987. This law requires that both laboratories and physicians report cases of HIV and AIDS within seven days to Colorado Department of Public Health and Environment. In the case of laboratories, all tests indicative of or highly correlated with HIV, such as HIV positive antibody tests, HIV viral load by RNA PCR, positive cultures for HIV and CD4+ counts of less than 500 mm^3 are reportable.

Since 1988, Colorado Department of Public Health and Environment has collaborated with the Centers for Disease Control and Prevention, local health departments and other agencies to conduct HIV seroprevalence surveys which assess HIV prevalence and incidence in different at-risk populations. In past years this report has utilized data from anonymous, or unlinked studies, where personal identifying information was removed. This year, studies in the setting of drug out-reach programs (where patients volunteer for testing) have been used to measure HIV and Hepatitis C among injection drug users.

The Colorado Department of Local Affairs/Division of Local Government/Demography Section has provided information about characteristics of Colorado's population to allow comparisons to persons reported with HIV infection or AIDS. Colorado's demographic and geographic data is based on the 2000 US census. Estimates are made each year about changes to Colorado's population by the State Demographer's Office.

The Colorado Department of Human Services/Alcohol and Drug Abuse Division has provided estimates about the scope and size of the injecting drug population in Colorado.

The Vital Statistics Section of Colorado Department of Public Health and Environment has provided cause of death data obtained from death certificates filed with the department through 2000.

The Colorado Department of Corrections has provided data on the demographic characteristics of its population.

Strengths and Limitations of the Data

Both HIV and AIDS have been reportable by name from laboratories and care providers since 1985 by regulation and since 1987 by statute. In 1987, Colorado Department of Public Health and Environment initiated an active system of surveillance for HIV and AIDS in order to accurately characterize the epidemic in Colorado. An ongoing evaluation study conducted in 2001 demonstrated that completeness of reporting of AIDS and HIV in Colorado was approximately 97% for recently diagnosed cases. The Colorado Department of Public Health and Environment also collects local variables, such as incarceration or Hepatitis C status, to provide additional information to HIV prevention and care planners.

In general, persons who are infected with HIV, without treatment, will eventually progress to AIDS; for a few individuals, this progression may be relatively rapid (under two years) but has usually been over a five to ten year period, however the "incubation period" of HIV progression to AIDS may be substantially longer. Thus, aggregate data about AIDS cases may have limited use for HIV prevention planning because they characterize persons (and their risk behaviors) who may have been infected a decade or more ago. The introduction of highly active anti-retroviral therapies has further altered the natural history of HIV and delayed progression to AIDS, making AIDS data less useful each year for planning purposes.

For purposes of HIV prevention planning, it would be more useful to know who is currently (or at least more recently) becoming infected. Unfortunately, laboratory technology that would allow identification of new infections is not currently widely available. What is available is data about persons with newly diagnosed HIV infection (which does not mean newly infected). Because these persons have not yet progressed to AIDS, they may represent those who are more recently infected with HIV (although treatments may confound this). However, the usefulness of this data is limited because it only includes persons who elected to be tested for HIV. This represents a major limitation of HIV case reports: they do not represent persons who have not accessed testing at all.

The usefulness of the data is further limited by the availability of anonymous testing. Anonymous testing for HIV has been available as a testing option in Colorado since July of 1990; because names are not used when a person is tested anonymously, these cases are not entered in the HIV/AIDS Reporting System (HARS) database and thus are not included in this report. When these persons access health care, they are reported by their providers and by laboratories that perform testing to assess immune function; at that point they are entered into HARS. (Bindman,[2] et al suggest that persons who are anonymously tested positive for HIV seek medical care more promptly than those who are tested confidentially.) They are included in epidemiologic profiles when they are reported with HIV or AIDS by name and Colorado Department of Public Health and Environment can assure that no duplication in reporting has occurred.

Finally, data about risk is less complete for newly diagnosed HIV infected persons than for persons with AIDS. In 2000, risk data for all AIDS cases reported since 1982 was not available for 3.6% of cases (n=7063); for AIDS cases newly diagnosed in 2000, risk was not identified in 5.8% of cases. However, 18% of HIV cases diagnosed in 2000 (n=236) had no risk reported. The reason for this is that investigation of risk factors for HIV occurs over time; persons who are newly infected may not have disclosed risk with HIV counselors, disease intervention specialists or their care providers. As the patient seeks care and agrees to interviews, risk is more likely to be ascertained.

Where a case of HIV or AIDS is "counted" presents a special challenge. Jurisdiction (county, state) of HIV or AIDS is established at the time of diagnosis. Individual cases are not monitored for changes in address; consequently it is impossible to measure the impact of in- or out-migration on any county or on Colorado as a whole.

Lastly, caution should be exercised when interpreting small numbers.

In general, persons who are infected with HIV, without treatment, will eventually progress to AIDS; for a few individuals, this progression may be relatively rapid (under two years) but has usually been over a five to ten year period, however the “incubation period” of HIV progression to AIDS may be substantially longer.

Description of Colorado

Geography

Colorado is geographically a rural state. It is comprised of 63 counties and has a land mass of 103,728 square miles. The largest proportion of Colorado's population is located in ten counties along the front range (Adams, Arapahoe, Boulder, Denver, Douglas, El Paso, Jefferson, Larimer, Pueblo and Weld Counties) which account for 16.2% of Colorado's land area but 81% of the population. These counties include the population centers of Colorado Springs, Pueblo, metropolitan Denver, Boulder, Fort Collins and Greeley.

Population

According to the US census, Colorado's population reached 4.3 million in 2000. Colorado ranks 24th in the nation in population, and accounts for approximately 1.7% of the US population.

Age

The median age in Colorado was 34.3 years for the year 2000, up from 32.5 years in 1990 (the median age is projected to increase to 36.3 years in 2025) and 2.9 million people are under the age of 45 years. The elderly population (over 65) has remained stable at approximately 10% of the population during the 1990s and is projected to remain at this level through 2010.

Race

Approximately 74.6% of Colorado's population is White, 15.4% of the population is Hispanic, 3.8% is Black, 2.3% is Asian/Pacific Islander and 1.0% is Native American. It is worth noting that according to the Urban Institute, in 1999 5.1% of Colorado's population may be non-citizen immigrants. Because of Colorado's migrant workforce, it is likely that these immigrants are Hispanic. It is not possible to determine whether these immigrants are included in Colorado's census figures, although it seems unlikely because the census is conducted in April of the start of each decade, and the immigrant workforce influx generally occurs during the growing season, starting in June.

Poverty and Income

According to the U.S. Census Bureau, in 1990 Colorado ranked number 19 in the nation in persons living in poverty (14% of the population). In 1996, Colorado's median household income was $38,328: it ranked 18th nationally, and 11% of the population were living in poverty. By 2000, Colorado's median income increased to $49,238 and 8% of the population lived in poverty.

Employment

There were an estimated 62,500 persons who were unemployed in Colorado in 2000, a rate of 2.7%, according to the Colorado Department of Labor. This reflects a decreasing trend of unemployment since the late 1980's; in 1990 the unemployment rate was 4.9%.

Health Insurance

According to the US Census Bureau, increasing numbers of Coloradans have health insurance; in 2000, 13% of Colorado's population were uninsured, compared to 16.6% in 1996. In 1998, 7.0% of children (less than 19 years old) at or below 200% of poverty level did not have health insurance.

Mortality

According to the Vital Statistics Section of the Colorado Department of Public Health and Environment, Colorado's death rate in 2000 was 629.6 per 100,000 population with 27,229 deaths reported. Heart disease continues to be the leading cause of death, followed by cancer. While Colorado reported lower rates of death than the nation, Colorado's suicide rate (14.2/100,000 population) in 2000 continues to be substantially higher than the preliminary US suicide rate (10.3/100,000) in the same year. Currently, Colorado has the nations 10th highest suicide rate.

Education

According to the Colorado Department of Education, in 2000 there was a combined public and non-public school enrollment of 724,508 in Colorado. There are 2,052 schools and 178 districts in the state. Whites comprised 68% of school enrollment, Blacks 6%, Hispanics 22%, Native Americans 1% and Asians 3%. Overall, dropout rates in Colorado in 2000 were 3.0%; dropout rates among Whites were the lowest at 2%, and Hispanics were the highest at 6%. Rates for Blacks were 4% and for Native Americans 5%.

Incarcerated persons

According to data from the Colorado Department of Corrections , 15,441 persons were in the custody of Colorado Department of Corrections in 2000; 12,065 were incarcerated in 21 state correctional facilities in 2000; seven (33 %) of the DOC facilities are located in Fremont County. The remaining 3,376 were housed in contracted facilities or in county jails. Of the total 15,441 inmates, 8% were female and 92% were male. The racial and ethnic make-up of the 2000 Colorado Department of Corrections population is: 45% White, 23% Black, 28% Hispanic, 2% Native American, and 1% Asian.

Changes in Population in the Last Decade

The following two tables illustrate changes in Colorado's population, by number and percentage, in the last decade of the century; in addition to a 30.6% increase in Colorado's total population, these tables describe significant increases in the Hispanic and Black populations and in persons over 45 years of age.

TABLE 1: Colorado Population Change between 1990 and 2000

	1990	2000	Amount Change	Percent Change
Total Population	3,294,394	4,301,261	1,006,867	30.6%
Race				
White & Other Non-Hispanic	2,663,194	3,208,392	545,198	20.5%
White & Other Hispanic	410,416	661,544	251,128	61.2%
Black/African American	133,146	165,063	31,917	24.0%
Asian & Pac Islander	59,862	99,834	39,972	66.8%
Am Indian	27,776	44,241	16,465	59.3%
Two or More Races	N/A	122,187	122,187	N/A
All Hispanics	424,302	735,601	311,299	73.4%
Sex				
Male	1,631,295	2,165,983	534,688	32.8%
Female	1,663,099	2,135,278	472,179	28.4%
Age				
Median Age	32.5	34.3	1.8	5.5%
Under 15	733,379	917,430	184,051	25.1%
Aged 15 to 24	463,412	613,476	150,438	32.5%
Aged 25 to 44	1,179,936	1,400,850	220,914	18.7%
Aged 45 to 64	588,224	953,432	365,208	62.1%
Aged 65+	329,443	416,073	86,630	26.3%

TABLE 2: Percent of Total Population Change between 1990 and 2000

	1990	2000	Percent Change
Race			
White & Other Non-Hispanic	80.8%	74.6%	7.7▼
White & Other Hispanic	12.5%	15.4%	23.2▲
Black/African American	4.0%	3.8%	6.0▼
Asian & Pac Islander	1.8%	2.3%	27.7▲
Am Indian	0.8%	1.0%	25.0▲
Two or More Races	N/A	2.8%	N/A
All Hispanics	12.9%	17.1%	32.6▲
Sex			
Male	49.5%	50.4%	1.8▲
Female	50.5%	49.6%	1.8▼
Age			
Under 15	22.3%	21.3%	4.5▼
Aged 15 to 24	14.1%	14.3%	1.4▲
Aged 25 to 44	35.8%	32.6%	8.9▼
Aged 45 to 64	17.9%	22.2%	24.0▲
Aged 65+	10.0%	9.7%	3.0▼

Generally, persons reported with HIV are presumed to be more recently infected than persons with AIDS and probably provide a more recent "picture" of Colorado's epidemic than AIDS data.

2

Epidemiological Trends in HIV and AIDS in Colorado

Through September 30, 2001 a cumulative total of 7,272 cases of AIDS and 4,457 AIDS-related deaths have been reported. An additional 5,821 cases of HIV infection (persons who have not progressed to AIDS) have been reported. Colorado ranks 24th in total cases of AIDS in the US (0.9 % of all reported AIDS cases) and ranks 24th in population (1.5% of US population).

National AIDS data demonstrate a decrease in reported cases of 9% between 1999 and 2000. In Colorado, there was a slight increase (1.5%) in reported cases in the same time period. Nationwide, AIDS-related mortality decreased by 8% from 1998 to 1999; Colorado's decrease was 3%.

Table 3 compares the demographic characteristics of newly diagnosed Colorado AIDS cases, newly diagnosed Colorado HIV cases and US AIDS cases for 2000. (Generally, persons reported with HIV are presumed to be more recently infected than persons with AIDS and probably provide a more recent "picture" of Colorado's epidemic than AIDS data.) Persons reported with AIDS in Colorado are more often male (91%) as compared to the US (75%), although females are an increasing percentage of HIV cases (19%) in Colorado. Forty-five percent of new Colorado AIDS cases were between 30–39 years of age, compared with 41% of US AIDS cases. Whites continue to be the largest percentage of newly reported Colorado AIDS (62%) or HIV (58%) cases as compared to the US (32%).

■ **TABLE 3: Demographic Characteristics of Persons Reported with AIDS and HIV in 2000, Colorado and US**

Demographic Characteristic	US AIDS cases (n=42,156)	Colorado AIDS cases (n=334)	Colorado HIV cases (n=288)
Sex			
Male	75%	91%	81%
Female	25%	9%	19%
Age (years) at diagnosis			
<13	0%	0%	0%
13–19	1%	0%	2%
20–24	3%	3%	10%
25–29	9%	8%	21%
30–39	41%	45%	41%
40–59	31%	34%	19%
50+	14%	9%	6%
Race			
White	32%	62%	58%
Black	47%	14%	18%
Hispanic	19%	23%	20%

■ **TABLE 4: Exposure Categories of US AIDS cases, Colorado AIDS Cases and Colorado HIV cases, 2000**

Exposure Category	US AIDS cases		Colorado AIDS cases		Colorado HIV cases	
	Male (%) (n=31,588)	Female (%) (n=10,568)	Male (%) (n=303)	Female (%) (n=31)	Male (%) (n=233)	Female (%) (n=55)
Male-Male Sex (MSM)	43%	N/A	66%	N/A	64%	N/A
Injecting Drug Use (IDU)	19%	25%	8%	35%	11%	18%
MSM+ IDU	5%	N/A	14%	N/A	8%	N/A
Hemophilia	0%	<1%	<1%	0%	0%	0%
Heterosexual Contact	8%	38%	5%	55%	4%	40%
Transfusion	0%	1%	0%	3%	0%	0%
Maternal Transmission	<1%	1%	0%	0%	0%	4%
Other/Unidentified	24%	36%	6%	6%	14%	38%

Table 4 illustrates the exposure categories for newly diagnosed cases of both HIV and AIDS in Colorado in 2000 compared to US AIDS cases diagnosed in 2000. Among Colorado male AIDS and HIV cases, MSM remains the main exposure category and comprises a substantially greater proportion in Colorado (66% of male AIDS cases and 64% of HIV cases) than for US AIDS cases reported in men (43%). IDU comprises a greater proportion of US AIDS cases in men (19%) compared to Colorado AIDS (8%) or HIV cases (11%). Heterosexual contact appears to comprise a greater proportion of Colorado's HIV and AIDS cases than US AIDS cases; however, the number of Colorado female HIV and AIDS cases are small and caution should be used in interpreting these numbers. Colorado's no-identified risk rate is lower in both the HIV and AIDS categories as compared to the nation.

AIDS/HIV among Adults/Adolescents in Colorado

Figure 1 illustrates that diagnosed cases of AIDS peaked in 1993 and have decreased steadily since that time. For the first time since 1992, AIDS cases have increased in Colorado: the 326 cases of AIDS diagnosed in 2000 represents an increase of 6% from 1999, when 308 cases were diagnosed. Figure 1 also demonstrates that deaths have declined since peaking in 1995. Deaths decreased dramatically from 1995 to 1997 and rate of decrease appeared to have leveled off in 1998 to 1999. During the time period 1999 to 2000 (115 vs 97 deaths, respectively) there was a 16% decrease in deaths. Declines in AIDS deaths are thought to be primarily due to the success of anti-retroviral therapies introduced in 1996 that delay disease progression. The increase in AIDS cases observed in the period 1999 to 2000 may be due to persons who delay testing or seeking care.

■ **FIGURE 1: Reported Colorado AIDS Cases and Deaths by Year of Diagnosis or Year of Death, 1982–2000**

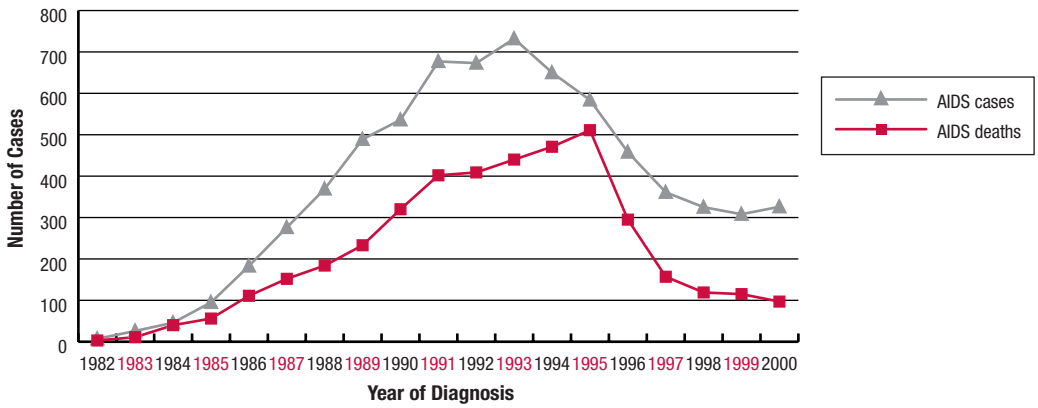
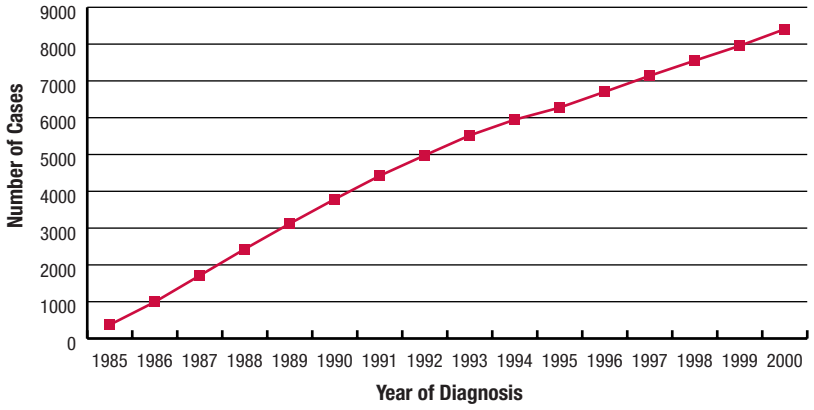


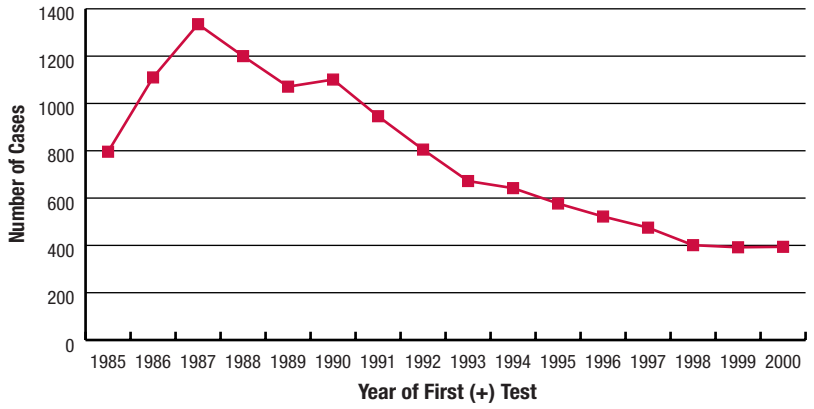
Figure 2 shows a continuing increase in the number of persons living with either HIV or AIDS in Colorado. The number of persons living with full-blown AIDS contributes to this increase in prevalent cases because of improved survival for persons with AIDS who receive treatment and due to decreases in the number of deaths from AIDS. By 2000, an estimated 8,406 persons were living with HIV or AIDS in Colorado (an increase of 6% over 1999, when 7,953 persons were living with HIV or AIDS.)

■ **FIGURE 2: Cumulative Living HIV/AIDS Cases by Year of Diagnosis Through 9/30/01, Colorado**



In contrast to trends in new AIDS cases, which peaked in 1993, the trend in persons testing positive peaked in 1987, as illustrated by **Figure 3**. This trend suggests that new HIV infections may have peaked in the early to mid-1980's.

■ **FIGURE 3: Reported Colorado HIV and AIDS Cases by Year of First Positive Test**



HIV and AIDS by Gender

Although increases in prevalent cases (**Figure 4**) are seen in both men and women, women account for an increasing proportion of persons living with HIV/AIDS. In 2000, women account for 9% of persons living with HIV or AIDS, up from 2% in 1985 and 5% in 1990.

FIGURE 4: Cumulative Living HIV/AIDS Cases by Sex Reported Through 9/30/01, Colorado

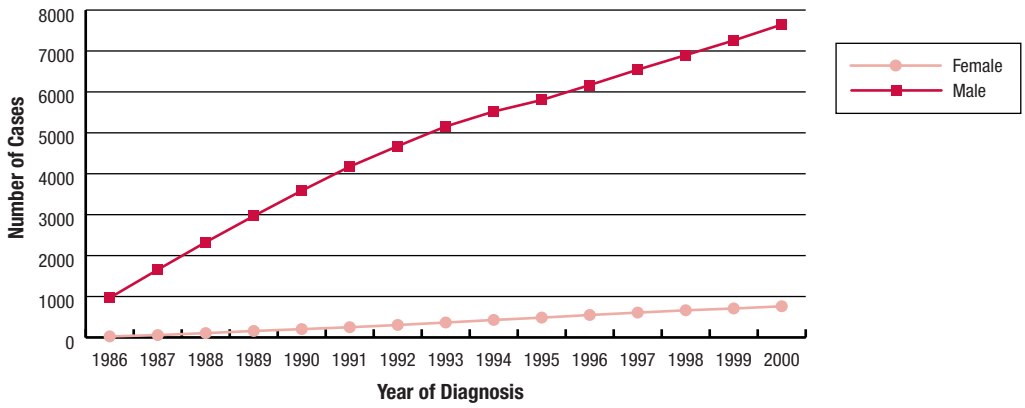


Figure 5 illustrates changes in the epidemic by comparing the gender characteristics of the earliest diagnosed AIDS cases with more recently diagnosed HIV cases. Among AIDS cases in the early years (1982 to 1990) of the epidemic, females accounted for only 5% of reported cases. When HIV cases reported from 1995-2000 are analyzed by gender, the proportion of cases among females had increased to 14%.

FIGURE 5: HIV/AIDS by Sex

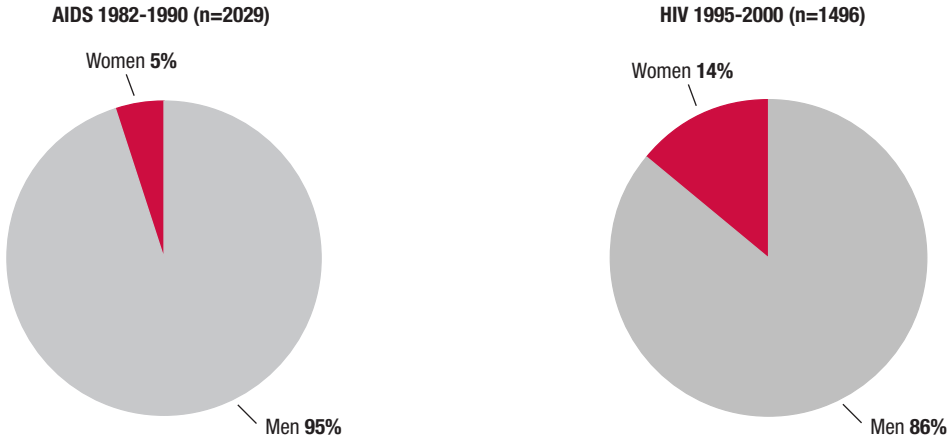
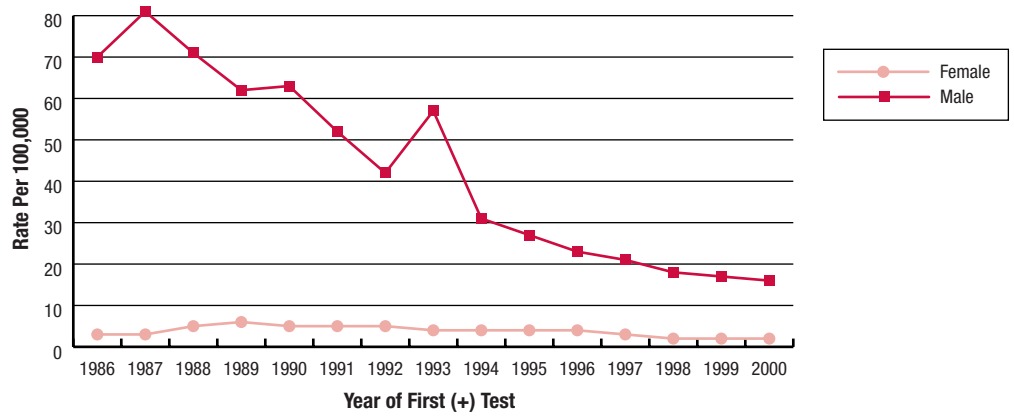


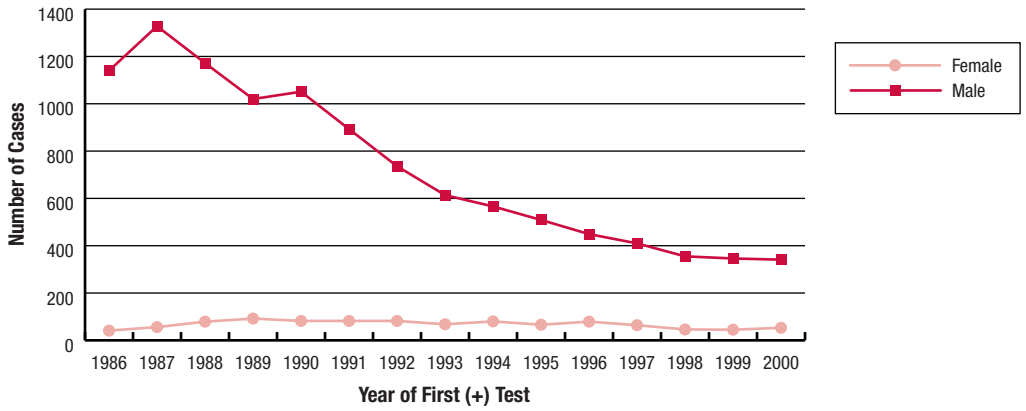
Figure 6 shows that HIV and AIDS rates per 100,000 population for males have decreased by 81% since 1987 (from a rate of 81.0/100,000 to 15.7/100,000). Rates among females have remained low, but have not decreased as significantly (26%, from 3.4 to 2.5/100,000).

■ **FIGURE 6: HIV/AIDS Rate per 100,000 by Year of First (+) Test and Sex Reported Through 9/30/01, Colorado**



Similar to the graph above, **Figure 7** illustrates that the number of HIV and AIDS cases by sex also shows a marked decrease among males while the number of cases among females has remained stable since the late 1980s.

■ **FIGURE 7: HIV/AIDS Cases by Sex and Year of First (+) Test Reported Through 9/30/01, Colorado**



AIDS/HIV by Race

The following pie charts (**Figure 8**) illustrate the changes in the racial distribution of Colorado's HIV epidemic by comparing persons presumed to have been infected in the 1980's (AIDS 1982–1990) versus those presumed to be more recently infected (HIV 1995–2000). Using this model, the proportion of Whites is smaller (from 81% of AIDS cases to 61% of HIV cases), while the percentage of Blacks is larger among racial groups (from 8% of AIDS cases to 17% of HIV cases). The differences in the percentage of Hispanics also indicate that they are an increasing proportion of more recently infected persons, from 10% to 19%.

FIGURE 8: AIDS and HIV Cases by Race, Colorado

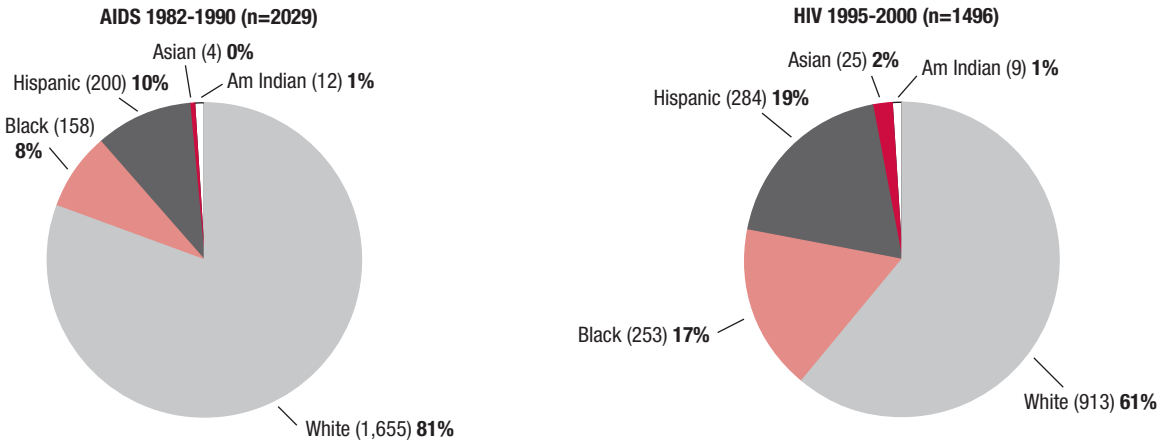
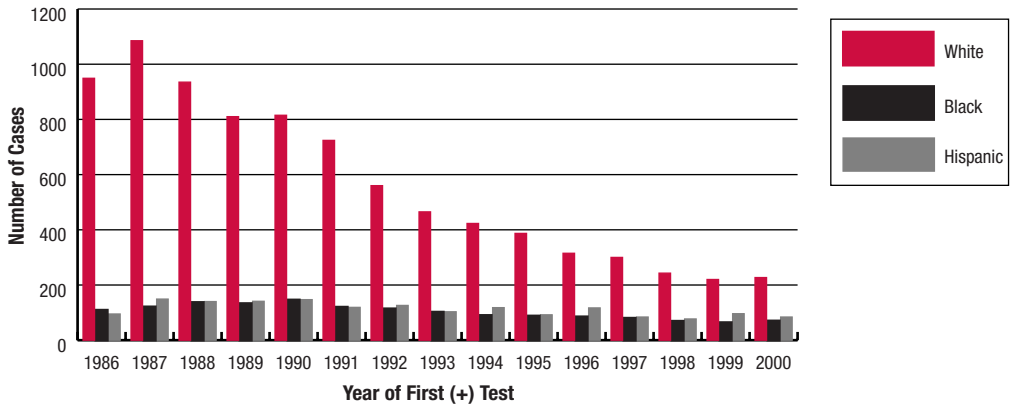


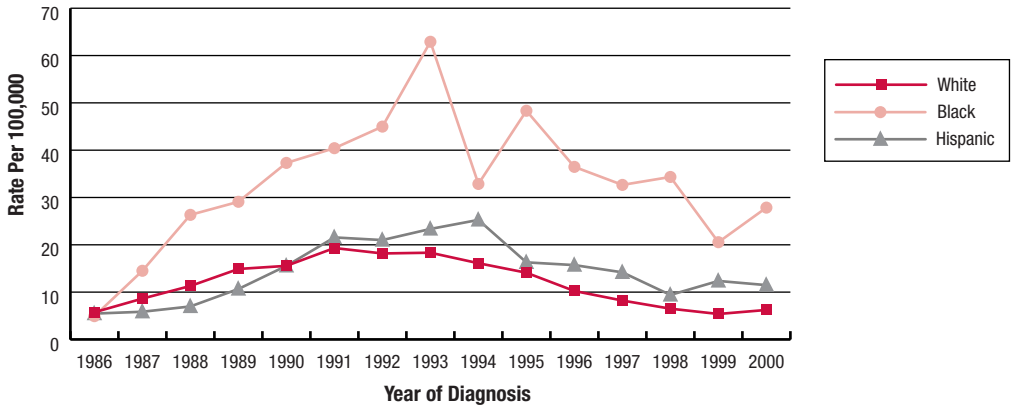
Figure 9 illustrates that while the number of persons testing positive for HIV peaked in 1987 and has decreased substantially through 2000 among Whites (by 79%), newly identified HIV/AIDS cases among ethnic minorities have not demonstrated the same rate of decrease (by 44% among Hispanics and 42% among Blacks).

FIGURE 9: HIV/AIDS Cases by Race and Year of First (+) Test Reported Through 9/30/01, Colorado



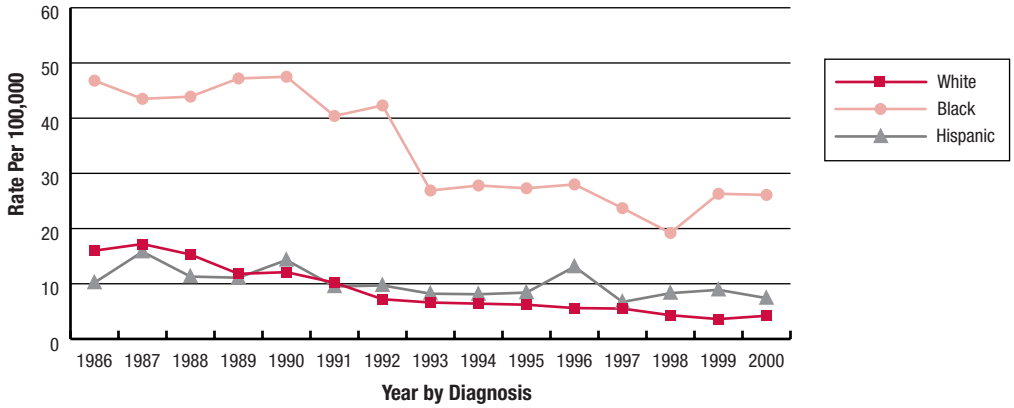
Although Whites comprise the largest number of both AIDS and HIV cases, **Figures 10 and 11** illustrate that when population rates are compared, both Blacks and Hispanics are disproportionately affected by this epidemic. As **Figure 10** shows, while there appears to have been a decrease in AIDS by population rates since 1993 among all racial groups, Blacks demonstrate disproportionately higher rates, at 27.9/100,000 in 2000 compared to 6.2/100,000 in Whites and 11.5/100,000 in Hispanics.

■ **FIGURE 10: AIDS Rate per 100,000 Population by Race, 1986–2000**



When more recent infection is examined (**Figure 11**) the differences in population rates among racial groups are even more significant. All groups have experienced decreases in population rates per 100,000 since the late 1980s; rates in Whites decreased steadily from a high of 17.2/100,000 in 1987 to 4.2/100,000 in 2000 (a decrease of 76%). Rates in Blacks indicate that this group is still more affected by this epidemic; rates in Blacks decreased from a rate per 100,000 population of nearly 47.5 in 1990 to19.2 in 1998, a decrease of 60%. During the same time period, rates in Hispanics also decreased (a high of 15.8/100,000 in 1987 to a low of 8.3 in 1998, a decrease of 47%). However, from 1998 to 2000, Blacks demonstrated an increase of 36% in rate/100,000 to 26.1. Hispanics have decreased in the past year by 17% to 7.4/100,000.

■ **FIGURE 11: HIV Rate per 100,000 Population by Race, 1986–2000**



As illustrated by **Figure 12** there have been substantial decreases since the epidemic peaked in 1993 in the number of diagnosed AIDS cases by year among Whites and Blacks (Hispanics peaked in 1994). Among Whites, cases decreased from 525 cases in 1993 to 200 cases in 2000. Cases decreased among Whites by 46% from 1995 to 1997 and by 15% from 1997 to 1999. Decreases, although not as profound, are also significant for both Blacks and Hispanics. Cases in Blacks decreased by 52% in the period 1993 to 2000, from 96 to 46 cases, while Hispanic cases decreased by only 36%, from 118 cases in 1994 to 76 cases in 2000. Black cases decreased by 30% from 1995 to 1997 and by 27% from 1997 to 1999. Hispanic cases decreased by 37% from 1994 to 1997. There were small increases in the number of cases diagnosed among all racial groups in 2000.

■ **FIGURE 12: Number of AIDS Cases by Race and Year of Diagnosis Reported Through 9/30/01, Colorado**

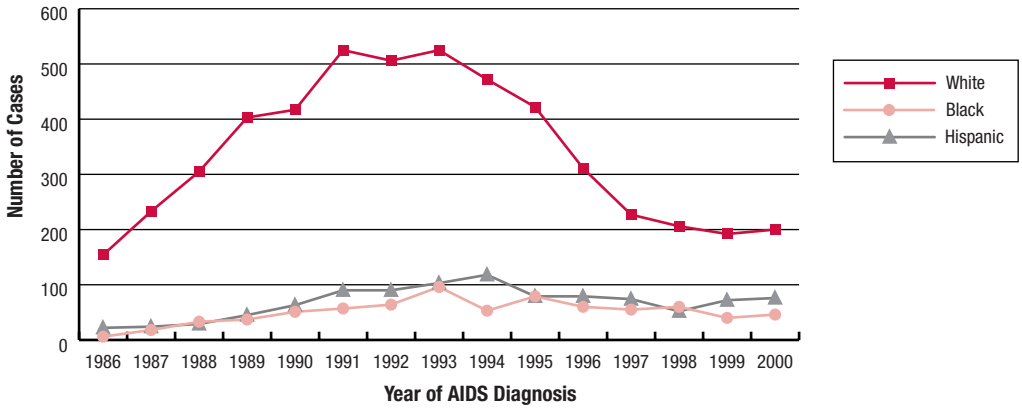
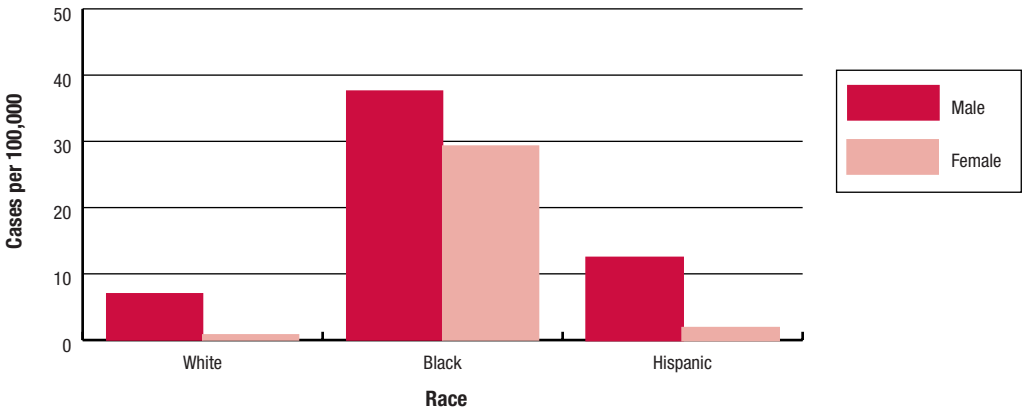


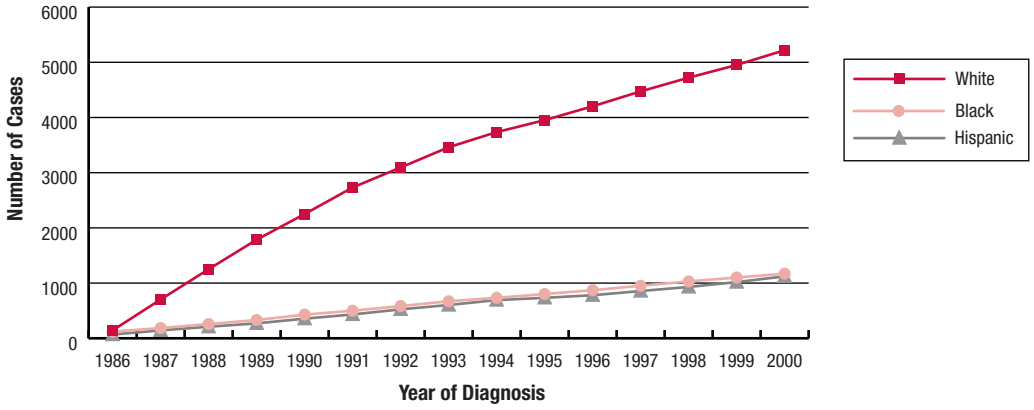
Figure 13 demonstrates the increasing burden of HIV on racial and ethnic minority populations in Colorado by illustrating recently diagnosed HIV cases; the rate among Black males (37.6 per 100,000 population) is over five times that of White males (7.0/100,000) and over three times that of Hispanic males (12.4/100,000). Among females, the racial differences are even more profound; the rate among Black females (29.3/100,000) is over 36 times that in White females (.80/100,000) and is over 16 times that in Hispanic females (1.8/100,000).

■ **FIGURE 13: Average Annual HIV Case Rates 1999–2000 by Sex and Race, Colorado**



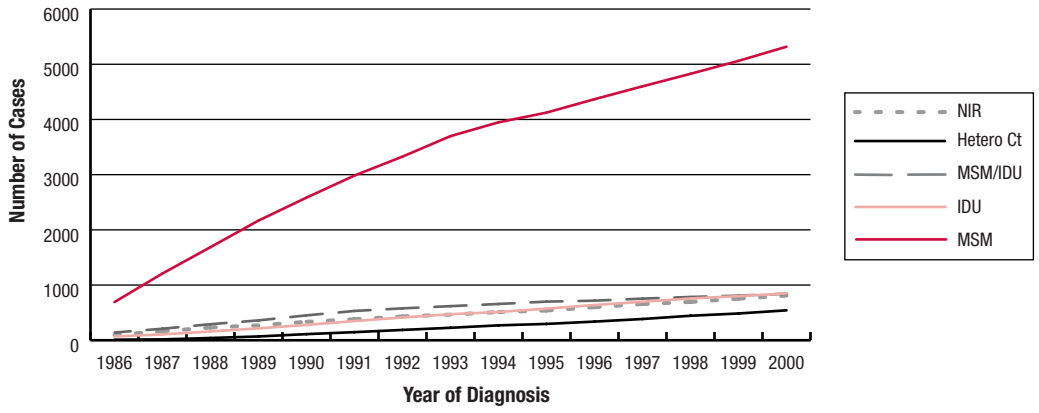
Cases of persons living with HIV and AIDS by race are illustrated in **Figure 14**. Whites constitute the largest number and percentage of prevalent HIV/AIDS cases (5219 out of 8406 or 62% in 2000). Blacks and Hispanics have nearly identical numbers of living cases which is why the graph lines intersect throughout much of the graph. In 2000, Blacks and Hispanics account for 13% each (1136 and 1122, respectively) of prevalent cases of HIV/AIDS in Colorado.

■ **FIGURE 14: Living HIV/AIDS Cases by Race Reported Through 9/30/01, Colorado**



As shown in **Figure 15**, the vast majority of cases of persons living with HIV and AIDS in Colorado are men who have sex with men (63%); MSM/IDU constitute another 10% of HIV cases who were living in 2000. (Prevalent MSM cases increased by 5% from 1999 to 2000, while MSM/IDU increased by 4%). All other risk groups are far behind MSM, including IDU, which constitute 10% of prevalent cases in 2000 and increased by 6% over the past year. Heterosexual contact appears to be a growing risk group (increasing 12% in the past year) but is far behind all other groups at 6% of persons living with HIV or AIDS at the end of 2000.

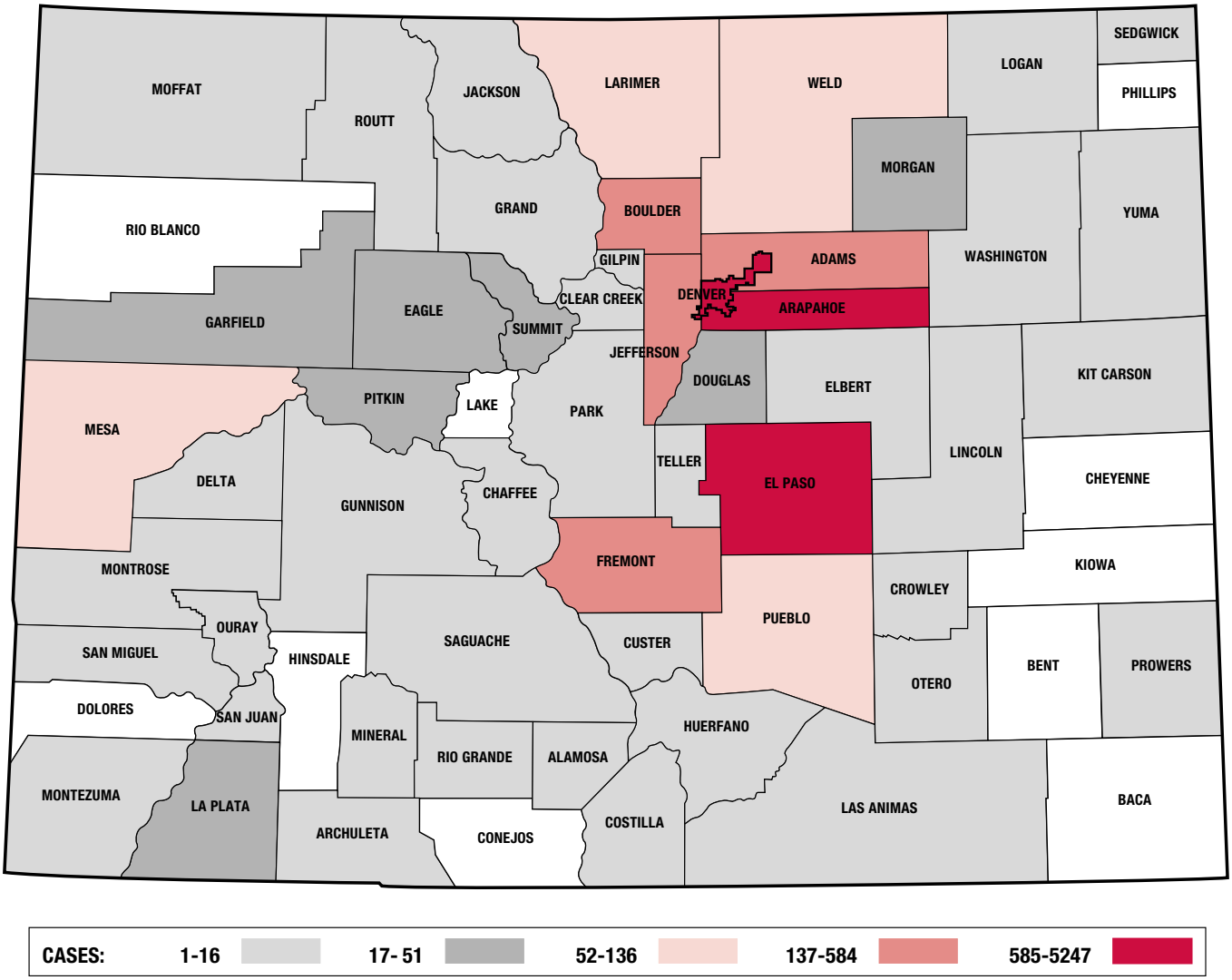
■ **FIGURE 15: Living HIV/AIDS by Risk Reported Through 9/30/01, Colorado**



Geographical Characteristics of HIV

Figure 16 demonstrates that the HIV epidemic in Colorado is concentrated in the Front Range in the counties (and population centers) of Denver, Boulder, Adams, Arapahoe, Jefferson, Douglas, El Paso and Larimer. These counties represent 91% of prevalent HIV/AIDS cases and 70% of Colorado's population. This map shows that Fremont County appears to have a disproportionate share of HIV because it is home to the Colorado state correctional facility that houses virtually all HIV infected prisoners. Because these patients are incarcerated, they do not place a burden for HIV care or prevention services on the surrounding rural community.

■ **FIGURE 16: Living Colorado HIV/AIDS Cases by County of Residence at Time of Diagnosis**



County level data about HIV and AIDS is illustrated in **Table 5** on the next page.

TABLE 5: HIV and AIDS in Colorado by County Through 9/30/01

County	AIDS	HIV	Deaths[8]
ADAMS	349	214	224
ALAMOSA	10	4	*
ARAPAHOE	545	409	311
ARCHULETA	2	0	*
BACA	2	0	*
BENT	2	0	*
BOULDER	252	233	140
CHAFFEE	6	5	*
CLEAR CREEK	10	6	*
CONEJOS	1	0	*
COSTILLA	4	1	*
CROWLEY	0	1	*
CUSTER	2	0	*
DELTA	7	5	5
DENVER	4,369	3,670	2,791
DOUGLAS	44	21	21
EAGLE	24	23	9
EL PASO	473	409	293
ELBERT	8	2	*
FREMONT	115	77	43
GARFIELD	16	17	7
GILPIN	10	4	*
GRAND	8	8	*
GUNNISON	4	1	*
HINSDALE	1	0	*
HUERFANO	8	2	*
JACKSON	1	0	*
JEFFERSON	463	287	267
KIT CARSON	2	0	*
LAKE	1	0	*
LA PLATA	15	17	7
LARIMER	114	80	64
LAS ANIMAS	10	11	*
LINCOLN	0	4	*
LOGAN	10	4	5
MESA	43	38	24
MINERAL	0	1	*
MOFFAT	6	5	*
MONTEZUMA	5	6	2
MONTROSE	8	3	3
MORGAN	18	10	11
OTERO	7	5	2
OURAY	1	0	*
PARK	12	4	*
PHILLIPS	3	0	*
PITKIN	17	22	*
PROWERS	6	1	*
PUEBLO	104	85	64
RIO BLANCO	1	0	*
RIO GRANDE	6	3	*
ROUTT	7	10	*

continued on page 22

[8] Includes 4191 deaths among AIDS cases and 266 deaths among persons with HIV infection who did not meet the AIDS case definition.

* In counties with less than 15,000 population, total HIV and AIDS cases will be reported; race, exposure category, age and mortality status will not be reported.

■ **TABLE 5: HIV and AIDS in Colorado by County Through 9/30/01**

continued from page 21

County	AIDS	HIV	Deaths[8]
SAGUACHE	6	2	*
SAN JUAN	0	3	*
SAN MIGUEL	2	6	*
SEDGWICK	0	1	*
SUMMIT	26	15	*
TELLER	6	1	*
WASHINGTON	0	1	*
WELD	95	53	51
YUMA	5	1	*
UNKNOWN	0	30	0
Colorado Totals	**7,272**	**5,821**	**4,457**

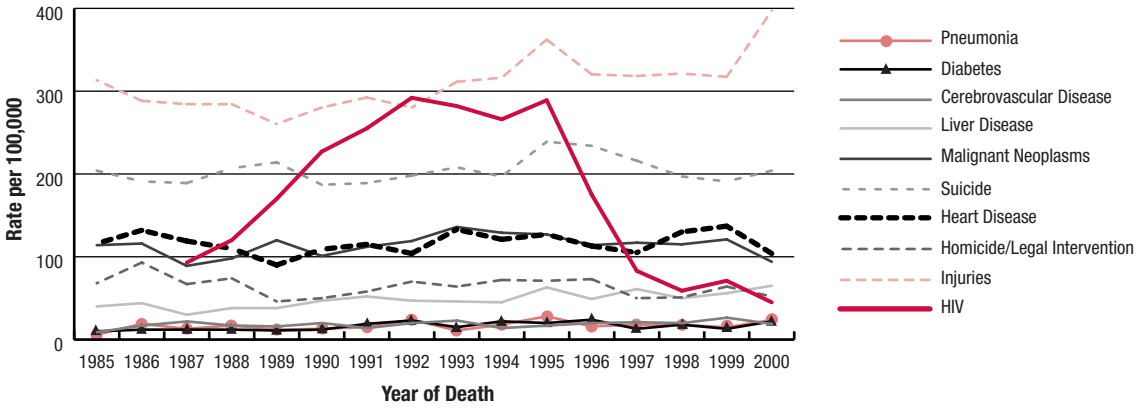
[8] Includes 4191 deaths among AIDS cases and 266 deaths among persons with HIV infection who did not meet the AIDS case definition.

* In counties with less than 15,000 population, total HIV and AIDS cases will be reported; race, exposure category, age and mortality status will not be reported.

HIV Related Mortality

Figure 17 illustrates the leading causes of death in males 25–44 in the period 1985 through 2000 (the last complete year for death data). HIV (the dark red line) has fallen dramatically since 1992 when it was the leading cause of death among young adult males (surpassing injuries); in 2000 it was the seventh leading cause of death.

■ **FIGURE 17: Death Rates From Leading Causes of Death Among Men Aged 25–44 Years, Colorado, 1985–2000**



HIV is no longer among the ten leading causes of death in young adult females aged 25–44. HIV peaked in 1995 as the seventh leading cause of death in this group and tied with pneumonia in 1998 as the tenth leading cause of death. In 2000, HIV dropped to the 12th leading cause of death. The leading cause of death in this group is related to malignancies.

For the first time since 1992, AIDS cases have increased in Colorado: the 326 cases of AIDS diagnosed in 2000 represents an increase of 6% from 1999, when 308 cases were diagnosed.

3

Characteristics of HIV and AIDS in High Risk Populations

Men Who Have Sex With Men (MSM)

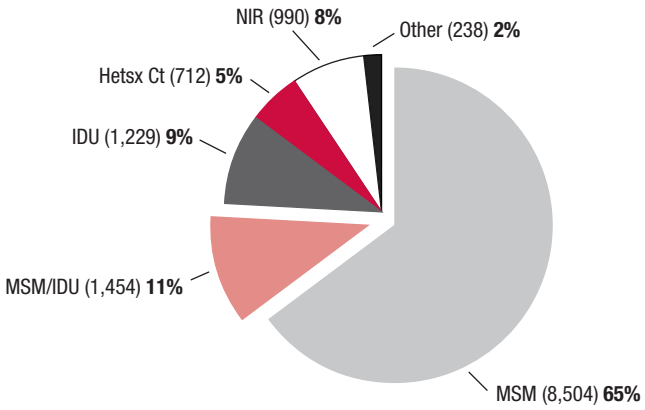
Estimates of MSM in Colorado

According to data provided by the U.S. Census Bureau for 2000, there are 1,483,879 males in Colorado between the ages of 15–64, which is the age range when persons are most sexually active. The literature[3] indicates that the percentage of men who have sex with men (MSM) ranges from 2.1% to 10.1%, with the average at 2.9%. This would mean that the number of MSM in Colorado could be estimated at 43,000, although the range is much broader.

Proportion of the Epidemic Among MSM

The vast majority of persons with HIV or AIDS in Colorado (as shown in **Figure 18**) are men who have sex with men (65% or 8,504 cases); all other modes of acquisition are far behind this significant group (although recent data suggests a shift toward IDU). Because MSM behavior appears to hierarchically present the greatest risk of acquiring HIV in Colorado, men who report both sex with men and injecting drug use (MSM/IDU) are included in the MSM group for purposes of this analysis. When MSM/IDU, representing 11% (or 1,454 cases) of the total, is combined with MSM, they comprise 76% of the epidemic in Colorado.

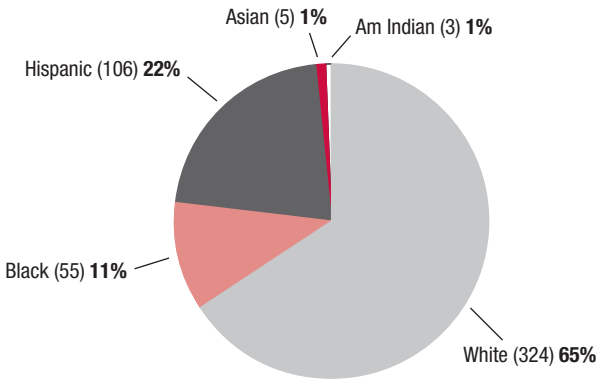
■ **FIGURE 18: HIV/AIDS by Risk Reported Through 9/30/01, Colorado**



Racial/Ethnic Trends Among MSM

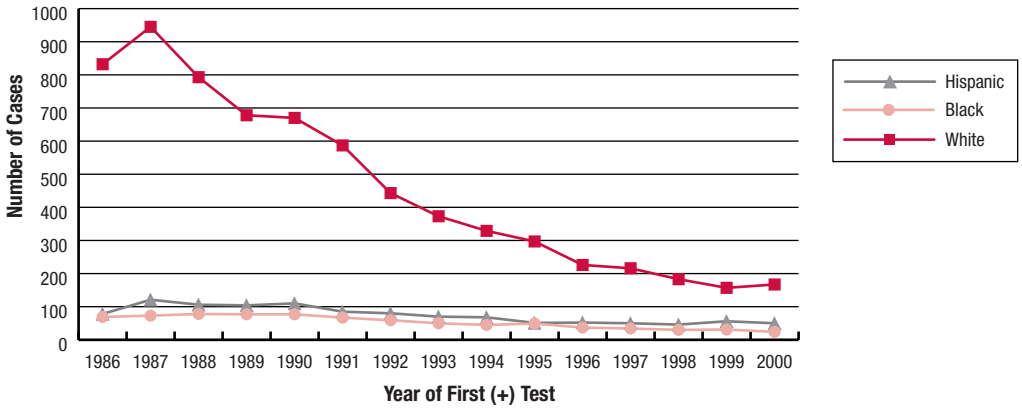
As **Figure 19** on the next page demonstrates, Blacks are over represented in the HIV epidemic among MSM and MSM/IDU; they account for 4% of Colorado's population but are 11% of recently diagnosed HIV/AIDS in this group. Whites are under represented and Hispanics are slightly over represented in their proportion of the population (15%).

■ **FIGURE 19: MSM & MSM/IDU HIV Diagnosed (+) 1999–2000 by Race Reported Through 9/30/01, Colorado**

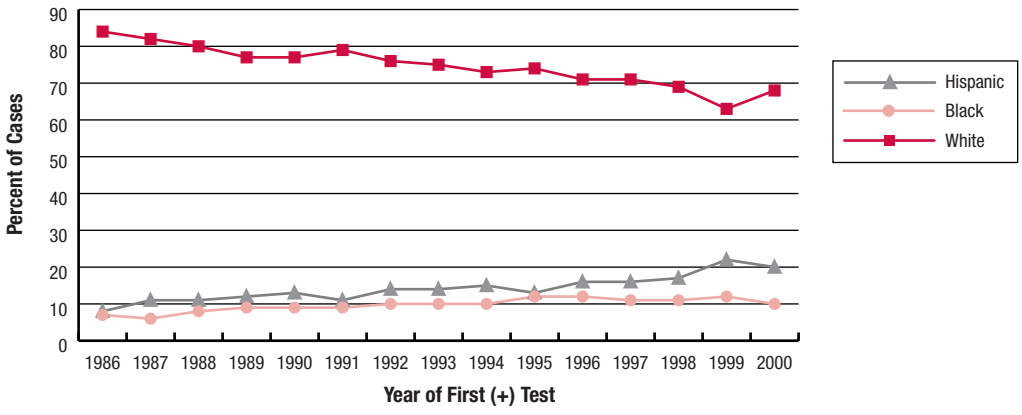


Figures 20 and 21 illustrate the changes in the number and proportion of HIV cases among White, Black and Hispanic MSM and MSM/IDU. The number of new cases (**Figure 20**) has decreased steadily for Whites since 1987 but has remained stable for Blacks and Hispanics. **Figure 21** shows Whites accounted for 84% of the HIV burden among MSM and MSM/IDU in 1986 and 68% in 2000. The proportion of Blacks increased in this time period, from 7% in 1986 to 10% in 2000. Hispanics nearly tripled in proportion, increasing from 8% in 1986 to 20% in 2000.

■ **FIGURE 20: Number of MSM & MSM/IDU with HIV/AIDS by Year of First (+) HIV Test & Race Reported Through 9/30/01, Colorado**



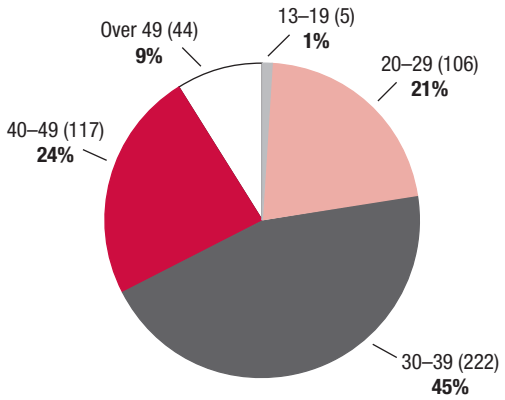
■ **FIGURE 21: Percentage of MSM & MSM/IDU with HIV/AIDS by Year of First (+) HIV Test & Race Reported Through 9/30/01, Colorado**



Age Trends Among MSM

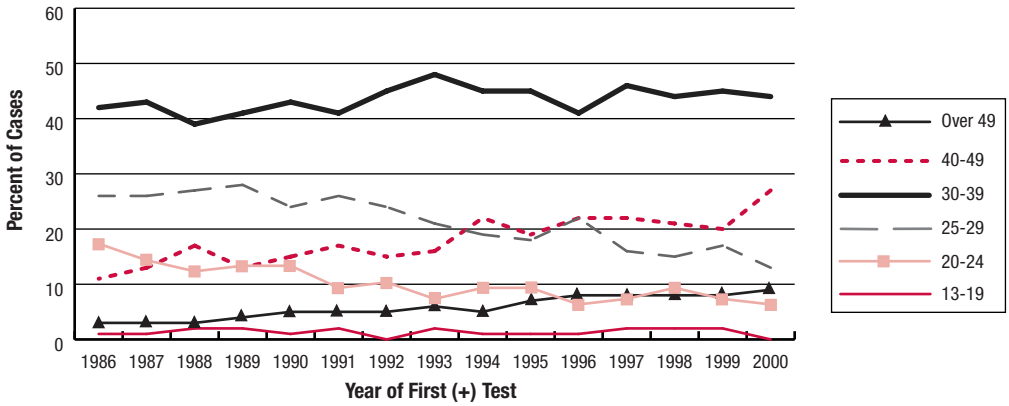
Figure 22 describes the recent HIV epidemic among MSM and MSM/IDU by age. In Colorado, 45% of the HIV epidemic in this group is in the 30-39 year age group which represents 15% of the male population. Men 40-49 years old comprise 24% of the recent HIV cases and are 17% of the male population. Young men ages 20 to 29 are over represented: they are 15% of the male population, but account for 21% of the epidemic. Teenagers ages 13-19 are 10% of Colorado's population yet comprise only 1% (5 cases) of the epidemic.

■ **FIGURE 22: MSM & MSM/IDU HIV Diagnosed (+) 1999–2000 by Age Reported Through 9/30/01, Colorado**

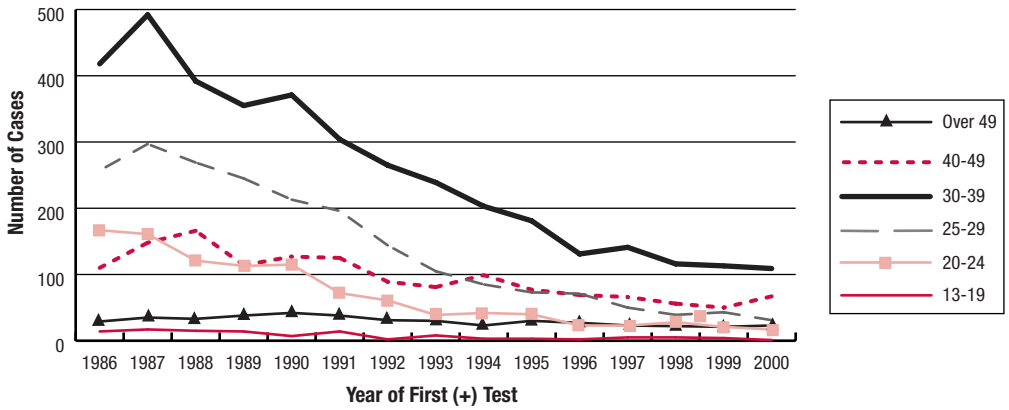


Figures 23 and 24 illustrate the number and proportion of HIV cases in the last 14 years among MSM and MSM/IDU by age. **Figures 23** shows that the proportion of positive HIV tests by age groups have remained relatively stable, with some exceptions; 20–24 year olds have decreased from 17% to 6% in the time period 1986–2000. In the 25 to 29 age group, the proportion decreased from 26% to 13% from 1986 to 2000. The proportion of men aged 30 to 39 has increased slightly from 42% of the epidemic in 1986 to 44% in 2000. In the 40–49 age group, there has been a significant increase, from 11% in 1986 to 27% in 2000, and in the over-49 year age group, from 3% in 1986 to 9% in 2000. The 13–19 year old age group is too small to illustrate significant changes.

■ **FIGURE 23: Percentage of MSM & MSM/IDU with HIV/AIDS by Year of First (+) Test and Age Reported Through 9/30/01, Colorado**



■ **FIGURE 24: Number of MSM & MSM/IDU with HIV/AIDS by Year of First (+) Test and Age Reported Through 9/30/01, Colorado**



HIV in MSM by Region

The HIV epidemic in Colorado among men who have sex with men, with or without a history of injecting drug use, is clearly centered in urban Colorado (the counties of Adams, Arapahoe, Boulder, Denver, Jefferson and El Paso) which accounts for 64% of the state's population but 89% of the recent HIV epidemic. **Figure 25** illustrates that only 11% of recently diagnosed HIV and AIDS cases in this risk group are residents of rural Colorado (36% of Colorado's population).

■ **FIGURE 25: MSM & MSM/IDU HIV Diagnosed (+), 1999–2000 by Region Reported Through 9/30/01, Colorado**

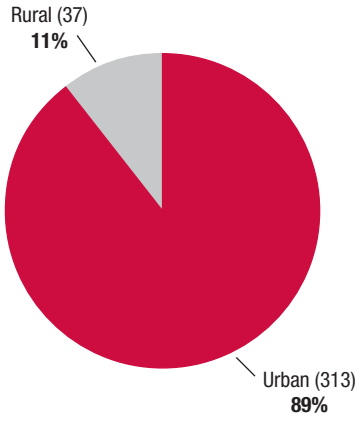


Figure 26 demonstrates that steady decreases in the reported number of HIV or AIDS cases among MSM is observed in both urban and rural areas since peaking in 1986 and 1987. **Figure 27** shows that HIV has remained a proportionately stable urban epidemic and has not migrated into rural Colorado.

FIGURE 26: Number of MSM & MSM/IDU with HIV/AIDS by Year of First (+) Test and Region Reported Through 9/30/01, Colorado

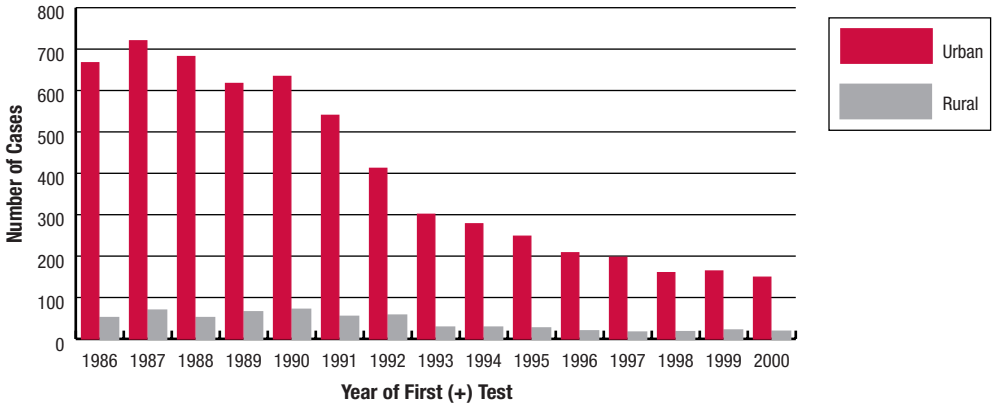
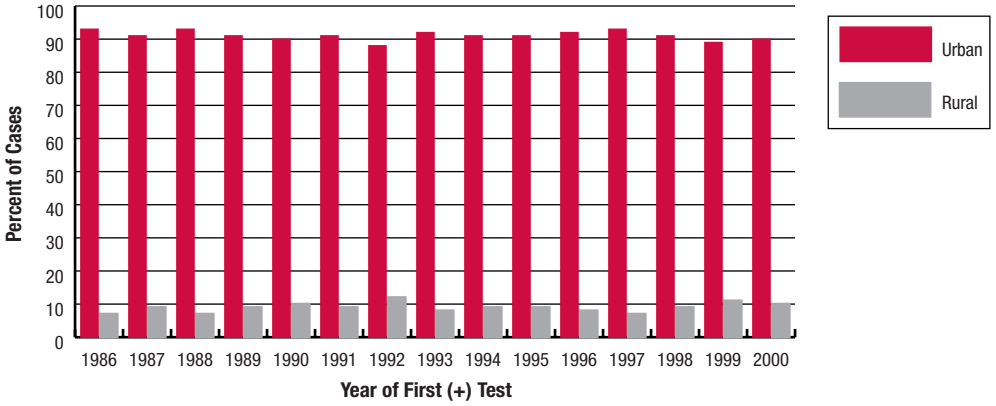


FIGURE 27: Percentage of MSM & MSM/IDU with HIV/AIDS by Year of First (+) Test and Region Reported Through 9/30/01, Colorado

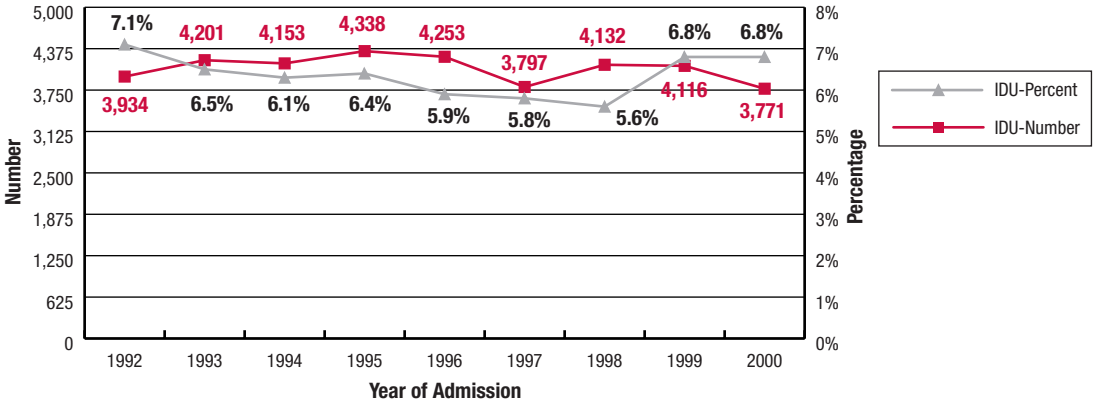


Injecting Drug Use (IDU)

Estimate of Injecting Drug Use in Colorado

According to data provided by the Colorado Department of Human Services/Alcohol and Drug Abuse Division (ADAD), there were 3,771 injecting drug users (IDU) in treatment in Colorado in 2000, compared to 4,116 IDU in treatment in 1999. ADAD staff indicate that it is generally acceptable to estimate the number of IDU in the population as six times the number of IDU in treatment; this means that there are approximately 23,000 IDU currently using illict drugs by injection in Colorado.[4]

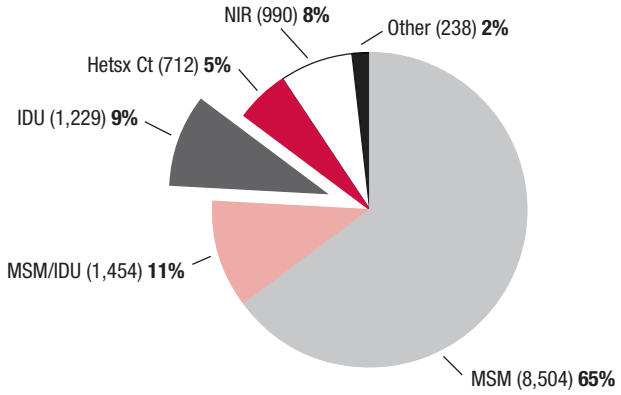
■ **FIGURE 28: Injection Drug Users in Treatment: 1992–2000**



Proportion of Epidemic Among IDU

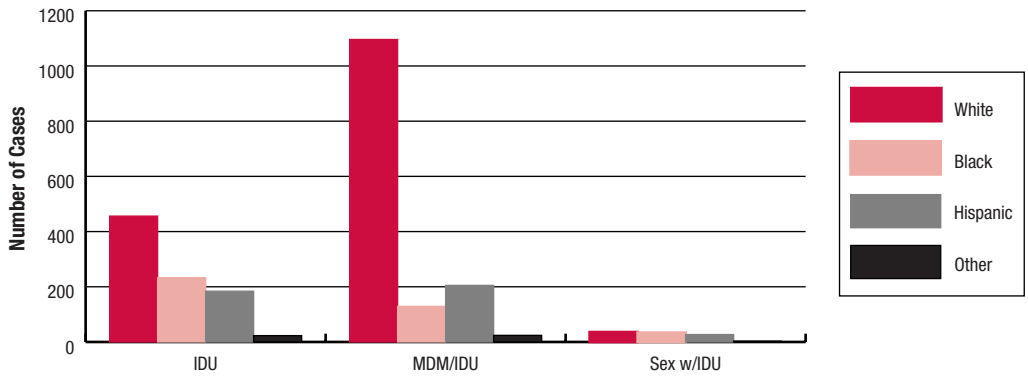
Through September 30, 2001, there were cumulative totals of 1,639 cases of AIDS and 1,250 cases of HIV infection associated with IDU (either IDU alone reported by the patient, reported MSM/IDU or sex with an IDU). Of these, 81% were reported in men and 19% were reported in women.

■ **FIGURE 29: HIV/AIDS by Risk Reported Through 9/30/01, Colorado**

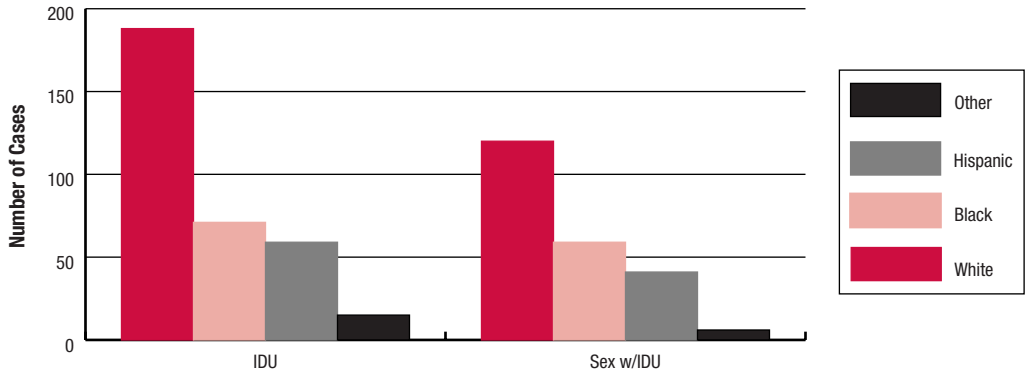


The following two graphs illustrate the impact of the use of drugs by injection on both males and females by race. **Figure 30** illustrates that among 896 males with HIV or AIDS whose only risk is injecting drug use, Whites account for 456 cases (51%), Blacks for 233 cases (26%) and Hispanics for 184 cases (21%). Among males who are MSM/IDU, the impact on racial/ethnic minorities is less profound; of the 1,454 cases, Whites account for the overwhelming majority (1096 or 75%) of these cases, Blacks for 129 cases (9%) and Hispanics for 205 cases (14%). Among men who acquired HIV through heterosexual contact with an IDU (a total of 100 cases), Blacks and Whites appear to be equally effected in terms of number of cases (Whites, 36 cases, Blacks, 34). However, Blacks are over represented in terms of proportion of cases in this group (34%) and Whites are under represented (36%). Twenty-seven (27%) cases were reported among male Hispanics in this risk group. Among females (**Figure 31**), the number of IDU-related HIV or AIDS cases is smaller than for males; 333 cases of HIV or AIDS in females are directly related to IDU. Whites account for 56% of these cases (188). Blacks account for 71 cases and are over represented at 21% of females in this risk group. Hispanics constitute 18% (59 cases) and are also over represented among female IDUs. The number of cases of females who acquired their infection as a result of heterosexual contact with an IDU is significantly higher than for males in all racial/ethnic groups (226 total cases). White females comprise 53% (or 120 cases), Black females are over represented at 26% (59 cases) and Hispanic females comprise 18% (41cases) of this group.

■ **FIGURE 30: Cumulative IDU-Associated HIV/AIDS in Males Reported Through 9/30/01, Colorado**



■ **FIGURE 31: Cumulative IDU-Associated HIV/AIDS in Females Reported Through 9/30/01, Colorado**

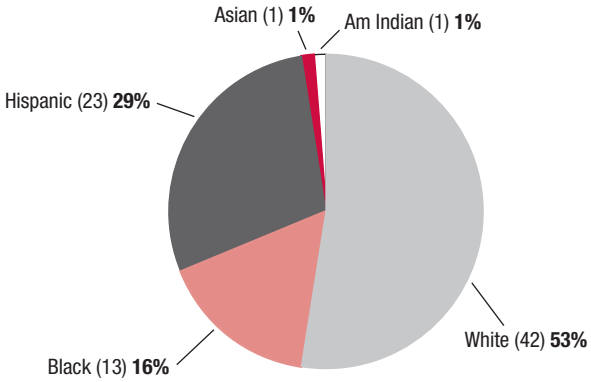


Although not graphically illustrated, of the cumulative 220 children in Colorado who were born to HIV positive mothers, 31% were associated with IDU because the mother reported a history of injecting drug use and 25% because the mother reported sexual contact with an IDU.

Racial/Ethnic Trends Among IDU

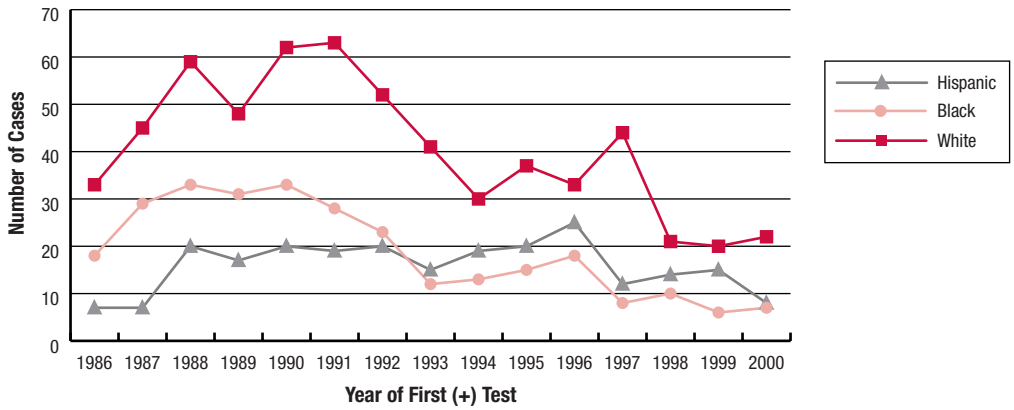
Figure 32 shows recently diagnosed HIV cases among persons who report injecting drug use, by race/ethnicity. At 47% of new HIV cases, ethnic minorities are noticeably over represented based on their proportion of the state's population. (Blacks are over represented by a factor of four at 16% and Hispanics by a factor of almost two at 29%. Whites are under represented at 53% of the recent HIV burden.)

■ **FIGURE 32: IDU HIV Diagnosed (+) 1999–2000 by Race Reported Through 9/30/01, Colorado**

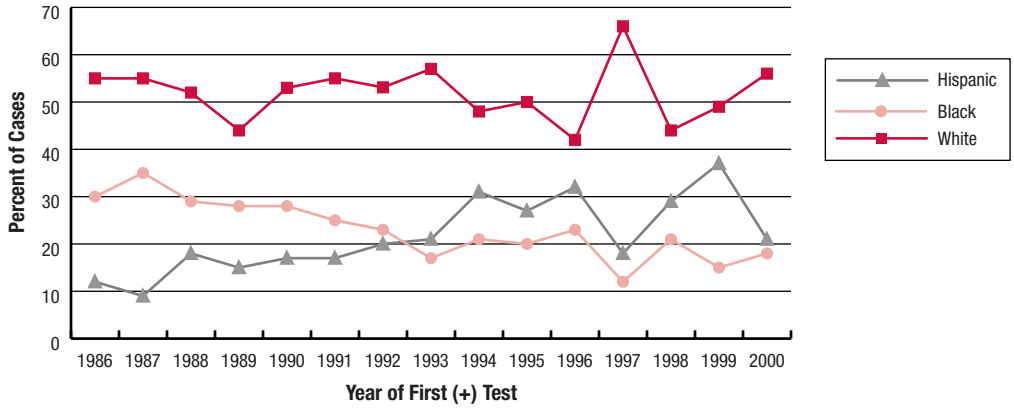


Figures 33 and 34 on the following page show the number and percent of new HIV cases among IDUs by race/ethnicity. Reported cases demonstrate a decreasing trend among all racial groups since peaking in the early 1990s; this decrease is more apparent among Whites. From 1991 to 2000, cases among Whites decreased from 63 in 1991 to 22 in 2000, a decrease of 65%. Cases among Blacks decreased in the same time period from 28 to 7 cases, a decrease of 75%. Cases among Hispanics also decreased in the same time period from 19 to 8 cases, a decrease of 58%. When the proportion of cases is compared, an increasing proportion of IDU appear to be White (50% of the cases in 1995, and 56% of cases in 2000), while the proportion of IDU who are Hispanic or Black appears to be decreasing or stable. Hispanics constitute 27% of the epidemic among IDU in 1995 and 21% in 2000, and Blacks, 20% in 1995 and 18% in 2000. (These numbers are so small that this may not be significant).

■ **FIGURE 33: Number of IDU with HIV/AIDS by Year of First (+) Test & Race Reported Through 9/30/01, Colorado**



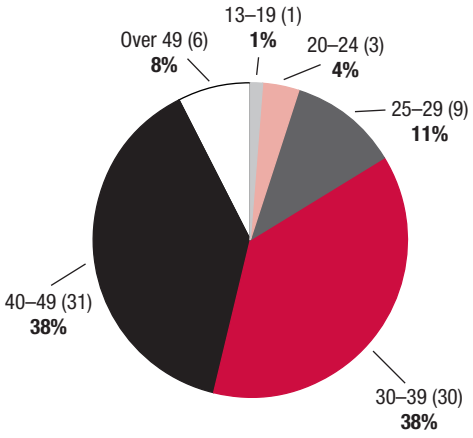
■ **FIGURE 34: Percentage of IDU with HIV/AIDS by Year of First (+) Test & Race Reported Through 9/30/01, Colorado**



Age Trends Among IDU

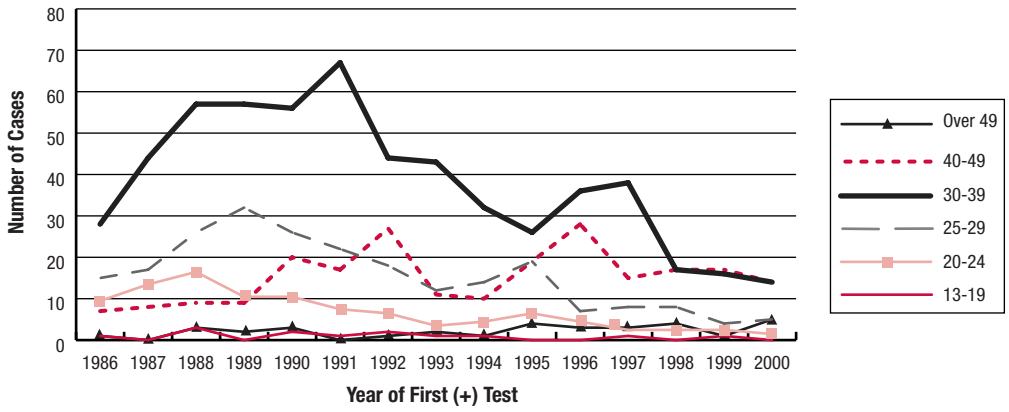
HIV is clearly an epidemic among older IDU (between the ages of 30–49), as shown in **Figure 35**, who comprise 76% of the recent (1999–2000) IDU epidemic and only 32% of Colorado's population. Adolescents (13–19) do not appear to be profoundly affected by HIV related to IDU; only one case was reported in this age group in 1999–2000.

■ **FIGURE 35: IDU HIV (+) Diagnosed by Age 1999–2000 Reported Through 9/30/01, Colorado**

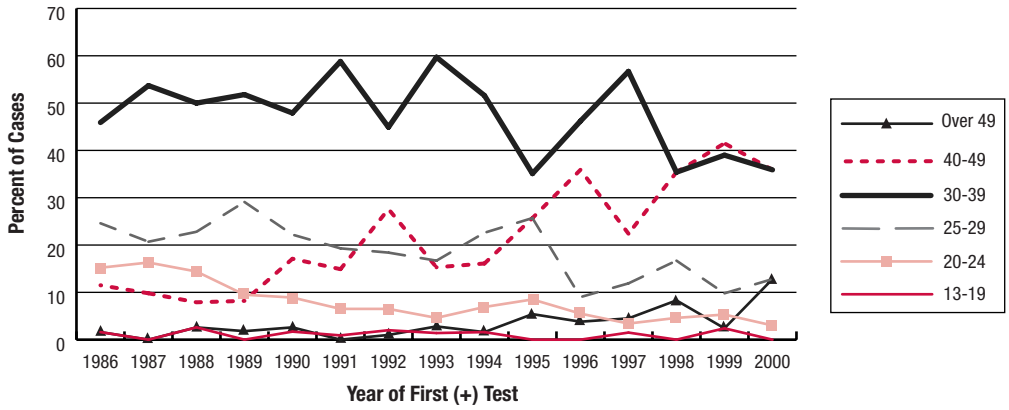


The following two graphs illustrate trends among IDUs by age. Reported HIV and AIDS cases appear to have peaked for the 20–24 and the 25–29 age groups in the late 1980s (**Figure 36**). The 30–39 age group peaked in 1991 with 67 cases. The 40–49 year age group peaked in 1996 with a high of 28 cases. There has been a shift toward older IDU (ages 40–49 and over 49 years). The 40–49 age group increased from 16% in 1994 to 36% in 2000. The over 49 age group increased from 2% in 1994 to 13% in 2000. A corresponding decrease was seen in younger IDU (ages 20–24 and 25–29). The 20–24 age group decreased from 7% in 1994 to 3% in 2000 and the 25–29 age group decreased from 23% to 13% in the same period. Historically, the 30–39 age group is the most impacted; it remains high at 36% of new cases in 2000, down from 60% in 1993. The numbers of reported cases among IDU by age are small, so caution should be exercised in interpreting these data.

■ **FIGURE 36: Number of IDU with HIV/AIDS by Year of First (+) Test & Age Reported Through 9/30/01, Colorado**



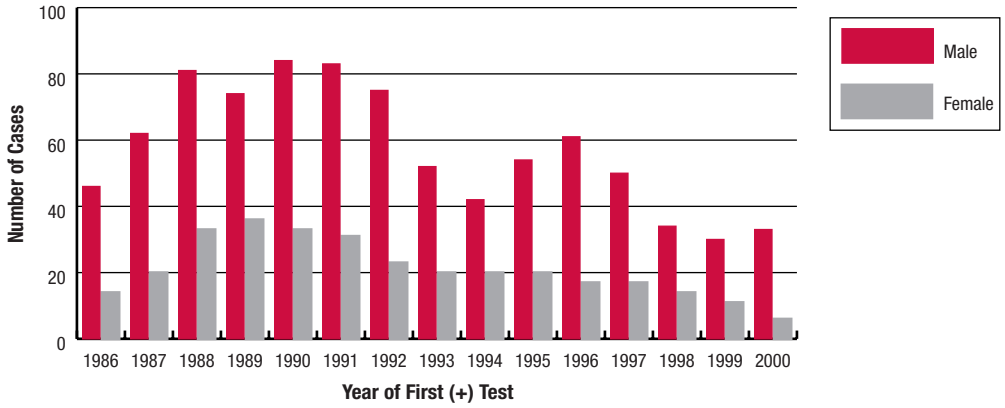
■ **FIGURE 37: Percentage of IDU with HIV/AIDS by Year of First (+) Test & Age Reported Through 9/30/01, Colorado**



Comparisons of HIV Among IDU by Sex

The following two graphs show both number and percentage of HIV and AIDS cases among IDUs by sex since 1986. Cases of HIV or AIDS among females peaked in 1989 (**Figure 38**), with 36 cases of IDU-related HIV or AIDS of a total of 110. In 2000, six cases were reported among females and 33 among males. The sexual characteristics of the epidemic since 1986 among IDUs have remained relatively stable, (**Figure 39**) with females representing between approximately one third and one quarter of the proportion of HIV/AIDS cases among IDU. Cases in females peaked in terms of their proportion of HIV/AIDS cases in 1989, at 33%. Recently, females comprised 22% of the epidemic in IDU in 1996 and 15% in 2000.

■ **FIGURE 38: Number of IDU with HIV/AIDS by Year of First (+) Test & Sex Reported Through 9/30/01, Colorado**



■ **FIGURE 39: Percentage of IDU with HIV/AIDS by Year of First (+) Test & Sex Reported Through 9/30/01, Colorado**

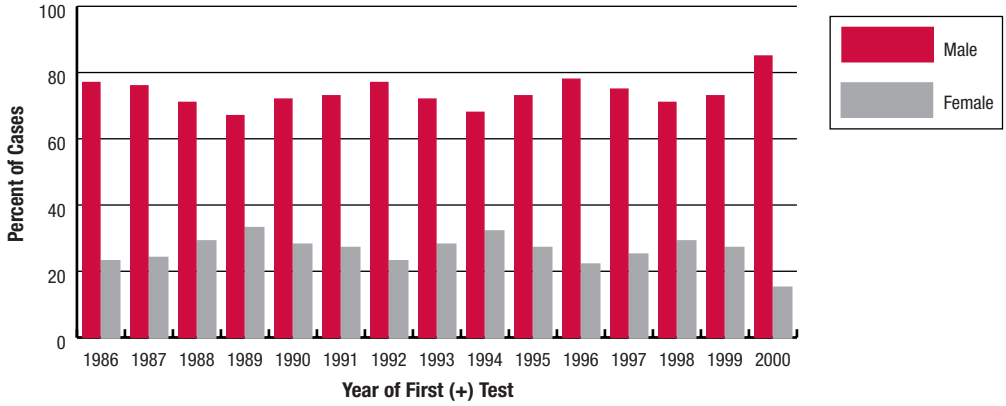
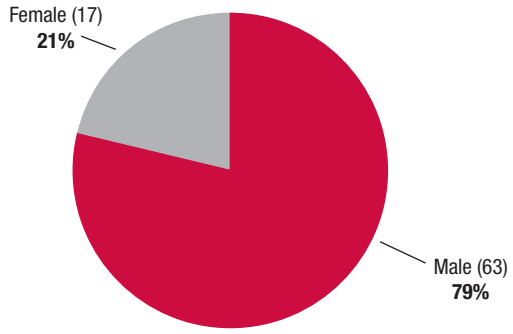


Figure 40 shows that women appear to bear a much larger burden of the recent HIV epidemic among IDU than of Colorado's total HIV/AIDS epidemic. While women account for 8% of the cumulative epidemic, they account for 21% of HIV cases diagnosed in 1999–2000 among IDU.

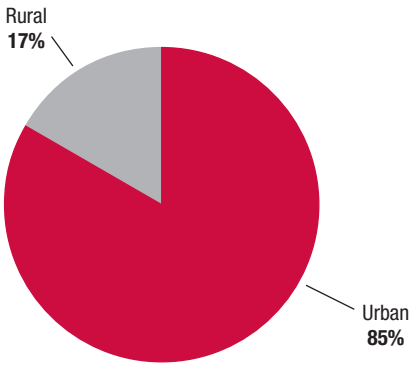
■ **FIGURE 40: IDU HIV Diagnosed (+) 1999–2000 by Sex Reported Through 9/30/01, Colorado**



HIV Among IDU by Region

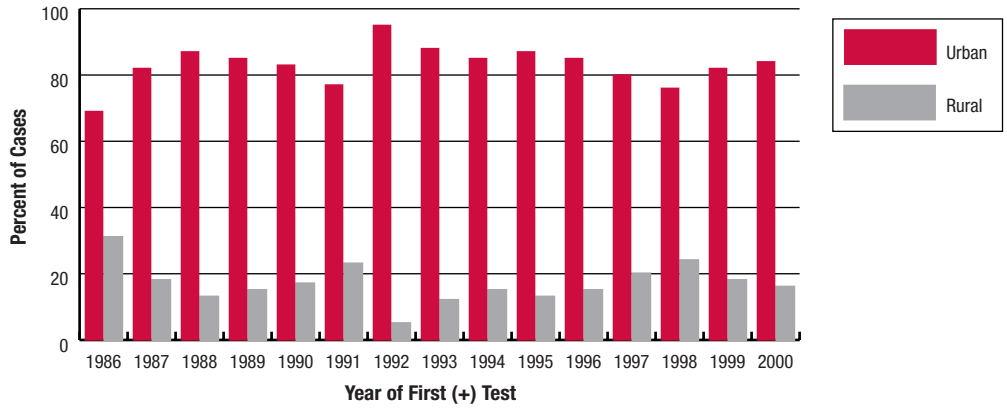
Figure 41 demonstrates that the recent HIV epidemic among IDU is more likely to effect rural (17%) Colorado than the larger epidemic of HIV/AIDS among MSM statewide, where 8% are cases reported as residing in rural Colorado. (Urban Colorado is defined as the front range counties of Adams, Arapahoe, Boulder, Denver, Jefferson and El Paso.) Rural Colorado comprises 36% of the state's population.

■ **FIGURE 41: IDU HIV Diagnosed (+) 1999–2000 by Region Reported Through 9/30/01, Colorado**

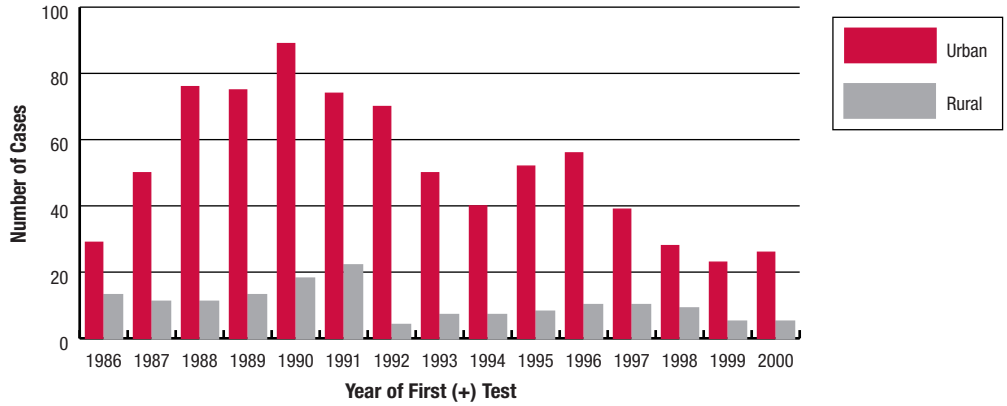


Figures 42 and 43 illustrate the geographic distribution of the proportion and number of HIV/AIDS cases among IDU. In 1986, 31% of IDU-related cases were living in rural Colorado at the time of diagnosis; by 1992, 5% lived in rural Colorado. Recent data indicate that this percentage has increased to over 16% in 2000. The small number of reported rural IDU cases has fluctuated widely since 1986 but this seems to have stabilized in the past two years. In 1999, five out of 28 cases were rural and in 2000 five of 31 were rural. Caution should be used in interpreting small numbers.

■ **FIGURE 42: Percentage of IDU with HIV/AIDS by Year of First (+) Test and Region Reported Through 9/30/01, Colorado**



■ **FIGURE 43: Number of IDU with HIV/AIDS by Year of First (+) Test and Region Reported Through 9/30/01, Colorado**



Other Factors Contributing to Risk Among IDU

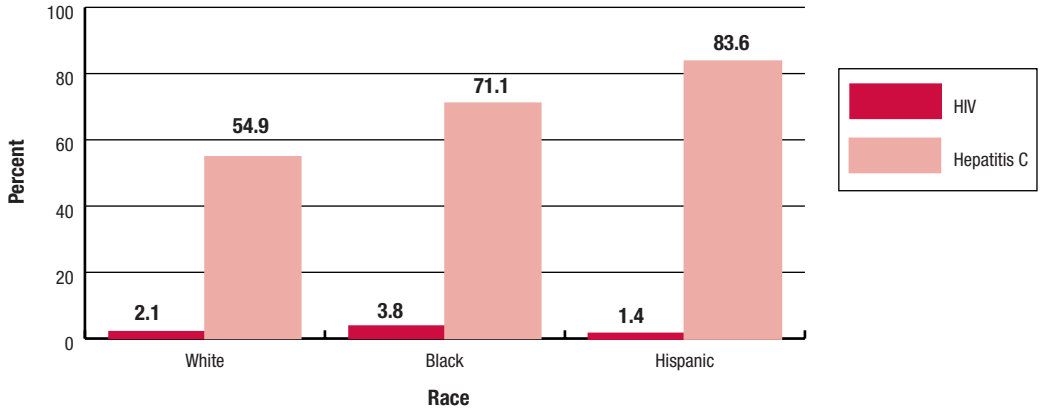
Table 6 illustrates the comparison of the HIV/AIDS database to the database of persons infected with Hepatitis C since 1993; 936 persons with HIV were also infected with Hepatitis C in this time period. This means that 15.3% of Colorado HIV/AIDS cases are co-infected with Hepatitis C. Compared to the database of persons diagnosed since 1993 with HIV, persons co-infected with Hepatitis C were more likely to be IDU, female, older and Black or Hispanic. Co-infection with Hepatitis C poses special clinical challenges for the treatment of HIV. Additionally, CDC guidance [5] suggests that persons who are infected with HIV and Hepatitis C at the same time may have a delayed seroconversion period for HIV of up to 13 months; this has profound implications for agencies testing persons at risk for both infections and may require that different information about follow-up testing be given to this group.

■ **TABLE 6: Hepatitis C and HIV/AIDS Cases in Colorado, Diagnosed Since 1993 and Reported Through 9/30/01**

	HIV/AIDS w/ HCV		Total HIV/AIDS	
Sex				
Male	798	85.3%	5435	89.1%
Female	138	14.7%	666	10.9%
Age				
Under 5	2	0.2%	18	0.3%
5–12	0	0.0%	6	0.1%
13–19	12	1.3%	59	1.0%
20–29	183	19.6%	1262	20.7%
30–39	446	47.7%	2848	47.7%
40–49	248	26.5%	1421	23.3%
Over 49	43	4.6%	486	8.0%
Unknown	2	0.2%	1	0.0%
Race				
White	540	57.7%	4034	66.1%
Black	188	20.1%	882	14.5%
Hispanic	184	19.7%	1072	17.6%
Asian	5	0.5%	38	0.6%
Am Indian	17	1.8%	57	0.9%
Unknown	2	0.2%	18	0.3%
Mode of HIV Acquisition				
MSM	225	24.0%	3774	61.8%
IDU	349	37.3%	681	11.2%
MSM/IDU	259	27.7%	575	9.4%
Hemophilia	26	2.8%	18	0.3%
Heterosexual Contact	37	4.0%	489	8.0%
Transfusion	3	0.3%	22	0.4%
NIR	34	3.6%	518	8.5%
Perinatal	3	0.3%	24	0.4%
Total	**936**		**6,101**	

Figure 44 summarizes HIV and Hepatitis C (HCV) seroprevalence estimates in injecting and illicit drug users (IDU) by race. These data were collected as part of an HIV/HCV seroincidence outreach study among illicit drug users from 1996–2000 in the Denver metro area. Of a total survey population of 1,341 persons, 1,334 tested at least once for HIV and 859 tested at least once for HCV. While Hepatitis C was more prevalent among Hispanic IDUs (83.6%), HIV was more prevalent among Blacks (3.8%) in this survey group. Within this survey group, 1,300 persons (96.9%) had injected illicit drugs at least one time, and most of these had injected drugs in the past 30 days.

■ **FIGURE 44: Proportion of HIV and HCV in Illicit Drug Users, 1996–2000, Denver**



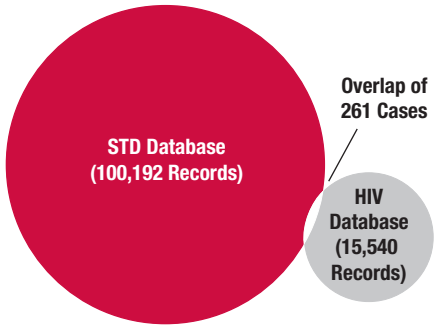
High Risk Heterosexual Contact

Estimates of High Risk Heterosexual Behavior in Colorado

It is difficult to make an assessment of the number of persons in Colorado who engage in heterosexual contact that puts them at high risk for HIV acquisition. Despite the fact that the population of those persons who acquire HIV heterosexually is not the same as those who acquire sexually transmitted disease (STD), a diagnosis of an STD would suggest that the individual is engaging in unsafe sexual practices. HIV prevention messages should be directed toward these individuals. In 2000, 12,088 cases of chlamydia and 3,089 cases of gonorrhea were reported to CDPHE. Females represent a larger percentage of reported cases of chlamydia; they account for 75% of cases reported in 2000. (Among gonorrhea cases, females comprise 50%.) Data about racial or ethnic characteristics of chlamydia cases is not available, but among reported gonorrhea cases, Blacks (at 44% of cases reported in 2000) and Hispanics (at 32%) are over represented.

Even though information about sexual orientation is not routinely collected as an STD surveillance activity, it is widely assumed that gonorrhea, syphilis and chlamydia are epidemics of heterosexuals. It has been feared that because a diagnosis of an STD is an indicator of unsafe sex, this group is at risk for acquisition of HIV. We were able to alleviate this concern by assessing the overlap of the HIV and STD infection "pools". In September 2001, the HIV/AIDS reporting system (HARS) was compared to the sexually transmitted disease management information system (STD-MIS) database. There were a total of 15,540 records in HARS dating back to 1982 and a total of 100,192 records in STD-MIS of reports of gonorrhea, syphilis and chlamydia dating back to 1990. The overlap comprised a total of only 261 individuals who contracted a sexually transmitted disease after their HIV diagnosis. This overlap of cases is illustrated in **Figure 45**.

■ **Figure 45: HIV/AIDS and Sexually Transmitted Disease Case Overlap**



The overwhelming majority (78.9%) of cases of STD/HIV co-infection were among men who have sex with men. Only 5.7% of HIV/STD co-infected cases were attributed to heterosexual contact.

Two hundred and seventy-six cases of gonorrhea, 23 cases of syphilis and 44 cases of chlamydia were reported in persons with HIV. The number of reported cases of STDs in individuals infected with HIV remains small but has more than doubled (21 cases in 1990 compared to 51 cases in 2000) in the last eleven years. Details about the demographics of this group are seen in **Table 7**.

■ **TABLE 7: Characteristics of People Infected with an STD After Their HIV Diagnosis**

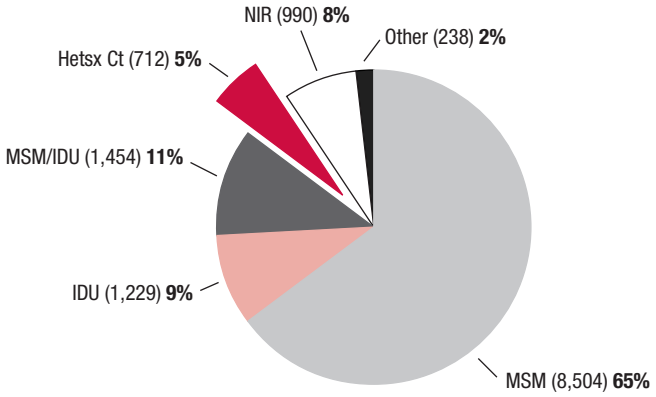
Sex		
Male	228	(87.4%)
Female	33	(12.6%)
Race		
White	136	(52.1%)
Black	77	(29.5%)
Hispanic	41	(15.7%)
Am Indian	5	(1.9%)
Unknown	2	(0.8%)
Age		
Under 13	0	(0.0%)
13–19	14	(5.4%)
20–29	104	(39.8%)
30–39	115	(44.1%)
40–49	25	(9.6%)
Over 49	3	(1.1%)
Mode of HIV acquisition		
MSM	173	(66.3%)
IDU	26	(10.0%)
MSM/IDU	33	(12.6%)
Heterosexual Contact	15	(5.7%)
NIR	11	(4.2%)
Other	3	(1.2%)

To assure the accuracy of data about heterosexual acquisition of HIV, in order for a case of HIV or AIDS to be classified as heterosexual acquisition, a Colorado Department of Public Health and Environment investigation must demonstrate either that the individual had heterosexual contact with a person who has documented HIV infection or AIDS or had heterosexual contact with a person who is in a high risk group for HIV (IDU or MSM). A report by the patient that he or she acquired HIV heterosexually will not automatically classify that individual into the category of heterosexual acquisition.

Proportion of Epidemic Among High Risk Heterosexuals

Heterosexual acquisition (**Figure 46**) accounts for only 5% of Colorado's HIV/AIDS epidemic.

■ **Figure 46: HIV/AIDS by Risk Reported Through 9/30/01, Colorado**



Gender Trends in High-Risk Heterosexual Contact

According to **Figure 47**, females are more likely to be affected by heterosexual acquisition of recent HIV than males; females account for 67% of this transmission category. Males account for 33% of this risk group.

■ **Figure 47: Heterosexually Transmitted HIV Diagnosed 1999–2000 Reported Through 9/30/01, Colorado**

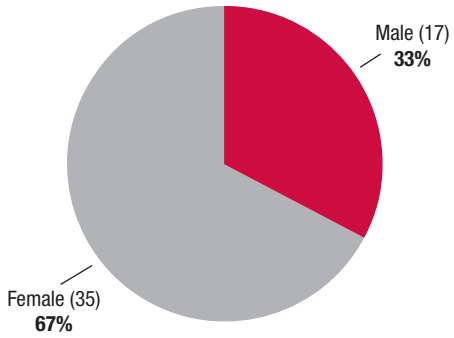
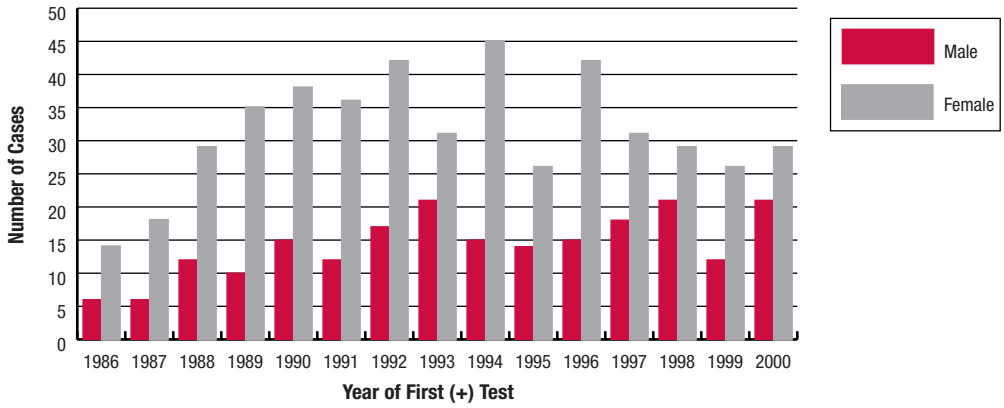


Figure 48 demonstrates a decrease in heterosexually-acquired HIV cases in females in the past four years; cases decreased by 31% in the period 1996 to 2000 (42 to 29 cases). Cases of heterosexually-acquired HIV among males increased 40% in the same period, from 15 to 21 cases. Care should be taken in interpreting trends in this group, especially in recent years, due to the small number of cases.

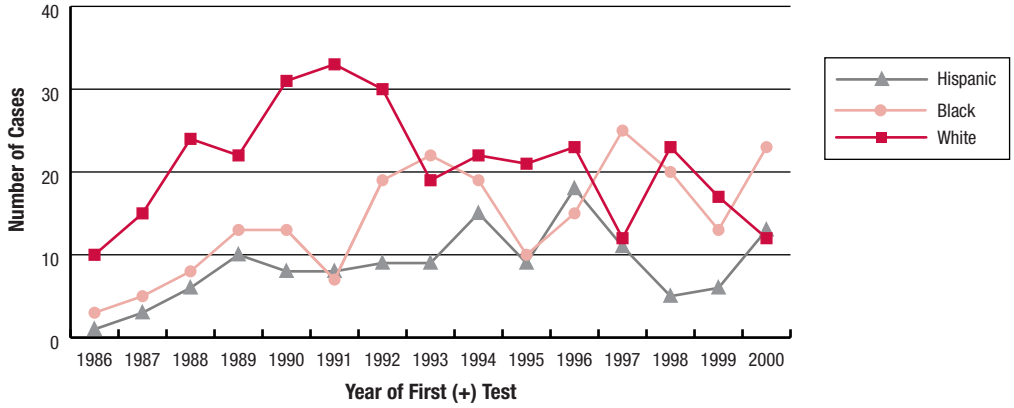
■ **Figure 48: Number of Heterosexually Acquired HIV/AIDS by Year of First (+) Test & Sex Reported Through 9/30/01, Colorado**



Racial/Ethnic Trends Among High Risk Heterosexuals

Figure 49 shows changes in the number of cases of heterosexually acquired HIV infection since 1986. These numbers are small and they should be interpreted cautiously. This chart shows substantial fluctuations in reported cases in each racial group, with increases among all racial groups in the early years of the epidemic and overall decreases in the early 90s across most groups. Cases in Whites decreased from 33 cases in 1991 to 12 cases in 2000, cases in Blacks increased slightly from 22 in 1993 to 23 in 2000 and cases in Hispanics decreased from nine cases in 1993 to five in 1998. However, an increase to 13 cases was observed in Hispanics in 2000.

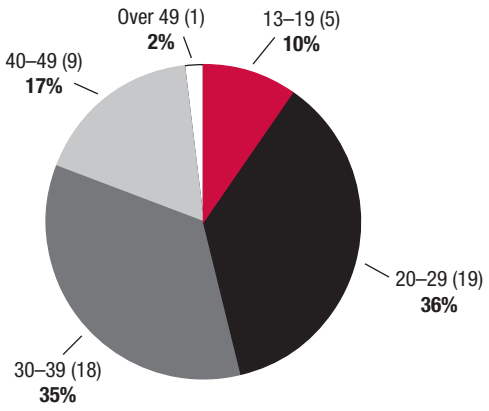
■ **Figure 49: Number of Heterosexually Acquired HIV/AIDS by Year of First (+) Test & Race Reported Through 9/30/01, Colorado**



Age Trends Among High-Risk Heterosexuals

Recently diagnosed cases of HIV and AIDS attributed to heterosexual contact by age are illustrated in **Figure 50** on page 42. This pie indicates that the largest percentages of newly diagnosed cases are in the 20–29 (36%) age group (it is worth noting that these individuals may have been infected as adolescent or young adults) and the 30–39 (35%) age group. Adolescents comprise only 10% (five cases) of newly diagnosed cases.

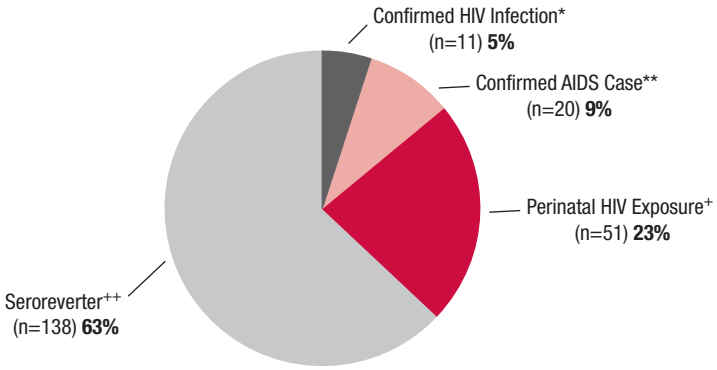
■ **Figure 50: Heterosexually Acquired HIV Diagnosed (+) 1999–2000 Reported Through 9/30/01, Colorado**



Infants Born to HIV-infected Women

Figure 51 shows that the proportion of cases of infants born to HIV-infected mothers by infection status. The overwhelming majority (63%) of children born to HIV-infected mothers subsequently lose their maternal HIV antibody (seroreverted) and have not acquired HIV from their mothers; 5% are confirmed to have acquired HIV from their mothers; 9% have met the AIDS case definition for pediatric patients and 23% are still classified as perinatal HIV exposure cases and have not been classified as either infected or uninfected with HIV. Most of these infants will remain in this category because they have left Colorado and are lost to follow-up.

■ **Figure 51: Infants Born to HIV-infected Women, 1979–September 2001, Colorado (n=220)**



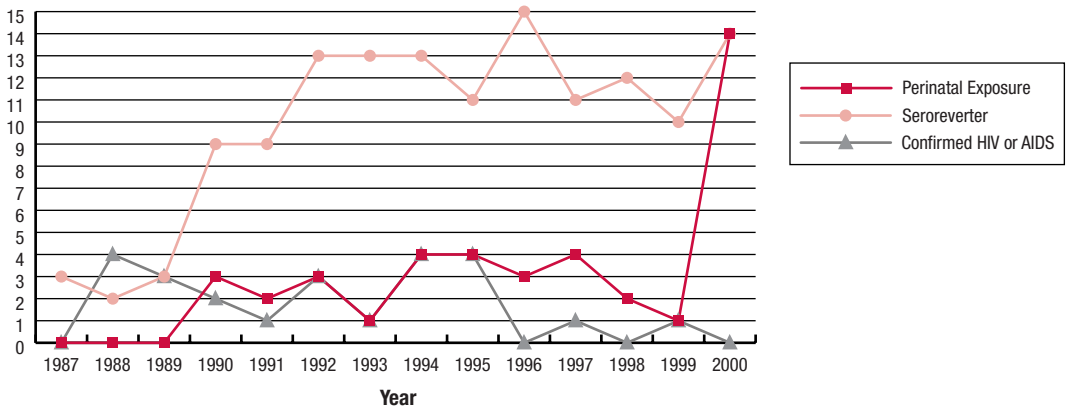
* Confirmed HIV infection means the laboratory testing of the infant shows that they have acquired HIV from their mother.

** Confirmed AIDS case means that the infant has met the CDC pediatric AIDS case definition (these children usually demonstrate symptoms of HIV-related illness).

\+ Perinatal HIV exposure means that the infant tests positive for HIV anti-body, but it is unknown yet whether the infant actually has HIV or if the infant's test is positive because of maternal anti-body to HIV.

++ Seroreverter means that the infant once tested positive because of maternal antibody to HIV but has shed that maternal antibody and is now negative for HIV. It has been determined that this child did not acquire HIV from its mother

■ **Figure 52: Infants Born to HIV-infected Women, Colorado, 1987–2000**



The time period 1987 to 2000 was used instead of 1979 to 2000 because two or fewer cases were reported in each of the years 1979 to 1986; 2001 was not included because it is a partial year

As shown in **Figure 52**, the number of infants born to HIV-infected women in Colorado peaked in 2000, with 28 HIV-infected women giving birth in that year, up from 11 births in 1999 (an increase of 154%). However, cases of confirmed AIDS or HIV infection in infants peaked in 1994-1995, with four cases in infants reported in both years. The decrease in cases of HIV in infants each year is attributed to the effectiveness of anti-HIV medications during pregnancy and delivery in reducing perinatal transmission of HIV. In the past two years, two cases of confirmed HIV-infection were reported (one in 1999 and one in 2001); one woman did not receive prenatal care and her infant was not tested at delivery. The other woman, who had prenatal HIV testing performed during her first trimester, seroconverted later in pregnancy.

Other Modes of Transmission

It is important for HIV prevention planning that the HIV epidemic be characterized by mode of transmission. Persons who are diagnosed with HIV and AIDS are interviewed and their medical records are examined to determine their risk category.

Data about risk is less complete for newly diagnosed HIV-infected persons than for persons with AIDS. In 2000, risk data for cumulative AIDS cases was not available for 267 or 4% of cases (n=7,272); for AIDS cases newly diagnosed in 2000, risk was not identified in 17% of the cases. Similarly, 16% of newly diagnosed HIV cases (n=211) had no risk reported. No cases of female-to-female transmission have been documented.

Other modes of transmission (blood transfusion, organ or tissue transplant, hemophilia and occupational acquisition) account for 2% of AIDS cases (159/7,272) through September 2001. Transfusion recipients account for 76 cumulative AIDS cases since 1982, transplant recipients for one; hemophiliacs (recipients of clotting factor) for 80 and occupational acquisition for two (both were health care workers who sustained percutaneous needlestick injuries from HIV-infected patients and seroconversion was documented; one other probable case of occupational acquisition is classified as "no identified risk").

It is important to articulate here that "no identified risk" does not mean that there are new or unidentified means of transmission.

Delays in HIV Testing

As **Table 8** shows, the time between the first positive HIV test and AIDS diagnosis was examined for cases of AIDS diagnosed between 1992 and 2000. A significant number of AIDS cases are tested relatively late in the course of their HIV infection: 35% were tested for HIV within two months and 42% within 12 months of AIDS diagnosis. These individuals pose a challenge to HIV prevention efforts. Knowing one's serostatus allows for early medical evaluation and possible appropriate clinical intervention as well as behavior changes that may prevent transmission to others.

Women tend to test later in their course of infection than men. People of color test later than Whites, and the Asian population tests latest (67% tested within 12 months of AIDS diagnosis). Heterosexual contact and cases with no identified risk test later in their infection than other risk groups. The numbers in these groups are small with the majority of the cases among White MSM. Persons who live in rural Colorado appear to seek testing for HIV later in the course of their infection than persons living in urban Colorado.

TABLE 8: Colorado AIDS Cases Diagnosed 1992–2000

		Time between HIV test and AIDS diagnosis			
	n	Within 2 months		Within 12 months	
Total	4,413	1,533	34.7%	1,836	41.6%
Sex					
Male	4,042	1,393	34.5%	1,660	41.1%
Female	371	140	37.7%	176	47.4%
Race					
White	3,061	1,005	32.8%	1,191	38.9%
Black	553	209	37.8%	259	46.8%
Hispanic	743	296	39.8%	356	47.9%
Asian	24	12	50.0%	16	66.7%
Am Indian	32	11	34.4%	14	43.8%
Risk					
MSM	2,911	1,006	34.6%	1,201	41.3%
IDU	458	138	30.1%	176	38.4%
Heterosexual Contact	307	148	48.2%	181	59.0%
NIR	201	126	62.7%	142	70.6%
Region					
Urban	3,861	1,317	34.1%	1,581	40.9%
Rural	552	216	39.1%	255	46.2%

HIV in Colorado's Prisons*

Since 1985, the Colorado Department of Corrections (DOC) has screened inmates for HIV when they were admitted to a DOC facility. Through September 30, 2001, 476 HIV-infected inmates have been admitted to DOC. The overwhelming majority of these inmates are housed at the Colorado Territorial Correctional Facility in Canon City (CTCF), where specialized medical care is available. (There are three exceptions to housing HIV-infected inmates at CTCF: 1) When inmates pose a serious threat to the safety of other inmates, correctional officers or to themselves, they are incarcerated at the Colorado State Penitentiary, or so-called "Super-Max", where the inmate is confined to their cell 23 hours a day and does not have contact with other inmates; 2) when the patient is about to be released and is assigned to Camp George West, a pre-release facility; and, 3) when the patient is hospitalized in a DOC mental health facility.)

■ **Figure 53: HIV/AIDS in DOC by Race Reported Through 9/30/01, Colorado**

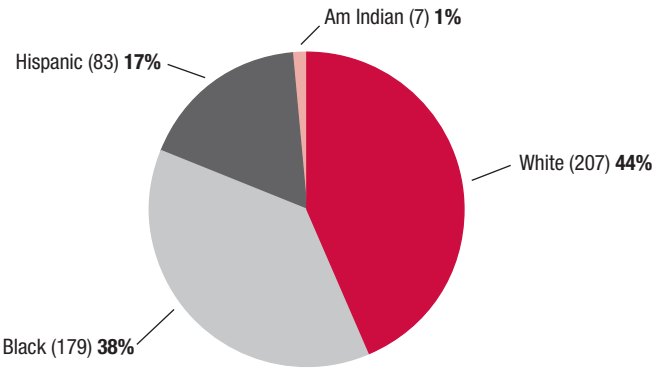


Figure 53 shows that the racial and ethnic composition of HIV and AIDS cases in the Colorado Department of Corrections is markedly different than the composition of Colorado's population (Whites account for 75% of the state, Blacks 4% and Hispanics 15%) and somewhat different than the Department of Corrections racial characteristics. The DOC population is 44% White, 24% Black and 27% Hispanic. Blacks are over represented by a factor of five in terms of their contribution to the recent statewide HIV epidemic, appear to be over represented among incarcerated persons by a factor of ten when compared to Colorado's population and by a factor of 1.5 when compared to the DOC population. Although not graphically illustrated, of the 476 cases of HIV or AIDS at DOC, 91% are male and 9% are female, which is fairly consistent with the sexual characteristics of DOC where 92% of inmates are male and 8% female.

■ **Figure 54: HIV/AIDS in DOC by Risk Reported Through 9/30/01, Colorado**

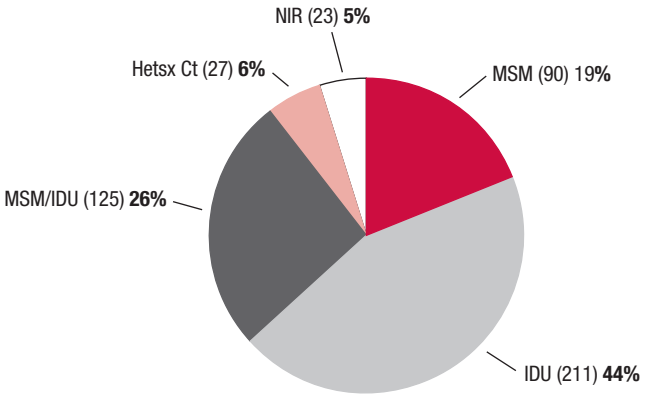


Figure 54 shows the risk characteristics of HIV in DOC. When compared to risk for Colorado's epidemic, prisoners with HIV are more likely to be injecting drug users (IDU) (44% compared to 11%) and men who have sex with men and inject drugs (MSM/IDU) (26% compared to 11%). They are less likely to be MSM (19% among HIV/AIDS cases at DOC compared to 65% of cases statewide) or to have an unidentified risk (5% compared to 8%). This suggests that IDU are more likely to be incarcerated than MSM. The percentage of cases ascribed to heterosexual acquisition is the same, 5% in both groups.

*This data excludes federal prisons, which do not routinely screen for HIV, but will test for HIV on the inmate's request; 86 HIV positive tests have been reported from the four federal correctional facilities in Colorado since 1987.

. . . a number of studies suggest that the perception that HIV is now a treatable disease (so-called HAART optimism) may lead to increases in high-risk behaviors among persons with and without HIV infection.

4

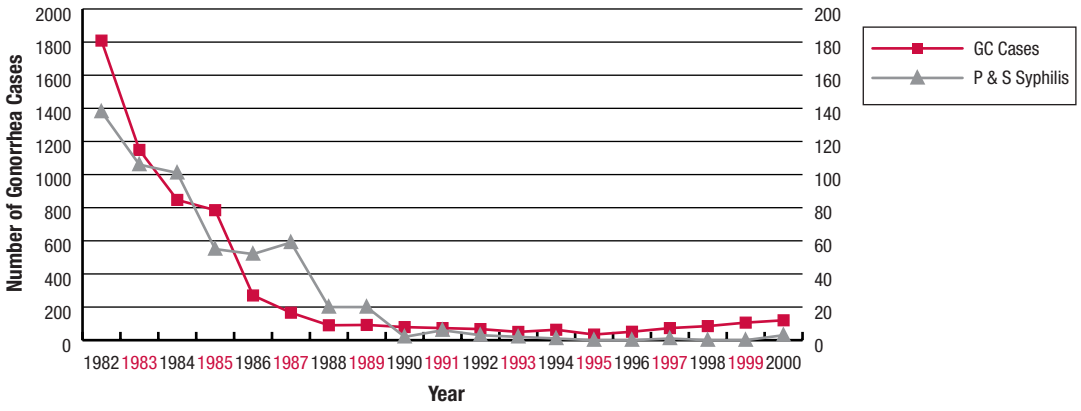
Data of Local Significance

The Denver Public Health Department (DPH) has conducted numerous HIV surveillance and epidemiological projects since the beginning of the AIDS epidemic. HIV surveillance systems at Denver Public Health Department include the HIV/AIDS Reporting System (HARS), the Supplement to HIV/AIDS Surveillance (SHAS), and the Adult Spectrum of Disease (ASD) projects. The DPH HARS database contains basic information on persons reported with HIV/AIDS and is directly linked to the HARS database at CDPHE. SHAS is a multi-site, interview-based project enrolling persons with HIV/AIDS who access Denver Health for care since 1990. SHAS collects in-depth information on socio-demographics, risk behaviors, reproductive health (for women), and treatment adherence. Through October, 2001, 2,849 persons with HIV/AIDS have been enrolled in this project. ASD is a parallel project, also funded by the CDC, collecting clinical information through bi-annual chart abstraction from patients with HIV/AIDS who receive care at Denver Health. To date, the ASD project at DPH has enrolled over 3,800 patients. In addition, DPH has data available from two HIV Testing Surveys (HITS) conducted in 1996 and 1998. HITS is a CDC-funded, multi-site project, primarily designed to assess HIV testing behaviors among three high-risk populations: STD clinic patients, gay men in bars, and injection drug users in street settings. Besides HIV testing behaviors, HITS also collected extensive risk behavior information. Additional data sources include electronic information from the DPH STD clinic and HIV counseling and testing site (CTS) that collect clinical and behavioral information from patients who access these services. Finally, important information also is available from periodic surveys and research projects conducted at DPH, including ongoing risk assessments among persons with HIV who access Denver Health for care, HIV sero-surveillance projects, and HIV vaccine trials. In this section of the epidemiologic profile, a number of highlights from these data sources are presented.

Gonorrhea And Syphilis Among Men Who Have Sex With Men (MSM)

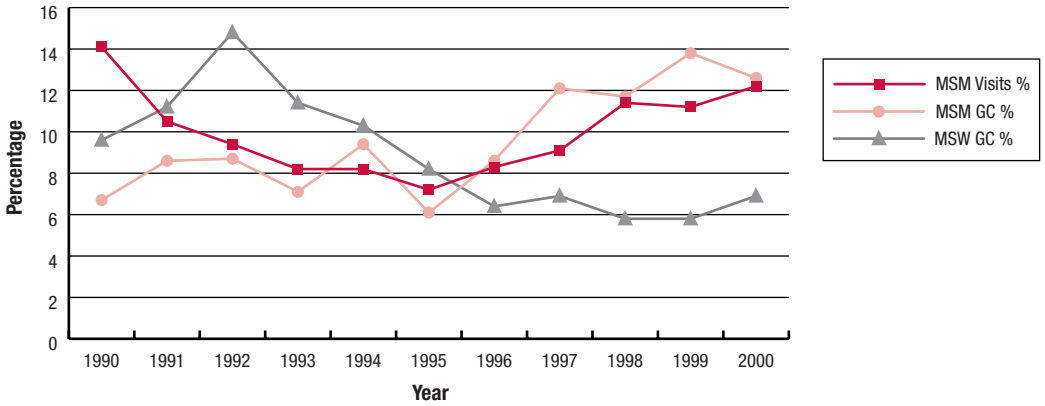
As shown in **Figure 55**, the number of gonorrhea and syphilis cases among men who have sex with men (MSM) diagnosed in the DPH STD clinic declined rapidly after the onset of the AIDS epidemic in 1981. This trend was part of a national and international trend that suggested a rapid behavioral response by the MSM community.[6] In Denver, the number of gonorrhea cases among MSM decreased more than 10-fold from 1809 cases in 1982 to 270 cases in 1986 and 34 cases in 1995. Likewise, primary and secondary syphilis declined from 138 cases in 1982 to 52 cases in 1986, and 0 cases in 1995. However, while primary and secondary syphilis remained stable in the second half of the 1990s, gonorrhea started a slow, but sustained upward trend since 1995.

FIGURE 55: Incidence of Gonorrhea and Primary and Secondary Syphilis Among MSM, Denver Metro Health Clinic, 1982–2000



This trend is paralleled by increasing numbers of MSM making visits to the DPH STD clinic, both in absolute numbers as well as in the proportion of all male visits. The number of MSM visits decreased from 1180 in 1990 to 555 in 1995 and then increased to 952 in 2000, while the proportion of MSM visits of all male visits decreased from 14.1% in 1990 to 7.2% in 1995 and then increased to 12.2% in 2000 (**Figure 56**).

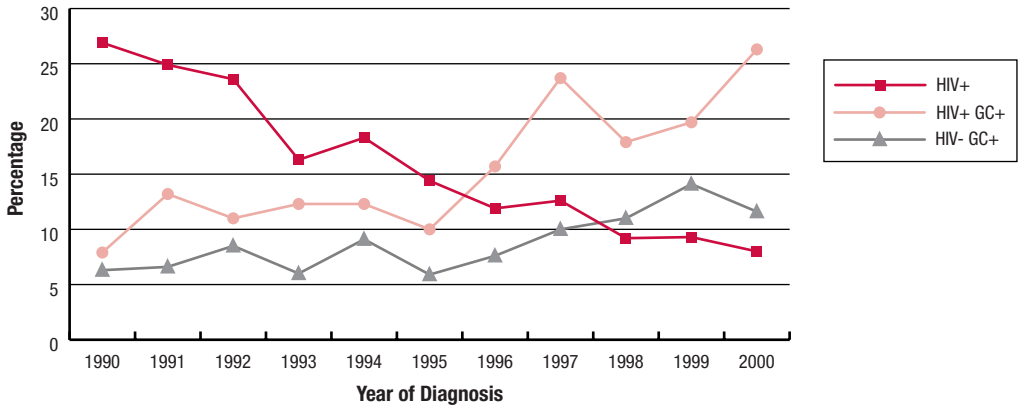
Figure 56: Proportion MSM Visits of Total Male Visits and Proportion of MSM and MSW with Gonorrhea, Denver Metro Health Clinic, 1990–2000



Among MSM the proportion diagnosed with gonorrhea was stable at 6.7%–6.1% between 1990 and 1995, but then doubled to 12.6% in 2000. At the same time, gonorrhea among men having sex with women reached a peak of 14.8% in 1992 and then declined to 6.9% in 2000. While the proportion of visits at which gonorrhea was diagnosed among MSM compared to men having sex with women was significantly lower in 1990, the proportion was significantly higher in 2000.

Figure 57 shows the gonorrhea trends among MSM in relation to HIV serostatus.

■ **Figure 57: HIV and Gonorrhea Among MSM, Denver Metro Health Clinic, 1990–2000**



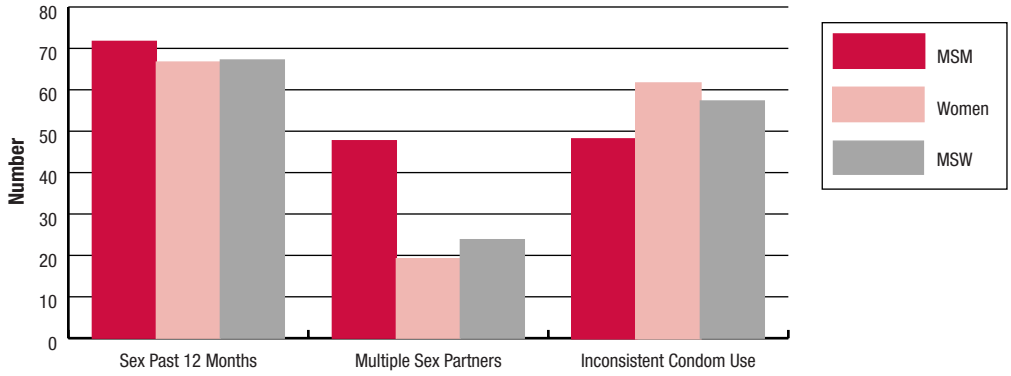
Overall HIV seroprevalence rates among MSM decreased from 26.9% in 1990 to 8% in 2000. However, among HIV-infected MSM the gonorrhea rate increased from 7.9% to 26.3%, while the rate increased from 6.3% to 11.6% among MSM who were uninfected.

The gonorrhea trends among MSM in Denver are similar to trends reported nationwide. The reversal of downward trends around 1995/1996 suggests a relationship with the availability of highly-active antiretroviral therapy (HAART) for the treatment of persons with HIV/AIDS. Indeed, a number of studies suggest that the perception that HIV is now a treatable disease (so-called HAART optimism) may lead to increases in high-risk behaviors among persons with and without HIV infection.[7,8] These changes in risk behaviors among MSM may signal the beginning of a new wave of HIV infections in this group, which may be aggravated by the presence of gonorrhea and other STDs. Data from San Francisco indicate that HIV incidence among MSM has increased over the past few years.[9] Such trends have not been observed in Denver, but increasing gonorrhea rates among MSM do demonstrate a need to enhance monitoring STDs among MSM and to develop prevention interventions among MSM who attend STD and HIV clinics.

Sexual Behaviors Among Persons with HIV Infection Accessing Medical Services at Denver Health

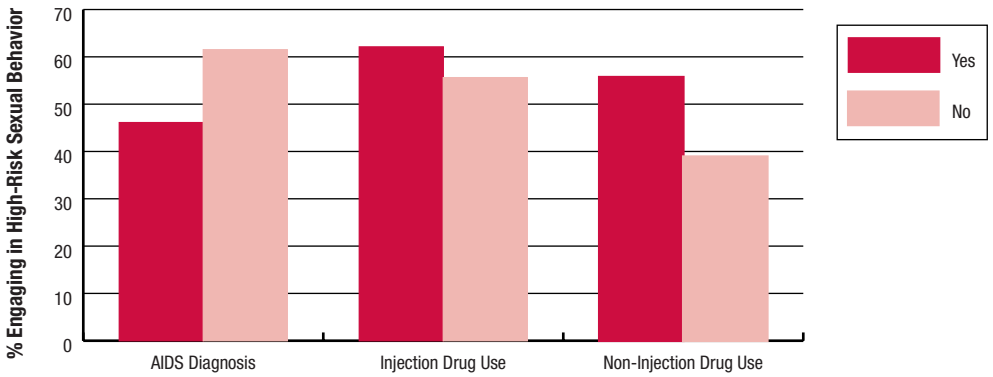
Persons with HIV infection may continue or resume high-risk sexual behaviors and may benefit from ongoing prevention interventions. The medical care setting may be an appropriate place to provide ongoing prevention services. The SHAS database was analyzed to assess the need for such services and this analysis is illustrated in **Figure 58**.

■ **Figure 58: Sexual Behaviors Among Persons with HIV Infection, Denver Health, 1995–1999**



For this analysis, the following risk groups were distinguished: men who reported sex with men in the previous five years or who self-identified as homosexual (MSM), men who reported sex with women in the previous five years or who self-identified as heterosexual and did not report sex with men in the previous five years (MSW), and women, regardless of sexual orientation. Among 819 HIV-infected persons who accessed Denver Health since 1995, 619 (75.6%) were MSM, 122 (14.9%) were MSW, and 78 (9.5%) were women. Of these, 578 (70.6%) reported any vaginal or anal sex in the twelve months prior to interview (see **Figure 58**). These proportions did not vary significantly by risk group; MSM: 71.7%; MSW: 67.2%; and women: 66.7%. Significantly more MSM reported more than one sex partner in the previous year (47.7%), compared to MSW (23.8%) and women (19.2%). Among persons who had vaginal or anal sex in the previous year, inconsistent condom use (those not using condoms all the time in the previous year) was more frequently reported by women (61.5%) and MSW (57.3%) than by MSM (48.0%). A further analysis of high-risk sexual behavior (defined as either inconsistent condom use or multiple partners in the past twelve months) is shown in **Figure 59**.

■ **Figure 59: Factors Associated with High-Risk Sexual Behaviors Among Persons with HIV Infection, Denver Health, 1995–1999**



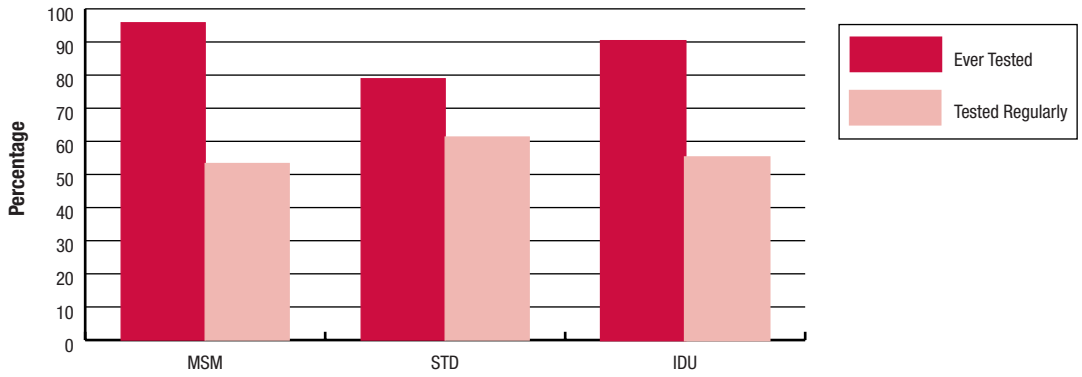
Persons with an AIDS diagnosis were less likely to have engaged in high-risk sexual behaviors (46.1%) than persons without an AIDS diagnosis (61.5%). Persons who had ever injected drugs were more likely to have engaged in high-risk sexual behaviors (62.1%), than those who had never injected drugs (55.6%). Among persons who had never injected drugs, those who had used non-injection drugs (e.g. cocaine, methamphetamine) were more likely to report high-risk sexual behaviors (55.7%) than persons who had not used non-injection drugs (38.9%).

These data indicate that sexual risk behaviors are quite common among persons with HIV infection in care and that persons who are healthier (i.e., those who do not have an AIDS diagnosis) and those who use injection or non-injection drugs are more likely to engage in such behaviors. Prevention interventions in HIV care settings appear to be warranted as has been recommended by the CDC.[10]

HIV Testing Patterns Among High-Risk Populations

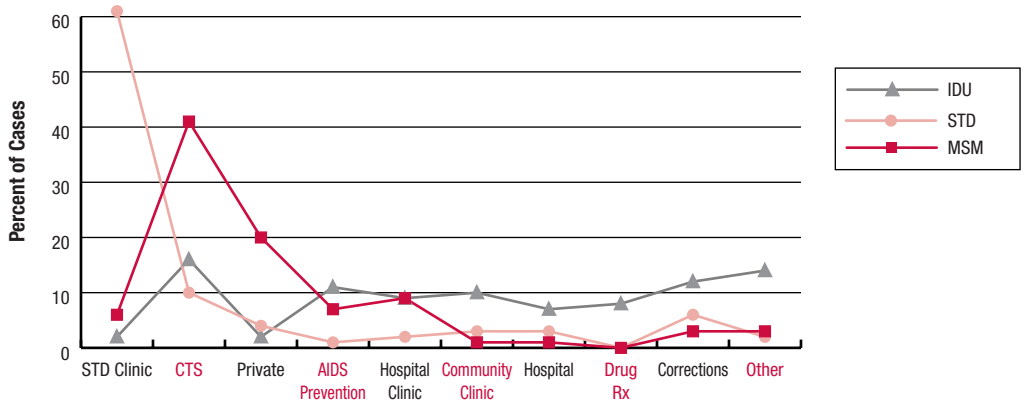
One of the cornerstones of CDC's HIV Prevention Strategic Plan through 2005, is increasing HIV sero-status awareness among high-risk populations.[8] In Denver, HIV testing patterns were studied in the 1996 and 1998 HITS surveys among three high-risk populations: MSM recruited in bars, injection drug users (IDU) recruited in street settings, and heterosexual men and women recruited in STD clinic waiting rooms. In the 1998 HITS survey, a total of 362 men and women were interviewed, 120 MSM, 123 IDU, and 119 STD clinic clients. Of all respondents, 88.4% reported ever being tested for HIV, 95.8% of MSM, 90.2% of IDU, and 79.0% of STD clinic clients. Among persons tested, 53.3% of MSM, 55.1% of IDU and 61.3% of STD clinic clients reported to be tested on a regular basis, e.g., every six or twelve months (**Figure 60**).

■ **Figure 60: Persons Ever and Regularly Tested for HIV by Risk Group, Denver, 1998**



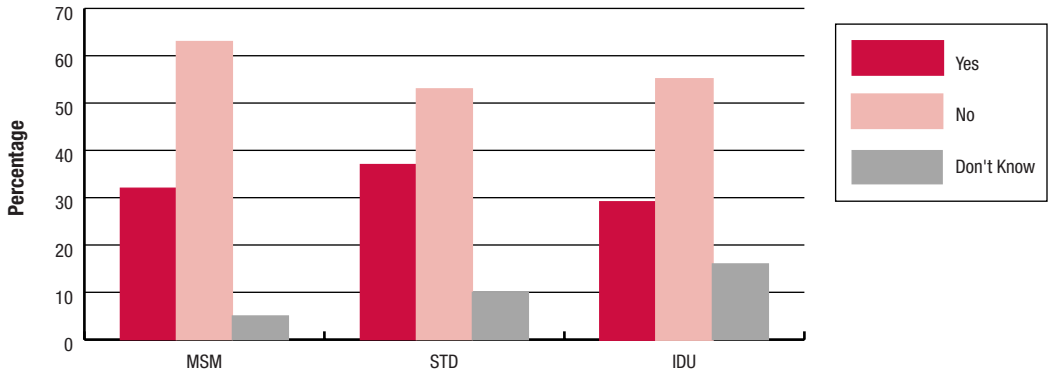
The place of last HIV test varied by risk group. Most MSM were tested at an HIV Counseling and Testing Site (41.4%) or by a private provider (19.5%). By contrast, most STD clinic clients were tested at the STD clinic (61.1%), while among IDU there was no clear site preference (**Figure 61**).

Figure 61: Place of Most Recent HIV Test by Risk Group, Denver, 1998



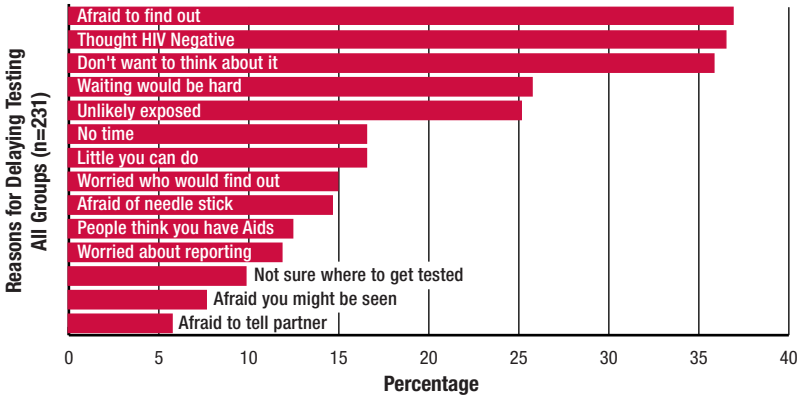
Of persons tested, 32.7% reported that the last test was anonymous, with little variation among risk groups (**Figure 62**).

Figure 62: Proportion of Persons Testing Anonymously at Most Recent Test, Denver, 1998



When asked for reasons why HIV testing might have been delayed, the most frequently mentioned reasons were anxiety about testing HIV positive (36.9%), the belief of being HIV negative (36.5%), not wanting to think about being HIV positive (35.8%), difficulty waiting for results (25.7%), being unlikely to be exposed to HIV (25.1%), and not having had the time to test (16.5%). Concerns about who would find out they were HIV positive was stated as a reason for delaying testing by 14.9% and worries about reporting to the government by 11.8% (**Figure 63**).

■ **Figure 63: Reasons for Delaying HIV Testing, Denver, 1998**



Reasons for delay varied somewhat by risk group. MSM were more concerned about finding out they were HIV positive (51.8%) and were more likely to be worried about who would find out about their test result (24.6%) and reporting to the government (19.3%), compared to both IDU and STD clinic clients.

While the HITS survey data cannot be generalized outside of the venues where data were collected, the results suggest that in the Denver area, a majority of persons at highest risk for HIV have been tested at some point in the past and that regular testing is also common. Reasons for testing delays appear to be mostly related to anxiety about finding out one's serostatus and less to fears about reporting. The latter finding may be in part explained by the availability of anonymous testing, reported by about one third of the surveyed population as the mode of testing at their last test.

HIV Incidence in Selected Populations

Currently, most information on the HIV/AIDS epidemic is derived from HIV and AIDS case reports, but it is not known when these persons were infected. Knowledge of recently acquired infections may provide a better understanding of the current status of the HIV/AIDS epidemic. In a recent analysis of the DPH HIV Counseling and Testing database, two measures of HIV incidence based were compared, one based on multiple tests done on the same individual ("Test-Retest"), the other based on a single test and the person's recollection about the results of previous HIV tests ("Prior Test Recall"). The results from 1994 to 2001 are summarized in **Table 9**. These data suggest that among 100 MSM who receive counseling and testing for HIV at DPH, one to two will become infected with HIV every year. The overall estimate of HIV incidence in this analysis compared exactly between the two methods: 0.54 persons infected each year of 100 persons in the DPH CTS, or about one person newly infected of 200 persons who seek HIV counseling and testing at DPH every year. Among MSM this rate is approximately three to five times higher, meaning that of 100 MSM seeking counseling and testing, three to five will become HIV infected each year. However, results from these analyses should be interpreted with caution because the number of seroconversions is so small and the analysis samples are biased. Also, persons visiting CTS may not be representative of the whole population.

Nonetheless, these data are consistent with the notion that, in Denver, MSM still constitute the single most important risk group for HIV infection and that among them, Black and Hispanic men represent an important proportion. To complete this analysis, Serologic Testing Algorithm for Recent HIV Seroconversion (STARHS) methods are being used to yield a third incidence estimate in these data and will be reported in the coming year.

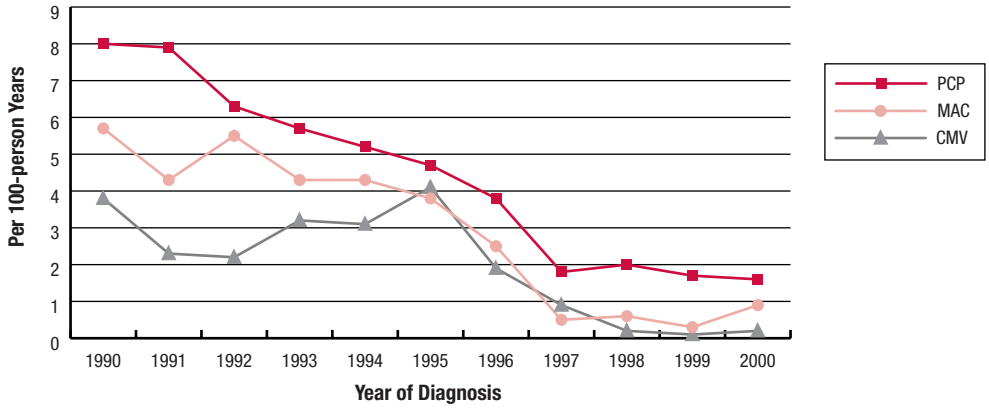
■ **TABLE 9: HIV Incidence Estimates by Test-Retest and Prior Test Recall, Denver Public Health Counseling and Testing Site, 1994–2000**

	Test Retest		Prior Test Recall	
	# Sero-conversions	# Infected per 100 Persons at CTS Each Year	# Sero-conversions	# Infected per 100 Persons at CTS Each Year
Total	19	0.54	134	0.54
Gender				
Male	18	0.79	124	0.86
Female	1	0.08	10	0.10
Race/Ethnicity				
White	12	0.48	75	0.49
Black	2	0.66	17	0.95
Hispanic	4	0.75	18	0.63
Risk Group				
MSM	16	1.37	114	2.38
IDU	2	0.40	5	0.15
Heterosexual	1	0.05	15	0.09
Age Category				
<20	0	0.00	1	0.11
20–29	8	0.74	54	0.68
30–39	9	0.74	47	0.54
40+	2	0.19	32	0.44

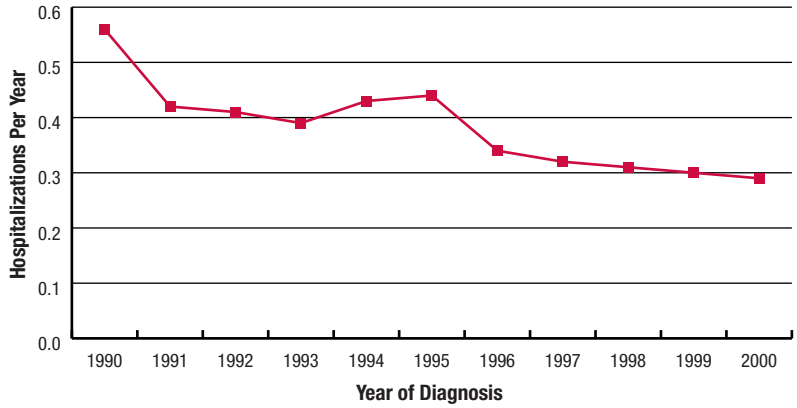
Trends in Opportunistic Infections and Health Care Utilization Among Persons with HIV Infection in Care

Through the Adult Spectrum of Disease (ASD) project, DPH has been tracking the incidence of HIV-related morbidity and mortality among persons accessing the Denver Health system for HIV/AIDS care since 1990. **Figure 64** shows incidence trends for three common HIV-related opportunistic infections (OIs) as well as trends of hospitalizations (**Figure 65**) as a measure of health care utilization among persons with HIV/AIDS.

■ **Figure 64: Incidence of Selected Opportunistic Infections in AIDS Patients, Denver Health, 1990–2000**



■ **Figure 65: Hospitalizations in HIV/ AIDS Patients, Denver Health, 1990–2000**



Since 1990, there has been about a fourfold decline in the incidence of Pneumocystis carinii (PCP) pneumonia, disseminated Mycobacterium avium complex (MAC) disease, and cytomegalovirus (CMV) infection. There are similar data showing significant decreases in nearly all the other opportunistic diseases associated with AIDS during this time period (data not shown). At the same time the number of hospitalizations per person receiving care at Denver Health, declined from 0.42 in 1990 to 0.29 in 2000. While the downward trends for the three OIs were particularly striking since the availability of highly active anti-retroviral therapy (HAART) in 1996, the figure also indicates that the downsloping trends already started in the early part of the 1990s, especially for PCP and MAC. This is also true for the trend in hospitalizations, suggesting that improvements in patient management and treatment/prophylaxis of OIs had resulted in moderate decreases in HIV-related morbidity prior to the HAART era. As HAART became implemented it was asked whether the use of these expensive medications was cost effective. Accurate trend data, such as these from ASD, were used to demonstrate legislators and funders that HAART was effective in decreasing illness and preventing expensive hospitalizations.

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