# HIV/AIDS Integrated Epidemic Profile

Office of HIV, STD and Hepatitis C Services
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## EXECUTIVE SUMMARY

As of September 1, 2010, prevalence data indicated 14,142 people reported living with HIV/AIDS in Arizona. AIDS prevalence was 6,647, while HIV prevalence was 7,495. Overall, males accounted for 85% of HIV cases and 88% of AIDS cases, while persons aged 20 to 44 years accounted for 53% and 43% of HIV and AIDS, respectively. Men who have sex with men (MSM) continues to be the predominant reported transmission risk in Arizona. The impact of HIV disease is felt most disproportionately among African Americans in Arizona. African Americans comprise 4.4% of the total population in 2009, yet represent 12% of HIV prevalence and 11% of AIDS prevalence.

Maricopa County (Phoenix) and Pima County (Tucson) account for 75% of the state population. Most HIV/AIDS services are located in Maricopa, Pima, Coconino, and Yavapai counties, which mirror the epidemic. The rural counties have minimal services available.

**Current Arizona Data** (2010):

**Cumulative counts:**

Since 1981, the initial year HIV/AIDS cases appeared in Arizona, there have been 18,920 HIV infections among Arizona residents reported to ADHS.

Of these:

- 12,465 (65.9%) were initially reported as HIV, and 6,455 (34.1%) were initially reported as AIDS.
- 5,739 HIV cases were re-diagnosed with AIDS in Arizona, representing non-emergent AIDS diagnoses.
- As much as 7% of Arizona's reports of HIV disease may be attributed to current patterns of migration.

**Mortality:**

The annual number of deaths among persons with AIDS in the state declined in 1996, which is attributable to the introduction of multi-drug treatment. Over the past 10 years (1999-2009),

ADHS was notified on average of 187 annual deaths (any cause) among AIDS cases and 30 deaths among HIV cases (any cause).

**Prevalence and Incidence (2010):**

Arizona currently has 14,142 persons known to be living with HIV or AIDS. Among persons now living with HIV infection, 7,336 have a diagnosis of AIDS and 6,810 have a diagnosis of HIV. Arizona's HIV prevalence rate is 217.6 per 100,000 persons. Based on current prevalence estimates, 1 of every 459 persons in Arizona has HIV; however, HIV and AIDS in Arizona are disproportionately distributed. The greatest prevalence and incidence rates are observed among persons who engage in high-risk sexual activity, injection drug use, and in urban settings. Maricopa and Pima Counties, Arizona's most urbanized regions, contain 76% of Arizona's population, but account for 85% of current HIV prevalence and 85% of emergent cases in 2008. In the past decade, the annual rate for reported emergent HIV (based on diagnosis date) infection has shown a steady decline from 25.2 per 100,000 in 1990 to a low of 10.8 per 100,000 in 2008.

**Gender Trends:**

Throughout the epidemic in Arizona, the majority of emergent HIV infections have been among males, who comprise 87.7% (16,589/18,920) of all confirmed Arizona emergent HIV infections and 86.2% (12,194/14,142) of estimated prevalence (2009). The proportion of female cases is slowly increasing. For the three-year period from 1985 to 1987, 6.6% of emergent cases of HIV infection were female, while the three-year period from 2002 to 2004, revealed that 12.3% of emergent cases were female, and in the three-year period from 2007 to 2009 the proportion of emergent HIV/AIDS cases female cases increased slightly to 13.3%.

**Race/Ethnicity Trends:**

Trends of emergent HIV infection among all racial ethnic groups in Arizona are reflective of broader Arizona population trends with the clear exception of Non-Hispanic Blacks. The US Census lists Non-Hispanic Blacks as just 4.4% of Arizona's population in 2009, but accounted for 11.7% of emergent HIV infections in 2004-2008. Nationally, Non-Hispanic Blacks are 12.9% of the US population and account for 50% of new HIV infections. This 3 to 4 fold disproportionate impact is not seen among other race/ethnicity groups.

**Risk/Transmission Mode Trends:**

The predominant behavior associated with emergent HIV infection in Arizona continues to be men who have sex with men (MSM) This includes the risk heading of MSM/IDU which is a mode unique to CDC HIV data collection. Since the start of the epidemic the proportion of emergent HIV cases reporting MSM behavior declined steadily, until 1995 when it leveled off at 59%. It remained level through 2000, but then began to rise slightly. From 2005 to 2009, an average of 66.0% of emergent HIV infections had MSM behavior reported. MSM/IDU accounts for approximately 5% of cases over the last five years. Injection drug use (IDU) as a proportion of emergent cases, has remained steady over the last 5 years at approximately 10% of cases each year.

High Risk Heterosexual (HRH) is only considered a likely mode of HIV infection when MSM or IDU is not reported. HRH was associated with emergent HIV infection in around 5% of cases in the early 1990's. In 2003, HRH was associated with 12.6% of emergent HIV infection reports. By the period encompassing 2005 through 2009, HRH averaged 8.6% of newly reported cases.

Beginning in 2006, the success of ADHS and its partners to obtain risk information from interviews and chart reviews began to decline. The primary reasons for this is attributable to reduced funding for and shifting priorities and experienced staff away from Core Surveillance to other activities including HIV Incidence Surveillance, Capacity Building, activities required in the adoption of Electronic Laboratory Reporting, and the work required to processes data sets for the comorbidity analysis and this Integrated Epidemic Profile.

**Comorbidity:**

Patterns of comorbidity among persons now reported with HIV/AIDS demonstrate that significantly elevated risk of HIV infection exists among persons with a history of diagnosis with Hepatitis C, Syphilis or Gonorrhea. Beginning in 2003, there has been an increase of HIV/Syphilis and HIV/Gonorrhea coinfection in men. Approximately 16% of reports of HIV in Arizona have a lifetime history of coinfection with Syphilis or Hepatitis C. Patterns of STD

diagnosis among persons with HIV establish that ongoing high-risk sexual behaviors continue after HIV diagnosis among a significant proportion of persons living with HIV in Arizona.

## INTRODUCTION

The 2010 Arizona Integrated Epidemiologic Profile draws upon many diverse data sources to present a comprehensive picture of the current HIV/AIDS epidemic in Arizona. The profile describes the general population of Arizona, and of those infected with HIV. It reports recent trends in modes of HIV transmission, and examines comorbidity patterns associated with HIV transmission. It describes those currently receiving care and services, and those with unmet treatment needs.

The Profile is intended to inform, support, and advise state programs and advisory/planning groups within the prevention and care and services realms to help meet their performance objectives. It seeks to use data-driven methods that suggest strategies for improvement and support better appropriation of resources in existing HIV/AIDS programs. It is hoped that the profile will draw attention to both the reality and the subtleties of the HIV/AIDS epidemic in Arizona. The profile seeks to answer five essential questions:

1. What are the socio-demographic characteristics of the general population, and the HIV/AIDS population of Arizona?
2. What is the scope of the HIV/AIDS epidemic in Arizona?
3. What are the indicators of HIV/AIDS infection risk in Arizona?
4. What are the number and characteristics of individuals who know they are HIV positive but who are not in care?
5. What are the HIV service utilization patterns of individuals in Arizona?

The Profile is arranged in the order of the questions listed above, with each question representing a section of the Profile.

**Core Epidemiological Questions:**

The general population of Arizona is described in detail, including the distribution of HIV disease and a closer look at those known to be HIV infected. This section addresses the following questions:

1. What are the socio-demographic characteristics of the general population, and the HIV/AIDS population of Arizona?
2. What is the scope of the HIV/AIDS epidemic in Arizona?
3. What are the indicators of HIV/AIDS infection risk in Arizona?

**Ryan White HIV/AIDS CARE Act Impact:**

Those receiving care and services in Arizona under the federal Ryan White HIV/AIDS CARE Act are described, including utilization patterns and those who do not receive treatment after diagnosis. This section attempts to answer the remaining two questions:

4. What are the number and characteristics of individuals who know they are HIV-positive, but who are not in care?
5. What are the HIV/AIDS service utilization patterns of individuals in Arizona?

The Profile's form and content are largely in response to guidelines and initiatives by the Centers for Disease Control and Prevention (CDC) and the Health Resources and Services Administration (HRSA) toward capacity building, and integration/coordination of services. In 2005, the first Integrated Epidemiological Profile concerning HIV/AIDS was conducted in Arizona.

**Profile Strengths and Limitations:**

The profile is the result of an initiative to build epidemiological capacity in Arizona, and to make that expanded capacity readily available to all HIV/AIDS programs and groups in the state. This profile is not the first result of that initiative. The state's annual reports include county-specific

reporting, and standardized rates. Those reports are available at AZDHS.gov. County-specific reporting and standardized rates have also been employed in this Profile.
Effort has been made to find new ways to present epidemiological data that more closely conform to the classic public health indicators of prevalence and incidence. In addition, new methods of comparison of non-HIV data sources with the electronic HIV/AIDS Reporting System (eHARS) data has allowed direct measures of risk behavior among the prevalent HIV/AIDS population to be studied, rather than using proxy indicators.

**Behavioral Definitions and Data:**

Since HIV infection is associated with high-risk behaviors, behavioral analysis can offer valuable insight for prevention. However, analysis of the HIV/AIDS epidemic using behavioral rather than demographic definitions must resolve two fundamental problems. The first problem is that, unlike demographic data, behavioral data have no recognized population data source. Numerous studies have attempted to estimate population size of behavioral risk groups related to HIV/AIDS, but none are universally acknowledged as a reliable standard, and none offer current data estimates. The second problem is, unlike demographic data categories, behavioral data categories are not statistically independent. For example, one person may not be both age 20-29 and age 30-39 simultaneously, but they may be both an injection drug user and a participant in high-risk sexual activity. As a result of the possibility of such statistical confounding, changes in one behavioral category may, and often do influence other behavioral category outcomes. Some of this may be resolved by how behavioral categories are defined, but there is no simple solution to this problem with behavioral data.

It is also important to understand that there is a difference between behavioral definitions, and self-identification definitions. Not every man who participates in sexual contact with other men will identify himself as gay or homosexual. For this reason, it is important not to equate the behavioral definitions used in this behavioral analysis with other social, political, or self-identification issues. The CDC has established several categories of behavioral risk in HIV/AIDS surveillance data. The principal categories include Men having Sex with Men (MSM), Injection Drug User (IDU), Men having Sex with Men who also report Injection Drug Use (MSM/IDU), and High-Risk Heterosexuals (HRH). In scenarios where persons report

multiple risk behaviors, the CDC uses a priority system to assign a mode of transmission to each report of HIV infection. For instance, an HIV infected person who reports MSM and Heterosexual behaviors will be assigned to the MSM mode of transmission, but a person reporting MSM and IDU behaviors will be assigned to the MSM/IDU mode of transmission. Only a person reporting heterosexual behavior with no other risk behaviors will be assigned to the heterosexual mode of transmission. Thus, even the existing behavior categories have potential confounding.

Given these limitations, the ADHS Office of HIV/AIDS has made some effort within this profile to portray behavioral data according to a simpler definition of behaviors. In some instances, MSM and IDU behaviors will include all cases reporting that behavior, including those that report both. We may also wish to report data by specific risk behaviors without consideration of other risk behaviors. This approach does not resolve the problem with heterosexual behaviors that may exist with other behaviors such as MSM or IDU. The definition of HRH in this profile refers to persons who report no other risk behaviors, but who have had heterosexual contact with persons known or suspected to be infected with HIV and/or persons who are known to have other high-risk behaviors or events (MSM, IDU or medical/surgical/occupational exposure to blood or blood/tissue products).

**Emergence and Incidence:**

*Emergence* as an epidemiological event is an important concept within the HIV/AIDS realm. In the past, diagnostic counts for both HIV (non-AIDS) and AIDS have been reported as a method of estimating incidence. However, many persons will receive HIV diagnosis years before an AIDS diagnosis, and would therefore be counted twice in an incidence estimate based entirely on diagnostic event. The natural inclination to derive an incidence count is to sum the number of HIV and AIDS diagnostic events within a time period, but doing so will skew the tally toward AIDS because of the double-counting issue. This problem may be resolved by defining an emergent diagnosis for each person, which can only occur once in the disease history of persons reported with HIV infection or AIDS. The emergent diagnosis would be the earliest report of HIV infection for each person. Those first diagnosed as HIV (non-AIDS) would be emergent HIV cases, and those first diagnosed as AIDS would be emergent AIDS. Incidence estimates

derived from diagnostic reports would only count emergent cases. Non-emergent diagnostic events are not newly reported cases of HIV infection, but a progression in diagnostic status of previously reported cases. Incidence estimates reported in this profile count only emergent cases.

Using emergence as the basis for incidence has the same limitations as using counts of diagnostic events of both HIV and AIDS because neither really measures incidence. The classic definition of incidence is the number of new *infections*, not the number of reports. For this reason it should be clearly understood that emergence is not considered to be incidence, only a more precise *estimator* of incidence than diagnostic counts alone. Emergence has advantages beyond resolving the double-counting problem. Because emergent AIDS cases are first discovered only when they develop an AIDS-defining illness, there has been no influence by anti-retroviral therapy to slow the progression of disease in emergent AIDS cases. The emergent AIDS group may be used to estimate the distribution of age at infection.

**Risk Group Population Estimates:**

Ample sources are available to estimate population by geographic region, or demographic characteristic (age, race, sex, or ethnicity); therefore, generating standardized rates of incidence and prevalence from HIV/AIDS reports is possible on a geographic or demographic basis. However producing standardized rates by risk behavior is not possible if no population estimates exist for behavioral groups. When developing HIV/AIDS prevention strategies and priorities, this deficiency means that policy must to some extent rely upon speculation.

**Cross-matching Studies:**

Epidemiologists in HIV/AIDS, Sexually Transmitted Disease (STD), Hepatitis C, Hepatitis B, Tuberculosis and Coccidioidomycosis sections of ADHS collaborated to identify persons who have multiple disease comorbidities. Probabilistic cross-match studies were conducted between eHARS and reports of STDs, Hepatitis C, Hepatitis B, Tuberculosis and Coccidioidomycosis that permitted comorbidity patterns to be compiled for persons with a history of HIV infection. Patterns observed both prior to and after HIV diagnosis provide valuable information for prevention and ongoing care. This same method was also used to complete the Unmet Needs

Framework for Ryan White CARE Act programs in the state, which evaluated whether persons reported living in Arizona with HIV/AIDS were receiving a minimal standard of care. Inconsistencies in basic data format and completeness among different databases, as well as error inherent in the cross-matching process, posed obstacles to assembling a comprehensive picture of co-morbidity and care among persons with HIV infection. However, these studies can still provide useful information for developing effective prevention and care strategies.

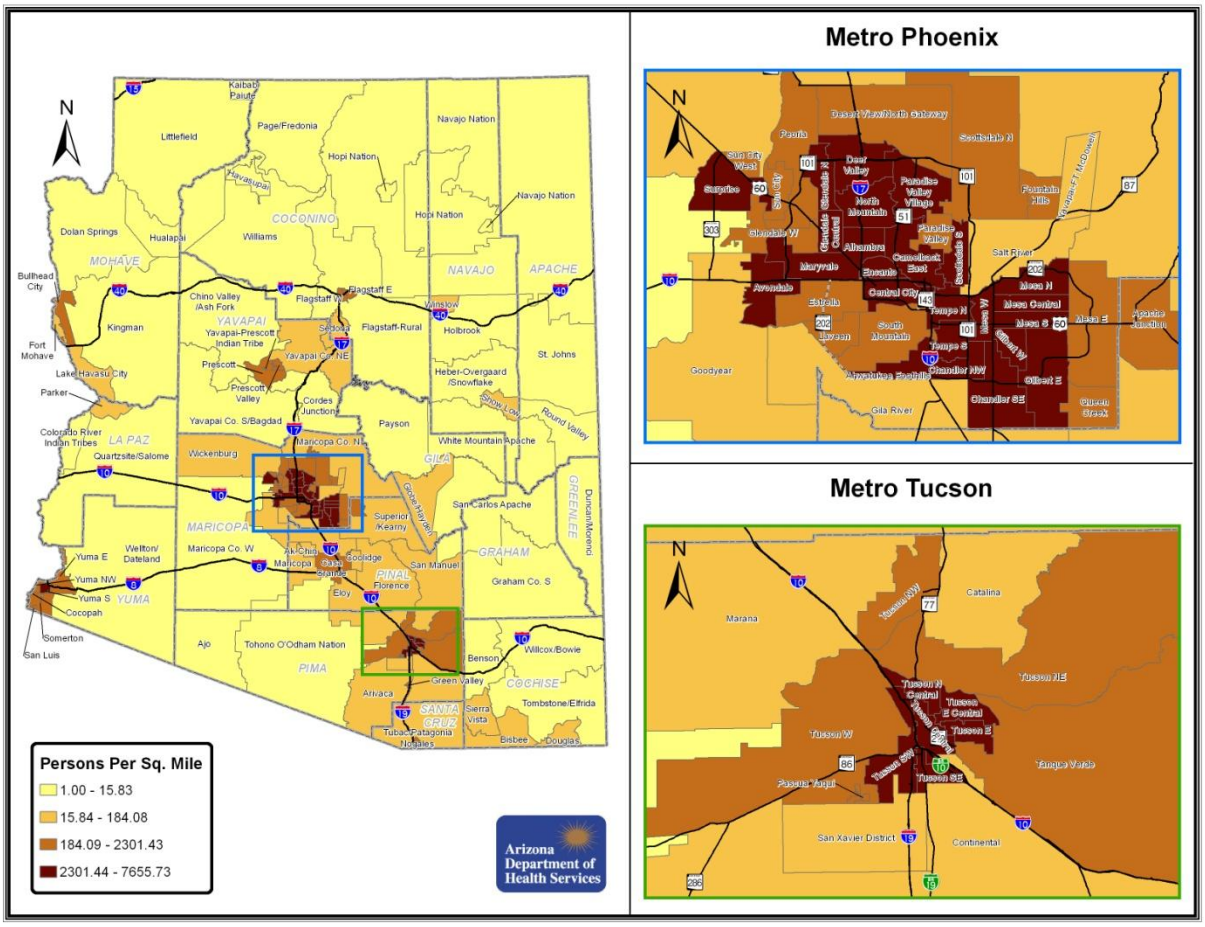
## ARIZONA DEMOGRAPHICS

Arizona is 113,909 square miles in area, has 15 counties and 22 Native American sovereign nations. According to the U.S. Census in 2009, the estimated Arizona population was 6,595,778. In 2008, U.S Census figures indicate that males accounted for 50.9% of the state's population while females represented 49.1% of the population. For this same census year, Whites represented 57.3 % of the state population, Hispanics 30.8%, African Americans 4.4%, American Indian/Alaskan Natives accounted for 4.9%, and Asian/Native Hawaiian/Pacific Islanders were 2.6% of the state's populace (2008 US Census Estimate).

Each Native American sovereign nation represents an Arizona tribe. Tribal lands span the state and even beyond state borders, with the Navajo Reservation crossing into New Mexico and Colorado, and the T'ohono O'Odham Reservation extending into Mexico. Approximately 18% of tribal members reside on tribal lands while 82% reside in urban settings. Some counties have high proportions of American Indians among their population. Seventy-seven percent of Apache County, 48% of Navajo County, and 29 % of Coconino County residents are American Indians.

According to the Arizona Department of Commerce, Arizona's population increased 30% from 2000 to 2009. The city of Phoenix, with a population of 1.6 million, recently moved ahead of Philadelphia as the 5$^{th}$-most populous city in the nation (Phoenix was ranked 10$^{th}$ in 1990). Map 1 is a population density map for the state. Arizona's population is younger than the national average. Arizona's median age is 34.2 years versus 35.3 years, nationally, while the proportion of those under 25 and those over 65 is roughly equivalent to the national average.

**Map 1:** Arizona Population Density Map, 2010




Arizona's per-capita income peaked at $34,365 in 2007, but dropped to $32,935 in 2009. For specific economic statistics, please reference the State Master website which compiles data from various federal government agencies.

As of November 2010, of Arizona's 6.5 million residents, more than 1.3 million are enrolled in the state's version of Medicaid, AHCCCS (Arizona Health Care Cost Containment System). Refer to AHCCCS Population Statistics for more specific information.

## SCOPE OF THE HIV/AIDS EPIDEMIC IN ARIZONA

This report attempts to paint the picture of the scope of the HIV/AIDS epidemic in the state of Arizona using data pertaining to the prevalence and emergence of HIV/AIDS cases. Prevalence data exclusively provides information on cases that are alive at the end of December 2008. Emergent data reflects statistics related to cases diagnosed between 2004 and 2008.

Since the advent of HIV/AIDS in the United States and in the state of Arizona, men have been disproportionately affected by the epidemic. According to the CDC, in 2006, men constituted 75% of persons living with HIV in the United States. Table 1 illustrates the year by year gender-specific emergent HIV/AIDS statistics. The rate of new HIV/AIDS cases were consistently fivefold or higher for men compared to women. Every year from 2004 through 2008, men represented over 80% of newly reported HIV/AIDS cases in the state. Although, during this period the rate of emergent HIV/AIDS amongst men decreased, the proportion of prevalent male cases in the state increased every year with the highest proportion reported in 2008 (88%). At the national level, from 2005 to 2008, males had an HIV diagnosis rate that was approximately 3 times greater than that of females (CDC).

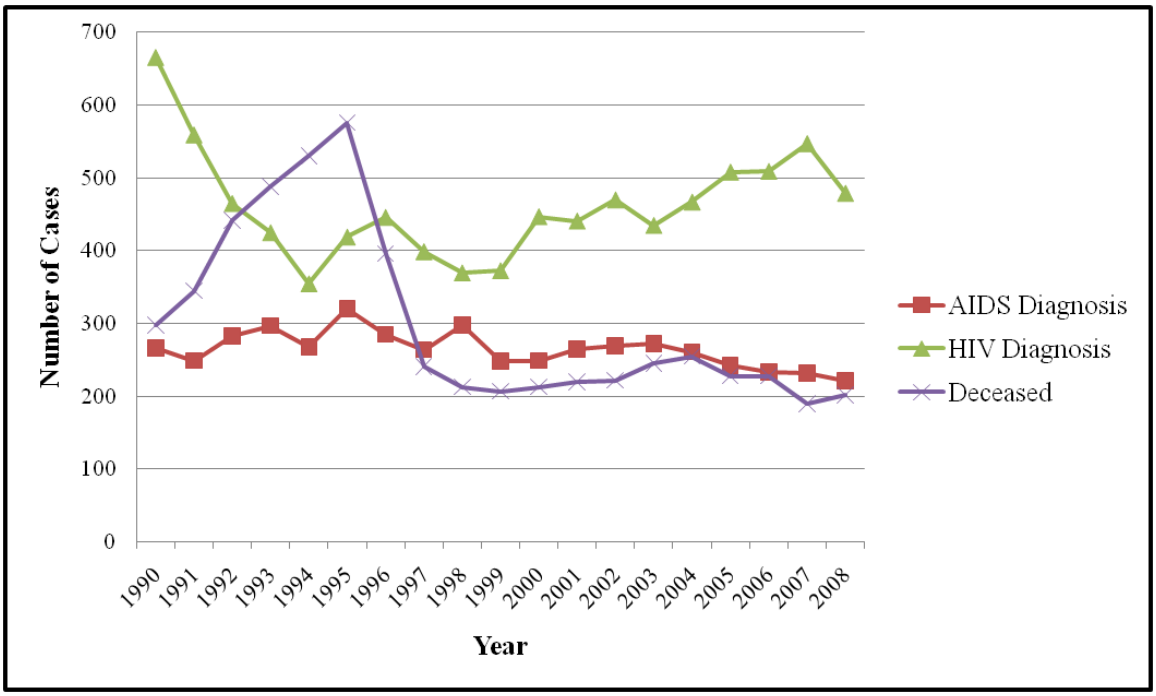
**Table 1:** Gender-Specific Proportions and Rates of Emergent HIV/AIDS, Arizona, 2004-2008

| | 2004 | | | 2005 | | | 2006 | | | 2007 | | | 2008 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Cases** | **% State Total** | **Rate Per 100,000** | **Cases** | **% State Total** | **Rate Per 100,000** | **Cases** | **% State Total** | **Rate Per 100,000** | **Cases** | **% State Total** | **Rate Per 100,000** | **Cases** | **% State Total** | **Rate Per 100,000** |
| **Male** | 607 | 83.40% | 21.13 | 639 | 85.20% | 21.47 | 636 | 85.70% | 20.61 | 666 | 85.50% | 20.99 | 616 | 88% | 18.91 |
| **Female** | 121 | 16.60% | 4.21 | 111 | 14.80% | 3.73 | 106 | 14.30% | 3.44 | 113 | 14.50% | 3.57 | 84 | 12% | 2.59 |
| **Total** | 728 | 100% | 12.67 | 750 | 100% | 12.6 | 742 | 100% | 12.03 | 779 | 100% | 12.29 | 700 | 100% | 10.77 |

As illustrated in Figure 1, the number of annual HIV diagnoses was at its lowest in 1994 (335 cases). In 2008, there were 479 newly diagnosed and reported HIV cases and the number of reported AIDS diagnoses was at its all time lowest (221 cases), since the onset of the epidemic. The advent of effective highly active antiretroviral therapy (HAART) drugs has contributed to the lengthening of the latency period between HIV infection and subsequent progression to AIDS, hence, permitting persons living with HIV to have a longer life expectancy (CDC). The latter also explains the rapid decline in HIV/AIDS related deaths in the mid to late 1990's. Since

then, as shown in Figure 1, mortality among persons with HIV/AIDS has remained level around 200 deaths per year.

**Figure 1:** Frequency of HIV diagnosis, AIDS Diagnosis and HIV/AIDS Related Deaths, Arizona, 1990-2008




The 2008 Arizona population estimates showed that males and females were evenly distributed in the overall population. Table 2 depicts the gender-specific distribution of prevalent HIV/AIDS cases and emergent cases in Arizona. As expected, and in accordance with previous years, HIV/AIDS statistics are not representative of the gender distribution of the overall state population. The rate of prevalent male HIV/AIDS cases (374.61 per 100,000) is over six times greater than that of female cases (59.87 per 100,000). A similar pattern is also observed for the gender-specific rates of emergent cases between 2004 and 2008, with males having a rate of 20.59 per 100,000 in comparison to 3.49 per 100,000 for females.

**Table 2:** Gender-Specific Prevalent HIV/AIDS, Emergent HIV/AIDS and State Population, Arizona

| | 2008 HIV/AIDS Prevalence | | | Emergent HIV/AIDS 2004-2008 | | | 2008 Population Estimates | |
|---|---|---|---|---|---|---|---|---|
| **Sex** | **Cases** | **% State Total** | **Rate Per 100,000** | **Cases** | **% State Total** | **Rate Per 100,000** | **Population** | **% State Total** |
| **Male** | 12,200 | 86.30% | 374.61 | 3,164 | 85.50% | 20.59 | 3,256,691 | 50.00% |
| **Female** | 1,942 | 13.70% | 59.87 | 535 | 14.50% | 3.49 | 3,243,489 | 50.00% |
| **TOTAL** | 14,142 | 100.00% | 217.56 | 3,699 | 100.00% | 12.05 | 6,500,180 | 100.00% |

Source: Arizona HARS 5/1/05; NCHS 2004--2008 Bridged-Race Intercensal Estimates.

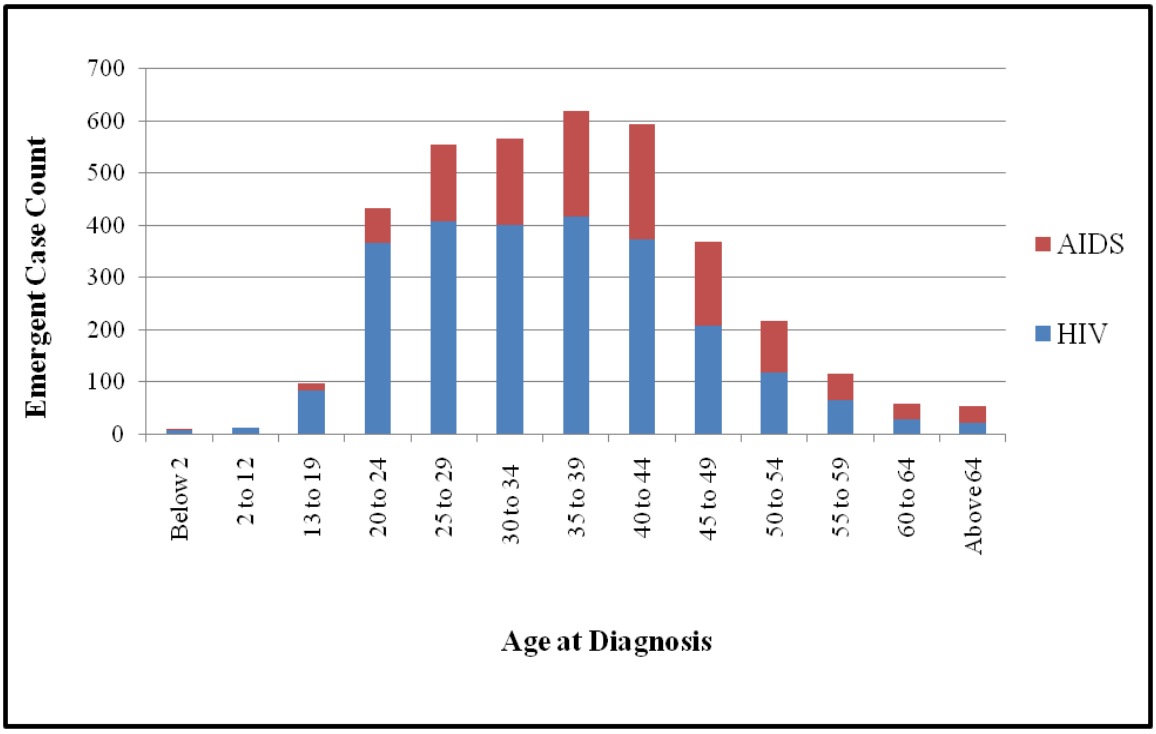
Table 3 presents age-specific HIV/AIDS statistics for prevalent and emergent cases for the state of Arizona. Almost 40% of prevalent HIV/AIDS cases are between the ages of 40 and 49, with 45-49 year olds being especially impacted (21.8%). Per CDC reports, persons currently living with HIV in Arizona appear to be older than HIV infected persons in the United States (2006). At the national level, the highest age-specific new HIV diagnosis rates were reported among 35-39 year olds in 2005-2006 and among 40-44 year olds in 2007-2008 (CDC ). In Arizona, emergent cases of HIV/AIDS reported between 2004-2008 were slightly younger; 32.7% of newly reported cases were between the ages of 35 and 44.

**Table 3:** Age-Specific Prevalent HIV/AIDS, Emergent HIV/AIDS, and State Population, Arizona, 2008

| | Current HIV/AIDS Prevalence | | | Emergent HIV/AIDS 2004-2008 | | | 2008 Population Estimates | |
|---|---|---|---|---|---|---|---|---|
| **Age** | **Cases** | **% State Total** | **Rate Per 100,000** | **Cases** | **% State Total** | **Rate Per 100,000** | **Population** | **% State Total** |
| **0-1** | 0 | 0.00% | 0 | 9 | 0.20% | 0.91 | 212,797 | 3.27% |
| **2-12** | 39 | 0.30% | 3.74 | 12 | 0.30% | 0.24 | 1,041,667 | 16.03% |
| **13-19** | 66 | 0.50% | 10.59 | 97 | 2.60% | 3.25 | 623,413 | 9.59% |
| **20-24** | 318 | 2.20% | 73.73 | 434 | 11.70% | 20.53 | 431,287 | 6.64% |
| **25-29** | 741 | 5.20% | 151.72 | 555 | 15.00% | 24.24 | 488,408 | 7.51% |
| **30-34** | 1152 | 8.10% | 258.91 | 566 | 15.30% | 26.48 | 444,946 | 6.85% |
| **35-39** | 1625 | 11.50% | 365.72 | 619 | 16.70% | 29.46 | 444,326 | 6.84% |
| **40-44** | 2466 | 17.40% | 577.41 | 593 | 16.00% | 27.89 | 427,082 | 6.57% |
| **45-49** | 3089 | 21.80% | 702.18 | 369 | 10.00% | 17.68 | 439,914 | 6.77% |
| **50-54** | 2144 | 15.20% | 528.14 | 217 | 5.90% | 11.55 | 405,952 | 6.25% |
| **55-59** | 1306 | 9.20% | 358.9 | 116 | 3.10% | 6.8 | 363,885 | 5.60% |
| **60-64** | 661 | 4.70% | 210.56 | 58 | 1.60% | 4.15 | 313,930 | 4.83% |
| **65 and Older** | 516 | 3.60% | 59.82 | 54 | 1.50% | 1.36 | 862,573 | 13.27% |
| **Unknown** | 19 | 0.10% | NA | 0 | 0.00% | N/A | 0 | 0 |
| **TOTAL** | 14,142 | 100.00% | 217.56 | 3699 | 100.00% | 12.05 | 6,500,180 | 100.00% |

Source: Arizona HARS 5/1/05; NCHS 2004-2008 Bridged-Race Intercensal Estimates.

**Figure 2:** Arizona Emergent HIV and AIDS Cases by Age Group at Diagnosis, 2004-2008




Across all age groups in Arizona, the burden of the epidemic is observed most amongst men. Overall, the highest prevalence of HIV/AIDS is reported in men aged 45-49 (19.3%) and men aged 40-44 (15.2%). Among women, the majority of the prevalent HIV/AIDS cases are between the ages of 45-49 years of age (2.60%) and 40-44 years of age (2.30%). Between 2004 and 2008, the age ranges with the highest number of new male and female HIV/AIDS cases reported were younger than the prevalent cases, 35-39 years of age for males (16.94% of emergent male cases) and 30-34 years of age for females (16.07% of emergent female cases).

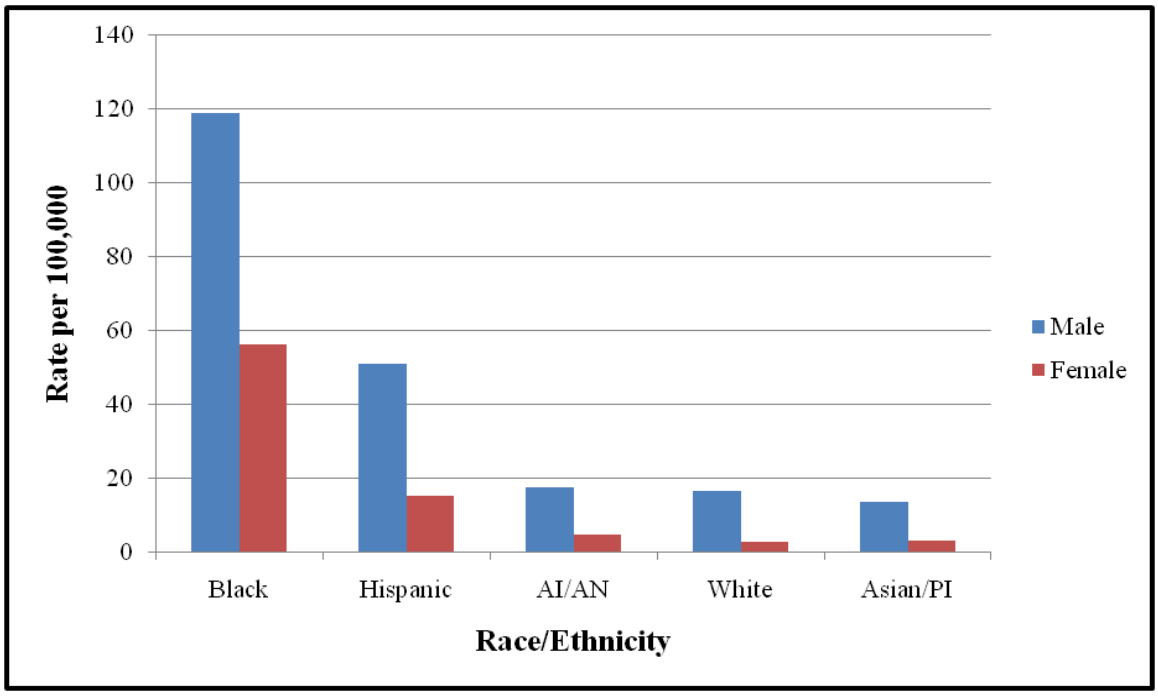
**Table 4:** Arizona Prevalent HIV/AIDS, Emergent HIV/AIDS, and State Population by Age Group and Sex

| | Current HIV/AIDS Prevalence | | | | | | Emergent HIV/AIDS 2004-2008 | | | | | | 2008 Population Estimates | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Age** | **Male Cases** | **% State Total** | **Rate Per 100,000** | **Female Cases** | **% State Total** | **Rate Per 100,000** | **Male Cases** | **% State Total** | **Rate Per 100,000** | **Female Cases** | **% State Total** | **Rate Per 100,000** | **Population** | **% State Total** |
| **0-1** | 0 | 0.00% | 0 | 0 | 0.00% | 0 | 4 | 0.10% | 0.79 | 5 | 0.10% | 1.03 | 212,797 | 3.27% |
| **2-12** | 18 | 0.10% | 3.38 | 21 | 0.10% | 4.12 | 4 | 0.10% | 0.16 | 8 | 0.20% | 0.33 | 1,041,667 | 16.03% |
| **13-19** | 36 | 0.30% | 11.19 | 30 | 0.20% | 9.94 | 73 | 2.00% | 4.74 | 24 | 0.60% | 1.66 | 623,413 | 9.59% |
| **20-24** | 260 | 1.80% | 114.06 | 58 | 0.40% | 28.52 | 370 | 10.00% | 33.04 | 64 | 1.70% | 6.43 | 431,287 | 6.64% |
| **25-29** | 631 | 4.50% | 245.33 | 110 | 0.80% | 47.58 | 487 | 13.20% | 40.52 | 68 | 1.80% | 6.25 | 488,408 | 7.51% |
| **30-34** | 959 | 6.80% | 412.52 | 193 | 1.40% | 90.84 | 480 | 13.00% | 43.13 | 86 | 2.30% | 8.39 | 444,946 | 6.85% |
| **35-39** | 1348 | 9.50% | 586.54 | 277 | 2.00% | 129.14 | 536 | 14.50% | 49.46 | 83 | 2.20% | 8.16 | 444,326 | 6.84% |
| **40-44** | 2143 | 15.20% | 983.48 | 323 | 2.30% | 154.41 | 531 | 14.40% | 49.34 | 62 | 1.70% | 5.9 | 427,082 | 6.57% |
| **45-49** | 2724 | 19.30% | 1243.9 | 365 | 2.60% | 165.21 | 311 | 8.40% | 30.03 | 58 | 1.60% | 5.52 | 439,914 | 6.77% |
| **50-54** | 1900 | 13.40% | 958.03 | 244 | 1.70% | 117.52 | 185 | 5.00% | 20.25 | 32 | 0.90% | 3.31 | 405,952 | 6.25% |
| **55-59** | 1149 | 8.10% | 658.44 | 157 | 1.10% | 82.9 | 91 | 2.50% | 11.1 | 25 | 0.70% | 2.82 | 363,885 | 5.60% |
| **60-64** | 583 | 4.10% | 389.64 | 78 | 0.60% | 47.47 | 47 | 1.30% | 7.09 | 11 | 0.30% | 1.5 | 313,930 | 4.83% |
| **65 and Older** | 436 | 3.10% | 112.51 | 80 | 0.60% | 16.84 | 45 | 1.20% | 2.53 | 9 | 0.20% | 0.41 | 862,573 | 13.27% |
| **Unknown** | 13 | 0.10% | N/A | 6 | 0.00% | NA | 0 | 0.00% | N/A | 0 | 0.00% | NA | 0 | 0 |
| **TOTAL** | 12,200 | 63.80% | 416.71 | 1,942 | 13.70% | 64.93 | 3,164 | 85.50% | 24.65 | 535 | 14.50% | 4.06 | 6,500,180 | 100.00% |

HIV infection disparities between race/ethnic groups continue to persist throughout the United States and Arizona. Figures 3 and 4 compare the national and Arizona rate for racial groups by sex. In the United States, although African Americans constituted about 12% of the total American population, 46% of persons living with HIV were Black (CDC 2006). As shown in Table 5, the rate of prevalent HIV/AIDS for African Americans is 3 times higher than the rate of their White counterparts (638.43 per 100,000 vs. 211.99 per 100,000). Cases reported between 2004 and 2008 experience comparable disparities with African Americans having a rate that is 4

times greater than White cases (38.54 per 100,000 vs. 9.48 per 100,000). African American men and women appear to be disproportionately impacted by the HIV/AIDS epidemic in Arizona as well, with respective AZ prevalence rates of 866.99 per 100,000 and 392.21 per 100,000 (Table 6). Though not as high as rates for Black men, White (386.73 per 100,000) and Hispanic (302.29 per 100,000) men also have noteworthy prevalence rates of HIV/AIDS. Native American women had the second highest prevalence rate for women; although the rate was almost 7 times lower than that of African American women (392.21 per 100,000 vs. 57.55 per 100,000). Similar patterns are also observed for emergent cases between 2004 and 2008.

**Figure 3:** Adults and Adolescents Specific Rates of Estimated HIV/AIDS Cases, United States, 2006




Data from 33 states with confidential name-based HIV infection reporting since at least 1999. Data have been adjusted for reporting delays.

**Figure 4:** Adults and Adolescents Specific Rates of Emergent HIV/AIDS Cases, Arizona, 2004-2008

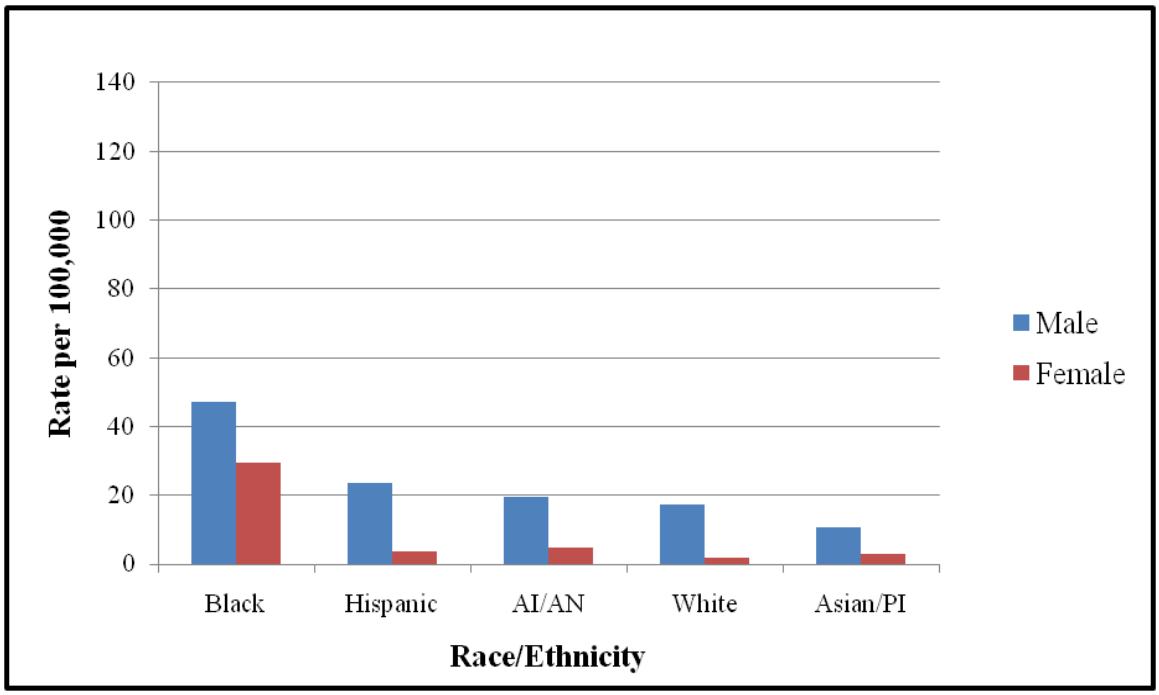



**Table 5:** Race/Ethnicity-Specific Prevalent HIV/AIDS, Emergent HIV/AIDS, and State Population, Arizona, 2008

| | Current HIV/AIDS Prevalence | | | Emergent HIV/AIDS 2004-2008 | | | 2008 Population Estimates | |
|---|---|---|---|---|---|---|---|---|
| **RACE/ETHNICITY** | **Cases** | **% Total** | **Rate Per 100,000** | **Cases** | **% Total** | **Rate Per 100,000** | **Population** | **% State Total** |
| **White non-Hispanic** | 8,146 | 57.60% | 211.99 | 1,760 | 47.6 | 9.48 | 3,842,673 | 59.10% |
| **Black non-Hispanic** | 1,596 | 11.30% | 638.43 | 431 | 11.7 | 38.54 | 249,988 | 3.80% |
| **Hispanic** | 3,561 | 25.20% | 182.09 | 1252 | 33.8 | 14.05 | 1,955,630 | 30.10% |
| **A/PI/H [1] non-Hispanic** | 166 | 1.20% | 96.31 | 51 | 1.4 | 6.58 | 172,364 | 2.70% |
| **AI/AN [2] non-Hispanic** | 445 | 3.10% | 159.2 | 161 | 4.4 | 12.07 | 279,525 | 4.30% |
| **MR/ [3]Other non-Hispanic** | 228 | 1.60% | N/A | 44 | 1.2 | N/A | N/A | N/A |
| **TOTAL** | 14142 | 100.00% | 217.56 | 3699 | 100 | 12.05 | 6,500,180 | 100.00% |

Source: Arizona HARS 9/1/10; NCHS 2004-2008 Bridged-Race Intercensal Estimates.

1. Asian / Pacific Islander / Native Hawaiian
2. American Indian / Alaska Native
3. Multiple Race / Other

Hispanic cases account for 33.8% of newly reported cases between 2004 and 2008 and 25.20% of prevalent HIV/AIDS cases. The rate of emergent Hispanic cases was 1.5 times greater than that of White cases. At the national level, Hispanics are also overwhelmingly affected by HIV/AIDS (CDC ).

The total number of prevalent HIV/AIDS cases has increased slightly each year. This finding is expected reported deaths decreased significantly since the advent of antiretroviral medication in the mid 1990s (see Fig 1). In June 2009, the number of AIDS prevalent cases surpassed the number of HIV cases recorded in Arizona for the first time. Figure 5 illustrates the HIV/AIDS, HIV, and AIDS prevalent case numbers.

**Figure 5:** Number of Prevalent HIV, AIDS and HIV/AIDS Cases, Arizona, 2004-2010

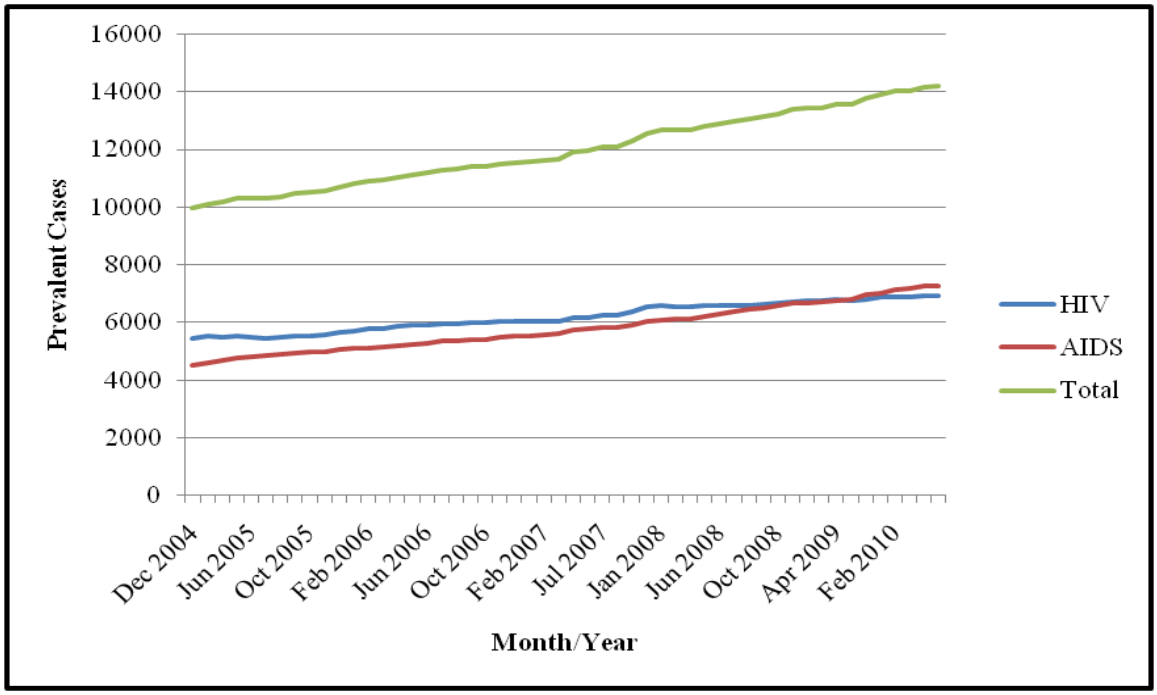


**Table 6:** Race/Ethnicity and Gender-Specific Prevalent HIV/AIDS, Emergent HIV/AIDS, Arizona, 2008

| | Current HIV/AIDS Prevalence | | | | | | Emergent HIV/AIDS 2004-2008 | | | | | | 2008 Population Estimates | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Race/Ethnicity** | **Male Cases** | **% State Total** | **Rate Per 100,000** | **Female Cases** | **% State Total** | **Rate Per 100,000** | **Male Cases** | **% State Total** | **Rate Per 100,000** | **Female Cases** | **% State Total** | **Rate Per 100,000** | **Population** | **% State Total** |
| **White non-Hispanic** | 7329 | 51.80% | 386.73 | 817 | 5.80% | 41.95 | 1599 | 43.20% | 17.48 | 161 | 4.40% | 1.71 | 1,947,567 | 30.00% |
| **Black non-Hispanic** | 1124 | 7.90% | 866.99 | 472 | 3.30% | 392.21 | 273 | 7.40% | 46.99 | 158 | 4.30% | 29.41 | 120,344 | 1.85% |
| **Hispanic** | 3067 | 21.70% | 302.29 | 494 | 3.50% | 52.49 | 1091 | 29.50% | 23.6 | 161 | 4.40% | 3.75 | 941,052 | 14.48% |
| **A/PI/H [1] non-Hispanic** | 136 | 1.00% | 165.71 | 30 | 0.20% | 33.23 | 39 | 1.10% | 10.59 | 12 | 0.30% | 2.95 | 90,293 | 1.40% |
| **AI/AN [2] non-Hispanic** | 362 | 2.60% | 267.71 | 83 | 0.60% | 57.55 | 127 | 3.40% | 19.67 | 34 | 0.90% | 4.94 | 144,233 | 2.22% |
| **MR/ [3]Other non-Hispanic** | 182 | 1.30% | N/A | 46 | 0.30% | N/A | 35 | 0.90% | N/A | 9 | 0.20% | N/A | N/A | N/A |
| **TOTAL** | 12,200 | 86.30% | 374.61 | 1,942 | 13.70% | 59.87 | 3,164 | 85.50% | 20.59 | 535 | 14.50% | 3.49 | 3,243,489 | 50% |

Source: Arizona HARS 9/1/10; NCHS 2004-2008 Bridged-Race Intercensal Estimates.

1. Asian / Pacific Islander / Native Hawaiian
2. American Indian / Alaska Native
3. Multiple Race / Other

More than half of all prevalent cases (60%) and emergent (60.70%) cases are classified as men who have sex with men (MSM). Being an injection drug user (IDU) was the second most common risk factor for prevalent cases (11.10%) and third amongst emergent cases (10.9%). Cases with no risk reported (NRR) represented the second highest group amongst newly reported cases between 2004 and 2008. Figure 5 compares the state of Arizona to the United States.

**Figure 6:** Transmission Category, Estimates of New HIV Infection, United States and Arizona, 2006

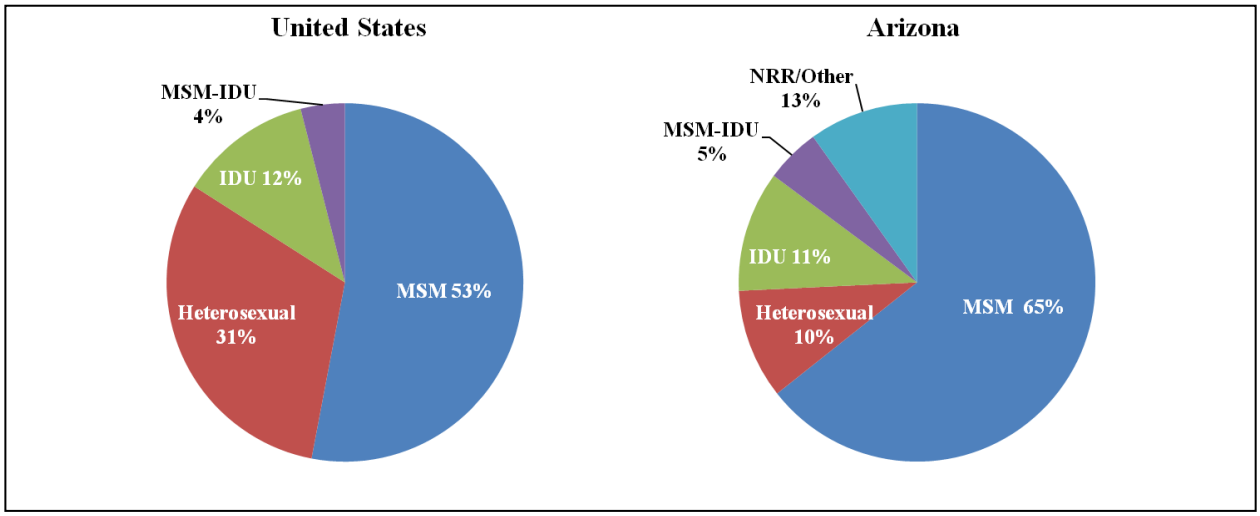



**Table 7:** Prevalent HIV/AIDS, Emergent HIV/AIDS Cases, and State Population, by Mode of Exposure, Arizona, 2008

| | Current HIV/AIDS Prevalence | | Emergent HIV/AIDS 2004-2008 | |
|---|---|---|---|---|
| **Risk Category/ Mode of Transmission** | **Cases** | **% State Total** | **Cases** | **% State Total** |
| **MSM** [1] | 8,491 | 60.00% | 2,247 | 60.70% |
| **IDU** [2] | 1,573 | 11.10% | 402 | 10.90% |
| **MSM/IDU** [3] | 1,206 | 8.50% | 193 | 5.20% |
| **Heterosexual** | 1,397 | 9.90% | 373 | 10.10% |
| **O/H/TF/TPR** [4] | 171 | 1.20% | 25 | 0.70% |
| **No Reported Risk** | 1,304 | 9.30% | 459 | 12.40% |
| **TOTAL** | 14,142 | 100.00% | 3,699 | 100.00% |

Source: Arizona HARS 9/1/10; NCHS 2004-2208 Bridged-Race Intercensal Estimates
1. Men having Sex with Men
2. Injection Drug Use
3. Men having Sex with men and reporting Injection Drug Use
4. Other/Hemophilia/Transfusion and Blood products/Transplant Recipient

Men are disproportionately affected by the HIV/AIDS epidemic. As shown in Table 8, MSM appears to be the most common risk classification for HIV transmission amongst men. Men reporting MSM behavior account for 68.50% of Arizona males living with HIV/AIDS and 65.90% of all emergent infections between 2004 and 2008. The most common risk classification for women was high-risk heterosexual (48.4% of emergent infections in females). Injection drug use (IDU) is the second most common risk factor for HIV transmission for both men and women living with HIV/AIDS.

**Table 8:** Gender-Specific Prevalent HIV/AIDS, Emergent HIV/AIDS Cases by Mode of Exposure, Arizona, 2008

| | Current HIV/AIDS Prevalence | | | | | | Emergent HIV/AIDS 2004-2008 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Risk Category/ Mode of Transmission** | **Male Cases** | **% State Total** | **Rate Per 100,000** | **Female Cases** | **% State Total** | **Rate Per 100,000** | **Male Cases** | **% State Total** | **Rate Per 100,000** | **Female Cases** | **% State Total** | **Rate Per 100,000** |
| **MSM [1]** | 8,491 | 60.00% | N/A | 0 | 0.00% | N/A | 2,247 | 60.70% | N/A | 0 | 0.00% | N/A |
| **IDU [2]** | 1,054 | 7.50% | N/A | 519 | 3.70% | N/A | 290 | 7.80% | N/A | 112 | 3.00% | N/A |
| **MSM/IDU [3]** | 1,206 | 8.50% | N/A | 0 | 0.00% | N/A | 193 | 5.20% | N/A | 0 | 0.00% | N/A |
| **Heterosexual** | 412 | 2.90% | N/A | 985 | 7.00% | N/A | 114 | 3.10% | N/A | 259 | 7.00% | N/A |
| **O/H/TF/TPR [4]** | 103 | 0.70% | N/A | 68 | 0.50% | N/A | 11 | 0.30% | N/A | 14 | 0.40% | N/A |
| **No Reported Risk** | 934 | 6.60% | N/A | 370 | 2.60% | N/A | 309 | 8.40% | N/A | 150 | 4.10% | N/A |
| **TOTAL** | 12,200 | 86.30% | N/A | 1,942 | 13.70% | N/A | 3,164 | 85.50% | N/A | 535 | 14.50% | N/A |

Source: Arizona HARS 9/1/10; NCHS 2004-2208 Bridged-Race Intercensal Estimates

1. Men having Sex with Men
2. Injection Drug Use
3. Men having Sex with men and reporting Injection Drug Use
4. Other/Hemophilia/Transfusion and Blood products/Transplant Recipient

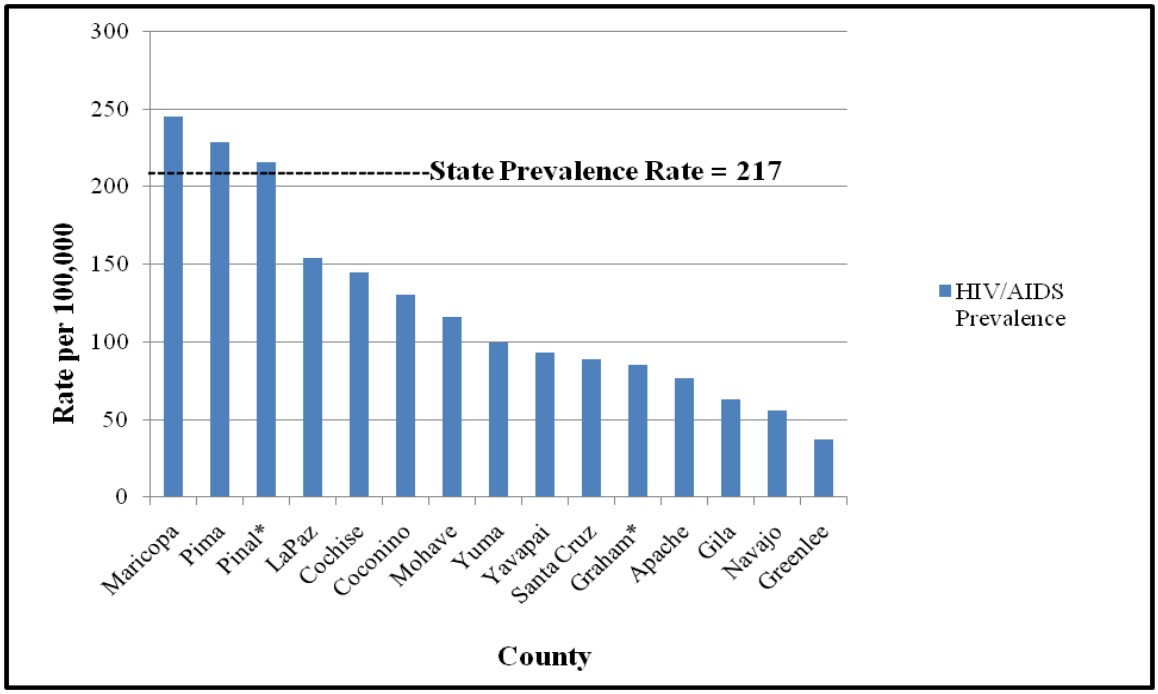
Approximately 80% of Arizona's population is concentrated in the two urban counties. Maricopa County, the most populous county, houses 60.80% of Arizona's population, and Pima County is home to 16% of Arizona's residents. This heterogeneous geographic distribution is also reflected in the geo-spatial distribution of prevalent HIV/AIDS cases. 68.5% of prevalent HIV/AIDS cases reside in Maricopa County while 16.30% are Pima County residents. High rates of prevalent HIV/AIDS are also observed in Pinal County (216.01 per 100,000). Though only 5% of the state population resides in Pinal County, from 2004 to 2008 the rate of emergent HIV/AIDS was higher in Pinal County (17.38 per 100,000) than Maricopa County (14.24 per 100,000) and Pima County (10.12 per 100,00). Such discordance is attributable to a large density of public and private correctional facilities located there.

**Table 9:** County-Specific Prevalent HIV/AIDS, Emergent HIV/AIDS, and State Population, Arizona, 2008

| | Current HIV/AIDS Prevalence | | | Emergent HIV/AIDS 2004-2008 | | | 2008 Population Estimates | | |
|---|---|---|---|---|---|---|---|---|---|
| **COUNTY** | **Cases** | **% Total** | **Rate Per 100,000** | **Cases** | **% Total** | **Rate Per 100,000** | **Population** | **% State Total** | **Population Density (people per sq. mile)** |
| **Apache** | 54 | 0.40% | 76.92 | 16 | 0.40% | 4.62 | 70,207 | 1.10% | 6.3 |
| **Cochise** | 187 | 1.30% | 144.95 | 46 | 1.20% | 7.27 | 129,006 | 2.00% | 20.9 |
| **Coconino** | 168 | 1.20% | 130.68 | 40 | 1.10% | 6.35 | 128,558 | 2.00% | 6.9 |
| **Gila** | 33 | 0.20% | 63.26 | 7 | 0.20% | 2.72 | 52,166 | 0.80% | 10.9 |
| **Graham** | 31 | 0.20% | 85.04 | 11 | 0.30% | 6.47 | 36,452 | 0.60% | 7.9 |
| **Greenlee** | 3 | 0.00% | 37.49 | 0 | 0.00% | 0 | 8,002 | 0.10% | 4.3 |
| **La Paz** | 31 | 0.20% | 154.34 | 4 | 0.10% | 4 | 20,086 | 0.30% | 4.5 |
| **Maricopa** | 9,686 | 68.50% | 244.93 | 2,672 | 72.20% | 14.24 | 3,954,598 | 60.80% | 429.7 |
| **Mohave** | 228 | 1.60% | 116.16 | 49 | 1.30% | 5.18 | 196,281 | 3.00% | 14.7 |
| **Navajo** | 63 | 0.40% | 55.87 | 33 | 0.90% | 6.05 | 112,757 | 1.70% | 11.3 |
| **Pima** | 2,311 | 16.30% | 228.36 | 482 | 13.00% | 10.12 | 1,012,018 | 16.00% | 110.2 |
| **Pinal** | 707 | 5.00% | 216.01 | 235 | 6.40% | 17.38 | 327,301 | 5.00% | 61 |
| **Santa Cruz** | 38 | 0.30% | 88.53 | 6 | 0.20% | 2.87 | 42,923 | 0.70% | 34.7 |
| **Yavapai** | 201 | 1.40% | 93.27 | 43 | 1.20% | 4.21 | 215,503 | 3.30% | 26.5 |
| **Yuma** | 193 | 1.40% | 99.32 | 55 | 1.50% | 5.94 | 194,322 | 3.00% | 35.2 |
| **Unknown** | 208 | 1.50% | N/A | 0 | 0.00% | N/A | N/A | N/A | N/A |
| **TOTAL** | 14,142 | 100.00% | 217.56 | 3,699 | 100.00% | 12.05 | 6,500,180 | 100.00% | 57.2 |

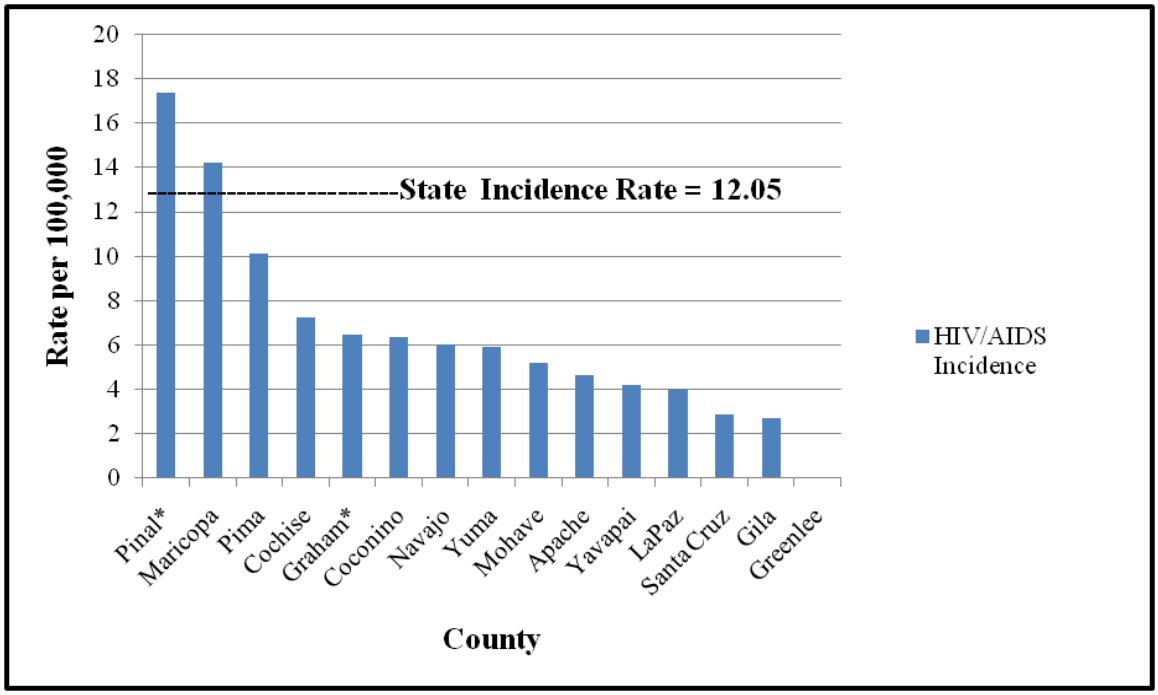
Source: Arizona HARS 9/1/10; U.S. Census Bureau at: http://quickfacts.census.gov/qfd/states/04/04027.html

**Figure 6:** County-Specific Prevalent HIV/AIDS Arizona, 2008




*30-40% of prevalent cases in Pinal and Graham County are among incarcerated persons.

**Figure 8:** County-Specific Emergent HIV/AIDS, Arizona



*30-40% of prevalent cases in Pinal and Graham County are among incarcerated persons.

Among both males and females HIV/AIDS cases, the majority were residents of Maricopa County or Pima County. As seen in Map 2, the highest prevalence rates were residents of Maricopa and Pima Counties.

**Map 2:** HIV/AIDS Prevalent Rate, Arizona, 2010

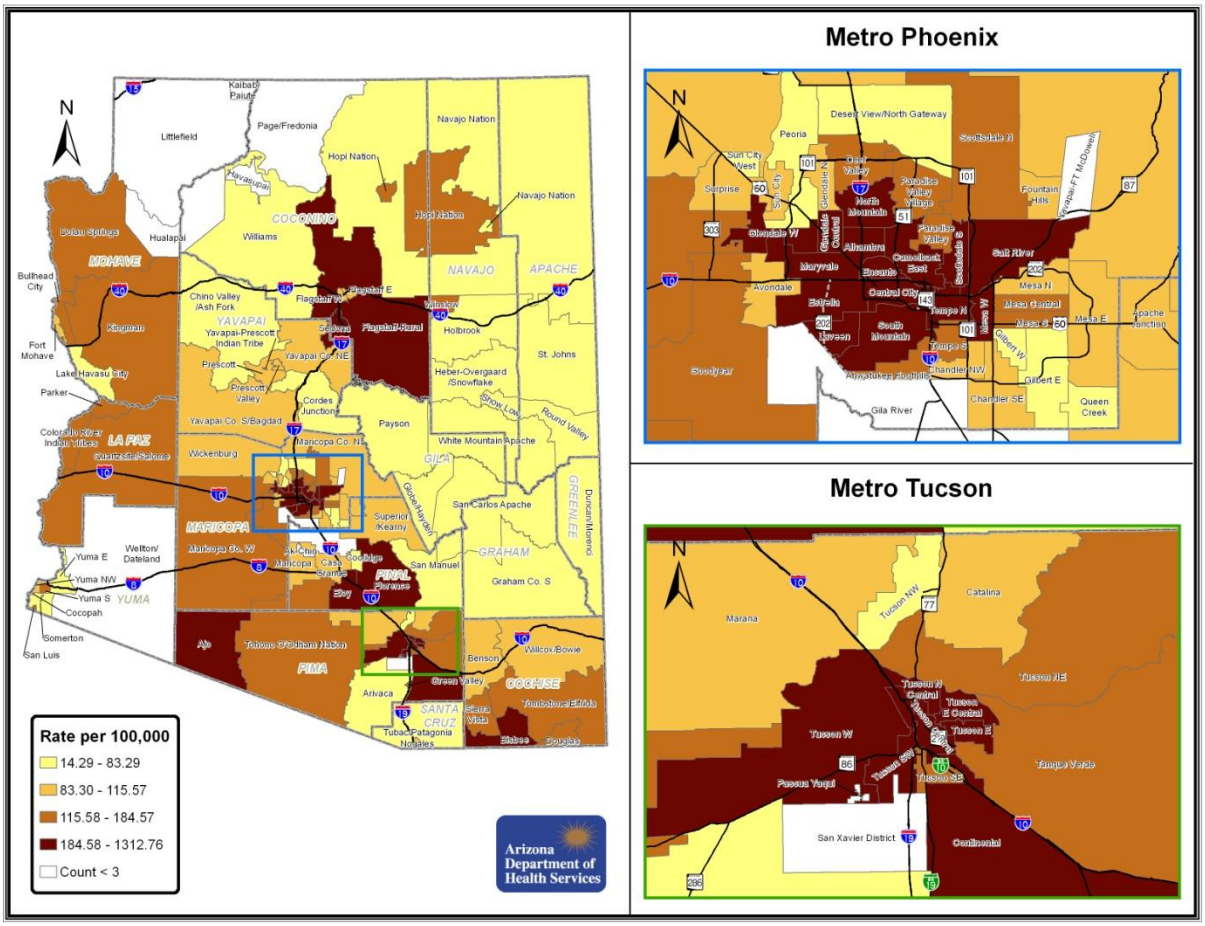


**Table 10:** Country and Gender-Specific Prevalent HIV/AIDS, Emergent HIV/AIDS, Arizona, 2008

| | Current HIV/AIDS Prevalence | | | | | | Emergent HIV/AIDS 2004-2008 | | | | | | 2008 Population Estimates | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **COUNTY** | **Male Cases** | **% State Total** | **Rate Per 100,000** | **Female Cases** | **% State Total** | **Rate Per 100,000** | **Male Cases** | **% State Total** | **Rate Per 100,000** | **Female Cases** | **% State Total** | **Rate Per 100,000** | **Population** | **% State Total** | **Population Density (people per sq. mile)** |
| **Apache** | 41 | 0.30% | 118.90 | 13 | 0.10% | 36.39 | 13 | 0.40% | 7.63 | 3 | 0.10% | 1.71 | 70,207 | 1.10% | 6.3 |
| **Cochise** | 149 | 1.10% | 232.99 | 38 | 0.30% | 58.41 | 39 | 1.10% | 12.44 | 7 | 0.20% | 2.19 | 129,006 | 2.00% | 20.9 |
| **Coconino** | 131 | 0.90% | 204.19 | 37 | 0.30% | 57.45 | 31 | 0.80% | 9.84 | 9 | 0.20% | 2.86 | 128,558 | 2.00% | 6.9 |
| **Gila** | 29 | 0.20% | 114.05 | 4 | 0.00% | 14.96 | 4 | 0.10% | 3.18 | 3 | 0.10% | 2.28 | 52,166 | 0.80% | 10.9 |
| **Graham** | 31 | 0.20% | 160.98 | 0 | 0.00% | 0.00 | 10 | 0.30% | 11.12 | 1 | 0.00% | 1.25 | 36,452 | 0.60% | 7.9 |
| **Greenlee** | 3 | 0.00% | 71.77 | 0 | 0.00% | 0.00 | 0 | 0.00% | N/A | 0 | 0.00% | N/A | 8,002 | 0.10% | 4.3 |
| **LaPaz** | 21 | 0.10% | 208.52 | 10 | 0.10% | 99.85 | 2 | 0.10% | 3.97 | 2 | 0.10% | 4.04 | 20,086 | 0.30% | 4.5 |
| **Maricopa** | 8,387 | 59.30% | 420.83 | 1,299 | 9.20% | 66.22 | 2,291 | 61.90% | 24.26 | 381 | 10.30% | 4.09 | 3,954,598 | 60.80% | 429.7 |
| **Mohave** | 184 | 1.30% | 189.72 | 44 | 0.30% | 44.31 | 40 | 1.10% | 8.57 | 9 | 0.20% | 1.88 | 196,281 | 3.00% | 14.7 |
| **Navajo** | 48 | 0.30% | 86.13 | 15 | 0.10% | 26.30 | 27 | 0.70% | 10.02 | 6 | 0.20% | 2.18 | 112,757 | 1.70% | 11.3 |
| **Pima** | 1,993 | 14.10% | 402.09 | 318 | 2.20% | 61.58 | 406 | 11.00% | 17.41 | 76 | 2.10% | 3.13 | 1,012,018 | 16.00% | 110.2 |
| **Pinal** | 631 | 4.50% | 368.70 | 76 | 0.50% | 48.67 | 211 | 5.70% | 29.8 | 24 | 0.60% | 3.73 | 327,301 | 5.00% | 61 |
| **Santa Cruz** | 33 | 0.20% | 162.69 | 5 | 0.00% | 22.09 | 5 | 0.10% | 5.05 | 1 | 0.00% | 0.91 | 42,923 | 0.70% | 34.7 |
| **Yavapai** | 162 | 1.10% | 153.07 | 39 | 0.30% | 35.56 | 37 | 1.00% | 7.37 | 6 | 0.20% | 1.15 | 215,503 | 3.30% | 26.5 |
| **Yuma** | 163 | 1.20% | 168.81 | 30 | 0.20% | 30.69 | 48 | 1.30% | 10.43 | 7 | 0.20% | 1.5 | 194,322 | 3.00% | 35.2 |
| **Unknown** | 194 | 1.59% | N/A | 14 | 0.72% | N/A | 0 | 0.00% | N/A | 0 | 0.00% | N/A | N/A | N/A | N/A |
| **TOTAL** | 12,200 | 86.39% | 374.61 | 1,942 | 14.32% | 59.87 | 3,164 | 85.50% | 20.59 | 535 | 14.50% | 3.49 | 6,500,180 | 100.00% | 57.2 |

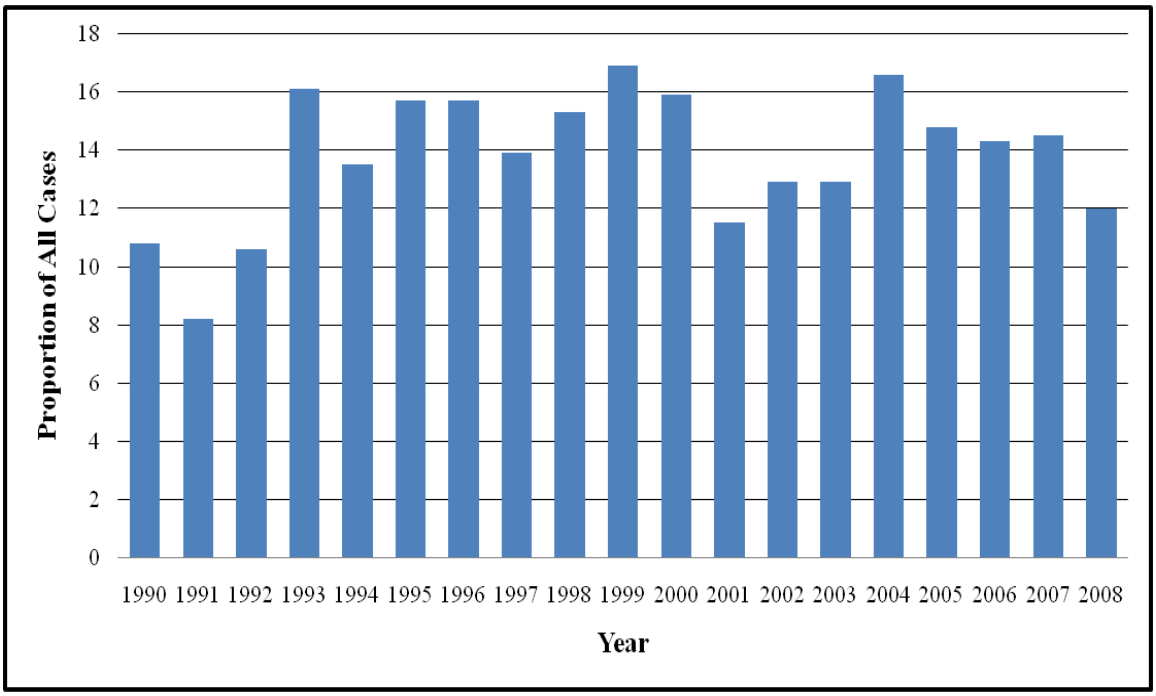
## SPECIAL POPULATIONS

The next section of the Epidemiological Profile discusses special populations affected by HIV/AIDS: women, African Americans, Hispanics, and individuals with a history of incarceration.

**Women:**

Over time, the HIV/AIDS epidemic has increasingly affected women. In 1985, females accounted for only 8% of the HIV epidemic. In 2005, females made up 27% of the prevalent HIV/AIDS cases in the United States. In Arizona, females account for approximately 13.7% of the prevalent HIV/AIDS cases. From 2004 to 2008, the proportion of emergent cases among females decreased from 16.6% to 12% of all cases. The rate for the same years is 12.05 per 100,000, which is slightly higher than the 2008 national rate (11.5 per 100,000) (CDC).

**Figure 9:** Female Emergent HIV/AIDS, Arizona, 1990-2009



Of the total number of prevalent cases, White non-Hispanic females accounted for the largest proportion, (5.8% of the state total), followed by Hispanics and then African Americans. Table 11 illustrates female cases by race/ethnicity. The overall prevalence rate for females is 59.87 per 100,000, but Black non-Hispanic females are disproportionately affected with a prevalence rate of 392.21 per 100,000. For emergent HIV/AIDS cases, White non-Hispanic, Black non-Hispanic, and Hispanic females have fairly similar proportions of the state total; however, Black females are contracting the virus at a rate 15 times higher than Whites and 7 times higher than Hispanic females.

**Table 11:** Female Prevalent HIV/AIDS, Emergent HIV/AIDS and State Population, Arizona, 2008

| | Current Female HIV/AIDS Prevalence | | | Emergent Female HIV/AIDS 2004-2008 | | | 2008 Female Population | |
|---|---|---|---|---|---|---|---|---|
| **Race/Ethnicity** | **Cases** | **% State Total** | **Rate Per 100,000** | **Cases** | **% State Total** | **Rate Per 100,000** | **Population** | **% State Total** |
| **White non-Hispanic** | 817 | 5.80% | 41.95 | 161 | 4.40% | 1.71 | 1,947,567 | 30.00% |
| **Black non-Hispanic** | 472 | 3.30% | 392.21 | 158 | 4.30% | 29.41 | 120,344 | 1.85% |
| **Hispanic** | 494 | 3.50% | 52.49 | 161 | 4.40% | 3.75 | 941,052 | 14.48% |
| **A/PI/H [1] non-Hispanic** | 30 | 0.20% | 33.23 | 12 | 0.30% | 2.95 | 90,293 | 1.40% |
| **AI/AN [2] non-Hispanic** | 83 | 0.60% | 57.55 | 34 | 0.90% | 4.94 | 144,233 | 2.22% |
| **MR/ [3]Other non-Hispanic** | 46 | 0.30% | N/A | 9 | 0.20% | N/A | N/A | N/A |
| **TOTAL** | 1,942 | 13.70% | 59.87 | 535 | 14.50% | 3.49 | 3,243,489 | 50% |

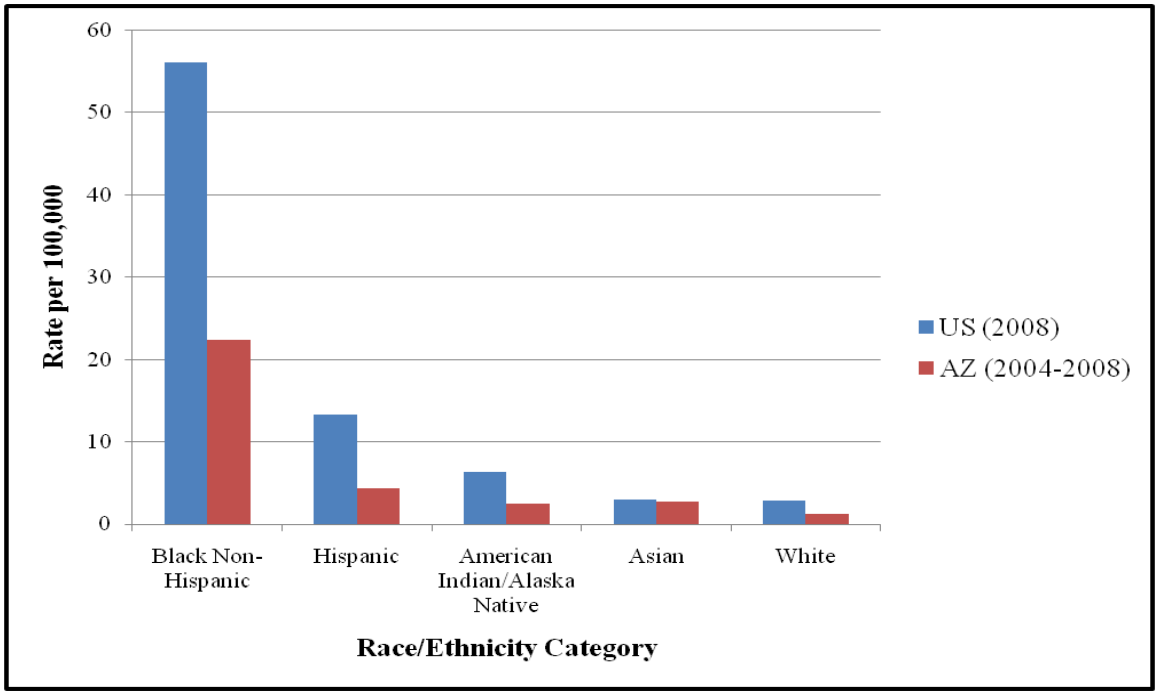
Source: Arizona HARS 9/1/10; NCHS 2004-2008 Bridged-Race Intercensal Estimates.

1. Asian / Pacific Islander / Native Hawaiian
2. American Indian / Alaska Native
3. Multiple Race / Other

The Arizona rates for all races are less than the national rates, where the rate for Black women is 55.7 per 100,000, 14.4 per 100,000 for Hispanic women and 3.8 per 100,000 for White women; however, the discrepancy between Black and White women is much greater in Arizona. Figure 9 shows the difference between the United States and Arizona rates for females. Attempts have been made to attribute these contrasting rates of HIV infection in the African American community to a number of factors, including though not limited to: “poverty, stigma, limited access to health care, higher rates of other sexually transmitted diseases, higher prevalence

among African Americans, and drug use. Many Black women face additional challenges, such as power imbalances with men in sexual relationships" (CDC).

**Figure 10:** Race/Ethnicity and Female-Specific Emergent HIV, United States and Arizona, 2004-2008



The distribution of HIV/AIDS for women is fairly similar for the two urban counties. Black women in Pima County have the highest rate followed by Black women in Maricopa County. Table 12 provides the HIV/AIDS prevalence for Maricopa, Pima, and all other counties by race/ethnicity.

**Table 12:** Counties and Race/Ethnicity Female Specific, Prevalent HIV/AIDS, Arizona, 2008

| | **Female HIV/AIDS Prevalence: Maricopa County** | | | **Female HIV/AIDS Prevalence: Pima County** | | | **Female HIV/AIDS Prevalence: All Other Counties** | | |
|---|---|---|---|---|---|---|---|---|---|
| **Race/Ethnicity** | **Cases** | **% County Total** | **Rate Per 100,000** | **Cases** | **% County Total** | **Rate Per 100,000** | **Cases** | **% County Total** | **Rate Per 100,000** |
| **White non-Hispanic** | 507 | 5.20% | 42.47 | 143 | 6.20% | 47.44 | 167 | 1.20% | 36.92 |
| **Black non-Hispanic** | 358 | 3.70% | 404.67 | 76 | 3.30% | 447.61 | 38 | 1.80% | 255.07 |
| **Hispanic** | 339 | 3.50% | 58.62 | 78 | 3.40% | 46.06 | 77 | 3.60% | 39.82 |
| **A/PI/H [1] non-Hispanic** | 21 | 0.20% | 32.18 | 4 | 0.20% | 28.27 | 5 | 0.20% | 45.94 |
| **AI/AN [2] non-Hispanic** | 44 | 0.50% | 123.14 | 8 | 0.30% | 55.33 | 31 | 1.40% | 32.96 |
| **MR/[3]Other non-Hispanic** | 30 | 0.30% | N/A | 9 | 0.40% | N/A | 7 | 0.3 | N/A |
| **TOTAL (% State Female Cases)** | 1299 (67%) | 13.4% | 66.22 | 318 (16%) | 13.8% | 61.58 | 325 (17%) | 15.2% | 42.46 |

Source: Arizona HARS 9/1/10; NCHS 2004-2008 Bridged-Race Intercensal Estimates.

1. Asian / Pacific Islander / Native Hawaiian
2. American Indian / Alaska Native
3. Multiple Race / Other

Table 13 examines White non-Hispanic, Black non-Hispanic and Hispanic female prevalent cases by mode of exposure. The statistics illustrate that regardless of race, women are most likely to have become infected from high-risk heterosexual contact, which the CDC defines as heterosexual contact with persons known or suspected to be infected with HIV and/or persons who are known to have other high-risk behaviors or events (MSM, IDU or medical/surgical/ occupational exposure to blood or blood/tissue products). White women were more likely to report injection drug use as a risk factor (35%). Approximately 25% of Black females were reported as having "no identifiable risk" compared to 17% for white and 16% of Hispanic females.

**Table 13:** Race/Ethnicity Female Prevalent HIV/AIDS Cases by Mode of Exposure, Arizona, 2008

| Race/Ethnicity | Prevalent Cases | IDU [1] | HRH [2] | NRR [3] / Other | Blood or Transplant | Vertical Pediatric |
|---|---|---|---|---|---|---|
| **White non-Hispanic** | 817 | 284 (35%) | 373 (46%) | 137 (17%) | 8 (1%) | 15 (2%) |
| **Black non-Hispanic** | 472 | 96 (20%) | 243 (51%) | 112 (24%) | 0 (0%) | 21 (4%) |
| **Hispanic** | 494 | 107 (22%) | 292 (59%) | 80 (16%) | 2 (1%) | 13 (3%) |

Source: Arizona HARS 9/1/10; NCHS 2004-2008 Bridged-Race Intercensal Estimates.

1. Injection drug use
2. High Risk Heterosexual
3. 'NIR' is no indicated risk

**African Americans:**

Racial/ethnic disparities in the incidence of HIV/AIDS have been documented since 1981. Nationally, African Americans make up nearly 50% of all individuals diagnosed with HIV (37 states and 5 US dependent areas). Additionally, African Americans represented 45% of the new cases diagnosed in the United States (2006) and 11.7% of new cases in Arizona (2004-08) (CDC). Though African Americans only account for 3.85% of the state population, their rate of emergent HIV/AIDS is on average three times higher than any other race category (39.0 per 100,000 persons) between 2004 and 2008. Hispanics (14.11 per 100,000) and American/Indian/Native Americans (12.09 per 100,000) represent the racial categories with the next highest rates (Figures 10 and 11).

**Figure 11:** Black Non-Hispanic Adults and Adolescents Living with a Diagnosis of HIV Infection, 37 States, 2007

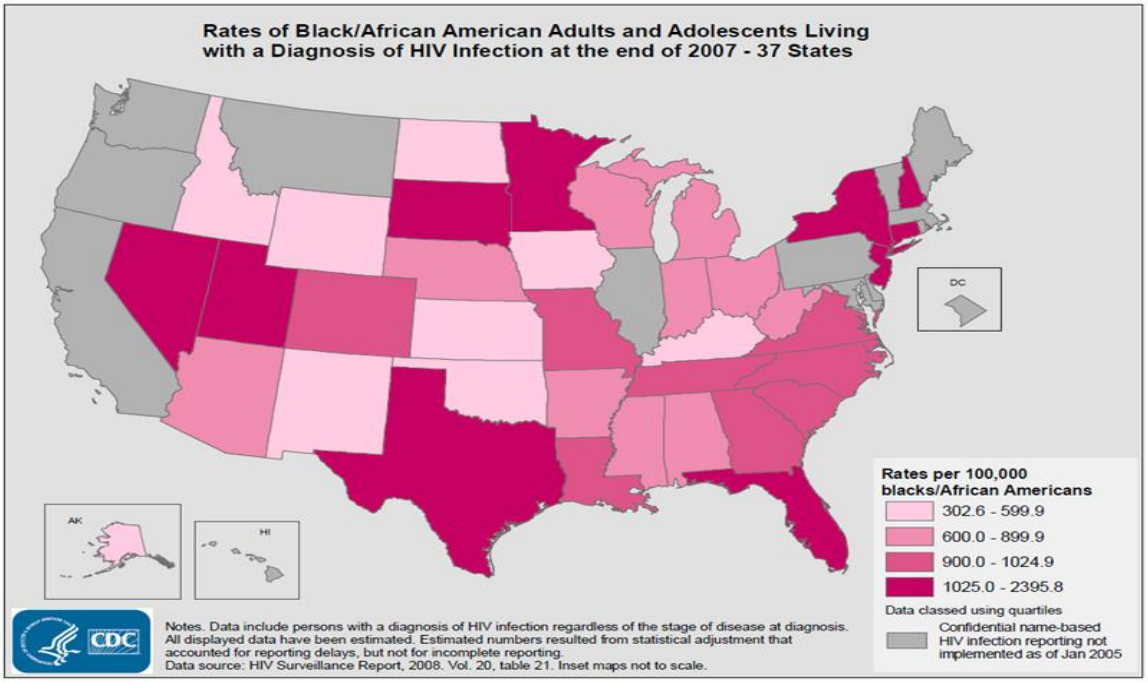
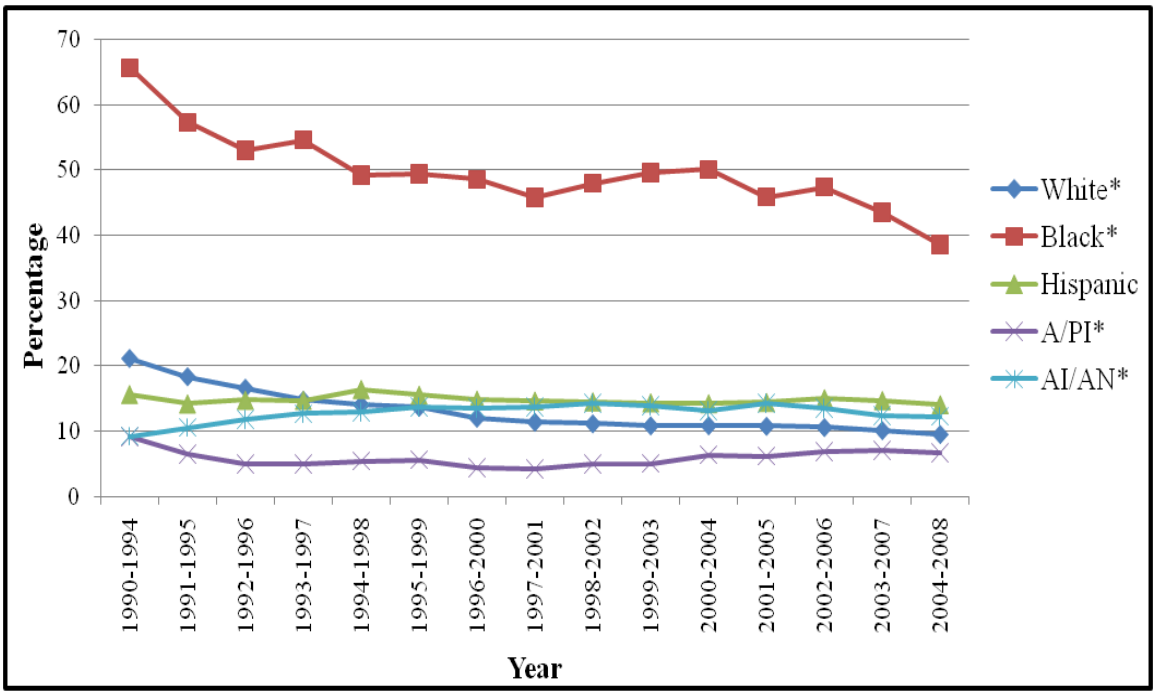


**Figure 12:** Race/Ethnicity-Specific Emergent HIV/AIDS Rate, Arizona, 2008




*Non-Hispanic

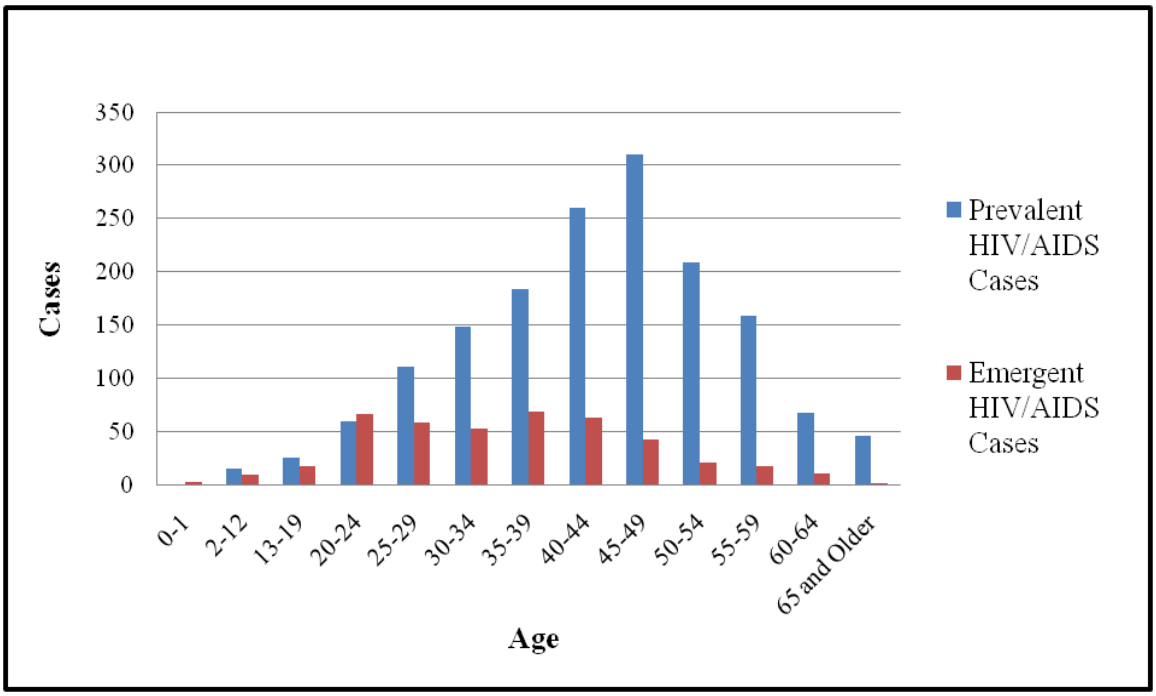
When stratified by gender, African American men have a current HIV/AIDS prevalence rate of 866.99 per 100,000 people. Hence approximately one out of every 100 Black males in Arizona have an HIV/AIDS diagnosis. For females, the prevalence rate is 392.21 per 100,000. Between 2004 and 2008, 7.4% of all emergent cases were African American males, who make up less than 2% of the total state population. Emergent cases of Black women accounted for slightly less of the state total at 4.3%.

**Table 14:** African American and Sex-Specific Prevalent HIV/AIDS, Emergent HIV/AIDS, Arizona, 2008

| | Current HIV/AIDS Prevalence | | | Emergent HIV/AIDS 2004-2008 | | | 2008 Population Estimates | |
|---|---|---|---|---|---|---|---|---|
| **Sex** | **Cases** | **% State Total** | **Rate Per 100,000** | **Cases** | **% State Total** | **Rate Per 100,000** | **Population** | **% State Total** |
| **Male** | 1,124 | 7.90% | 866.99 | 273 | 7.40% | 46.99 | 129,644 | 1.99% |
| **Female** | 472 | 3.30% | 392.21 | 158 | 4.30% | 29.41 | 120,344 | 1.85% |
| **TOTAL** | 1,596 | 11.20% | 638.43 | 431 | 11.70% | 38.54 | 249,988 | 3.84% |

The majority of African American prevalent cases are between the ages of 30 and 54 with a peak in between the ages of 45-49. Emergent cases have the highest counts in lower age categories: 20-24 and 35-44. Figure 12 depicts African American prevalent and emergent cases by age group.

**Figure 13:** African American and Age Group-Specific Prevalent HIV/AIDS, Emergent HIV/AIDS, Arizona, 2008



The highest proportion of prevalent and emergent African American HIV/AIDS cases reported MSM as their mode of transmission. High Risk Heterosexual contact and IDU were, respectively, the second and third most prevalent mode of transmission for African American cases. Table 15 presents information about African American cases by risk category.

**Table 15:** African American Prevalent HIV/AIDS, Emergent HIV/AIDS Cases by Mode of Exposure, and State Population, Arizona, 2008

| | Current HIV/AIDS Prevalence | | Emergent HIV/AIDS 2004-2008 | |
|---|---|---|---|---|
| **Risk Category/ Mode of Transmission** | **Cases** | **% State Total** | **Cases** | **% State Total** |
| **MSM [1]** | 587 | 4.20% | 154 | 4.20% |
| **IDU [2]** | 282 | 2.00% | 58 | 1.60% |
| **MSM/IDU [3]** | 128 | 0.90% | 12 | 0.30% |
| **Heterosexual** | 308 | 2.20% | 101 | 2.70% |
| **O/H/TF/TPR [4]** | 40 | 0.30% | 10 | 0.30% |
| **No Reported Risk** | 251 | 1.80% | 96 | 2.60% |
| **TOTAL** | 1,596 | 11.30% | 431 | 11.70% |

Source: Arizona HARS 9/1/10; NCHS 2004-2208 Bridged-Race Intercensal Estimates

1. Men having Sex with Men
2. Injection Drug Use
3. Men having Sex with men and reporting Injection Drug Use
4. Other/Hemophilia/Transfusion and Blood products/Transplant Recipient.

**Hispanics:**

Hispanics represent the second most predominant racial/ethnic group in the state of Arizona. In 2008, 30.10% of Arizona's population was Hispanic (Table 5). The rate of emergent HIV/AIDS was significantly higher for Hispanics (14.05 per 100,000) compared with Whites (9.48 per 100,000), as demonstrated in Table 5. The gender specific rates of prevalent and emergent HIV/AIDS are higher for Hispanics than Whites for both men and women (Table 6). Though the rates of HIV/AIDS in the Hispanic population residing in Arizona are not as alarming as those of African Americans, these statistics are indicative of existing disparities. Similarly to Arizona, Texas, California and New Mexico also share a border with Mexico and are home to large proportions of Hispanic residents. The rates of emergent HIV/AIDS for Hispanics (14.2 per 100,000) and Whites (10.3 per 100,000) in the state of Texas in 2008 were comparable to Arizona's (CDC). In California, the proportion of White persons living with HIV/AIDS in 2008 was lower than in Arizona (47.2% vs. 56.6%) (CDC); however, there was a greater proportion of seropositive Hispanics residing in California compared with Arizona (29.5% vs. 25.2%) (CDC) The rate of emergent HIV/AIDS for Hispanic residents of New Mexico was 8.3 per 100,000 compared with 5.4 per 100,000 for their White counterparts (CDC). These rates are notably lower than the state of Arizona statistics. Overall, it can be inferred that the rates of HIV/AIDS for Hispanics are similar across all Border States.

**Prison:**

According to the U.S. Department of Justice respectively, 1.8% and 1.0% of State and Federal inmates were confirmed HIV/AIDS cases (2005). Arizona State and Federal prisons housed 144 inmates with HIV/AIDS (1999). A slight increase in the number of HIV/AIDS prisoners was observed in 2005 (N=152). According to the Bureau of Justice Statistics, in 2008, the state of Arizona had the 5th highest proportion of state or federal inmates who were HIV/AIDS cases in the Western Jurisdiction.

Males (90.75%) were disproportionately represented among HIV/AIDS cases that had been in prison prior, during or after their first HIV/AIDS diagnosis. Such gender distribution is representative of the overall prison population in the United States. As shown in Table 16, male cases constituted 7.32% of prevalent HIV/AIDS cases with a history of incarceration. Overall, 6.93% of prevalent HIV/AIDS cases had been incarcerated in a State or Federal prison in the state of Arizona or another state.

**Table 16:** Gender-Specific Prevalent HIV/AIDS Cases with a History of Incarceration, 2008

| | Current HIV/AIDS Prevalence | | |
|---|---|---|---|
| **Sex** | **Cases** | **Total Male Cases** | **% State Total** |
| **Male** | 893 | 12,200 | 7.32% |
| **Female** | 87 | 1,942 | 4.48% |
| **TOTAL** | 980 | 14,142 | 6.93% |

Source: Arizona HARS 9/1/10; NCHS 2004-2008 Bridged-Race Intercensal Estimates.

At the national level men aged 30-34 years and women between the ages of 35-39 years had the highest incarceration rates (2008). Table 17 presents the age distribution of prevalent HIV/AIDS cases that had a history of incarceration. Prevalent male HIV/AIDS cases aged 35-39 years represented the most predominant group of prevalent cases with a history of imprisonment (Table 17). They were followed by male cases aged 30-34 years. Female cases with a history of incarceration were younger than their male counterparts. Females aged 25-29 years represented the largest group of prevalent HIV/AIDS cases with a history of imprisonment.

**Table 17:** Age-Specific Prevalent HIV/AIDS Cases with a History of Incarceration, 2008

| | Current HIV/AIDS Prevalence | | | | | |
|---|---|---|---|---|---|---|
| **Age** | **Male Cases** | **Total Male Cases** | **% State Total** | **Female Cases** | **Total Female Cases** | **% State Total** |
| **0-1** | 0 | 0 | NA | 0 | 0 | NA |
| **2-12** | 0 | 18 | 0.00% | 0 | 21 | 0.00% |
| **13-19** | 0 | 36 | 0.00% | 1 | 30 | 3.33% |
| **20-24** | 16 | 260 | 6.15% | 0 | 58 | 0.00% |
| **25-29** | 53 | 631 | 8.40% | 7 | 110 | 6.36% |
| **30-34** | 104 | 959 | 10.84% | 10 | 193 | 5.18% |
| **35-39** | 160 | 1348 | 11.87% | 11 | 277 | 3.97% |
| **40-44** | 182 | 2143 | 8.49% | 16 | 323 | 4.95% |
| **45-49** | 183 | 2724 | 6.72% | 21 | 365 | 5.75% |
| **50-54** | 102 | 1900 | 5.37% | 14 | 244 | 5.74% |
| **55-59** | 55 | 1149 | 4.79% | 6 | 157 | 3.82% |
| **60-64** | 25 | 583 | 4.29% | 1 | 78 | 1.28% |
| **65 and Older** | 11 | 436 | 2.52% | 0 | 80 | 0.00% |
| **Unknown** | 2 | 13 | 15.38% | 0 | 6 | 0.00% |
| **TOTAL** | 893 | 12,200 | 7.32% | 87 | 1,942 | 4.48% |

African American males are overly represented in prisons in the United States. In 2008, the rate of incarceration of African American men is over six fold that of White men (3,161 per 100,000 vs. 487 per 100,000). The rate of imprisonment of Hispanic males (1,200 per 100,000) was second to that of African American men. In Arizona, the proportion of prevalent HIV/AIDS African American males (12.37%) who had a history of incarceration was second to that of Hispanic cases (15.13%). Asian/Pacific Islander/Native Hawaiian males (9.56%) and American Indian/Alaska Native males (7.73%) who only respectively constituted 1% and 2.60% of the total state prevalence were disproportionately represented among prevalent HIV/AIDS cases with a history of incarceration (Table 18). White males made up the highest proportion of prevalent HIV/AIDS cases (51.80%) followed by Hispanic males (21.70%) and African American males (7.90%). A comparable pattern was observed for females. Nationally, African American females were disproportionately represented among incarcerated women. In the state of Arizona, 5.30% of prevalent African American female HIV/AIDS cases had a history of

imprisonment. The overrepresentation of American Indian/Alaska Native seropositive women with a history of incarceration represents the most noteworthy disparity. Though this group only made up 0.60% of the state prevalent cases (Table 6), 4.82% of these cases had a history of imprisonment.

**Table 18:** Race-Specific Prevalent HIV/AIDS Cases with a History of Incarceration, 2008

| | Current HIV/AIDS Prevalence | | | | | |
|---|---|---|---|---|---|---|
| **Race/Ethnicity** | **Male Cases** | **Total Male Cases** | **% State Total** | **Female Cases** | **Total Female Cases** | **% State Total** |
| **White non-Hispanic** | 234 | 7,329 | 3.19% | 37 | 817 | 4.53% |
| **Black non-Hispanic** | 139 | 1,124 | 12.37% | 25 | 472 | 5.30% |
| **Hispanic** | 464 | 3,067 | 15.13% | 19 | 494 | 3.85% |
| **A/PI/H [1] non-Hispanic** | 13 | 136 | 9.56% | 0 | 30 | 0.00% |
| **AI/AN [2] non-Hispanic** | 28 | 362 | 7.73% | 4 | 83 | 4.82% |
| **MR/ [3]Other non-Hispanic** | 15 | 182 | 8.24% | 2 | 46 | 4.35% |
| **TOTAL** | 893 | 12,200 | 7.32% | 87 | 1,942 | 4.48% |

Source: Arizona HARS 9/1/10; NCHS 2004-2008 Bridged-Race Intercensal Estimates.

1. Asian / Pacific Islander / Native Hawaiian
2. American Indian / Alaska Native
3. Multiple Race / Other

MSM, IDU and MSM/IDU represented the highest risk factors for HIV infection for prevalent HIV/AIDS cases (Table 8). However, for cases with a history of imprisonment, the use of illegal drugs appears to be the most prevalent risk factor for both male (29.13%) and female (12.91%) cases, as illustrated in Table 19.

**Table 19:** Prevalent HIV/AIDS Cases with a History of Incarceration by Mode of Exposure

| | Current HIV/AIDS Prevalence | | | | | |
|---|---|---|---|---|---|---|
| **Risk Category/ Mode of Transmission** | **Male Cases** | **Total Male Cases** | **% State Total** | **Female Cases** | **Total Female Cases** | **% State Total** |
| **MSM [1]** | 263 | 8,491 | 3.10% | NA | NA | NA |
| **IDU [2]** | 307 | 1,054 | 29.13% | 67 | 519 | 12.91% |
| **MSM/IDU [3]** | 191 | 1,206 | 15.84% | NA | NA | NA |
| **Heterosexual** | 43 | 412 | 10.44% | 13 | 985 | 1.32% |
| **O/H/TF/TPR [4]** | 2 | 103 | 1.94% | 1 | 68 | 1.47% |
| **No Reported Risk** | 87 | 934 | 9.31% | 6 | 370 | 1.62% |
| **TOTAL** | 893 | 12,200 | 7.32% | 87 | 1,942 | 4.48% |

Source: Arizona HARS 9/1/10; NCHS 2004-2208 Bridged-Race Intercensal Estimates
1. Men having Sex with Men
2. Injection Drug Use
3. Men having Sex with men and reporting Injection Drug Use
4. Other/Hemophilia/Transfusion and Blood products/Transplant Recipient.

Maricopa County and Pima County are the most populous counties in the state of Arizona. The highest proportions of prevalent HIV/AIDS cases in the state of Arizona reside in these counties (Table 9). Relatively high proportions of prevalent cases were reported to reside in Graham County (0.20%) and Pinal County (5.00%). As shown in Table 20, Graham County and Pinal County represented the counties of incarcerations of 70.97% and 65.93% of prevalent male cases. Pinal County was reported as the county of imprisonment for 17.11% of prevalent female cases. This suggests that the proportions of prevalent HIV/AIDS cases reported in Graham County and Pinal County reflect the presence of state and federal prisons in these counties.

**Table 20:** Prevalent HIV/AIDS Cases with a History of Incarceration by County of Incarceration

| | Current HIV/AIDS Prevalence | | | | | |
|---|---|---|---|---|---|---|
| **COUNTY** | **Male Cases** | **Total Male Cases** | **% State Total** | **Female Cases** | **Total Female Cases** | **% State Total** |
| **Apache** | 1 | 41 | 2.44% | 0 | 13 | 0.00% |
| **Cochise** | 8 | 149 | 5.37% | 0 | 38 | 0.00% |
| **Coconino** | 3 | 131 | 2.29% | 0 | 37 | 0.00% |
| **Gila** | 2 | 29 | 6.90% | 0 | 4 | 0.00% |
| **Graham** | 22 | 31 | 70.97% | 0 | 0 | NA |
| **Greenlee** | 0 | 3 | 0.00% | 0 | 0 | NA |
| **La Paz** | 4 | 21 | 19.05% | 0 | 10 | 0.00% |
| **Maricopa** | 285 | 8,387 | 3.40% | 56 | 1,299 | 4.31% |
| **Mohave** | 3 | 184 | 1.63% | 0 | 44 | 0.00% |
| **Navajo** | 5 | 48 | 10.42% | 0 | 15 | 0.00% |
| **Pima** | 85 | 1,993 | 4.26% | 9 | 318 | 2.83% |
| **Pinal** | 416 | 631 | 65.93% | 13 | 76 | 17.11% |
| **Santa Cruz** | 1 | 33 | 3.03% | 0 | 5 | 0.00% |
| **Yavapai** | 2 | 162 | 1.23% | 2 | 39 | 5.13% |
| **Yuma** | 5 | 163 | 3.07% | 1 | 30 | 3.33% |
| **Unknown** | 0 | 194 | 0.00% | 0 | 14 | 0.00% |
| **Out of State** | 52 | NA | NA | 6 | NA | NA |
| **TOTAL** | 894 | 12,200 | 7.32% | 87 | 1,942 | 4.48% |

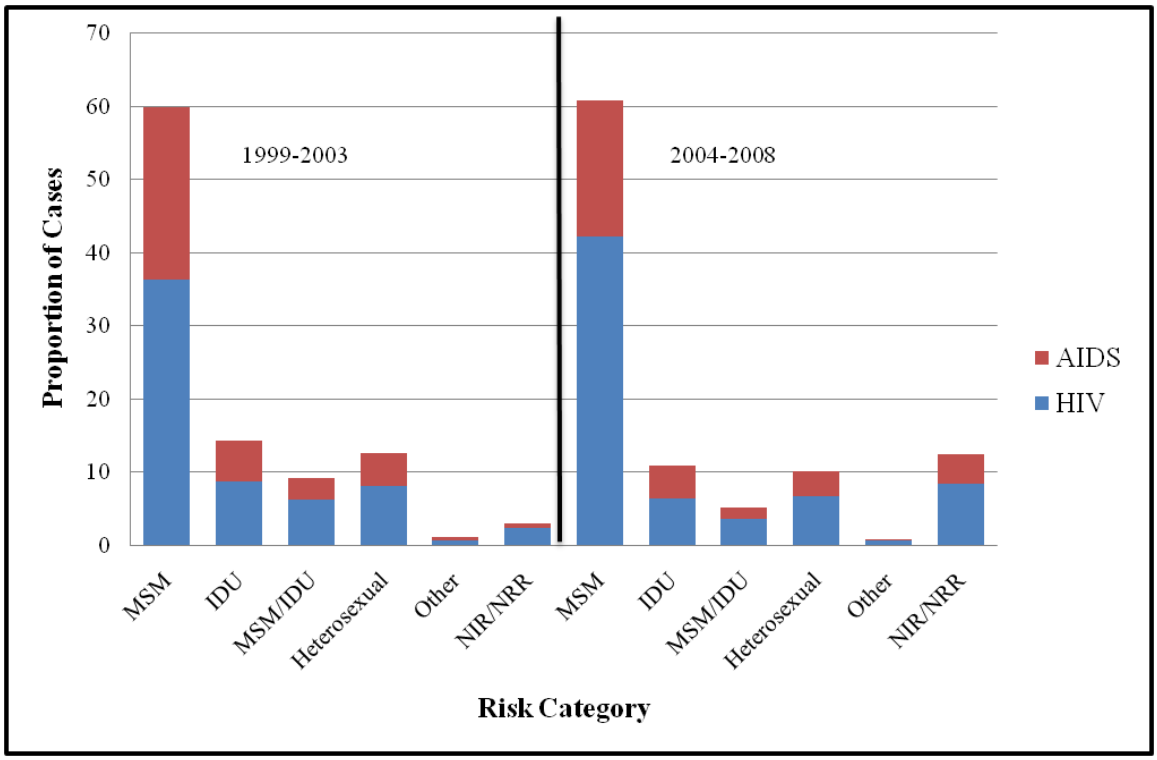
## INDICATORS OF HIV RISK

There are several indicators of HIV/AIDS infection risk in Arizona. The Centers for Disease Control and Prevention consider the following behaviors as risk for HIV infection: men who have sex with men (MSM), injection drug use (IDU), recipient of a clotting factor or high risk heterosexual contact. If no risk is identified the case is marked as having No Risk Reported (NRR). This Integrated Epidemiological Profile discusses three of these categories in more detail: MSM, IDU and NRR.

**MSM:**

Men who have sex with men (MSM) represent a large proportion of the individuals living with HIV/AIDS infection in Arizona and the United States. Since the beginning of the epidemic, the MSM community has been disproportionately impacted by the disease. National statistics from 2006 indicate that 53% of all new HIV diagnoses report MSM behavior. In Arizona, the MSM population accounted for nearly 60% of emergent HIV/AIDS cases. Figure 13 shows emergent HIV/AIDS by risk behavior category from 1999 to 2008.

**Figure 14:** Risk Behavior-Specific Emergent HIV/AIDS, Arizona, 1999-2008

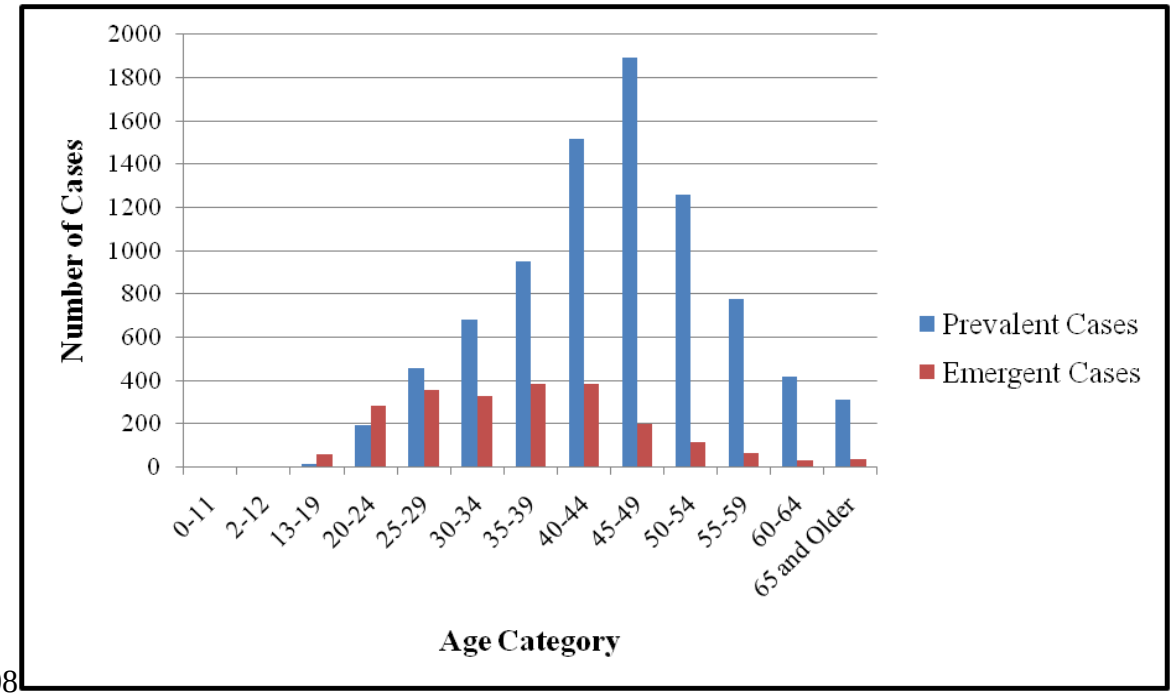



In Arizona, the majority of HIV/AIDS prevalent cases are between the ages of 35 and 54 (39.7%); however, of emergent (2004-2008) cases reporting MSM the age range is younger: 20 to 44. Table 22 and Figure 14 present the age-specific distribution of HIV/AIDS prevalence and emergence among men who reported MSM behavior.

**Table 22:** Age-Specific Prevalent HIV/AIDS, Emergent HIV/AIDS in MSM, Arizona, 2008

| | Current HIV/AIDS Prevalence | | Emergent HIV/AIDS 2004-2008 | |
|---|---|---|---|---|
| **Age** | **Cases** | **% State Total** | **Cases** | **% State Total** |
| **0-1** | 0 | 0.00% | 0 | 0.00% |
| **2-12** | 0 | 0.00% | 0 | 0.00% |
| **13-19** | 14 | 0.10% | 59 | 1.60% |
| **20-24** | 196 | 1.40% | 283 | 7.70% |
| **25-29** | 455 | 3.20% | 358 | 9.70% |
| **30-34** | 684 | 4.80% | 331 | 8.90% |
| **35-39** | 951 | 6.70% | 386 | 10.40% |
| **40-44** | 1,519 | 10.70% | 385 | 10.40% |
| **45-49** | 1,894 | 13.40% | 198 | 5.40% |
| **50-54** | 1,261 | 8.90% | 117 | 3.20% |
| **55-59** | 779 | 5.50% | 64 | 1.70% |
| **60-64** | 417 | 2.90% | 29 | 0.80% |
| **65 and Older** | 311 | 2.20% | 37 | 1.00% |
| **Unknown** | 10 | 0.10% | 0 | 0.00% |
| **TOTAL** | 8,491 | 60.00% | 2,247 | 60.70% |

**Figure 15:** Prevalent HIV/AIDS, Emergent HIV/AIDS in MSM, Arizona




2008

Nationally, this age difference in emergent cases is also seen when stratifying by race and gender. According to a CDC study, Black MSM between the ages of 13 and 29 represent over half (52%) of all new cases, making this demographic the largest within the MSM population. The majority of new White MSM cases occur in men between 30-49 years old (CDC). Within Arizona, Black MSM cases make up 4.2% of the state total HIV/AIDS cases, but Black men account for less than 2% of the state population. White Non-Hispanic MSM cases are 38.5% of the state HIV/AIDS prevalence with white men accounting for 30% of the total Arizona population, whereas Hispanic MSM cases are nearly equal to the total percentage of Hispanic men. Due to an inability to determine the total number of persons who identify as MSM, rates are unavailable for these statistics.

**Table 23:** Race-Specific Prevalent HIV/AIDS, Emergent HIV/AIDS in MSM, Arizona 2008

| | Current HIV/AIDS Prevalence | | | Emergent HIV/AIDS 2004-2008 | | |
|---|---|---|---|---|---|---|
| **Race/Ethnicity** | **Cases** | **% State Total** | **Rate Per 100,000** | **Cases** | **% State Total** | **Rate Per 100,000** |

| | | | | | | |
|---|---|---|---|---|---|---|
| **White non-Hispanic** | 5,446 | 38.50% | N/A | 1,213 | 32.80% | N/A |
| **Black non-Hispanic** | 587 | 4.20% | N/A | 154 | 4.20% | N/A |
| **Hispanic** | 2064 | 14.60% | N/A | 747 | 20.20% | N/A |
| **A/PI/H [1] non-Hispanic** | 102 | 0.70% | N/A | 27 | 0.70% | N/A |
| **AI/AN [2] non-Hispanic** | 233 | 1.60% | N/A | 86 | 2.30% | N/A |
| **MR/ [3]Other non-Hispanic** | 59 | 0.40% | N/A | 20 | 0.50% | N/A |
| **TOTAL (% State Male Cases)** | 8,491 (69.6%) | 60.0% | N/A | 2,247 (71%) | 60.7% | N/A |

Source: Arizona HARS 9/1/10; NCHS 2004-2008 Bridged-Race Intercensal Estimates.

1. Asian / Pacific Islander / Native Hawaiian
2. American Indian / Alaska Native
3. Multiple Race / Other

CDC statistics indicate that the number of White, Black and Hispanic cases reporting MSM as their mode of exposure has steadily increased from 1999 through 2006. In Arizona, the number of new HIV cases reporting risk as MSM has decreased from 2005 to present (CDC).

**IDU:**

The CDC classifies injection drug use (IDU) as a main risk category for HIV transmission. In addition to those who share needles, individuals who have sex with injection drug users or infants of injection drug users are also at risk. Nationally, from 2005 to 2008, injection drug use reported exposure decreased 19%. Arizona saw a decrease of 2.8% from 2005- 2008 (94 to 68 cases). Table 24 examines Arizona IDU prevalent HIV/AIDS and emergent HIV/AIDS IDU by age group (CDC). In Arizona the greatest numbers of HIV cases are reported between 40 and 54 years of age. Emergent HIV/AIDS IDU cases follow the same trend as MSM and are affecting a younger age group (30-44) for the 2004-2008 time periods.

**Table 24:** Age-Specific Prevalent HIV/AIDS, Emergent HIV/AIDS in IDU, Arizona 2008

| | **Current HIV/AIDS Prevalence** | | | **Emergent HIV/AIDS 2004-2008** | | |
|---|---|---|---|---|---|---|
| **Age** | **Cases** | **% State Total** | **Rate Per 100,000** | **Cases** | **% State Total** | **Rate Per 100,000** |

| | | | | | | |
|---|---|---|---|---|---|---|
| **0-1** | 0 | 0.00% | N/A | 0 | 0.00% | N/A |
| **02-12** | 0 | 0.00% | N/A | 0 | 0.00% | N/A |
| **13-19** | 0 | 0.00% | N/A | 5 | 0.10% | N/A |
| **20-24** | 11 | 0.10% | N/A | 33 | 0.90% | N/A |
| **25-29** | 55 | 0.40% | N/A | 43 | 1.20% | N/A |
| **30-34** | 109 | 0.80% | N/A | 69 | 1.90% | N/A |
| **35-39** | 152 | 1.10% | N/A | 73 | 2.00% | N/A |
| **40-44** | 269 | 1.90% | N/A | 70 | 1.90% | N/A |
| **45-49** | 356 | 2.50% | N/A | 54 | 1.50% | N/A |
| **50-54** | 292 | 2.10% | N/A | 32 | 0.90% | N/A |
| **55-59** | 211 | 1.50% | N/A | 13 | 0.40% | N/A |
| **60-64** | 78 | 0.60% | N/A | 5 | 0.10% | N/A |
| **65 and Older** | 37 | 0.30% | N/A | 5 | 0.10% | N/A |
| **Unknown** | 3 | 0.00% | N/A | 0 | 0.00% | N/A |
| **TOTAL** | 1,573 | 11.10% | N/A | 402 | 10.90% | N/A |

2007 CDC estimates attributed 15% of HIV infections of males to injection drug use and an additional 6% to male-to-male sexual contact and injection drug use. Among women, 24% of cases were attributed to injection drug use. Table 25 presents Arizona IDU prevalent and emergent cases by gender. In Arizona, IDU transmission category accounts for 11.2% of all prevalent cases and 10.8% of emergent cases. Additionally, the proportion among men and women for emergent cases is slightly less than national statistics with 11% of male cases and 21% of all emergent HIV/AIDS female cases reporting IDU risk (CDC).

**Table 25:** Gender-Specific Prevalent HIV/AIDS, Emergent HIV/AIDS in IDU, Arizona 2008

| | **Current HIV/AIDS Prevalence** | | | **Emergent HIV/AIDS 2004-2008** | | |
|---|---|---|---|---|---|---|
| **Sex** | **Cases** | **% State Total** | **Rate Per 100,000** | **Cases** | **% State Total** | **Rate Per 100,000** |
| **Male** | 1,054 | 7.50% | N/A | 290 | 7.80% | N/A |
| **Female** | 519 | 3.70% | N/A | 112 | 3.00% | N/A |
| **TOTAL** | 1,573 | 11.20% | N/A | 402 | 10.80% | N/A |

In Arizona, approximately 11% of emergent HIV/AIDS case report IDU exposure. Hispanic men account for the highest proportion of individuals who state their HIV exposure as injection

drug use, followed by White men and women (2004-2008). In the United States for emergent HIV, African Americans accounted for 52% of all reported IDU cases, followed by Hispanics at 26%. African American women accounted for 54% of all female IDU cases followed by White and Hispanic women, 27% and 16% respectively. The proportion of African American men (53%) was twofold that of both Hispanic and White men (CDC, 2008). In Arizona, 35% of emergent cases for White women reported IDU use, compared to 18% for Hispanic and 12% for Blacks. When examining the proportions in males, 14% of newly diagnosed African American men, 11% of Hispanics, and 7% of white men reported IDU exposure.

**Table 26:** Race and Gender-Specific Emergent HIV/AIDS, Arizona, 2004-2008

**Emergent HIV/AIDS Cases 2004-2008**

| Race/Ethnicity | Male Cases | % of State Total | Female Cases | % of State Total |
|---|---|---|---|---|
| **White non-Hispanic** | 112 | 3.00% | 57 | 1.5% |
| **Black non-Hispanic** | 39 | 1.00% | 19 | <1% |
| **Hispanic** | 120 | 3.20% | 29 | <1% |
| **A/PI/H [1] non-Hispanic** | 2 | <1% | 0 | 0.00% |
| **AI/AN [2] non-Hispanic** | 13 | <1%% | 6 | <1% |
| **MR/ [3]Other non-Hispanic** | 4 | <1% | 1 | <1% |
| **TOTAL** | 290 | 7.80% | 112 | 3.00% |

Source: Arizona HARS 9/1/10; NCHS 2004-2008 Bridged-Race Intercensal Estimates.

1. Asian / Pacific Islander / Native Hawaiian
2. American Indian / Alaska Native
3. Multiple Race / Other

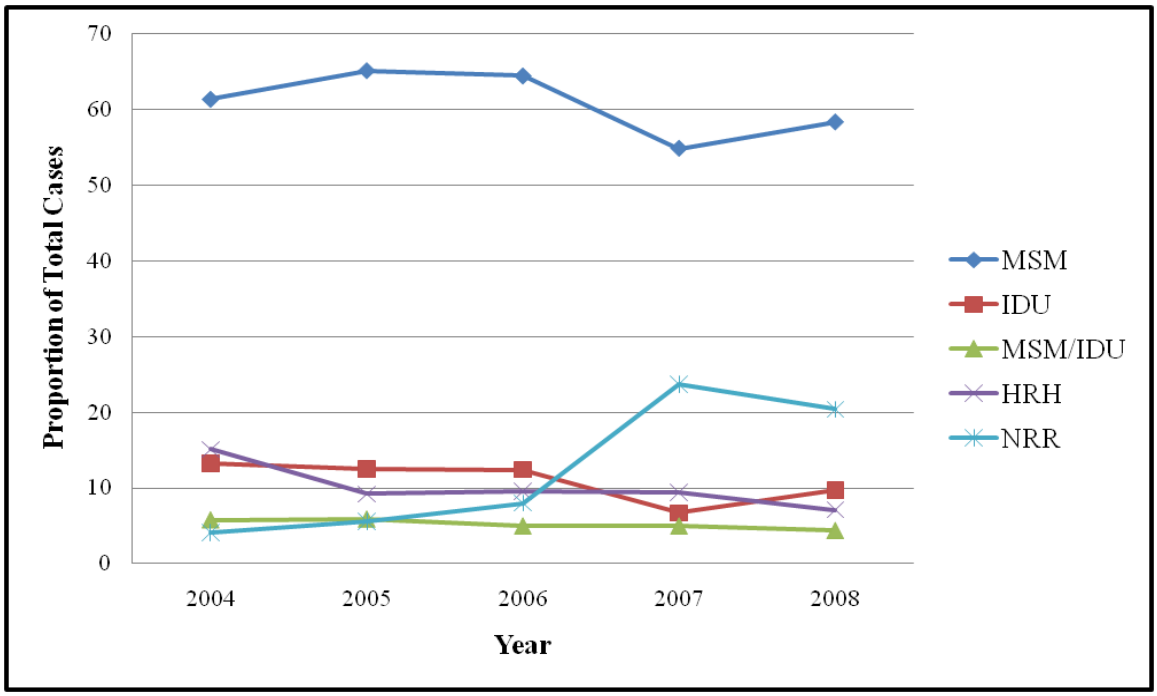
**NRR:**

No Risk Reported (NRR) is a risk exposure category created by the CDC. In Arizona, the number of NRR cases increased from 4.1% (2004) to an all-time high of 23.7% (2007). Prior to this date, Arizona was able to determine risk for over 95% of the HIV/AIDS cases diagnosed, which was well above the CDC standard of 85%. Since the NRR increase was noted, the state of Arizona has conducted several investigations to determine the reason for the spike in NRR cases including data analysis, chart reviews, and interviews with county personnel.

Between 2004 and 2008, on average 12.5% of emergent cases were classified as no risk reported (NRR). NRR cases are evenly distributed amongst both genders and racial groups. If no risk listed in the hierarchy of exposure categories is identified during the case investigation, the risk category is marked as no risk reported or no risk indicated (NRR or NIR). NRR cases include persons who are currently under investigation by local health department officials, persons whose exposure history is incomplete because they died, declined to be interviewed, or were lost to follow up; and persons who were interviewed or for whom other follow-up information was available and no exposure mode was identified (CDC).

Figure 15 illustrates the dramatic increase in NRR cases in 2004-2008 from 4.1% (2004) to an all-time high of 23.7% (2007). Beginning in 2006, the success of ADHS and its partners to obtain risk information from interviews and chart reviews began to decline. The primary reason for this is attributable to reduced funding for Core Surveillance staff and shifting priorities away from Core Surveillance to other activities including HIV Incidence Surveillance, Capacity Building, activities required in the adoption of Electronic Laboratory Reporting, and the work required to processes data sets for the co-morbidity analysis and production of the Integrated Epidemic Profile.

**Figure 16:** Risk Behavior, Emergent HIV/AIDS, Arizona 2004-2008




Although the NRR cases increase was not limited to just one county, an investigation in 2010 looked exclusively at NRR cases in Maricopa County. Maricopa County was chosen because that county represents the largest percentage of total HIV/AIDS cases. The August 2010 investigation included examining all the HIV/AIDS case files from June to October of 2006 and inspecting the HARS forms for inconsistencies. Next all NRR cases from January to August of 2010 (39) that had adequate supporting documentation were located on-site by Maricopa County Department of Health. Of the 39 NRR cases, 10 were found to have risk identified in the notes and corrections were made. (An additional 21 randomly selected NRR cases from 2006-2009 were located at an off-site storage, but insufficient data remained in the chart to complete a full chart review.) The results of the investigation revealed that errors were being made when both the County Surveillance and County Partner Services staff filled out the HARS form, specifically notes in the chart that pointed to a CDC defined risk which did not get recorded. As a result of the investigation, Maricopa County will develop a standard protocol for their Surveillance and Partner Services division to improve data quality and collaboration. In addition, monthly quality assurance data analysis will be implemented. Any cases reported as NRR will undergo further examination and additional chart reviews may be undertaken.

## COMORBIDITY

HIV comorbidity with other infectious diseases is a significant public health concern. An "epidemiological synergy" between HIV/AIDS and other sexually transmitted diseases (STDs) has been observed and studied since the beginning of the HIV/AIDS epidemic (CDC, 1998). Studies have shown that persons infected with STDs are more likely to become infected with HIV; it also has been demonstrated that persons coinfected with HIV and another STD are more likely to transmit HIV. This association has been observed both among ulcerative STDs (such as syphilis and herpes) and nonulcerative STDs (such as gonorrhea and Chlamydia). In addition to common modes of transmission, biological mechanisms for this epidemiological synergy have been observed:

> "HIV is detected routinely in the exudates of genital ulcers from HIV-infected men and women. Ulcers bleed easily and can come in contact with vaginal, cervical, oral urethral and rectal mucosa during sex. In men and women, inflammatory STDs (e.g., gonococcal and chlamydial infections) appear to increase both the prevalence of HIV shedding and the HIV RNA copy number or 'viral load' in genital secretions…In addition, both ulcerative (e.g., herpes, syphilis, and chancroid) and nonulcerative STDs (e.g., gonorrhea and chlamydia) attract CD4+ lymphocytes to either the ulcer surface or the endocervix, which disrupts epithelial and mucosal barriers to infections and establishes a potential mechanism to increase a person's susceptibility to HIV infection" (CDC, 1998).

HIV comorbidity with the Hepatitis C virus (HCV) is also a concern, particularly among injection drug users. HCV is primarily transmitted through direct blood-to-blood contact or perinatal transmission; sharing equipment during injection drug use is one of the primary modes of HCV transmission. HCV infections are often lifelong, it is estimated that 55-85% become chronic infections, and often present with long asymptomatic periods, delaying diagnosis. There are significant considerations for treatment and care with HIV and HCV coinfection. Coinfection with HIV makes Hepatitis C more difficult to treat, and progression of HCV-related morbidity and mortality is more rapid in HIV-coinfected patients (HRSA).

HIV comorbidity with Hepatitis B virus (HBV) has also been observed. It is estimated that 5% of persons infected with HIV in North America have also been infected with HBV (Hepatitis B Foundation). HBV is transmitted primarily through direct blood-to-blood contact and through sexual contact. HBV infections can be either acute or chronic. Among persons infected over 5 years of age, approximately 6-10% develop chronic hepatitis. Approximately 70% of adults with acute HBV infection present with symptoms, and asymptomatic persons can still spread the virus (CDC). A vaccine for HBV is available, and the majority of children born in Arizona since 1982 have received and completed the HBV vaccine series as part of their standard childhood vaccinations.

Examining HIV comorbidity with opportunistic infections also has important implications for care and treatment of persons with HIV. Tuberculosis (TB) is among the most dangerous AIDS-defining infections and is the leading cause of death among people with HIV worldwide. Persons with HIV are at increased risk for both TB infection and of progression to active TB disease. Testing for TB is considered to be a critical aspect of HIV care (CDC).

Coccidioidomycosis (Cocci) is an AIDS-defining infection that is endemic to the soil of the Southwest United States. Approximately two-thirds of Cocci diagnoses occur in Arizona (where it is a reportable disease); the disease is most commonly reported among persons with some degree of immunosuppression. Persons with occupational exposure to dust (such as construction and agricultural workers) and persons who have recently relocated to Arizona (especially the elderly and military personnel training in the desert) are also at increased risk. It is one of the most common opportunistic infections among persons with HIV in Arizona (University of Arizona Valley Fever Center for Excellence). While most persons with Cocci recover fully, some develop chronic pulmonary infections or disseminated infections that spread to the brain, bones, heart and other parts of the body. Persons with HIV are at particularly high risk of Cocci -related morbidity and mortality, particularly if the infection becomes disseminated (AIDS Healthcare Foundation).

The ADHS Office of HIV/AIDS examined all Arizona reports from 1998-2008 of STDs (Syphilis, Gonorrhea, Chlamydia, Herpes), Hepatitis C, Hepatitis B, Tuberculosis and

Coccidioidomycosis, and compared them to the entire HIV 2008 surveillance dataset. Each dataset was standardized and deduplicated, and probabilistic matching was used to determine which individuals had multiple disease reports. All HIV infection reports, regardless of prevalence or incidence status, were included in this analysis.

**HIV and Syphilis:**

Among persons reported in Arizona with HIV/AIDS or syphilis from 1998-2008, 1030 persons with reported HIV/AIDS infection and a previous, concurrent or subsequent reported syphilis infection (any stage) were identified. From 1998-2008, of all reported HIV/AIDS cases, 4.3% had a history of syphilis.

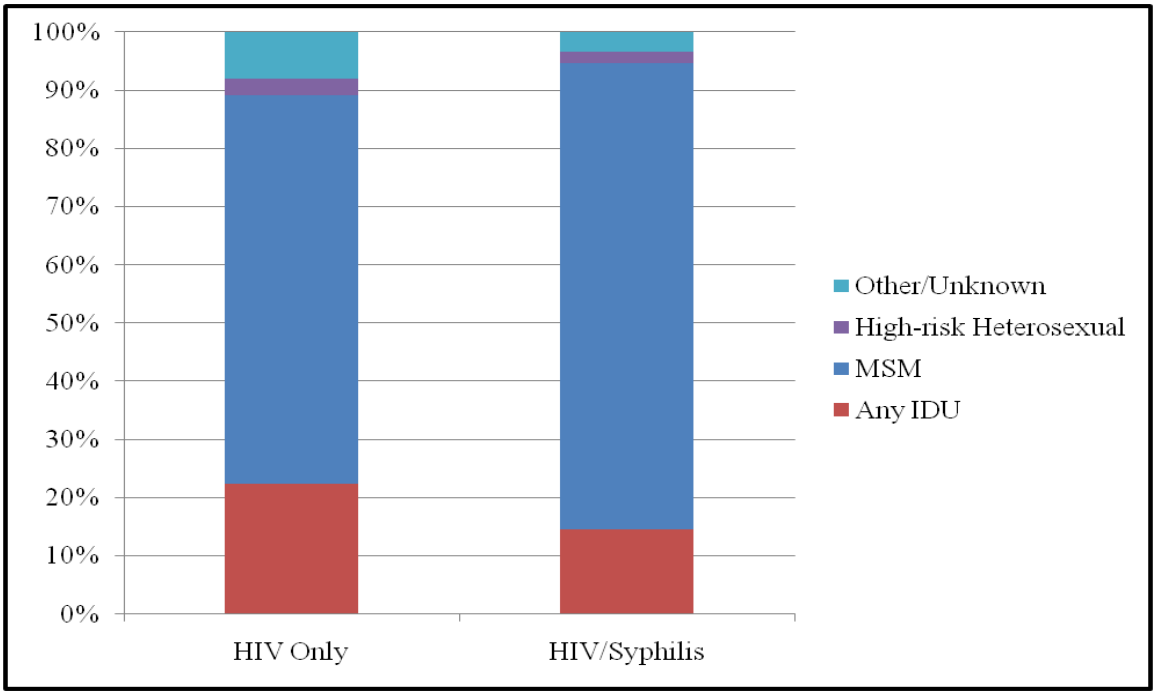
During the 1998-2008 time period it is estimated that approximately 0.75% of males and 0.1% of females in the general population had a report of HIV infection. Among persons with a reported syphilis history, approximately 14% of males and 1.4% of females had a report of HIV infection. The odds of HIV infection among persons with a history of syphilis are approximately 19 times higher than the general population for males and 14 times higher than the general population for females. Results of this analysis are reported in Table 27. (Note that persons with a gender other than "Male" and "Female" are excluded from all analyses stratified by sex in this section).

**Table 27:** Counts, Rates and Odds of HIV Infection among Persons with Reported Syphilis History, Arizona, 1998-2008

| | Males | Females |
|---|---|---|
| **Total Population** | 2,821,759 | 2,823,767 |
| **HIV infection only** | 20,138 | 2,772 |
| **Syphilis history only** | 5,974 | 3,751 |
| **HIV infection and Syphilis history** | 976 | 54 |
| **Estimated rate of HIV infection report** | 748 per 100,000 | 100 per 100,000 |
| **Estimated rate of Syphilis history report** | 246 per 100,000 | 135 per 100,000 |
| **Estimated HIV infection report rate among persons with Syphilis reported history** | 14,043 per 100,000 | 1,418 per 100,000 |
| **Estimated Syphilis history report rate among persons with reported HIV infection** | 4,623 per 100,000 | 1,911 per 100,000 |
| **Estimated odds of reported HIV infection with Syphilis history** | 18.8 | 14.2 |

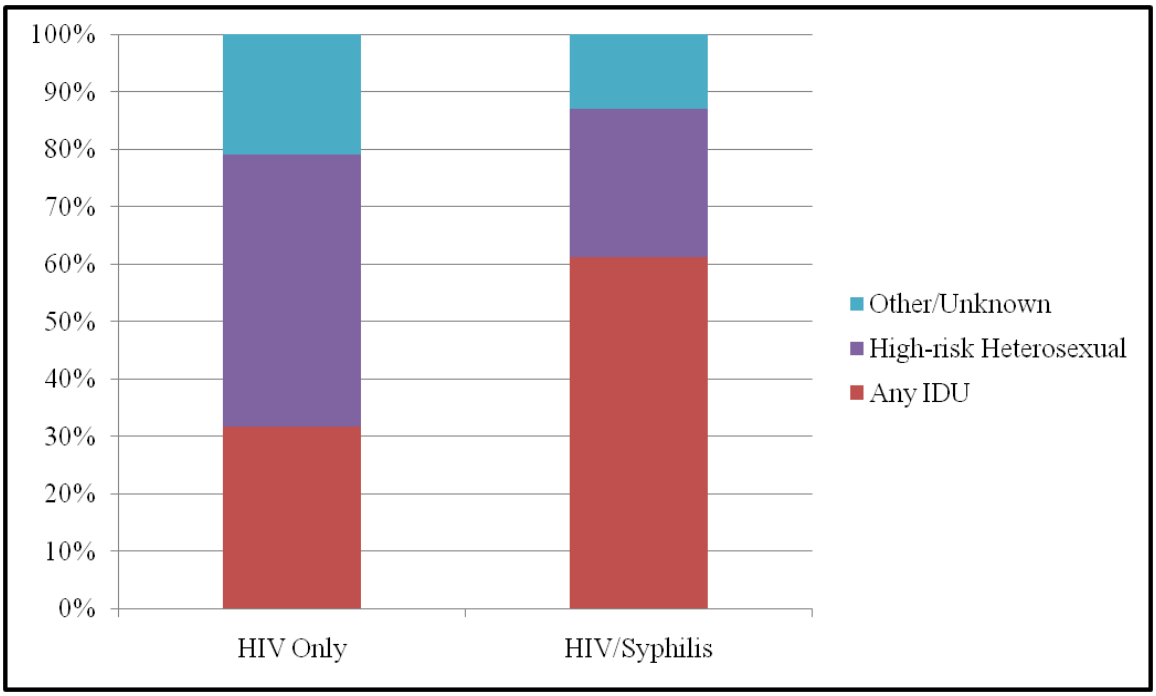
Among males with reports of both HIV and syphilis, 80.1% are men who have sex with men, compared to 66.7% MSM among males with HIV only.

**Figure 17:** Reported HIV Risk Among HIV/Syphilis Comorbid Males, Arizona, 1998-2008



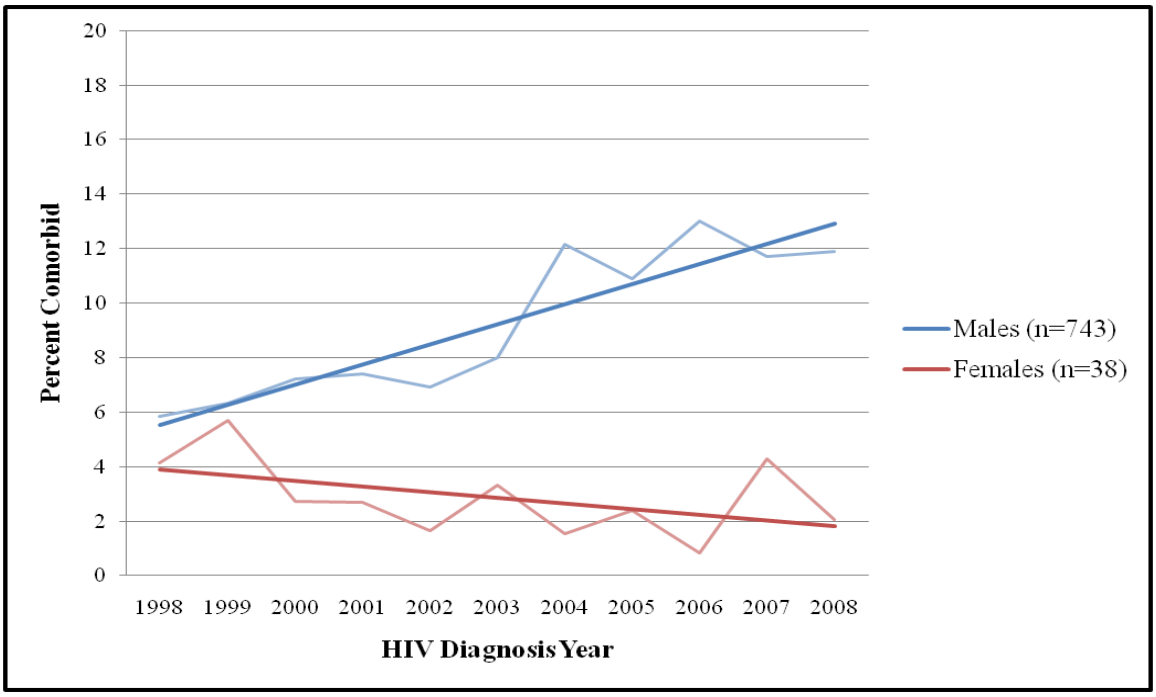
Among females with reports of both HIV and syphilis, 61.1% report injection drug use, compared to 31.6% among females with reports of HIV only. This suggests that males reporting male-to-male sexual contact and females reporting injection drug use may be at higher risk for HIV/Syphilis comorbidity.

**Figure 18:** Reported HIV Risk Among HIV/Syphilis Comorbid Females, Arizona, 1998-2008



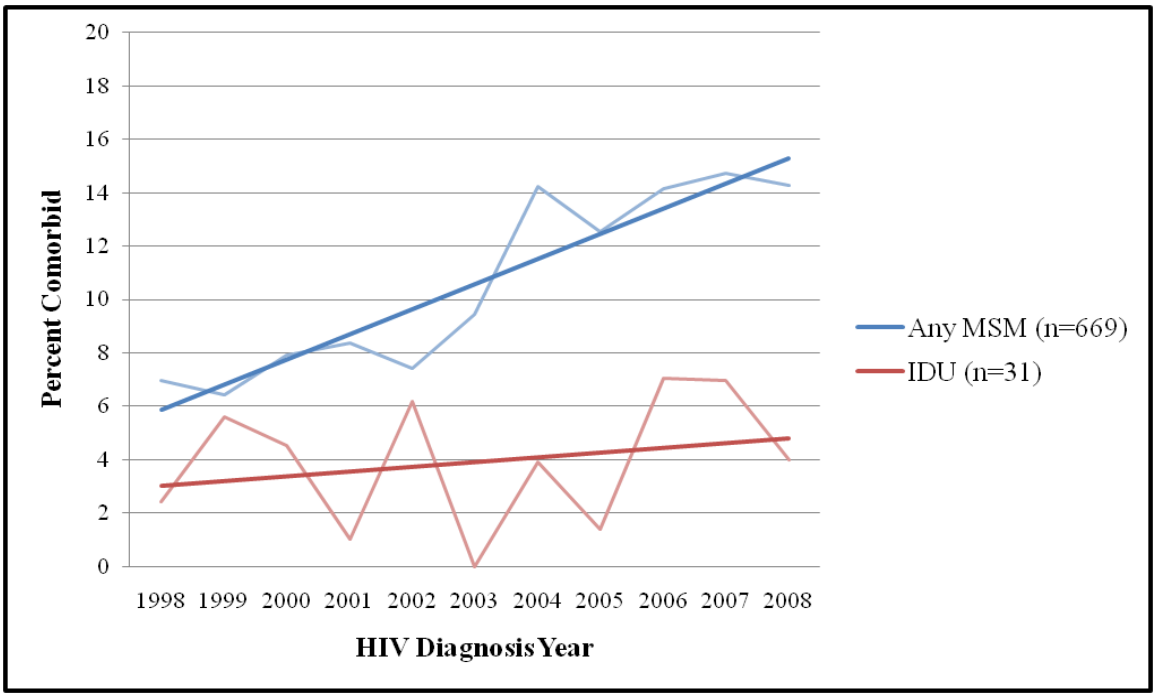
An increased percentage of males who report a history of both HIV and syphilis infection have been observed in recent years. Approximately 7% of males diagnosed with HIV in 2002 reported a previous, concurrent or subsequent syphilis diagnosis; this number nearly doubled in 2006 (13%).

**Figure 19:** Percentage of HIV Infected Persons with Reported History of Syphilis, Arizona 1998-2008



As shown in Figure 19, this increase appears to be primarily among males who report male-to-male sexual contact. (The 72 comorbid males reporting both male-to-male sexual contact and injection drug use were included in the MSM category because the trend closely reflected the MSM trend and not the IDU trend).

**Figure 20:** HIV Transmission Category-Specific Percentage of HIV Infected Males with Reported History of Syphilis, Arizona, 1998-2008



Persons infected with HIV who continue to engage in high-risk behavior are an important public health concern. An analysis of the percentage of primary, secondary and early latent syphilis events among persons with a previously reported HIV diagnosis was conducted. Persons diagnosed with primary, secondary or early latent syphilis were considered to be previously infected with HIV if they had been diagnosed with HIV more than 60 days prior to the syphilis diagnosis.

**Figure 21:** Percentage of Persons with Primary, Secondary or Early Latent Syphilis Diagnosis with Prior HIV Diagnosis, Arizona, 1998-2008

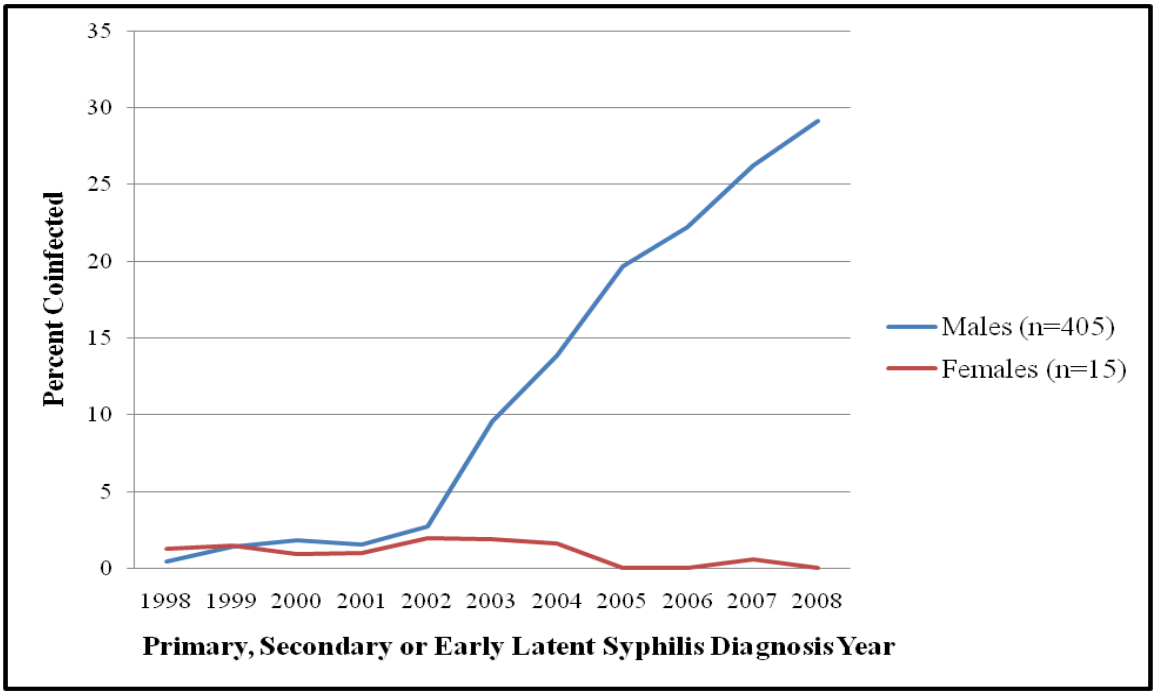


**Table 28:** Percentage of Persons with Primary, Secondary or Early Latent Syphilis Diagnosis with Prior HIV Diagnosis, Arizona, 1998-2008

| Year of Syphilis* Diagnosis | Males | | | Females | | |
|---|---|---|---|---|---|---|
| | Number of Syphilis* Cases | Number with Previous HIV Diagnosis** | Percent Coinfected | Number of Syphilis* Cases | Number with Previous HIV Diagnosis** | Percent Coinfected |
| 1998 | 216 | 1 | 0.46 | 160 | 2 | 1.25 |
| 1999 | 283 | 4 | 1.41 | 202 | 3 | 1.49 |
| 2000 | 215 | 4 | 1.86 | 220 | 2 | 0.91 |
| 2001 | 253 | 4 | 1.58 | 195 | 2 | 1.03 |
| 2002 | 219 | 6 | 2.74 | 154 | 3 | 1.95 |
| 2003 | 250 | 24 | 9.60 | 156 | 3 | 1.92 |
| 2004 | 224 | 31 | 13.84 | 124 | 2 | 1.61 |
| 2005 | 229 | 45 | 19.65 | 95 | 0 | 0.00 |
| 2006 | 252 | 56 | 22.22 | 94 | 0 | 0.00 |
| 2007 | 427 | 112 | 26.23 | 177 | 1 | 0.56 |
| 2008 | 405 | 118 | 29.14 | 134 | 0 | 0.00 |

*Primary, Secondary and Early Latent Syphilis
**HIV diagnosed more than 60 days before syphilis diagnosis

This analysis shows a sharp increase in the percentage of males who report a primary, secondary or early latent syphilis infection and a previous HIV infection; this percentage increased from 2.74% in 2002 to 29.14% in 2008. As shown in Figure 21, the majority of these coinfected males report male-to-male sexual contact. Though the number of coinfected MSM is not large, the upward trend in the data suggests that this group may benefit from additional prevention and partner services activities.

**Figure 22:** HIV Transmission Category and Male-Specific with Primary, Secondary or Early Latent Syphilis Diagnosis with Prior HIV Diagnosis, Arizona, 1998-2008

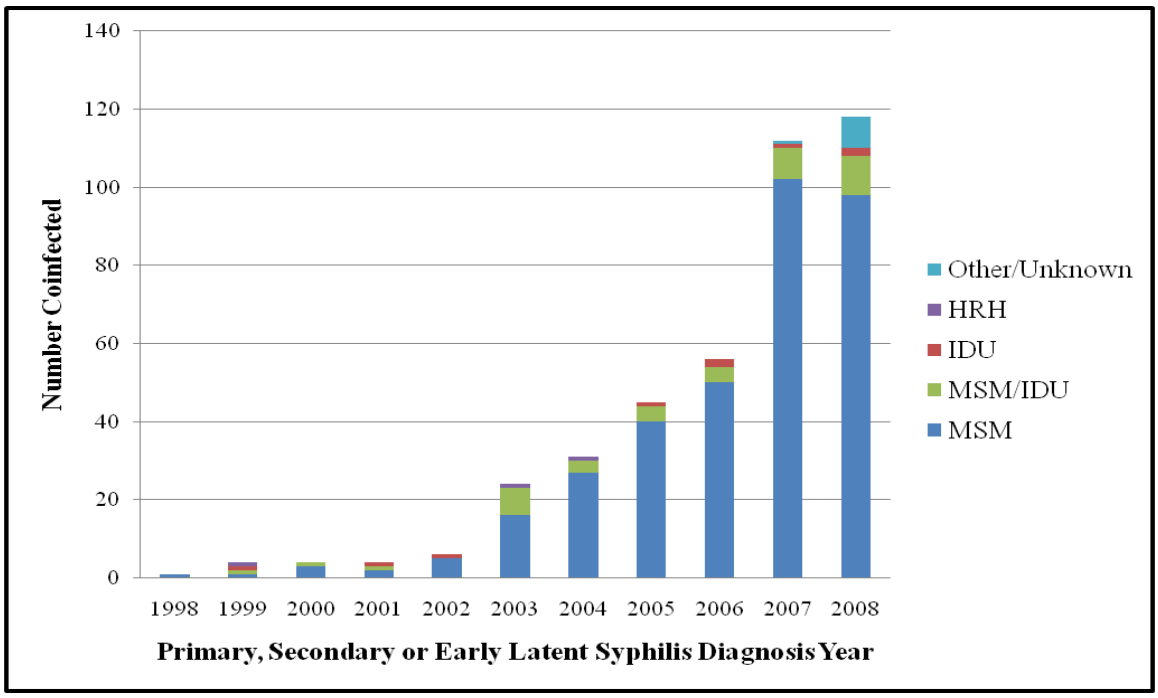



**Table 29:** HIV Transmission Category and Male-Specific with Primary, Secondary or Early Latent Syphilis Diagnosis with Prior HIV Diagnosis, Arizona, 1998-2008

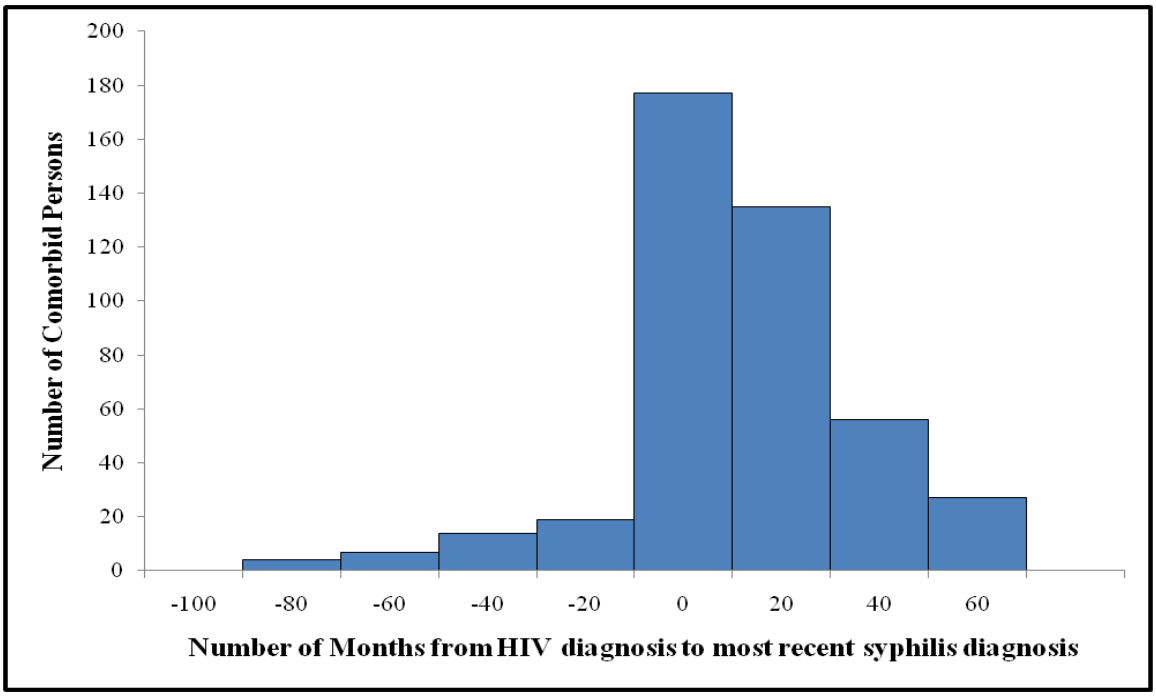
| Year of Syphilis* Diagnosis | Number HIV/Syphilis Coinfected** | | | | |
|---|---|---|---|---|---|
| | MSM | MSM/IDU | IDU | HRH | Other/ Unknown |
| 1998 | 1 | 0 | 0 | 0 | 0 |
| 1999 | 1 | 1 | 1 | 1 | 0 |
| 2000 | 3 | 1 | 0 | 0 | 0 |
| 2001 | 2 | 1 | 1 | 0 | 0 |
| 2002 | 5 | 0 | 1 | 0 | 0 |
| 2003 | 16 | 7 | 0 | 1 | 0 |
| 2004 | 27 | 3 | 0 | 1 | 0 |
| 2005 | 40 | 4 | 1 | 0 | 0 |
| 2006 | 50 | 4 | 2 | 0 | 0 |
| 2007 | 102 | 8 | 1 | 0 | 1 |
| 2008 | 98 | 10 | 2 | 0 | 8 |
| Total | 345 | 39 | 9 | 3 | 9 |

*Primary, Secondary and Early Latent Syphilis
*HIV diagnosed more than 60 days before syphilis diagnosis

The distribution of the number of months between HIV diagnosis and most recent syphilis diagnosis for comorbid persons was determined for persons with a reported syphilis history who were diagnosed with HIV from 2004-2008.

The median number of months from HIV diagnosis to the most recent syphilis diagnosis was 0 months, with a mean of 3.5 months. (Sample size =439). The data suggest that a large number of syphilis cases are diagnosed at the same time as HIV diagnosis, and there are also a notable number of syphilis events being diagnosed after HIV diagnosis. These results were similar when limited to only primary, secondary and early latent syphilis cases (data not shown).

**Figure 23:** Distribution of Time Lapse in Months Between Earliest HIV Diagnosis and Most Recent Syphilis Diagnosis Among HIV/Syphilis Comorbid Persons, Arizona, 2004-2008



**HIV and Gonorrhea:**

Among persons reported in Arizona with HIV/AIDS or gonorrhea from 1998-2008, 1,079 persons with reported HIV/AIDS infection and a previous, concurrent or subsequent reported gonorrhea infection were identified. Of all reported HIV/AIDS cases from 1998-2008, 4.5% had a history of gonorrhea.

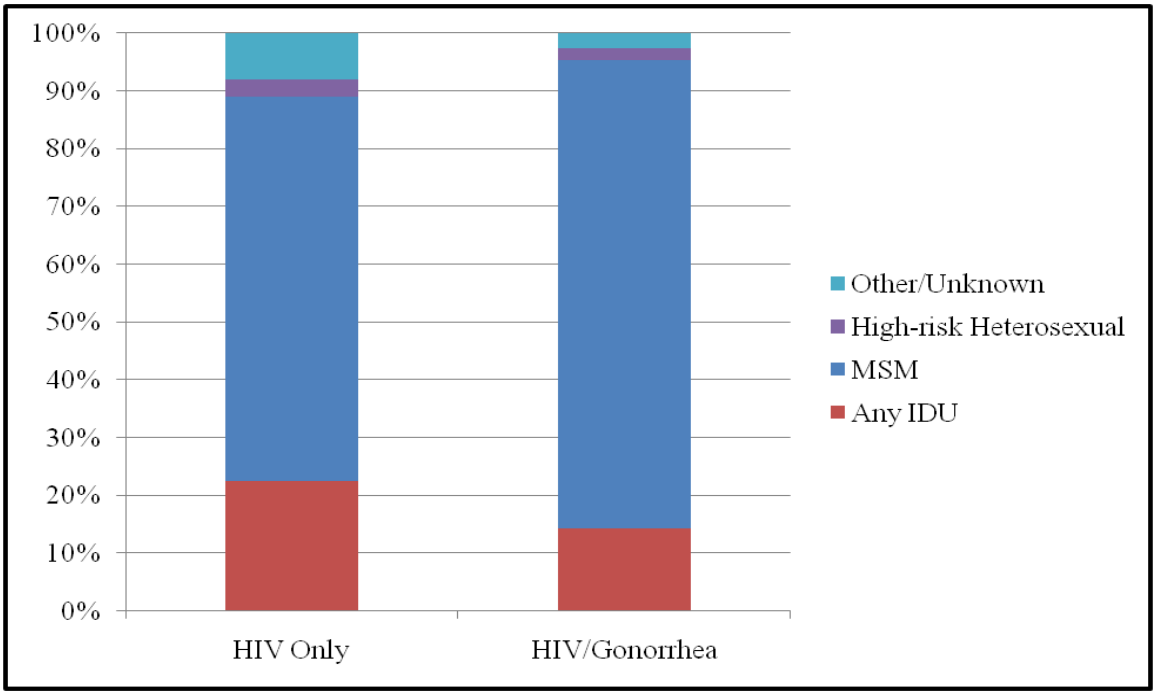
Among persons with a reported gonorrhea history, approximately 4.4% of males and 0.3% of females had a previous, concurrent or subsequent HIV infection. The odds of HIV infection among persons with a history of gonorrhea are approximately 6 times higher than the general population for males and 3 times higher than the general population for females. Results of this analysis are reported in Table 30.

**Table 30:** Counts, Rates and Odds of HIV Infection among Persons with Reported Gonorrhea History, Arizona, 1998-2008

| | Males | Females |
|---|---|---|
| **Total Population** | 2,821,759 | 2,823,767 |
| **HIV infection only** | 20,093 | 2,768 |
| **Gonorrhea history only** | 21,965 | 19,013 |
| **HIV infection and Gonorrhea history** | 1,021 | 58 |
| **Estimated rate of HIV infection report** | 748 per 100,000 | 100 per 100,000 |
| **Estimated rate of Gonorrhea history report** | 815 per 100,000 | 675 per 100,000 |
| **Estimated HIV infection report rate among persons with Gonorrhea reported history** | 4,442 per 100,000 | 304 per 100,000 |
| **Estimated Gonorrhea history report rate among persons with reported HIV infection** | 4,836 per 100,000 | 2,052 per 100,000 |
| **Estimated odds of reported HIV infection with Gonorrhea history** | 5.9 | 3.0 |

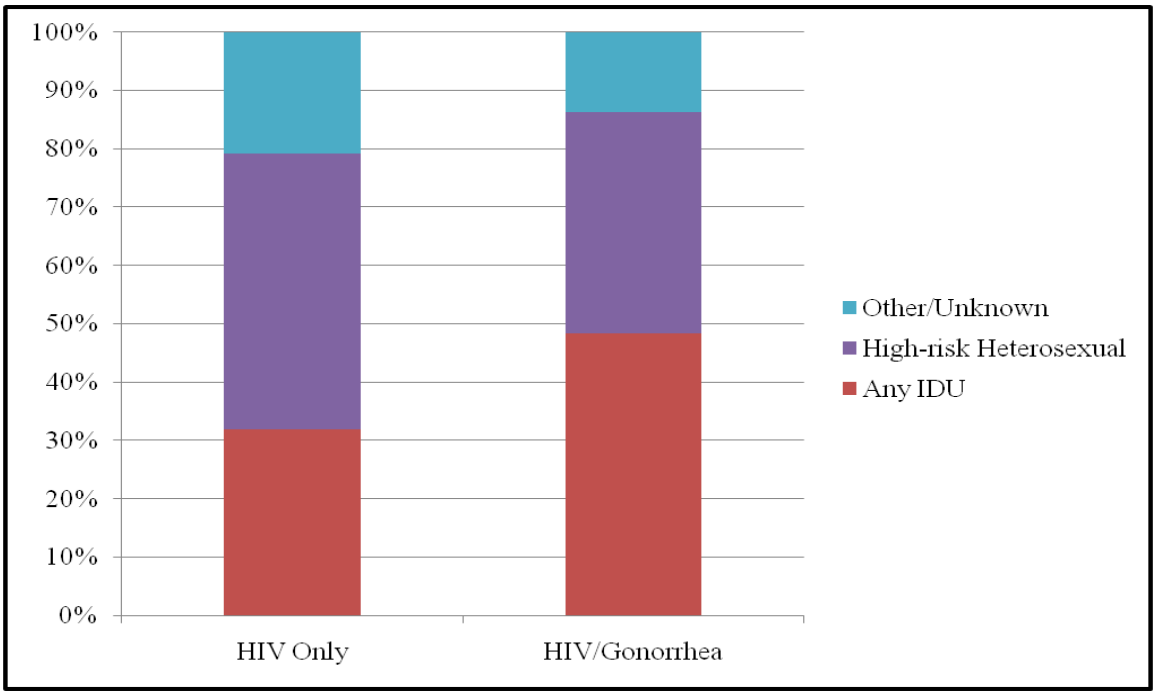
Among males with reports of both HIV and gonorrhea, 81.0% are MSM men, compared to 66.6% MSM among males with HIV only. These results are almost identical to the HIV/Syphilis results.

**Figure 24:** Reported HIV Risk Among HIV/ Gonorrhea Comorbid Males, Arizona, 1998-2008



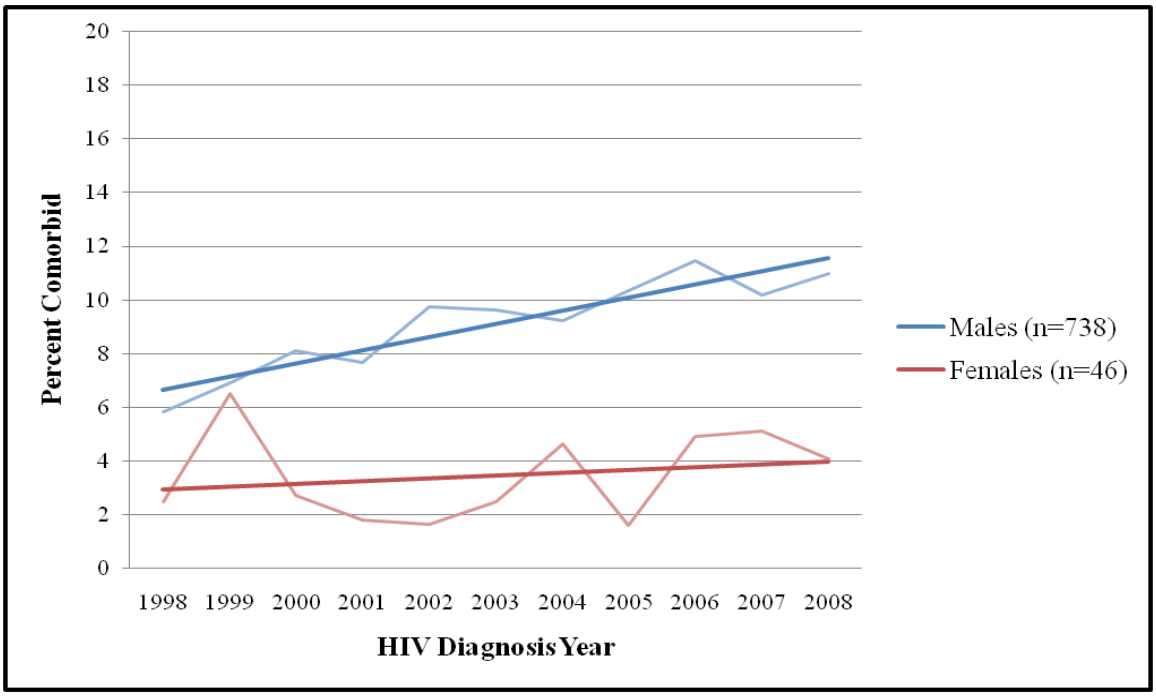
Among females with reports of both HIV and gonorrhea, 48.3% report injection drug use, compared to 31.9% among females with reports of HIV reports only. Again, these results are very similar to the HIV/Syphilis results and suggest that the same persons may have a higher risk of HIV/Gonorrhea comorbidity.

**Figure 25:** Reported HIV Risk Among HIV/Syphilis Comorbid Female, Arizona, 1998-2008



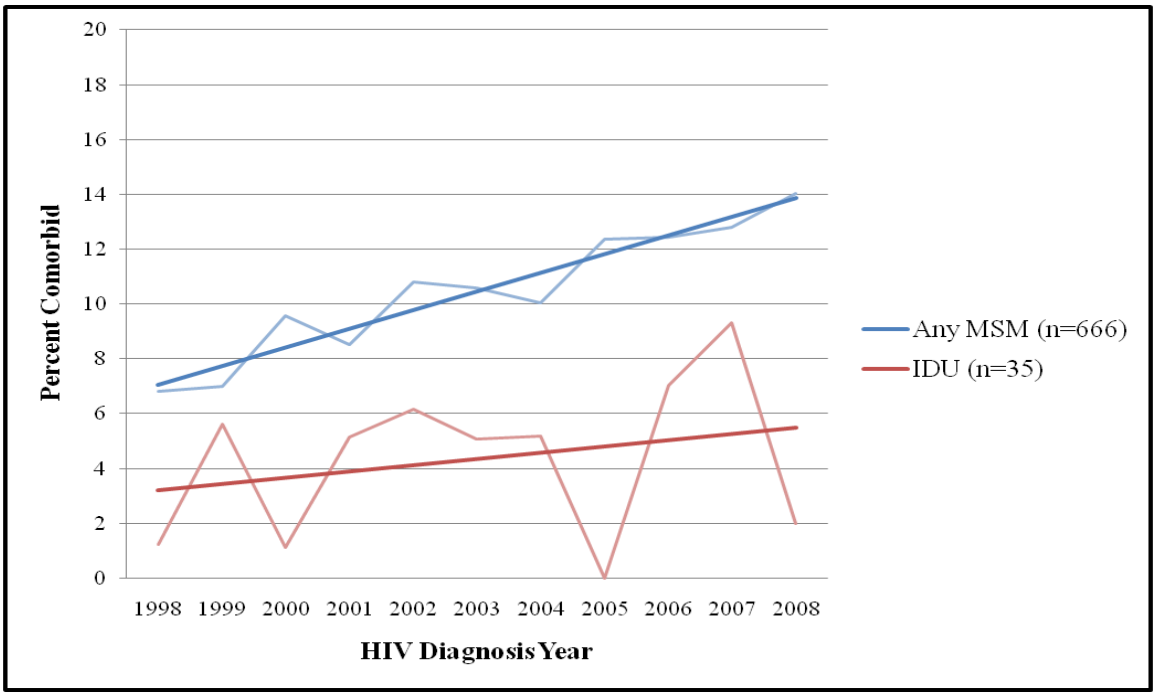
In recent years, an increased percentage of males who report a history of both HIV and gonorrhea infection have been observed. Approximately 5.9% of males diagnosed with HIV during 1998 reported a previous, concurrent or subsequent gonorrhea diagnosis; in 2008, this number increased to 10.4%.

**Figure 26:** Percentage of HIV Infected Persons with Reported History of Gonorrhea, 1998-2008



As shown in Figure 26, this increase appears to be primarily among males who report male-to-male sexual contact, but the increase is less pronounced than that seen in HIV/Syphilis comorbidity among males who report male-to-male sexual contact in the same time period.

**Figure 27:** HIV Transmission Category-Specific HIV Infected Males with Reported History of Gonorrhea, Arizona, 1998-2008



An analysis of the percentage of persons diagnosed with gonorrhea who had a previously reported HIV diagnosis was conducted. Persons diagnosed with gonorrhea were considered to be previously infected with HIV if they had been diagnosed with HIV more than 60 days prior to one or more gonorrhea diagnoses. (A case's gonorrhea diagnosis year was obtained from the first gonorrhea diagnosis date after HIV diagnosis if the case was HIV coinfected and the most recent gonorrhea diagnosis date if the case was not HIV coinfected).

**Figure 28:** Percentage of Persons with Gonorrhea Diagnosis with Prior HIV Diagnosis, Arizona, 1998-2008

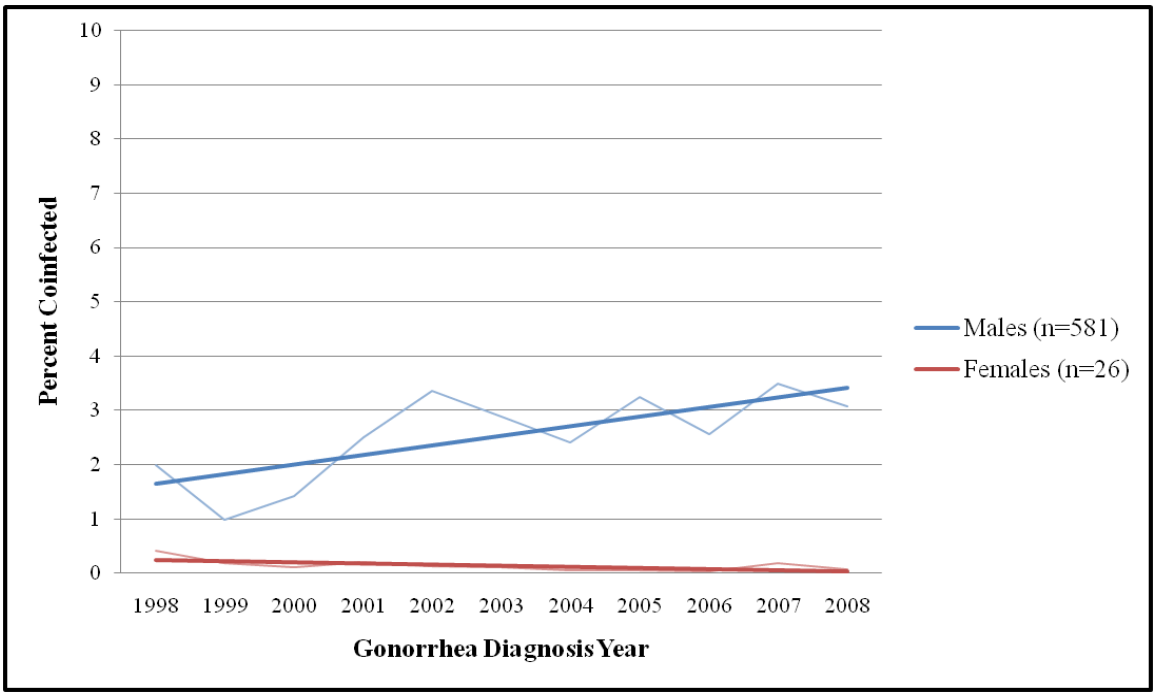


**Table 31:** Percentage of Persons with Gonorrhea Diagnosis with Prior HIV Diagnosis, Arizona, 1998-2008

| Year of Gonorrhea Diagnosis | Males | | | Females | | |
|---|---|---|---|---|---|---|
| | Number of Gonorrhea Cases | Number with Previous HIV Diagnosis* | Percent Coinfected | Number of Gonorrhea Cases | Number with Previous HIV Diagnosis* | Percent Coinfected |
| 1998 | 2104 | 42 | 2.00 | 1452 | 6 | 0.41 |
| 1999 | 2234 | 22 | 0.98 | 1560 | 3 | 0.19 |
| 2000 | 2169 | 31 | 1.43 | 1632 | 2 | 0.12 |
| 2001 | 1794 | 45 | 2.51 | 1411 | 3 | 0.21 |
| 2002 | 1936 | 65 | 3.36 | 1573 | 2 | 0.13 |
| 2003 | 2154 | 62 | 2.88 | 1863 | 2 | 0.11 |
| 2004 | 1910 | 46 | 2.41 | 1709 | 1 | 0.06 |
| 2005 | 2132 | 69 | 3.24 | 1874 | 1 | 0.05 |
| 2006 | 2488 | 64 | 2.57 | 2372 | 1 | 0.04 |
| 2007 | 2375 | 83 | 3.49 | 2143 | 4 | 0.19 |
| 2008 | 1690 | 52 | 3.08 | 1509 | 1 | 0.07 |

*HIV diagnosed more than 60 days before gonorrhea diagnosis

This analysis shows an increase in the amount of males who report a gonorrhea infection and a previous HIV infection; this number increased from 2.0% in 2002 to a peak of 3.5% in 2007. As shown in Figure 28, the majority of these coinfected males report male-to-male sexual contact, although large year-on-year variance makes interpretation of the data difficult. This analysis suggests that male-to-male sexual contact may not play as large a role in HIV/Gonorrhea coinfection as seen in HIV/Syphilis coinfection, but MSM do appear to be at particularly high risk of both and may benefit from additional prevention and partner services efforts.

**Figure 29:** HIV Transmission Category and Male-Specific Gonorrhea Diagnosis with Prior HIV Diagnosis by Transmission Category, Arizona, 1998-2008

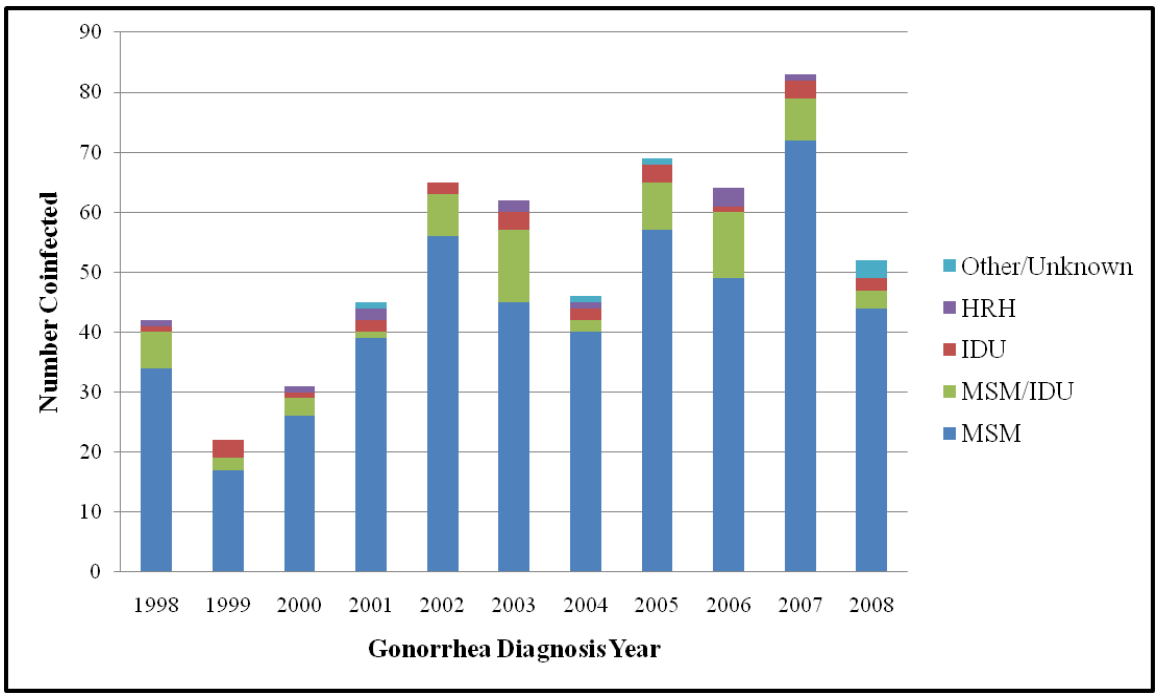


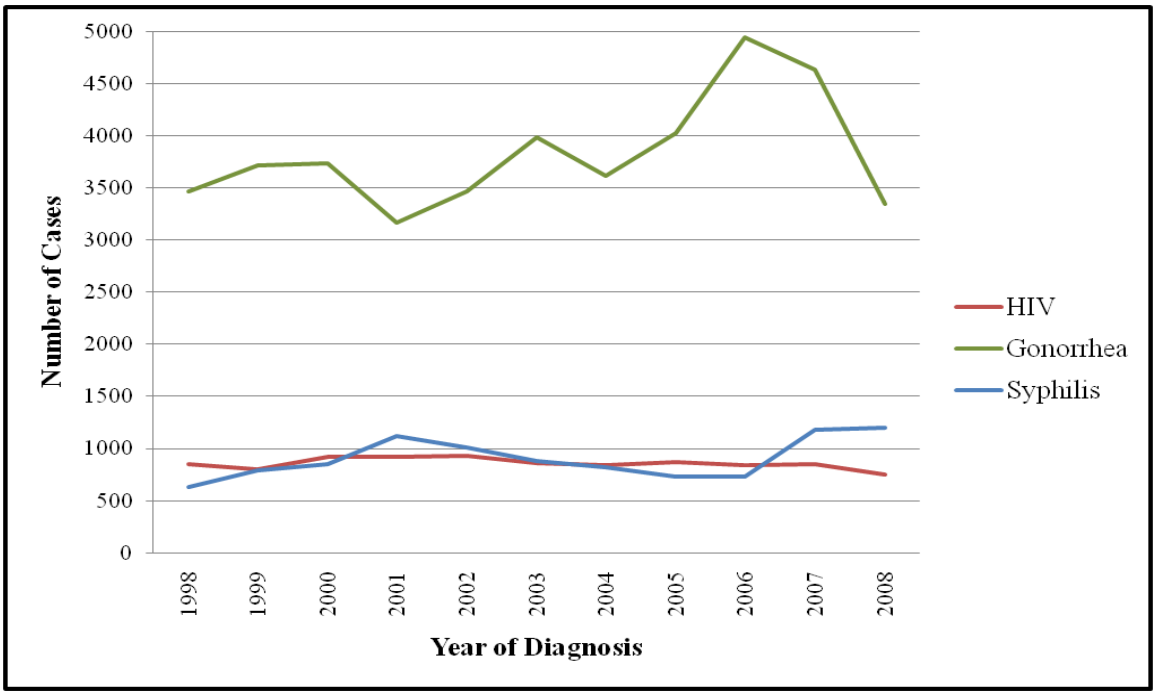

**Table 32:** HIV Transmission Category and Male-Specific Gonorrhea Diagnosis with Prior HIV Diagnosis by Transmission Category, Arizona, 1998-2008

| Year of Gonorrhea Diagnosis | Number HIV/Gonorrhea Coinfected* | | | | |
|---|---|---|---|---|---|
| | MSM | MSM/IDU | IDU | HRH | Other/ Unknown |
| 1998 | 34 | 6 | 1 | 1 | 0 |
| 1999 | 17 | 2 | 3 | 0 | 0 |
| 2000 | 26 | 3 | 1 | 1 | 0 |
| 2001 | 39 | 1 | 2 | 2 | 1 |
| 2002 | 56 | 7 | 2 | 0 | 0 |
| 2003 | 45 | 12 | 3 | 2 | 0 |
| 2004 | 40 | 2 | 2 | 1 | 1 |
| 2005 | 57 | 8 | 3 | 0 | 1 |
| 2006 | 49 | 11 | 1 | 3 | 0 |
| 2007 | 72 | 7 | 3 | 1 | 0 |
| 2008 | 44 | 3 | 2 | 0 | 3 |
| Total | 479 | 62 | 23 | 11 | 6 |

*HIV diagnosed more than 60 days before gonorrhea diagnosis

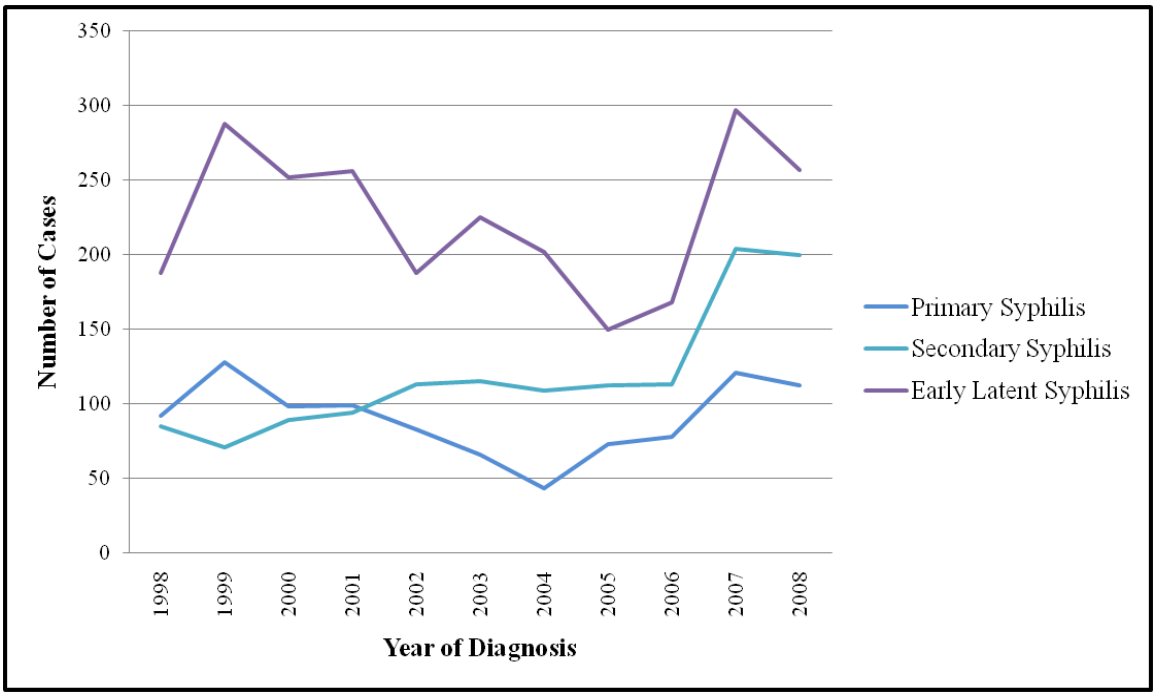
HIV comorbidity with both syphilis and gonorrhea in males was observed in increasing numbers over time, particularly HIV/Syphilis comorbidity among those reporting male-to-male sexual contact. The graphs below show the overall number of HIV, gonorrhea and syphilis cases reported from 1998-2008.

**Figure 30:** Number of HIV, Incident Syphilis and Gonorrhea Reports, 1998-2008




From 1998-2008, the number of HIV, gonorrhea and syphilis reports generally followed a cyclical pattern; although gonorrhea had a particularly wide swing from 2004-2008. There was also an increase in primary, secondary and early latent syphilis cases, starting in 2005, 2007 and 2005, respectively. This roughly corresponds to the upswing in the percentage of male primary, secondary and early latent syphilis cases coinfected with HIV; during that same time period, the number of HIV reports decreased slightly (Note: the graph shows all reports of HIV in Arizona, not just those who became classified as Arizona incident cases). The trends were similar when limited to males only (data not shown).

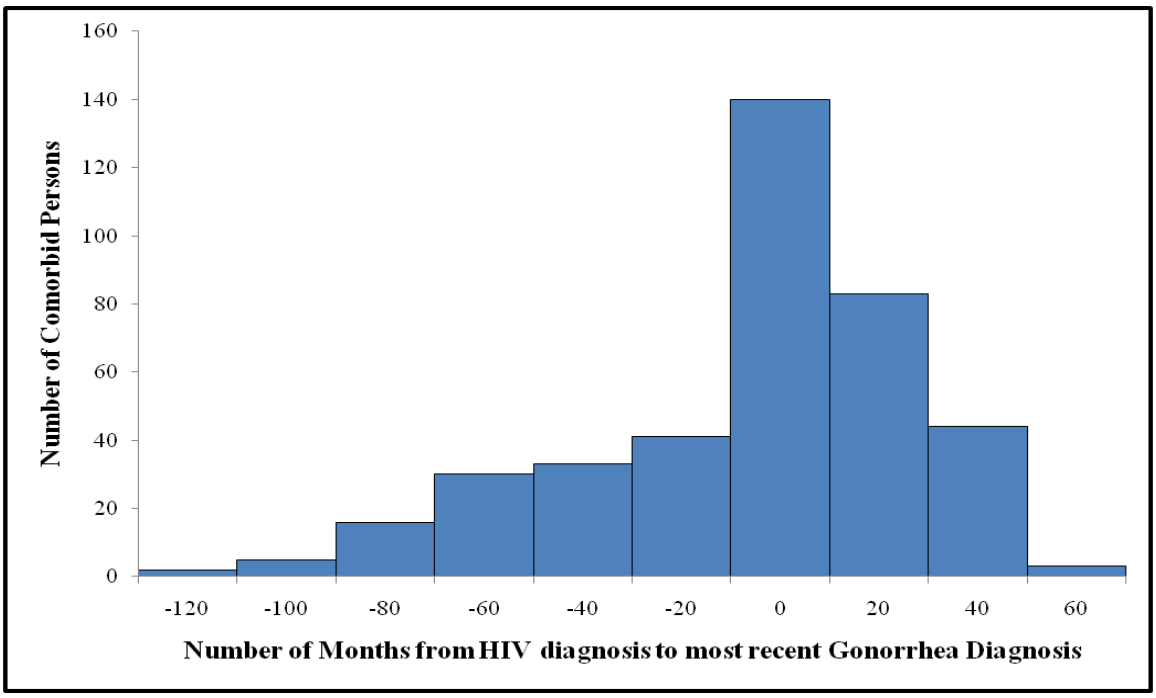
**Figure 31:** Number of Primary, Secondary, and Early Latent Syphilis Reports, 1998-2008




The distribution of the number of months between HIV diagnosis and most recent gonorrhea diagnosis for comorbid persons was determined for persons with a reported gonorrhea history who were diagnosed with HIV from 2004-2008.

The median number of months from HIV diagnosis to the most recent gonorrhea diagnosis was 3 months before HIV diagnosis, with a mean of 14.1 months before HIV diagnosis (Sample size = 397 persons.) The most common number of months from HIV diagnosis to the most recent gonorrhea diagnosis was 0 months. This analysis suggests that the majority of comorbid persons diagnosed with gonorrhea are diagnosed before HIV diagnosis. Given that gonorrhea infection often manifests symptoms sooner after infection than HIV (particularly in men); the data suggest that Gonorrhea diagnosis may serve as a sentinel event for HIV diagnosis.

**Figure 32:** Distribution of Time Lapse in Months Between Earliest HIV Diagnosis and Most Recent Gonorrhea Diagnosis Among HIV/ Gonorrhea Comorbid Persons, Arizona, 2004-2008



**HIV and Chlamydia:**

Among persons reported in Arizona with HIV/AIDS or Chlamydia from 1998-2008, 525 persons with reported HIV/AIDS infection and a previous, concurrent or subsequent reported Chlamydia infection were identified. Of all reported HIV/AIDS cases from 1998-2008, 2.2% had a history of Chlamydia infection.

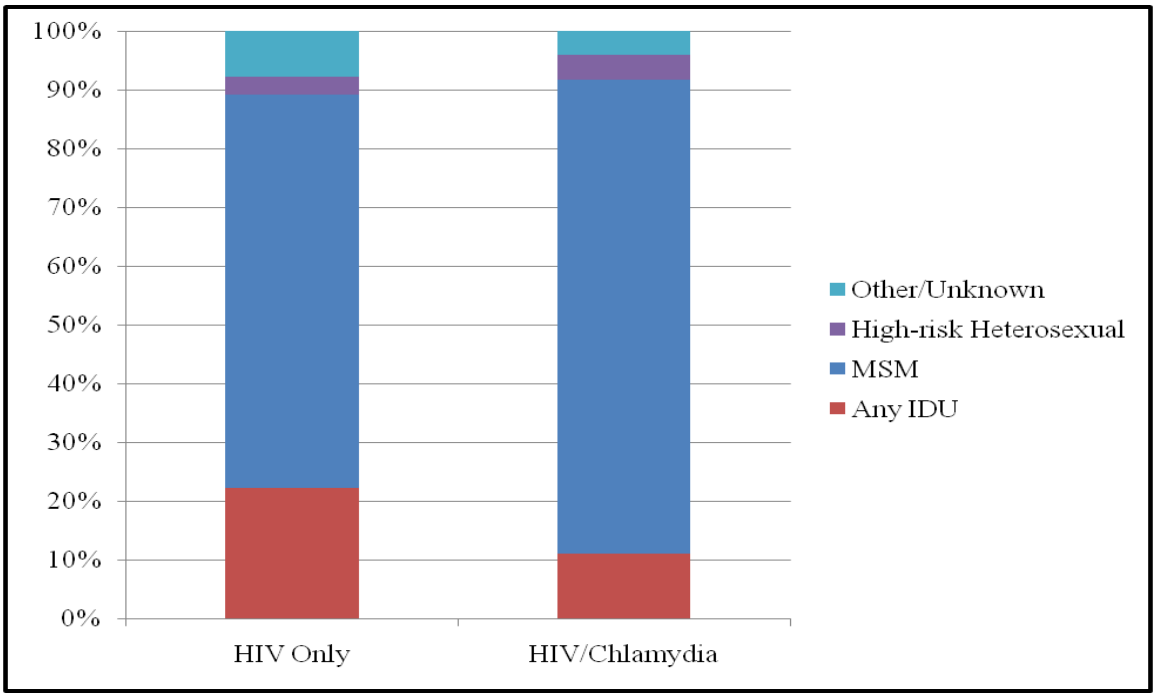
Among persons with a reported Chlamydia history, approximately 1.0% of males and 0.1% of females had a previous, concurrent or subsequent HIV infection. The odds of HIV infection report among persons with a history of Chlamydia are approximately the same as the general population for both males and females. Results of this analysis are reported in Table 33.

**Table 33:** Counts, Rates and Odds of HIV Infection among Persons with Reported Chlamydia History, Arizona, 1998-2008

| | Males | Females |
|---|---|---|
| **Total Population** | 2,821,759 | 2,823,767 |
| **HIV infection only** | 20,712 | 2,826 |
| **Chlamydia history only** | 39,857 | 117,656 |
| **HIV infection and Chlamydia history** | 402 | 123 |
| **Estimated rate of HIV infection report** | 748 per 100,000 | 100 per 100,000 |
| **Estimated rate of Chlamydia history report** | 1,427 per 100,000 | 4,171 per 100,000 |
| **Estimated HIV infection report rate among persons with Chlamydia reported history** | 999 per 100,000 | 104 per 100,000 |
| **Estimated Chlamydia history report rate among persons with reported HIV infection** | 1,904 per 100,000 | 4,352 per 100,000 |
| **Estimated odds of reported HIV infection with Chlamydia history** | 1.3 | 1.0 |

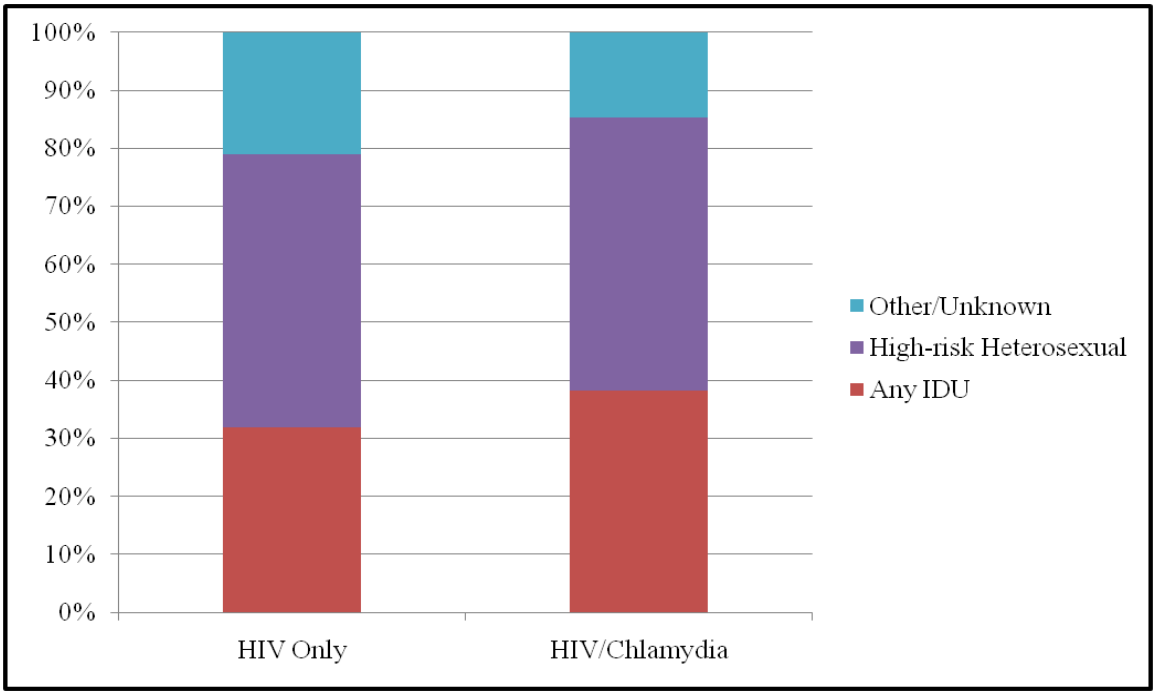
Among males with reports of both HIV and Chlamydia, 80.9% are men who have sex with men, compared to 67.0% MSM among males diagnosed with HIV only. These results are almost identical to the HIV/Syphilis and HIV/Gonorrhea results. However, among males reporting both HIV and Chlamydia, 4.2% were men reporting high-risk heterosexual behavior, compared to 2.9% among males diagnosed with HIV only. This contrasts with the HIV/Syphilis results (1.8% HRH among HIV/Syphilis males and 3.0% among HIV only males) and HIV/Gonorrhea results (2.1% HRH among HIV/Gonorrhea males and 3.0% among HIV only males).

**Figure 33:** Reported HIV Risk Among HIV/ Chlamydia Comorbid Males, Arizona, 1998-2008



Among females with reports of both HIV and Chlamydia, 38.2% report injection drug use, compared to 31.9% among females diagnosed with HIV only. This discrepancy is not as large as among HIV/Syphilis and HIV/Gonorrhea females. The data suggest that while some groups maybe at higher risk of HIV/Chlamydia comorbidity, overall there is not a large association between HIV diagnosis and a history of Chlamydia.

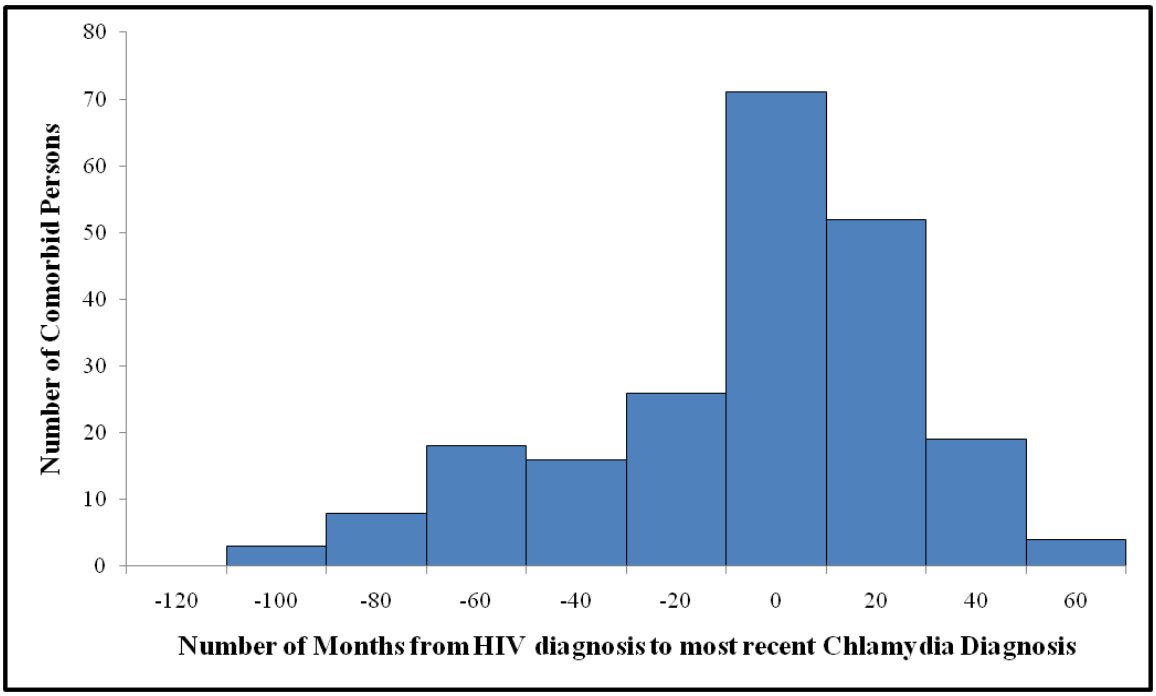
**Figure 34:** Reported HIV Risk Among HIV/Chlamydia Comorbid Females, Arizona, 1998-2008



The distribution of the number of months between HIV diagnosis and most recent Chlamydia diagnosis for comorbid persons was determined for persons with a reported Chlamydia history who were diagnosed with HIV from 2004-2008.

The median number of months from HIV diagnosis to the most recent Chlamydia diagnosis was 1 month before HIV diagnosis, with a mean of 13.5 months before HIV diagnosis (Sample size =217 persons.) The most frequent number of months from HIV diagnosis to the most recent Chlamydia diagnosis was 0 months. The data suggest that the majority of comorbid persons diagnosed with Chlamydia are diagnosed before HIV diagnosis.

**Figure 35:** Distribution of Time Lapse in Months Between Earliest HIV Diagnosis and Most Recent Chlamydia Diagnosis Among HIV/Chlamydia Comorbid Persons, Arizona, 2004-2008



**HIV and Herpes:**

Among persons reported in Arizona with HIV/AIDS or herpes from 1998-2008, 137 persons with reported HIV/AIDS infection and a previous, concurrent or subsequent reported herpes infection were identified. Of all reported HIV/AIDS cases from 1998-2008, only 0.6% had a reported herpes history. The small number of persons with reports of both HIV and herpes (137 persons over an 11-year period) make it difficult to draw reliable conclusions from the data. Herpes is not a laboratory-reportable disease in Arizona (except for neonatal herpes), and it is likely that underreporting occurs.

**HIV and Hepatitis C:**

Among persons reported in Arizona with HIV/AIDS or Hepatitis C from 1998-2008, 1,173 persons with an HIV/AIDS infection and a previous, concurrent or subsequent reported Hepatitis C infection were identified. Of all reported HIV/AIDS cases from 1998-2008, 4.9% had a reported chronic Hepatitis C history. These results suggest that Hepatitis C is the most common co-occurring infection amongst persons with a diagnosis of HIV in Arizona.

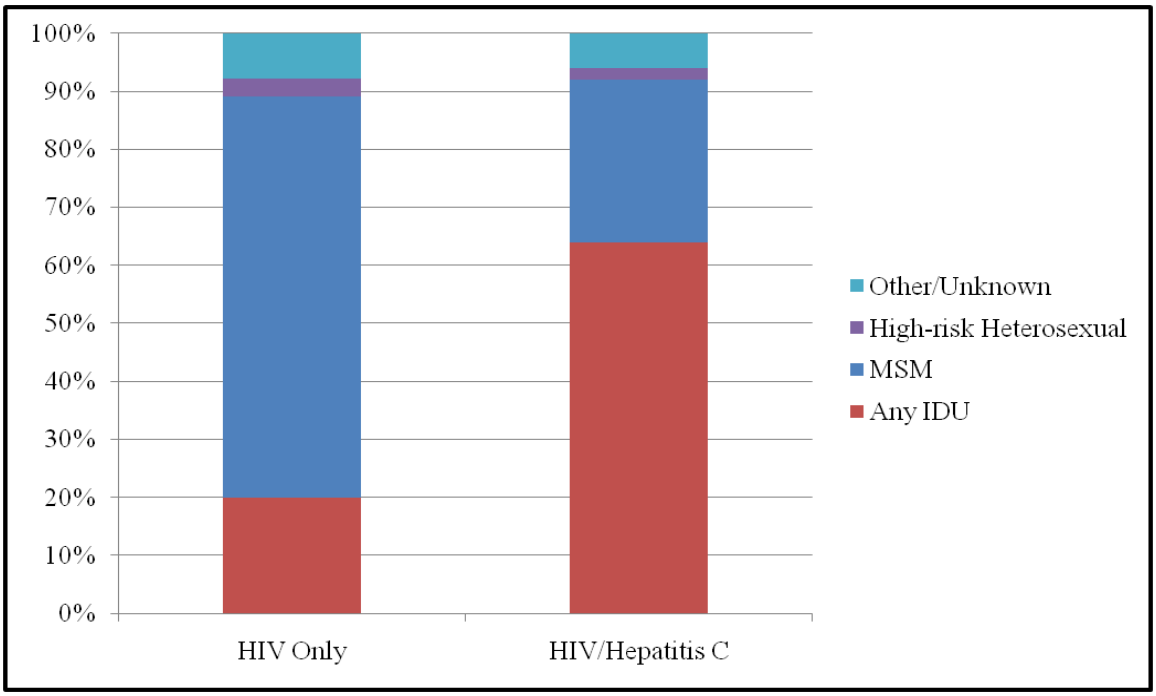
Among persons with a Hepatitis C diagnosis, approximately 2.9% of males and 1.1% of females had a report of HIV infection. The odds of HIV infection report among persons with a history of Hepatitis C diagnosis are approximately 4 times higher than the general population for males and 11 times higher than the general population for females. The fact that females have higher odds of reported HIV infection with a Hepatitis C history than males differs from the previously discussed HIV/STD comorbidity results. It is likely due to the fact that a higher proportion of females with HIV report injection drug use than HIV positive males. Results of this analysis are reported in Table 34.

**Table 34:** Counts, Rates and Odds of HIV Infection among Persons with Reported Hepatitis C History, 1998-2008

| | Males | Females |
|---|---|---|
| **Total Population** | 2,821,759 | 2,823,767 |
| **HIV infection only** | 20,124 | 2,643 |
| **Hepatitis C history only** | 33,346 | 16,738 |
| **HIV infection and Hepatitis C history** | 990 | 183 |
| **Estimated rate of HIV infection report** | 748 per 100,000 | 100 per 100,000 |
| **Estimated rate of Hepatitis C history report** | 1,216 per 100,000 | 599 per 100,000 |
| **Estimated HIV infection report rate among persons with Hepatitis C reported history** | 2,883 per 100,000 | 1,082 per 100,000 |
| **Estimated Hepatitis C history report rate among persons with reported HIV infection** | 4,687 per 100,000 | 6,476 per 100,000 |
| **Estimated odds of reported HIV infection with Hepatitis C history** | 3.9 | 10.8 |

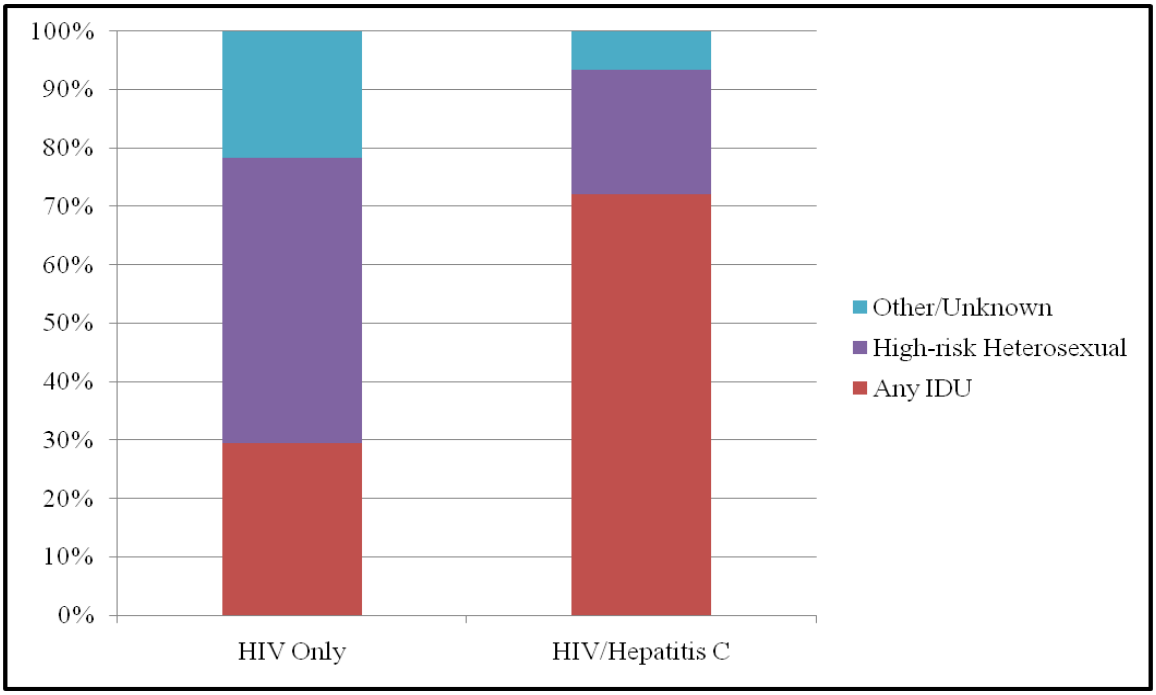
Among males diagnosed with both HIV and Hepatitis C, 63.9% report injection drug use, compared to 20.0% of males with HIV only. This is consistent with documented modes of Hepatitis C transmission.

**Figure 36:** Reported HIV Risk Among HIV/ Hepatitis C Coinfected Males, Arizona, 1998-2008



Among females with reports of both HIV and Hepatitis C, 72.1% report injection drug use, compared to 29.4% among females with reports of HIV only. Again, these results are consistent with documented modes of Hepatitis C transmission and suggest that injection drug users of both genders are at higher risk for HIV/Hepatitis C coinfection. Among the 5,562 persons reporting injection drug use and HIV infection from 1998-2008, 765 (13.8%) also reported Hepatitis C infection. It is estimated that approximately 15-30% of persons living with HIV are co-infected with Hepatitis C; this estimate increases to 50-90% among injection drug users living with HIV (HRSA).

**Figure 37:** Reported HIV Risk Among HIV/Hepatitis C Coinfected Females, Arizona, 1998-2008



The percentage of HIV cases with a previous, concurrent or subsequent Hepatitis C infection have remained mostly constant and reveal few gender differences. Large year-on-year variations and small sample sizes make trends difficult to identify.

**Figure 38:** Percentage of HIV Infected Persons with Reported History of Hepatitis C, Arizona, 1998-2008

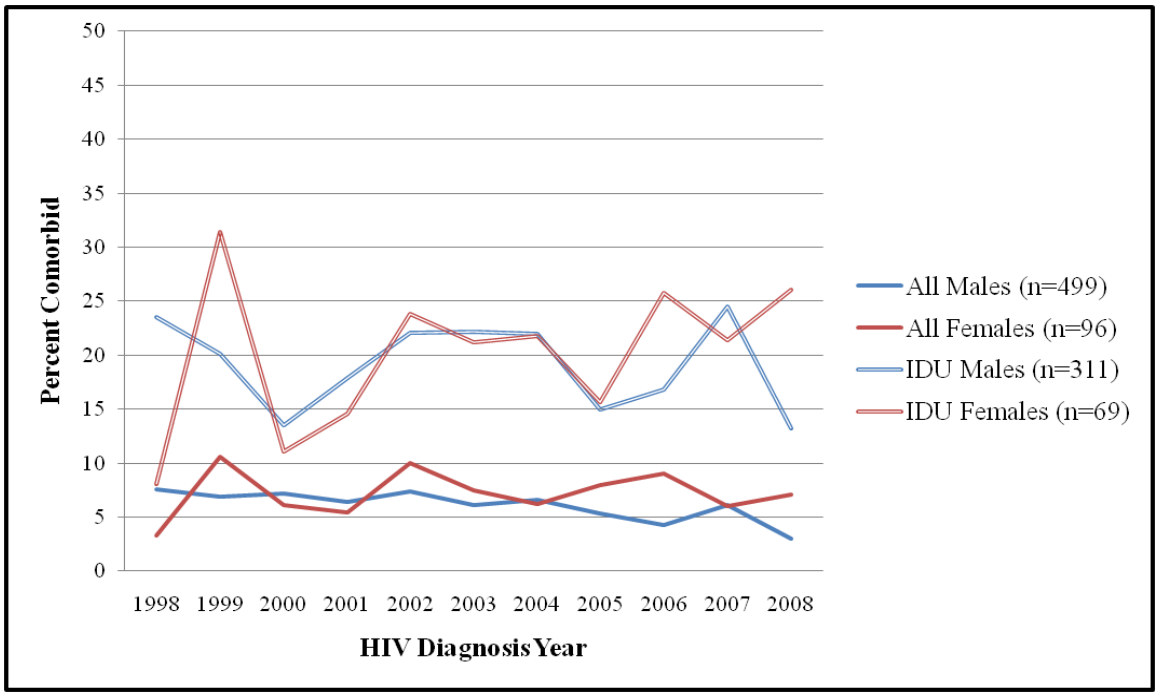


**Table 35:** Percentage of HIV Infected Persons with Reported History of Hepatitis C, Arizona, 1998-2008

| Year of HIV Diagnosis | Males | | | Females | | |
|---|---|---|---|---|---|---|
| | Number of HIV Cases | Number of HIV and Hepatitis C* Cases | Percent Coinfected | Number of HIV Cases | Number of HIV and Hepatitis C* Cases | Percent Coinfected |
| 1998 | 734 | 56 | 7.63 | 121 | 4 | 3.31 |
| 1999 | 681 | 47 | 6.90 | 123 | 13 | 10.57 |
| 2000 | 776 | 56 | 7.22 | 146 | 9 | 6.16 |
| 2001 | 810 | 52 | 6.42 | 111 | 6 | 5.41 |
| 2002 | 811 | 60 | 7.40 | 120 | 12 | 10.00 |
| 2003 | 738 | 45 | 6.10 | 120 | 9 | 7.50 |
| 2004 | 715 | 47 | 6.57 | 129 | 8 | 6.20 |
| 2005 | 744 | 40 | 5.38 | 125 | 10 | 8.00 |
| 2006 | 723 | 31 | 4.29 | 122 | 11 | 9.02 |
| 2007 | 735 | 45 | 6.12 | 117 | 7 | 5.98 |
| 2008 | 656 | 20 | 3.05 | 98 | 7 | 7.14 |

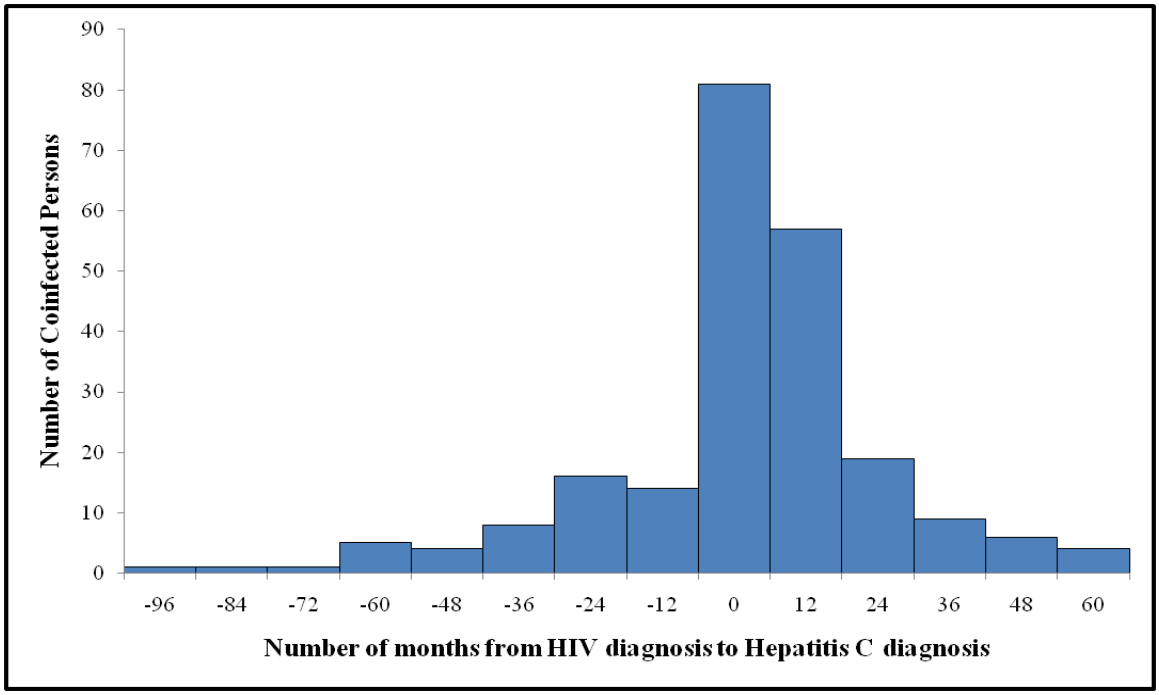
**Table 36:** Percentage of HIV Infected Persons with Reported History of Hepatitis C and IDU, Arizona, 1998-2008

| Year of HIV Diagnosis | IDU Males | | | IDU Females | | |
|---|---|---|---|---|---|---|
| | Number of HIV Cases | Number of HIV and Hepatitis C* Cases | Percent Coinfected | Number of HIV Cases | Number of HIV and Hepatitis C* Cases | Percent Coinfected |
| 1998 | 166 | 39 | 23.49 | 37 | 3 | 8.11 |
| 1999 | 169 | 34 | 20.12 | 35 | 11 | 31.43 |
| 2000 | 178 | 24 | 13.48 | 45 | 5 | 11.11 |
| 2001 | 179 | 32 | 17.88 | 41 | 6 | 14.63 |
| 2002 | 190 | 42 | 22.11 | 42 | 10 | 23.81 |
| 2003 | 167 | 37 | 22.16 | 33 | 7 | 21.21 |
| 2004 | 132 | 29 | 21.97 | 23 | 5 | 21.74 |
| 2005 | 134 | 20 | 14.93 | 32 | 5 | 15.63 |
| 2006 | 119 | 20 | 16.81 | 31 | 8 | 25.81 |
| 2007 | 94 | 23 | 24.47 | 14 | 3 | 21.43 |
| 2008 | 83 | 11 | 13.25 | 23 | 6 | 26.09 |

*HIV cases with Hepatitis C previously, concurrently or subsequently diagnosed

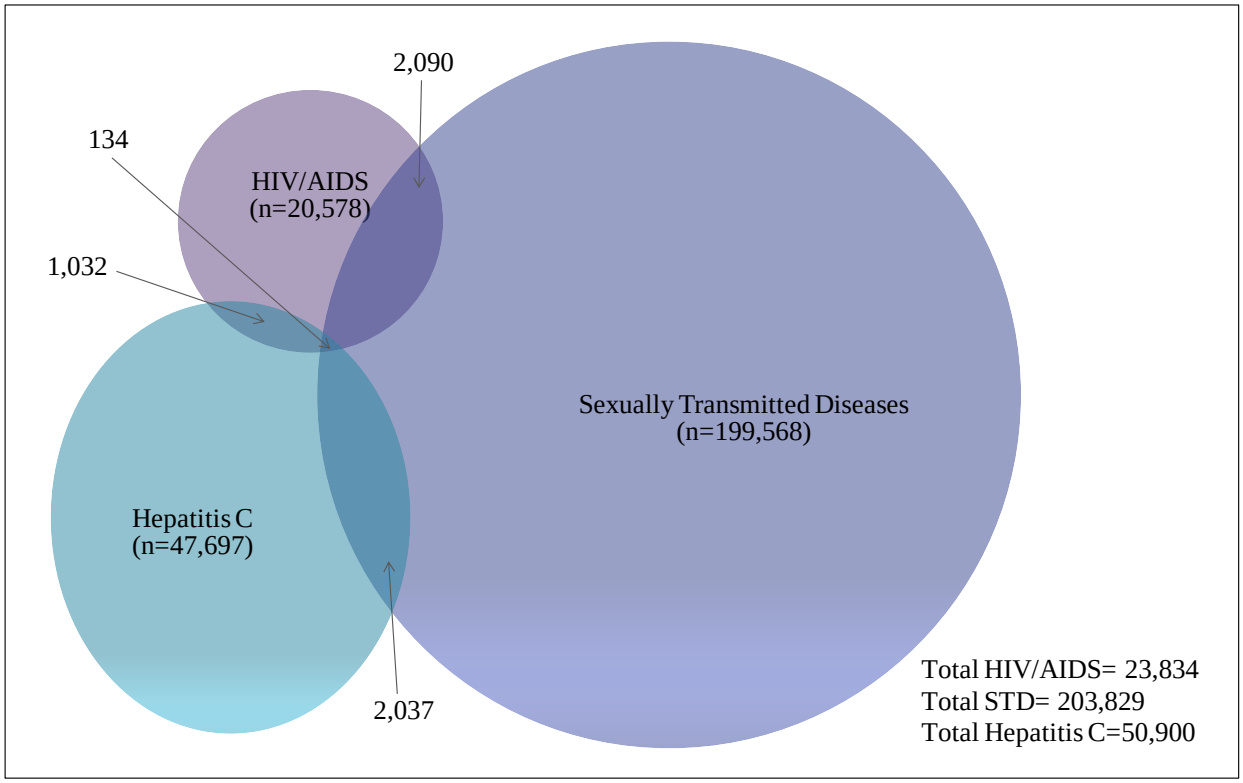
The median number of months from HIV diagnosis to Hepatitis C diagnosis was 0 months before HIV diagnosis, with a mean of 2.8 months before HIV diagnosis and a sample size of 226 persons. Most frequently, the most recent Hepatitis C diagnosis occurred at the same time as HIV diagnosis (28.3% of coinfected persons). Among coinfected persons who were not diagnosed with HIV and Hepatitis C at the same time, approximately 32.7% became aware of one infection within 12 months of becoming aware of the other. Both diseases have long latency periods, which makes the data is difficult to draw conclusions from; however this data suggest that approximately 61% of HIV/Hepatitis C coinfected persons received both diagnoses in the space of one year.

**Figure 39:** Distribution of Time Lapse in Months Between Earliest HIV Diagnosis and Hepatitis C Diagnosis Among HIV/Hepatitis C Coinfected Persons, Arizona, 2004-2008



In Arizona from 1998-2008, a total of 273,136 people were reported with HIV/AIDS, a sexually transmitted disease (syphilis, gonorrhea, chlamydia or herpes) or Hepatitis C. Approximately 16% of persons reported with HIV/AIDS in Arizona have a lifetime history of a sexually transmitted disease or Hepatitis C.

**Figure 40:** Lifetime Comorbidity Patterns Among Persons Diagnosed with HIV/AIDS, Sexually Transmitted Diseases or Hepatitis C, Arizona, 1998-2008



**HIV and Hepatitis B:**

Among persons reported in Arizona with HIV/AIDS or Hepatitis B from 1998-2008, 105 persons with HIV/AIDS infection and a previous, concurrent or subsequent reported acute Hepatitis B infection were identified. Of all reported HIV/AIDS cases from 1998-2008, 0.44% had a history of acute Hepatitis B infection.

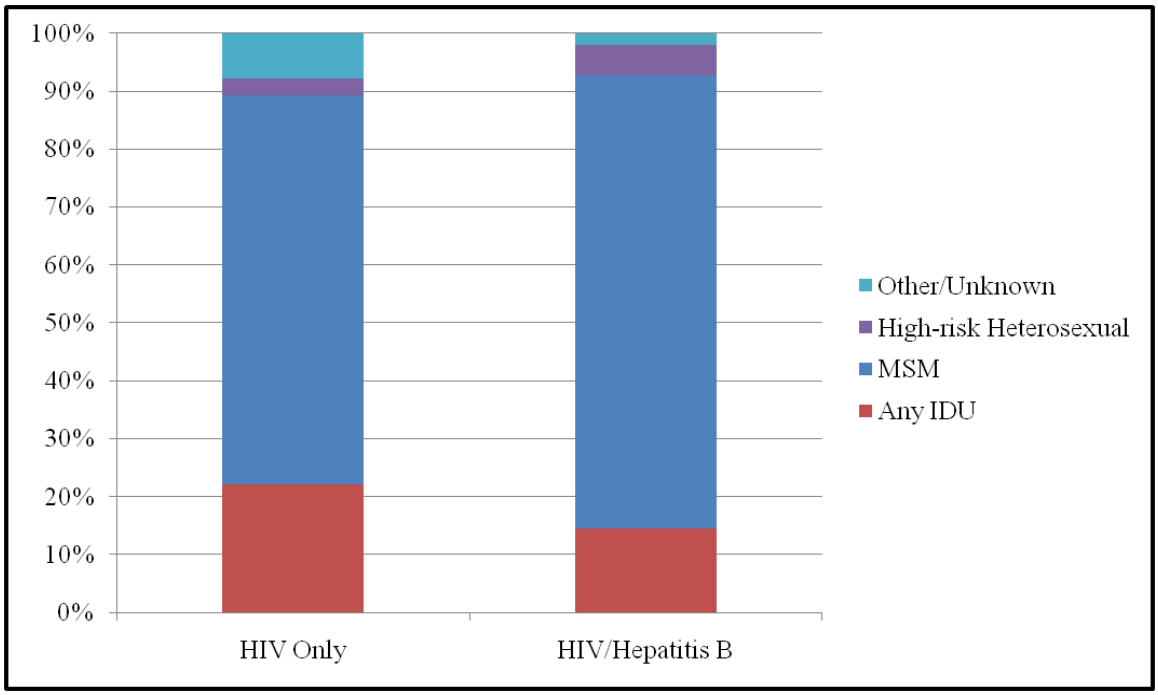
Among persons with a reported Hepatitis B history, approximately 6.5% of males and 0.9% of females had a report of HIV infection. The odds of HIV infection among persons with a history of Hepatitis B are approximately 9 times higher than the general population for both males and females. However, the small number of persons with reports of both HIV and Hepatitis B (105 persons over an 11-year period) make it difficult to draw conclusions. Results of this analysis are reported in Table 37.

**Table 37:** Counts, Rates and Odds of HIV Infection among Persons with Reported Acute Hepatitis B History, Arizona, 1998-2008

| | Males | Females |
|---|---|---|
| **Total Population** | 2,821,759 | 2,823,767 |
| **HIV infection only** | 21,018 | 2,817 |
| **Hepatitis B history only** | 1,386 | 990 |
| **HIV infection and Hepatitis B history** | 96 | 9 |
| **Estimated rate of HIV infection report** | 748 per 100,000 | 100 per 100,000 |
| **Estimated rate of Hepatitis B history report** | 53 per 100,000 | 35 per 100,000 |
| **Estimated HIV infection report rate among persons with Hepatitis B reported history** | 6,478 per 100,000 | 901 per 100,000 |
| **Estimated Hepatitis B history report rate among persons with reported HIV infection** | 455 per 100,000 | 319 per 100,000 |
| **Estimated odds of reported HIV infection with Hepatitis B history** | 8.7 | 9.0 |

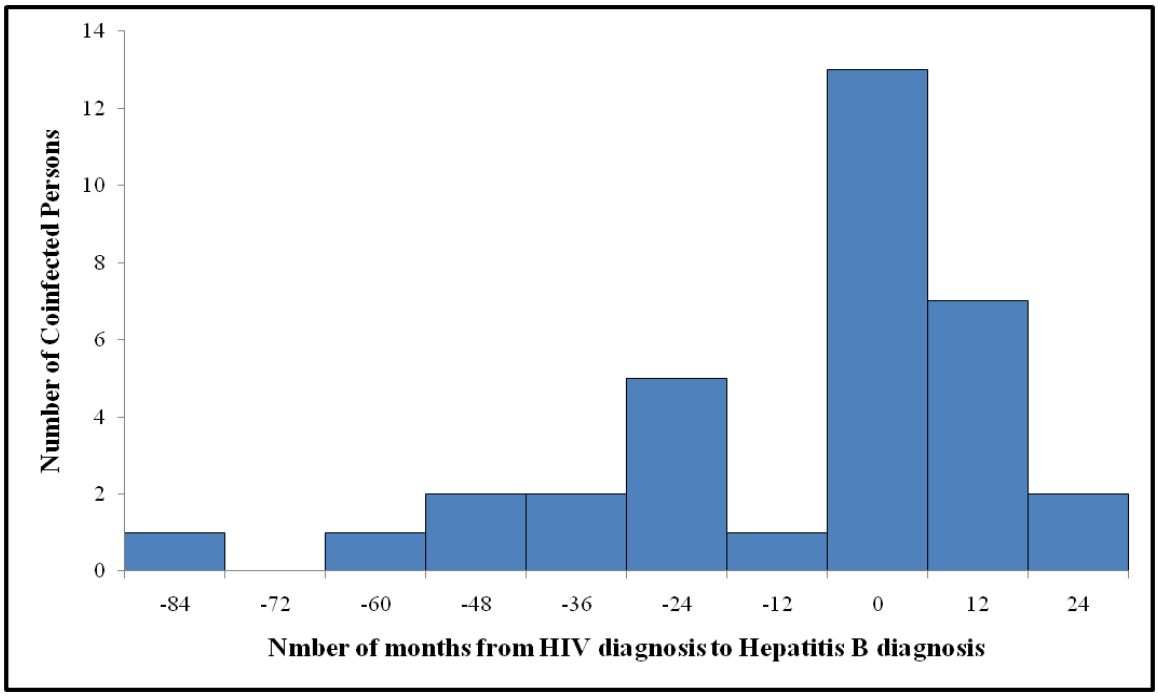
Among the 96 males with reports of both HIV and Hepatitis B, 14.6% report injection drug use and 78.1% report male-to-male sexual contact, compared to 22.1% of males with HIV only reporting injection drug use and 67.2% of males with HIV only reporting male-to-male sexual contact. Only nine females had reports of both HIV and Hepatitis B, so analysis was limited to males.

**Figure 41:** Reported HIV Risk Among HIV/ Hepatitis B Coinfected Males, Arizona, 1998-2008



The median number of months from HIV diagnosis to Hepatitis B diagnosis was 0 months before HIV diagnosis, with a mean of 13.8 months before HIV diagnosis (sample size=34). Most frequently, the most recent Hepatitis B diagnosis occurred at the same time as HIV diagnosis (26.5% of coinfected persons). Among comorbid persons who were not diagnosed with HIV and Hepatitis B at the same time, approximately 26.5% were diagnosed with Hepatitis B after 18 months of HIV diagnosis, and approximately 11.8% were diagnosed with Hepatitis B less than 12 months before HIV diagnosis.

**Figure 42:** Distribution of Time Lapse in Months Between HIV Diagnosis and Hepatitis B Diagnosis Among HIV/Hepatitis B Coinfected Persons, Arizona, 2004-2008



**HIV and Tuberculosis:**

Among persons reported in Arizona with HIV/AIDS or active tuberculosis (TB) from 1998-2008, 150 (0.63%) persons with HIV/AIDS infection had a concurrent or subsequent active TB infection. Only 3 persons with HIV (0.01%) reported an active TB infection prior to HIV diagnosis.

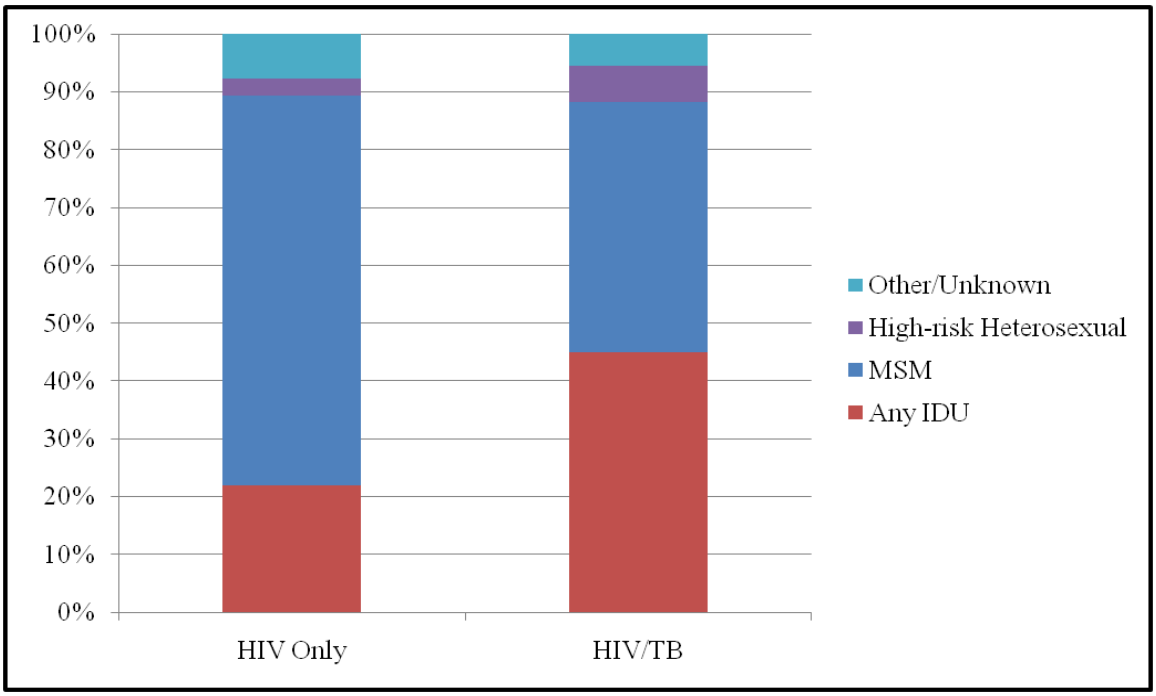
Among persons with a reported TB history, approximately 6.4% of males and 2.3% of females had a previous or concurrent HIV diagnosis. The odds of TB infection with a previous or concurrent HIV infection are approximately 9 times higher than the general population for males and 23 times higher than the general population for females. Results of this analysis are reported in Table 38.

**Table 38:** Counts, Rates and Odds of HIV Infection among Persons with Concurrent or Subsequent TB Infection, Arizona, 1998-2008

| | Males | Females |
|---|---|---|
| **Total Population** | 2,821,759 | 2,823,767 |
| **HIV infection only** | 20,987 | 2,803 |
| **TB history only** | 1,845 | 985 |
| **HIV with concurrent or subsequent TB infection** | 127 | 23 |
| **Estimated rate of HIV infection report** | 748 per 100,000 | 100 per 100,000 |
| **Estimated rate of TB history report** | 70 per 100,000 | 36 per 100,000 |
| **Estimated rate of previous or concurrent HIV infection report among persons with TB reported history** | 6,440 per 100,000 | 2,282 per 100,000 |
| **Estimated TB infection rate among persons with previous or concurrent HIV infection report** | 602 per 100,000 | 814 per 100,000 |
| **Estimated odds of reported TB infection with previous or concurrent HIV infection** | 8.6 | 22.8 |

Among the 127 males coinfected with HIV and TB, 44.9% report injection drug use, compared to 21.89% of males with HIV only. Among the 23 coinfected females, an increased proportion report injection drug use (39.1% coinfected females reported injection drug use compared to 32.1% of females with HIV only). The data should be interpreted with caution due the small number of HIV/TB coinfected females.

**Figure 43:** Reported HIV Risk Among HIV/TB Coinfected Males, Arizona, 1998-2008



Among the 150 persons coinfected with HIV and TB, higher proportions of Hispanics and Black Non-Hispanics were observed compared to persons infected with HIV only. The results were similar for males and females. The data suggest that injection drug users, Black Non-Hispanic and Hispanic persons may be at higher risk of HIV/TB coinfection. The age distribution of both groups were also analyzed and found to be nearly identical (data not shown).

**Figure 44:** Reported Race/Ethnicity Among HIV/TB Coinfected Persons, Arizona, 1998-2008

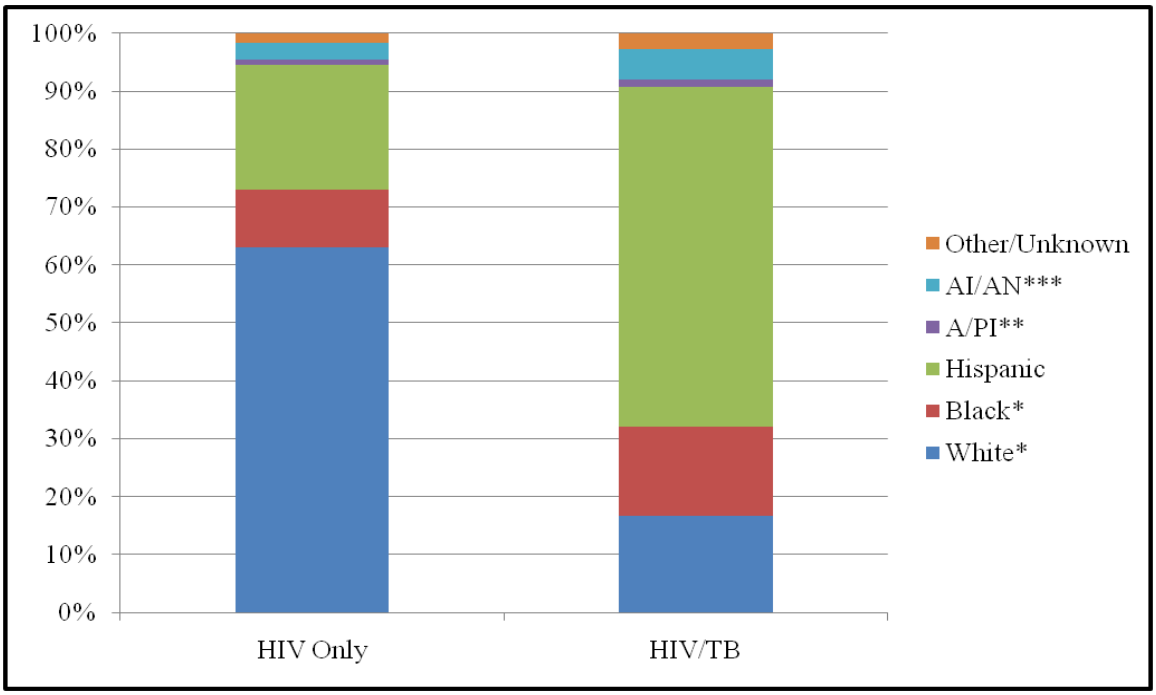



**Table 39:** Reported Race/Ethnicity Among HIV/TB Coinfected Persons, Arizona, 1998-2008

| Race/Ethnicity | HIV Only | HIV/TB |
|---|---|---|
| White* | 63.0% | 16.7% |
| Black* | 10.1% | 15.3% |
| Hispanic | 21.5% | 58.7% |
| A/PI** | 0.8% | 1.3% |
| AI/AN*** | 3.0% | 5.3% |
| Other/Unknown | 1.7% | 2.7% |

*Non-Hispanic
**Asian/Pacific Islander (Non-Hispanic)
**American Indian/Alaska Native (Non-Hispanic)

Among the 150 persons coinfected with HIV and TB, 86 (57.3%) reported a country of origin other than the United States, compared to 9.8% of persons with HIV only. Among persons reporting a country of origin other than the United States, Mexico is the most commonly reported country of origin among both those coinfected with HIV and TB (68.6%) and those infected with HIV only (58.3%).

**Figure 45:** Reported Country of Origin Among HIV/TB Coinfected Persons, Arizona, 1998-2008

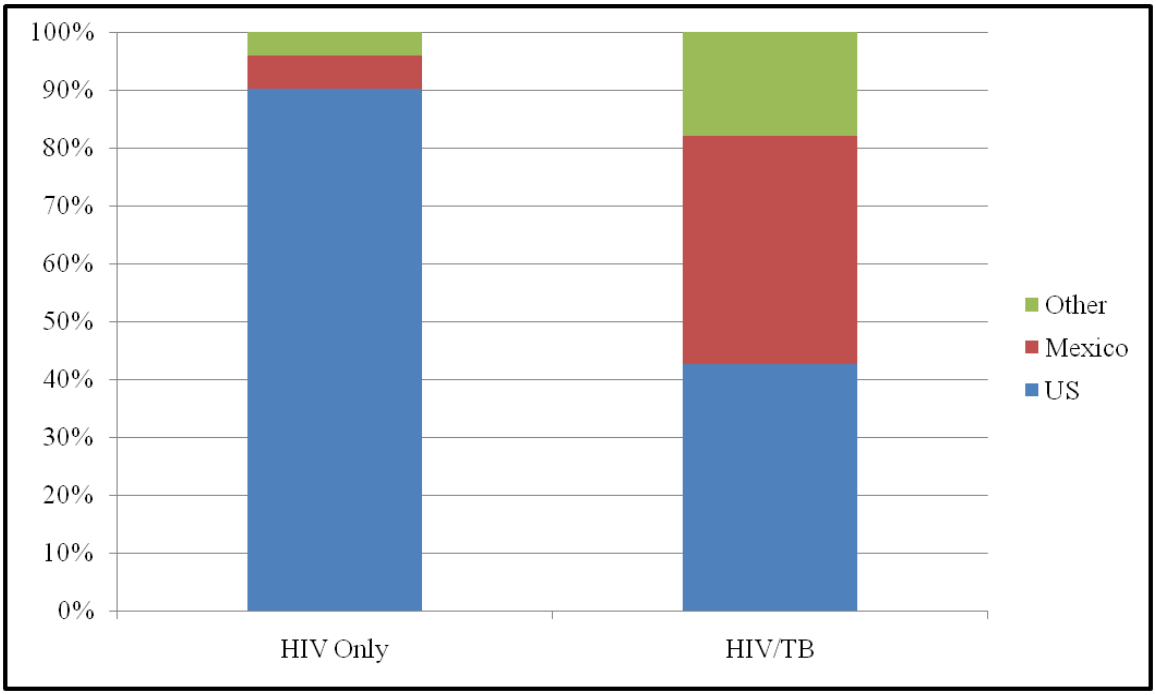
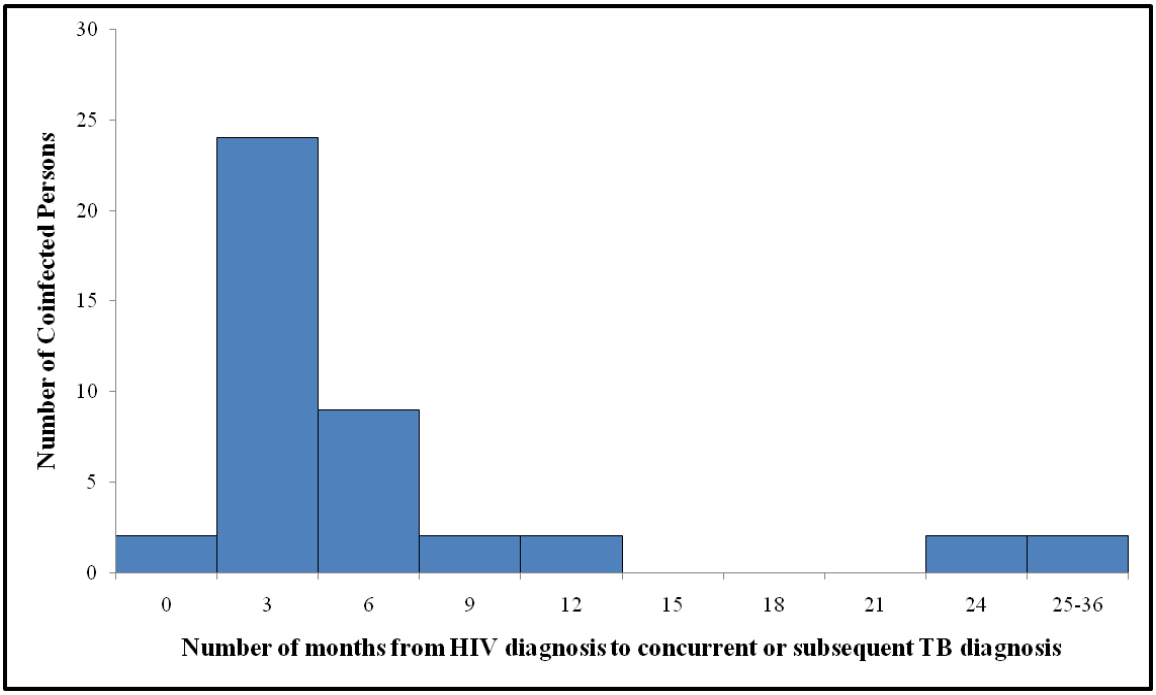



**Table 40:** Reported Country of Origin Among HIV/TB Coinfected Persons, Arizona, 1998-2008

| Country of Origin | HIV Only | HIV/TB |
|---|---|---|
| United States | 90.2% | 42.7% |
| Mexico | 5.7% | 39.3% |
| Other | 4.1% | 18.0% |

The median number of months from HIV diagnosis to concurrent or subsequent TB diagnosis was 3 months after HIV diagnosis, with a mean of 5.6 months after HIV diagnosis (Sample size = 43 persons). Most frequently, the most recent TB diagnosis occurred 1 month after HIV diagnosis (23.2% of coinfected persons). Among coinfected persons, 26 (60.5%) were diagnosed with TB within 3 months of HIV diagnosis, and 35 (81.4%) were diagnosed with TB within 6 months of HIV diagnosis. The data is difficult to draw conclusions from due to the long latency periods of HIV, but it does suggest that the majority of persons coinfected with HIV and TB receive their TB diagnosis shortly after receiving their HIV diagnosis.

**Figure 46:** Distribution of Time Lapse in Months Between Earliest HIV Diagnosis and Most Recent TB Diagnosis Among HIV/TB Coinfected Persons, Arizona, 2004-2008



**HIV and Coccidioidomycosis:**

Among persons reported in Arizona with HIV/AIDS or Coccidioidomycosis (Cocci) from 1998-2008, 1097 (4.58%) persons with reported HIV infection had a concurrent or subsequent Cocci infection. Only 37 persons with HIV (0.15%) reported a Cocci infection prior to HIV diagnosis. These results suggest that Cocci is the second most commonly co-occurring infection among persons reported with HIV in Arizona, after Hepatitis C.

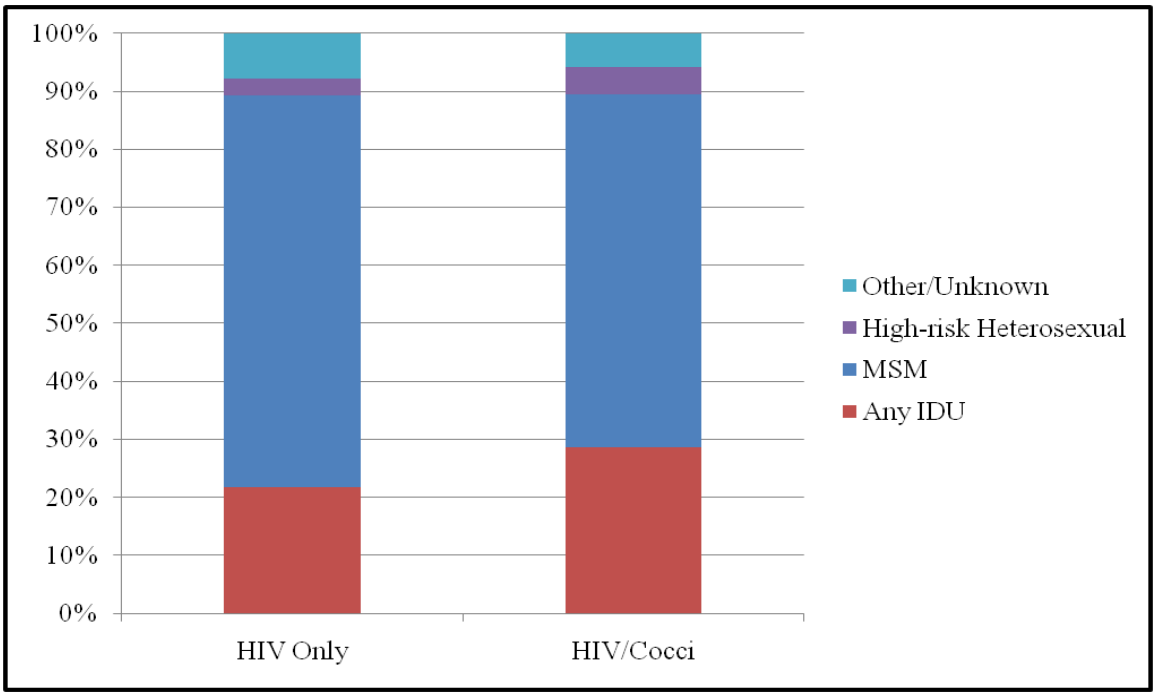
Among persons with a reported Cocci history, approximately 4.7% of males and 0.7% of females had a previous or concurrent report of HIV infection. The odds of Cocci infection with a previous or concurrent HIV infection are approximately 6 times higher than the general population for males and 7 times higher than the general population for females. When the analysis is limited to persons diagnosed with HIV and/or Cocci before age 50, approximately 8.4% of males and 1.4% of females had a previous or concurrent report of HIV infection. The odds of Cocci infection before age 50 with a previous or concurrent HIV infection are approximately 9 times higher than the general population under 50 for males and 11 times higher than the general population for females. Results of this analysis are reported in Table 41.

**Table 41:** Counts, Rates and Odds of HIV Infection among Persons with Concurrent or Subsequent Cocci Infection, Arizona, 1998-2008

| | Males | Females |
|---|---|---|
| **Total Population** | 2,821,759 | 2,823,767 |
| **HIV infection only** | 20,105 | 2,701 |
| **Cocci history only** | 19,918 | 17,146 |
| **HIV with concurrent or subsequent Cocci infection** | 976 | 121 |
| **Estimated rate of HIV infection report** | 748 per 100,000 | 100 per 100,000 |
| **Estimated rate of Cocci history report** | 740 per 100,000 | 611 per 100,000 |
| **Estimated rate of previous or concurrent HIV infection report among persons with Cocci reported history** | 4,671 per 100,000 | 701 per 100,000 |
| **Estimated Cocci infection rate among persons with previous or concurrent HIV infection report** | 4,630 per 100,000 | 4,288 per 100,000 |
| **Estimated odds of reported Cocci infection with previous or concurrent HIV infection** | 6.3 | 7.0 |

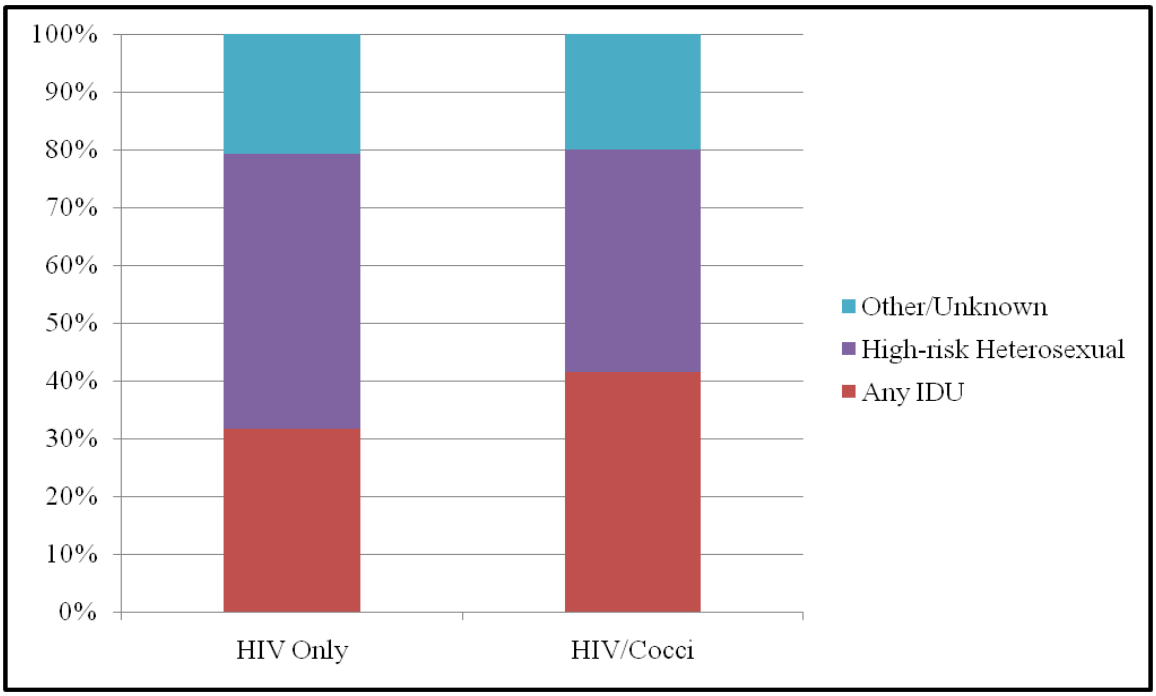
Among the 1009 males coinfected with HIV and Cocci, 29.1% report injection drug use, compared to 21.7% of males with HIV only.

**Figure 47:** Reported HIV Risk Among HIV/Cocci Coinfected Males, Arizona, 1998-2008




Among the 121 females coinfected with HIV and Cocci, there was also an increased proportion of coinfected persons reporting injection drug use; 41.3% of coinfected females reported injection drug use, compared to 31.8% of females with HIV only. These results are similar to the HIV/TB results but show less coinfection among injection drug users.

**Figure 48:** Reported HIV Risk Among HIV/Cocci Coinfected Females, Arizona, 1998-2008




Among males coinfected with HIV and Cocci, higher proportions of Hispanics, Black Non-Hispanics and American Indians/Alaska Natives were observed compared to males infected with HIV only. Among the 121 coinfected females, the differences between racial groups are much smaller, which differs from the HIV/TB results. The age distribution of both persons coinfected with HIV and Cocci and persons infected with HIV only were compared and found to be nearly identical (data not shown). Overall, the HIV/Cocci results are similar to the HIV/TB results, suggesting that the same groups may be at increased risk of HIV coinfection with opportunistic infections.

**Figure 49:** Reported Race/Ethnicity Among HIV/Cocci Coinfected Persons, Arizona, 1998-2008

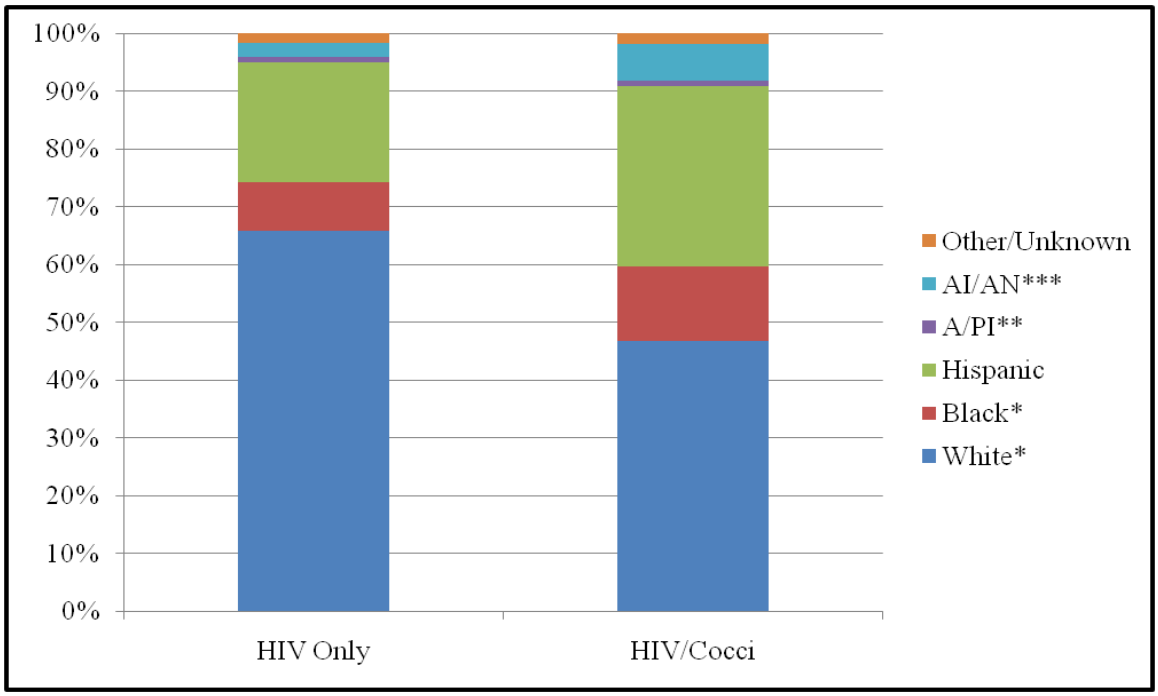


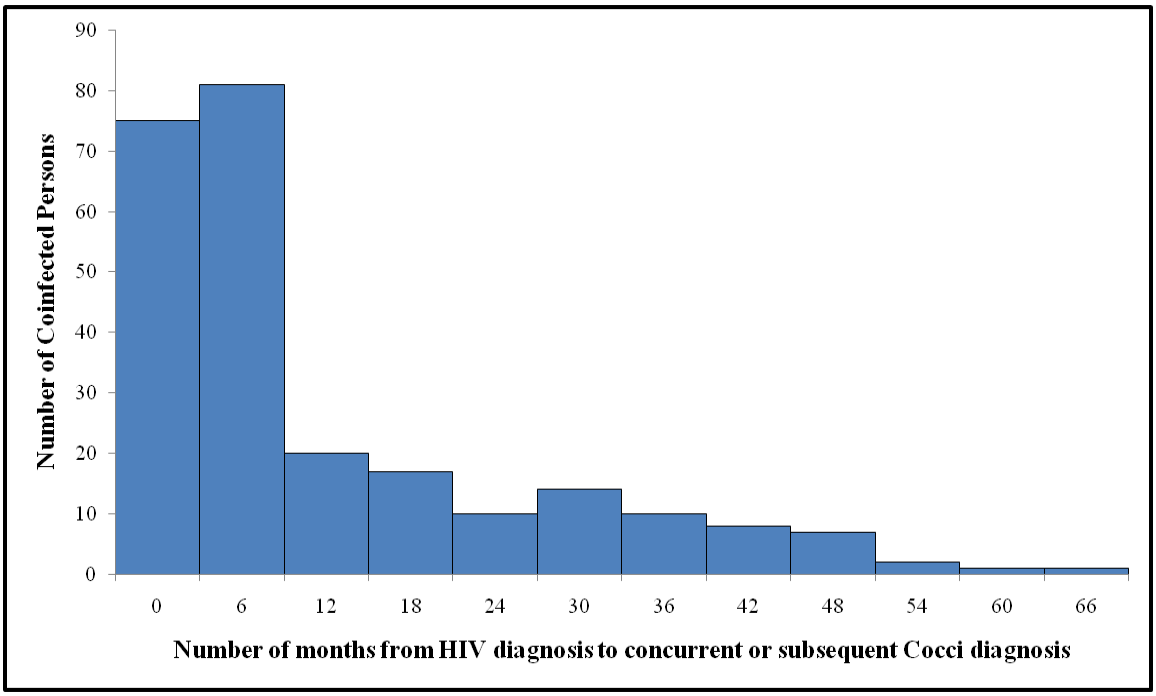

**Table 42:** Reported Race/Ethnicity Among HIV/Cocci Coinfected Persons, Arizona, 1998-2008

| Race/ Ethnicity | Males | | Females | |
|---|---|---|---|---|
| | HIV Only | HIV/Cocci | HIV Only | HIV/Cocci |
| White* | 65.8% | 46.9% | 46.3% | 41.3% |
| Black* | 8.4% | 12.4% | 21.3% | 20.7% |
| Hispanic | 20.9% | 31.6% | 24.0% | 28.9% |
| A/PI** | 0.8% | 0.9% | 1.3% | 2.5% |
| AI/AN*** | 2.6% | 6.5% | 4.6% | 5.8% |
| Other/Unknown | 1.6% | 1.7% | 2.5% | 0.8% |

*Non-Hispanic
**Asian/Pacific Islander (Non-Hispanic)
**American Indian/Alaska Native (Non-Hispanic)

The median number of months from HIV diagnosis to concurrent or subsequent Cocci diagnosis was 2 months after HIV diagnosis, with a mean of 9.8 months after HIV diagnosis (sample size= 246 persons). Most frequently, the most recent Cocci diagnosis occurred at the same time as HIV diagnosis (30.5% of coinfected persons). Among coinfected persons, 156 (63.4%) were diagnosed with Cocci within 6 months of HIV diagnosis, and 176 (71.5%) were diagnosed with Cocci within 12 months of HIV diagnosis. The data is difficult to draw conclusions from due to the long latency periods of HIV, but it does suggest that the majority of persons coinfected with HIV and Cocci receive their Cocci diagnosis shortly after receiving their HIV diagnosis.

**Figure 50:** Distribution of Time Lapse in Months Between Earliest HIV Diagnosis and Cocci Diagnosis Among HIV/Cocci Coinfected Persons, Arizona, 2004-2008




## RYAN WHITE CARE ACT

The delivery of Ryan White services in Arizona is administered by the HIV Care and Services Program within the Office of HIV, STD and Hepatitis Services of the Arizona Department of Health Services. The Program administers an AIDS Drug Assistance Program (ADAP), which provides life-sustaining medication to people living with HIV/AIDS throughout Arizona, and maintains a network of providers to deliver medical and supportive services outside of the metropolitan Phoenix area.

The Arizona HIV Care and Services Program, through its contracted providers, funds treatment adherence counseling, medical and non-medical case management, emergency financial assistance, medical transportation services, mental health services, oral health care, outpatient/ambulatory medical care, food bank, outpatient substance abuse services, and local pharmaceutical assistance. These services are provided in all Arizona counties except Maricopa

and Pinal, which are covered by the Phoenix Ryan White program, and Mohave County, which is covered by the Las Vegas (Nevada) Ryan White program. Information about the Ryan White Program and the federal authorizing law is available at http://hab.hrsa.gov/about/.

**ADAP:**

The AIDS Drug Assistance Program (ADAP) works collaboratively with other Ryan White funded programs within Arizona to maintain a continuum of HIV-related care that spans all regions of the state. ADAP is a payer of last resort, and is meant to provide assistance to those that have no other insurance option or creditable coverage. Applicants must have an HIV or AIDS diagnosis, be an Arizona resident, apply for AHCCCS and receive a denial letter. In addition, the applicant or client's household income must be less than 300% of the Federal Poverty Level. Table 43 shows ADAP service data compared to Arizona HIV prevalence data.

**Table 43:** ADAP Service Data and Arizona HIV Prevalence, 2009

| | ADAP | | Arizona Prevalence |
|---|---|---|---|
| | **Number of Clients** | **% Total** | **% Total** |
| **Gender** | | | |
| Male | 1304 | 83.9% | 86.4% |
| Female | 245 | 15.8% | 13.6% |
| Other/Unknown | 6 | 0.4% | N/A |
| **Total** | 1555 | 100.0% | 100.0% |
| **Age** | | | |
| 0-1 | 0 | 0.0% | 0.0% |
| 2-12 | 2 | 0.1% | 0.2% |
| 13-19 | 7 | 0.5% | 0.5% |
| 20-24 | 25 | 1.6% | 2.3% |
| 25-29 | 73 | 4.7% | 5.1% |
| 30-34 | 156 | 10.0% | 8.1% |
| 35-39 | 209 | 13.4% | 12.0% |
| 40-44 | 296 | 19.0% | 18.0% |
| 45-49 | 328 | 21.1% | 21.7% |
| 50-54 | 218 | 14.0% | 14.9% |
| 55-59 | 124 | 8.0% | 8.8% |
| 60-64 | 64 | 4.1% | 4.6% |
| 65 and Older | 53 | 3.4% | 3.6% |
| Unknown | 0 | 0.0% | 0.1% |
| **Total** | 1555 | 100.0% | 100.0% |
| **Race/Ethnicity** | | | |
| White Non-Hispanic | 732 | 47.1% | 58.1% |
| Black Non-Hispanic | 145 | 9.3% | 11.2% |
| Hispanic | 595 | 38.3% | 24.9% |
| A/PI/H [1] Non-Hispanic | 21 | 1.4% | 1.1% |
| AI/AN [2] Non-Hispanic | 30 | 1.9% | 3.0% |
| MR [3] /Other/ Unknown | 32 | 2.1% | 1.6% |
| **Total** | 1555 | 100.0% | 100.0% |

1. Asian / Pacific Islander / Native Hawaiian
2. American Indian / Alaska Native
3. Multiple Race / Other

There are significant differences among racial groups with respect to their use of ADAP. In 2009, Hispanics, representing 24.9% of reported HIV prevalence in Arizona, but are overrepresented in ADAP, constituting 38% of clients served. While other groups such as Non-

Hispanic Whites, Non-Hispanic Blacks and American Indians are served in lower proportions than their overall representation in HIV prevalence. Table 44 provides a breakdown of ADAP service patterns by race/ethnicity.

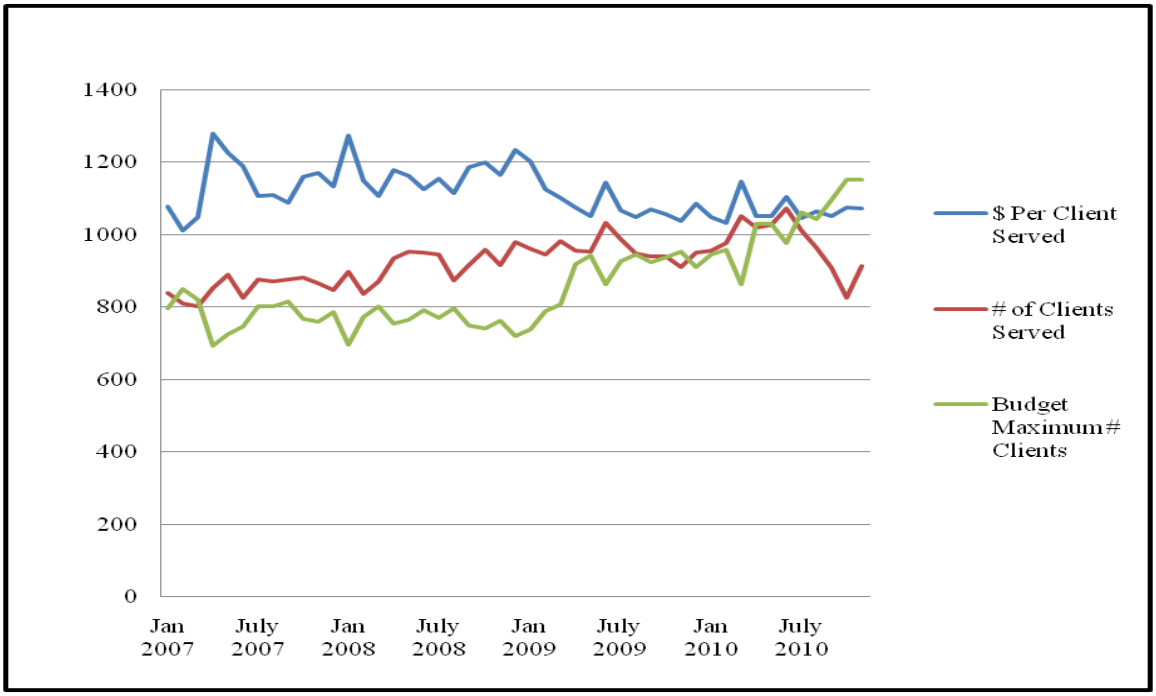
**Table 44:** ADAP Service Patterns by Race/Ethnicity, 2009

| Race/Ethnicity | Number of Clients | % Total | % Total HIV Prevalence | ADAP Rx Costs | % Total Rx Costs | Rx Cost Per Client | Number of Prescriptions | % of Total Prescriptions |
|---|---|---|---|---|---|---|---|---|
| **White Non-Hispanic** | 732 | 47.1 | 58.1 | $5,926,329 | 49.1 | $8,096.1 | 25,544 | 51.6 |
| **Black Non-Hispanic** | 145 | 9.3 | 11.2 | $981,414 | 8.1 | $6,768.4 | 3,828 | 7.7 |
| **Hispanic** | 595 | 38.3 | 24.9 | $4,606,419 | 38.1 | $7,741.9 | 18,280 | 36.9 |
| **A/PI/H [1] Non-Hispanic** | 21 | 1.4 | 1.1 | $160,134 | 1.3 | $7,625.4 | 533 | 1.1 |
| **AI/AN [2] Non-Hispanic** | 30 | 1.9 | 3.1 | $192,542 | 1.6 | $6,418.1 | 450 | 0.9 |
| **MR [3] /Other/ Unknown** | 32 | 2.1 | 1.6 | $211,194 | 1.7 | $6,599.8 | 899 | 1.8 |

1. Asian / Pacific Islander / Native Hawaiian
2. American Indian / Alaska Native
3. Multiple Race / Other

The demand for Ryan White services has increased in recent years. Figure 50 displays ADAP enrollment figures from 2007-2010. In fiscal year 2009, the Arizona ADAP program experienced a significant increase in client enrollment such that it became necessary to reduce the ADAP formulary in July 2009 to cut costs.

**Figure 51:** Monthly Arizona ADAP Costs and Clients, 2007-2010




**Unmet Need:**

The Unmet Needs Estimate is an annual estimate that measures the proportion of persons living with HIV/AIDS in Arizona who meet a minimal standard of HIV primary care. For the purposes of this estimate, a person is considered to have a "met need" for HIV primary care if they have had at least one CD4 count or viral load, or have taken HIV medication during the course of the year. All other persons are considered to have an "unmet need". The annual Unmet Need Estimate is the percentage of all known clients who remain classified as having an unmet need for HIV primary care after all testing and treatment data for that year are taken into consideration.

In Arizona, the Unmet Needs Estimate is calculated by examining all prevalent cases in the state and using data from eHARS, ADAP and laboratory sources to determine who has a met need for HIV primary care. Deterministic matching is used to link prevalent cases to lists of CD4 counts and viral loads ordered in 2009 from the four major laboratories in Arizona (Sonora Quest,

LabCorp, ARUP and the Maricopa Integrated Health System laboratory, which combined contribute approximately 90-95% of HIV-related tests reported to the Arizona HIV Surveillance Program). Data from the Arizona Motor Vehicle Division is also used to assist in identification of persons that have left the state.

The proportion of persons with an unmet need is stratified by gender, age, race/ethnicity, reported risk and diagnostic status. In addition to a statewide estimate, estimates are calculated for the Phoenix EMA (Maricopa and Pinal Counties), Maricopa County, Pima County, and the rural counties.

There are an estimated 5,972 persons in Arizona (41.37% of persons living with HIV/AIDS) with an unmet need for HIV primary care. More than half are between the ages of 30-49, and a large number report MSM and/or IDU behavior. The Unmet Needs proportions are generally similar to the Arizona prevalence proportions. Persons who have progressed to AIDS had a smaller proportion of persons with an unmet need relative to their representation in current HIV prevalence, as would be expected. Additionally, injection drug users have a higher proportion of persons with an unmet need relative to their representation in current HIV prevalence. Anecdotal data collected by the Phoenix EMA Ryan White program in 2006 suggest that significant barriers to accessing care include substance abuse, lack of transportation, and mental health issues, which present barriers to accessing care in other areas of the state. The statewide estimate for 2009 is shown below in Table 45; the estimates for the other regions can be found in the 2010 Annual Report.

**Table 45:** Unmet Needs Estimate, Arizona Prevalent Cases, 2009

| | Unmet Need Count | Unmet Need Relative Proportion | % State Population |
|---|---|---|---|
| **Total Persons with Unmet Need** | 5972 | 41.37% | |
| **Gender** | | | |
| Male | 5175 | 86.65% | 50.1% |
| Female | 797 | 13.35% | 49.9% |
| **Age** | | | |
| 0-1 | 0 | 0.00% | 3.3% |
| 2-12 | 15 | 0.25% | 16.0% |
| 13-19 | 24 | 0.40% | 9.5% |
| 20-24 | 111 | 1.86% | 6.5% |
| 25-29 | 279 | 4.67% | 7.6% |
| 30-34 | 472 | 7.90% | 6.8% |
| 35-39 | 704 | 11.79% | 6.8% |
| 40-44 | 1025 | 17.16% | 6.4% |
| 45-49 | 1321 | 22.12% | 6.8% |
| 50-54 | 911 | 15.25% | 6.3% |
| 55-59 | 549 | 9.19% | 5.7% |
| 60-64 | 289 | 4.84% | 5.0% |
| 65 and Older | 247 | 4.14% | 13.4% |
| Unknown | 25 | 0.42% | N/A |
| **Race/Ethnicity** | | | |
| White Non-Hispanic | 3341 | 55.94% | 58.5% |
| Black Non-Hispanic | 733 | 12.27% | 4.0% |
| Hispanic | 1547 | 25.90% | 30.6% |
| A/PI/H [1] Non-Hispanic | 49 | 0.82% | 2.7% |
| AI/AN [2] Non-Hispanic | 159 | 2.66% | 4.3% |
| MR [3] /Other/ Unknown | 143 | 2.39% | N/A |
| **Reported Risk** | | | |
| MSM | 3257 | 54.54% | N/A |
| IDU | 830 | 13.90% | N/A |
| MSM/IDU | 522 | 8.74% | N/A |
| High-Risk Heterosexual | 547 | 9.16% | N/A |
| Blood Exposure/Other | 33 | 0.55% | N/A |
| Maternal Vertical Transmission | 37 | 0.62% | N/A |
| No Reported Risk | 746 | 12.49% | N/A |
| **Diagnostic Status** | | | |
| HIV | 3724 | 62.36% | N/A |
| AIDS | 2248 | 37.64% | N/A |

1. Asian / Pacific Islander / Native Hawaiian
2. American Indian / Alaska Native
3. Multiple Race / Other

Figure 51 and Table 46 present the percentage of persons with an unmet need for HIV primary care. Pima County and the rural counties have both observed a slight decrease in the percentage of persons with an unmet need during the 2006-2009 time period. An increase in the percentage of persons with an unmet need in the regions of the state with urban areas (the Phoenix EMA and Pima County, which houses metropolitan Tucson) was also seen in 2009.

**Figure 52:** Percentage of Persons with an Unmet Need for HIV Primary Care, 2006-2009

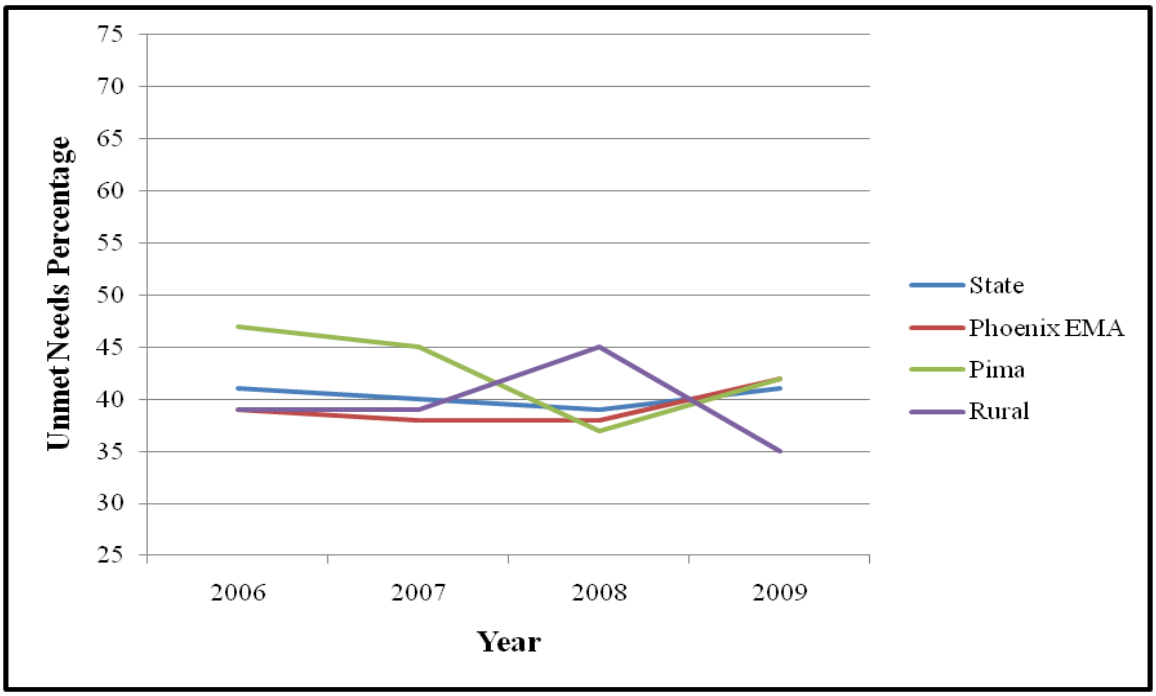



**Table 46:** Percentage of Persons with an Unmet Need for HIV Primary Care, 2006-2009

| Year | State | Phoenix EMA | Pima | Rural |
|---|---|---|---|---|
| 2006 | 41% | 39% | 47% | 39% |
| 2007 | 40% | 39% | 45% | 39% |
| 2008 | 39% | 38% | 37% | 45% |
| 2009 | 41% | 42% | 42% | 35% |

*Rural includes all counties in Arizona except Maricopa, Pima and Pinal

**HIV Viral Loads and CD4 Counts:**

In recent years, there has been an effort in the United States to examine aggregate HIV testing data to evaluate the treatment and health outcomes of persons living with HIV/AIDS for specific regions. Research on community viral load (CVL) has been conducted with increasing frequency. These analyses entail calculating the mean viral load of all HIV-positive individuals residing in a given area over a defined time period.

Using laboratory testing data obtained for the Unmet Needs Estimate, an assessment of CVL in Arizona was conducted for 2009 prevalent HIV/AIDS cases. The mean viral load for each person was calculated for every prevalent case with at least one reported viral load in 2009 (with undetectable viral loads being assigned a value of 0) then the mean viral load was calculated for each category. Due to the skewed distribution of viral load results and large outliers, only persons with mean viral loads within two standard deviations of the mean for each group were included in the final analysis (3,952 out of the 4,003).

The analysis demonstrates noteworthy variances in community viral load among different groups. Males, persons 20-29, Black Non-Hispanics, Hispanics, American Indians and MSM all had considerably higher CVLs. Notably, injection drug users did not have a particularly high CVL. It is important to recognize that this analysis is only limited to persons with a quantitative viral load reported to ADHS by the four laboratories participating in the Unmet Needs data collection and thus may not reflect the entire population of persons living with HIV/AIDS in Arizona.

**Table 47:** Community Viral Load, Arizona Prevalent Cases, 2009

| | Mean Viral Load | Standard Deviation | Number |
|---|---|---|---|
| **Community Viral Load** | 14,373 | 44,222 | 3,952 |
| **Gender** | | | |
| Male | 15,729 | 48,059 | 3,382 |
| Female | 6,652 | 20,546 | 567 |
| **Age** | | | |
| 0-1 | N/A | N/A | 0 |
| 2-12 | 6,061 | 9,002 | 7 |
| 13-19 | 3,988 | 10,002 | 14 |
| 20-24 | 31,547 | 59,975 | 96 |
| 25-29 | 36,643 | 91,417 | 215 |
| 30-34 | 12,682 | 28,153 | 344 |
| 35-39 | 18,194 | 55,587 | 539 |
| 40-44 | 12,224 | 37,947 | 774 |
| 45-49 | 8,367 | 26,895 | 793 |
| 50-54 | 10,171 | 34,583 | 539 |
| 55-59 | 5,232 | 17,388 | 323 |
| 60-64 | 1,675 | 7,732 | 155 |
| 65 and Older | 5,899 | 18,772 | 115 |
| Unknown | N/A | N/A | 0 |
| **Race/Ethnicity** | | | |
| White Non-Hispanic | 9,884 | 29,675 | 2,210 |
| Black Non-Hispanic | 13,300 | 32,698 | 439 |
| Hispanic | 12,549 | 39,595 | 1,084 |
| A/PI/H [1] Non-Hispanic | 3,799 | 7,974 | 57 |
| AI/AN [2] Non-Hispanic | 30,568 | 84,180 | 76 |
| MR [3] /Other/ Unknown | 10,981 | 36,215 | 37 |
| **Reported Risk** | | | |
| MSM | 14,857 | 47,107 | 2,486 |
| IDU | 10,978 | 27,984 | 391 |
| MSM/IDU | 5,283 | 15,153 | 336 |
| High-Risk Heterosexual | 6,601 | 19,491 | 442 |
| Blood Exposure/Other | 9,763 | 21,970 | 12 |
| Maternal Vertical Transmission | 9,126 | 14,247 | 18 |
| No Reported Risk | 18,020 | 50,076 | 231 |
| **Diagnostic Status** | | | |
| HIV | 10,311 | 26,961 | 1,734 |
| AIDS | 17,423 | 56,237 | 2,210 |

Aggregate CD4 counts are more difficult to analyze, given that CD4 counts vary widely by person and over time due to many factors. However, assessment of CD4 count at diagnosis can provide some insight into the patient's immune system's health at the time of diagnosis. When available, the first CD4 count performed after diagnosis is recorded in eHARS for new HIV/AIDS cases. An analysis of the value of the first CD4 count performed within 2 months of diagnosis was conducted for cases diagnosed in Arizona during the 2004-2009 time period.

Of the 3,699 cases diagnosed with HIV/AIDS in Arizona from 2004-2009, 2,026 (54.8%) had a reported CD4 count within 2 months of diagnosis. The mean first CD4 count has decreased over time for patients diagnosed with HIV, with a particularly sharp drop in 2008. This drop roughly corresponds with the onset of increased unemployment due to economic recession, and the corresponding increase in uninsured health status. The mean first CD4 count for patients with AIDS also shows a downward trend during that time period. However, the data should be interpreted with caution, given the large range of values, the fact that almost half of incident cases do not have a reported CD4 count within 2 months of diagnosis and that the data may not reflect the entire population of persons living with HIV/AIDS in Arizona.

**Figure 53:** Mean First CD4 Count by Status at Diagnosis, Arizona, 2004-2009

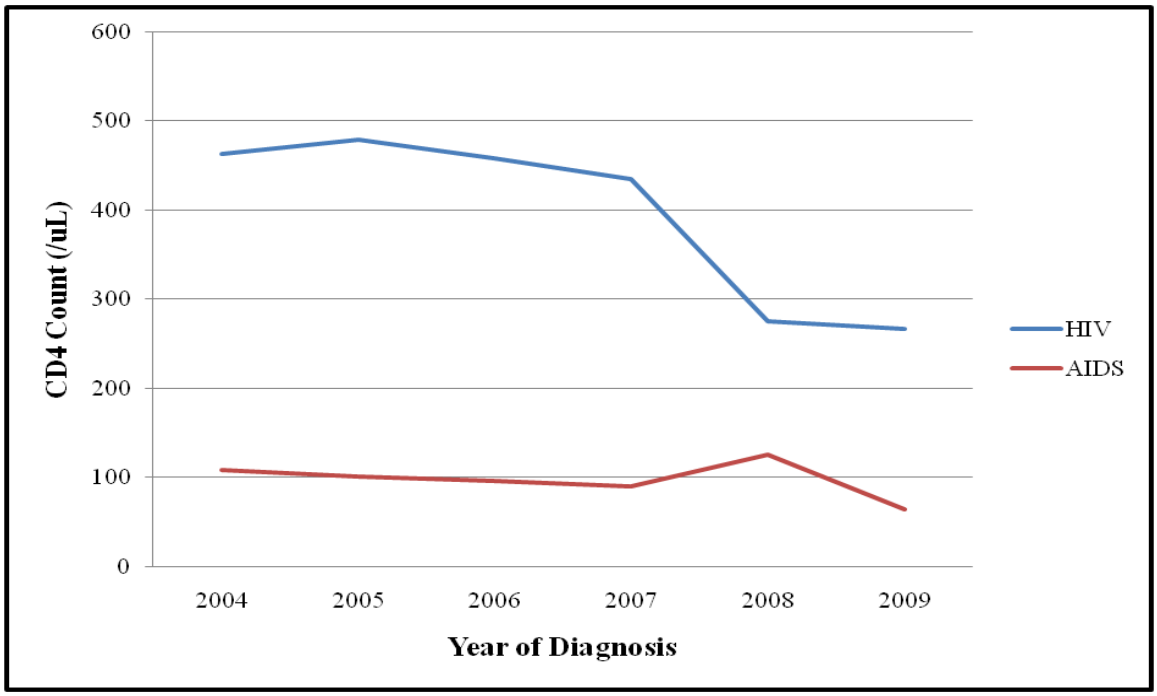


**Table 48:** Mean First CD4 Count by Status at Diagnosis, Arizona, 2004-2009

| Year of Diagnosis | HIV | | | | AIDS | | | |
|---|---|---|---|---|---|---|---|---|
| | Mean First CD4 (/uL) | Median First CD4 (/uL) | Standard Deviation | Number of Persons | Mean First CD4 (/uL) | Median First CD4 (/uL) | Standard Deviation | Number of Persons |
| 2004 | 463.50 | 451 | 278.79 | 257 | 109.10 | 61 | 151.74 | 145 |
| 2005 | 478.49 | 419 | 381.57 | 285 | 101.46 | 72 | 120.72 | 148 |
| 2006 | 458.62 | 407.5 | 328.88 | 218 | 96.34 | 46 | 132.72 | 132 |
| 2007 | 434.65 | 345 | 375.88 | 187 | 89.74 | 48.5 | 117.96 | 138 |
| 2008 | 274.83 | 157.5 | 291.61 | 204 | 126.05 | 43 | 264.53 | 39 |
| 2009 | 266.54 | 165 | 266.48 | 235 | 63.82 | 42.5 | 65.32 | 38 |