HIV/AIDS IN ARIZONA INTEGRATED EPIDEMIOLOGIC PROFILE

HIV/STD/TB Program, HIV Data and Analysis

2009-2012

Arizona Department of Health Services

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EXECUTIVE SUMMARY

Arizona's population continues to increase at some of the highest rates in the nation. The state's population grew 43% from 1990 to 2000 and continued to grow at a somewhat reduced pace that saw an increase of 20% over the last ten years (2002-2012).[1] That period's relatively slower growth rate was likely related to the economic issues beginning in 2007. Despite that the 1.1 million increase in residents during this most recent period was the 3rd fastest growth rate in the United States. During this time, the City of Phoenix maintained its ranking as 6th largest city in the United States with a population of 1.5 million within city limits. The Phoenix Metropolitan Statistical Area increased to 4.3 million which ranked 13th in the nation. Maricopa County (Phoenix) accounts for 60% of Arizona's population and 75% of its new HIV cases. Pima County (Tucson) accounts for 15% of the state population and 13% of HIV cases. Most HIV/AIDS services are located in Maricopa, Pima, Coconino, and Yavapai counties, because they have the bulk of the epidemic, while the more rural counties have minimal services available.

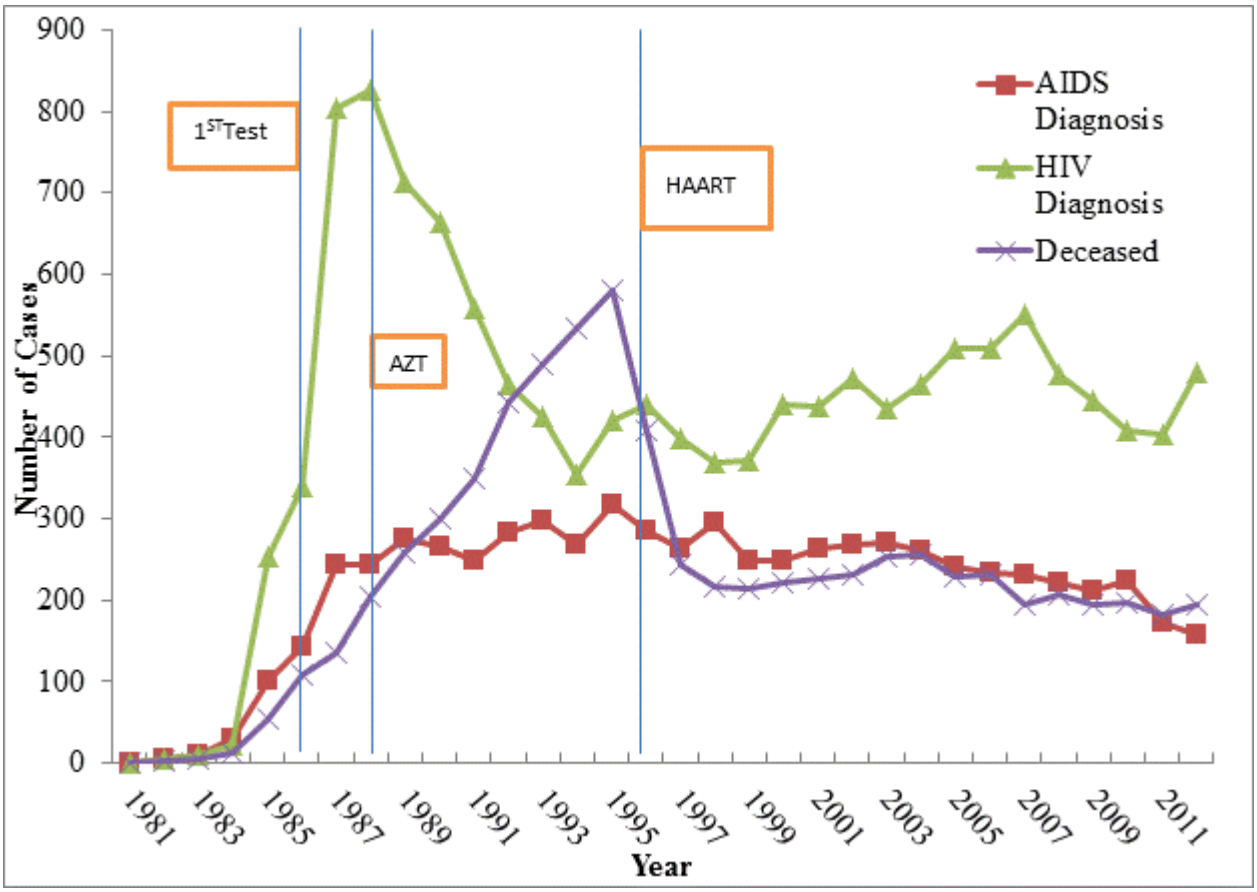


Figure 1: HIV/AIDS cases from onset of Arizona Surveillance, 1981-2012

1. State and County QuickFacts, Arizona. US Census Bureau. http://quickfacts.census.gov/qfd/states/04000.html. Accessed March 12, 2015.

CUMULATIVE COUNTS

Arizona began tracking HIV/AIDS cases when they first appeared in Arizona in 1981. From 1981-2012, 20,150 cases of HIV infection have been reported to Arizona Department of Health Services (ADHS) among Arizona's residents. Of these:

- 13,336 (66%) were *emergent* HIV.
- 6,814 (34%) were *emergent* AIDS.
- 6,105 HIV cases were later re-diagnosed with AIDS.

As of December 2012, 15,798 people reported to be living with HIV/AIDS in Arizona with 8,039 AIDS prevalence cases at and 7,759 HIV prevalence cases. By county, Maricopa has the largest number of cases with 10, 879 followed by Pima and Pinal counties (Figure 2). The impact of AIDS is felt most disproportionately among African Americans in Arizona. African Americans comprise 4.6% of the total population; yet they represent 12% of combined HIV and AIDS prevalence from 2009 to 2012. Men accounted for 85% of HIV cases and 88% of AIDS cases. The majority of cases occurred in persons aged 20 to 44 years which accounted for 76% of HIV cases and 59% of AIDS cases. Men who have sex with men (MSM) continues to be the predominant reported transmission risk in Arizona at 62% of all newly diagnosed cases of HIV.

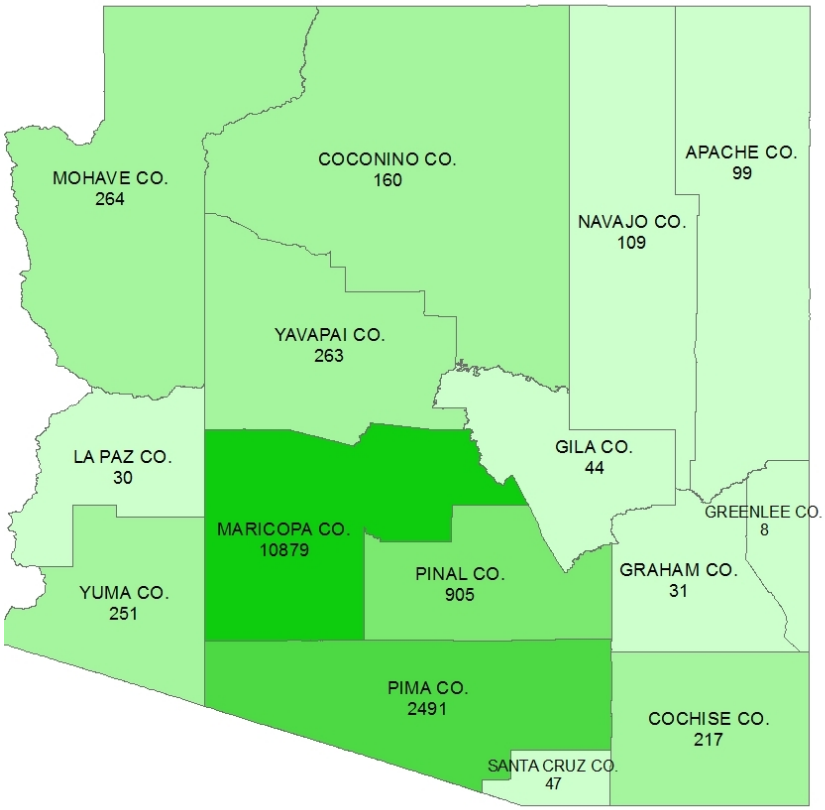


Figure 2: Prevalent HIV/AIDS cases by county, 2012

MORTALITY

In the four years of data included in this report (2009-2012), ADHS was notified of an average of 159 annual deaths (any cause) among AIDS cases and an average of 31 deaths among HIV cases (any cause). The annual number of deaths among persons with AIDS in the state declined from 1996 to present, which is attributable to the introduction of multi-drug treatment. Between 1999 and 2012, the number of deaths among persons with HIV or AIDS has decreased steadily from the most recent peak of 230 in 2004, to 156 in 2012.

PREVALENCE AND INCIDENCE

Arizona currently has 15,798 persons known to be living with HIV or AIDS. As of 2012 data, among persons now living with HIV infection, 8,039 have a diagnosis of AIDS and 7,759 have a diagnosis of HIV (Figure 3). Arizona has a known HIV disease prevalence rate of 241.0 per 100,000 persons. Based on current prevalence estimates, at least 1 of every 415 persons in Arizona has HIV. HIV and AIDS in Arizona are disproportionately distributed with the greatest prevalence and incidence rates observed among persons who engage in high-risk sexual activity, injection drug use, and those living in urban regions of the state.

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 9.6 per 100,000 in 2012.

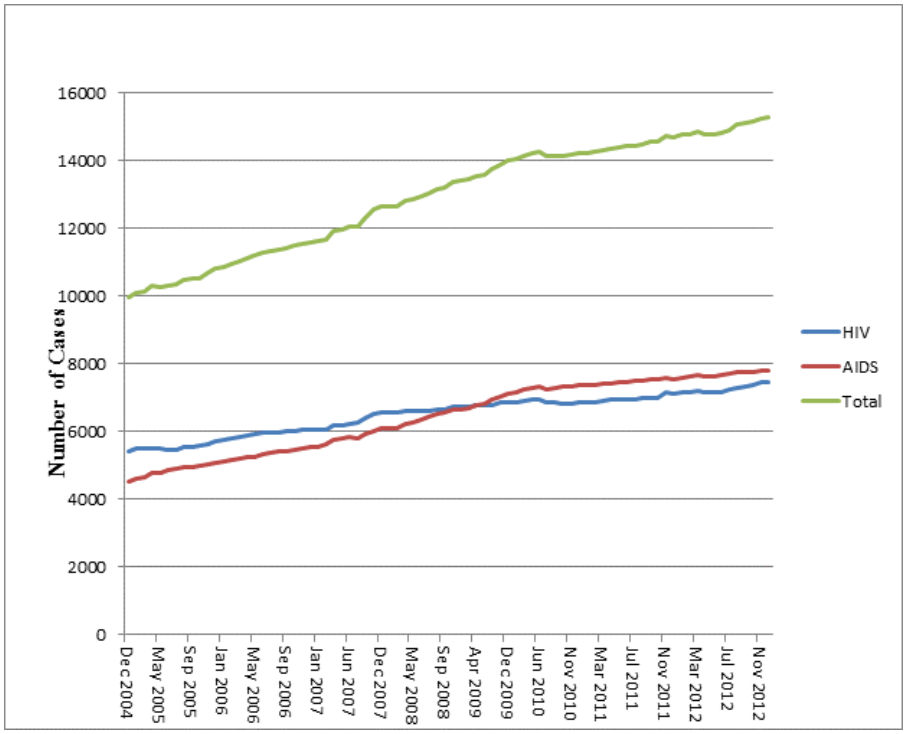


Figure 3: Current Arizona Statistics, Number of HIV/AIDS cases 2004-2012

GENDER TRENDS

As in the past, the majority of *emergent* HIV infections from 2009 to 2012 have been among males, who comprise 86% of all Arizona *emergent* HIV/AIDS cases. Over the four year period, males accounted for 1,477 cases of HIV (369 per year), and 679 cases of first-ever reported AIDS (170 per year). By contrast, females accounted for 247 cases of HIV over the four year period (62 per year) and 86 cases of first-ever reported AIDS (22 per year). For the three-year period from 1985 to 1987, 6.6% of *emergent* cases of HIV infection were female. During the 1990s, females accounted for 18% of new cases. At the time it was expected that female HIV rates would climb higher, but the rates actually dropped below 13% in 2002 and have maintained an average of 14.7% throughout the last decade.

RACE/ETHNICITY TRENDS

Trends of emergent HIV infection among all racial ethnic groups in Arizona are reflective of broader 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 2012, but accounted for 13.4% of emergent HIV infection over the four-year period. Nationally, non-Hispanic blacks are 13.2% of the US population and account for over 44% of new HIV cases according to CDC estimates. This 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) which was reported as comprising 61.6% of emergent HIV infections on average over the period from 2009 to 2012. This includes the risk group of men who have sex with men/injection drug use (MSM/IDU) which is a mode peculiar to CDC HIV data collection and specifically looks at people with both MSM and IDU identified as a risk factor for HIV. MSM/IDU accounts for 5.8 % of cases over the last five years. After declining steadily, the proportion of emergent HIV cases reporting MSM behavior reached 59% in 1995, and remained level through 2000. Beginning in 2001, the proportion of emergent HIV cases reporting MSM behavior rose slightly and has maintained an average of 61.8% over the last ten years. By 2007, injection drug use (IDU) as a proportion of emergent cases had decreased to 8% of cases each year and has remained so over the last 4 years.

High Risk Heterosexual (HRH) contact 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 2009 through 2012, HRH averaged 8% of newly reported cases, despite an increase to 12% and 14% in the last two years of the period.

CO-MORBIDITY

Patterns of co-morbidity 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. 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.

KEY TERMS

Cross-Matching

In order to combine information from separate databases, we conducted probabilistic cross-matching. To analyze comorbidity, eHARS and disease reports from STDs, Hepatitis B, Tuberculosis and Coccidioidomycosis sections of ADHS were matched. Additionally, eHARS was matched to Refugee Health program data to analyze HIV in refugee populations. eHARS was also matched to several sources of HIV primary care data in order to construct the Spectrum of Care cascade.

Due to inconsistencies in basic data format and completeness among different databases, as well as error inherent in the cross-matching process, this method is only accurate for population-level data, not client-level data. However, these studies provide useful information for developing effective prevention and care strategies.

eHARS

The electronic HIV/AIDS Reporting System (eHARS) is a browser-based application designed for HIV/AIDS reporting. This database is used in each jurisdiction and contains HIV/AIDS data on individuals reported in that jurisdiction.

Emergence and Incidence

Emergence as an epidemiological event is an important concept within the HIV/AIDS realm. It is the number of newly reported diagnoses in a given time period. Since persons with HIV infection can be asymptomatic for several years after infection, it is not ideal to calculate incidence by summing the number of HIV and AIDS diagnostic events within a time period. Instead, we use emergence as a substitute for incidence.

The classic definition of incidence is the number of new infections, not the number of reports or diagnoses. Since emergence is not an exact substitute for incidence, Arizona is one of twenty-five sites with a dedicated Incidence program that is funded by the Centers for Disease Control and Prevention (CDC). The Incidence program provides an estimate of when an HIV infection truly occurred, by using specific testing methods on blood samples from HIV positive individuals. In this report, incidence numbers come from the Incidence program's estimates, unless otherwise stated.

A case is counted as an emergent Arizona case if the person has a confirmed pediatric or adult HIV or AIDS diagnosis and the earliest diagnosis was in Arizona. Those first diagnosed as HIV (non-AIDS) would be emergent HIV cases, and those first diagnosed as AIDS would be emergent AIDS cases. If a person is first diagnosed with HIV and transitions to AIDS in the same calendar year, they are counted as an emergent AIDS case. This method is employed to avoid double-counting cases that transition from HIV to AIDS.

Emergence numbers for each year are calculated no earlier than six months after the last day of that year. This is done in order to allow sufficient time to complete case investigations, collect laboratory data and communicate with other jurisdictions to determine the location of the first diagnosis.

Population

Population denominators for the state of Arizona are obtained yearly from the U.S. Census Bureau. At the time of publication of this report, the most recent population numbers available are from the 2012 bridged-race census estimate. Emergence calculations for each year use that year's population numbers; the 2013 prevalence rates are calculated with the 2012 population denominators. Population numbers are also available by county, sex, age and race/ethnicity, and these numbers are used when calculating rates for subpopulations.

KEY TERMS

Prevalence

Since HIV/AIDS is a chronic illness, calculating prevalence allows us to look at all persons currently living with HIV/AIDS in Arizona. A case is counted as a prevalent case if the person has a confirmed pediatric or adult HIV or AIDS diagnosis and is currently alive and residing in Arizona. Prevalence numbers for each year are calculated from a dataset frozen at the end of the calendar year. Throughout the year, data is collected from laboratories, health care providers, other jurisdictions and death registries in order to more accurately ascertain if persons are currently alive and residing in Arizona.

Race/Ethnicity

Race and ethnicity are self-reported. All persons who identify as being of Hispanic ethnicity are classified as Hispanic, regardless of self-identified race. All persons who report more than one race are classified as Multiple Race/Other/Unknown. AI/AN is American Indian/Alaska Native and PI/NH refers to Pacific Islander/Native Hawaiian.

Risk Factors

In the course of a case investigation, information is collected about known risk factors for HIV. These risk factors are: sexual contact with men, sexual contact with women, injection drug use, heterosexual contact with persons considered to be high-risk (injection drug users, bisexual men (applies to women only) and persons known to be HIV-infected), perinatal (mother-to-child) transmission and medical/surgical/occupational exposure to blood or blood/tissue products. NIR or NRR refers to No Identified Risk or No Risk Reported.

Analysis of risk factors in HIV/AIDS patients presents several difficulties not found in analysis of geographic and demographic data. Behavioral risk factor 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. Consequently, we are unable to generate rates of incidence and prevalence for risk groups. When comparing risk groups, we report the count and/or proportion of the population that report a given risk factor. It is also important to understand that there is a difference between behavioral definitions and self-identification definitions. For example, not every man who participates in sexual contact with other men will identify himself as gay or bisexual. Furthermore, during case investigations, information is collected about whether the patient ever engaged in a risk behavior prior to diagnosis. As a result, it is not possible to ascertain if the risk behavior was actually present at the time of HIV infection.

Risk factor data categories are also not mutually exclusive. 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, risk categories are often used for analysis among adult cases. The principal risk categories in HIV/AIDS surveillance 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 patients report multiple HIV/AIDS risks, the CDC uses a priority system to assign a mode of transmission to each report of HIV infection, with MSM and IDU receiving higher priority than high-risk heterosexual contact for both males and females. Only a person reporting high-risk heterosexual behavior with no other risk behaviors will be assigned to the HRH mode of transmission. In recent years, a Presumed Heterosexual Contact category has been added to some analyses. Only persons who report no other risk behaviors and report heterosexual contact not considered to be high-risk are assigned to this category.

In some parts of this report, analysis of MSM and IDU behaviors will include all cases reporting that behavior, including those that report both and those who report other risk factors. In those instances, this will be noted in the text.

KEY TERMS

Sex
Cases are classified by sex at birth. Due to extremely small numbers of transgendered persons and persons who do not identify as male or female, analyses by gender were not included.

Spectrum of Care Engagement
HIV-Infected: Prevalent cases and estimated unaware cases of HIV infection at end of year.

HIV-Diagnosed: Prevalent cases.

Linked to HIV Care: Prevalent cases with a documented lab test, doctor visit or medication use in the calendar year.

Retained in HIV Care: Prevalent cases with a documented lab test, doctor visit or anti-retroviral (ARV) use in this calendar year and last calendar year.

Need ARV Therapy: Prevalent cases whose last CD4 count of the calendar year was less than 350/µL, whose last viral load of the calendar year was greater than 100,000 copies/mL, who had a documented opportunistic infection or who had no documented ARV use during the calendar year.

On ARV Therapy: Prevalent cases with documented ARV use or whose last viral load of the calendar year was undetectable.

Adherent/Undetectable: Prevalent cases whose last viral load of the calendar year was undetectable.

Arizona Department of Health Services

ARIZONA DEMOGRAPHIC PROFILE

POPULATION

The demographics of a population are an important component of any health issue. The population of Arizona has been increasing at very high rates over the past decade. The state's population in 2012 was 20.2% greater than 2002 (Table 1). Arizona's growth rate for this time period was more than two times greater than the national growth rate (9.1%). Arizona had the 3rd largest growth rate among the 50 states for this period only behind Nevada (27.4%) and Utah (22.3%); the state experienced an increase of 1,101,147 during this period. During the 2002-2007 period, the state's population increased by 16.7%.

Table 1 : Arizona Counties' 2002-2012 Population Numbers

			2002-2012	Growth
County	2002	2012	N	%
Apache	67,267	73,195	5,928	8.8%
Cochise	119,750	132,088	12,338	10.3%
Coconino	120,390	136,011	15,621	13.0%
Gila	51,225	53,144	1,919	3.7%
Graham	33,120	37,416	35,806	13.0%
Greenlee	7,706	8,802	1,096	14.2%
La Paz	19,346	20,281	935	4.8%
Maricopa	3,299,127	3,942,169	643,042	19.5%
Mohave	165,177	203,334	38,157	23.1%
Navajo	101,358	107,094	5,736	5.7%
Pima	886,063	992,394	106,331	12.0%
Pinal	197,830	387,365	189,535	95.8%
Santa Cruz	39,288	47,303	8,015	20.4%
Yavapai	178,390	212,637	34,247	19.2%
Yuma	166,071	200,022	33,951	20.4%
Arizona Total	5,452,108	6,553,255	1,101,147	20.2%

Source : U.S. Census Bureau

QUICK FACTS:

- Arizona's population (2012) is 6,553,255.
- Maricopa is the largest county in Arizona with a population of 3,942,169 in 2012.
- Pinal county has had the largest growth rate in the past decade.
- 58.0% of the Arizona population is white.
- 30.2% of the Arizona population is Hispanic.

From 2007-2012 the growth rate dropped to 3%. Among the 15 counties in Arizona, the urban county of Maricopa experienced the largest increase (643,042) in population from 2002-2012. Pinal County has experienced the largest growth rate within the state by almost doubling their population during the past decade (increase of 96%).

GENDER

It is important to consider the sex break down of the population because males have substantially higher rates of HIV/AIDS than females. Arizona has a slightly higher percentage of males (49.7% VS. 49.2%) than the entire country (Table 2).

RACE

Race and sex are demographic factors that are strongly related to HIV/AIDS infection. The Arizona HIV Surveillance program uses five racial/ethnic categories for analyses: white non-Hispanic, black non-Hispanic, Asian/Pacific Islander non-Hispanic, American Indian/Alaska Native non-Hispanic, and Hispanic (Table 1). Whites make up the largest racial/ethnic group in Arizona at 57% which is similar to the country as a whole at 64%. Hispanics make up the second largest racial-ethnic group in Arizona. When compared to the nation, Arizona has a much larger proportion of Hispanics, 30% compared to 17%. Asian/Pacific Islander non-Hispanics, American Indian/Alaska Native non-Hispanics, and black non-Hispanics in Arizona made up less than 5% of the population.

Table 2: Gender and Racial-Ethnic Composition, 2012 Mid-Year

	Arizona		USA	
	Count	Col. %	Freq.	Col. %
Male	3,258,483	49.7%	154,492,067	49.2%
Female	3,294,772	50.3%	159,421,973	50.8%
TOTAL	6,553,255	100.0%	313,914,040	100.0%
White Non-Hispanic	3,798,807	58.0%	200,698,847	63.9%
Black Non-Hispanic	286,669	4.4%	40,391,388	12.9%
Hispanic	1,976,106	30.2%	53,027,708	16.9%
Asian/Pacific Islander non-Hispanic	215,449	3.3%	17,175,596	5.5%
American Indian/Alaska Native non-Hispanic	276,224	4.2%	2,620,501	0.8%
TOTAL	6,553,255	100.0%	313,914,040	100.0%

Source: U.S. Census Bureau, Vintage 2011 and 2012 Bridged-Race Postcensal Population Estimate

AGE

Age is one of the most important factors in any disease as it affects both the acquisition and the progression of the disease. Age distributions are often depicted in the graphs as seen below (Figure 1 and 2). The shape of the graphs describes the population as a whole, for example if the curve is bell shaped, it represents a younger population. This can be seen in Arizona which has a younger population when compared to the nation as a whole. The median age of the United States as of 2010 was 37.2 years compared to Arizona which was 35.9.[1] Age differences in the sexes can also be seen with females in both the US and Arizona living longer than males; the median male age in the US as of 2010 was 35.8 and in Arizona was 35, compared to females in the US at 38.5 and 37 in Arizona.[1]

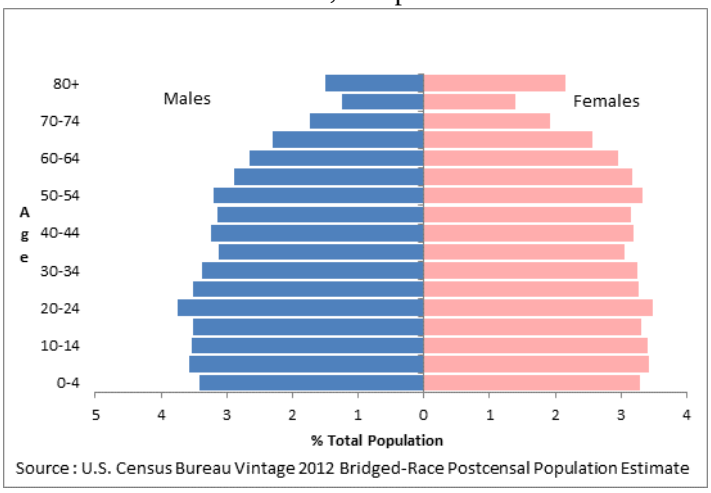


Figure 1 : United States 2012

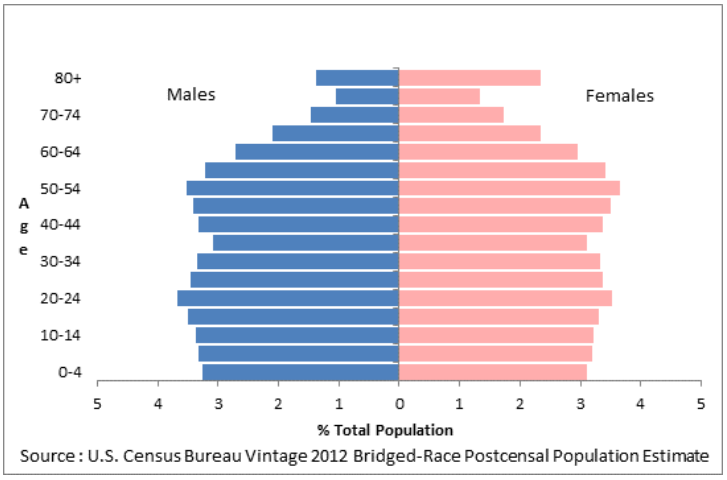


Figure 2 : Arizona 2012

1. Age and Sex Composition: 2010. US Census Bureau. May 2011. http://www.census.gov/prod/cen2010/briefs/c2010br-03.pdf. Accessed March 12, 2015.

ARIZONA CASE SURVEILLANCE

BACKGROUND

The emergence of HIV/AIDS in Arizona has been for the most part stable, following a cyclical pattern. From 2009-2012, there were a total of 2,489 persons diagnosed with HIV/AIDS in Arizona. There were 659 cases diagnosed in 2009 (10.0 per 100,000). Emergence declined slightly in 2010 and 2011 (dropping to a low of 567 cases, or 8.8 per 100,000) but rose back up to 632 cases in 2012 (9.6 per 100,000) (Table 1). On average, 31% of new diagnoses were classified as AIDS cases at diagnosis; this percentage declined from a high of 36% in 2010 to 24% in 2012.

Table 1: Emergence Rates in Arizona, 2009-2012

	2009		2010		2011		2012	
	Count	Rate	Count	Rate	Count	Rate	Count	Rate
HIV	444	6.73	405	6.34	397	6.12	478	7.29
AIDS	215	3.26	226	3.54	170	2.62	154	2.35
Total	659	9.99	631	9.87	567	8.75	632	9.64

SEX

Since the beginning of the HIV/AIDS epidemic, the HIV-infected population in Arizona has been primarily male. During the 2009-2012 time period, 2,156 of the 2,489 new cases (86%) were among males, and emergence rates among males were more than six times higher than the rates for females. Additionally, males accounted for 13,552 of the 15,798 people (86%) living with HIV/AIDS in Arizona in 2013 (Table 2).

Table 2: HIV/AIDS Emergence by Sex, 2009-2012

	2009		2010		2011		2012	
	Count	Rate	Count	Rate	Count	Rate	Count	Rate
Males	571	17.27	554	17.44	491	15.23	540	16.57
Females	88	2.68	77	2.39	76	2.33	92	2.79
Total	659	9.99	631	9.87	567	8.75	632	9.64

In 2013, there were 15,798 cases of HIV/AIDS in Arizona (241.1 per 100,000). From 2009-2012, the prevalence of HIV/AIDS increased 14%, from 13,422 cases to 15,288 cases (Figure 2). In June 2009, AIDS prevalence surpassed HIV prevalence for the first time statewide, and the prevalence of AIDS has continued to be higher than the prevalence of HIV since that point. In the northern region of the state, AIDS prevalence first surpassed HIV prevalence in March 2005; in the southern region, this event occurred in February 2007.

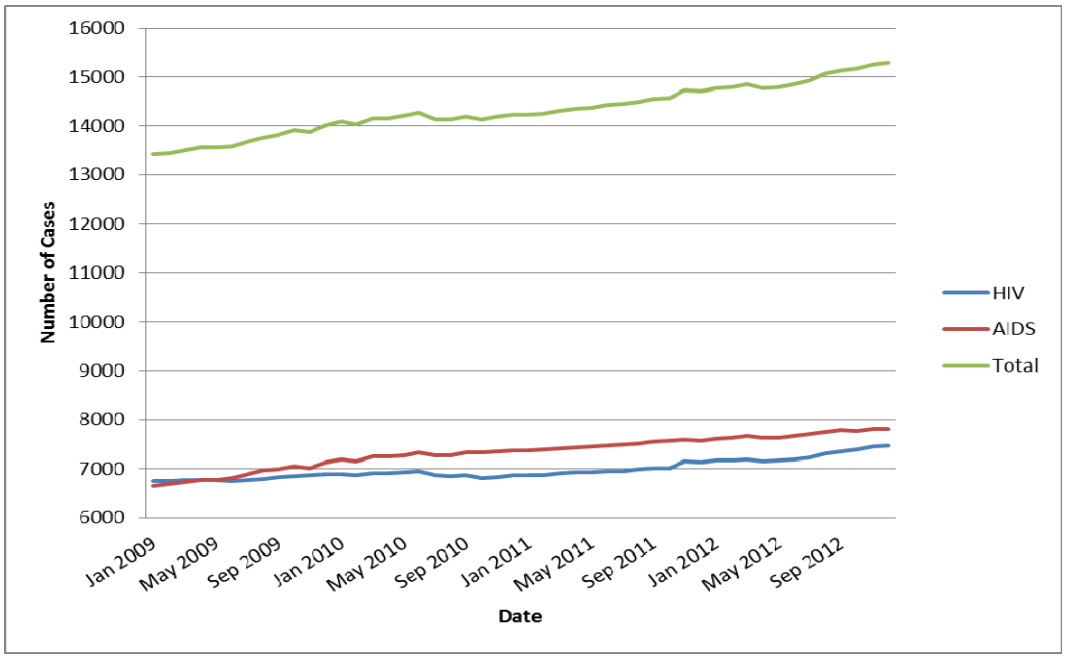


Figure 1: HIV/AIDS Prevalence in Arizona from 2009-2012

However, in central Arizona (Maricopa and Pinal Counties), AIDS prevalence did not surpass HIV prevalence until September 2009, and starting in November 2012, HIV prevalence in the central region has been higher than AIDS prevalence.

Maricopa county continues to have the highest number of emergent cases with 495 (77%) cases in 2012 while Pima county had 76 (12%) emergent cases. The bulk of the state's population resides in Maricopa county attributing to the high number of cases (Figure 2).

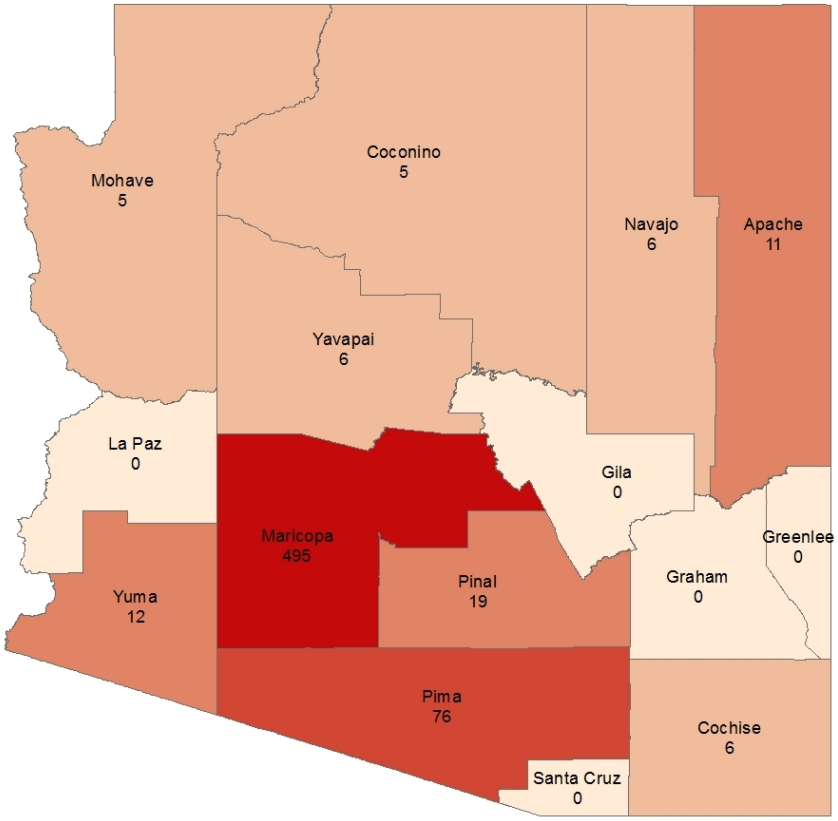


Figure 2: Emergent cases in Arizona by county, 2012

REGIONS OF DIAGNOSIS

HIV/AIDS diagnoses in Arizona are strongly concentrated in urban areas. Maricopa County (including the city of Phoenix) consistently has the highest number and rate of new HIV/AIDS cases. Among the 2,489 new cases in Arizona in 2009-2012, 1,779 (71%) were diagnosed in Maricopa County, 318 (13%) were diagnosed in Pima County (including the city of Tucson) and 392 (16%) were diagnosed in the remaining counties. Prevalent cases followed the same pattern. Maricopa County is home to 60% of Arizona's population and 68% of people living with HIV/AIDS, while Pima County is home to 15% of Arizona's population and 16% of people living with HIV/AIDS (Figure 3).

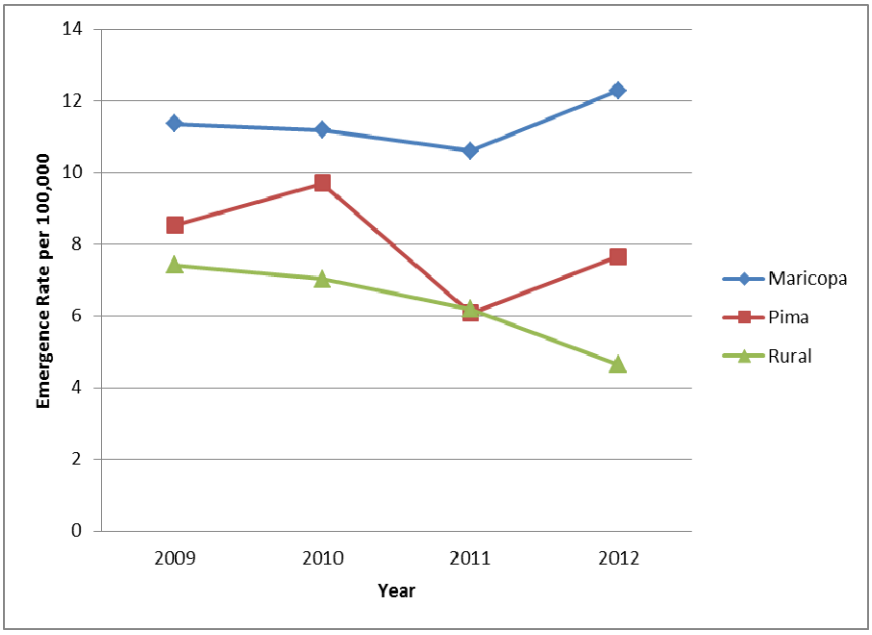


Figure 3: New/Emergent HIV/AIDS cases by region of diagnosis

RACE/ETHNICITY

Among new cases of HIV/AIDS in 2009-2012, black non-Hispanics consistently have the highest emergence rates, reaching 36.3 per 100,000 in 2012 (Figure 4). Blacks are diagnosed with HIV/AIDS at almost three times the rate of persons in Arizona as a whole and almost twice the race of American Indians/Alaska Natives, which have the second-highest emergence rates in the state. White non-Hispanics have the highest number of emergent cases in the state, followed by Hispanics and by blacks. The race/ethnicity of prevalent cases have a similar profile. Blacks make up 4% of Arizona's population and 12% of persons living with HIV/AIDS in Arizona.

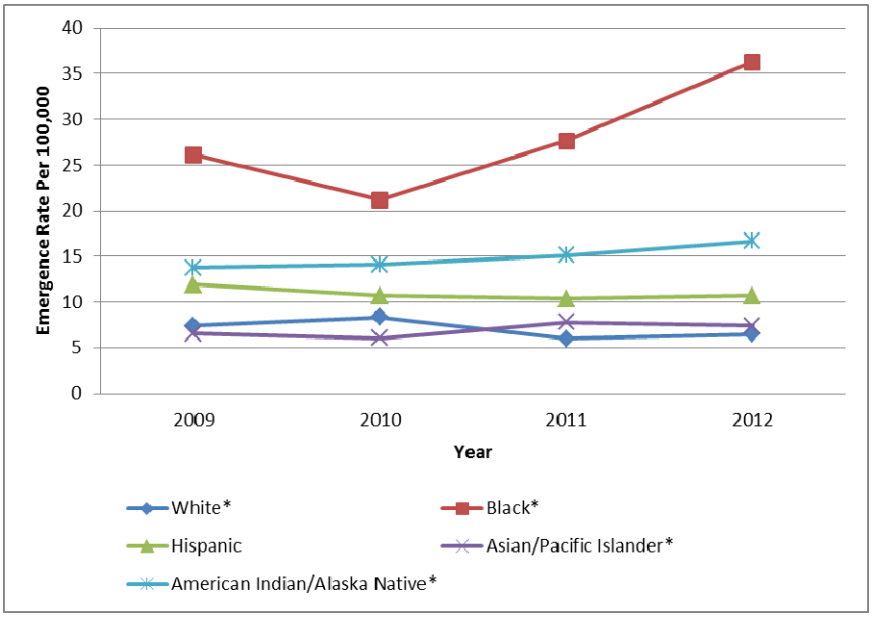
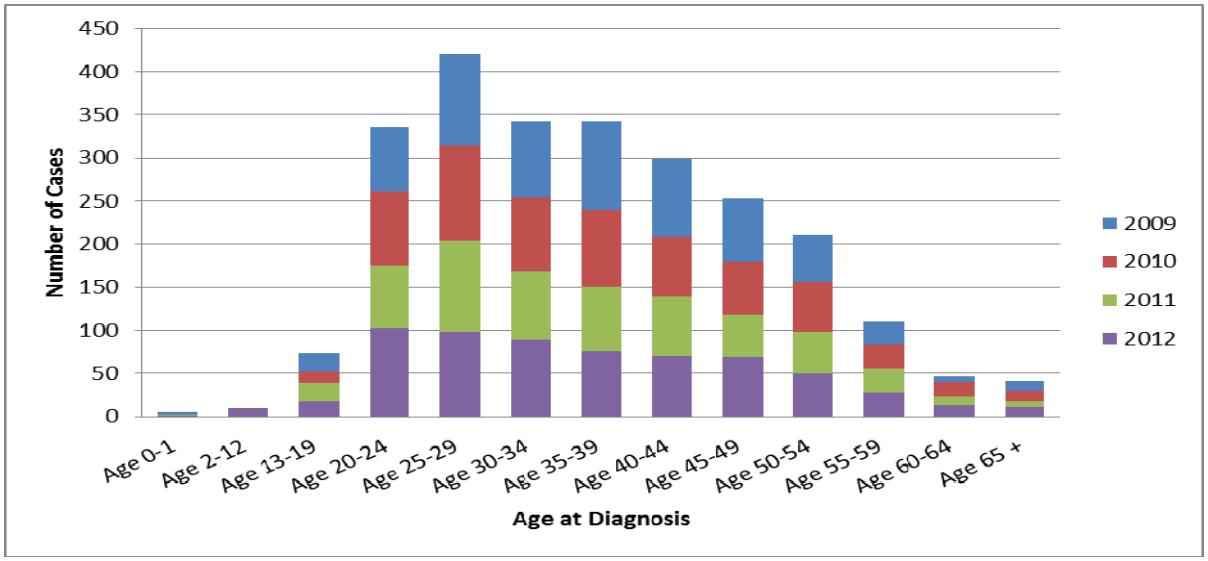


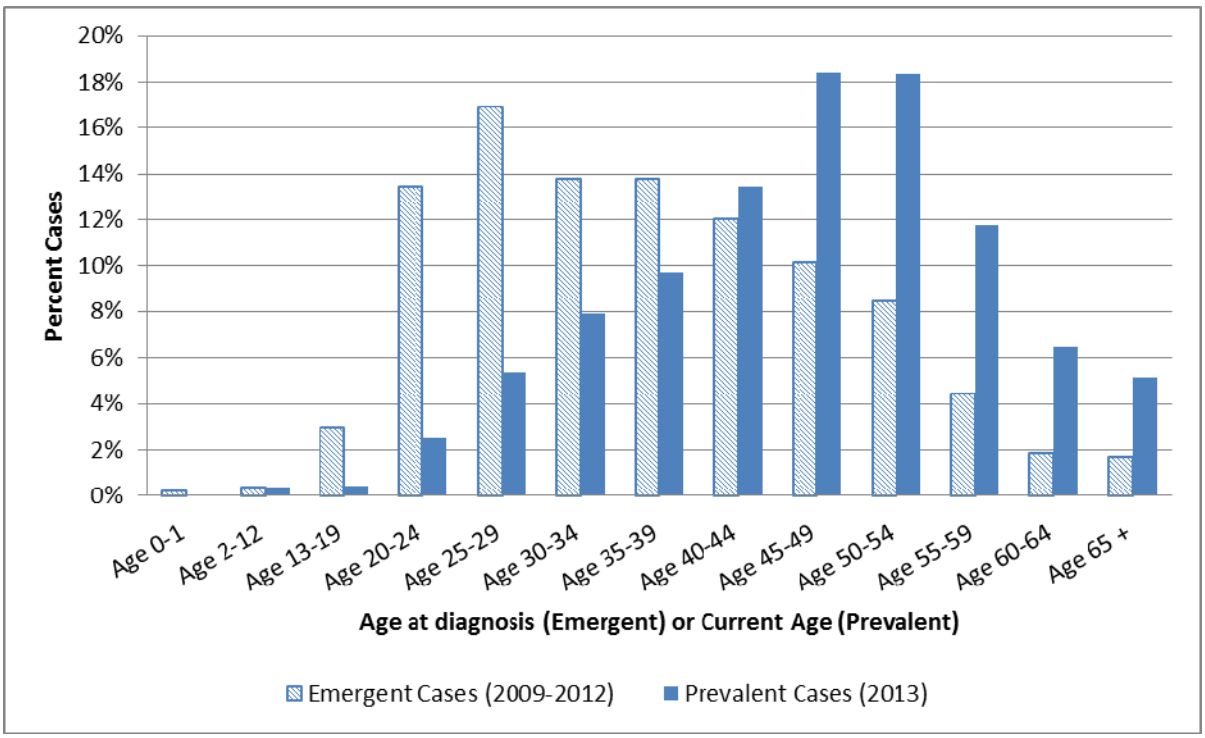
Figure 4: HIV/AIDS Emergence by Race and Ethnicity in Arizona 2009-2012

*Non-Hispanic

AGE GROUPS

The highest proportion of new HIV/AIDS cases from 2009-2012 (17%) were among those aged 25-29 followed by those aged 30-34, 35-39, 20-24 respectively (14% each) (Figure 5). However, prevalent cases as a whole are older. Among those aged 40-44 and 45-49 each accounted for 18% of the 2013 prevalent cases, while those aged 25-29 made up only 5% of 2013 prevalent cases (Figure 6).





Figures 5 & 6: Number of Cases by Age Group and Comparison of Emergent and Prevalent Cases by Age Group

RISK CATEGORIES

Men who have sex with men (MSM) continue to make up the majority of Arizona HIV/AIDS cases. (Figure 7) From 2009-2012, MSM accounted for 58% of all emergent cases and 67% of emergent cases among men. MSM who also report injection drug use (MSM/IDU) accounted for an additional 6% of all emergent cases and 6% of emergent cases among men. Among women, heterosexual contact made up 79% of emergent cases. 48% of female emergent cases were classified high-risk heterosexual (HRH) transmission (heterosexual contact with a partner known to be HIV-infected or have a known HIV risk factor), and 31% of female emergent cases were classified as presumed heterosexual (PH) transmission (no reported HIV risk factors except for heterosexual contact with a partner not classified as high-risk). Injection drug use (IDU) accounted for 17% of emergent cases among women.

MSM also make up the majority of prevalent cases. In 2013 60% of all prevalent cases were among MSM, with MSM/IDU comprising an additional 8% of prevalent cases. Among men MSM and MSM/IDU make up 70% and 10% percent of cases, respectively (Figure 8). Among female prevalent cases, high-risk heterosexual contact (HRH) accounts for 54% of prevalent cases, IDU for 24% of cases and presumed heterosexual for 16% (Figure 9).

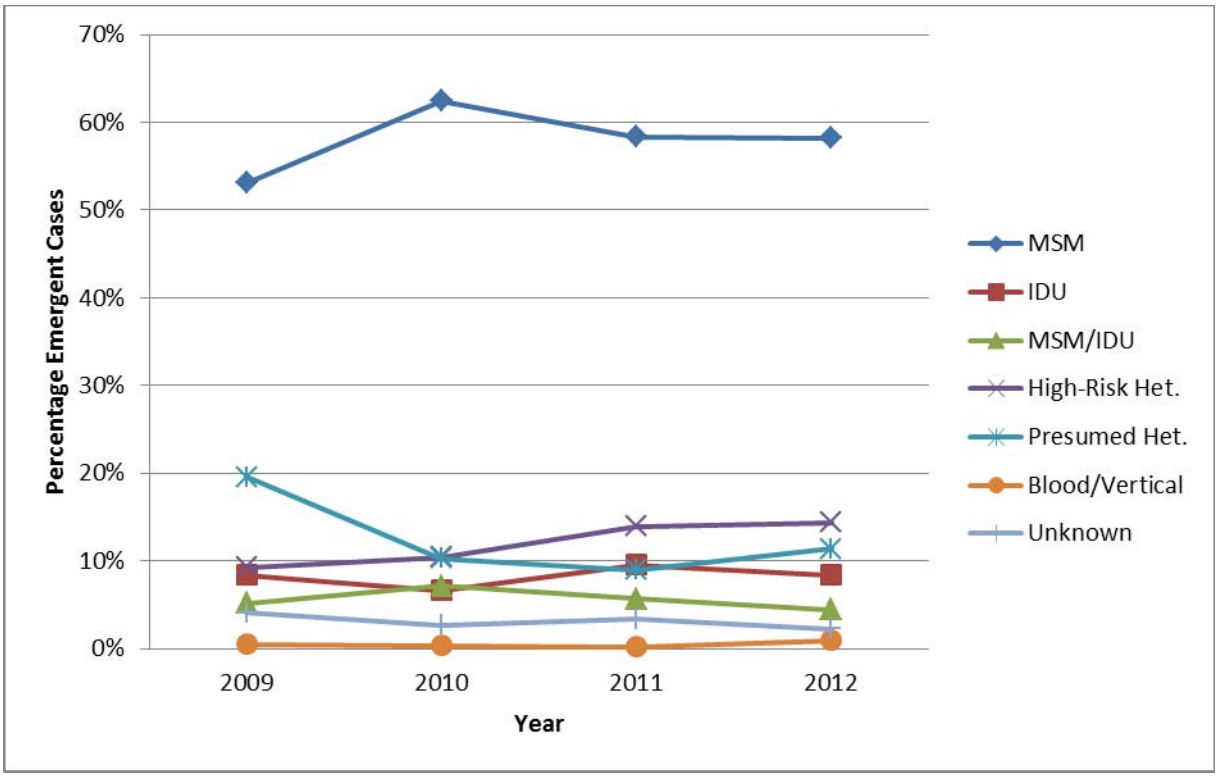


Figure 7: HIV/AIDS Cases by Risk* Group

*Self Reported Variable

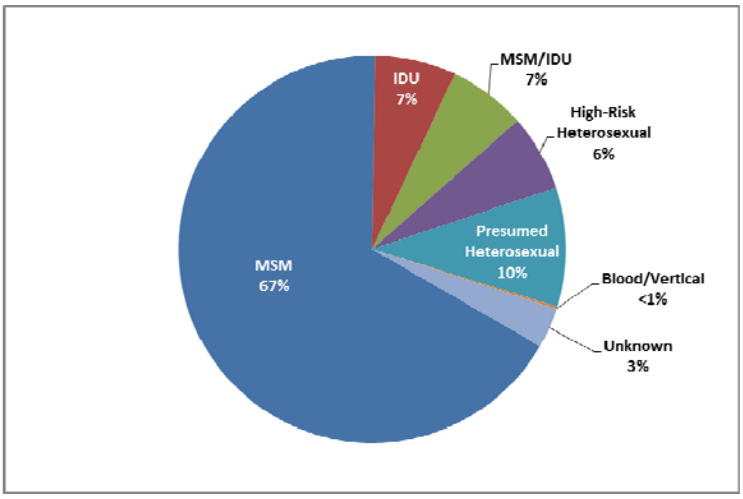


Figure 8: Percentage of Prevalent Case by Risk Group, Males*

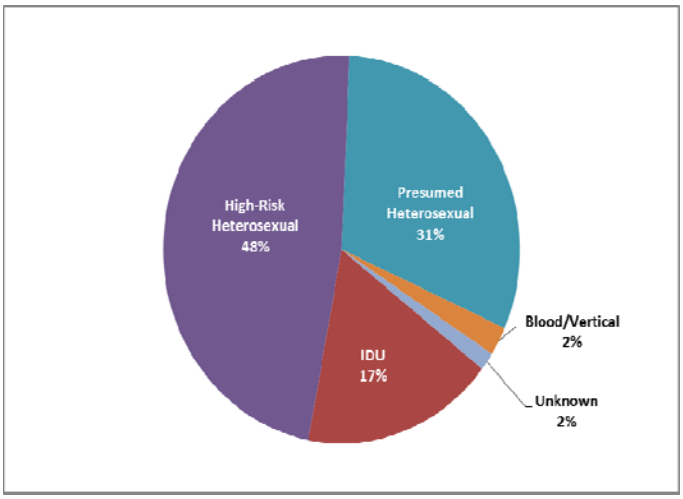


Figure 9: Percentage of Prevalent Case by Risk Group, Females*

Figure 10 shows all subpopulations that accounted for at least two percent of emergent HIV/AIDS cases in Arizona from 2009-2012. More than half of all emergent cases were among white MSM (762 cases, 32%) and Hispanic MSM (562 cases, 23%). Black MSM and American Indian/Alaska Native MSM accounted for an additional 9% of emergent cases (126 and 87 cases, respectively). Additionally, white and Hispanic heterosexual men composed 11% of all emergent cases (147 and 121 cases, respectively). Among these white and Hispanic men, only 36% (97 cases) reported heterosexual contact with a high-risk partner (females known to be injection drug users, be HIV-infected or have another documented risk of HIV infection). It is presumed that the remaining cases were infected by heterosexual contact, but it is possible that other risk factors were present and not reported.

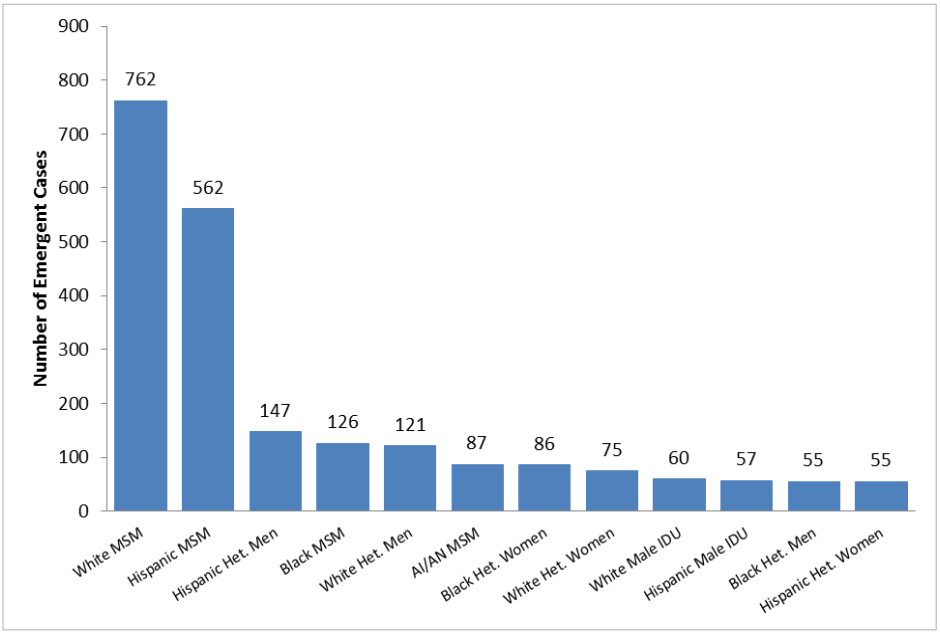


Figure 10: Subpopulations in Emergent HIV/AIDS cases, Arizona 2009-2012*

*Any male reporting sexual contact with a male was classified as MSM, including those reporting injection drug use. Any person that reported high-risk heterosexual contact, or reported heterosexual contact and no other risk factor were classified as heterosexual.

INCIDENCE

BACKGROUND

Arizona is one of twenty-five sites participating in the Centers for Disease Control and Prevention (CDC) funded HIV Incidence Program. The incidence program's goal is to track newly diagnosed cases during a specified time period, by testing blood samples from HIV positive individuals, to determine when the infection was acquired. Eligible cases comprise individuals who are newly diagnosed, over the age of 13, and not yet categorized as AIDS. The information is used to create an Incidence Estimate, which is used to monitor the HIV epidemic, and to target prevention resources and services to those most affected by HIV.[1]

INCIDENCE VS EMERGENCE

Incidence refers to the number of new infections occurring during a specified time period while emergence refers to the number of newly reported cases. For emergent cases, these individuals may have tested positive for the first time in Arizona but contracted the infection many years earlier.

INCIDENCE ESTIMATES

In 2012, there were 738 individuals estimated to be newly infected with HIV in Arizona, up 28% from 2009 (Figure 1). The rate of newly infected individuals in 2009 was 8.73 per 100,000 persons, while the rate increased to 11.26 per 100,000 in 2012.

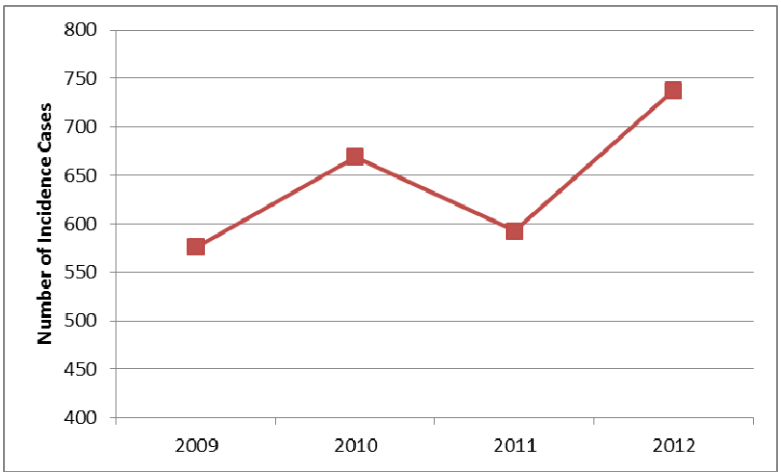


Figure 1. Incidence Estimate Cases, Arizona 2009-2012

QUICK FACTS:

- In 2012, there were 738 estimated new HIV incidence cases in Arizona.
- Whites and Hispanics have the largest burden of HIV infection in Arizona.
- In 2012, men were 5.9 times more likely to be diagnosed with HIV than females.
- The highest number of new HIV infections in 2012 were among those aged 13-24.

TRANSMISSION CATEGORY

Since the beginning of the HIV/AIDS epidemic, men have been disproportionately affected by HIV/AIDS. Men who have sex with men (MSM) is still the single largest risk factor for acquiring HIV. In 2012, MSM was the transmission category for 507 of the total 738 incident cases (69%) (Table 1). From 2009 to 2012, there was a 21% increase in incidence cases among MSM populations. In 2012, 16% of incidence cases were among injection drug users (IDU), while heterosexual contact/other accounted for the remaining 15% of new cases.

RACE/ETHNICITY

White non-Hispanics and Hispanics had the largest burden of new HIV infection in 2012. Of the 738 new HIV infections, 274 were white and 273 were Hispanic (Figure 2). Hispanics and Multi/Other races had a 47% and 48% increase, respectively, while black non-Hispanics saw the largest increase of 57% of new diagnoses, but only accounted for 13% of all the new diagnoses during this time period.

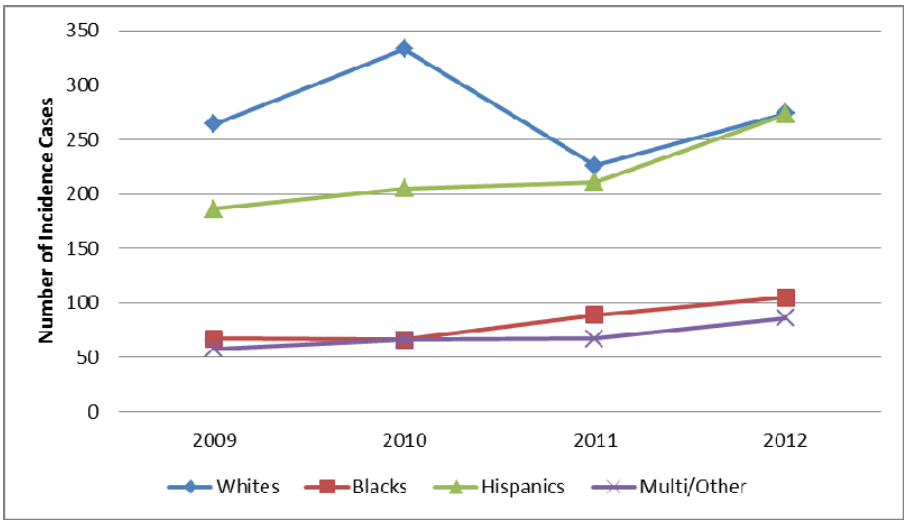


Figure 2: Incidence Estimate Cases by Race, Arizona 2009-2012

SEX

Among males, the estimated number of new HIV infections increased from 438 in 2009 to 632 in 2012. For females, new HIV infections have remained relatively consistent during this time period, 93 in 2009 and 107 in 2012 (Table 1). When comparing males and females from 2009 to 2012, males had double the increase of incident cases when compared with females. Focusing only on 2012 incidence figures, the number of new infections for males was 5.9 times higher when compared to females.

Table 1: Incidence Estimate Cases by Sex, Race/Ethnicity, Age at Infection, and Transmission Category, Arizona, 2009-2012

Year	2009	2010	2011	2012
Incidence Estimate Total	576	669	593	738
Sex				
Males	483	591	509	632
Females	93	78	84	107
Race/Ethnicity				
Whites	264	333	226	274
Blacks	67	66	89	105
Hispanics	186	205	211	273
Multi/Other*	58	66	67	86
Age at Infection				
13-24	142	145	129	211
25-34	145	265	212	193
35-44	163	136	127	158
45+	126	124	124	177
Transmission Category				
MSM**	420	497	407	507
IDU***	74	87	80	119
Hetero/Other****	82	85	107	113

*Multi/Other includes Asian/Pacific Islander/Native Hawaiian, American Indian/Alaska Native non-Hispanic, Multiple races, all other races, and unknown races.
**MSM = Men who have Sex with Men
***IDU = Injection Drug Use
****Hetero/Other = Adult high-risk heterosexual contact and all other transmission categories for individuals thirteen years and older

AGE

In 2012, individuals aged 13-24 had the highest number of new infections with 211 cases (29%) (Figure 3). The 25-34 age group had the second highest number with 193 cases (26%). This runs counter to the national trend where the 25-34 age group has the highest number of new infections per year followed by the 13-24 age group[1]. Subsequently all age groups in Arizona except those in the 35-44 age range had an increase in incidence cases from 2009 to 2012.

1. HIV Incidence. Centers for Disease Control and Prevention. http://www.cdc.gov/hiv/statistics/surveillance/incidence. Accessed March 12, 2015.

SURVIVAL ANALYSIS

SURVIVAL ANALYSIS, 1998-2012

HIV/AIDS claims the lives of approximately 200 Arizonans every year. Modern treatments collectively known as Highly Active Antiretroviral Therapy (HAART) provide effective treatment to manage the disease to increase survival to near normal life expectancy. From 2009 to 2012, 759 reported deaths were attributed to HIV. The number of deaths per year among the HIV/AIDS population remains relatively stable; there were 194 deaths in 2009 and 192 in 2012.

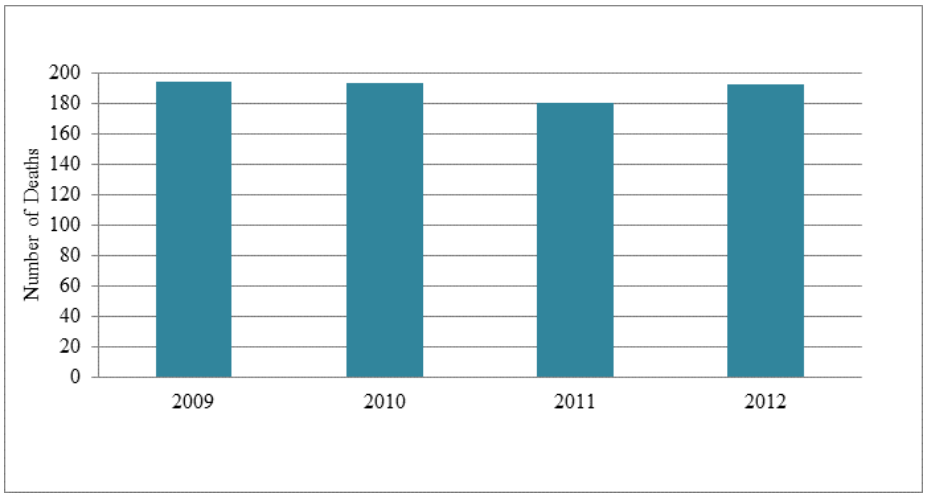


Figure 1: Death Counts, Arizona 2009-2012

Substantial differences exist in the number of deaths between race groups. Table 1 shows the number of diagnosed cases between 1998-2012 and the percentage of cases that died within this time frame. Whites had the largest number of deaths (775), but also dominate the diagnosed cases. Asians, Pacific Islanders, and Hawaiians (A/PI/H) had by far the lowest percentage of deaths (7%), while Hispanics had the second lowest percentage (15%) of deaths. Among all the larger race groups that had more than 1,000 diagnosed cases, non-Hispanic blacks had the highest percentage of deaths (18%).

QUICK FACTS:

In Arizona, after 15 years of living with HIV/AIDS, survival rates differ among groups:

- Among non-Hispanic whites, the rate of survival is 84 out of 100.
- Among Hispanics, the rate of survival is 80 out of 100.
- Among non-Hispanic blacks, the rate of survival is 78 out of 100.
- Among American Indian/ Alaska Natives, the rate of survival is 77 out of 100 cases.

Table 1: Deaths among Cases Diagnosed between 1998-2012

	Diagnosis Year	Deaths	Deceased (%)
Race	1998-2012	1998-2012	
White	4,995	775	16%
Black	1,201	212	18%
Hispanic	3,316	481	15%
AI/AN*	505	99	20%
A/PI/NH**	138	9	7%
Multi/Other/Unknown	116	28	24%
All Races	10,271	1,604	16%

*Asian/Pacific Islander/Native Hawaiian **American Indian/Alaska Native

There are some race groups that have a smaller percent of people who died after 15 years from HIV/AIDS than other groups. Whites, Asian/Pacific Islander/Native Hawaiian A/PI/NH, and Hispanics have a higher percent of people surviving when compared to non-Hispanic blacks, American Indian/Alaska Natives (AI/AN) and multiple race/other/unknown (Mult/Oth/Unk). Figure 1 displays survival curves for 10,271 HIV/AIDS patients diagnosed from 1998-2012. This group has two categories; cases that were diagnosed with AIDS during the time frame (5,370), and HIV only cases (4,901). Figure 2 shows the results for cases with AIDS. These results indicate that after 15 years of being infected, about 84 out of 100 whites and about 80 out of 100 Hispanics were still living. The race with the highest percent of people surviving after 15 years of exposure was A/PI/H (87%). The (Mult/Oth/Unk) race group had the lowest survival rate at 64%.

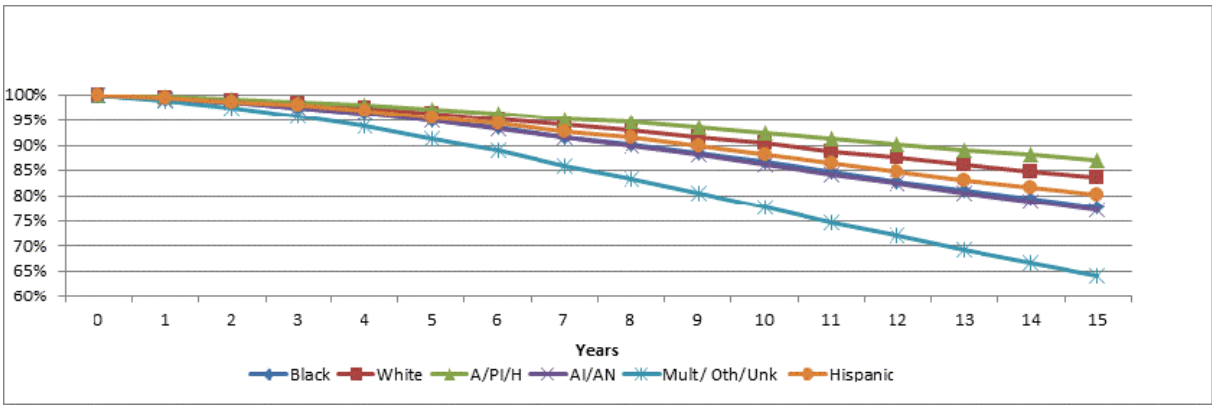


Figure 2: Kaplan-Meir Survival Curves (Sample with HIV/AIDS)

A/PI/H=Asian/Pacific Islander/Native Hawaiian AI/AN=American Indian/Alaska Native

There is a distinction between HIV and AIDS; HIV is the state of being infected with the virus whereas AIDS is the symptomatic state of the disease and is characterized by a suppressed immune system, opportunistic infections, and other debilitating conditions. Therefore it is expected that people who have not progressed to AIDS will be healthier and therefore live longer. This holds true in this analysis. Comparing the survival of people with HIV to AIDS among racial groups in this population, there is a higher percentage of people with HIV not yet progressed to AIDS that survived longer. When comparing the group diagnosed with HIV that has not yet progressed to AIDS to the overall HIV/AIDS population over a 15 year time period, the same racial groups that had the highest percent of people surviving with A/PI/H at 97%, and both whites and Hispanics at 96% respectively. The minority groups, non-Hispanic blacks and AI/AN, had the lowest percent of people living after 15 years of having HIV; non-Hispanic blacks had a 93% survival rate, and AI/AN had a rate of 94%.

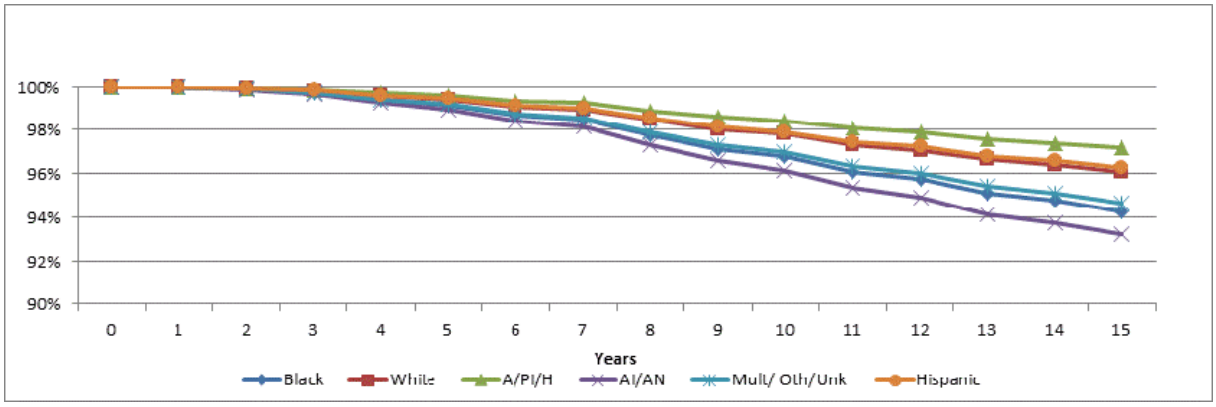


Figure 3: Kaplan-Meir Survival Curves (Sample with HIV only)

A/PI/H=Asian/Pacific Islander/Native Hawaiian AI/AN=American Indian/Alaska Native

1. HIV/AIDS. Centers for Disease Control and Prevention. http://www.cdc.gov/hiv/library/slideSets/index.html. Accessed March 12, 2015.

LINKAGE TO CARE

BACKGROUND

The Spectrum of Care is a method designed by Gardner et al., 2011 to depict how well the HIV-positive population is engaged with health care. Of the people with HIV at the end of 2012 that are alive and residents of Arizona, 57% are linked to medical care. This means they had at least one medical visit, lab test or HIV medication prescription in the calendar year. This is an important measure as it indicates a patient's ability to receive medication, improving the patient's prognosis as well as decreasing the chance of the spread of the virus.

At the end of 2012, 47% of people with HIV in Arizona were retained in medical care. Retained in medical care is determined by having a medical visit, lab test or HIV medication use in this calendar year and at least one in the calendar year prior. Of this group, 43% need to be on HIV medication. This is defined as people who have evidence of medication use or who are ill enough to need it (CD4 count <350 or viral load >100,000 C/mL). Using Testing and Treatment History data as well as the Arizona AIDS Drug Assistance Program (ADAP) database, it was determined that 37% of the cases in Arizona as of the end of 2012 were on HIV medication (ARV therapy). Of this group, an estimated 35% of HIV diagnosed people have undetectable viral loads. This is a key measure as people with undetectable viral loads are less likely to pass the virus to others.

QUICK FACTS:

- Approximately 35% of HIV positive people in Arizona have undetectable viral loads.
- By racial groups, Native Americans have a higher percentage of care in all categories.
- Sixty percent (60%) of individuals who identify as High Risk Heterosexual are linked to care.

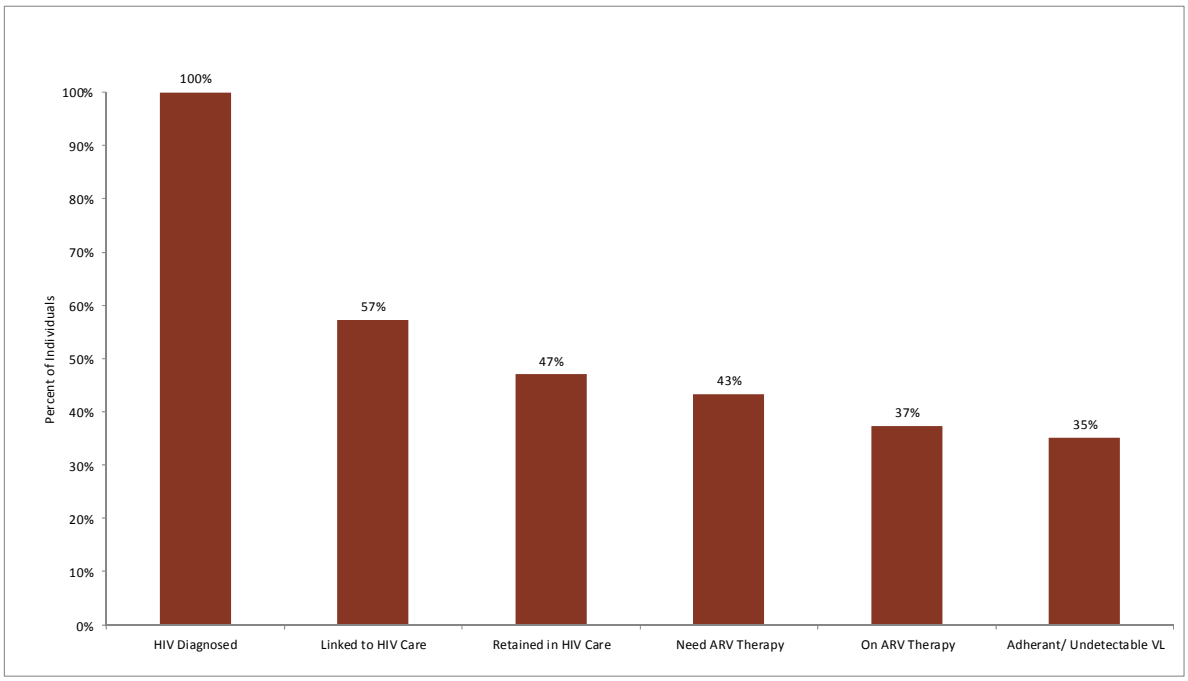


Figure 1: Spectrum of Care Arizona prevalent cases as a percent of total diagnosed HIV positive, 2012

SPECTRUM OF CARE BY RACE/ETHNICITY

The Spectrum of Care is a useful tool to illustrate the care component of the epidemic in specific populations of interest. Differences can be seen in the spectrum when it is looked at by racial/ethnic group. Of the cases living in Arizona at the end of 2012, non-Hispanic American Indian/Alaska Natives had the largest percent of people in all stages of the spectrum of care. Almost three quarters of this group were linked to medical care and approximately 50% had no detectable virus in the bloodstream as indicated by blood tests.

Only 28% of black non-Hispanics had undetectable viral loads, the lowest of all racial/ethnic groups. Though the black non-Hispanic population had the smallest percentage of people on medication and retained in medical care, the population has a higher percentage of people linked to medical care than Hispanics.

Racial and ethnic difference in the spectrum of care could be due to factors such as access to health care, quality of care, and socioeconomic status.

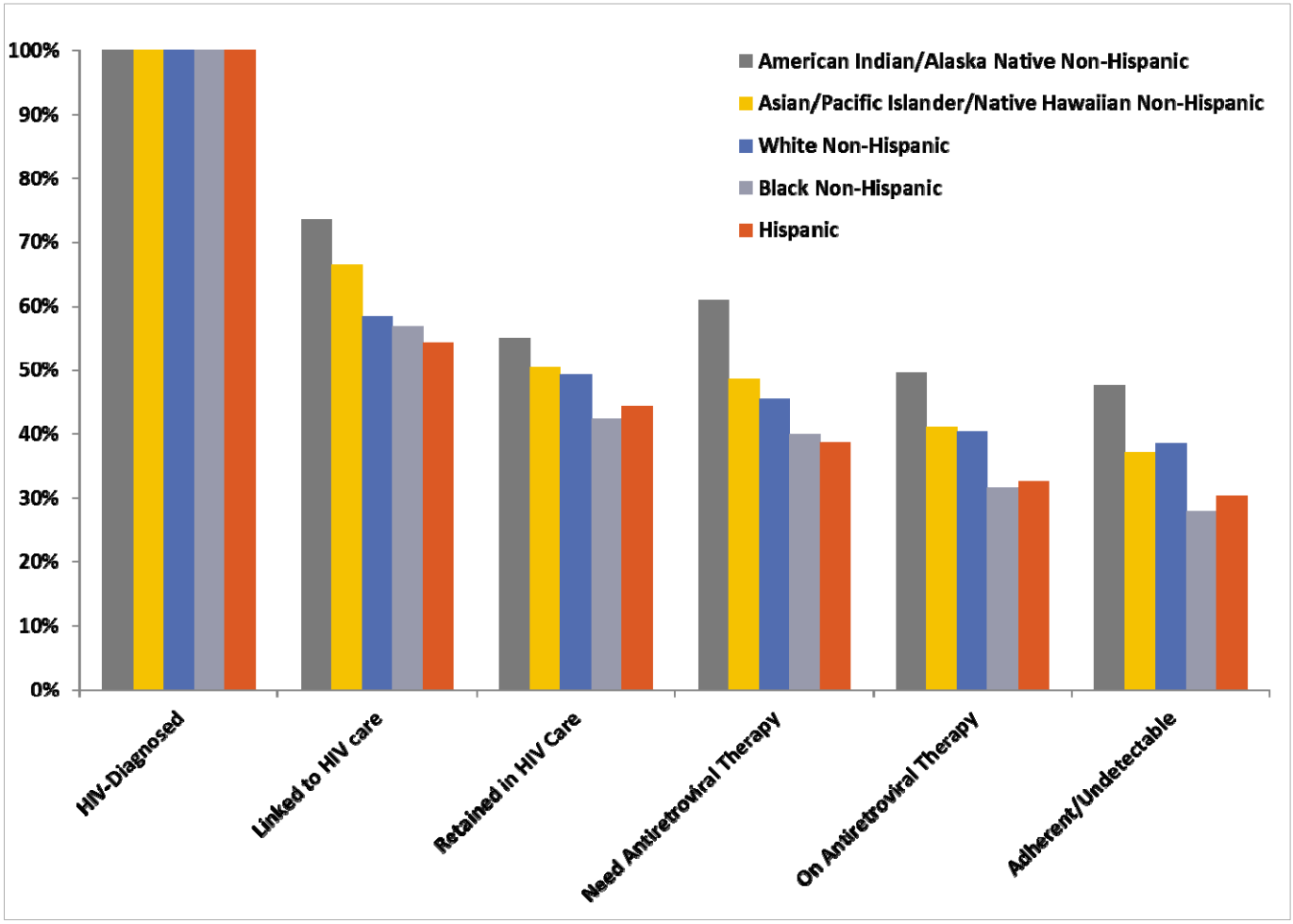


Figure 2: Spectrum of Care, Arizona 2012 prevalent cases by racial/ethnic groups. Percentage is of total HIV diagnosed in Arizona

SPECTRUM OF CARE BY HIV RISK

An HIV risk factor is a specific behavior reported by an HIV positive person which is a recognized way of acquiring HIV. Both in Arizona and nationwide, men who have sex with men (MSM) is the most common risk factor of people with HIV. When looking at people with HIV in Arizona at the end of 2012, high-risk heterosexual sexual contact (HRH) has the largest percentage of people linked to care (61%) followed by MSM (60%).

Cases who report injection drug use (IDU) as a risk have the smallest percentage of people in all stages of the spectrum of care with only 50% being linked to care and 26% having undetectable viral loads.

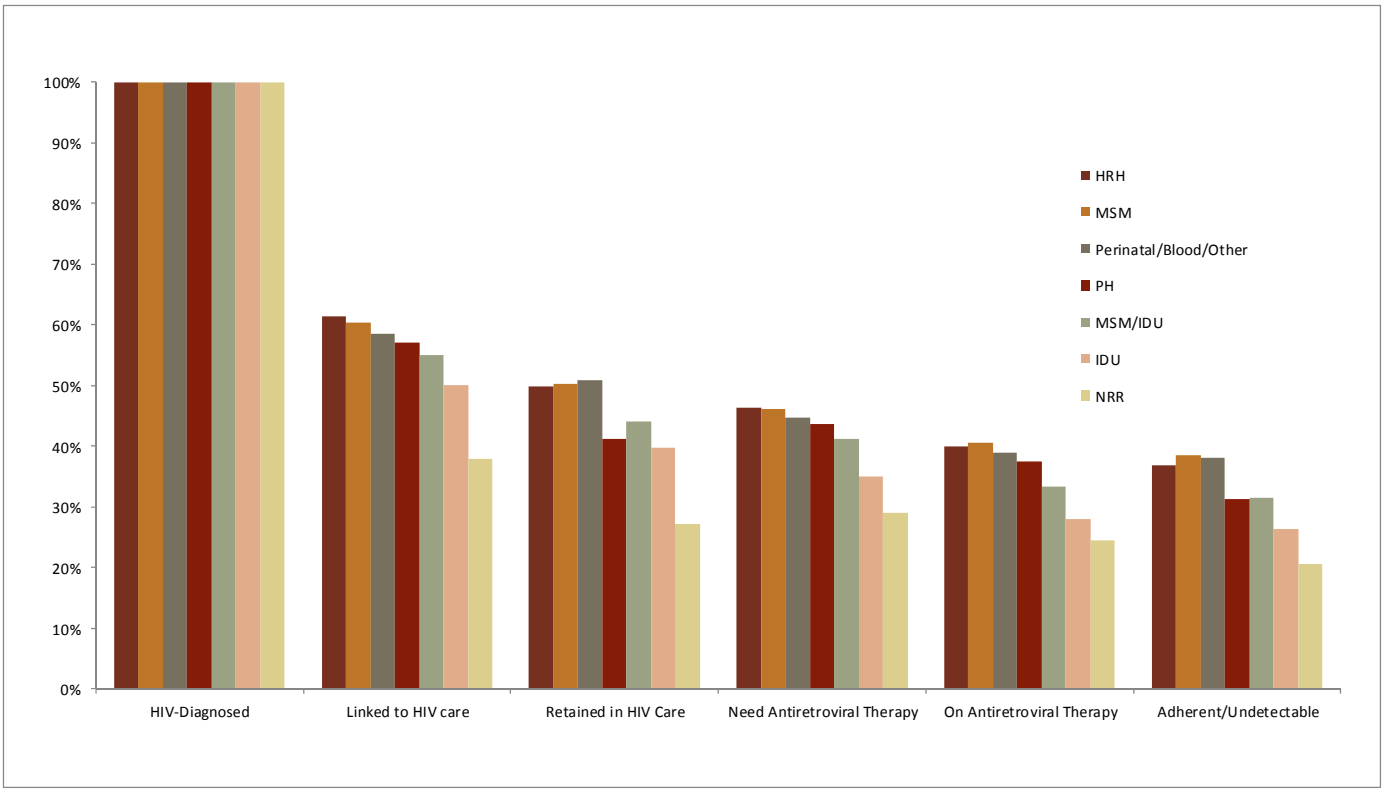


Figure 3: Spectrum of Care, Arizona 2012 prevalent cases by self reported HIV risk*. Percentage is of total HIV diagnosed people in Arizona.

HRH= high risk heterosexual behavior, MSM= men who have sex with men, Perinatal/Blood/Other= perinatal HIV exposure, needle sticks, transplants, hemophilia, blood exposure, PH= presumed heterosexual women with heterosexual contact with partners not classified as high risk, MSM/IDU= men who have sex with men and inject non prescription drugs, IDU= non prescription injection drug user, NRR= no HIV risk reported (either no information on risk or the behavior is not one of the HIV risk categories)

1. Gardner E., McLees M., Steiner J., Del Rio C., Burman, W. The Spectrum of Engagement in HIV Care and its Relevance to Test-and-Treat Strategies for Prevention of HIV Infection. Clinical Infectious Diseases 2011.52(6):793-800.

RYAN WHITE PART B HIV CARE & SERVICES AIDS DRUG ASSISTANCE PROGRAM (ADAP)

BACKGROUND

The mission of the Ryan White Part B HIV Care and Services Program is to provide medically necessary health care and support services. Individuals who are eligible for the program are low-income individuals with HIV infection that lack sufficient health care coverage or financial resources for coping with HIV/AIDS. Ryan White Part B services include outpatient medical care and diagnostic testing. Other services available include: dental care, mental health services, substance abuse services, transportation assistance, case management, food box/home delivered meals, health insurance premium, and cost sharing assistance.

The program administers the AIDS Drug Assistance Program (ADAP) for the entire state of Arizona which includes medication for uninsured individuals and medication copay assistance for insured clients. The Arizona Department of Health Services (ADHS) is responsible for the administration of ADAP for the state. ADAP provides access to medications used to treat HIV and prevent the onset of related opportunistic infections to low-income individuals living with HIV who have limited or no insurance coverage. ADAP Assist offers copay assistance for ADAP clients who have private insurance, Medicare, employer-based insurance, or insurance through the Federally Facilitated Marketplace (FFM).

CLIENTS SERVED

In 2013 the AIDS Drug Assistance Program served 902 Assist clients and 916 ADAP-only clients per month on average. Of all ADAP clients 98% are on antiretroviral therapy and 61% of the clients have an undetectable viral load (Figure 1).

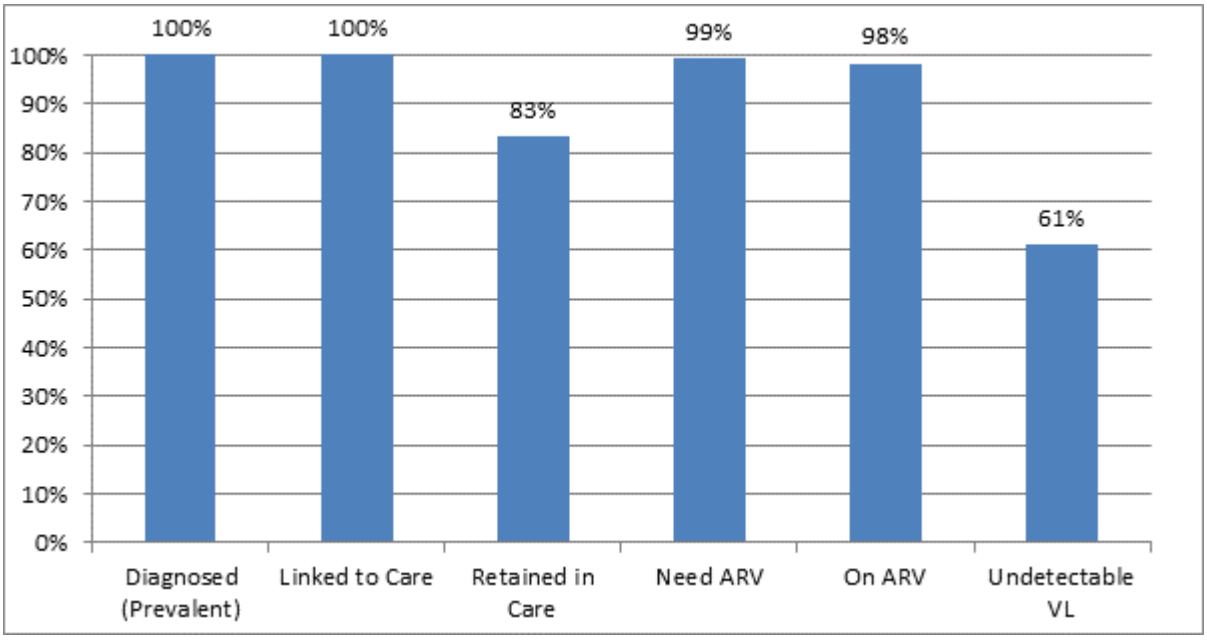


Figure 1: Continuum of Care for ADAP clients, 2013

There are significant differences among racial groups with respect to their enrollment in ADAP. In 2013, the Hispanic population represented 26% of reported HIV prevalence in Arizona. In ADAP the Hispanic population is overrepresented, constituting 38% of clients served (Figure 2). The ADAP and Ryan White Part B Programs play an integral role in the care of the HIV positive population in Arizona.

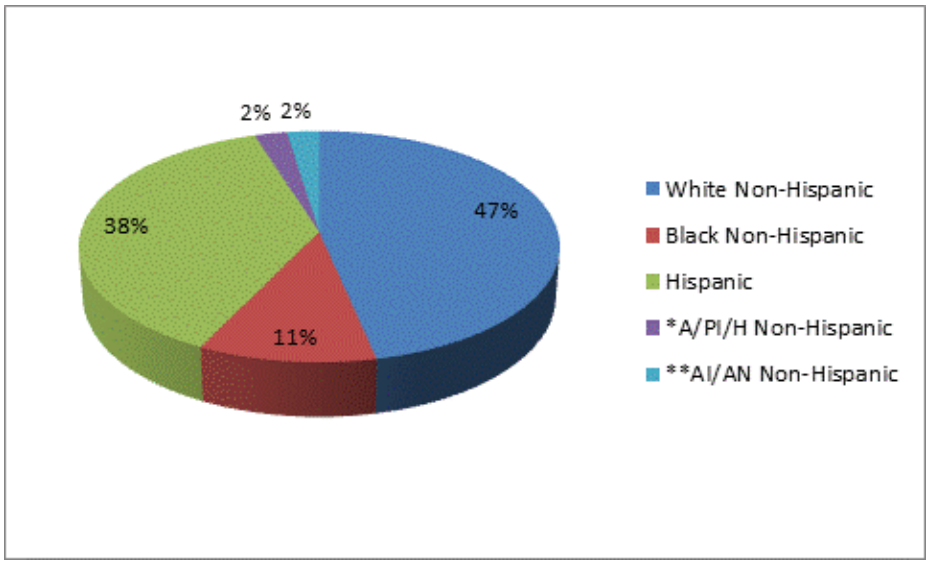


Figure 2: Race/Ethnicity of ADAP clients in 2013
***Asian/Pacific Islander/Hawaiian Non-Hispanic**
****American Indian/Alaska Native Non-Hispanic**

HIV PREVENTION

BACKGROUND

In Arizona, the HIV Prevention Program specializes in all areas of HIV prevention from community planning efforts to HIV testing and partner services. By 2017, the program's goal is to reduce new HIV infections in Arizona by 25%. To accomplish this, the program utilizes CDC funding to support High Impact Prevention activities statewide. HIV prevention efforts focus on treatment as prevention to eliminate the spread of HIV, focusing on the concept that individuals with reduced viral loads are less likely to transmit HIV to partners. This cost-effective strategy is based on scientific research. The HIV Prevention Program accomplishes its goals by funding services delivered by local health departments, hospitals, and community organizations.

QUICK FACTS:

High Impact HIV Interventions

- HIV testing and linkage to care
- HIV Medication Adherence
- Condom distribution
- Prevention programs for people living with HIV and their partners
- Screening/treatment for other STIs

HIV TESTING AND LINKAGE TO CARE

The HIV Prevention Program funds ten local health departments throughout the state to provide HIV Testing and Partner Services. Partner Services offers HIV positive people free assistance to get linked to medical care and also helps these people notify others they may have been exposed to HIV. In 2013 funded partners tested approximately 23,000 people and identified 281 new cases of HIV (Table 1).

The HIV Prevention Program collaborated with Maricopa Integrated Health System (MIHS) to begin routine testing in the Emergency Department of Maricopa Medical Center. Since the program began in July 2011, more than 31,000 people have been tested. Of this number, 85 have been diagnosed with HIV and referred to medical care. MIHS is also contracted to provide Antiretroviral Treatment and Access to Services (ARTAS), a program designed to assist people living with HIV who need extra help engaging in medical care. In addition, University of Arizona Medical Center (Tucson) will begin routine HIV testing in its Emergency Department in late 2014.

The HIV Prevention Program collaborates with the Maricopa County Jail system to offer routine testing to inmates during their medical screening at intake. More than 15,000 inmates are tested each year. When HIV positive inmates leave the jail, a case manager provides them with help to connect to medical services in their community (Figure 1).

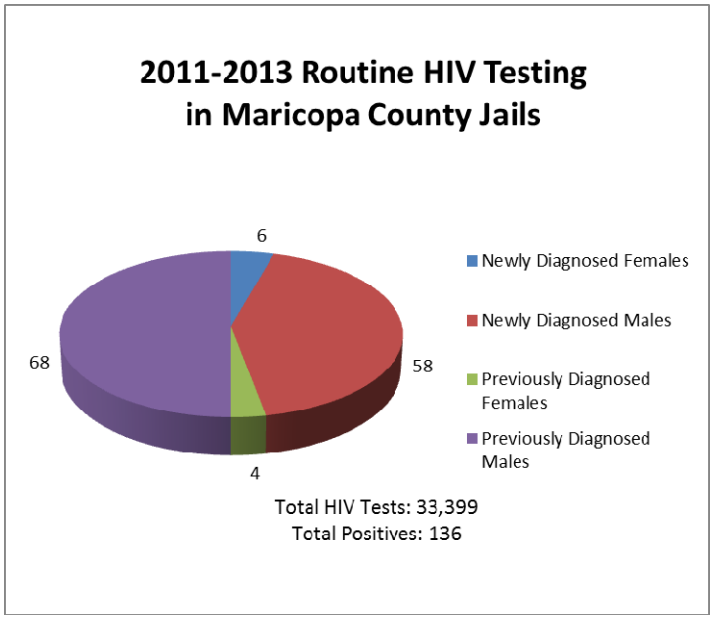


Figure 1: Routine HIV Testing in Maricopa County Jails, 2011-2013

Prevention Program Target Populations by Region

- ***Flagstaff/Northern Region:*** Men who have Sex with Men (MSM), Hispanics, and Native Americans
- ***Phoenix/Central Region:*** MSM, Hispanics, African Americans/Blacks (especially AA/B women)
- ***Tucson/Southern Region:*** MSM, Hispanics, Injection Drug Users

BEHAVIORAL INTERVENTIONS

HIV Prevention also utilizes behavioral interventions which are vital to the success of any long-term disease management. Several entities are funded to provide behavioral interventions. Choosing Life: Empowerment! Action! Results! (CLEAR) focuses on reducing behaviors that may increase the risk of HIV transmission or infection and helps clients maintain better health. Healthy Relationships is a five-session, small group intervention focused on building skills related to disclosure of HIV status to others and establishing safer sexual behaviors.

CONDOM DISTRIBUTION

Condom use is a proven HIV prevention strategy used in Arizona. Each year, the HIV Prevention Program distributes more than 150,000 condoms statewide. A unique pharmacy distribution program offers free condoms to people living with HIV when they pick up their medications.

COMMUNITY-FOCUSED ACTIVITIES

Other statewide programmatic activities include technical assistance for funded and non-funded partners, community mobilization efforts, policy development, integrated prevention and care planning, and social marketing and media initiatives.

The diverse activities of the HIV Prevention Program will maximize Arizona's ability to provide HIV testing, ensure rapid linkages to medical care, and promote treatment adherence, ultimately reducing the number of new HIV infections within the state.

Table 1: 2013 HIV Test Events in Healthcare Settings

# of Test Events	Newly Diagnosed Positive Test Events		Newly Diagnosed Positive Test Events with Client Linked to HIV Medical Care		Newly Diagnosed Confirmed Positive Test Events		Newly Diagnosed Confirmed Positive Test Events with Client Interviewed for Partner Services		Newly Diagnosed Confirmed Positive Test Events with Client Referred to Prevention Services	
	Count (n)	%	Count (n)	%	Count (n)	%	Count (n)	%	Count (n)	%
22,677	281	1.2	220	.78	253	.90	217	.85	220	.87

1. All Things HIV in Arizona. www.hivaz.org. Accessed March 12, 2015.

SPECIFIC POPULATIONS: MSM

BACKGROUND

Men who have sex with men (MSM) is the most common risk factor associated with contracting HIV. From the onset of the HIV/AIDS epidemic in the 1980's, the MSM community has been disproportionally impacted by the disease. From 2009-2012, 64% of individuals diagnosed with HIV or AIDS in Arizona identified MSM as a risk factor. From 2009 to 2012, 67% of HIV cases that have not yet progressed to AIDS reported MSM as a risk factor. In comparison, 55% of new AIDS cases reported MSM as a risk factor. In the same time frame, HIV transmission related to MSM has increased by 14% while AIDS from MSM has decreased by 25% (Figure 1). In comparison, at the national level from 2009-2011, the estimated new HIV diagnoses associated with MSM was 60% while new AIDS diagnoses was 51%.[1]

Regarding male transmission risk factors in Arizona from 2009 to 2012, MSM accounted for 78% of new HIV diagnoses and 62% of new AIDS diagnoses. In Figure 2, 66% of HIV/AIDS among males were identified as MSM. Seven percent of males with HIV/AIDS had both MSM and injection drug use (MSM/IDU) as risk factors.

QUICK FACTS:

- MSM accounted for 67% of emergent HIV cases and 55% of emergent AIDS cases from 2009-2012 in Arizona.
- In Arizona, MSM is the highest risk transmission category for males age 25-29.
- MSM among black non-Hispanics and Hispanics creates a disproportionately high risk for HIV compared to population size.

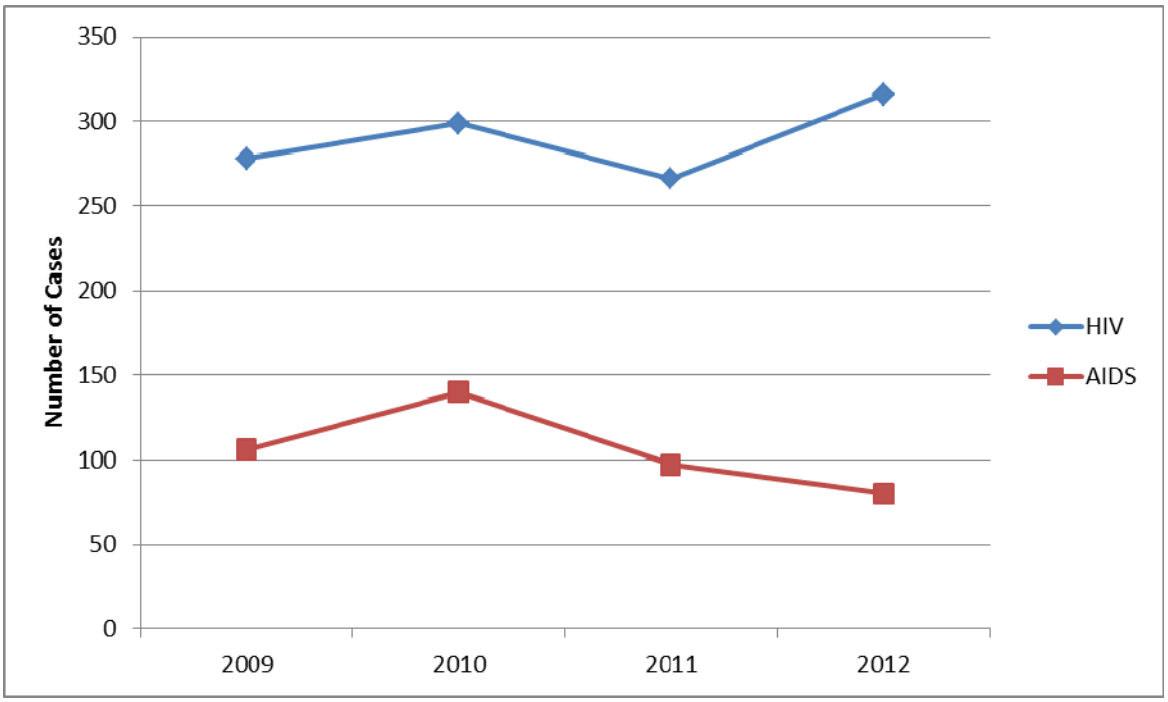


Figure 1: Emergent HIV and AIDS Cases, MSM Risk Factor, Arizona 2009-2012

AGE AND MSM

For newly diagnosed cases in 2009-2012 reporting MSM as a risk factor, the majority of cases at 19% were among the 25-29 age group (Figure 3). This represents a shift from 2004-2008 when the 35-44 age group had the most new cases reporting MSM as a risk factor. Among prevalent MSM cases, the largest age group is 45-49 at 16%. This indicates an older demographic in prevalent cases compared to new cases. This same age group also has the largest number of people living with AIDS that identified MSM as a risk at 22%. This is consistent with the pattern seen in 2004-2008[2].

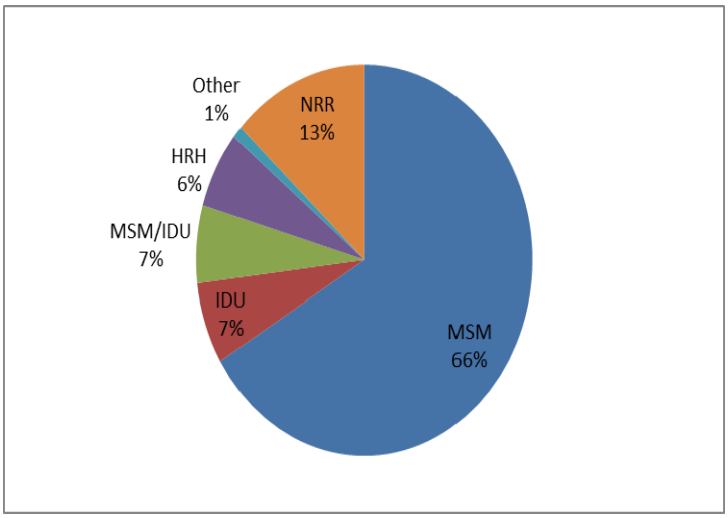


Figure 2: Male HIV/AIDS Transmission Categories, Arizona 2009-2012

MSM=Men who have sex with men, IDU=Injection drug use, HRH=High risk heterosexual, NRR=No Risk Reported

RACE AND MSM

In 2010 non-Hispanic whites and non-Hispanic blacks had the highest proportion of new HIV/AIDS cases nationwide that reported MSM as a transmission risk, with 38% and 36% espectively[3]. In Arizona the total population consists of 58% non-Hispanic whites, 30% Hispanics, and 4% non-Hispanic blacks. This breakdown by race and ethnicity is not reflected in the HIV/AIDS population as the disease disproportionately affects Hispanics and blacks. From 2009 -2012 in Arizona, non-Hispanic whites reporting MSM included 48% of all new HIV/AIDS infections followed by Hispanics at 36% and non-Hispanic blacks at 8% (Table 1).

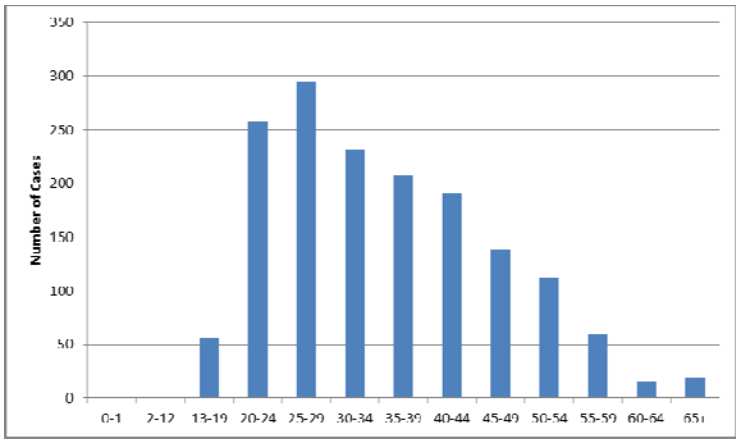


Figure 3: Emergent HIV Cases by MSM and Age, Arizona 2009-2012

Table 1: Emergent HIV/AIDS Cases by Race in Arizona Compared with Arizona's Population, 2009-2012

	Emergent HIV/AIDS Cases by Race		Arizona State Population by Race 2009-2012	
Race	Number	Percent	Number	Percent
White, non-Hispanic	762	48%	3791481	58%
Black, non-Hispanic	126	8%	275571.5	4%
Hispanic	562	36%	1963050	31%
Asian/Pacific Islander/Native Hawaiian Non-Hispanic	27	2%	200695	3%
American Indian/Alaska Native Non-Hispanic	87	5%	275091.3	4%
Multi-Race/Other/Unknown	18	1%	*	*

*No Data Available

1. CDC HIV/AIDS Surveillance Data. Diagnoses of HIV Infection in the United States and Dependent Areas, 2011. http://www.cdc.gov/hiv/library/reportssurveillance/2011/surveillance_Report_vol_23.html. Published May 2014. Accessed March 12, 2015.
2. HIV Epidemiology Program. 2010 Integrated Epidemic Profile. http://www.azdhs.gov/phs/edc/odis/hiv-epidemiology/reports/index.php?pg=other. Accessed March 12, 2015.
3. Centers for Disease Control and Prevention. HIV Among Gay and Bisexual Men. http://www.cdc.gov/hiv/risk/gender/msm/facts/index.html. May 2014. Accessed March 12, 2015.

SPECIFIC POPULATIONS: IDU

BACKGROUND

Injection drug use (IDU) is a major risk factor for HIV transmission. Injection drug users accounted for 8% of all new HIV/AIDS diagnoses from 2009 to 2012. Nationally from 2009 to 2011, HIV infection from IDU decreased 24%,[1] while there was a 9% decrease in Arizona from 2009-2012 (Figure 1).

Females accounted for 17% of the new HIV cases from IDU 2009-2012 and males accounted for 83%. When compared with the new cases from 2004-2008, females who identified IDU as a risk factor decreased 39% while male cases increased 15%[2]. Furthermore males are 1.9 times more likely to have HIV at the time of diagnosis than AIDS when the risk is injection drug use. On the other hand, females are 6.3 times more likely to have HIV at the time of diagnosis than AIDS. IDU cases that had not progressed from HIV to AIDS at time of diagnosis represented 69% of new infections, whereas new HIV cases that had progressed to AIDS at time of diagnosis represented 31%. These numbers are consistent with those in other HIV risk factors.

QUICK FACTS:

- HIV infection from injection drug use accounted for 8% of all new HIV/AIDS cases.
- Males between the age of 25-29 and 40-44 and females between the age of 40-44 and 50-54 have the greatest risk of exposure to HIV from IDU.
- HIV infection by IDU risk factor decreased 9% in Arizona from 2009 to 2012.

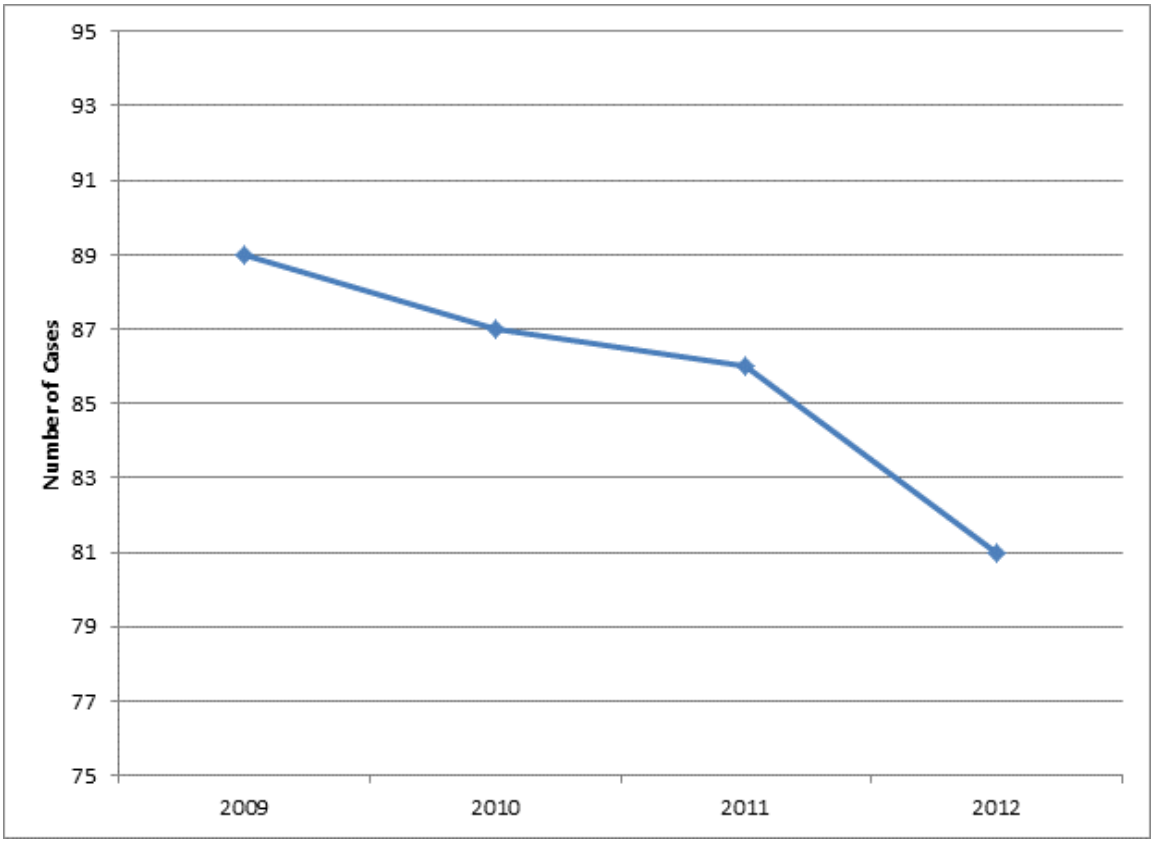


Figure 1: HIV Cases by Injection Drug Use Risk, Arizona 2009-2012

AGE

Male injection drug users had the largest number of new infections in the 25-29 and 35-39 age groups, both at 20%. However, female injection drug users had the largest number of new infections for the 40-44 and 50-54 age groups, both at 16%. Comparatively, females had a more advanced age among new HIV/AIDS cases (40-44 and 50-54 age ranges) than their male counterparts (25-29 and 35-39 age ranges) (Table 1).

Table 1: Male and Female Injection Drug Use Cases by Age Group, Arizona 2009-2012

Age Range	Male Cases Count	Male Cases %	Female Cases Count	Female Cases Count	Both Sexes Cases	Both Sexes %
20-24	29	10%	7	12%	36	11%
25-29	57	20%	8	14%	65	19%
30-34	37	13%	5	9%	42	12%
35-39	57	20%	8	14%	65	19%
40-44	35	12%	9	16%	44	13%
45-49	23	8%	8	14%	31	9%
50-54	27	9%	9	16%	36	11%
55+	17	6%	*	7%	21	6%
Total	285		58		343	

*Denotes value less than 6

RACE

In Arizona from 2009-2012, white non-Hispanics make up the largest number of individuals who identify their risk for HIV exposure as injection drug use (157). Hispanics and American Indian/Alaska Native non-Hispanics (AI/AN) accounted for the next highest number of new HIV/AIDS cases from IDU exposure, 114 and 40, respectively (Table 1). There is a similar percent of males and females who identify IDU as their risk, 14% in males and 17% in females. Comparing racial groups by sex, white non-Hispanic males made up the largest proportion of IDU cases at 36%, followed by Hispanic males and AI/AN males at 31% and 10% of cases respectively. Of all IDU cases, 9% are among white non-Hispanic females, and 3% among Hispanic females. Approximately 2% of new IDU cases were among black non-Hispanic females and AI/AN females (Table 2).

Table 2: Male and Female Injection Drug Use Cases by Race/ Ethnicity, Arizona 2009-2012

Race/Ethnicity	Male Cases	Males Cases %	Female Cases	Females Cases %	Total Cases	Total Cases %
White non-Hispanic	125	36%	32	9%	157	46%
Black non-Hispanic	16	5%	8	2%	24	7%
Hispanic	105	31%	9	3%	114	33%
Asian/Pacific Islander/Native Hawaiian non-Hispanic	*	*	*	*	*	*
American Indian/Alaska Native non-Hispanic	33	10%	7	2%	40	12%
Multi-Race/ Other/Unknown non-Hispanic	*	*	*	*	*	*
Total	285		58		343	

*Denotes value less than 6

1. CDC HIV/AIDS Surveillance Data. Diagnoses of HIV Infection in the United States and Dependent Areas, 2011. http://www.cdc.gov/hiv/library/reports/surveillance/2011/surveillance_Report_vol_23.html. May 2014. Accessed March 12, 2015.
2. HIV Epidemiology Program. 2010 Integrated Epidemic Profile. http://www.azdhs.gov/phs/edc/odis/hiv-epidemiology/reports/index.php?pg=other. Accessed March 12, 2015.

SPECIFIC POPULATIONS: CORRECTIONS

BACKGROUND

In the United States, there are more than 2 million people incarcerated in jails and prisons. According to 2008 data, 1.4% (21,987) of individuals incarcerated in the United States were confirmed HIV/AIDS cases. Of those cases, 91% are male and 9% are female.[1] According to the CDC, HIV testing programs in jails and prisons are often one of the first to diagnose and treat new HIV cases[1] (Table 1)

Table 1: Number of Incarcerated Persons in United States and Arizona, 2009-2012[2]

	2009	2010	2011	2012
National Statistics (U.S. Total)	1,615,487	1,613,803	1,598,968	1,570,397
Male	1,502,002	1,500,936	1,487,561	1,461,625
Female	113,485	112,867	111,407	108,772
Arizona	40,544	40,209	40,020	40,080
Male	36,768	36,521	36,470	36,447
Female	3,776	3,688	3,550	3,633

QUICK FACTS:

- 95% of those incarcerated in Arizona from 2009-2012 are male while the general HIV/AIDS population is 86% male.
- At 32%, injection drug use (IDU) is the main risk factor for incarcerated individuals in Arizona from 2009-2012 which is much higher than 10% in the general HIV/AIDS population.

As of 2012 in Arizona, there were 40,080 (4.1%) incarcerated persons in state and federal institutions[2] (Table 1) and 642 (1.6%) were HIV positive. The rate of HIV among incarcerated persons (1602 per 100,000) is more than 6 times higher than the rate of HIV in the general population (241 per 100,000).

SEX AND RACE/ETHNICITY

Of those incarcerated in Arizona with HIV from 2009-2012, 95% are male, which is much higher than the general HIV population which is 86% male. There are also differences in the racial/ethnic breakdown of the incarcerated HIV positive population when compared to the general HIV positive population in Arizona. For instance, 19% of incarcerated HIV persons are white non-Hispanic, 9% are black non-Hispanic, 66% are Hispanic, and 2.5% are non-Hispanic American Indian/Alaska Native. In comparison, among the entire HIV population in Arizona, 55% are white, 12% are black, 26% are Hispanic, and 4% are American Indian/Alaska Native (Figure 1).

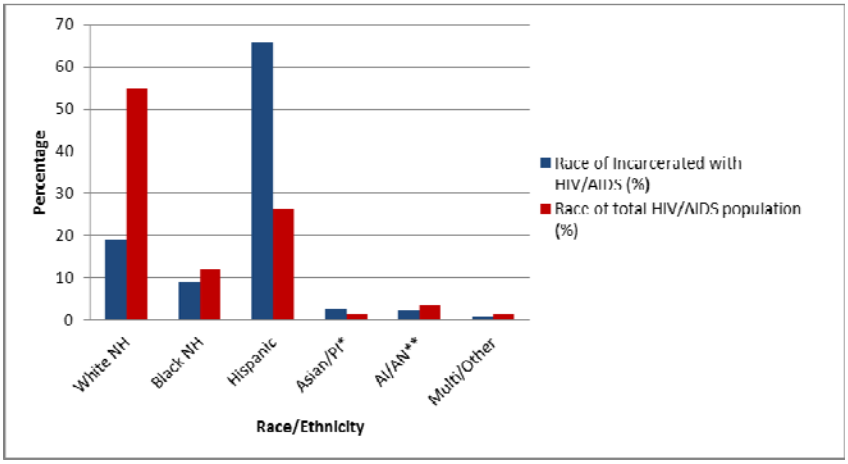


Figure 1: Comparison of Race/Ethnicity Incarcerated HIV/AIDS to Entire HIV/AIDS Populations, Arizona 2009-2012

***Pacific Islander ** American Indian/Alaska Native**

AGE

In Arizona, there were distinct differences in the age breakdown of people with HIV among incarcerated compared to the general HIV population. Specifically there were a larger percentage of incarcerated HIV positive people between the ages 25-40 than the general population. Also, there were a higher percentage of older HIV positive people (45+) in the state compared to correctional institutions. (Figure 2).

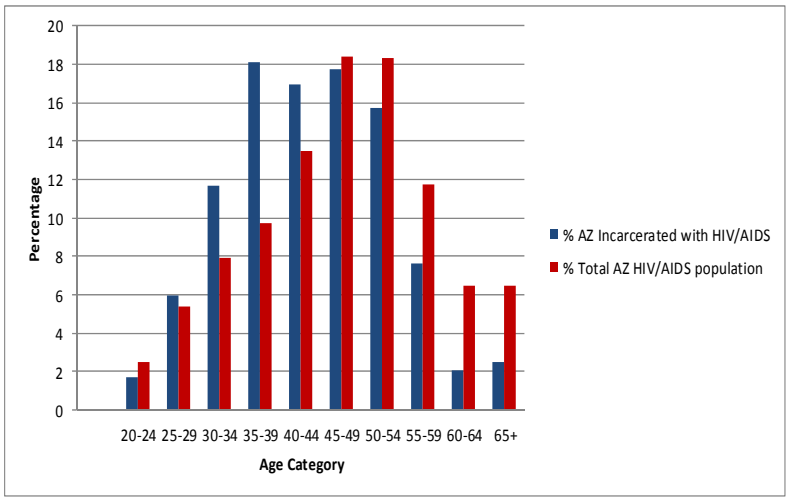


Figure 2: Comparison of Age Incarcerated HIV/AIDS to Entire HIV/AIDS Populations, Arizona 2009-2012

RISK

The main risk for transmission of HIV/AIDS among those incarcerated is injection drug use (IDU) which accounts for 32% of cases which is much higher than the 10% percent in the general HIV population. There was a smaller percentage of HIV cases that reported MSM as their risk factor among incarcerated people than among all HIV positive people in Arizona from 2009-2012 at 31% and 60% respectively, while 17% are both IDU and MSM and 9% are high risk heterosexual (HRH). Comparatively, of all HIV cases, 8% are MSM and IDU, and 11% are HRH (Figure 3).

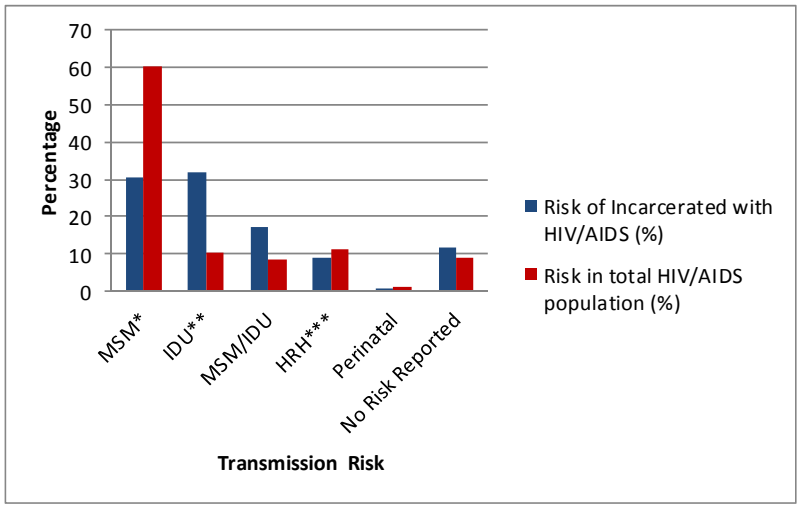


Figure 3: Comparison of Incarcerated HIV/AIDS and Entire HIV/AIDS Populations, Arizona 2009-2012
***Men who have sex with men, **Injection drug use, ***High risk heterosexual**

1. HIV in Correctional Settings. Centers for Disease Control and Prevention. http://www.cdc.gov/hiv/risk/other/correctional.html. Accessed March 12, 2015.

2. Bureau of Justice Statistics. Corrections Statistical Analysis Tool (CSAT)-Prisoners. http://www.bjs.gov/index.cfm?ty=nps. Accessed March 12, 2015.

SPECIFIC POPULATIONS: BLACKS

POPULATION

Black non-Hispanics* have the highest emergence rates of HIV/AIDS in Arizona. From 2009-2012 black non-Hispanics in Arizona had an average emergence rate that was 3 times greater than whites and 1.5 times greater than Hispanics (Figure 1). This is similar to the national pattern, where black non-Hispanics also have the highest emergence rate.[1] In Arizona, the emergence rate declined 19% from 2009 to 2010 followed by a sharp increase of 71% from 2010 to 2012.

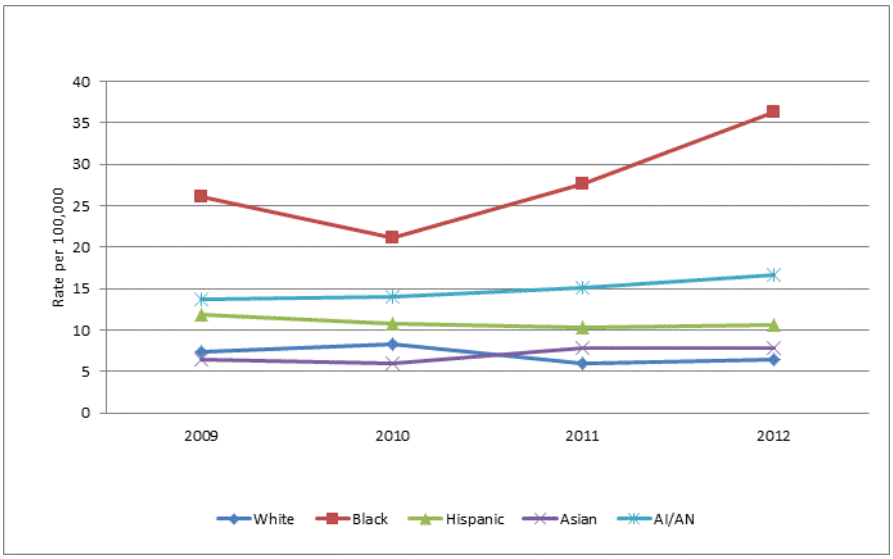


Figure 1: Arizona HIV/AIDS Emergence Rates per 100,000, 2009-2012

AI/AN=American Indian/Alaska Native

QUICK FACTS:

- HIV/AIDS emergent cases among African Americans has increased by 39% from 2009 to 2012.
- Black non-Hispanics have a prevalence rate that is 2.9 times larger than whites and 3.2 times larger than Hispanics.
- Among the 1,935 black non-Hispanics who have HIV/AIDS, 304 were in the 45-49 age group.

It is common for males to have a greater HIV emergence rate than females in the United States. Similarly in Arizona, males have a higher emergence rate within the black non-Hispanic population. On average, black non-Hispanic male emergence rates were about double those of females from 2009-2012 (Figure 2). For example, in 2012 males had a rate that was 2.1 times higher than females. Both the male and female emergence rates increased from 2009 to 2012 at 41% and 32% respectively.

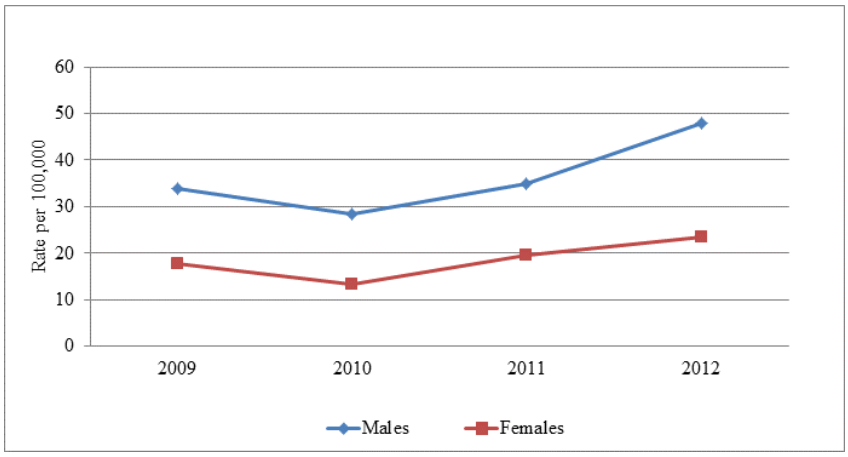


Figure 2 : Black HIV/AIDS Emergence 2009-2012

PREVALENCE AMONG BLACKS

Black non-Hispanics have disproportionate HIV prevalence rates when compared to other racial ethnic groups. This group has the highest prevalence rate among all races with an HIV prevalence rate of 650 per 100,000 people (Figure 3). Black non-Hispanics have a prevalence rate that is 2.9 times larger than whites and 3.2 times larger than Hispanics. Although, this group has the highest HIV prevalence rate, numerically, by 2012 they had 1,811 HIV/AIDS cases while Hispanics had 3,966 and whites had 8,525. This is due to the fact that the population of whites and Hispanics is much larger than black non-Hispanics.

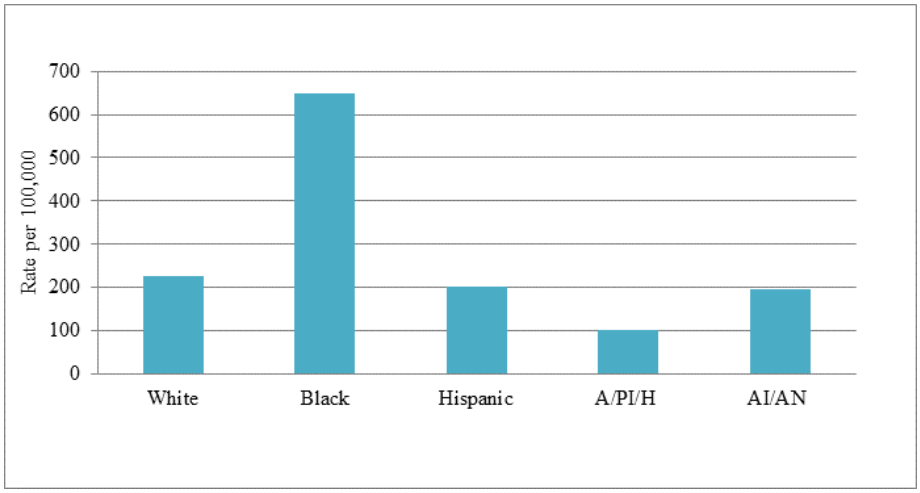


Figure 3: Prevalence Rates by Race (2012)

A/PI/H=Asian/Pacific Islander, Native Hawaiian AI/AN=American Indian/Alaska Native

Similar to other populations and due to the slow progression of the disease, AIDS is more prevalent among older black non-Hispanics (40 and over) and an HIV only diagnosis is more prevalent among the younger adult population (Figure 4). Middle-aged (45-49) black non-Hispanics had the highest HIV/AIDS rate among all the age groups, 1,820 per 100,000. The HIV/AIDS rates were the lowest among people under 19. This group had total HIV/AIDS rates that were lower than 75 per 100,000. Those aged 45-49 had a total HIV/AIDS rate that was 3.8 times greater than young adults ages 20-24.

Overall the black non-Hispanic population in Arizona has higher HIV/AIDS rates than all other racial/ethnic groups. The health disparities seen in the HIV/AIDS epidemic in this population are addressed by the White House Office of National AIDS Policy 2010 National HIV/AIDS Strategy for the United States which outlines specific plans for both preventing HIV in this population and managing the disease for individuals already infected.[2]

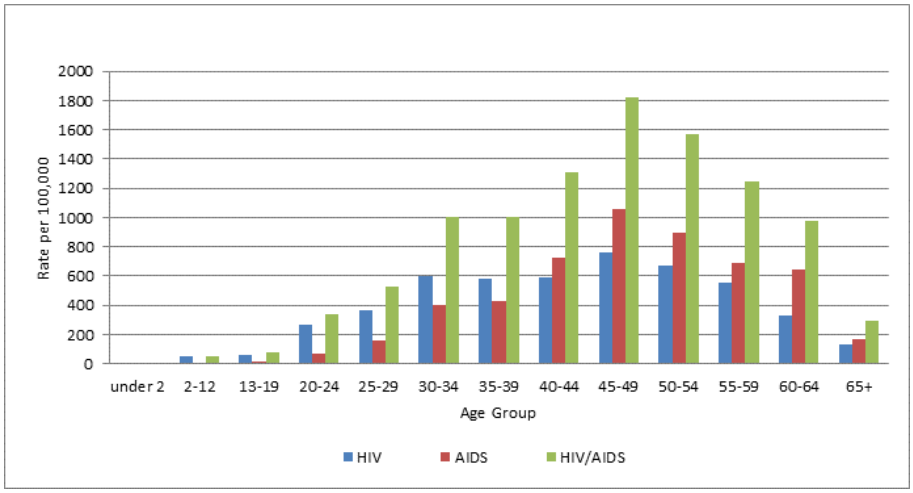


Figure 4 : African American Prevalence 2012

*Includes African Americans, Africans, and any other race/ethnicity that identifies with this particular group

1. HIV/AIDS. Centers for Disease Control and Prevention. http://www.cdc.gov/hiv/library/slideSets/index.html. Accessed March 12, 2015.

SPECIFIC POPULATIONS: HISPANICS

POPULATION

The Hispanic community has the second largest population in Arizona following whites[1] in Arizona. Racial/ethnic health disparity research has shown that Hispanics in the United States fair better across multiple health outcomes than most minority groups[2] but continue to exhibit disparities when compared to whites. In addition, Hispanics also display more favorable HIV/AIDS indicators than most minorities in Arizona. Hispanics had consistently lower emergence rates than black non-Hispanics and American Indian/Alaska Natives (AI/AN) during 2009-2012 (Figure 1). The Hispanic rates were on average 0.6 times lower than black non-Hispanics and 0.3 times lower than AI/AN (Figure 1). However, whites and Asians had emergence rates that were slightly lower than Hispanics. There was an improvement in emergence rates during this 4 year period among Hispanics with a 10% drop in emergence rates.

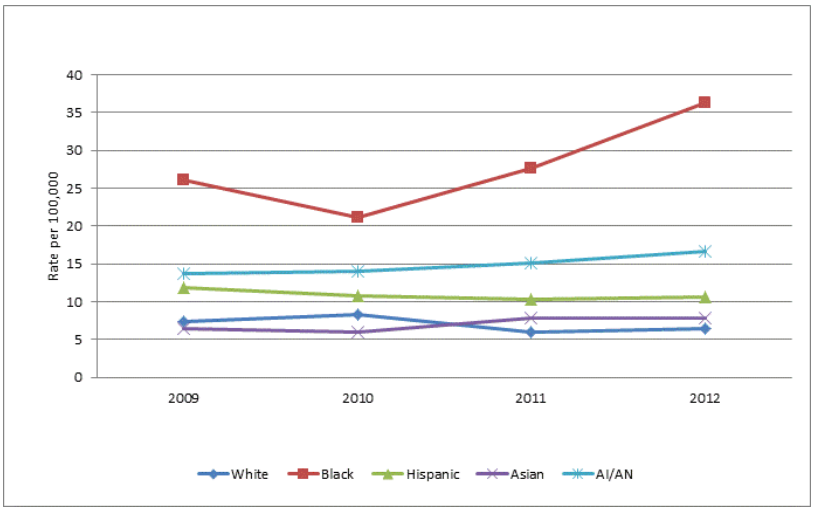


Figure 1: Arizona HIV/AIDS Emergence Rates per 100,000, 2009-2012

AI/AN=American Indian/Alaska Native

QUICK FACTS:

- Hispanics had lower emergence rates than blacks and American Indian/Alaska Natives during 2009-2012.
- More cases were AIDS than HIV only among Hispanics in 2012.
- The rate of HIV/AIDS cases is 203 for every 100,000 Hispanics in the state.
- Hispanic females had rates that were 25% less than white females in 2009 and 40% less in 2010.

AIDS AMONG HISPANICS

Recently the trend of HIV infected individuals developing AIDS has decreased while the opposite is true for the Hispanic community. As of 2012, there were 2,044 cases of AIDS and 1,922 HIV only cases among Hispanics (Figure 2). The number of AIDS cases increased by 22% from 2009 to 2012 while HIV only cases increased by 7%. Hispanics have a higher percentage of AIDS.

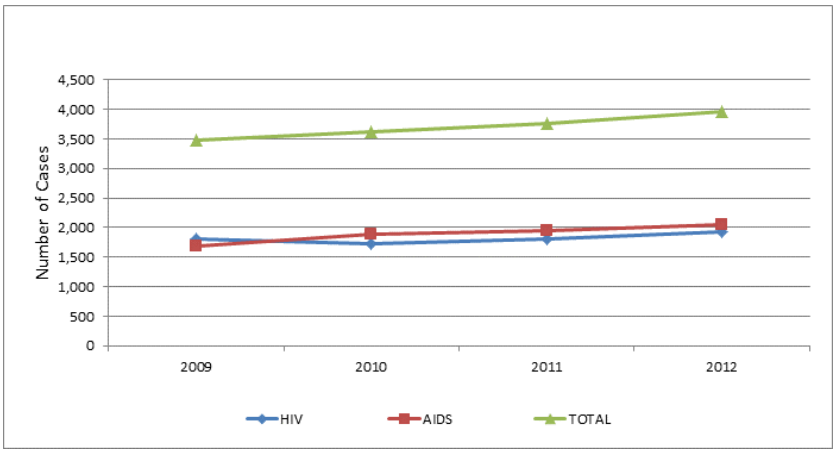


Figure 2 : Hispanic Prevalence 2009-2012

PREVALENCE AMONG HISPANICS

From 2009-2012, Hispanics had the second largest number of prevalent cases at 3,966 (Figure 3). Hispanics had a prevalence count 2.2 times greater than blacks and 0.5 times lower than whites. There are 203 cases of HIV/AIDS for every 100,000 Hispanics in the state (Figure 4).

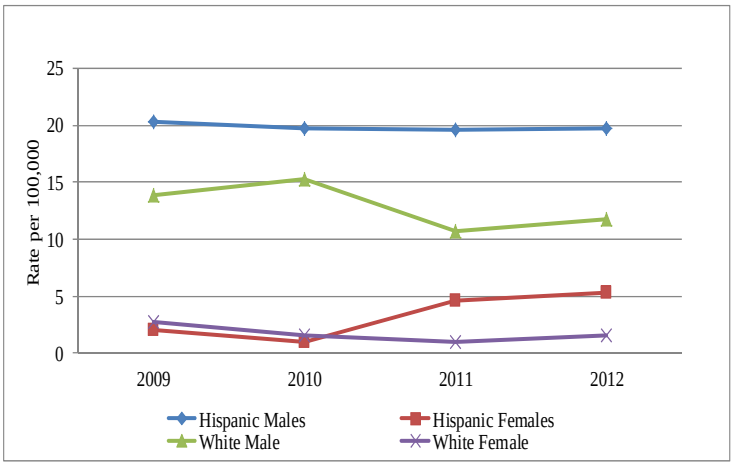


Figure 3: HIV/AIDS Prevalence by Race

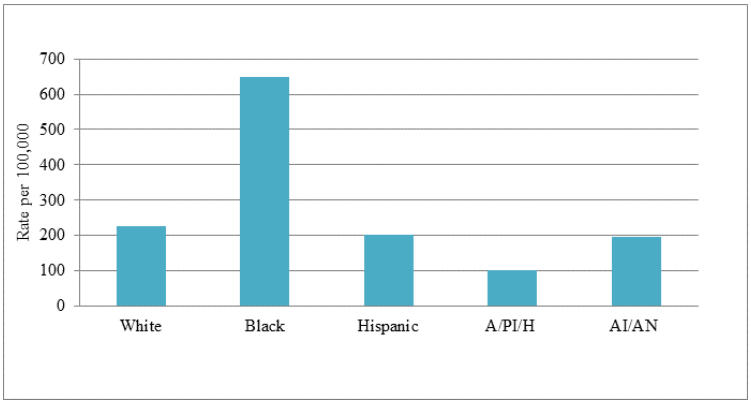


Figure 4: Prevalence Rates by Race, 2012

EMERGENCE AMONG HISPANICS

Hispanic females have particularly low emergence rates. Hispanic females had lower rates compared to white females in 2009 while white females had substantially lower rates in 2011 and 2012. However, Hispanic females emergence rates increased 155% from 2009 to 2012. On the other hand, Hispanic males had consistently greater rates than white males. From 2009 to 2012, Hispanic males had emergence rates that were 1.6 times greater on average than white males.

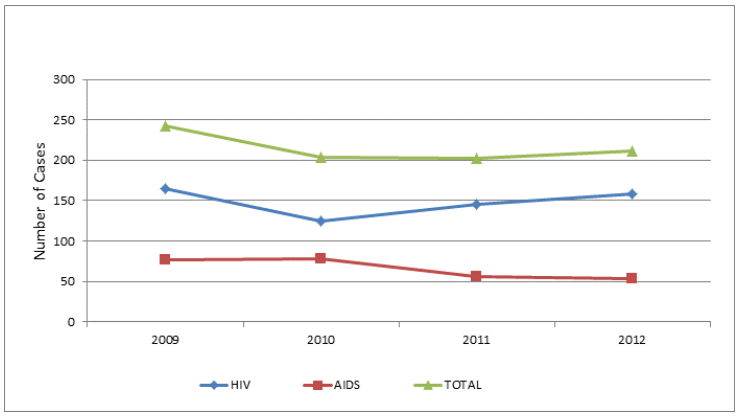


Figure 5: Hispanic Emergence by Race, 2009-2012

1. American FactFinder II. U.S. Census Bureau. https://catalog.data.gov/dataset/american-factfinder-ii. Accessed March 12, 2015.

2. Berkman L., Kawachi I. *Social Epidemiology.* New York, NY; Oxford University Press; 2000.

SPECIFIC POPULATIONS: AMERICAN INDIAN/ALASKA NATIVES

BACKGROUND

Arizona is a state with a prominent American Indian/Alaska Native (AI/AN) presence. As of 2010, there were 353,386[1] people in Arizona who self-reported race as AI/AN including those living on and not on reservations. There are 21 federally recognized Native American tribes within the state.[3] About 6.5 % of the population in Arizona self-reports as AI/AN which is significantly higher than the national average of 1.7%.[1]

In Arizona, American Indian/Alaska Natives have higher than average HIV/AIDS emergence rates (Figure 1) in Arizona, but their rates have remained somewhat stable in the last four years. From 2009-2012, AI/AN emergence rates were on average 2.2 times greater than whites and 1.4 times greater than Hispanics. Despite AI/AN's high rates, the rate has only increased from 14% to 17% while the black non-Hispanic rate increased from 26% to 36% in the same time period.

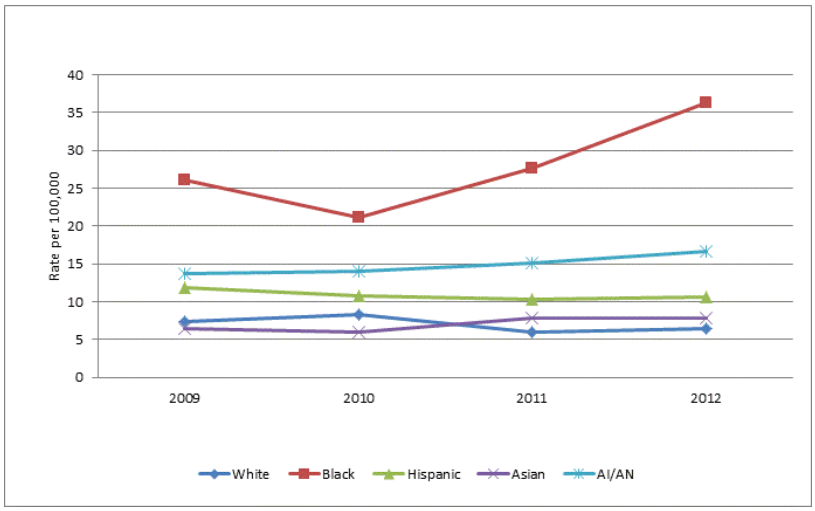


Figure 1: Arizona HIV/AIDS Emergence Rates per 100,000 by Race, 2009-2012

AI/AN= American Indian/Alaska Native

QUICK FACTS:

- From 2009-2012, AI/AN HIV emergence rates have on average been 2.2 times greater than whites and 1.4 times greater than Hispanics.
- In Arizona, 197 cases are diagnosed with HIV/AIDS for every 100,000 American Indian/Alaska Natives.
- 74% of AI/AN are linked to care compared to 58% of whites.
- From 2009-2012, the HIV urban emergence rate has been on average 1.8 times greater than in rural counties.

PREVALENCE

Although American Indian/Alaska Natives have higher emergence rates, this pattern is not seen in prevalence rates (Figure 2). The AI/AN rate of 197 per 100,000 people is slightly less than the rate for both Hispanics and Whites.

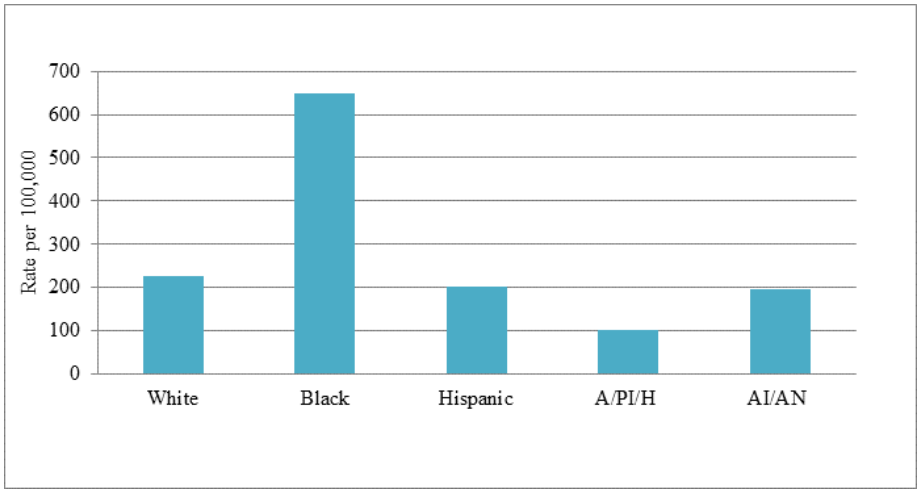


Figure 2: Prevalence Rates by Race (2012)

LINKAGE TO CARE

Among all racial/ethnic groups in 2012, American Indian/Alaska Natives have the highest percentages in all the stages of the spectrum of care. At the end of 2012, AI/AN were more often linked to care than other racial/ethnic groups. Figure 3 displays the percentage of cases in various stages of the spectrum of care by race. For example, among all the HIV diagnosed cases, 74% of AI/AN were linked to care while 58% of Whites were linked. The percentage of cases linked to care for AI/AN is even greater than Asian/Pacific Islander/Native Hawaiians (67%) who typically have the best health outcomes.[3] American Indian/Alaska Natives also have a higher percentage retained in care than Hispanics 55% compared to 44%.

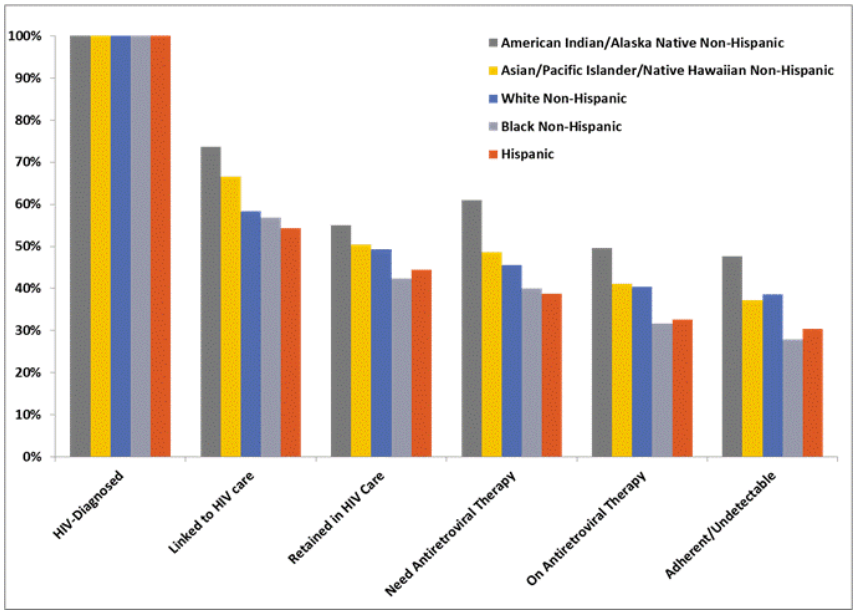


Figure 3: Spectrum of Care by Race

EMERGENCE BY URBAN AND RURAL POPULATIONS

Most of American Indian/Alaska Native cases are diagnosed in urban counties which includes Maricopa and Pima. The remaining 13 Arizona counties are classified as rural. Figure 4 illustrates emergence rates by urban/rural location. From 2009-2012, the urban emergence rate was on average 1.8 times greater than in rural counties. This urban/rural disparity increased during the 4 year timeframe to be 1.7 times greater in 2012.

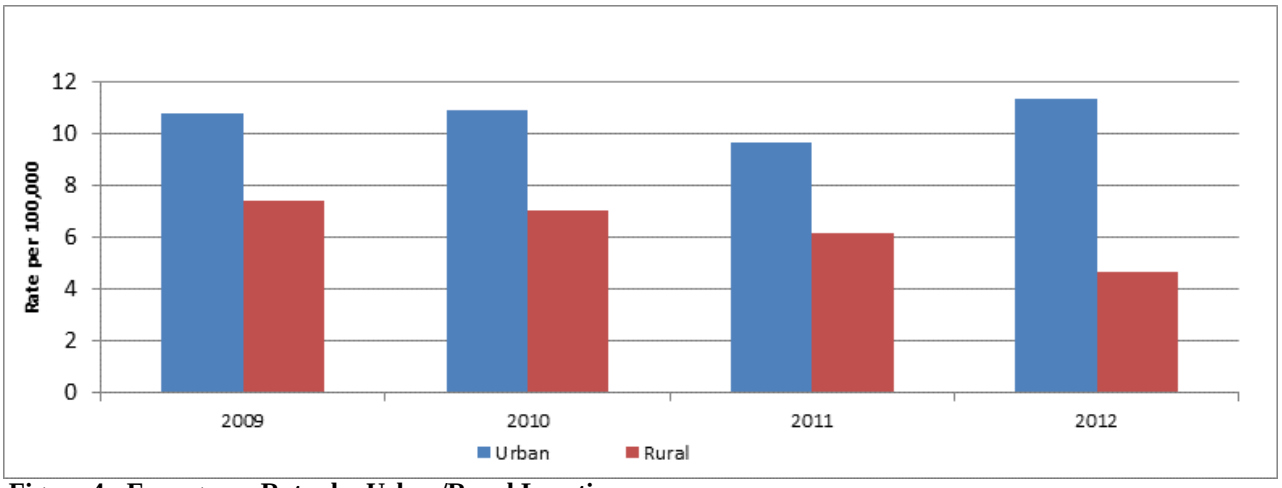


Figure 4 : Emergence Rates by Urban/Rural Location

1. U.S. Census Bureau. The American Indian and Alaska Native population. Suitland (MD): U.S. Department of Commerce; 2010.
2. Gardner E., McLees M., Steiner J., Del Rio C., Burman, W. The Spectrum of Engagement in HIV Care and its Relevance to Test-and-Treat Strategies for Prevention of HIV Infection. Clinical Infectious Diseases 2011.52(6):793-800.
3. Federal and State Recognized Tribes. National Conference of State Legislatures. http://www.ncsl.org/research/state-tribal-institute/list-of-federal-and-state-recognized-tribes.aspx. http://www.ncsl.org/research/state-tribal-institute/list-of-federal-and-state-recognized-tribes.aspx
4. Berkman L., Kawachi I. *Social Epidemiology.* New York, NY; Oxford University Press; 2000.

SPECIFIC POPULATIONS: YOUTH

PEDRIATRIC/PERINATAL CASES

Pediatric cases include children aged birth to 13 and the majority of these cases are infected via perinatal transmission, mother to child at birth. Only children born to an HIV-positive mother, whose infection has been confirmed at 18 months of age or later, or a detectable viral load at any age are included in these statistics.

From 2009-2012, 12 pediatric emergent cases of HIV/AIDS in Arizona were attributed to perinatal transmission. Of these 12 cases, 6 (50%) were not born in the United States; all of these children were born in an African country. Among the six children born in the United States, the majority of the cases were Hispanic. The HIV Surveillance Program tracks children who were exposed to HIV through an HIV-positive mother, but children that tested negative at or after 18 months of age were not included in this analysis.

The number of emergent perinatal cases in Arizona has remained largely unchanged in the last ten years (Figure 1); there are usually five or fewer cases per year, with a roughly equal split between United States and foreign-born cases. All emergent cases during this time were diagnosed in Maricopa or Pima County, and all were under the age of 13 when diagnosed in Arizona.

In 2013, there were 148 people living with HIV/AIDS in Arizona who were infected by perinatal transmission. Less than half are currently under the age of 13 (36%, 54 cases), and 28% (41 cases) are currently ages 13-19. 26% (39 cases) were born outside the United States, higher when compared to 14% of non-perinatal prevalent cases. Among the cases born outside the United States and currently living in Arizona, the majority are black non-Hispanic (82%, 32 cases). Among those born in the United States, 39% (43 cases) are white non-Hispanic, followed by 28% (30 cases) Hispanic and 25% (27 cases) black non-Hispanic.

QUICK FACTS:

- In Arizona from 2009-2012, 12 new cases of HIV/AIDS were reported as transmission from mother to child.
- Of those cases, 50% were children born in an African country.
- 30% of new HIV/AIDS cases were among men ages 13-29.
- The primary transmission risk reported among young men ages 13-29 is male to male sexual contact (MSM).

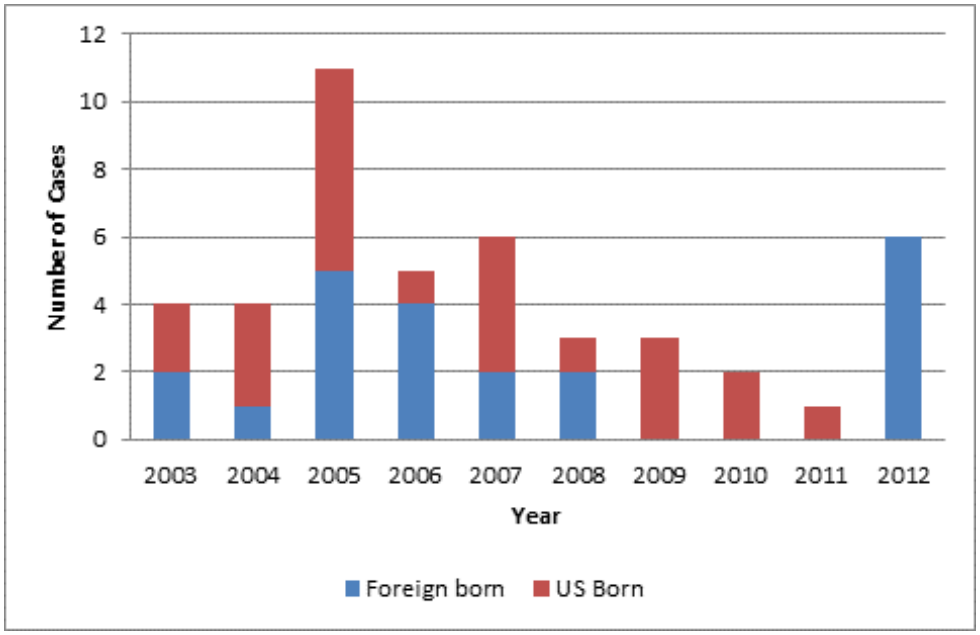


Figure 1: Emergent HIV/AIDS cases resulting from perinatal transmission, 2003-2012

HIV IN YOUNG MEN

Men ages 13-29 comprise 24% of Arizona's population, but account for 30% (747 cases) of new HIV diagnoses and 35% of new male HIV diagnoses from 2009-2012. While they encompass a small percentage of those living with HIV/AIDS statewide (1102, 7%), young men are diagnosed with HIV at approximately twice the rate in Arizona. Men 20-29 are diagnosed at approximately three times the rate in Arizona. Emergence rates in men 13-29 have also been increasing over the last ten years while emergence rates among all men and in the state as a whole have been slightly decreasing (Figure 2).

Black non-Hispanics have the highest emergence rates among all men ages 13-29. The emergence rate among young black men in 2009-2012 was 53.4 per 100,000 and peaked at 85.6 per 100,000 in 2012. Black men ages 13-29 are diagnosed at rates 5.5 times higher than the state as a whole and 2.5 times higher than the rate of all men. They account for 43% of all cases diagnosed among black men during that time period (Table 1). Among black men ages 13-29 living in Arizona, 459.6 per 100,000 are living with HIV/AIDS, compared to 138.0 per 100,000 among all men ages 13-29. These trends mirror national data among young black men.

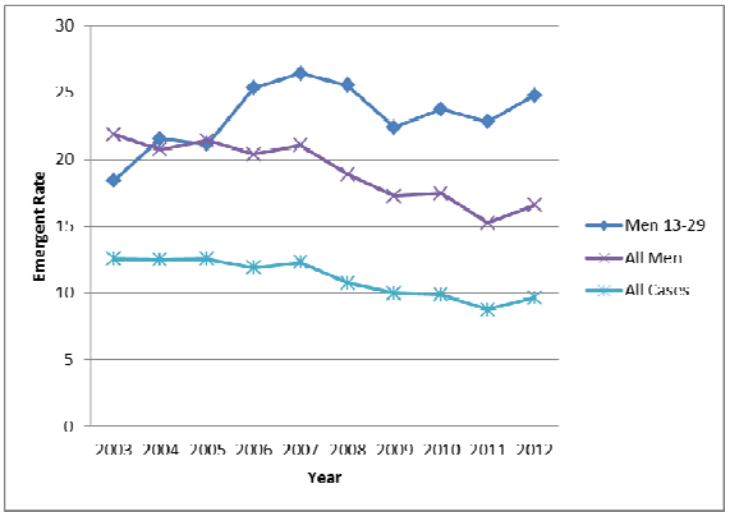


Figure 2: Emergent HIV/AIDS rates among men 13-29 (2003-2012)

Other racial/ethnic differences are also seen among young men. The emergence rate for American Indian/Alaska Native (AI/AN) men ages 13-29 from 2009-2012 was 35.6 per 100,000 and peaked at 45.4 per 100,000 in 2012. These young men comprise 48% of all cases among AI/AN men. Hispanic and non-Hispanic white men have the highest number of cases of young men diagnosed in 2009-2012 (315 Hispanic and 255 white), as well as the highest number of young men living with HIV/AIDS in 2013 (402 white and 399 Hispanic).

Male-to-male sexual contact (MSM) is reported by the majority of men ages 13-29 diagnosed from 2009-2012; 81% (608) report MSM (with 51 of these men also reporting injection drug use (IDU)), compared to 69% (974, with 88 of these men also reporting IDU) of men ages 30 and above (Table 1). This difference between age groups is most pronounced in black non-Hispanic men; 76% of emergent cases among black men ages 13-29 report male-to-male sexual contact compared to 50% of emergent cases among black men ages 30 and above. The high emergence rates among young men combined with the high proportion of MSM suggest that young MSM in Arizona, especially young black MSM, may be at increased risk of HIV infection.

Table 1: Emergent Cases Among Men 13-29 (2009-2012)

	N (%)	Rate per 100,000	Emergent Male Cases %	Report MSM N (%)
White Non-Hispanic	255 (34)	16.66	27%	217 (85)
Black Non-Hispanic	91 (12)	53.37	43%	69 (76)
Hispanic	315 (42)	25.93	40%	259 (82)
A/PI/H* Non-Hispanic	11 (1)	10.8	26%	7 (64)
AI/AN** Non-Hispanic	60 (8)	35.57	48%	46 (77)
Multi/Other Non-Hispanic	15 (2)	N/A	58%	10 (67)
TOTAL	747	23.44	35%	608 (81)

*Asian/Pacific Islander/Native Hawaiian **American Indian/Alaska Native

REFUGEE HEALTH

REFUGEE HEALTH IN ARIZONA

A refugee is a person who has fled his/her home country and is unable to return due to persecution. Participating in the federal program for refugee resettlement, Arizona is the home of more than 60,000 refugees with some 3000 arriving each year with most being resettled in Maricopa or Pima counties (Figure 1). Hailing from 107 different countries around the world, and speaking many languages (Figures 2, 3) Arizona's refugee populations demonstrate a unique and complex array of health challenges and medical needs (Figures 2, 3).

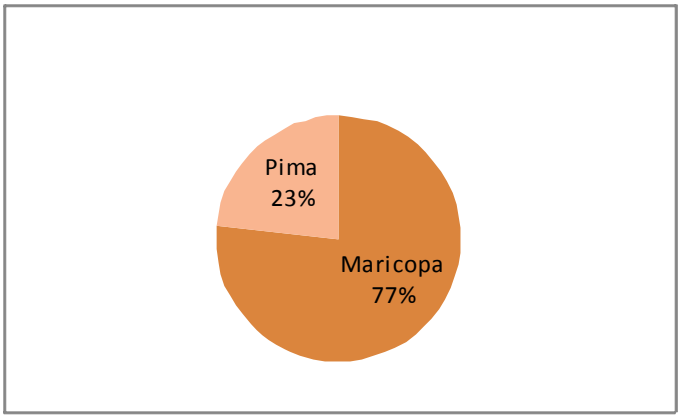


Figure 1: Resettlement by Arizona County, 2009-2012

QUICK FACTS:

- Arizona is home to more than 60,000 refugees, re-settling about 3,000 each year.
- Many refugees were at high risk of physical and psychological illness in their home countries.
- Refugees are screened for infectious diseases and other illnesses both before and after entry into the United States.
- Even after resettlement, refugees continue to have a higher burden of disease than the general popula-tion.

THE REFUGEE HEALTH PROGRAM

The Arizona Department of Health Services' Refugee Health Program seeks to support refugee health in Arizona by serving as an advocate, educator, and facili-tator of public health interventions and initiatives. Through disease surveillance, health education, and collaboration with refugee communities and other refugee health stakeholders, the program aims to support the unique health needs of this diverse population, allowing refugees to better integrate into and contribute to their new communities.

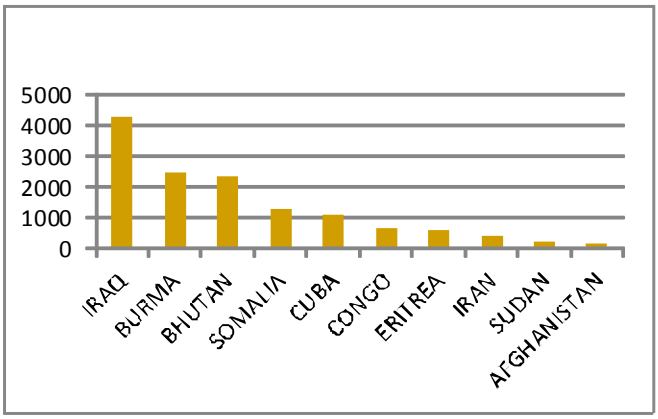


Figure 2: Top 10 Arrival Countries in Arizona, 2009-2012

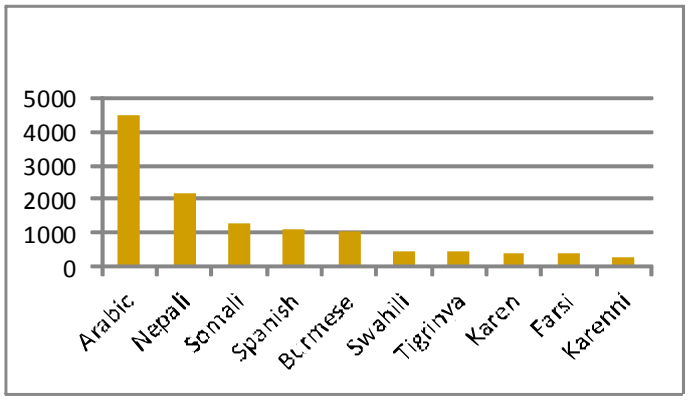


Figure 3: Top 10 Refugee Languages in Arizona, 2009-2012

OVERSEAS MEDICAL SCREENING

Before being granted entry into the United States, refugees are screened for Class A conditions, which include active tuberculosis, syphilis, chancroid, gonorrhea, granuloma inguinale, lymphogranuloma venereum, leprosy, mental disorders associated with harmful behavior, and substance abuse. If any of these illnesses are identified, refugees are denied entry until the condition is resolved. However, HIV and other diseases do not prevent refugees from being resettled to the United States, though they are required to seek follow-up care upon arrival.

DOMESTIC REFUGEE SCREENING

As soon as refugees arrive in the US, they receive medical coverage under the Refugee Medical Assistance program, which offers short term benefits similar to those offered by Medicaid. Within the first 90 days of arrival, this coverage provides refugees a domestic health screening, which is more thorough than its overseas counterpart. During these examinations, refugees are screened for HIV, tuberculosis, malaria, intestinal parasites and STDs, in addition to behavioral health disorders and nutritional deficiencies. From this screening, refugees are referred to providers that can address any health conditions identified at the screening and manage long-term refugee health and wellbeing.

REFUGEE HEALTH CHALLENGES

When compared with the general population of Arizona, refugees not only have a uniquely high burden of infectious, chronic, and psychological illness, but they also face significantly more barriers to care. Many refugees are coming from regions with high rates of communicable disease, many of which are untreated before they arrive.

Furthermore, many refugees have also been put at high risk of other health conditions and injuries resulting from physical and psychological trauma, armed conflict, and extended stays in refugee camps.

Table 1: Infectious Disease Incidence among Refugees upon arrival, 2009-2012

HEPATITIS B	483
COCCIDIOIDOMYCOSIS	325
HIV	69
GIARDIASIS	44
MALARIA	17
SHIGELLOSIS	11
ASEPTIC MENINGITIS, VIRAL	10
SALMONELLOSIS	8
MRSA	7
CAMPYLOBACTERIOSIS	6
STREPTOCOCCUS PNEUMONIAE, INVASIVE	*
AMEBIASIS	*
LEGIONELLOSIS	*
BRUCELLOSIS	*
VARICELLA (CHICKENPOX)	*
HEPATITIS A	*
PERTUSSIS	*
CRYPTOSPORIDIOSIS	*

*Denotes value less than 6

Despite the high need, many refugees are unable to access care due to language and cultural barriers, lack of understanding of the US healthcare system, stigma surrounding particular illnesses, and the high costs of care. As a result, many refugees continue to face health disadvantages even after resettlement in Arizona.

FUTURE FOR REFUGEE HEALTH

With new refugee arrivals entering the state each day, the work to support refugee health is never ending. The Refugee Health Program will continue to conduct disease surveillance, health education, and public health interventions to meet the health needs and foster health equity for this unique population.

1. Refugee Health. Arizona Department of Health Services. http://www.azdhs.gov/phs/edc/odis/refugee/index.htm. Accessed March 12, 2015.

SPECIFIC POPULATIONS: HIV/AIDS IN REFUGEE POPULATIONS

BACKGROUND

From 1980 to 2012, approximately 60,000 refugees settled in Arizona. A refugee is a person who "owing to a well-founded fear of being persecuted for reasons of race, religion, nationality, membership of a particular social group or political opinion, is outside the country of his nationality, and is unable to, or owing to such fear, is unwilling to avail himself of the protection of that country." according to the United Nations[1]. Arizona accepts from 2,000 to 4,000 refugees each year; and ranks in the top ten states for refugee resettlement[2].

HIV IN REFUGEES

Upon arrival in Arizona, all refugees are tested for HIV infection at prescribed clinics. Refugees often come from countries with higher HIV prevalence than the United States, such as Sub-Saharan Africa and Southeast Asia. Other contributing factors to HIV infection in refugees include disenfranchisement, sexual assault, access to HIV prevention measures (condoms, prophylaxis), and complex social situations leading to refugee status such as violence and persecution.

QUICK FACTS:

- From 2009-2012 Myanmar refugees have had the highest burden of HIV.
- Over half of the HIV positive refugees that entered the United States 2009-2012 were female.
- Among refugees, the pediatric case burden is higher at 15% than the general HIV population.

HIV IN REFUGEES 2009-2012

Between 2009 and 2012, a total of 14,303 refugees settled in Arizona. Of those refugees, 69 were positive for HIV, or 0.05%. Of these, 54% were females; this is much higher than the Arizona HIV population in general where only about 12% are female.

This parity in the distribution mirrors the HIV epidemic in the home nations of the refugees. In many refugees' home countries, HIV is primarily transmitted through heterosexual contact or injection drug use which causes a higher rate of infection in females as opposed to men having sex with men as in Arizona.

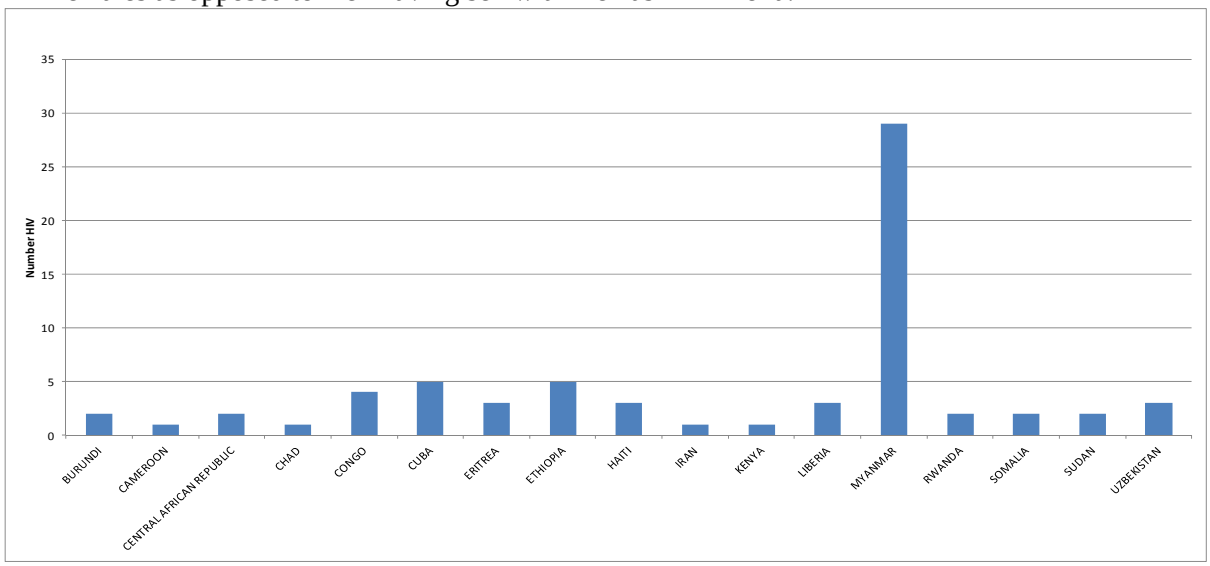


Figure 1: Number of Refugees with HIV by Country of Origin 2009-2012

REFUGEES AND AGE

Of HIV positive refugees who entered Arizona from 2009 -2012, 15% were aged 13 or under when diagnosed which is classified as pediatric HIV (including perinatal transmission). This is a higher rate than the HIV positive population in Arizona in general. There is a significant number of pediatric HIV cases in the HIV positive refugee population when compared to the general HIV positive population (15% vs. 0.6%) (Figure 2,3). This coupled with the high percentage of female cases suggests that transmission methods among refugees differ greatly from those of the general United States population. From this, it can be concluded that approaches to prevention and care must be configured to meet the unique needs of this population.

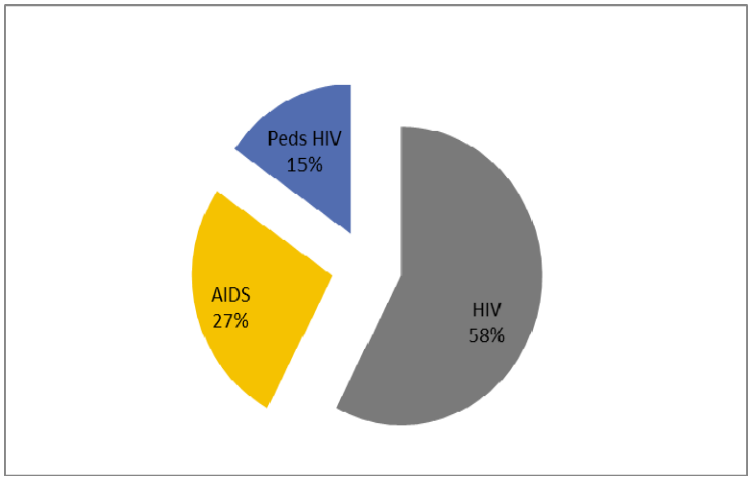


Figure 2: Disease Stage-Refugees**

COUNTRY OF ORIGIN

The 69 refugees with HIV were from 17 countries all around the world. Historically from 1980 to 2008, Liberia had by far the most refugees with HIV. Since then, the number of Liberian refugees and the number of HIV positive refugees from Liberia has significantly decreased. The country of origin with the largest number of HIV cases from 2009-2012 was Myanmar with 29 cases (Figure 1).

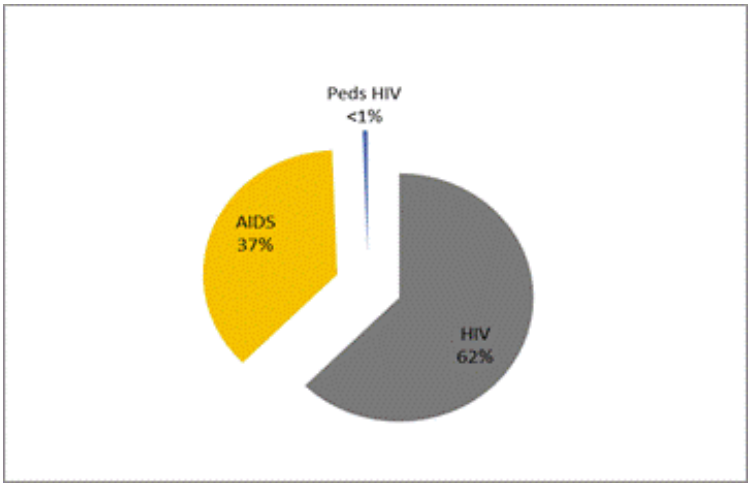


Figure 3: Disease Stage-All HIV/AIDS**

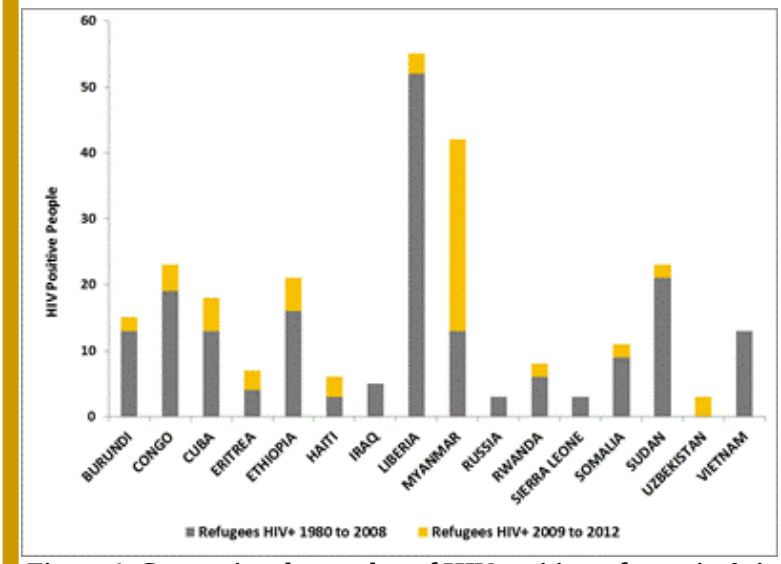


Figure 4: Comparing the number of HIV positive refugees in Arizona, 1980-2008 and 2009-2012*

However, Haiti had the largest percentage of HIV positive refugees at 11%.

Twenty-eight of the 69 HIV positive refugees are from African nations (40%), 33 are from Asia (48%), and eight are from the Americas (12%) (Figure 4). The majority of Myanmarese refugees with HIV entered Arizona between 2009 and 2012, but the percentage of these refugees with HIV has not changed when comparing 1980 to 2008 and 2009 to 2012. Conversely Liberia had far fewer HIV positive refugees enter the country from 2009 to 2012 but the percentage of those refugees with HIV is much larger (4% vs. 9%).

*Some refugees from Somalia, Sudan, Eritrea and Ethiopia are identified by the Refugee Health Program as originating from Ethiopia. Some refugees from Ethiopia, Somalia, Sudan or the Democratic Republic of Congo are identified by the Refugee Health Program as originating from Kenya. This can be attributed to refugee camp locations and reporting issues.

**Figures 2 & 3: Comparing the disease stage of HIV, AIDS, and pediatric HIV (Peds HIV) among the general HIV population in Arizona from 2009-2012 and the Refugee population 2009-2012.

There are differences between HIV in the refugees settling in Arizona and HIV in their home nations. For example Myanmar has an estimated HIV prevalence of 0.6%[3] which is lower than the Arizona Myanmar refugee population which has a prevalence of 1% overall. Conversely, Liberian refugees have a lower HIV prevalence than the nation of Liberia as of 2012 (0.9% vs. 4.5%)[3] (Figure 5).

Overall, the refugee population in Arizona has different dynamics than the general HIV positive population in Arizona and often different from the general population in their home country. The differences of the groups can be seen reflected in their health issues and needs once they settle in Arizona.

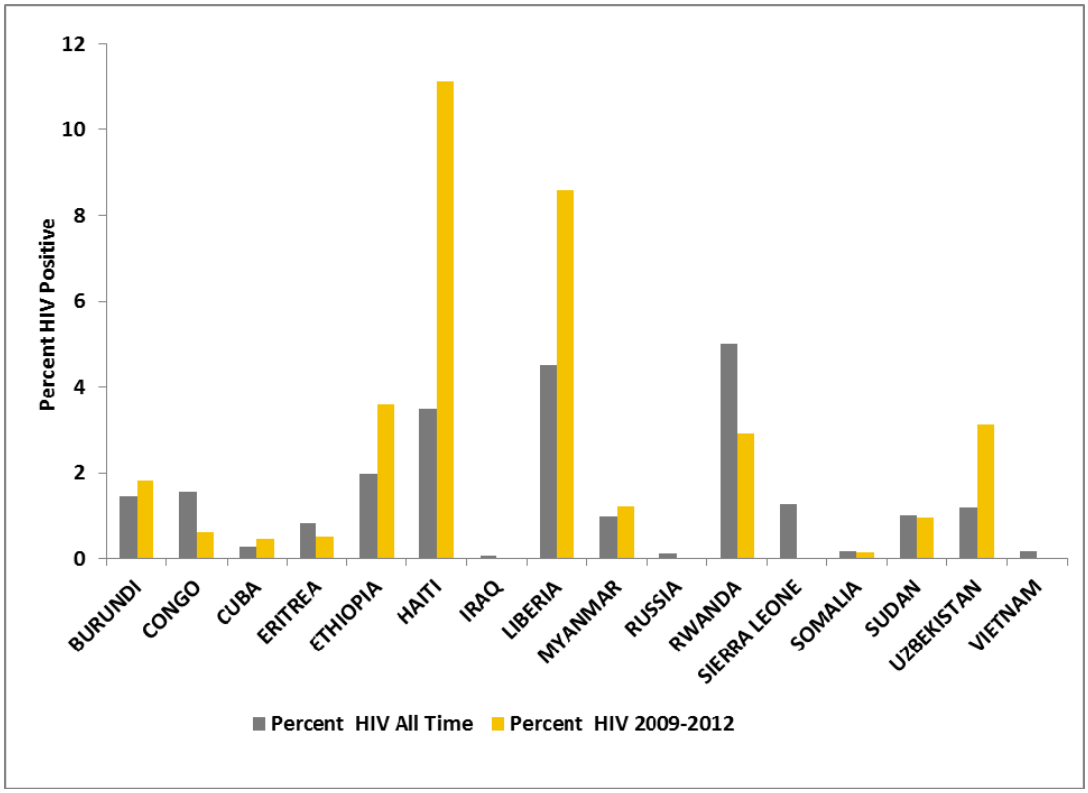


Figure 5: Comparing HIV positive refugees by country of origin in Arizona, 1980-2008 and 2009-2012

1. Refugees. The UN Refugee Agency (UNHCR). http://www.unhcr.org/pages/49c3646c125.html. Accessed March 12, 2015.
2. Refugee Health. Arizona Department of Health Services. http://www.azdhs.gov/phs/edc/odis/refugee/index.htm. Accessed March 12, 2015.
3. Myanmar. UNAIDS. http://www.unaids.org/en/regionscountries/countries/myanmar. Accessed March 12, 2015.

SYPHILIS

BACKGROUND

The number of reported primary and secondary (P&S) syphilis cases in the state of Arizona decreased 13.5% from 2009 to 2012. In 2012, there were 204 P&S syphilis cases reported with a corresponding rate of 3.1 cases per 100,000 people which represents a seven-year low.

Maricopa and Pima, the two most populous of Arizona's 15 counties, accounted for approximately 95% of all P&S syphilis cases reported in Arizona in 2012. In 2009, the rate of P&S syphilis in Maricopa County was 4.1 cases per 100,000 people and increased slightly to a rate of 4.2 in 2012. Conversely, the rate of P&S syphilis has decreased every year since 2009 in Pima County. In 2009, the rate of P&S syphilis in Pima County was 5.3 per 100,000 people and 3.1 in 2012. For the first time in a decade in 2012, Pima County P&S syphilis case rate was not higher than the P&S case rate for the state of Arizona. Among the rest of the counties in Arizona, the overall case rate in 2009 was 0.9 cases per 100,000 people and 0.7 in 2012.

QUICK FACTS:

- In Arizona, 204 cases of primary and secondary (P&S) syphilis were reported in 2012.
- The highest rates of P&S syphilis were seen among blacks in Arizona.
- In 2012, 188 cases were reported among males.
- Among male P&S syphilis cases in Maricopa and Pima counties, 75% were self-reported as MSM in 2012.

GENDER

In 2009, the case rate of P&S syphilis among males in Arizona was 9 times greater than the rate among females. By 2011, this disparity reached a six year high, as the rate among males was 16 times greater than the rate among females. A decrease in the number of cases among males, from 257 cases in 2011 to 187 cases in 2012, resulted in a male case rate 12 times greater than the rate among women in 2012 (Figure 1). The number of P&S syphilis cases reported among women has remained relatively stable; 24 cases in 2009, 19 in 2010, 15 in 2011, and 16 in 2012.

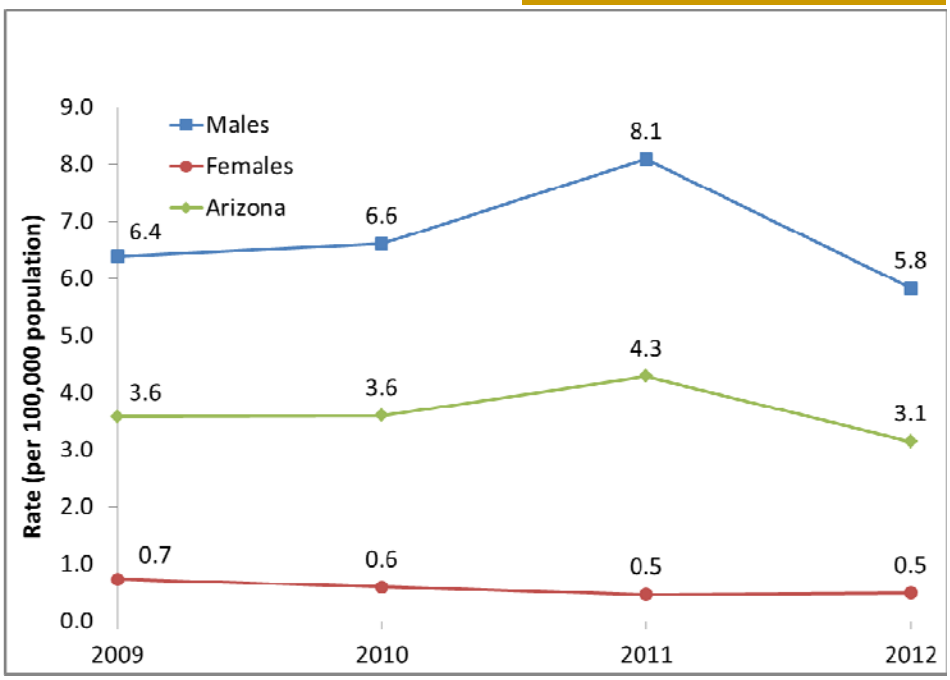


Figure 1: Reported Primary and Secondary Syphilis Case Rates by Gender, Arizona 2009-2012

RACE AND ETHNICITY

Of the 204 cases of P&S syphilis cases reported in 2012, 24 (12%) were reported among blacks, 74 (36%) among Hispanics and 11 (5%) among American Indians/Alaskan Natives (AI/AN). The United States census estimates that in 2012, blacks made up 4.5% of the population in Arizona, Hispanics 30%, and AI/AN 5.3%.

Historically, the highest rates of P&S syphilis in Arizona have been observed among blacks. In 2011, the rate of P&S syphilis among blacks in Arizona was 16.3 cases per 100,000 people. This rate was 5 times greater than that seen among non-Hispanic whites. A drop in the number of cases among blacks from 39 (2011) to 24 (2012) reduced the P&S syphilis rate in this group to 8.6 in 2012. This resulted in a rate that was 4 times greater than that seen among non-Hispanic whites.

AGE

Individuals less than 30 years of age accounted for approximately 44% of all P&S syphilis cases reported in 2012 compared to 40% in 2009. Since 2010, the 20-24 age group has accounted for both the highest number of reported P&S syphilis cases as well as the highest P&S syphilis rate among the age groups.

MEN WHO HAVE SEX WITH MEN

Since 2009, men who have sex with men (MSM) have accounted for over 75% of the combined male cases reported from Maricopa and Pima counties (Figure 2). In 2012, 150 cases of P&S syphilis were reported among men in Maricopa County. Of these, 107 (71%) self-reported as MSM. In the three years prior to 2010, the percentage of male P&S syphilis cases that self-reported as MSM never exceeded 35% in Pima County. For the first time, MSM accounted for over 65% of reported male cases in 2010. Most recently, 93% of reported cases of P&S syphilis among males in Pima County self-reported as MSM (29 male cases, 27 self-reported MSM).

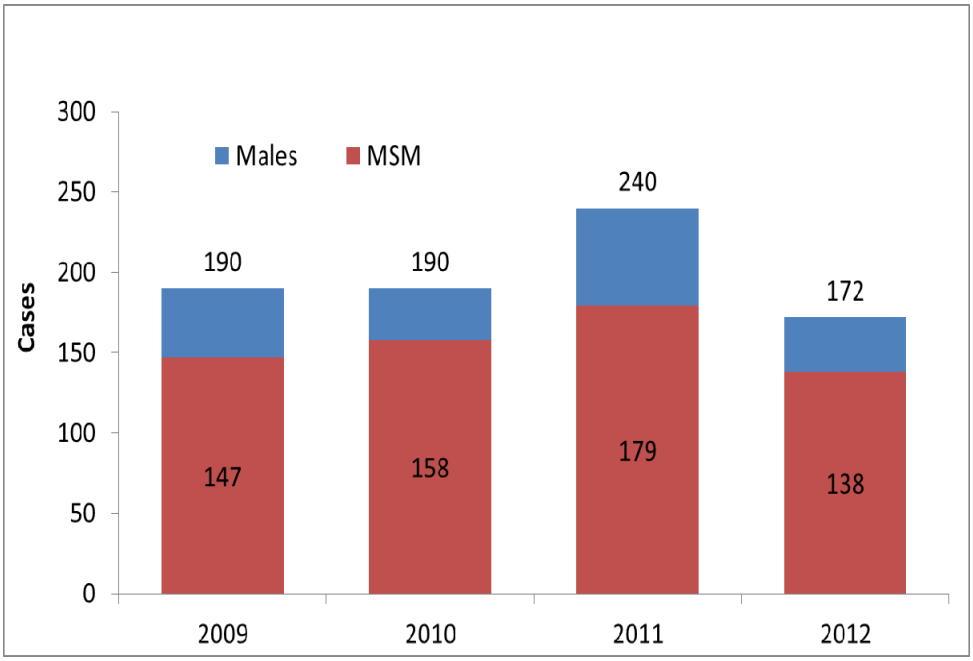


Figure 2: Reported Primary and Secondary Syphilis Cases by Sexual Preference, Maricopa and Pima Counties 2009-2012

1. Sexually Transmitted Disease (STD) Control Program. Arizona Department of Health Services. http://azdhs.gov/phs/edc/odis/std/index.htm. Accessed March 12, 2015.

COMORBIDITY: HIV & SYPHILIS

BACKGROUND

Both Syphilis and HIV are sexually transmitted diseases that occur most often in men who have sex with men (MSM). This is an important co-infection as it not only indicates a continued risk behavior but increases the risk of transmission of both diseases as well as other STDs.

COMORBIDITY IN ARIZONA

From 2009-2012 in Arizona, a total of 843 HIV cases were diagnosed with syphilis (all stages) with some being infected more than once. During this timeframe, there were 931 instances of syphilis diagnoses among HIV positive cases. Of these syphilis diagnoses, 762 (82%) contracted syphilis once, 145 (16%) contracted it twice and 24 (3%) people contracted it three times. In order to classify syphilis cases in the co-infected population by the year of diagnosis, the analysis has been restricted to primary, secondary and early latent syphilis.

GENDER

When looking at the sex breakdown of this HIV/syphilis co-infected group, all but two were male, 99.5%. This is higher than the 86% of males in the HIV prevalent population.

RACE/ETHNICITY

By race and ethnicity, the co-infected group is very similar when compared to the HIV prevalent population. White non-Hispanics make up the largest proportion of both groups at 56 % HIV only and 54% HIV/syphilis co-infection (Figure 1).

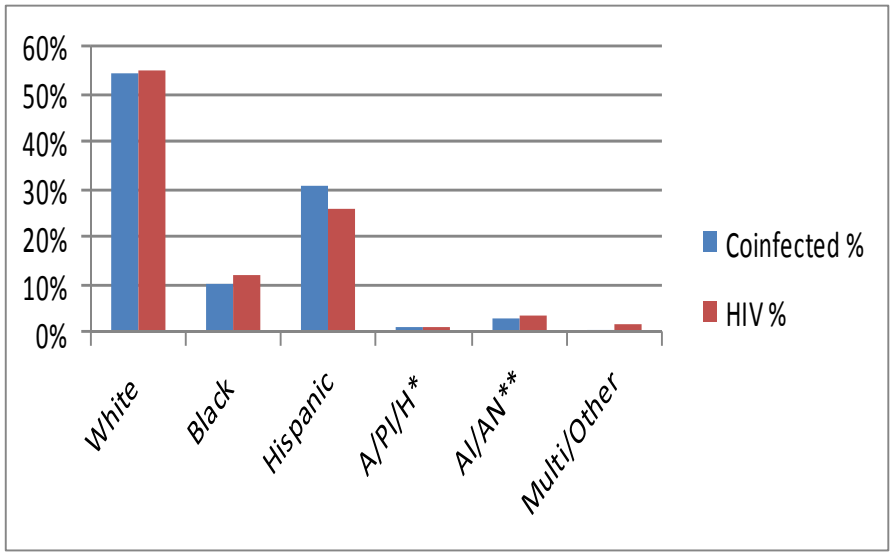


Figure 1: HIV/Syphilis Co-infected and HIV Only by Race, 2009-2012

*Asian/Pacific Islander/Native Hawaiian **American Indian/Alaska Native

QUICK FACTS:

- From 2009-2012, there were 931 cases of HIV/ syphilis co-infection in Arizona.
- The majority of HIV/ syphilis co-infections were male at 99.5%.
- By race, white non-Hispanics make up the majority of HIV/Syphilis co-infections.

RISK

Risk factors for the contraction of both HIV and syphilis are key to tracing of transmissions and can be used to tailor interventions in these populations. Among these cases from 2009-2012, 86% of HIV cases are among men who have sex with men (MSM), which is much higher than the 66% among the HIV prevalent population (Figure 2). By combining MSM and injection drug use (IDU) (MSM/IDU) risks with the MSM only risk group, it accounts for 95% of all co-infections. HIV positive MSM were significantly more likely to develop syphilis from 2009-2012 compared to HIV positive people who were not MSM. When a previously positive HIV patient later contracts syphilis, it indicates ongoing risk behavior. Among the co-infected population, 6% contracted syphilis before HIV while 74% had HIV earlier and 20% contracted both diseases in the same year.

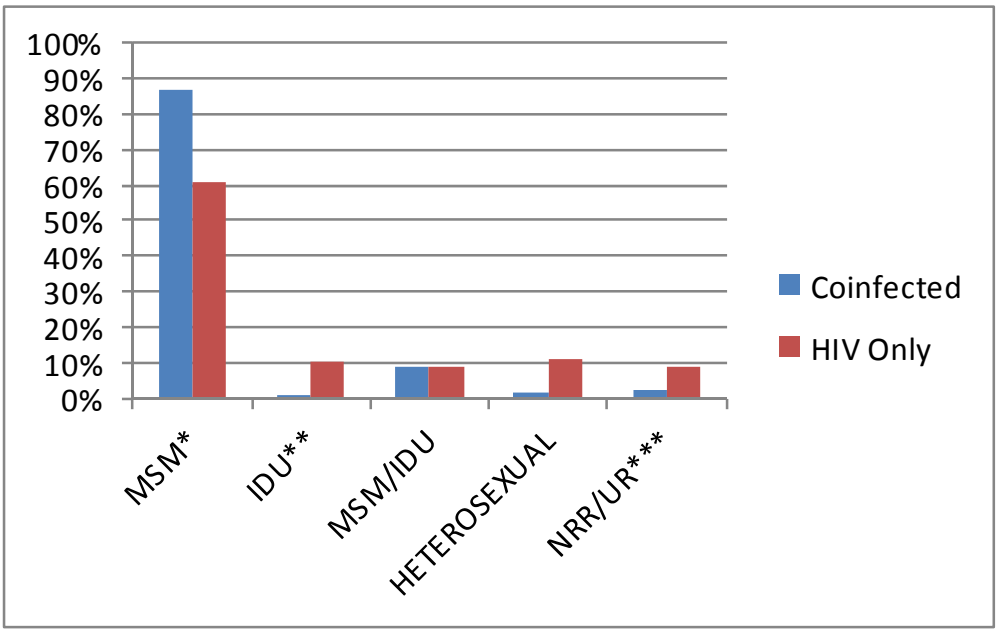


Figure 2: HIV/Syphilis Co-infected and HIV Only by Risk, 2009-2012

*Men who have sex with Men **Injection drug use ***No risk reported/Unknown risk

TRENDS

By analyzing syphilis diagnoses in previously HIV diagnosed people, which is classified as HIV diagnosis 60 days prior to syphilis diagnosis, there has been a sharp increase in the percentage of males in this group. This has been steadily increasing from 2002 to 2009. There was a subsequent drop in the percentage of HIV cases with new syphilis diagnoses in 2010 but this increased over the following two years (Figure 3). The continuing trend of syphilis infections occurring in HIV positive men who are mostly MSM indicates syphilis is now endemic in this group. One theory behind this pattern is sero-sorting among MSM. Sero-sorting is the practice of choosing sexual partners of the same HIV status; this has been shown to increase rates of all STD acquisition and specifically syphilis among these men[1]. Due to the increasing amount of co-infection in Arizona and the associated complications, it is important to continue to monitor the trends for incorporation into public health interventions.

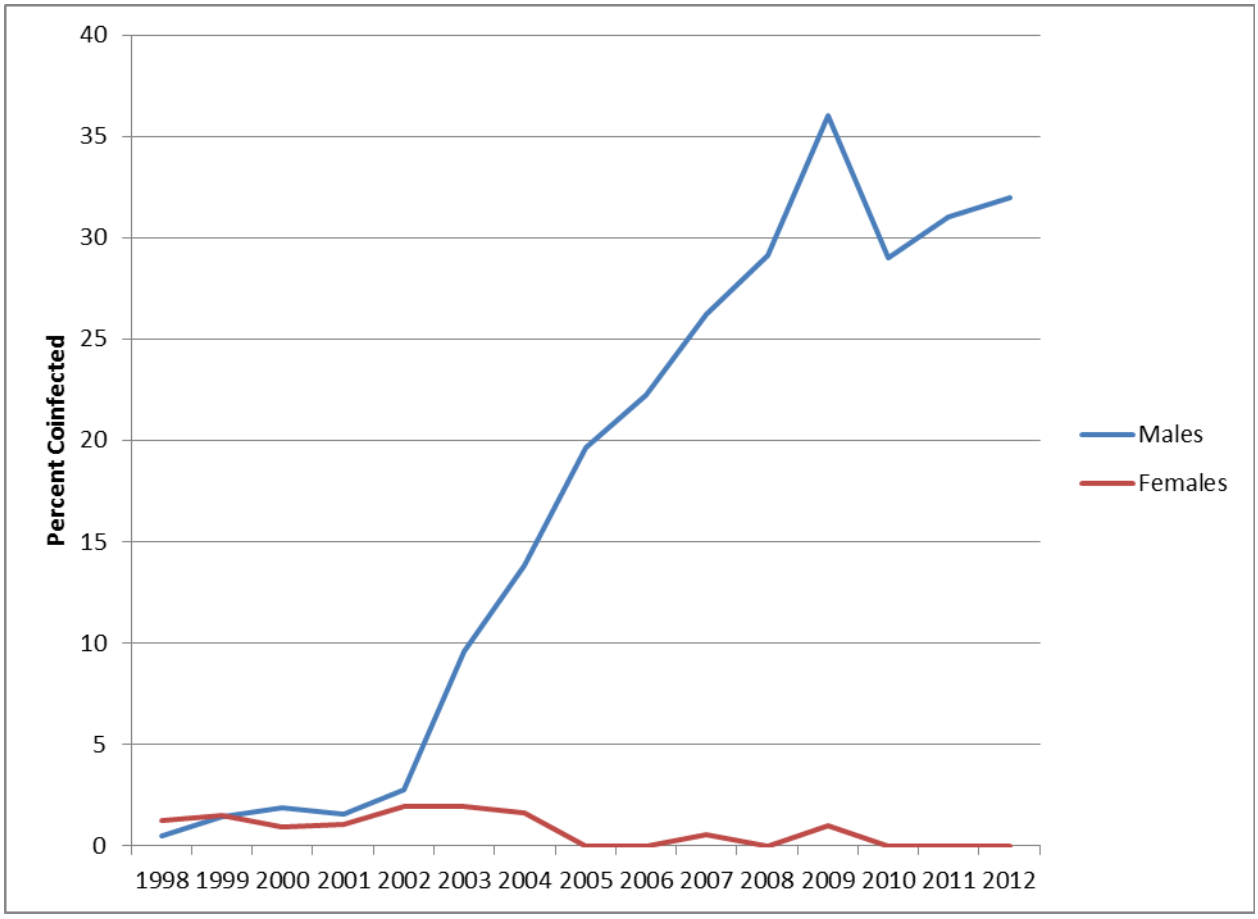


Figure 3: Percentage of Primary, Secondary, or Early Latent Syphilis Cases with Prior HIV Diagnoses, 1998-2012

1. Lucht A., Shah M., Kretzschmar M. Could HIV Serosorting Explain Increases in Syphilis Prevalence Among Men Who Have Sex with Men? - A Mathematical Modelling Study. Sexually Transmitted Infections, 2013; 89: Suppl 1 A188-189. doi:10.1136/sextrans-2013-051184.0591. Accessed March 12, 2015.

GONORRHEA

GONORRHEA IN ARIZONA

From 2009 to 2012, the reported infection count and rate of gonorrhea has almost doubled in Arizona; from a decade low of 3,254 cases in 2009 (49.3 cases per 100,000 persons) to the highest count and rate in 2012 (5,856 cases, and 89.4 cases per 100,000 persons) (Figure 1).

While Arizona's reported infection rate ranked 24th nationally in 2012, Maricopa County observed the 8th highest count of reported gonorrhea infections this same year when compared to other cities/metropolitan areas. Annually, Maricopa and Pima counties represent at least 80% of all reported cases, and thus increases in case counts in these counties have consistently foreshadowed statewide increases in cases and case rates. From 2009-2012, Maricopa and Pima counties represented 86% of all reported gonorrhea cases in Arizona while containing 75% of the state population. During 2011 and 2012, the highest case rates were observed in Navajo and Apache counties, though they collectively represented 4.8% and 4.5% of all Arizona cases, respectively.

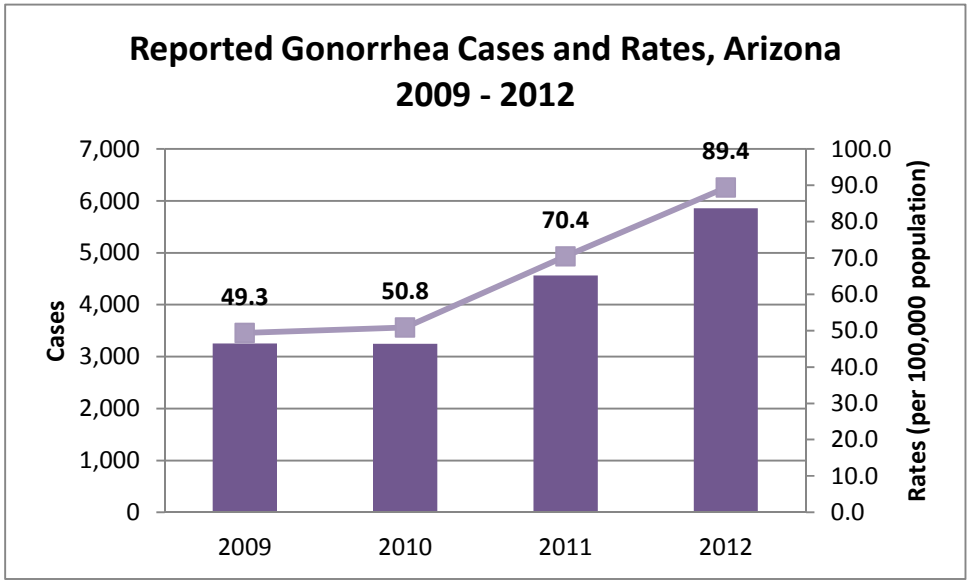


Figure 1: Reported Gonorrhea Cases and Rates, Arizona 2009-2012

QUICK FACTS:

- Arizona ranks 24th nationwide among gonorrhea cases and case rates.
- There were 5,856 cases of gonorrhea reported in Arizona in 2012, compared to 334,826 cases reported nationwide.
- The Maricopa County metropolitan area ranked 8th nation-wide in terms of gonorrhea case counts in 2012.

AGE

Reported gonorrhea infections in Arizona mirror national trends regarding age-related morbidity. Nationally, both males and females aged 15-29 carry the overall disease burden. In Arizona, these age groups have represented an average of 74% of all cases form 2009-2012. The highest case rates are consistently found among 20-24 year olds (416.3 cases per 100,000 persons in 2012). Older age groups contribute less to the overall disease burden, but have experienced a higher percent increase in case counts from 2009-2012.

GENDER

Though reported infection rates are higher among women nationally, males have had slightly higher case counts and rates for the last decade in Arizona. Gender-based rate differences decreased from 2009 to 2011; the rate difference among the sexes decreased from 2009-2011, but slightly increased again in 2012. When gender is separated by age group, female case counts outnumber that of males among those in the high-morbidity age range of 15-29, especially among 15-19 year olds. Female cases outnumbered male cases by at least 63% from 2009 to 2012. In 2009, females contributed 51% of the high-morbidity age-range cases, and this proportion increased to 54% by 2012. It is also important to note that although case counts increased for both sexes from 2009 to 2012, females experienced a 93% increase in cases compared to an increase of 69% for males.

RACE/ETHNICITY

There are large disparities between racial/ethnic groups in people infected with gonorrhea across the United States. In Arizona, blacks and American Indians/Alaskan Natives (AI/AN) are disproportionately affected. These cases represent an average of 22% and 8% of all Arizona cases from 2009 to 2012 respectively, while each group constitutes roughly 4% of the state population. Blacks have the highest case rate in Arizona, at 380.6 cases per 100,000 people in 2012, which was 12.3 times greater than the infection rate among non-Hispanic whites. While reported infections have increased for all race/ethnic groups in Arizona, blacks had the lowest percent increase in cases from 2009-2012 (31%, 7.8% annually).

Reported infections among AI/AN are also disparate in Arizona as they experienced the second highest rate of infection from 2009-2012 while representing only 8% of all cases. The number of infections increased by 190% for this group from 2009 to 2012 (from 177 cases to 513 cases). This high rate of infection is despite large variations in the population during this time. It is important to note that a significant proportion of cases reported in Arizona have unknown race/ethnicity (21% of cases in 2012).

Table 1: Infection Rate Ratio By Racial/Ethnic Group, Arizona, 2009-2012

	2009	2010	2011	2012
White	1	1	1	1
Black	16.7	14.2	12.6	12.3
AI/AN	2.7	4.0	5.5	6.0
Asian/PI	0.6	0.5	0.6	0.8
Hispanic	2.5	2.4	2.3	2.9

1. Sexually Transmitted Disease (STD) Control Program. Arizona Department of Health Services. http://azdhs.gov/phs/edc/odis/std/index.htm. Accessed March 12, 2015.

COMORBIDITY: HIV & GONORRHEA

BACKGROUND

There are differences in race composition and transmission risk factors between the HIV population and the HIV/Gonorrhea comorbid population. From 2009 to 2012, 532 cases of gonorrhea were co-infected with HIV.

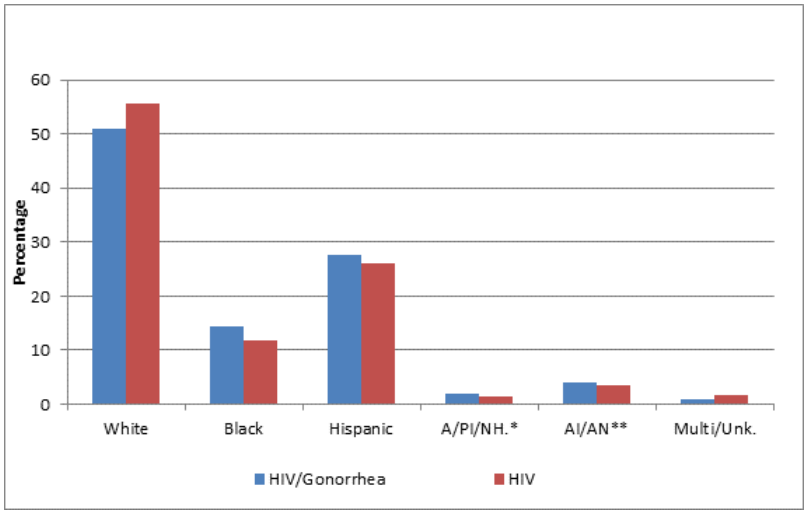


Figure 1: HIV/Gonorrhea by Race/Ethnicity

*Asian/Pacific Islander/Native Hawaiian **American Indian/Alaska Native

QUICK FACTS:

- From 2009 to 2012, there were 532 HIV/Gonorrhea co-infections.
- Among the HIV/ Gonorrhea population, 15% were black while 12% are black in the HIV prevalent population.
- MSM is the greatest risk factor for HIV/Gonorrhea co-infection with 81%. In comparison, 60% of the HIV prevalent population is MSM.

RISK

Among the transmission risk groups, men who have sex with men (MSM) make up 81% of the co-infected population while they only comprise 60% of the HIV prevalent population. Injection drug users (IDU) (12% vs 19%) and High Risk Heterosexuals (HRH) (11% vs 3%) have higher percentages in the HIV prevalent population than in the co-infected group (Figure 2).

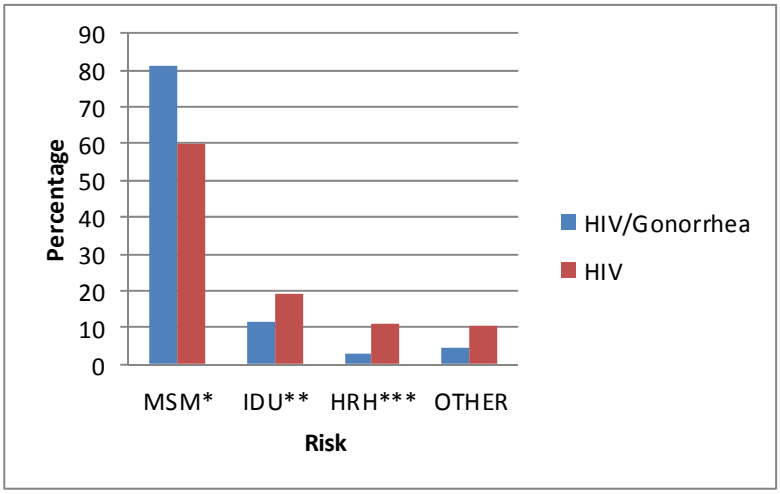


Figure 2: HIV/Gonorrhea by Transmission Risk

*Men who have sex with men, **Injection drug use, ***High risk heterosexual

RACE/ETHNICITY

More blacks and Hispanics exist in the co-infected population than in the HIV population. Among the co-infected population, blacks make up 15% of the cases while they only represent 12% of the HIV population. Hispanics comprise 28% of the co-infected cases and 26% of the HIV prevalent cases. Whites display the opposite pattern having a greater percentage of cases in the HIV population than in the co-infected population with 56% and 51% respectively (Figure 1).

CHLAMYDIA

BACKGROUND

Chlamydia is the most commonly reported infectious disease in the United States. It is caused by a bacterium and can be cured with appropriate antibiotics. Chlamydial infections often show no symptoms in women but can be symptomatic in men. If untreated, chlamydia can have short and long term health consequences for both men and women. Untreated infections in women can result in Pelvic Inflammatory Disease, infertility, and chronic pelvic pain. The number of chlamydia cases reported in 2012 increased by 1,320 cases over the number of cases reported in 2011, a 4.5% increase (Figure 1). The 2012 annual rate increased 3.1% of the 2011 case rate from 457.6 to 471.6 per 100,000 people. From 2009-2012, the Arizona chlamydia case rate increased 20% from 394.3 to 471.6 per 100,000 respectively. Although cases have continued to increase state wide from year to year over the past decade, 4 of Arizona's 15 counties showed a decrease in chlamydia cases and rates, from 2011-2012. It should be noted that these are rural counties and 3 of them are the least populated counties in Arizona.

QUICK FACTS:

- Chlamydia is the most commonly reported infectious disease in the United States.
- Chlamydia is easily treated and often asymptomatic. If left untreated, serious complications can occur.
- In 2012, there were 30,571 cases of chlamydia reported in Arizona.

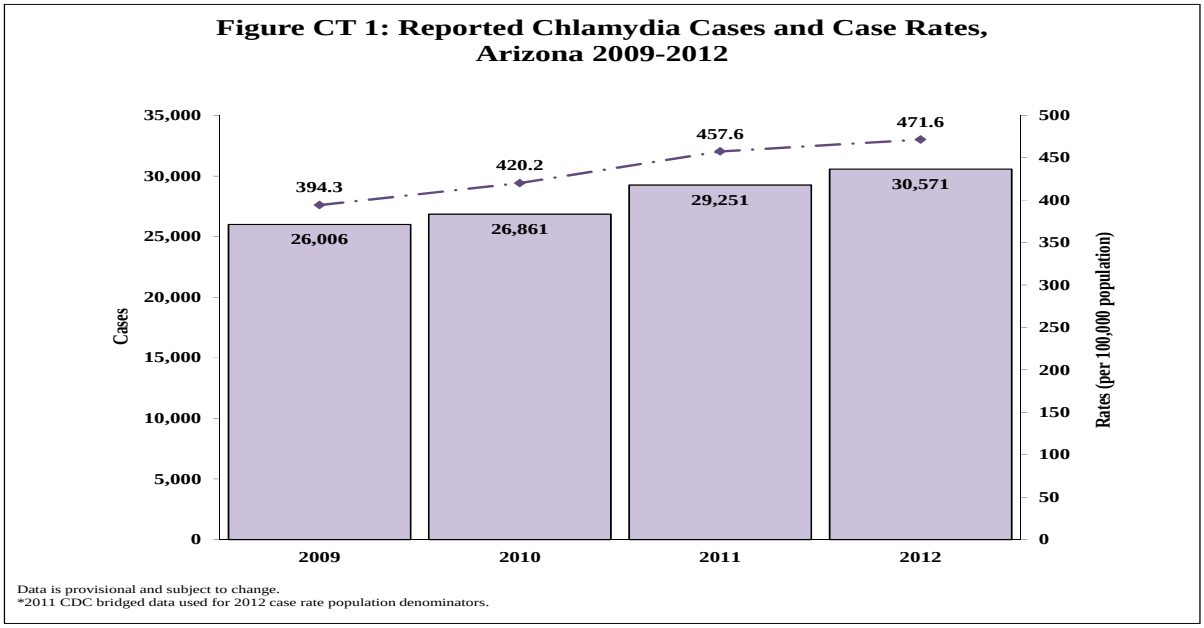


Figure 1: Reported Chlamydia Cases and Case Rates, Arizona 2009-2012

AGE

Adolescents in Arizona continue to be disproportionally affected by chlamydia. Closer examination of the 2012 rates among young people ages 15-24 reveals that while this age group represents only 14% of the population in Arizona, the rate for this age group (22,214) is 4.5 times higher than the rate of the state (474.9). This is the only demographic where the chlamydia rate trend rarely changes.

In 2012, the rate among the 20-24 age group remains the highest in the state at 2,542 per 100,000. On average, from 2009-2012, case counts for people under 25 years of age maintain 68% of cases, while case counts under age 30 maintain 85% of case counts (Table 1). The chlamydia screening efforts of the Arizona Infertility Prevention Project, which targeted at-risk females 25 and under for chlamydia screening, can be attributed in part (5% of total cases) for the increase in cases and rates of chlamydia in the 15-24 age group as well as females overall in Arizona.

GENDER

Over the past few years, Arizona chlamydia case rates have remained approximately three times higher in females than in males. This disparity mirrors the nationwide trend between chlamydia rates among men and women. There are a few reasons that may explain this discrepancy of rate between males and females. This may be due to the fact that since 1993 guidelines have recommended screening for women less than 26 years of age and women may be more likely to seek care. There are currently no screening guidelines in place to screen males for chlamydia.

The chlamydia rate for women increased 17% from 579.7 in 2009 to 680.5 per 100,000 in 2012; the rate for men increased 24% from 209.3 to 260.3 per 100,000 in 2012.

RACE/ETHNICITY

Table 1. Reported Chlamydia Cases and Case Rate per 100,000 Population by Age Group, Arizona 2009-2012

	2012		2011		2010		2009	
Age group	N	Rate	N	Rate	N	Rate	N	Rate
10-14	224	49	241	54	255	57	265	57
15-19	8,621	1913	8,857	1,919	8,304	1799	8,502	1864
20-24	11,706	2526	11,032	2,493	9,930	2244	9,292	2034
25-29	5,090	1147	4,726	1,074	4,430	1007	4,345	866
30-34	2,348	550	2,220	533	1,997	479	1,902	412
35-39	1,248	307	1,085	261	984	237	931	205
40-44	652	157	515	127	467	115	452	99
45-49	369	89	298	70	220	52	232	52
50-54	155	37	139	34	130	31	94	23
55-59	79	21	64	17	61	16	51	14
60-64	32	9	28	8	22	6	19	6
65+	32	4	28	3	23	3	30	4
Total	30,571	472	29,251	458	26,861	420	26,006	394
Percent under age 25	67%		69%		69%		69%	
Percent under age 30	84%		85%		85%		86%	

There is a clear health disparity when looking at chlamydia rates in Arizona by race/ethnicity. For more than 10 years the black and American Indian/Alaska Native (AI/AN) populations have maintained disproportionately higher rates of chlamydia than all other races. From 2007-2011, the black population has maintained the highest rates of chlamydia. However, in 2012, the black population showed a significant decrease in cases by 7.5% from 2,741 to 2,535. Conversely, the black population showed a significant growth in population of 16.6% between 2010 and 2011. This decrease in rate of chlamydia among the black population left the AI/AN population with the highest reported rate of chlamydia among all races in Arizona at 1,116.4 per 100,000 in 2012. This rate is 23% higher than the black population and 7.5 times greater than the non-Hispanic white population. It should be noted that although the rate of chlamydia among AI/AN shows a small decrease in rate from 1,129 to 1,116 from 2011-2012, the case count in this population actually increased from 2,908 to 3,030, a 4.2% increase in cases.

1. Sexually Transmitted Disease (STD) Control Program. Arizona Department of Health Services. http://azdhs.gov/phs/edc/odis/std/index.htm. Accessed March 12, 2015.

Arizona Department of Health Services

HEPATITIS B

BACKGROUND

The Hepatitis B virus (HBV) affects the liver disease and can cause acute and chronic disease. Approximately 50% of adults with acute HBV are asymptomatic. Acute disease usually lasts for a few weeks and symptoms can include fever, fatigue, loss of appetite, nausea, vomiting, abdominal pain, dark urine, clay-colored stools, joint pain, and jaundice. Approximately 5% of individuals with acute disease progress to lifelong chronic infection. It is transmitted through exposure to infected body fluids, such as blood and semen.

Most people who are chronically infected with HBV are asymptomatic. Those who have chronic HBV may develop cirrhosis, liver failure, or liver cancer; approximately 25% of people with chronic HBV die early from liver disease. Populations at risk for HBV include people who were born in Asia, Africa, and other regions where HBV is endemic, men who have sex with men (MSM), and people with HIV. It is important that people who are at risk get tested for HBV; treatment may be recommended for people with chronic HBV.

Hepatitis B is a vaccine-preventable disease; the vaccine is recommended at birth, followed by the second dose at 1-2 months, and a third dose at 6-18 months of age. High risk adults who have not been vaccinated should be vaccinated including people with HIV.

QUICK FACTS:

- Of people with HIV in the United States, about 10% are co-infected with HBV.
- About 20% of all new HBV infections in the United States are among MSM.
- Asian and Pacific Islanders account for more than 50% of Americans living with chronic HBV.
- The best way to prevent HBV is to get vaccinated.

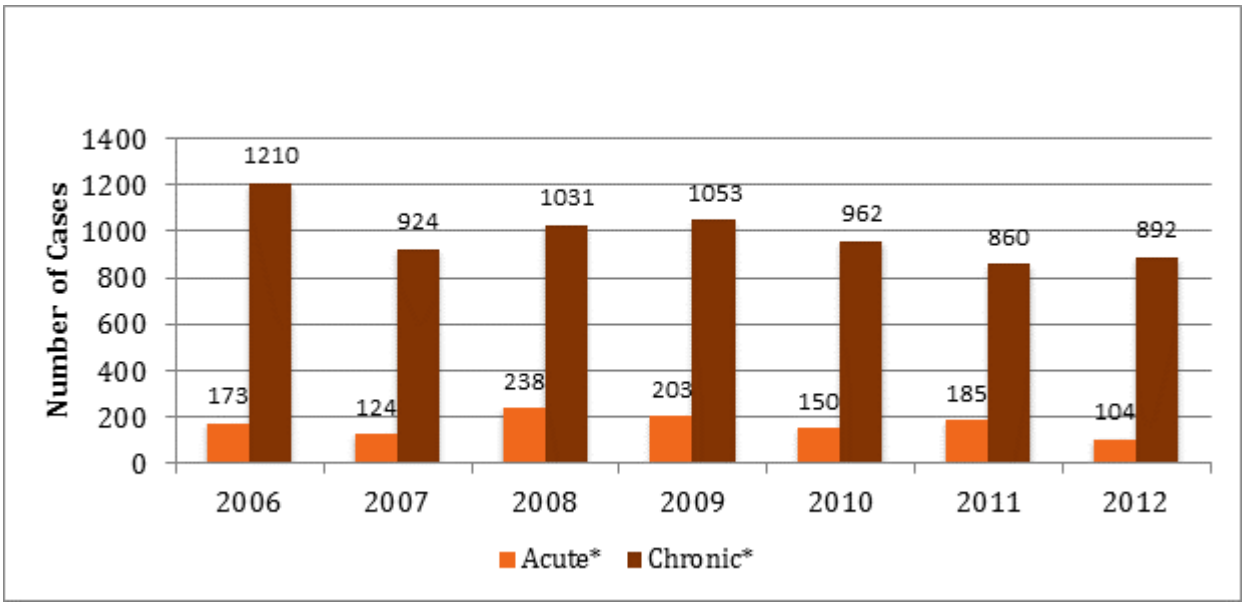


Figure 1: Number of Acute and Chronic Hepatitis B Cases in Arizona by Year, 2006-2012

*Number of cases include both confirmed and probable for acute and chronic hepatitis B.

HEPATITIS B SURVEILLANCE

The Arizona Department of Health Services (ADHS), Bureau of Epidemiology and Disease Control Services, Office of Infectious Disease Services conducts surveillance for HBV and also works with the Arizona Immunizations program to follow-up with pregnant women who are positive for HBV to prevent perinatal transmission.

From 2006-2012, an average of 168 confirmed and probable cases of acute HBV and 990 chronic HBV were reported to ADHS every year (Figure 1). The highest average rates of both acute and chronic HBV were among Asians/Pacific Islanders at 7.2 cases per 100,000 population and 35.8 cases of chronic HBV per 100,000 population, respectively (Figure 2). By county, Mohave had the highest average rate of acute HBV with 27 or more cases per 100,000 and Maricopa had the highest rate of chronic HBV with 120 or more cases per 100,000 from 2006-2012 (Figure 3, 4).

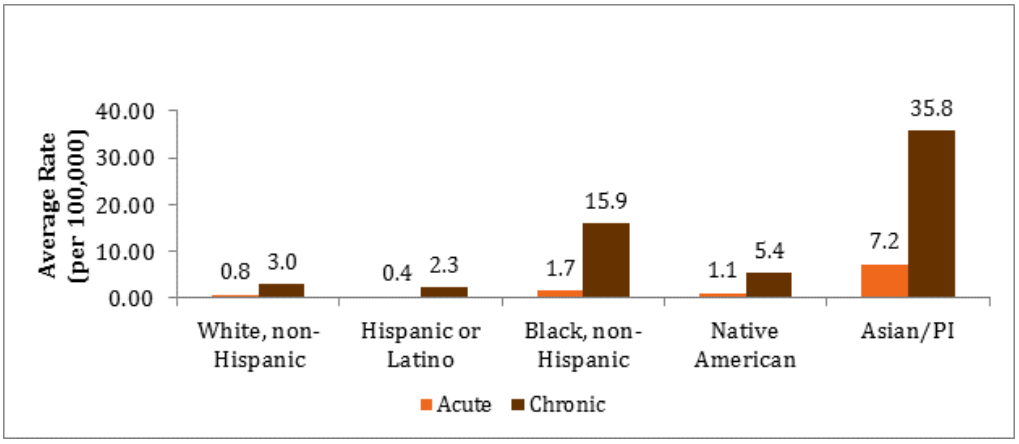


Figure 2: Average Rate of Acute and Chronic Hepatitis B in Arizona by Race/Ethnicity 2006-2012, PI=Pacific Islander

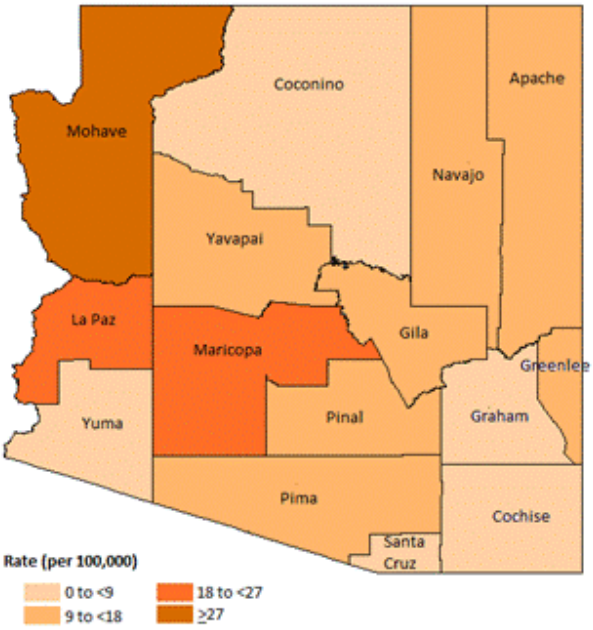


Figure 3: Average Rate of Acute Hepatitis B in Arizona by County, 2006-2012

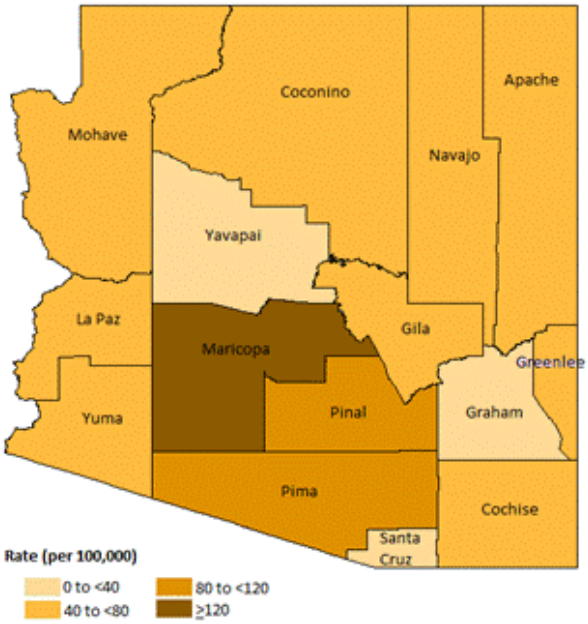


Figure 4: Average Rate of Chronic Hepatitis B in Arizona by County, 2006-2012

1. Hepatitis Program. Arizona Department of Health Services. http://azdhs.gov/phs/edc/odis/std/index.htm. Accessed March 12, 2015.

Arizona Department of Health Services

COMORBIDITY: HIV & HEPATITIS B

BACKGROUND

The comorbidity of HIV and Hepatitis B is a significant public health concern as it is with other HIV co-infections. Both the HIV and Hepatitis B virus (HBV) can be transmitted person to person through blood, semen, or other body fluids[1]. Hepatitis B is a contagious disease caused by the Hepatitis B virus. It is 50-100 times more infectious than HIV. It targets the liver which can lead to liver damage, cirrhosis, liver cancer, and liver failure[1]. Acute cases of Hepatitis B range from mild to severe and occur within six months of exposure. If an individual is unable to clear the infection due to a condition that compromises the immune system such as HIV, the virus can become chronic. There is a vaccine available to prevent Hepatitis B; the vaccine is currently recommended for newborns as well as for individuals at risk including those with HIV.[1]

In the United States, there are approximately 1.2 million people living with chronic Hepatitis B with an estimated 40,000 new infections each year.[1] Among HBV cases reported in the United States, about 10% are co-infected with HIV. Of those, 20% are among men having sex with men (MSM), and 50% of chronic cases are among Asian and Pacific Islanders.[3,4]

QUICK FACTS:

- Hepatitis B is 50-100 times more infectious than HIV. It can lead to various liver diseases.
- From 2009-2012, the comorbidity of Hepatitis B and HIV was 26 cases, 100% males.
- 73% of the HIV/Hepatitis B cases were in Maricopa County.

COMORBIDITY IN ARIZONA

An HBV/HIV comorbid case is defined as having HIV/AIDS infection and a previous, concurrent, or subsequent reported acute Hepatitis B infection. Each year in Arizona, an average of 168 acute and 990 chronic cases of HBV are reported to the Arizona Department of Health Services.[2] From 2009-2012, 26 cases, all males, were reported in Arizona with both HIV/AIDS and Hepatitis B. Of the reported concurrent cases, 73% were in Maricopa County. The rate of Hepatitis B infection in Arizona is 15 cases per 100,000 while the rate of Hepatitis B among HIV cases is 152 per 100,000.

GENDER

Of all reported HIV/AIDS cases from 2009-2012, 0.15% had a history of acute Hepatitis B infection with a higher percentage among males at 0.18%.

RACE/ETHNICITY

From 2009-2012, the cases of comorbid Hepatitis B and HIV were 69% white non-Hispanic, 12% black non-Hispanic, 15% Hispanic, and 4% American Indian/Alaska Native (Figure 1).

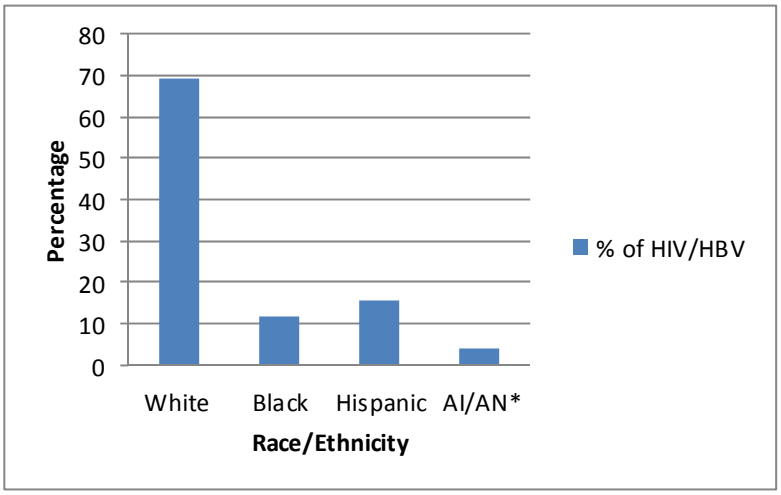


Figure 1: Race/Ethnicity among HIV/HBV cases from 2009-2012
*American Indian/Alaska Native

RISK

Among the 26 males with reports of both HIV and Hepatitis B, 73% report male-to-male sexual contact (MSM) and 4% report injection drug use (IDU), while 11% reported both injection drug use and male-to-male sexual contact. In comparison, of all male HIV/AIDS only cases, 66% report male-to male sexual contact, 7% report injection drug use, and 7% report both injection drug use and male-to-male sexual contact (Figure 2).

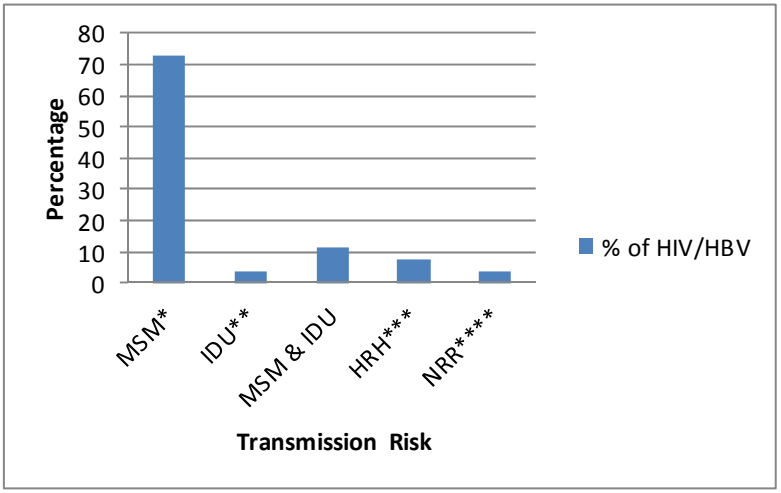


Figure 2: Transmission risk among HIV/HBV cases from 2009-2012
*Men who have sex with men, **Injection drug use, ***High risk heterosexual ****No risk reported

1. Hepatitis B General Information. Centers for Disease Control and Prevention. http://www.cdc.gov/hepatitis/hbv/pdfs/hepbgeneralfactsheet.pdf. Accessed March 12, 2015.
2. Hepatitis Program. Arizona Department of Health Services. http://azdhs.gov/phs/edc/odis/std/index.htm. Accessed March 12, 2015.
3. Viral Hepatitis Populations. Centers for Disease Control and Prevention. http://www.cdc.gov/hepatitis/Populations/api.htm. Accessed March 12, 2015.
4. HIV and Viral Hepatitis. Centers for Disease Control and Prevention. http://www.cdc.gov/hepatitis/Populations/PDFs/HIVandHep-FactSheet.pdf. Accessed March 12, 2015.

TUBERCULOSIS

BACKGROUND

The ADHS Tuberculosis (TB) Control Program has the overall responsibility for surveillance, management, and evaluation of TB activities in Arizona. The Department provides epidemiological, technical, medical, and programmatic consultative services regarding TB prevention and control to local and tribal health departments, health care providers, and facilities.

Since the 1950s, reported TB cases in the United States (US) have been on the decline and the state of Arizona is following this trend. The first year that the US reported less than 10,000 cases of TB was in 2012. Arizona reported 211 cases in 2012 with a case rate of 3.2 per 100,000 population, which was the same as the national case rate (Figure 1).

TB disproportionately affects foreign-born individuals. In Arizona, more than two-thirds of reported cases are born outside the US. The number of cases among Hispanics is the highest in Arizona, but the TB case rate is highest among Asian non-Hispanics (Figure 2).

QUICK FACTS:

- 2012 had the lowest number of reported cases of TB in the US.
- More than two-thirds of TB cases reported in Arizona were born outside the US.
- 90% of reported TB cases in Arizona who start treatment finish treatment within 1 year.
- Due to increases in drug resistance across the globe, drug resistance is monitored closely.

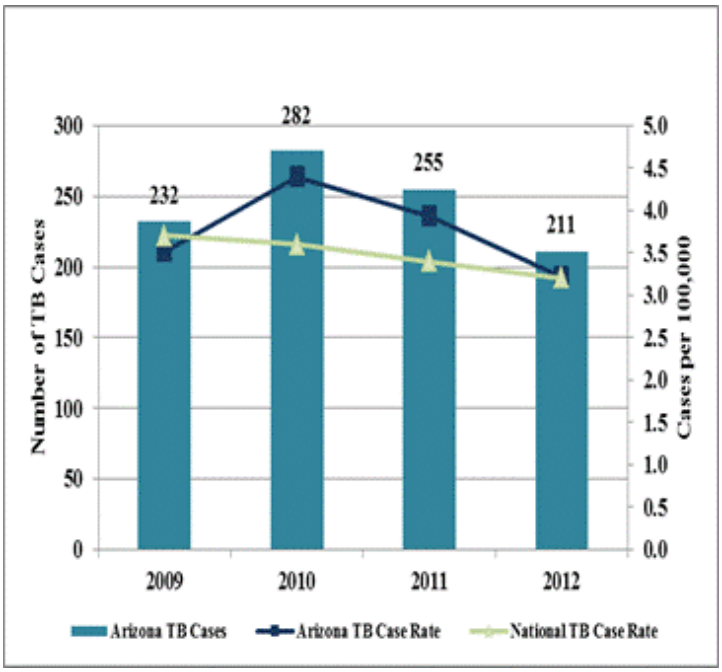


Figure 1: TB Cases and Case Rate, US and Arizona 2009-2012

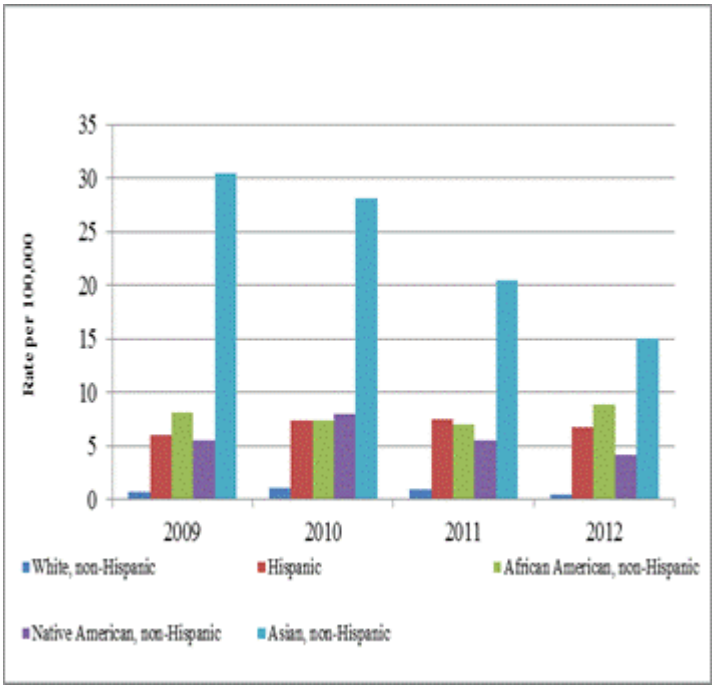


Figure 2: TB Case Rates by Race/Ethnicity, Arizona 2009-

TUBERCULOSIS TREATMENT

The TB control program at ADHS closely monitors the treatment of TB cases. This includes tracking completion of treatment rates within the state and also the percentage of cases who receive directly-observed therapy (DOT). DOT requires a health worker to visit a patient's residence to watch TB patients take their medications. This practice increases adherence to treatment and treatment completion rates, which in turn may prevent drug resistant TB cases in the future. In 2011, 90% of cases within Arizona finished treatment within one year and more than 92% of TB patients received DOT.

TUBERCULOSIS IN A BORDER STATE

Four counties in Arizona share border with Mexico: Yuma, Pima, Santa Cruz, and Cochise. Continuing care for a TB case who repatriates back to his/her home country can be challenging. In 2012, Pinal County had the highest rate of TB with 42 cases (including corrections) (Figure 3).

There are two entities which provide TB case management throughout the world, CureTB (primarily Mexico) and Migrant Clinicians Network (worldwide). The TB control program routinely partners with these two entities to ensure patients continue and complete their treatment after returning to their home country.

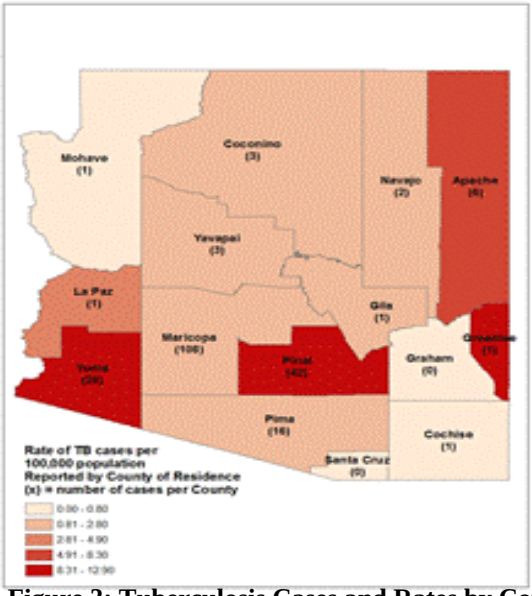


Figure 3: Tuberculosis Cases and Rates by County, Arizona 2012

For cases that frequently cross the border, the TB surveillance system, MEDSIS (Medical Electronic Disease Surveillance Intelligence System), has a Spanish version which the health departments in Mexico have access. This allows for increased communication and more effective case management of bi-national TB cases.

TUBERCULOSIS RISK FACTORS

The TB control program collects data on all active TB cases. Some of the important information that is collected are risk factors that help characterize and understand how the case was exposed to TB (Table 1). Also, these risk factors can help explain how someone developed active TB disease. For example, if the case has a disease which weakens the immune system such as diabetes mellitus or cancer the likelihood of developing active TB after exposure is much higher than a healthy individual.

Table 1: Percentage of Risk Factors Among TB Cases, 2012

Risk Factor	Percentage
Diabetes Mellitus	17.0%
Contact to an Infectious TB Patient <2 years	3.8%
End Stage Renal Disease	2.4%
Incomplete LTBI Therapy	2.4%
HIV/AIDS	5.2%
Immunosuppression (not HIV related)	1.9%
TNF-antagonist therapy	1.4%
Missed Contact	0.5%
Post-organ transplantation	0.5%
Resident of a Correctional Facility at Diagnosis	26.5%
Excess Alcohol Use	11.9%
Injecting Drug Use	4.0%
Non-injecting Drug Use	12.9%
Homelessness within last year	5.7%

FUTURE FOR TUBERCULOSIS CONTROL

The TB Control Program is dedicated to elimination of TB in Arizona. This is not possible until people with latent TB infection complete treatment and the global burden of TB. There is still much work to be done to have a future free of TB.

COMORBIDITY: HIV & TUBERCULOSIS

BACKGROUND

Tuberculosis (TB) is a highly contagious disease caused by the bacterium *Mycobacterium tuberculosis* and the pathogen is spread through the air from one individual to another. While the majority of TB infections are found in the lungs, the infection can spread throughout the body and becomes known as disseminated TB. Tuberculosis can be either latent or active. Latent TB occurs when an infected person's immune system has the disease under control and is not contagious. However, a weakened immune system can result in latent TB developing into active TB which can cause serious health complications which can be fatal if left untreated[1].

People with HIV, especially those meeting the clinical definition of AIDS, are at an increased risk of acquiring tuberculosis. TB and HIV co-infection is significant as it requires longer and more complicated treatment courses for the patient. Of the 932 confirmed active TB cases reported in Arizona from 2009-2012, 49 (5.3%) were co-infected with HIV. Of the 49 co-infected cases, 46 developed TB after their HIV diagnosis (94%). Of all the prevalent HIV/AIDS cases in Arizona, 0.17% developed active TB from 2009-2012. Of the HIV/TB co-infected people, 43 (88%) were male and 6 (12%) were female, which is a similar proportion to the HIV positive population in general. The proportion of people born outside of the United States is 5 times larger in the HIV/TB co-infected group than it is for people with HIV only. Of the HIV/AIDS only population, 88% were born in the US while only 43% of people with HIV and TB co-infection were born in the US (Figure 1).

QUICK FACTS:

- 49 HIV positive individuals developed a co-infection with TB in Arizona from 2009-2012.
- There were about 7 times more co-infected males than females.
- The majority (51%) of co-infected individuals were born outside the United States.

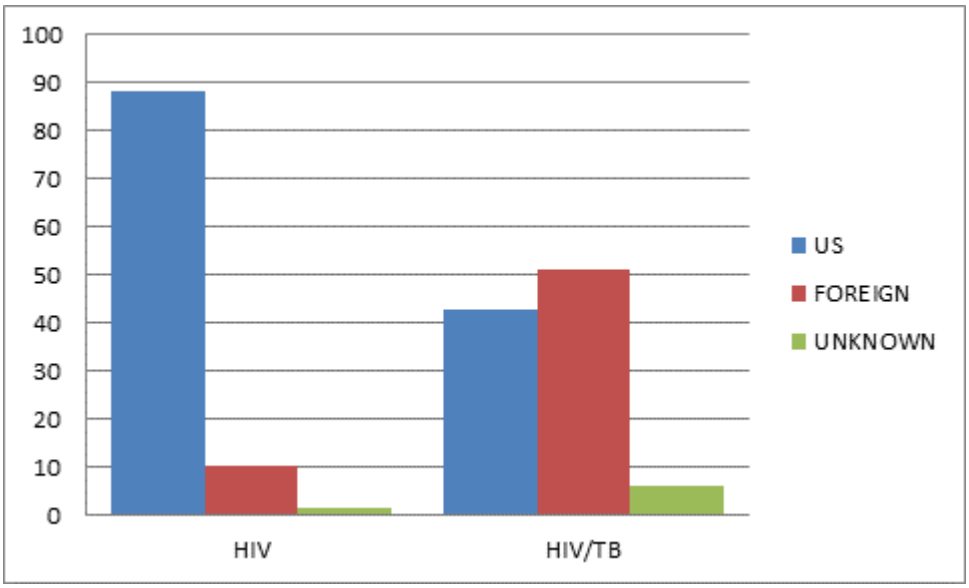


Figure 1: Country of Origin Among HIV and HIV/TB

RACE

Among racial/ethnic groups, there are differences between individuals with HIV and those co-infected with HIV/TB. From 2009-2012, the proportion of white non-Hispanics in the total Arizona HIV population was 4.9 times larger than in the co-infected population. Whereas the proportion of Hispanics with both HIV and TB from 2009-2012 is 2.6 times larger than the proportion of Hispanics in the general HIV population (Figure 2).

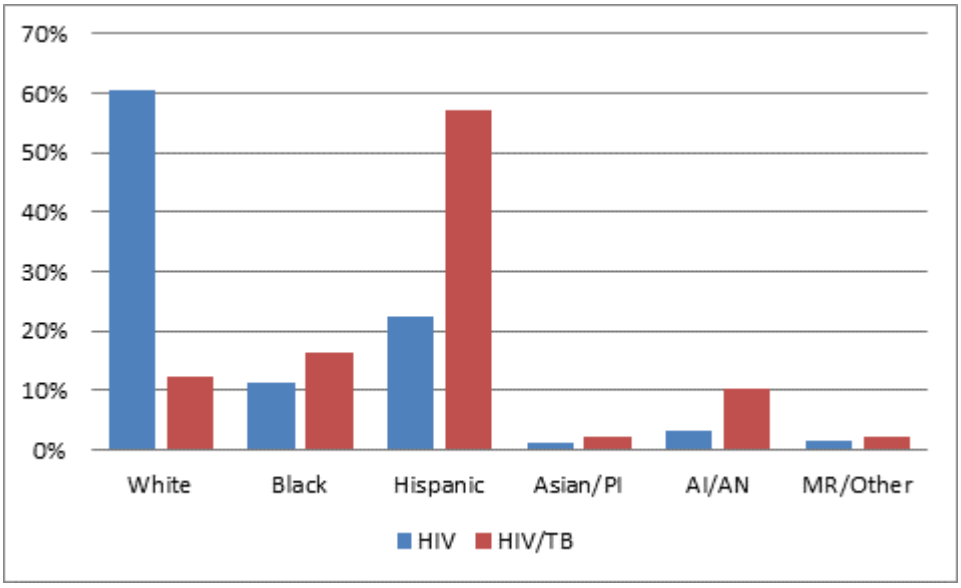


Figure 2: Percentage of race/ethnicity for HIV/TB co-infected individuals in Arizona, 2009-2012 and HIV only persons in Arizona, 1981-2013

PI=Pacific Islander, AI/AN=American Indian/Alaska Native, MR=Multi Race

RISK

There are also differences in the overall HIV population when compared to the HIV/TB co-infection group from 2009-2012 with regard to HIV risk. The proportion of people with HIV only that identified one of their risks for HIV to be men having sex with men is 2.1 times larger than in the HIV/TB co-infection group. All of the other HIV risks including injection drug use (IDU), high-risk heterosexual contact, and other/unknown risk factors made up a larger percent of the HIV/TB co-infected group than in the HIV only group (Figure 3). Specifically 20% of the HIV/TB co-infected group identified IDU as a risk whereas only 12% of the HIV only group identified IDU.

TIME BETWEEN HIV AND TB DIAGNOSIS

Time between HIV and TB diagnosis can be an informative measure when looking at the co-infected population. Whether a person is infected with HIV or TB prior to or at the same time and/or the timeframe of development of the second disease can be indicative of risk behaviors, health care access, and treatment success. In the co-infected population from 2009-2012 in Arizona, the majority of cases were diagnosed with TB very close to their HIV diagnosis or much longer after their HIV diagnosis. Nineteen of the 49 co-infected people were diagnosed with TB within one month of their HIV diagnosis (39%). Since HIV and TB can be latent in a person for extended periods of time, it cannot be determined which infection was acquired first. This pattern can be attributed to point of medical care contact which caught both diseases at the same time. An equal number of co-infected people were diagnosed with TB at least two years after their HIV diagnosis (19 of 49). This finding follows the typical disease progression of HIV where AIDS and its associated infections such as tuberculosis often take years to develop.

1. TB and HIV Coinfection. Centers for Disease Control and Prevention. http://www.cdc.gov/tb/topic/TBHIVcoinfection/default.htm. Accessed March 12, 2015.

Arizona Department of Health Services

COCCIDIOIDOMYCOSIS (VALLEY FEVER)

COCCIDIOIDOMYCOSIS IN ARIZONA

Coccidioidomycosis, also known as Valley Fever, is an infection caused by *Coccidioides*, a fungus found in the soil of the southwestern United States, parts of Mexico, Central and South America. Approximately two-thirds of reported coccidioidomycosis cases occur in Arizona. Infection occurs upon inhalation of fungal spores made airborne by disturbance of soil via natural or human activity. Sixty percent of infected persons experience systems ranging from asymptomatic to mild. The remaining 40% experience a self-limited respiratory illness with symptoms such as fever, cough, fatigue, chest pain, shortness of breath, and rash. Valley Fever is not spread by person to person contact.

In less than 5% of people with symptoms, infection may progress to severe respiratory disease or disseminate to sites outside of the lungs (e.g. bones, joints, skin, meninges). Severe pulmonary and disseminated disease requires treatment with antifungal medication. Risk factors for dissemination include immunosuppression, race, in particular blacks or Filipinos, adults ages 60 or older, and pregnant women. In addition, an individual with HIV who acquires disseminated coccidioidomycosis becomes classified as AIDS.

QUICK FACTS:

- Because of the desert climate, Coccidiodomycosis (Valley Fever) is very common with 2/3 of reported cases occurring in Arizona.
- Per 100,000 people, the case rates of Coccidioidomycosis have increased from 47.9 in 2003 to 198.8 in 2012.
- Males, pregnant women, blacks, Filipinos, and those with HIV are at greater risk for acquiring Valley Fever.

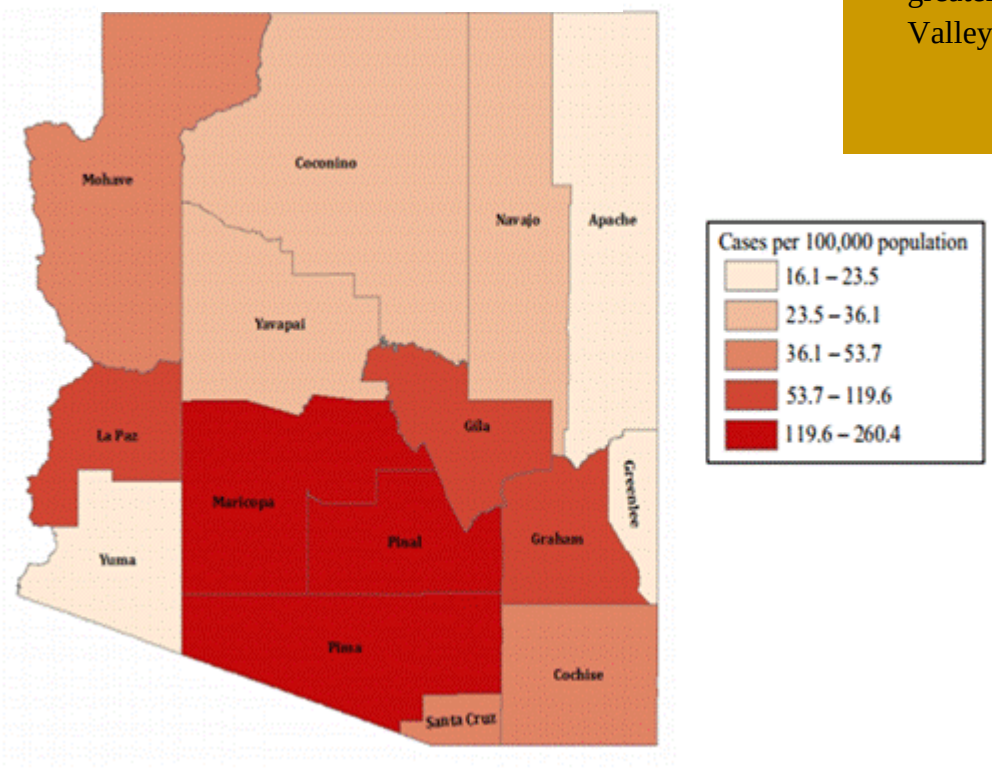


Figure 1: Coccidioidomycosis cases per 100,000 population by county, Arizona 2012

COCCIDIOIDOMYCOSIS SURVEILLANCE

Coccidioidomycosis is a reportable disease in Arizona. The ADHS Office of Infectious Disease Services conducts surveillance for coccidioidomycosis. Rates of reported coccidioidomycosis have increased significantly from 47.9 cases per 100,000 persons in 2003 to 198.8 cases per 100,000 persons in 2012. Possible causes include an influx of susceptible migrants to the endemic area, climate, increased soil disturbance, and increased awareness of the disease among physicians and the general public. Changes in reporting and testing methods at a major commercial laboratory greatly affected the number of cases reported to ADHS between 2009 and 2012 (Figure 2).

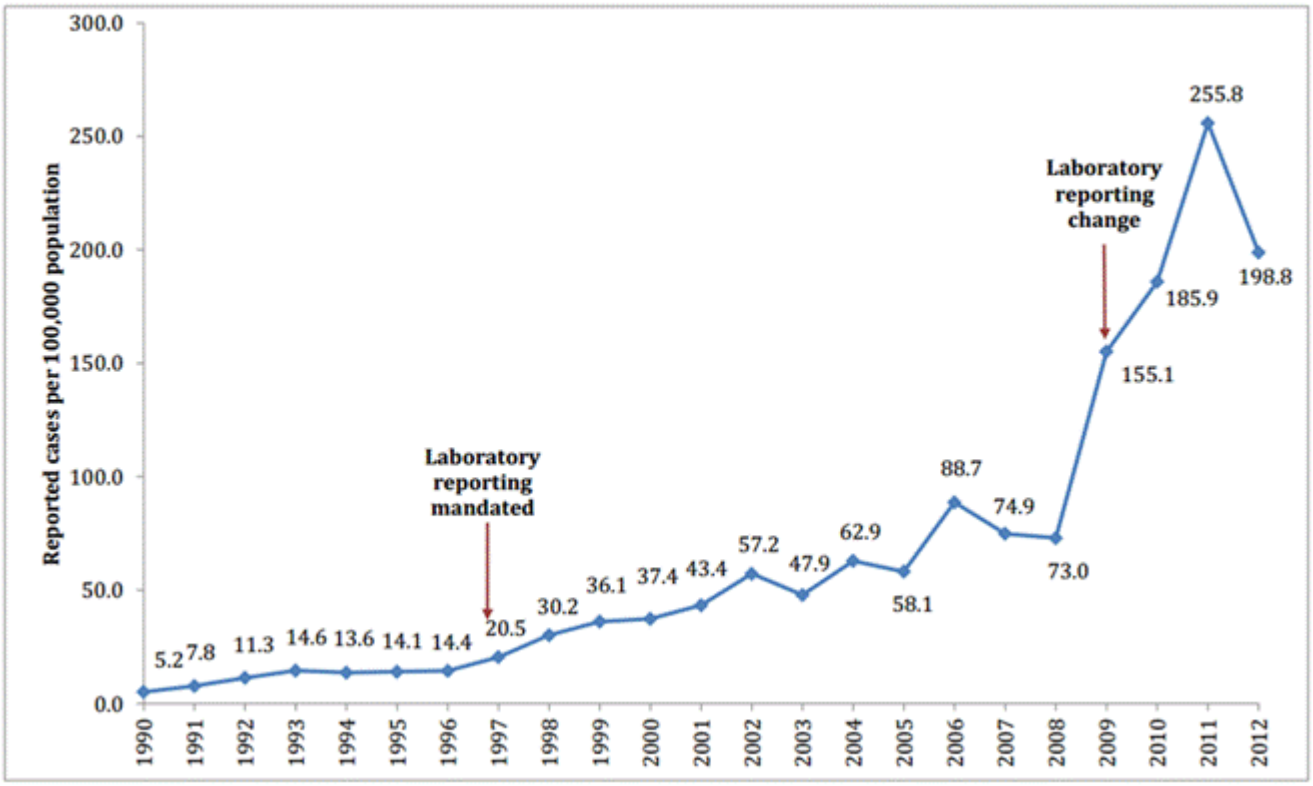


Figure 2: Reported cases of Coccidioidomycosis per 100,000 population, Arizona 1990-2012

Arizona Department of Health Services

COMORBIDITY: HIV & COCCIDIOIDOMYCOSIS

BACKGROUND

Coccidioides, a soil-based fungus attributed to Valley Fever present in the American southwest from southern California to Texas, is common in Arizona which has two-thirds of the reported infections. Inhalation of the airborne fungus can result in infection of the lungs known as coccidioidomycosis (Valley Fever). About 60% of coccidioidomycosis infections are asymptomatic; the condition cannot be transmitted from person to person[1]. According to a CDC study, coccidioides infection is responsible for nearly 30% of community-acquired pneumonia cases in endemic areas[2]. Valley Fever is generally mild and self-limiting but more serious cases are treated with anti-fungal medication.

Coccidiodomycosis is a reportable condition in Arizona. In 2012, 12,290 cases were reported to the Arizona Department of Health Services (ADHS).

Coccidiodomycosis is of particular importance to the HIV positive population. The suppressed immune system of HIV positive people may allow the normally pulmonary-based infection to disseminate into other tissues such as the extra-pulmonary chest cavity, lymph tissues, circulatory system, or major organs. When a disseminated coccidiodomycosis infection is discovered in an individual with HIV, this is considered an AIDS-defining condition; however, an HIV-infected individual who has pulmonary coccidiodomycosis infection only would not be classified as AIDS.

QUICK FACTS:

- Valley Fever (Coccidiodomycosis) is endemic in Arizona with 2/3 of infections occurring in the state.
- From 2009-2012, 656 people in Arizona were co-infected with HIV and Valley Fever.
- The majority of HIV/ Coccidiodomycosis infections were among those classified as High Risk Heterosexual (HRH) at 51%.

COMORBIDITY IN ARIZONA*

From 2009 to 2012, 50,809 coccidiodomycosis cases were reported to ADHS. At the end of 2012, there were 15,288 individuals in Arizona living with HIV (prevalent cases).

Of those included in this analysis, 656 HIV positive people were co-infected with coccidiodomycosis from 2009-2012. This should not imply that many of the 656 were diagnosed with AIDS-defining disseminated coccidiodomycosis. The presence of coccidiodomycosis even in the pulmonary form can develop into AIDS defining disseminated coccidiodomycosis as HIV suppresses the immune system as it progresses. Disseminated coccidiodomycosis is identified by HIV surveillance staff for new HIV reports outside of the normal coccidiodomycosis reporting. From 2009-2012 only 15 cases of confirmed disseminated coccidiodomycosis were found among HIV patients (2.3%). Public health activities to identify disseminated coccidiodomycosis among HIV positive people have decreased in recent years leading to an under identification of coccidiodomycosis in this group.

RACE

People with HIV/coccidiodomycosis co-infections have different characteristics for key demographic and risk factors when compared to the general HIV population. There are fewer whites (46%) among the co-infected population when compared to the general HIV population (56%); there was a larger proportion of American Indians in the co-infected group compared to the HIV-only group (11% v 3%) (Figure 1).

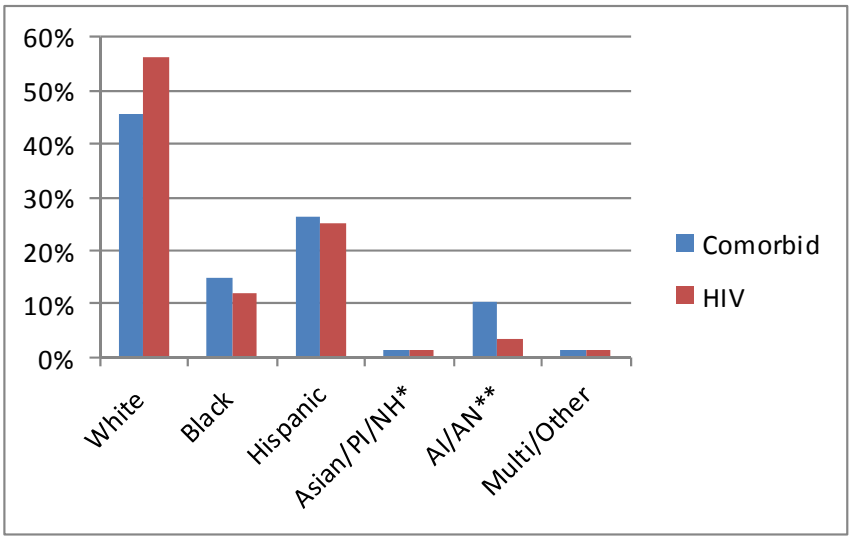


Figure 1: Percentage of race/ethnicity for HIV/Coccidiodomycosis co-infected individuals and HIV only, Arizona 2009-2012

*Pacific Islander/Native Hawaiian **American Indian/Alaska Native

RISK FACTORS

The two risk groups with higher proportions of HIV/coccidiodomycosis co-infections are men who have sex with men and injection drug users. The proportion of MSM who are co-infected with HIV and coccidiodomycosis is relatively lower than the proportion of MSM infected with HIV only (51% v 60%). The proportion of people infected with both HIV and coccidiodomycosis who are also injection drug users on the other hand is higher than the proportion of injection drug users who are only infected with HIV (25% v 19%) (Figure 2).

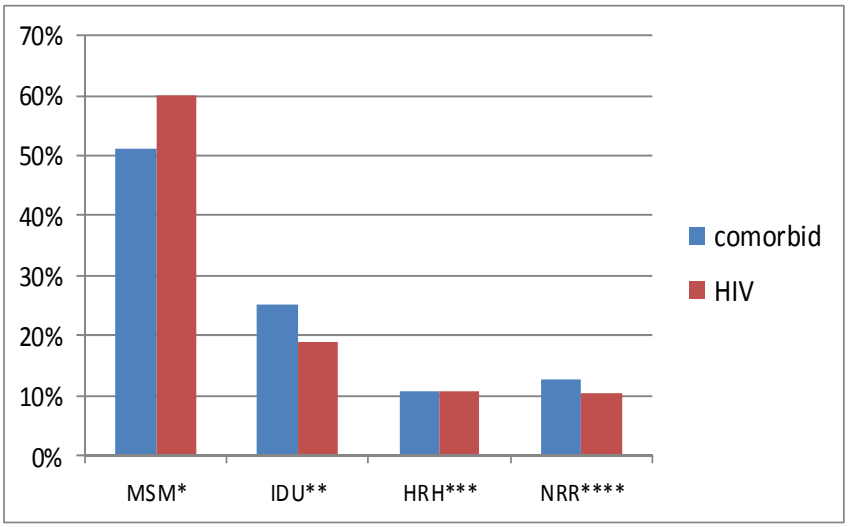


Figure 2: Percentage of risk for HIV/Coccidiodomycosis co-infected individuals and HIV only, Arizona 2009-2012

*Men who have sex with men, **Injection drug use, ***High risk heterosexual ****No risk reported

*The analysis was conducted by matching a portion of the ADHS coccidioidomycosis registry with all the prevalent HIV cases in the ADHS registry

1. Valley Fever Center for Excellence. The University of Arizona. https://www.vfce.arizona.edu/valleyfeverinpeople/faqs.aspx. Accessed March 12, 2015.
2. Valdivia L., Nix D., Wright M., Lindberg E., Fagan T., Lieberman D., et al. Coccidioidomycosis as a common cause of community-acquired pneumonia. Emerg Infect Dis: 2006 Jun [*December 4 2014*]. http://dx.doi.org/10.3201/eid1206.060028.

HIV/AIDS in Arizona Integrated Epidemiologic Profile, January 2015[1]

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1. HIV Epidemiology Program. Arizona Department of Health Services. http://www.azdhs.gov/phs/edc/odis/hiv-epidemiology/reports/index.php. Accessed March 12, 2015.