

Section 1: Core Epidemiologic Questions

Question 1: What are the sociodemographic characteristics of the general population in Ohio?

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Question **1**

What are the sociodemographic characteristics of the general population in Ohio?

This section provides demographic and socioeconomic information to describe the sociodemographic characteristics of Ohio residents. The 2014 U.S. Census Bureau estimates were the primary source of sociodemographic data for Ohio.

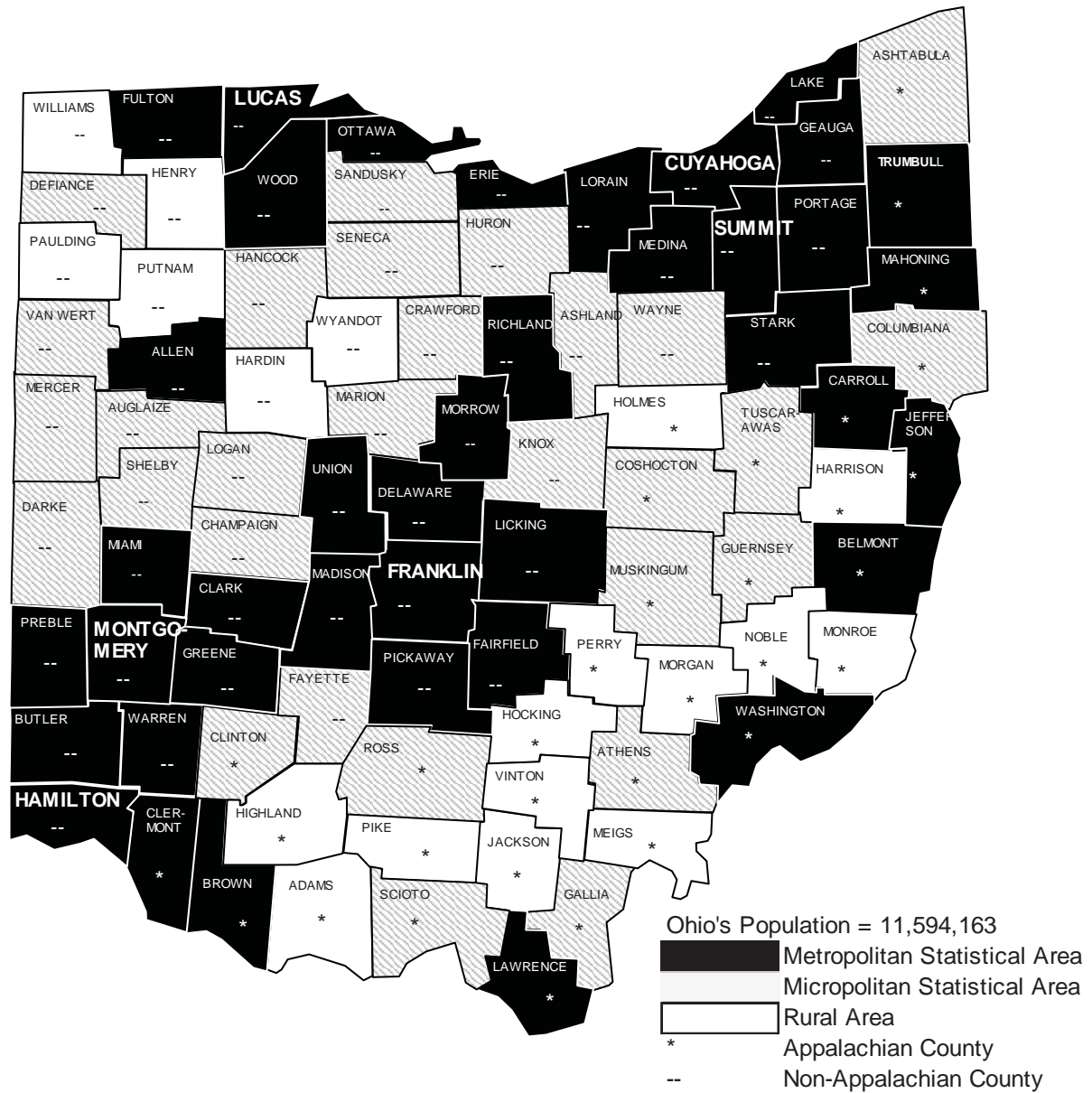
Highlights **Sociodemographic Characteristics of Ohio's Population**

- Ohio is composed of 88 counties with a population of 11,594,163, according to 2014 U.S. Census Bureau estimates. The five Ohio counties with the most residents are Cuyahoga, Franklin, Hamilton, Montgomery and Summit. Twenty-nine counties located in southeastern Ohio are considered Appalachian counties. In addition, Ohio contains 16 Metropolitan Statistical Areas (MSAs) and three major cities (Cleveland, Cincinnati and Columbus).
- According to 2014 U.S. Census estimates, 80 percent of Ohio's residents are white, 12 percent are black/African American, three percent are Hispanic/Latino and two percent are Asian/Pacific Islanders. American Indian/Alaska Natives comprise less than one percent of Ohio's population. The proportion of females (51 percent) is slightly higher than the proportion of males (49 percent). The median age of Ohio residents is 39 years. The age distribution for males and females in Ohio are similar; however, a greater proportion of females (16 percent) are age 65 and older compared to males (14 percent). One-third (33 percent) of Ohio's population is less than 25 years of age.
- The percent of Ohioans living below the 2013 Federal Poverty Level (FPL) is 15.8 percent. A county with an FPL 25 percent or more above the state average is defined as having a high level of poverty. Eleven Appalachian counties concentrated along the southeast border of Ohio, and one core urban county – Lucas – have high levels of poverty.

Demographics

Geographic Description

Figure 1. Geographic description of Ohio by county



Note: Counties in bold, large type contain a core urban area of 50,000 or more population. County populations in table form can be located in Appendix C.

Source: Summary File 1, U.S. Census Bureau, 2014.

As stated previously, Ohio is composed of 88 counties with a population of 11,594,163 residents according to 2014 U.S. Census estimates. Ohio counties are categorized as part of a metro, micro or rural area. A metro area contains a core urban area of 50,000 or more population, and a micro area contains an urban core of at least 10,000 (but less than 50,000) population. Each metro or micro area consists of one or more counties and includes the counties containing the core urban area, as well as any adjacent counties that have a high degree of social and economic integration (as measured by commuting to work) with the urban core. The remaining counties that are not contained in a metro or micro area are part of the rural area. Almost half, 40 of 88, of Ohio counties are in metro areas with Cuyahoga, Franklin, Hamilton, Montgomery and Summit as the most populace. Twenty-nine counties are in micro areas and the remaining 19 counties are in rural areas. Thirteen of 19 counties in the rural area are Appalachian counties along the southeast border of Ohio. Farmers with distinct settlement patterns, land use practices, and cultural values that were essentially a mixture of Scots-Irish, German/Swiss, and Cherokee cultures settled these counties. This inter-cultural "Back Country" lifestyle formed the basis for the cultural difference that later developed between Appalachian and non-Appalachian Ohio.

The core counties for the eight largest urban areas in Ohio represent 46.7 percent of Ohio's population. These counties include Summit County (Akron), Stark County (Canton), Hamilton County (Cincinnati), Cuyahoga County (Cleveland), Franklin County (Columbus), Montgomery County (Dayton), Lucas County (Toledo) and Mahoning County (Youngstown). The greatest proportion of Ohio residents reside in Cuyahoga County (11.1 percent) followed by Franklin (10.1 percent) and Hamilton (7.0 percent) counties. Ohio counties that are the least populous include Harrison, Monroe, Morgan, Noble and Vinton. These counties are part of the Appalachian region and 0.1 percent of Ohioans live in each county (**Figure 1**).

Sex and Age

Table 1. Distribution of Ohio's population, by sex and age

AGE	Ohio					
	Males		Females		Total Population	
	No.	%	No.	%	No.	%
<14	1,111,894	20%	1,062,955	18%	2,174,849	19%
15-19	395,276	7%	377,210	6%	772,486	7%
20-24	399,235	7%	391,444	7%	790,679	7%
25-29	377,023	7%	371,797	6%	748,820	6%
30-34	359,065	6%	362,807	6%	721,872	6%
35-39	337,867	6%	341,728	6%	679,595	6%
40-44	360,875	6%	366,587	6%	727,462	6%
45-49	374,828	7%	381,210	6%	756,038	7%
50-54	415,261	7%	431,666	7%	846,927	7%
55-64	763,947	13%	812,319	14%	1,576,266	14%
65+	779,501	14%	1,019,668	16%	1,799,169	16%
Total	5,674,772	100%	5,919,391	100%	11,594,163	100%

Source: County Characteristics Dataset, U.S. Census Bureau, Vintage 2014.

Forty-nine percent of Ohio's 11,594,163 residents are male and 51 percent are female. The median age of Ohio residents is 39 years. The age distribution for males and females in Ohio is similar; however, a greater proportion of females (30 percent) are age 55 and older compared to males (27 percent). One-third (33 percent) of the population is less than 25 years of age (**Table 1**).

Race/Ethnicity and Sex

Table 2. Distribution of Ohio's population, by race/ethnicity and sex

RACE/ETHNICITY	Ohio					
	Males		Females		Total Population	
	No.	%	No.	%	No.	%
White, not Hispanic	4,554,871	80%	4,733,389	80%	9,288,260	80%
Black/African American, not Hispanic	681,061	12%	745,398	13%	1,426,459	12%
Hispanic/Latino	207,149	4%	196,041	3%	403,190	3%
Asian/Pacific Islander	112,283	2%	121,310	2%	233,593	2%
American Indian/Alaska Native	11,033	<1%	10,956	<1%	21,989	<1%
Other	108,375	2%	112,297	2%	220,672	2%
Total	5,674,772	100%	5,919,391	100%	11,594,163	100%

Note: Other includes persons of two or more races and persons of unknown race/ethnicity.

Source: U.S. Census Bureau, Census 2014 Estimates.

U.S. Census 2014 estimates 80 percent of Ohio residents are white, 12 percent are black/African American, three percent are Hispanic and two percent are Asian/Pacific Islanders. American Indian/Alaskan Natives are less than one percent of Ohio's population. The racial/ethnic distribution of Ohio residents is the same between males and females (**Table 2**).

Socioeconomic Status (SES)

Poverty

The percent of Ohioans living below the 2013 Federal Poverty Level (FPL) is 15.8 percent. Counties with a FPL at least 25 percent below the state average, less than 11.9 percent living in poverty, are defined as having a low level of poverty. Fifteen counties concentrated in metro, micro and rural areas in the northwest and southwest regions of the state have low levels of poverty. Delaware and Warren counties have the lowest poverty levels - 4.9 and 6.3 percent, respectively.

Counties with a FPL of 25 percent or more above the state average, greater than 19.8 percent living in poverty, are defined as having a high level of poverty. Eleven counties concentrated along the southeast border of Ohio, Appalachian counties, and one core urban county – Lucas have high levels of poverty. Athens, Jackson and Pike counties have the highest poverty levels - 31.7, 24.6 and 23.5 percent, respectively. Summary data in table form can be located in Appendix C.

Education Level

In Ohio, 88.9 percent of persons 25 years of age and older have a high school diploma or more education, and 25.5 percent have a bachelor's degree or higher. Holmes County had the lowest

percentage of persons with a high school diploma or higher at 54.9 percent. This may be attributed to the large Amish population in this Ohio county. Delaware County had the greatest percentage (96.0 percent) of persons 25 years of age and older with a high school diploma or more education and the greatest percentage of persons with a bachelor's degree or higher (50.6 percent).

Uninsured Persons

U.S. Census 2013 estimates indicate 11.6 percent of Ohio's civilian noninstitutionalized population were without health insurance. The uninsured include those without health insurance and those who have coverage under the U.S. Indian Health Service only.

Counties where the proportion of uninsured persons is at least 25 percent below the state average, which is less than 8.3 percent uninsured, are defined as having a low proportion of uninsured persons. Eight counties concentrated in micro and rural areas in the northwest region of the state and metro counties adjacent to counties with core urban areas have a low proportion of uninsured persons. Putnam, Delaware and Warren counties have the lowest proportion of uninsured persons - 4.9, 5.3 and 7.0 percent, respectively.

Counties where the proportion of uninsured persons is 25 percent or more above the state average, which is greater than 14.5 percent uninsured, are defined as having a high proportion of uninsured persons. Thirteen counties mostly concentrated in the Appalachian region have a high proportion of uninsured persons. Holmes, Adams and Highland counties have the highest proportion of uninsured persons - 45.7, 18.5 and 16.3 percent, respectively. Summary data in table form can be located in Appendix C.

Table 3. Distribution of non-elderly (0-64 years of age) population and uninsured by race/ethnicity, Ohio 2014

Race/Ethnicity	Ohio		
	Non-Elderly Population	Non-Elderly Uninsured	
	No.	No.	%
White, not Hispanic	7,695,927	596,100	8%
Black, not Hispanic	1,271,084	115,300	9%
Hispanic	382,664	67,300	18%
Other ^a	445,339	55,100	12%
Total	9,794,994	833,800	9%

^a"Other" includes Asian/Pacific Islanders and American Indian/Alaskan Native.

Source: KFF State Health Facts Online. [Http://www.statehealthfacts.org](http://www.statehealthfacts.org)

Based on the Census Bureau's 2014 Current Population Survey, nine percent of non-elderly (0-64 years of age) Ohioans are uninsured. The proportion of persons with health insurance is different among race/ethnic groups. Non-elderly whites are more likely to have health insurance (8 percent uninsured), compared to non-elderly blacks/African Americans (9 percent uninsured), and non-elderly Hispanics (18 percent uninsured) (**Table 3**).

Medicaid

According to the U.S. Census Bureau, approximately 16.3 percent of Ohioans received Medicaid benefits in 2013. Counties where the proportion of persons who receive Medicaid is at least 25 percent below the state average, which is less than 12.2 percent, are defined as having a low proportion of persons receiving Medicaid benefits. Twelve counties concentrated in micro and rural areas in the northwest region of the state and metro counties adjacent to counties with core urban areas have a low proportion of persons receiving Medicaid benefits. Delaware, Geauga and Warren counties have the lowest proportion of persons receiving Medicaid benefits - 6.5, 7.4 and 7.6 percent, respectively.

Counties where the proportion of persons receiving Medicaid benefits is 25 percent or more above the state average, which is greater than 20.4 percent, are defined as having a high proportion of persons receiving Medicaid benefits. Twenty counties mostly concentrated in the Appalachian region have a high proportion of persons receiving Medicaid benefits. Vinton, Pike and Scioto counties have the highest proportion of persons receiving Medicaid benefits – 31.6, 30.3 and 26.6, respectively. Summary data in table form can be located in Appendix C.

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Question 2

What is the Scope of the HIV/AIDS Epidemic in Ohio?

The HIV/AIDS epidemic affects persons regardless of sex, age, race/ethnic group and/or geographic region in Ohio, but the impact is not the same for all population groups. While white males who report having sex with men (MSM) continues to account for the highest number of cases in Ohio's epidemic, recent trends suggest increases in cases among females, blacks and heterosexuals. The HIV/AIDS epidemic has affected persons in Ohio for over 30 years. As the HIV epidemic continues to change and the number of persons living with a diagnosis of HIV infection continues to grow, it is important to identify populations most impacted and at greatest risk for HIV infection to equitably allocate resources for HIV prevention and care initiatives throughout Ohio. There is a continuing need to report cases of HIV infection in a timely, complete and accurate manner.

This section provides detailed information about demographic and risk characteristics of HIV-infected individuals and trends in the epidemic in Ohio. The data presented in this section include new diagnoses of HIV infection, AIDS diagnoses in 2014, and the number of persons living with a diagnosis of HIV infection as of December 31, 2014, as reported through June 30 2015. HIV/AIDS surveillance data are analyzed using the date of diagnosis to increase the completeness of case reporting and provide an accurate reflection of the epidemic.

Highlights Scope of the HIV Epidemic in Ohio

Sex: Since Ohio's HIV epidemic began in the early-mid 1980's, the majority of persons diagnosed with an HIV infection each year are male. Eighty six percent (86%) of persons newly diagnosed with an HIV infection in Ohio in 2014 were male.

Age: Persons newly diagnosed with an HIV infection in Ohio are increasingly younger than in previous years. In 2014, the highest number (217 cases) and proportion (23 percent) of persons diagnosed with an HIV infection in Ohio were 20-24 years of age. This represents an increase of 12 percent within this age group since 2010. The proportion of persons 24-29 years of age diagnosed with HIV infection saw the largest proportional increase (28 percent) in new HIV diagnoses reported between 2010 (142 cases) and 2014 (181 cases). Conversely, the number and proportion of new HIV diagnoses decreased among persons 15-19 years of age, and all age groups among persons 35 years of age and older between 2010 and 2014.

Race/ethnicity: Racial/ethnic disparities in new HIV infections in Ohio mirror disparities observed across the nation. Black/African Americans accounted for 47-52 percent of new diagnoses of HIV infection reported between 2010 and 2014, but represent only 12 percent of Ohio's population in each year per U.S. Census estimates. Hispanics/Latinos accounted for four-seven percent of new diagnoses of HIV infection reported between 2010 and 2014, but represent only three percent of Ohio's population in each year per U.S. Census estimates. In 2014, black/African-American males accounted for 43 percent of all diagnosed HIV infections reported in Ohio, followed by white males (33 percent), black/African-American females (9 percent), Hispanic/Latino males (6 percent), and white females (4 percent). Males and females of all other race/ethnicities combined, accounted for two percent of diagnosed HIV infections in Ohio in 2014.

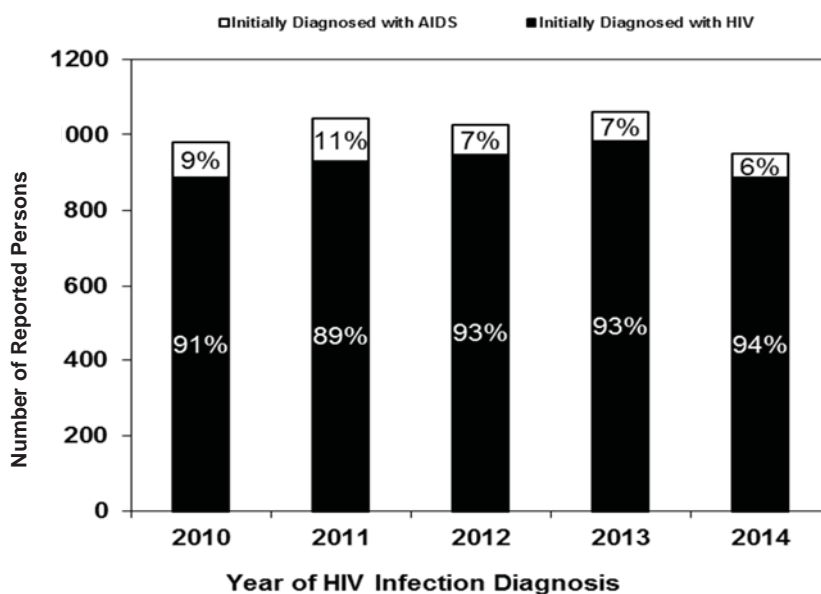
Mode of transmission: Ohio's leading mode of transmission for diagnoses of HIV infection in 2014 was male-to-male sexual contact (74%) followed by heterosexual contact (17%). Among males, an estimated 87 percent of cases were attributed to male-to-male sexual contact, six percent to heterosexual contact and four percent to injection drug use (IDU). Among females, an estimated 82 percent of cases were attributed to heterosexual contact and 18 percent to injection drug use. Caution should be used in interpreting IDU data as proportions may appear inflated due to the small numbers of cases reporting IDU as a mode of HIV transmission in proportion to the number of total new HIV diagnoses reported.

Overall Trends in HIV Infection in Ohio

HIV/AIDS Diagnoses

Figure 2 illustrates the number and proportion of persons reported with an initial diagnosis of HIV infection (not AIDS) compared to persons initially diagnosed with AIDS from 2010-2014. Six percent of persons reported with an HIV infection in Ohio in 2014 were initially diagnosed with AIDS. This trend has held over the five-year period examined, and suggests the overwhelming majority of persons who receive an initial diagnosis of HIV in Ohio are being diagnosed at an earlier stage of disease.

Figure 2. Reported new diagnoses of HIV infection by initial diagnosis, Ohio, 2010-2014



Source: Ohio Department of Health HIV/AIDS Surveillance Program. Data reported through June 30, 2015.

The majority of persons newly diagnosed with an HIV infection in Ohio in 2014 were male (86 percent). This trend has remained unchanged since cases HIV infection, then called AIDS, were first identified and reported in Ohio in the 1980's. Persons diagnosed with an HIV infection in Ohio are increasingly younger than in previous years. In 2014, the highest number (217 cases) and proportion (23 percent) of persons diagnosed with HIV infection were 20-24 years of age – a 12 percent increase from the number of persons diagnosed in this age group in 2010. However, it is those 24-29 years of age where the number and proportion of persons diagnosed with HIV infection increased the most – 28 percent – between 2010 (142 cases) and 2014 (181 cases). Conversely, the numbers and proportions of persons newly diagnosed decreased among persons in several age groups, including those 15-19, 35-39, 40-44, 45-49 and 50-54 years of age, respectively, between 2010 and 2014.

Health disparities occur when these groups experience more disease, death or disability beyond what would normally be expected. Health disparities are often characterized by such measures

as disproportionate incidence, prevalence and/or mortality rates of diseases or health conditions. Growing disparities are observed when examining new HIV diagnoses by race/ethnicity. The largest percentage of diagnoses of HIV infection in Ohio from 2010-2014 occurred among blacks/African Americans. Table 4 reveals blacks/African Americans accounted for between 47-52 percent of new diagnoses of HIV infections reported between 2010 and 2014, yet represented only 12 percent of Ohio's population in each of these years per U.S. Census estimates. Similarly, Hispanic/Latinos accounted for between 4-7 percent of new diagnoses of HIV infection in Ohio over the five year period, but represented only three percent of Ohio's population in each year per U.S. Census estimates.

These disparities are even more pronounced when further examining HIV diagnoses among males and females by race/ethnicity. In 2014, black/African-American males accounted for 43 percent of the HIV infections diagnosed in Ohio. This was followed by white males (33 percent), black/African American females (9 percent), Hispanic/Latino males (6 percent) and white females (4 percent). Males and females of all other race/ethnicities combined, accounted for approximately two percent of all diagnosed HIV infections in 2014 (Table 44). Black/African American males were the only subpopulation group for whom the number, percentage and rate of new infections consistently increased each year from 2010-2014.

Table 4. New diagnoses of HIV infection, by year of diagnosis and cumulative diagnoses, by selected characteristics, Ohio, 2010-2014

Characteristic	Diagnosis of HIV Infection by Year														
	2010			2011			2012			2013			2014		
	Rate ^a	No.	%	Rate ^a	No.	%	Rate ^a	No.	%	Rate ^a	No.	%	Rate ^a	No.	%
Sex															
Males	14.3	809	83%	14.5	823	79%	14.8	839	82%	15.3	871	82%	14.3	813	86%
Females	2.9	170	17%	3.7	220	21%	3.2	187	18%	3.2	189	18%	2.3	137	14%
Age at diagnosis (yr)															
<13	0.3	5	1%	*	3	<1%	0.4	8	1%	0.5	9	1%	*	3	<1%
13-14	*	1	<1%	*	-	-	*	-	-	*	1	<1%	*	-	-
15-19	10.1	78	8%	8.3	64	6%	8.2	63	6%	8.3	64	6%	6.9	53	6%
20-24	24.5	194	20%	27.8	220	21%	27.1	214	21%	29.6	234	22%	27.4	217	23%
25-29	19.0	142	15%	20.7	155	15%	21.6	162	16%	23.1	173	16%	24.2	181	19%
30-34	16.8	121	12%	18.8	136	13%	20.2	146	14%	16.2	117	11%	16.8	121	13%
35-39	16.8	114	12%	16.8	114	11%	13.7	93	9%	15.0	102	10%	14.1	96	10%
40-44	14.4	105	11%	15.4	112	11%	12.5	91	9%	13.5	98	9%	11.8	86	9%
45-49	13.2	100	10%	12.2	92	9%	13.0	98	10%	12.8	97	9%	11.5	87	9%
50-54	7.4	63	6%	9.4	80	8%	9.1	77	8%	8.1	69	7%	4.7	40	4%
55-64	3.0	47	5%	3.4	54	5%	4.0	63	6%	4.8	76	7%	3.5	55	6%
65+	0.5	9	1%	0.7	13	1%	0.6	11	1%	1.1	20	2%	0.6	11	1%
Race/Ethnicity															
White, not Hispanic	4.5	415	42%	4.7	436	42%	4.5	418	41%	4.7	432	41%	3.8	355	37%
Black/African American, not Hispanic	33.1	472	48%	35.5	506	49%	34.1	486	47%	35.8	511	48%	34.6	493	52%
Hispanic/Latino	11.2	45	5%	14.9	60	6%	14.1	57	6%	15.4	62	6%	16.9	68	7%
Asian/Pacific Islander	2.6	6	1%	3.0	7	1%	2.6	6	1%	3.4	8	1%	3.4	8	1%
American Indian/Alaska Native	*	1	<1%	*	1	<1%	*	-	-	*	1	<1%	*	1	<1%
Unknown	*	40	4%	*	33	3%	*	59	6%	*	46	4%	*	25	3%
Race/Sex															
White, not Hispanic Males	8.0	363	37%	8.0	366	35%	8.1	368	36%	8.2	375	35%	6.9	314	33%
White, not Hispanic Females	1.1	52	5%	1.5	70	7%	1.1	50	5%	1.2	57	5%	0.9	41	4%
Black/African American, not Hispanic Males	54.2	369	38%	54.6	372	36%	53.7	366	36%	59.9	408	38%	60.5	412	43%
Black/African American, not Hispanic Females	13.8	103	11%	18.0	134	13%	16.1	120	12%	13.8	103	10%	10.9	81	9%
Hispanic/Latino Males	18.3	38	4%	24.1	50	5%	25.1	52	5%	22.7	47	4%	28.5	59	6%
Hispanic/Latina Females	3.6	7	1%	5.1	10	1%	2.6	5	<1%	7.7	15	1%	4.6	9	1%
Asian/Pacific Islander Males	*	4	<1%	*	4	<1%	4.5	5	<1%	5.3	6	1%	5.3	6	1%
Asian/Pacific Islander Females	*	2	<1%	*	3	<1%	*	1	<1%	*	2	<1%	*	2	<1%
American Indian/Alaska Native Males	*	1	<1%	*	1	<1%	*	-	-	*	1	<1%	*	-	-
American Indian/Alaska Native Females	*	-	-	*	-	-	*	-	-	*	-	-	*	1	<1%
Unknown	*	40	4%	*	33	3%	*	59	6%	*	46	4%	*	25	3%
Total	8.4	979		9.0	1,043		8.8	1,026		9.1	1,060		8.2	950	

Notes: Diagnoses of HIV infection include persons with a diagnosis of HIV (not AIDS), a diagnosis of HIV and a later AIDS diagnosis, and concurrent diagnoses of HIV and AIDS. Diagnoses of HIV infection by year (2010-2014) represent all reported cases diagnosed in each year.

^a The rate is the number of persons with a reported diagnosis of HIV infection per 100,000 population calculated using 2014 U.S. Census estimates.

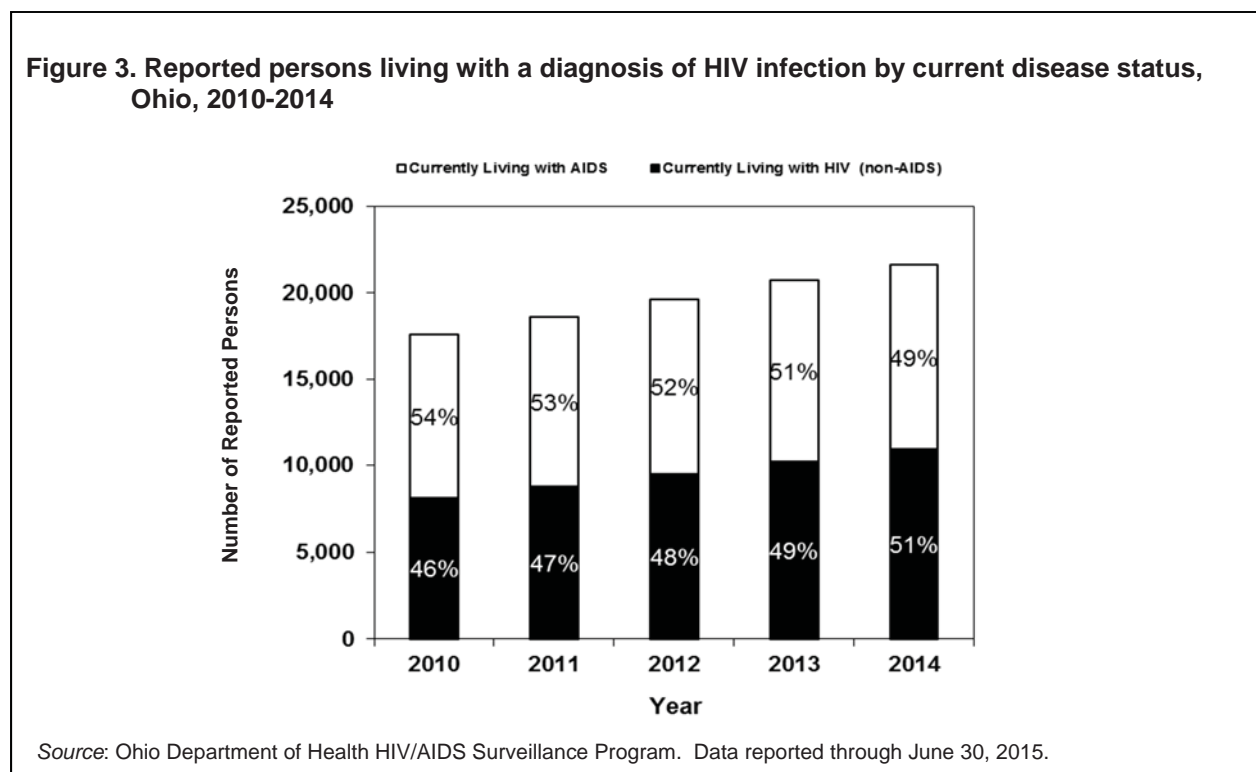
Dash (-) indicates no cases were reported for the given category. Asterisk (*) indicates rate not calculated for case count < 5 due to unstable rates.

Source: Ohio Department of Health HIV/AIDS Surveillance Program. Data reported through June 30, 2015.

Persons Living with a Diagnosis of HIV Infection

Figure 3 illustrates the increase in the number of persons living with a diagnosis of HIV infection in Ohio by current disease status. From 2010 to 2014, the proportion of reported persons living with HIV (non-AIDS) increased by five percent. Of persons living with a diagnosis of HIV infection in 2014, 51 percent were living with HIV (non-AIDS) and 49 percent were living with AIDS.

As people live longer with a diagnosis of HIV infection, the cumulative number of persons living with HIV in Ohio continues to increase each year. The number of persons living with a diagnosis of HIV infection reflects all persons ever reported with HIV or AIDS who are not known to have died.



In 2010, 17,593 persons in Ohio were known to be living with a diagnosis of HIV infection and in 2014, this increased 23 percent to 21,612 persons. During this same time, persons living with a diagnosis of HIV infection 34 years of age or younger increased by 27 percent. Whereas those 25-29 years of age were six to eight percent of persons living with a diagnosis of HIV infection during this time, their numbers increased by 51 percent – from 1,120 in 2010 to 1,688 in 2014. The number of blacks/African Americans living with a diagnosis of HIV infection increased 26 percent, Hispanic/Latinos living with a diagnosis of HIV infection increased 25 percent and whites living with a diagnosis of HIV infection increased 19 percent. Persons living with a diagnosis of HIV infection categorized as “other” or unknown race also increased, but represented no more than three percent of all cases in any given year (**Table 5**).

Table 5. Reported persons living with a diagnosis of HIV infection, by year and by selected characteristics, Ohio, 2010-2014

Characteristic	Living with a Diagnosis of HIV Infection									
	2010		2011		2012		2013		2014	
	No.	%	No.	%	No.	%	No.	%	No.	%
Sex										
Males	13,906	79%	14,716	79%	15,553	79%	16,407	79%	17,204	80%
Females	3,687	21%	3,897	21%	4,083	21%	4,272	21%	4,408	20%
Age at end of year										
<13	61	<1%	59	<1%	66	<1%	72	<1%	65	<1%
13-14	25	<1%	21	<1%	11	<1%	8	<1%	13	<1%
15-19	176	1%	159	1%	156	1%	144	1%	136	1%
20-24	780	4%	883	5%	959	5%	1,012	5%	968	4%
25-29	1,120	6%	1,243	7%	1,364	7%	1,517	7%	1,688	8%
30-34	1,458	8%	1,521	8%	1,607	8%	1,648	8%	1,715	8%
35-39	1,962	11%	1,876	10%	1,880	10%	1,901	9%	1,959	9%
40-44	3,008	17%	2,933	16%	2,798	14%	2,671	13%	2,578	12%
45-49	3,564	20%	3,666	20%	3,648	19%	3,666	18%	3,531	16%
50-54	2,662	15%	2,938	16%	3,301	17%	3,568	17%	3,823	18%
55-64	2,319	13%	2,751	15%	3,147	16%	3,595	17%	4,070	19%
65+	458	3%	563	3%	699	4%	877	4%	1,066	5%
Race/Ethnicity										
White, not Hispanic	8,390	48%	8,818	47%	9,224	47%	9,643	47%	9,995	46%
Black/African American, not Hispanic	7,592	43%	8,083	43%	8,570	44%	9,076	44%	9,558	44%
Hispanic/Latino	1,001	6%	1,056	6%	1,122	6%	1,185	6%	1,250	6%
Asian/Pacific Islander	73	<1%	79	<1%	84	<1%	93	<1%	101	<1%
American Indian/Alaska Native	17	<1%	18	<1%	19	<1%	20	<1%	21	<1%
Unknown	520	3%	559	3%	617	3%	662	3%	687	3%
Race/Sex										
White, not Hispanic Males	7,240	41%	7,598	41%	7,951	40%	8,314	40%	8,626	40%
White, not Hispanic Females	1,150	7%	1,220	7%	1,273	6%	1,329	6%	1,369	6%
Black/African American, not Hispanic Males	5,458	31%	5,825	31%	6,196	32%	6,597	32%	6,999	32%
Black/African American, not Hispanic Females	2,134	12%	2,258	12%	2,374	12%	2,479	12%	2,559	12%
Hispanic/Latino Males	726	4%	771	4%	831	4%	879	4%	934	4%
Hispanic/Latina Females	275	2%	285	2%	291	1%	306	1%	316	1%
Asian/Pacific Islander Males	64	<1%	67	<1%	71	<1%	78	<1%	84	<1%
Asian/Pacific Islander Females	9	<1%	12	<1%	13	<1%	15	<1%	17	<1%
American Indian/Alaska Native Males	11	<1%	12	<1%	13	<1%	14	<1%	14	<1%
American Indian/Alaska Native Females	6	<1%	6	<1%	6	<1%	6	<1%	7	<1%
Unknown	520	3%	559	3%	617	3%	662	3%	687	3%
Total	17,593		18,613		19,636		20,679		21,612	

Notes: Living with a diagnosis of HIV infection by year (2010-2014) represents all persons ever diagnosed and reported with HIV or AIDS who have not been reported as having died as of December 31, 2014. Persons living with a diagnosis of HIV infection represent persons living in Ohio as of December 31, 2014, regardless of whether or not the person was a resident of Ohio at time of initial HIV and/or AIDS diagnosis.

Source: Ohio Department of Health HIV/AIDS Surveillance Program. Data reported through June 30, 2015.

Table 6. Reported persons living with a diagnosis of HIV infection by current disease status and by selected characteristics, Ohio

Characteristic	Living with a diagnosis of HIV infection in 2014			Current Disease Status			
	Rate ^a	No.	%	HIV (not AIDS)		AIDS	
				No.	%	No.	%
Sex							
Males	303.2	17,204	80%	8,572	78%	8,632	81%
Females	74.5	4,408	20%	2,358	22%	2,050	19%
Age at end of year							
<13	3.5	65	<1%	48	<1%	17	<1%
13-14	4.3	13	<1%	7	<1%	6	<1%
15-19	17.6	136	1%	115	1%	21	<1%
20-24	122.4	968	4%	772	7%	196	2%
25-29	225.4	1,688	8%	1,188	11%	500	5%
30-34	237.6	1,715	8%	1,085	10%	630	6%
35-39	288.3	1,959	9%	1,094	10%	865	8%
40-44	354.4	2,578	12%	1,278	12%	1,300	12%
45-49	467.0	3,531	16%	1,566	14%	1,965	18%
50-54	451.4	3,823	18%	1,589	15%	2,234	21%
55-64	258.2	4,070	19%	1,735	16%	2,335	22%
65+	59.2	1,066	5%	453	4%	613	6%
Race/Ethnicity							
White, not Hispanic	107.6	9,995	46%	4,993	46%	5,002	47%
Black/African American, not Hispanic	670.1	9,558	44%	4,873	45%	4,685	44%
Hispanic/Latino	310.0	1,250	6%	600	5%	650	6%
Asian/Pacific Islander	43.2	101	<1%	58	1%	43	<1%
American Indian/Alaska Native	95.5	21	<1%	11	<1%	10	<1%
Unknown	*	687	3%	395	4%	292	3%
Race/Sex							
White, not Hispanic Males	189.4	8,626	40%	4,224	39%	4,402	41%
White, not Hispanic Females	28.9	1,369	6%	769	7%	600	6%
Black/African American, not Hispanic Males	1,027.7	6,999	32%	3,539	32%	3,460	32%
Black/African American, not Hispanic Females	343.3	2,559	12%	1,334	12%	1,225	11%
Hispanic/Latino Males	450.9	934	4%	444	4%	490	5%
Hispanic/Latina Females	161.2	316	1%	156	1%	160	1%
Asian/Pacific Islander Males	74.8	84	<1%	48	<1%	36	<1%
Asian/Pacific Islander Females	14.0	17	<1%	10	<1%	7	<1%
American Indian/Alaska Native Males	126.9	14	<1%	8	<1%	6	<1%
American Indian/Alaska Native Females	63.9	7	<1%	3	<1%	4	<1%
Unknown	*	687	3%	395	4%	292	3%
Total	186.4	21,612		10,930		10,682	

Notes: Living with a diagnosis of HIV infection represents all persons ever diagnosed and reported with HIV or AIDS who have not been reported as having died as of December 31, 2014. Persons living with a diagnosis of HIV infection represent persons living in Ohio as of December 31, 2014, regardless of whether or not the person was a resident of Ohio at time of initial HIV and/or AIDS diagnosis.

Asterisk (*) indicates rate not calculated for case count < 5 due to unstable rates.

^a The rate is the number of persons living with a diagnosis of HIV infection per 100,000 population calculated using 2014 U.S. Census estimates.

Source: Ohio Department of Health HIV/AIDS Surveillance Program. Data reported through June 30, 2015.

The rates in Table 6 depict the extent to which populations are impacted by diagnoses of HIV infection. The rate of persons living with a diagnosis of HIV infection in Ohio in 2014 was 186.4 cases per 100,000 population. The rate of blacks/African Americans living with a diagnosis of HIV infection per 100,000 population was more than six times the rate among whites (670.1 per 100,000 black/African American compared to 107.6 per 100,000 whites). Among Ohio's Hispanic/Latino population, the rate was almost three times the rate among whites (310.0 per 100,000 Hispanic/Latinos). The rate of males living with a diagnosis of HIV infection was 303.2 per 100,000 population compared to 74.5 per 100,000 population for females.

The disproportionate impact of HIV infections among Ohio black/African Americans and Hispanic/Latinos is observed among males and females. The rate of persons living with a diagnosis of HIV infection was 1,027.7 per 100,000 population for black/African American males and 450.9 per 100,000 population for Hispanic/Latino males, compared to 189.4 per 100,000 population for white males. For females, the rate was 343.3 per 100,000 population for black/African American females, 161.2 per 100,000 population for Hispanic/Latina females and 28.9 per 100,000 population for white females.

HIV Infections by Ohio County

Table 7. Diagnoses of HIV infection in 2014, reported persons living with a diagnosis of HIV infection as of December 31, 2014, and cumulative deaths reported among persons with a diagnosis of HIV infection as of December 31, 2014, Ohio, by County

County ^b	Diagnoses of HIV Infection ^a		Persons Living with a Diagnosis of HIV Infection ^c		Cumulative Reported Deaths ^e	County ^b	Diagnoses of HIV Infection ^a		Persons Living with a Diagnosis of HIV Infection ^c		Cumulative Reported Deaths ^e
	2014	No.	Rate ^d	No.	No.		2014	No.	Rate ^d	No.	No.
Adams	3		92.4	26	11	Logan	-	57.1	26	19	
Allen	6		152.3	160	89	Lorain	8	113.7	346	185	
Ashland	1		39.6	21	11	Lucas	43	222.4	968	583	
Ashtabula	3		99.8	99	39	Madison	-	102.5	45	20	
Athens	2		72.6	47	30	Mahoning	22	205.8	480	271	
Auglaize	-		48.0	22	14	Marion	1	105.0	69	39	
Belmont	2		64.8	45	29	Medina	2	43.2	76	23	
Brown	2		65.7	29	13	Meigs	-	60.0	14	6	
Butler	19		91.1	341	155	Mercer	1	19.6	8	12	
Carroll	-		31.9	9	8	Miami	2	70.3	73	46	
Champaign	3		94.6	37	25	Monroe	-	48.4	7	4	
Clark	3		93.0	127	124	Montgomery	59	244.8	1,305	776	
Clermont	10		64.0	129	54	Morgan	1	121.3	18	2	
Clinton	1		110.0	46	21	Morrow	1	42.7	15	16	
Columbiana	4		68.1	72	48	Muskingum	2	85.1	73	41	
Coshocton	2		57.5	21	9	Noble	-	69.6	10	1	
Crawford	-		77.7	33	20	Ottawa	-	36.4	15	15	
Cuyahoga	210		347.7	4,381	2,733	Paulding	-	63.2	12	10	
Darke	3		61.3	32	21	Perry	2	81.0	29	12	
Defiance	2		64.9	25	20	Pickaway	1	112.5	64	54	
Delaware	6		76.7	145	38	Pike	-	67.2	19	13	
Erie	4		102.9	78	60	Portage	9	59.9	97	56	
Fairfield	7		97.8	147	52	Preble	3	43.3	18	12	
Fayette	1		90.3	26	14	Putnam	-	14.6	5	9	
Franklin	215		377.0	4,642	2,235	Richland	-	88.6	108	100	
Fulton	-		54.0	23	17	Ross	1	90.7	70	49	
Gallia	2		69.1	21	9	Sandusky	2	73.1	44	27	
Geauga	2		36.1	34	26	Scioto	1	106.1	82	36	
Greene	7		92.8	152	78	Seneca	-	37.7	21	24	
Guernsey	2		58.1	23	11	Shelby	4	42.9	21	19	
Hamilton	148		343.0	2,767	1,483	Stark	20	108.3	407	270	
Hancock	-		53.1	40	32	Summit	38	151.3	820	504	
Hardin	1		47.2	15	9	Trumbull	7	97.5	200	109	
Harrison	-		38.6	6	5	Tuscarawas	1	20.5	19	17	
Henry	-		39.4	11	9	Union	1	94.8	51	17	
Highland	-		55.8	24	15	Van Wert	-	38.6	11	4	
Hocking	1		73.1	21	11	Vinton	-	45.3	6	3	
Holmes	-		-	4	5	Warren	7	64.5	143	43	
Huron	-		44.3	26	14	Washington	-	67.0	41	49	
Jackson	2		67.2	22	15	Wayne	2	61.5	71	30	
Jefferson	1		85.7	58	57	Williams	3	61.7	23	19	
Knox	-		49.0	30	17	Wood	2	50.9	66	46	
Lake	6		65.4	150	89	Wyandot	-	31.3	7	5	
Lawrence	-		92.5	57	29	No County	19	-	1,226	528	
Licking	4		93.9	159	73	Total	950	186.4	21,612	12,001	

^a The number of diagnoses of HIV infection includes persons with a diagnosis of HIV (not AIDS), a diagnosis of HIV and a later AIDS diagnosis, and concurrent diagnoses of HIV and AIDS.

^b County is based on county of residence at time of earliest HIV diagnosis. Cases whose residence is a correctional facility or whose county is unknown are included in No County.

^c Living with a diagnosis of HIV infection represents all persons ever diagnosed and reported with HIV or AIDS who have not been reported as having died as of December 31, 2014.

Persons living with a diagnosis of HIV infection represent persons living in Ohio as of December 31, 2014, regardless of whether or not the person was a resident of Ohio at time of initial HIV and/or AIDS diagnosis.

^d The rate is the number of persons living with a diagnosis of HIV infection per 100,000 population calculated using 2014 U.S. Census estimates.

^e Deaths of persons with a diagnosis of HIV infection may be due to any cause.

Dash (-) indicates no cases were reported for the given category.

Source: Ohio Department of Health HIV/AIDS Surveillance Program. Data reported through June 30, 2015.

Every county in Ohio has reported persons living with a diagnosis of HIV infection; however, the impact of HIV infections varies by county. Franklin County had the highest rate of HIV infection in Ohio (377.0 per 100,000 population) followed by Cuyahoga County (347.7 per 100,000 population) and Hamilton County (343.0 per 100,000 population) (**Table 7**).

While HIV affects the entire state, the majority of cases are from the counties containing the eight largest urban areas in Ohio. These counties include Summit County (Akron), Stark County (Canton), Hamilton County (Cincinnati), Cuyahoga County (Cleveland), Franklin County (Columbus), Montgomery County (Dayton), Lucas County (Toledo) and Mahoning County (Youngstown). These counties account for 73 percent of persons living with a diagnosis of HIV infection in Ohio in 2014; however, they account for 48 percent of Ohio's population. Of the rural counties, while Allen County had few new diagnosis of HIV infections reported in 2014 (six cases); they had the highest rate of persons living with a diagnosis of HIV infection in 2014 among rural Ohio counties (152.3 cases per 100,000 population) (**Table 7**).

HIV Infections and U.S. Census Data

As discussed earlier, the demographic distribution of the HIV epidemic in Ohio differs from the distribution of Ohio's overall population. The following tables and graphs illustrate these differences.

Table 8. Reported persons living with a diagnosis of HIV infection 2014 and U.S. Census 2014 estimates, by selected demographic characteristics

Demographic Characteristics	Living with a Diagnosis of HIV Infection			Census 2014 Estimates	
	Rate ^a	No.	%	No.	%
Sex					
Males	303.2	17,204	80%	5,674,772	49%
Females	74.5	4,408	20%	5,919,391	51%
Age as of 12/14					
<13	3.5	65	<1%	1,872,157	16%
13-14	4.3	13	<1%	302,692	3%
15-19	17.6	136	1%	772,486	7%
20-24	122.4	968	4%	790,679	7%
25-29	225.4	1,688	8%	748,820	6%
30-34	237.6	1,715	8%	721,872	6%
35-39	288.3	1,959	9%	679,595	6%
40-44	354.4	2,578	12%	727,462	6%
45-49	467.0	3,531	16%	756,038	7%
50-54	451.4	3,823	18%	846,927	7%
55-64	258.2	4,070	19%	1,576,266	14%
65+	59.2	1,066	5%	1,799,169	16%
Race/Ethnicity					
White, not Hispanic	107.6	9,995	46%	9,288,260	80%
Black/African American, not Hispanic	670.1	9,558	44%	1,426,459	12%
Hispanic/Latino	310.0	1,250	6%	403,190	3%
Asian/Pacific Islander	43.2	101	<1%	233,593	2%
American Indian/Alaska Native	95.5	21	<1%	21,989	<1%
Unknown	*	687	3%		*
Race/Sex					
White, not Hispanic Males	189.4	8,626	40%	4,554,871	39%
White, not Hispanic Females	28.9	1,369	6%	4,733,389	41%
Black/African American, not Hispanic Males	1,027.7	6,999	32%	681,061	6%
Black/African American, not Hispanic Females	343.3	2,559	12%	745,398	6%
Hispanic/Latino Males	450.9	934	4%	207,149	2%
Hispanic/Latina Females	161.2	316	1%	196,041	2%
Asian/Pacific Islander Males	74.8	84	<1%	112,283	1%
Asian/Pacific Islander Females	14.0	17	<1%	121,310	1%
American Indian/Alaska Native Males	126.9	14	<1%	11,033	<1%
American Indian/Alaska Native Females	63.9	7	<1%	10,956	<1%
Unknown	*	687	3%	*	*
Total	186.4	21,612	100%	11,594,163	100%

Notes: Living with a diagnosis of HIV infection represents all persons ever diagnosed and reported with HIV or AIDS who have not been reported as having died as of December 31, 2014. Living with a diagnosis of HIV infection by current disease status includes cases of those diagnosed with HIV (not AIDS) and those diagnosed with AIDS as of December 31, 2014.

Asterisk (*) indicates case count < 5 and/or rate not calculated because Census data is not applicable to the respective category.

^a The rate is the number of persons living with a diagnosis of HIV infection per 100,000 population calculated using 2014 U.S. Census estimates.

Source: Ohio Department of Health HIV/AIDS Surveillance Program. Data reported through June 30, 2015.

Table 8 compares 2014 United States Census data to persons living with a diagnosis of HIV infection as of December 31, 2014 and demonstrates the disproportionate impact of HIV by sex and race/ethnicity. Although almost equal proportions of males and females reside in Ohio, 80 percent of Ohioans living with a diagnosis of HIV infection in 2014 were male. Black/African-American males and females each accounted for six percent of Ohio's population, but 32 percent of Ohioans living with a diagnosis of HIV infection in 2014 were black/African-American males and 12 percent were black females.

HIV Infections by Race/Ethnicity and Sex

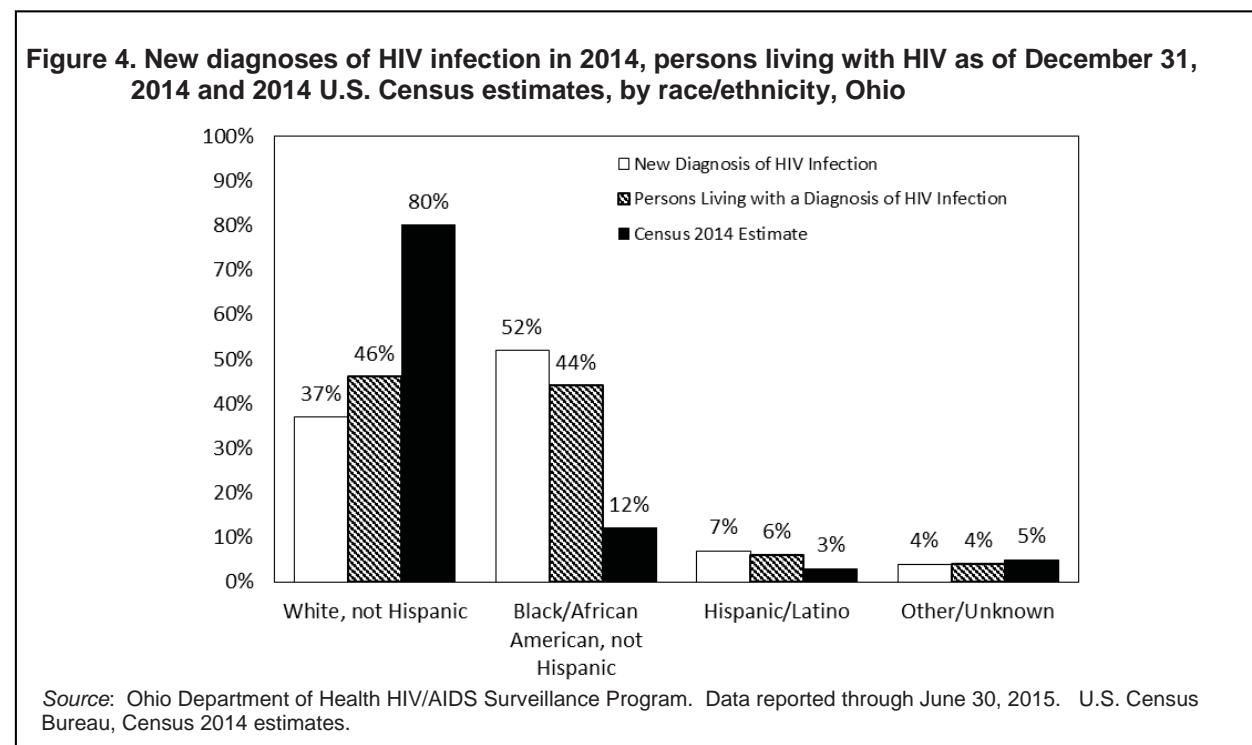


Figure 4 illustrates the disproportionate impact of HIV on blacks/African Americans and Hispanic/Latinos. Twelve percent of Ohioans were black; however, 52 percent of Ohio's new diagnoses of HIV infection in 2014 and 44 percent of Ohioans living with a diagnosis of HIV infection in 2014 were black/African-American. Hispanic/Latinos comprised three percent of Ohio's population; however, seven percent of Ohio's new diagnoses of HIV infection in 2014 and six percent of Ohioans living with a diagnosis of HIV infection in 2014 were Hispanic/Latino.

Table 9. New diagnoses of HIV infection by race/ethnicity and sex, Ohio, 2014

Race/Ethnicity	Males			Females			2014 Diagnoses of HIV Infection		
	No.	%	Rate ^a	No.	%	Rate ^a	No.	%	Rate ^a
White, not Hispanic	314	39%	6.9	41	30%	0.9	355	37%	3.8
Black/African American, not Hispanic	412	51%	60.5	81	59%	10.9	493	52%	34.6
Hispanic/Latino	59	7%	28.5	9	7%	4.6	68	7%	16.9
Asian/Pacific Islander	6	1%	5.3	2	*	*	8	1%	3.4
American Indian/Alaska Native	-	*	*	1	*	*	1	<1%	*
Unknown	22	2%	*	3	*	*	25	3%	*
Total	813	100%	14.3	137	100%	2.3	950	100%	8.2

Note: Diagnoses of HIV infection include persons with a diagnosis of HIV (not AIDS), a diagnosis of HIV and an AIDS diagnosis within 12 months (HIV & later AIDS), and concurrent diagnoses of HIV and AIDS.

Dash (-) indicates no cases. Asterisk (*) indicates rate not calculated because case count < 5 or U.S. Census data is not applicable to the respective category.

^a The rate is the number of persons living with a diagnosis of HIV infection per 100,000 population calculated using 2014 U.S. Census estimates.

Source: Ohio Department of Health HIV/AIDS Surveillance Program. Data reported through June 30, 2015.

Among Ohio males newly diagnosed with an HIV infection in 2014, 51 percent were black/African American, 39 percent were white and seven percent were Hispanic/Latino. Among females, 59 percent of new diagnoses of HIV infection were black/African American, 30 percent were white and seven percent were Hispanic/Latina (Table 9).

In 2014, the overall rate of new diagnoses of HIV infection was 8.2 per 100,000 population in Ohio. Males had over six times the rate of new diagnoses of HIV infection compared to females (14.3 per 100,000 males and 2.3 per 100,000 females). Blacks/African Americans had the highest rate of reported new diagnoses of HIV infection (34.6 per 100,000 blacks/African Americans) followed by Hispanic/Latinos (16.9 per 100,000 Hispanic/Latino(a)s). Among males, black/African American males had the highest rate of reported new diagnoses of HIV infection (60.5 per 100,000 black/African American males) followed by Hispanic/Latino males (28.5 per 100,000 Hispanic/Latino males). Among females, black/African-American females had the highest rate of reported diagnoses of HIV infection (10.9 per 100,000 black/African American females) followed by Hispanic/Latina females (4.6 per 100,000 Hispanic/Latina females) (Table 9).

HIV Infections by Age Group

Table 10. New diagnoses of HIV infection by age group and sex, Ohio, 2014

Age at Diagnosis	Males		Females		2014 Diagnoses of HIV Infection	
	No.	%	No.	%	No.	%
<13	1	<1%	2	<1%	3	<1%
13-14	-	-	-	-	-	-
15-19	48	6%	5	4%	53	6%
20-24	198	24%	19	14%	217	23%
25-29	162	20%	19	14%	181	19%
30-34	103	13%	18	13%	121	13%
35-39	74	9%	22	16%	96	10%
40-44	73	9%	13	9%	86	9%
45-49	72	9%	15	11%	87	9%
50-54	33	4%	7	5%	40	4%
55-64	43	5%	12	9%	55	6%
65+	6	1%	5	4%	11	1%
Total	813	100%	137	100%	950	100%

Note: Diagnoses of HIV infection reflect cases of HIV diagnosed for the first time, including cases that are diagnosed with HIV, not AIDS; cases that are diagnosed with HIV and later progressed to AIDS; and cases concurrently with HIV and AIDS.

Dash (-) indicates no cases were reported for the given category.

Source: Ohio Department of Health HIV/AIDS Surveillance Program. Data reported through June 30, 2015.

The largest proportion of Ohio's new diagnoses of HIV infection in 2014 were 20-24 years of age (23 percent). Ohio males at the time of diagnosis of HIV infection were younger than females. Thirty percent of Ohio's males were 24 years or younger at the time of diagnosis of HIV infection compared to 18 percent of Ohio's females who were 24 years or younger at the time of diagnosis of HIV infection (**Table 10**).

Table 11. New diagnoses of HIV infection by age group and race/ethnicity, Ohio, 2014

Age at Diagnosis	White, not Hispanic		Black/African American, not Hispanic		Hispanic/Latino		Other/Unknown		2014 Diagnoses of HIV Infection	
	No.	%	No.	%	No.	%	No.	%	No.	%
<13	-	-	2	<1%	-	-	1	<1%	3	<1%
13-14	-	-	-	-	-	-	-	-	-	-
15-19	9	3%	37	8%	5	7%	2	6%	53	6%
20-24	44	12%	152	31%	12	18%	9	26%	217	23%
25-29	58	16%	99	20%	16	24%	8	24%	181	19%
30-34	49	14%	62	13%	8	12%	2	6%	121	13%
35-39	49	14%	33	7%	9	13%	5	15%	96	10%
40-44	43	12%	29	6%	10	15%	4	12%	86	9%
45-49	47	13%	32	6%	5	7%	3	9%	87	9%
50-54	24	7%	15	3%	1	1%	-	-	40	4%
55-64	27	8%	26	5%	2	3%	-	-	55	6%
65+	5	1%	6	1%	-	-	-	-	11	1%
Total	355	100%	493	100%	68	100%	34	100%	950	100%

Note: Diagnoses of HIV infection reflect cases of HIV diagnosed for the first time, including cases that are diagnosed with HIV (not AIDS); cases diagnosed with HIV and later progressed to AIDS; and cases diagnosed concurrently with HIV and AIDS.

Dash (-) indicates no cases were reported for the given category.

Source: Ohio Department of Health HIV/AIDS Surveillance Program. Data reported through June 30, 2015.

The proportion of Ohio's reported diagnoses of HIV infection varied by age group among race/ethnicity categories. Black/African American Ohioans diagnosed with an HIV infection were younger when diagnosed compared to whites. Thirty-nine percent of blacks/African Americans were 24 years or younger at the time of diagnosis of HIV infection compared to 15 percent of whites. Comparisons with Hispanic/Latino or Other/Unknown race/ethnicity categories were not suitable due to the small number of cases in each age group (**Table 11**).

Pediatric HIV Infections

Pediatric HIV infections are classified as perinatal or other/unknown HIV transmissions. Perinatal HIV transmissions represent pediatric HIV infections from mother-to-child during pregnancy, delivery or breastfeeding one to four weeks after birth. Perinatal HIV transmission accounts for 91 percent of all AIDS cases among children under the age of 13 in the U.S. and 100 percent of all reported AIDS cases among children under the age of 13 in Ohio¹. Children with other/unknown HIV transmissions represent pediatric HIV infections among children under the age of 13 whose mother HIV-status is negative or unknown at the time of the child's birth. Reports of pediatric HIV transmission are underestimated for several reasons including lack of routine HIV testing in physicians' practices – approximately 60 percent of Ohio pregnant women who had a live birth were tested². Information from Ohio's Pregnancy Risk Assessment Monitoring System (PRAMS) indicates that only 72 percent of recent mothers were offered an HIV test during pregnancy or delivery in 2011 in Ohio. In addition, pregnant women may not seek appropriate prenatal care regardless of HIV-status. Even if follow-up on perinatal exposures were prioritized over other surveillance activities, we would have difficulties following all exposures until they meet the definition of sero-reversion because of mothers changing physicians and moving. In addition, children are considered sero-reverters by physicians before meeting the surveillance case definition making it difficult to identify perinatal exposures.

Table 12. Reported perinatal HIV transmission diagnoses by birth country status and race/ethnicity, 2010-2014

Demographic Characteristics	Year of HIV Diagnosis									
	2010		2011		2012		2013		2014	
	No.	%	No.	%	No.	%	No.	%	No.	%
Child Transmission Category										
Perinatal	4	80%	3	100%	5	63%	4	44%	2	67%
Other/Unknown	1	20%	-	-	3	37%	5	56%	1	33%
Birth Country Status										
Foreign born	5	100%	2	67%	8	100%	9	100%	3	100%
U.S. born	-	-	1	33%	-	-	-	-	-	-
Race/Ethnicity										
White, not Hispanic	-	-	-	-	-	-	1	11%	-	-
Black/African American, not Hispanic	5	100%	2	67%	8	100%	5	56%	2	67%
Other/Unknown	-	-	1	33%	-	-	3	33%	1	33%
Total	5	100%	3	100%	8	100%	9	100%	3	100%

Notes: Diagnoses of HIV infection include persons with a diagnosis of HIV (not AIDS), a diagnosis of HIV and a later AIDS diagnosis, and concurrent diagnoses of HIV and AIDS. Diagnoses of HIV infection by year (2010-2014) represent all reported cases diagnosed in each year.

Other/Unknown includes Hispanic/Latino, Asian/Pacific Islander, American Indian/Alaska Native and missing race/ethnicity.

Dash (-) indicates no cases were reported for the given category.

Source: Ohio Department of Health HIV/AIDS Surveillance Program. Data reported through June 30, 2015.

¹ Centers for Disease Control and Prevention. "One Test. Two Lives". Atlanta: Department of Health and Human Services, Centers for Disease Control and Prevention <http://www.cdc.gov/hiv/topics/perinatal/1test2lives/>

² Ohio Department of Health, Ohio Pregnancy Risk Assessment Monitoring System. (2014). Prevention of perinatal HIV transmission and Ohio's HIV testing laws Retrieved from <http://www.odh.ohio.gov/healthstats/pramshs/pramsdata.aspx>

Table 12 shows that the majority of pediatric HIV infections in any given year were perinatal infections; the exception is 2013 when 56 percent of children had other/unknown risk. Most pediatric HIV infections were among foreign-born and black/African-American children (**Table 12**).

HIV Infections by Mode of Transmission

No identified risk (NIR)

Mode of transmission information is collected on the HIV/AIDS reporting form; however, the number of reports lacking this information is increasing and can be greater than 50 percent for some population groups in Ohio. A case is considered to have no identified risk reported (NIR) if risk information is absent from the initial case report. The case is considered NIR while epidemiologic follow-up is conducted. NIR was reported for 23 percent of Ohio males and 25 percent of Ohio females with a new diagnosis of HIV infection in 2014. For Ohioans living with a diagnosis of HIV infection in 2014, 17 percent of males and 21 percent of females were reported as having NIR. This lack of information may be attributed to a person's inability to identify risk, unwillingness to disclose risk behavior, or reluctance and/or inability to identify with a risk behavior as defined by CDC. Reports of HIV infection with NIR information are investigated in an attempt to reclassify them into a transmission category.

Because data reflecting recent HIV diagnoses have a large proportion of NIR cases due to inadequate time to investigate and reclassify, CDC transmission estimates for Ohio will be presented in this section. These are point estimates adjusted for reporting delays and for redistribution of cases in persons initially diagnosed as NIR; however they do not adjust for incomplete reporting. After adjustment for reporting delays and redistribution of cases among persons initially diagnosed as NIR, greater than 99 percent of cases were reclassified into a transmission category. Totals for estimated new diagnoses and persons living with a diagnosis of HIV infection do not match actual totals, due to elimination of cases not reclassified into a transmission category.

HIV transmission remains a key reporting indicator 33 years into the epidemic. Health care providers and others offering testing and treatment for HIV should continue to help patients understand why this remains critical to helping prevent HIV and AIDS in Ohio.

Table 13. New diagnoses of HIV infection by estimated transmission category and sex, Ohio, 2014

Transmission Category	Males		Females		Total	
	No.	%	No.	%	No.	%
Male-to-male sexual contact	704	87%	N/A	0%	704	74%
Injection drug use (IDU)	29	4%	25	18%	54	6%
Male-to-male sexual contact and IDU	27	3%	N/A	0%	27	3%
Heterosexual contact	53	6%	112	82%	165	17%
Total	813	100%	137	100%	950	100%

Note: Numbers do not represent actual cases of HIV infection reported in each transmission category. Data reflect point estimates of cases of HIV infection statistically adjusted for reporting delays and redistribution of cases in persons initially reported without an identified transmission. The estimates have not been adjusted for incomplete reporting. Numbers of cases of HIV include persons with a diagnosis of HIV (not AIDS), a diagnosis of HIV and later AIDS diagnosis, and concurrent diagnoses of HIV and AIDS. Source: Ohio Department of Health HIV Surveillance Program. Data reported through June 30, 2015.

Ohio's estimated leading mode of transmission for new diagnoses of HIV infection in 2014 was male-to-male sexual contact followed by heterosexual contact. Among males, an estimated 87 percent of cases were attributed to male-to-male sexual contact, six percent to heterosexual contact and four percent to injection drug use. Among females, an estimated 82 percent of cases were attributed to heterosexual contact and 18 percent to injection drug use (**Table 13**).

Table 14. New diagnoses of HIV infection by estimated transmission category and race/ethnicity, Ohio, 2014

Transmission Category	White, not Hispanic		Black/African American, not Hispanic		Hispanic/Latino		Other/Unknown		2014 Diagnoses of HIV Infection	
	No.	%	No.	%	No.	%	No.	%	No.	%
Male-to-male sexual contact	274	77%	360	73%	47	69%	23	68%	762	80%
Injection drug use (IDU)	27	8%	18	4%	9	13%	1	3%	62	7%
Male-to-male sexual contact and IDU	17	5%	6	1%	3	4%	2	6%	27	3%
Heterosexual contact	37	10%	109	22%	9	13%	8	24%	293	31%
Total	355	100%	493	100%	68	100%	34	100%	950	100%

Note: Numbers do not represent actual cases of HIV infection. They are point estimates of cases of HIV diagnoses statistically adjusted for reporting delays and for redistribution of cases in persons initially reported without an identified risk. The estimates have not been adjusted for incomplete reporting. Numbers of cases of HIV infection include persons with a diagnosis of HIV(not AIDS), a diagnosis of HIV and a later AIDS diagnosis and concurrent diagnoses of HIV and AIDS.

Source: Ohio Department of Health HIV/AIDS Surveillance Program. Data reported through June 30, 2015.

Male-to-male sex was estimated as the leading mode of HIV transmission across all racial/ethnic groups in Ohio. Black/African Americans and Hispanic/Latinos had a lower estimated percentage of HIV cases attributed to male-to-male sexual contact compared to whites and a larger percentage of estimated HIV cases attributed to heterosexual contact compared to whites. Hispanic/Latinos had a higher estimated percentage of estimated HIV cases attributed to injection drug use compared to whites (**Table 14**).

Table 15. Persons living with a diagnosis of HIV infection by estimated transmission category, Ohio, 2010-2014

Transmission Category	2010		2011		2012		2013		2014	
	No.	%	No.	%	No.	%	No.	%	No.	%
Male-to-male sexual contact	10,762	61%	11,472	62%	12,202	62%	12,948	63%	13,641	63%
Injection drug use (IDU)	1,537	9%	1,593	9%	1,650	8%	1,715	8%	1,768	8%
Male-to-male sexual contact and IDU	856	5%	883	5%	915	5%	940	5%	968	4%
Heterosexual contact	4,438	25%	4,665	25%	4,869	25%	5,076	25%	5,235	24%
Total	17,593	100%	18,613	100%	19,636	100%	20,679	100%	21,612	100%

Note: Numbers do not represent actual cases of HIV infection. They are point estimates of cases of HIV diagnoses statistically adjusted for reporting delays and for redistribution of cases in persons initially reported without an identified risk. The estimates have not been adjusted for incomplete reporting. Numbers of cases of HIV infection include persons with a diagnosis of HIV(not AIDS), a diagnosis of HIV and a later AIDS diagnosis and concurrent diagnoses of HIV and AIDS.

Source: Ohio Department of Health HIV/AIDS Surveillance Program. Data reported through June 30, 2015.

Table 15 further illustrates that for persons living with a diagnosis of HIV infection, the leading estimated mode of transmission continues to be male-to-male sexual contact, followed by heterosexual contact and primary injection drug use. The proportion of persons living with a

diagnosis of HIV infection among the three estimated modes of transmission remains relatively stable during the five-year period. Estimates indicate the number of persons living with a diagnosis of HIV infection reporting male-to-male sexual contact increased 27 percent from 2010 through 2014. Those reporting heterosexual contact increased 18 percent and those reporting injection drug use increased 15 percent during the same period.

AIDS Trends

As new drug treatments make it possible for HIV infected individuals to remain asymptomatic, the number of new AIDS diagnoses and AIDS-related deaths has declined since 1996. AIDS incidence (the number of new AIDS diagnoses) is no longer the gold standard to monitor the HIV/AIDS epidemic. However, it is important to continue monitoring AIDS incidence and mortality, as one measure of the efficacy of improved treatments and help identify groups that might not be receiving care, for whom treatment has not been successful or who have not tested to learn their status. Examining the period between HIV diagnosis and AIDS diagnosis helps to identify persons who may not be diagnosed with HIV early in the course of the disease. Data should be interpreted with caution, as it is possible some cases reported with a diagnosis of HIV less than 12 months prior to their AIDS diagnosis may have previously tested anonymously or confidentially in a different state and not reported in Ohio.

Table 16. Reported AIDS diagnoses by race and sex, 2014

Race/Ethnicity	Males		Females		2014 AIDS Diagnoses	
	No.	Rate ^a	No.	Rate ^a	No.	Rate ^a
White, not Hispanic	133	2.9	20	0.4	153	1.6
Black/African American, not Hispanic	142	20.8	43	5.8	185	13.0
Hispanic/Latino	20	9.7	-	*	20	5.0
Asian/Pacific Islander	3	*	1	*	4	*
American Indian/Alaska Native	1	*	-	*	1	*
Unknown	10	*	2	*	12	*
Total	309	5.4	66	1.1	375	3.2

Note: Data reflects all persons with an AIDS diagnoses in 2014.

Dash (-) indicates no cases. Asterisk (*) indicates rate not calculated because case count < 5 and/or U.S. Census data is not applicable to the respective category.

^aThe rate is the number of persons living with a diagnosis of HIV infection per 100,000 population calculated using 2014 U.S. Census estimates.

Source: Ohio Department of Health HIV/AIDS Surveillance Program. Data reported through June 30, 2015.

Table 16 shows the rates per 100,000 population of reported AIDS diagnoses by race and sex in Ohio in 2014. The rates depict the disproportionate impact of AIDS by race and sex. Almost half (49 percent) of persons in Ohio with AIDS diagnoses were black/African American. The rate of reported AIDS diagnoses among black/African Americans (13.0 per 100,000 blacks) was eight times greater compared to whites (1.6 per 100,000 whites). The rate of reported AIDS diagnoses per 100,000 population was higher among black/African American (20.8 per 100,000 black/African American males) and Hispanic/Latino males (9.7 per 100,000 Hispanic/Latino males) compared to white males (2.9 per 100,000 white males). The rate of reported AIDS diagnoses per 100,000 population was also greater among black/African-American females (5.8 per 100,000 black/African American females) compared to white females (0.4 per 100,000 white females) in Ohio (**Table 16**).

Table 17. Time to an AIDS diagnosis after a diagnosis of HIV infection by selected characteristics, Ohio, 2014

Characteristic	AIDS Diagnoses					
	Total AIDS Diagnoses		>= 12 Months after HIV Diagnosis		< 12 Months after HIV Diagnosis ^a	
	No.	%	No.	%	No.	%
Sex						
Males	309	82%	104	81%	205	83%
Females	66	18%	25	19%	41	17%
Age at AIDS diagnosis						
<13	-	-	-	-	-	-
13-14	-	-	-	-	-	-
15-19	1	<1%	-	-	1	<1%
20-24	42	11%	9	7%	33	13%
25-29	45	12%	16	12%	29	12%
30-34	57	15%	15	12%	42	17%
35-39	36	10%	13	10%	23	9%
40-44	45	12%	20	16%	25	10%
45-49	48	13%	12	9%	36	15%
50-54	43	11%	25	19%	18	7%
55-64	48	13%	17	13%	31	13%
65+	10	3%	2	2%	8	3%
Race/Ethnicity						
White, not Hispanic	153	41%	51	40%	102	41%
Black/African American, not Hispanic	185	49%	64	50%	121	49%
Hispanic/Latino	20	5%	3	2%	17	7%
Asian/Pacific Islander	4	1%	2	2%	2	1%
American Indian/Alaska Native	1	<1%	1	1%	-	-
Unknow n	12	3%	8	6%	4	2%
Race/Sex						
White, not Hispanic Males	133	35%	44	34%	89	36%
White, not Hispanic Females	20	5%	7	5%	13	5%
Black/African American, not Hispanic Males	142	38%	48	37%	94	38%
Black/African American, not Hispanic Females	43	11%	16	12%	27	11%
Hispanic/Latino Males	20	5%	3	2%	17	7%
Hispanic/Latina Females	-	-	-	-	-	-
Asian/Pacific Islander Males	3	1%	1	1%	2	1%
Asian/Pacific Islander Females	1	<1%	1	1%	-	-
American Indian/Alaska Native Males	1	<1%	1	1%	-	-
American Indian/Alaska Native Females	-	-	-	-	-	-
Unknow n	12	3%	8	6%	4	2%
Transmission Category						
Male adult or adolescent						
Male-to-male sexual contact	186	60%	54	52%	132	64%
Injection drug use (IDU)	7	2%	3	3%	4	2%
Male-to-male sexual contact and IDU	7	2%	7	7%	-	-
Heterosexual contact	28	9%	15	14%	13	6%
Other/unknow n	81	26%	25	24%	56	27%
Subtotal	309	100%	104	100%	205	100%
Female adult or adolescent						
Injection drug use	5	8%	2	8%	3	7%
Heterosexual contact	40	61%	15	60%	25	61%
Other/unknow n	21	32%	8	32%	13	32%
Subtotal	66	100%	25	100%	41	100%
Child (<13 yrs at diagnosis)						
Perinatal	-	-	-	-	-	-
Other/unknow n	-	-	-	-	-	-
Subtotal	-	-	-	-	-	-
Total	375		129		246	

^aIncludes cases whose diagnoses of HIV and AIDS were concurrent.

Dash (-) indicates no cases were reported for the given category.

Source: Ohio Department of Health HIV/AIDS Surveillance Program. Data reported through June 30, 2015.

Among Ohioans diagnosed with AIDS in 2014, 18 percent were female, 50 percent were 30-49 years of age, 49 percent were black, 41 percent white and five percent were Hispanic/Latino. The leading mode of transmission among Ohio males was male-to-male sexual contact (60 percent), followed by heterosexual contact (nine percent). Among Ohio females, heterosexual contact was the leading mode of transmission (61 percent) followed by injection drug use (eight percent). Twenty-six percent of males and 32 percent of females had other/unknown as the mode of transmission in Ohio.

Thirty-four percent of Ohio's reported AIDS cases were diagnosed a year or more after the first reported HIV diagnosis. Eighty-one percent of AIDS cases were male, 59 percent were 40 years or older and 50 percent black/African American. Black/African American males comprised 37 percent, white males 34 percent and black/African American females 12 percent of AIDS cases diagnosed a year or more after the first reported HIV diagnosis.

Sixty-six percent of AIDS cases were diagnosed less than 12 months after the first reported HIV diagnosis. The majority of these AIDS cases were male (83 percent), 17 percent were 30-34 years of age, 15 percent were 45-49 years of age and blacks/African Americans comprised 49 percent of AIDS cases diagnosed less than a year after the first reported HIV diagnosis (**Table 17**).

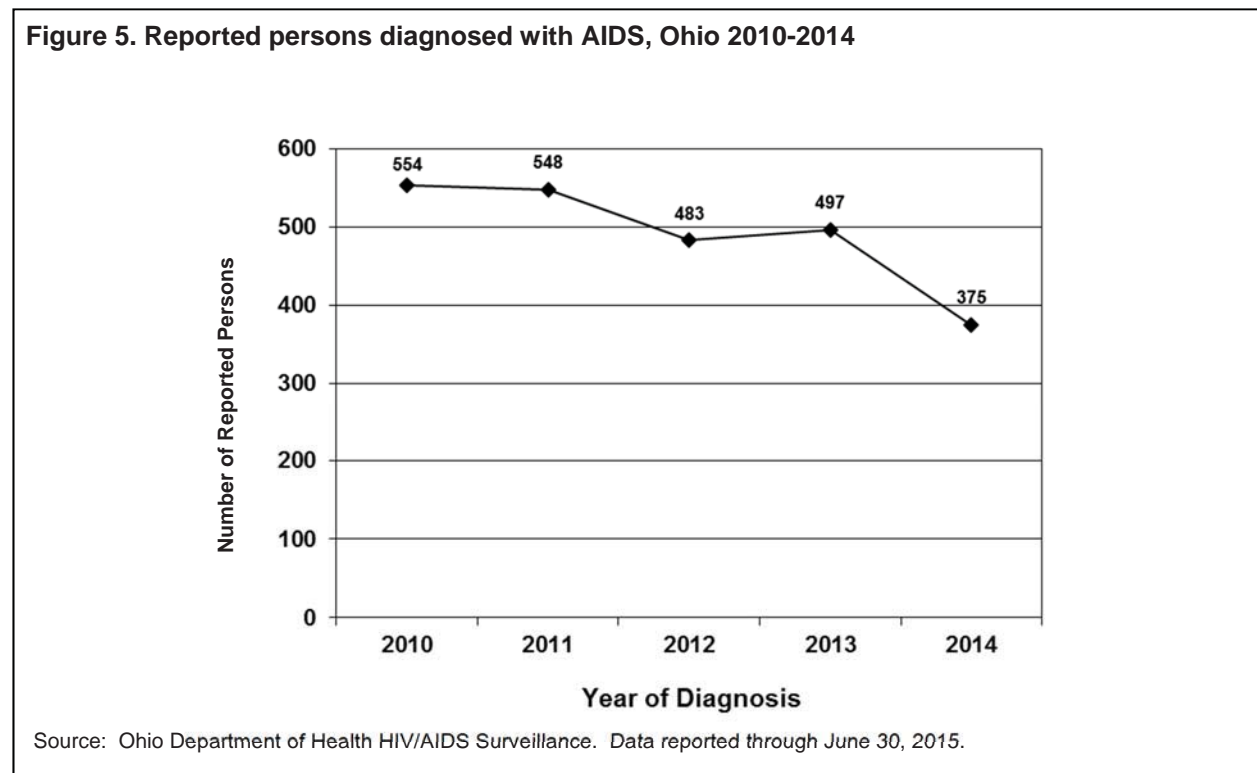


Figure 5 illustrates the general trends in reported AIDS diagnoses in Ohio from 2010 to 2014. The number of reported persons diagnosed with AIDS among persons previously reported with a diagnosis of HIV infection remained below 600 in each year. The number of reported AIDS diagnoses decreased significantly (48 percent) between 2010 and 2014.

Table 18. Ranking of HIV as an underlying cause of death among males 25-64 years old, Ohio, 2014

Male Race/Ethnicity	Ranking	Deaths No.	Death Rate^a
White, not Hispanic	Not Ranked	55	2.2
Black/African American, not Hispanic	12th	45	13.0
Hispanic/Latino	Not Ranked	3	unreliable
Total	14th	103	3.4

^aNumber of deaths with HIV as the leading underlying cause per 100,000 population calculated using 2014 U.S. census estimates.

Source: Centers for Disease Control and Prevention, National Center for Health Statistics. Underlying Cause of Death 1999-2014 on CDC WONDER Online Database, released 2015. Data are from the Multiple Cause of Death Files, 1999-2014, as compiled from data provided by the 57 vital statistics jurisdictions through the Vital Statistics Cooperative Program. Accessed at <http://wonder.cdc.gov/ucd-icd10.html> on Dec 9, 2015 12:12:16 PM

HIV as the underlying cause of death means AIDS was documented by the certifying physician of death as the primary cause of death on the death certificate. In 2014, HIV was the fourteenth leading underlying cause of death for males 25 to 64 years of age in Ohio. For white and Hispanic/Latino males between 25 and 64 years of age in Ohio, HIV did not rank as a leading underlying cause of death in 2014. HIV ranked as the twelfth leading underlying cause of death for black/African American males 25 to 64 years of age in Ohio in 2014. Although white males had more deaths with HIV as the underlying cause compared to black males, black males were almost six times more likely to have a death with HIV as the underlying cause (Table 18). HIV was not a leading underlying cause of death for any race/ethnicity or age group among Ohio females in 2014.

Question 3

What are the indicators of risk for HIV infection and AIDS in Ohio?

This section examines direct measures of risk behavior in the groups at greatest risk for acquiring HIV. The focus of this section will be on three high-risk behaviors: male/male sex (MSM), injection drug and other substance use, and heterosexual contact. HIV/STD co-infection data is also presented as a direct measure of risk behavior to more easily identify patterns in HIV/STD co-infections that may inform and improve HIV prevention and targeted HIV testing strategies in Ohio.

Highlights

Risk Indicators for HIV Infection in Ohio

- Among Ohio MSM reported in ODRS through partner notification services in 2014, 56 percent reported having unprotected sexual contact with two to six partners in the past 12 months and 10 percent reported 10 or more partners.
- Among Ohio MSM reported in ODRS through partner notification services in 2014, six percent reported always, 79 percent reported sometimes and 12 percent reported never using a condom or barrier method when performing anal sex during the previous 12 months.
- According to the 2013 Youth Risk Behavior Survey (YRBS) among Ohio's high school population, 2.2 percent of high school students reported using a needle to inject any illegal drug into their body one or more times during their life.
- According to the 2010 Ohio Behavioral Risk Factor Surveillance System (BRFSS), among the heterosexual population almost 11 percent of persons 18-24 years of age and 8.5 percent of blacks/African Americans reported engaging in a high-risk situation in the past 12 months. High-risk situations include IDU, contracting an STD, anal sex, or exchanging sex for money/drugs in the last 12 months.
- According to the 2011 Ohio HIV/STD surveillance study, the greatest proportion of persons co-infected with HIV and Syphilis between 2001 and 2010 were white males (57 percent) and black/African American males (35 percent). Persons living with a diagnosis of HIV infection (PLWH) and syphilis during the study period were almost exclusively male (97 percent).
- According to the 2011 Ohio HIV/STD surveillance study, a person with a reported history of Syphilis between 2001 and 2010 was 2.2 times more likely to be living with HIV compared to a PLWHA with no reported history of syphilis.

Male/Male Sex

Among persons tested at Ohio's HIV Counseling, Testing and Referral Sites (CTR) who are men who have sex with men (MSM), the following direct measures of risk behavior are collected and analyzed to provide information about how these risk behaviors are associated with an increased risk for acquiring or transmitting HIV infection:

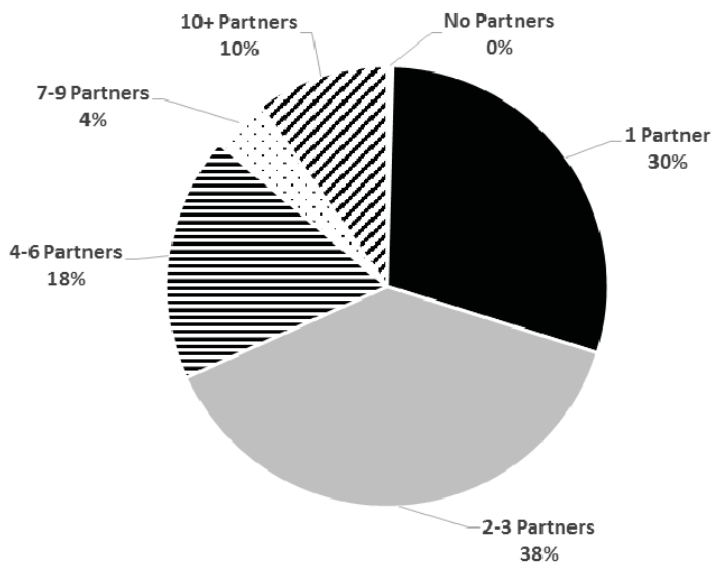
- Number of sex partners
- Frequency of condom use
- Substance use

The definition for MSM in this report is men who acknowledge having had sexual contact with another male regardless of how an individual identifies in terms of sexual orientation and regardless of any reported sexual contact with a female.

Ohio's HIV CTR is one of several data sources used in this section to describe risk behaviors. These sites provide anonymous and confidential HIV tests as well as counseling, referrals and partner notification services. In the Ohio Disease Reporting System (ODRS) the number of HIV tests performed at CTR, not the number of individuals tested at CTR is reported. Therefore, persons tested multiple times are counted multiple times in ODRS data.

Number of sex partners

Figure 6. Number of unprotected sexual contacts of Men Who Have had Sex with Men in the previous 12 months (n=482), Ohio, 2014

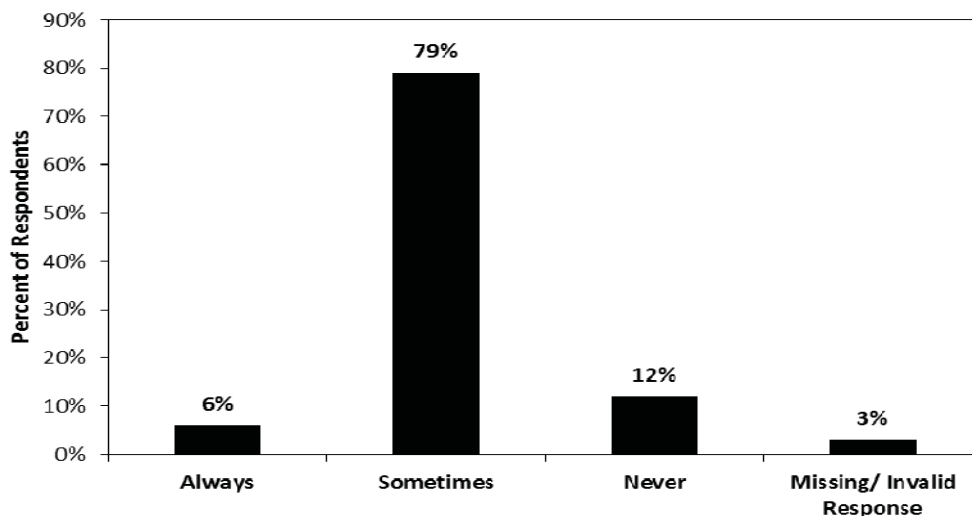


Source: Ohio Department of Health STD Surveillance. Data reported as of August 16, 2015.

The number of sex partners an individual has is associated with his/her risk of becoming infected with HIV - the more sex partners a person has, the greater the chance that one of those partners might be HIV infected. Among Ohio MSM reported in ODRS through partner notification services in 2014, 56 percent reported having unprotected sexual contact with two to six partners in the past 12 months and 10 percent reported 10 or more partners (**Figure 6**).

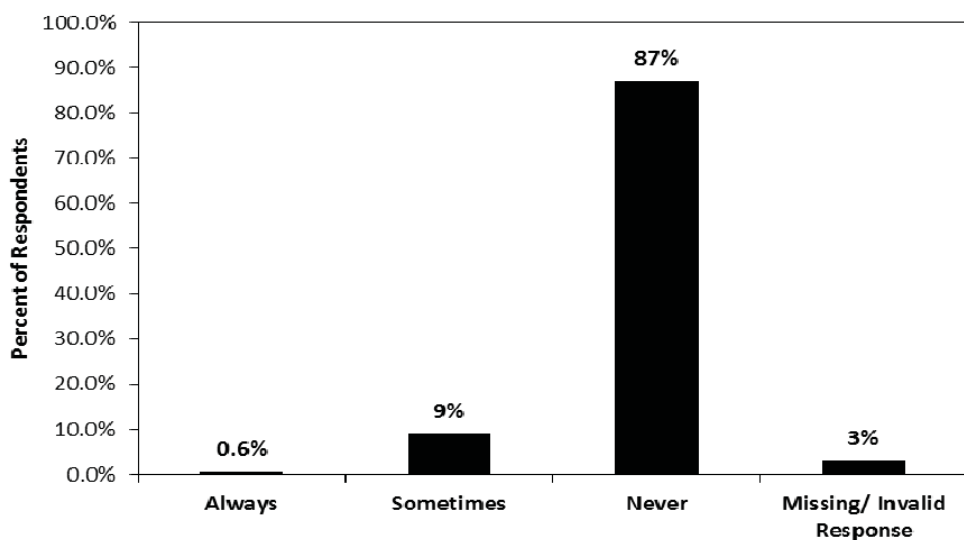
Frequency of condom use

Figure 7. Condom or barrier used by Men Who Have had Sex with Men in the previous 12 months (n=481) when performing anal sex, Ohio, 2014



Source: Ohio Department of Health STD Surveillance. Data reported as of August 16, 2015.

Figure 8. Condom or barrier used by Men Who Have had Sex with Men in the previous 12 months (n=481) when performing oral sex, Ohio, 2014



Source: Ohio Department of Health STD Surveillance. Data reported as of August 16, 2015.

The risk of getting or transmitting HIV varies widely depending on the type of sexual risk exposure. Some sexual risk exposures, such as receptive anal intercourse, carry a much higher risk of transmission than other exposures, such as oral sex. Regardless of the type of sexual risk exposure, consistent use of condoms reduces the risk of getting or transmitting HIV by approximately 80 percent³. Condom use can prevent the transmission of HIV through sexual contact. Among Ohio MSM reported in ODRS through partner notification services in 2014, six percent reported always, 79 percent reported sometimes and 12 percent reported never using a condom or barrier method when performing anal sex during the previous 12 months (**Figure 7**). Conversely, less than one percent of Ohio MSM reported in ODRS through partner notification services in 2014 always used a condom or barrier method when performing oral sex during the previous 12 months (**Figure 8**).

Substance Use

Using contaminated equipment when injecting illicit or non-illicit drugs is a risk factor for transmitting HIV because of the potential for direct contact with HIV-infected blood; in addition, injection drug use and other substance use can impair a person's judgment leading to unprotected sex, which may put a person at increased risk for HIV infection. Exchanging sex for drugs/money is another risk factor for HIV infection. Among Ohio MSM reported in ODRS through partner notification services in 2014, three percent engaged in injection drug use, 50 percent engaged in non-injection drug use and three percent exchanged sex for drugs/money during the previous 12 months.

Indirect Measures of Risk Behavior

Sexually transmitted disease (STD) surveillance data and hepatitis surveillance data provide information that might indicate the potential of high-risk behaviors among MSM. STDs among MSM are an indirect measure of risk behavior for HIV among MSM because STDs are an indicator of unprotected sex and unprotected sex is a risk behavior for HIV. Having an STD can also increase the potential of transmitting or acquiring HIV. Research has demonstrated increased risk of HIV transmission in the presence of STD infections that cause genital ulcers (such as syphilis or herpes) as well as other STDs that are frequently asymptomatic such as chlamydia and gonorrhea. This is especially true in women. Wasserheit (1992) found a three to five times higher risk of acquiring HIV through sexual transmission if an individual is infected with STDs compared to those not infected with STDs.⁴ Further, an individual co-infected with the HIV virus and another STD is three to five times more likely than other HIV-infected persons to transmit HIV through sexual contact. Studies in Asia and in Africa have also illustrated the interrelationship between HIV and STD interventions where focus on STD prevention slowed the progress of the HIV epidemic.⁵

Trends in reported early syphilis cases who are men who have sex with men

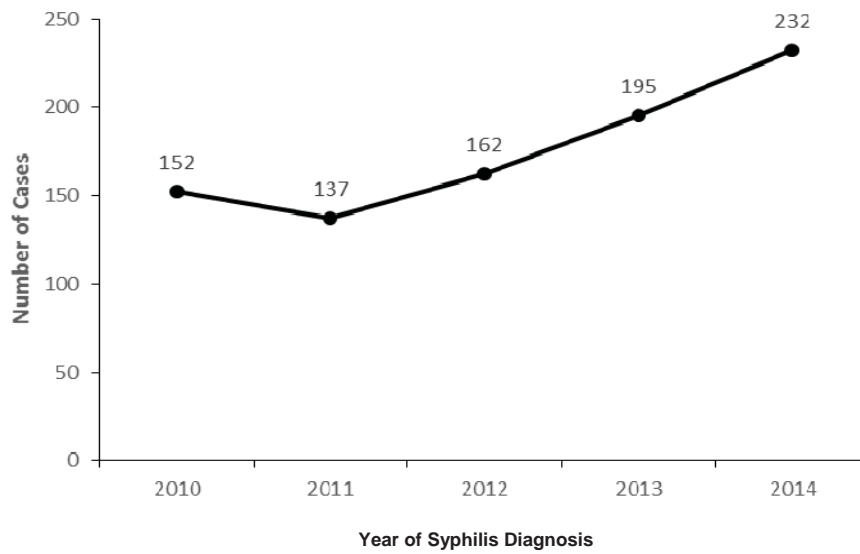
Trends in reported early syphilis cases who are MSM provide information to identify any increases in reported syphilis cases.

³ Weller SC, Davis-Beaty K. Condom effectiveness in reducing heterosexual HIV transmission (Review). The Cochrane Collaboration. Wiley and Sons, 2011.

⁴ Wasserheit JN. 1992. "Epidemiology synergy: interrelationship between human immunodeficiency virus infection and other sexually transmitted diseases." *Sexually Transmitted Diseases* 9:61-77.

⁵ Grosskurth H et al. 1995. "Impact of improved treatment of sexually transmitted diseases on HIV infection in rural Tanzania: randomised controlled trial." In: *The Lancet*, 346:530-36.

Figure 9. Trends in reported early syphilis cases who are MSM, Ohio, 2010-2014



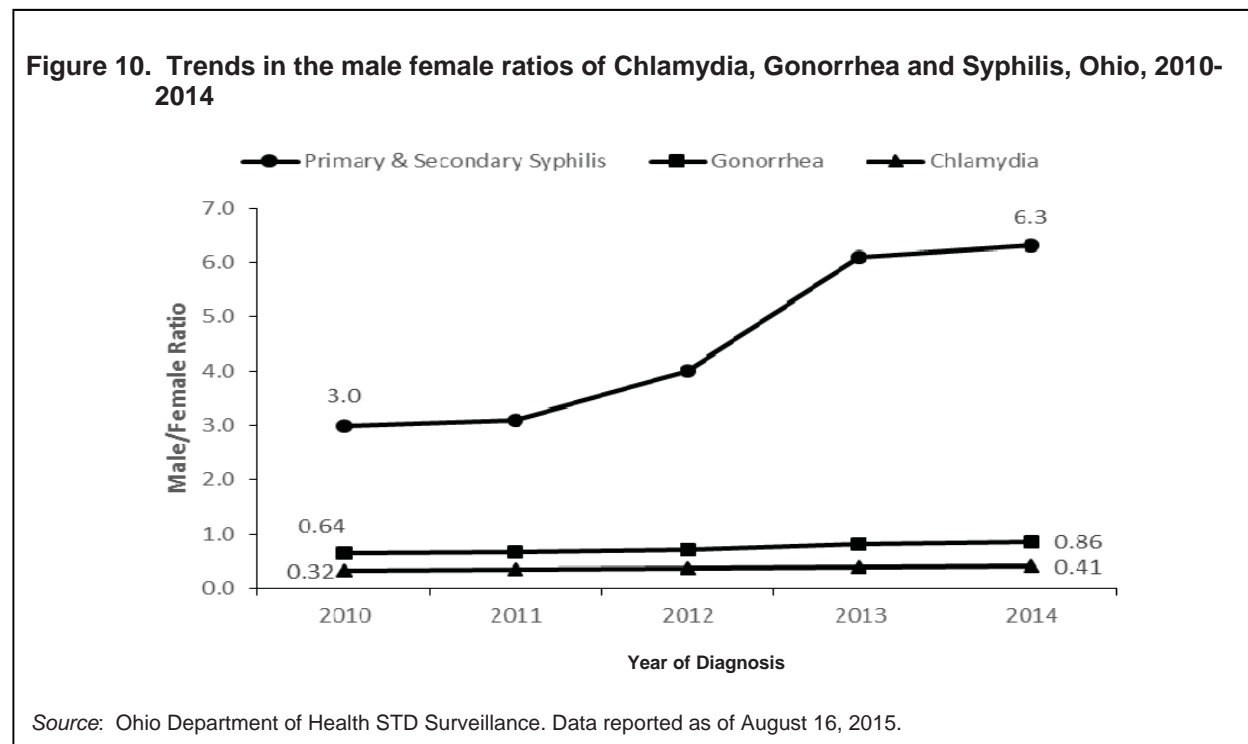
Early syphilis includes primary, secondary and early latent syphilis

Source: Ohio Department of Health STD Surveillance. Data reported as of August 16, 2015.

Trends in reported early syphilis cases who are MSM indicate an increase in the number of early syphilis infections between 2010 and 2014. The number of early syphilis infections among MSM increased more than 69 percent during the time period (**Figure 9**).

Male/Female Ratios of Chlamydia, Gonorrhea, Syphilis

Trends in the male/female ratio of chlamydia, gonorrhea and syphilis provide an indirect measure of increasing rates of infection among MSM. If the ratio is greater than one, it indicates more males were diagnosed compared to females.



Male/female ratios of chlamydia, gonorrhea and syphilis indicate varying increasing trends. The male/female ratio of chlamydia slightly increased from 2010 to 2014. In 2010, the male/female ratio was 0.32 and in 2014, it slightly increased to 0.41 indicating more females were diagnosed with chlamydia in each year compared to males.

The male/female ratio of gonorrhea from 2010 to 2014 also indicates a slightly increasing trend. In 2010, the male/female ratio was 0.64 and in 2014, it slightly increased to 0.86, indicating more females were diagnosed with gonorrhea in each year compared to males.

The male/female ratio of syphilis indicates a substantial increasing trend. In 2010, the male/female ratio was 3.0 and in 2014, the ratio increased more than two-fold to 6.3, indicating substantially more males were diagnosed with syphilis in each year compared to females. This is an indicator that reported syphilis is possibly increasing among MSM.

Injection Drug and Other Substance Use

Among persons using injection drugs (IDU) or other substances (illegal and legal), the following measures of risk behavior are available in Ohio to provide information associated with acquiring or transmitting HIV infection:

- Injection drug and other substance use
- Exchanging sex for drugs or money

The Substance Abuse and Mental Health Administration (SAMHSA) Treatment Episode Data Set (TEDS), Youth Risk Behavior Survey (YRBS) and questions asked of clients newly diagnosed with HIV or syphilis by Ohio disease investigation specialists (DIS) provide information on behaviors related to substance use.

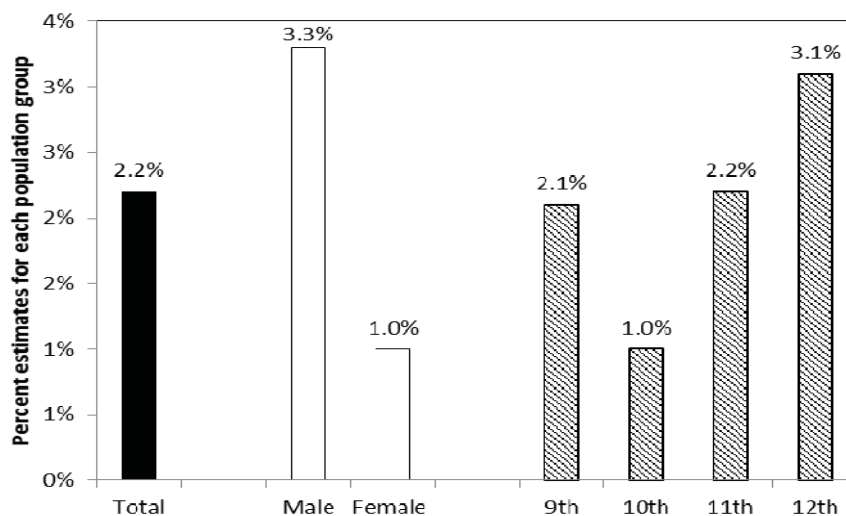
SAMHSA TEDS provides client-level data routinely collected by states' administrative data systems to monitor their substance abuse treatment systems. The TEDS system consists of the Admissions and the Discharge Data Sets. The TEDS Admission Data Set includes client-level data on substance abuse treatment admissions from 1992 through the present. The TEDS Discharge Data Set includes information from clients discharged in 2000 and later. A Minimum Data Set of items collected by all states where individual data items are reported include demographic information, primary substances and their route of administration, frequency of use, and age at first use.

The YRBS is a self-administered questionnaire distributed in public and private high schools containing grades 9-12 throughout the U.S. Schools for incarcerated youth are not included in this survey. The questionnaire contains multiple-choice questions addressing several categories of health-related behaviors including drug use, sexual behaviors, HIV infection and other STDs. The YRBS is useful in assessing HIV risk among high school students because it provides students' responses to questions about their sexual and drug use behaviors. Because IDU and sexual contact are potential sources of HIV transmission, having knowledge about the extent to which students are engaging in these behaviors is beneficial for HIV prevention efforts. YRBS analysis is representative of high school students only and because the survey is based upon self-reports, there is the potential for reporting bias.

DIS attempt to interview all Ohio patients newly diagnosed with HIV or syphilis in order to inform the patient of their disease status, assist with partner notification and educate them about the prevention measures they must take in order to avoid infecting others. Information is collected on clinical status, treatment, patient demographics and detailed mode of exposure. Early syphilis data can serve as a surrogate marker for recent unsafe sexual practices because of the short incubation period between exposure and infection. In addition, early syphilis can serve as a surrogate measure for specific behaviors that can facilitate the transmission and/or acquisition of HIV infection.

The YRBS for 2013 reveals among Ohio’s high school population, 2.2 percent of high school students reported using a needle to inject any illegal drug into their body one or more times during their life. IDU was highest among male students (3.3%) and students in twelfth grade (3.6%) (**Figure 11**).

Figure 11. Injection drug use among high school students, by sex and school grade, Ohio, 2013



Source: Youth Risk Behavior Survey (YRBS), 2013. Data available at <http://apps.nccd.cdc.gov/yrbss/>.

Error! Not a valid bookmark self-reference. provides percentages of substance use among persons admitted to a substance abuse treatment center in Ohio in 2011, the latest year available. Percentages are provided for the following substances: past year use of any illicit drug, past year use of any illicit drug other than marijuana and opiates, past year use of alcohol, past year use of cocaine, past year use of marijuana and past year use of opiates. Percentages are shown for persons admitted to a substance abuse treatment center age 12 years or older, 12-19 years of age, 20-24 years of age and those older than 24 years of age.

Table 19. Percentage of Ohio annual admissions to substance abuse treatment by age at admission and primary substance, 2011

Substance Use	12-19 years of age	20-24 years of age	>24 years of age	Total (12 years of age and older)
	Estimated %	Estimated %	Estimated %	Estimated %
Past Year Use of Any Illicit Drug ^a	18.04%	19.76%	62.20%	66.23%
Past Year Use of Any Illicit Drug other than Marijuana and Opiates	11.62%	8.29%	39.50%	15.73%
Past Year Use of Alcohol	7.12%	13.11%	79.77%	33.77%
Past Year Use of Cocaine	1.39%	6.38%	92.23%	8.25%
Past Year Use of Marijuana	36.30%	23.00%	40.70%	24.53%
Past Year Use of Opiates ^b	4.49%	22.38%	73.13%	25.97%

^a Any illicit drug includes marijuana, cocaine (including crack), heroin, hallucinogens, inhalants or any prescription-type psychotherapeutic used nonmedically.

^b Opiates include heroin and non-heroin opiates/synthetics.

Source: Center for Behavioral Health Statistics and Quality, Substance Abuse and Mental Health Services Administration (SAMHSA), Treatment Episode Data Set (TEDS). Data received through October 15, 2012.

Among persons admitted to a substance abuse treatment center in Ohio in 2011, 66 percent of those 12 years or older reported use of *any* illicit drug in the past year. Any illicit drug includes marijuana/hashish, cocaine (including crack), heroin, hallucinogens, inhalants or any prescription-type psychotherapeutic drug used non-medically. Approximately 16 percent of persons admitted to a substance abuse treatment center in Ohio in 2011 reported past year use of any illicit drug other than marijuana and opiates, 34 percent reported past year use of alcohol, eight percent reported past year use of cocaine, 25 percent reported past year use of marijuana and 26 percent reported past year use of opiates. Overall, 32 percent of persons admitted to a substance abuse treatment center in Ohio in 2011 were 12-24 years of age.

Exchanging sex for drugs or money

Local disease intervention specialist (DIS) interview persons newly diagnosed with HIV infection to gather information on clinical status, treatment, patient demographics and detailed mode of exposure. Of the 870 Ohio patients newly diagnosed with HIV infection who received an interview by a DIS 2014, 33 persons (3.8 percent) reporting exchanging sex for drugs or money (data not shown).

Indirect Measures of Risk Behavior

SAMHSA TEDS also provides information that might indicate the possible occurrence of behaviors related to IDU and other substance use that place an individual at risk for HIV infection. As a national client-level database on substance abuse treatment, SAMHSA TEDS provides data on substance abuse treatment events routinely collected by states. It primarily includes information on clients admitted to programs that receive public funds. Because SAMHSA TEDS is an admission-based system, it may include duplicated individuals if an individual has multiple admissions in one calendar year.

Substance Abuse Treatment Admissions

Table 20. Substance abuse treatment admissions by primary substance of abuse, by selected characteristics, Ohio, 2011

	Total Admissions*	Alcohol Only	Alcohol w/ Secondary drug	Heroin	Opiates (excluding Heroin)	Cocaine (smoked)	Cocaine (other route)	Marijuana	Metham- phetamines/ Amphetamines
Sex									
Male	61.6%	69.1%	68.6%	51.5%	46.1%	46.6%	56.3%	71.2%	50.4%
Female	38.4%	30.9%	31.4%	48.5%	53.9%	53.4%	43.7%	28.8%	49.6%
Age at Admission									
12 to 19 years	14.4%	6.0%	8.1%	4.0%	5.1%	0.8%	3.4%	36.3%	8.2%
20 to 24 years	17.5%	11.4%	14.6%	23.5%	21.0%	5.2%	10.4%	23.0%	18.1%
25 to 29 years	17.6%	12.0%	14.3%	28.6%	27.2%	8.3%	19.0%	15.5%	20.2%
30 to 34 years	14.3%	12.9%	13.7%	18.7%	19.7%	12.7%	17.1%	10.6%	23.2%
35 to 39 years	9.8%	11.9%	11.5%	9.3%	10.4%	14.3%	15.6%	5.8%	12.1%
40 to 44 years	8.6%	12.9%	11.7%	5.6%	6.1%	19.0%	12.4%	3.9%	9.1%
45 to 49 years	7.8%	13.5%	12.2%	3.7%	4.6%	18.5%	7.6%	2.5%	6.3%
50 to 54 years	6.0%	10.7%	8.9%	3.3%	3.6%	14.1%	9.0%	1.5%	2.5%
55 to 59 years	2.9%	5.8%	3.6%	2.3%	1.9%	5.4%	4.0%	0.7%	0.4%
60 years and older	1.2%	2.9%	1.3%	0.9%	0.6%	1.6%	1.5%	0.2%	0.0%
Race/Ethnicity									
White (non-Hispanic)	72.4%	81.3%	69.6%	91.6%	94.9%	43.5%	66.2%	54.0%	95.1%
Black (non-Hispanic)	25.0%	15.8%	27.9%	5.7%	3.8%	54.1%	30.3%	42.8%	3.9%
Hispanic	1.8%	2.0%	1.6%	2.2%	0.9%	1.5%	2.8%	2.2%	0.9%
American Indian/Alaska Native	0.2%	0.2%	0.3%	0.1%	0.2%	0.3%	0.0%	0.1%	0.0%
Asian/Pacific Islander	0.2%	0.4%	0.2%	0.1%	0.2%	0.1%	0.2%	0.1%	0.2%
Other	0.4%	0.3%	0.4%	0.3%	0.1%	0.5%	0.5%	0.7%	0.0%
Number of Admissions	64,780	10,186	11,691	9,263	7,562	4,137	1,207	15,887	570
Percentage of Admissions	100.0%	15.7%	18.0%	14.3%	11.7%	6.4%	1.9%	24.5%	0.9%

*In addition to substances reported in the table, total admissions also includes tranquilizers, sedatives, hallucinogens, PCP, inhalants and other/unknown substances.

Source: Center for Behavioral Health Statistics and Quality, Substance Abuse and Mental Health Services Administration, Treatment Episode Data Set (TEDS). Data received through October 15, 2012.

According to SAMHSA TEDS, in 2011, there were 64,780 substance abuse admissions to Ohio licensed substance abuse treatment facilities. Of these admissions, more than 14 percent were related to heroin use, almost 12 percent related to opiates other than heroin; over 6 percent related to smoking cocaine and almost 2 percent related to cocaine use through another route (Table 20).

The majority of persons admitted to substance abuse treatment centers were males, between 20-29 years of age and white. However, these treatment admission demographics differ somewhat by primary substance.

Looking at sex by primary treatment admissions, the proportion of male admissions for alcohol, alcohol with secondary drug and marijuana were 2 times greater or more than female admissions. The majority of substance abuse treatment admissions were male except for cocaine (smoked) and opiates other than heroin, where females comprised the majority of admissions (**Table 20**).

The age distribution among treatment admissions differs somewhat by primary substance. Persons admitted for heroin, opiates other than heroin and marijuana use were younger compared to the other admissions categories. Almost 55 percent of heroin admissions, 53 percent of opiates other than heroin admissions and almost 75 percent of marijuana admissions were between 12-30 years of age. Persons admitted for treatment due to cocaine use by a route other than smoking were younger than persons admitted for smoking cocaine. Among cocaine smokers, over 50 percent were 35-49 years of age (**Table 20**).

The majority of admissions to substance abuse treatment centers by primary substance were white except for admissions due to smoking cocaine where more admissions were black (54 percent). Another notable difference is among treatment admissions for methamphetamines/ amphetamines where whites accounted for 95 percent of admissions (**Table 20**).

Heterosexual Contact

The following direct measures of risk behavior are collected and analyzed to provide information about behaviors associated with acquiring or transmitting HIV infection among persons engaging in heterosexual contact:

- High risk situations (IDU, STD, unprotected anal sex or exchange of sex for money or drugs in the last 12 months)
- Number of sex partners
- Frequency of condom use
- Substance use

Questions asked of clients with a new diagnosis of HIV infection or syphilis by Ohio DIS, Behavioral Risk Factor Surveillance System (BRFSS) and YRBS provide information on risk behaviors related to heterosexual contact.

High-risk situations

Table 21. Percent of high-risk situations in the past 12 months among persons who had heterosexual contact, by demographic characteristics, Ohio, 2010

Demographic Characteristics	%
Sex	
Males	2.8%
Females	3.8%
Age as of 12/10	
18-24	10.8%
25-34	5.6%
35-44	1.4%
45-54	1.7%
55-64	0.6%
Race/Ethnicity	
White, not Hispanic	2.6%
Black/African American, not Hispanic	8.5%
Hispanic/Latino	11.6%
Total	3.3%

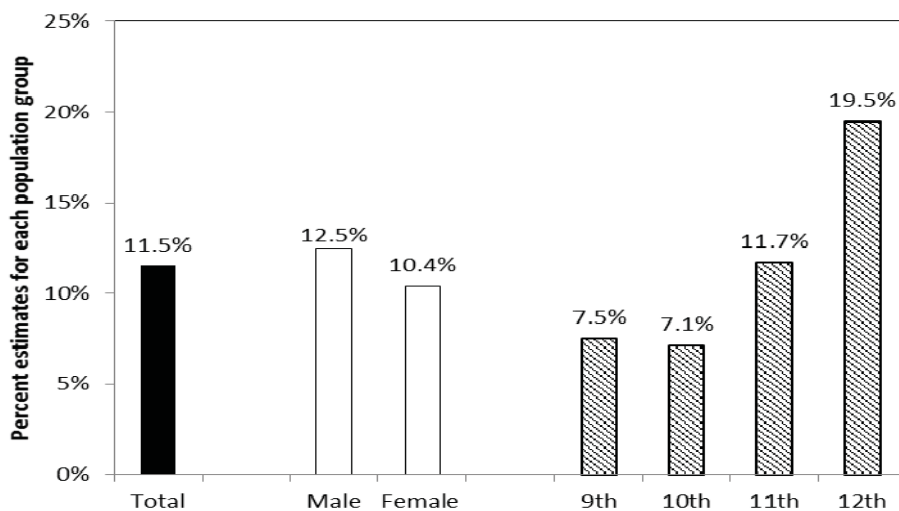
Source: Behavioral Risk Factor Surveillance System (BRFSS), 2010

The 2010 BRFSS was the last year the sexual health module was conducted that included high-risk situations. High-risk situations include IDU, contracting an STD, anal sex, or exchanging sex for money/drugs in the last 12 months. According to the 2010 Ohio BRFSS, a greater proportion of females (3.8 percent) engaged in a high-risk situation in the past 12 months compared to males (2.8 percent). Almost 11 percent of persons 18-24 years of age and 8.5 percent of black/African Americans reported engaging in a high-risk situation in the past 12 months (**Table 21**).

Number of sex partners

According to the 2013 YRBS, 43 percent of high school students and 57 percent of 12th grade students reported having sexual intercourse, suggesting that the majority of students will have sex while in high school (data not shown).

Figure 12. Percentage of high school students reporting four or more lifetime sex partners, by sex and school grade, Ohio, 2013

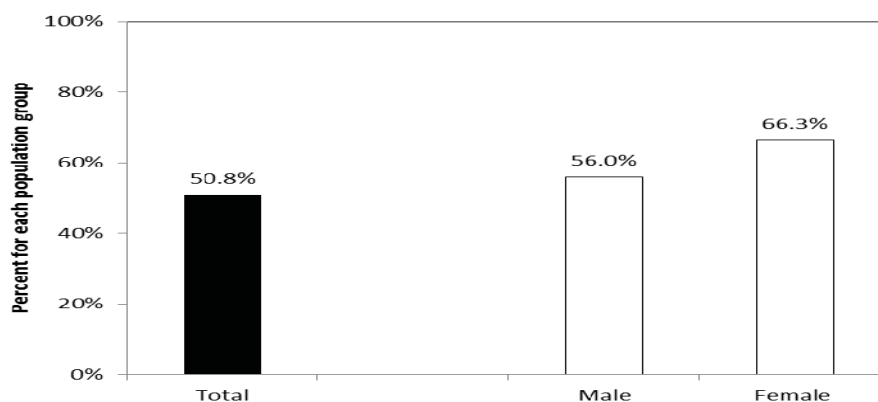


Source: Youth Risk Behavior Survey (YRBS), 2013. Data available at <http://apps.nccd.cdc.gov/yrbss>

More than 11 percent of high school students reported four or more sex partners during their lifetime, according to the 2013 YRBS. Over 12 percent of males and 10 percent of females had four or more sex partners and almost 20 percent of 12th grade students reported four or more sex partners (**Figure 12**).

Frequency of condom use

Figure 13. Condom use of high school students who have had sex in the past three months at last sexual intercourse, by sex, Ohio, 2013

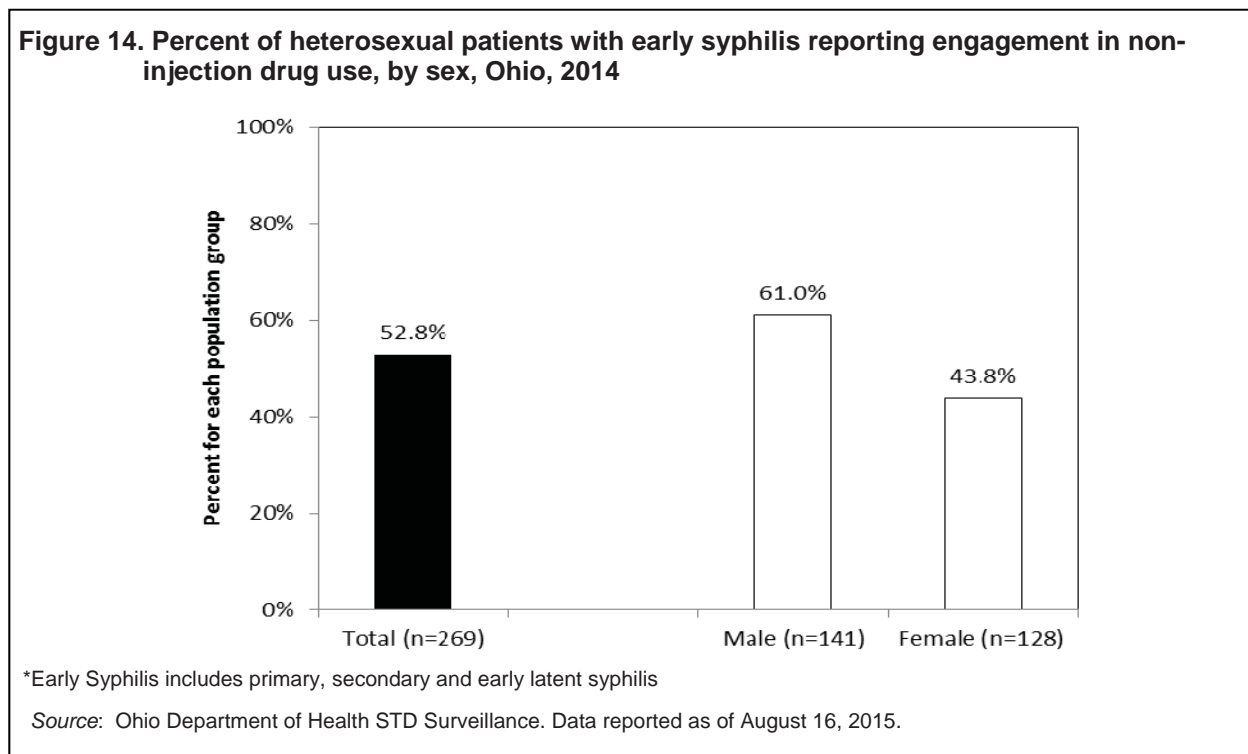


Source: Youth Risk Behavior Survey (YRBS), 2013. Data available at <http://apps.nccd.cdc.gov/yrbss>

The 2013 YRBS indicated that among Ohio high school students, approximately 51 percent who have had sexual intercourse in the past three months reported using a condom at last sexual intercourse. More females (66 percent) than males (56 percent) who have had sexual intercourse in the past three months reported using a condom at last sexual intercourse (**Figure 13**).

Substance use

The Ohio STD Surveillance Program collects data about information that may indicate high-risk behaviors among heterosexual males and females. Having an STD can also increase the potential of transmitting or acquiring HIV. There is an increased risk of HIV transmission in the presence of STD infections that cause genital ulcers (such as syphilis or herpes) as well as other STDs that are frequently asymptomatic (such as chlamydia and gonorrhea)⁶. While heterosexual males and females with early syphilis may not be representative of all heterosexual males and females in Ohio, data on these patients do provide valuable information on HIV risk behaviors in a subpopulation of high-risk heterosexual males and females.



Approximately 53 percent of heterosexual patients with early syphilis in Ohio reported engaging in non-injection drug use in 2014. More males reported engaging in non-injection drug use (61 percent) compared to females engaging in non-injection drug use (44 percent) (**Figure 14**).

According to the 2013 YRBS, 18 percent of high school students who had sex in the past three months used alcohol or drugs at last sexual intercourse. Alcohol and drug use at last sexual intercourse was higher among males (24 percent) than females (14 percent) (data not shown).

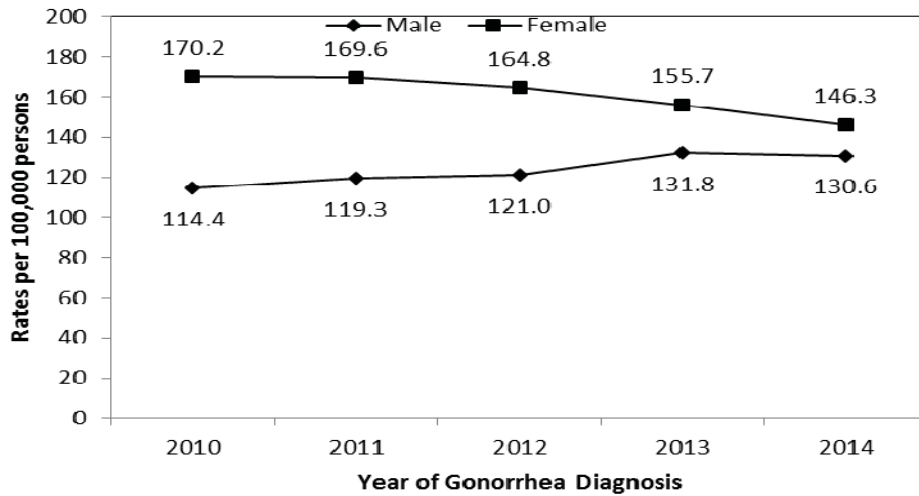
⁶ Centers for Disease Control and Prevention. 2007. The role of STD prevention and treatment in HIV prevention. Fact Sheet: CS115145.

Indirect Measures of Risk Behavior

STD Surveillance data and Vital Statistics data on teen pregnancy rates provide information that might indicate the potential of high-risk heterosexual behaviors. Increases in STD or teen pregnancy rates do not directly indicate an increase in HIV infections, but they might indicate an increase in unprotected sex.

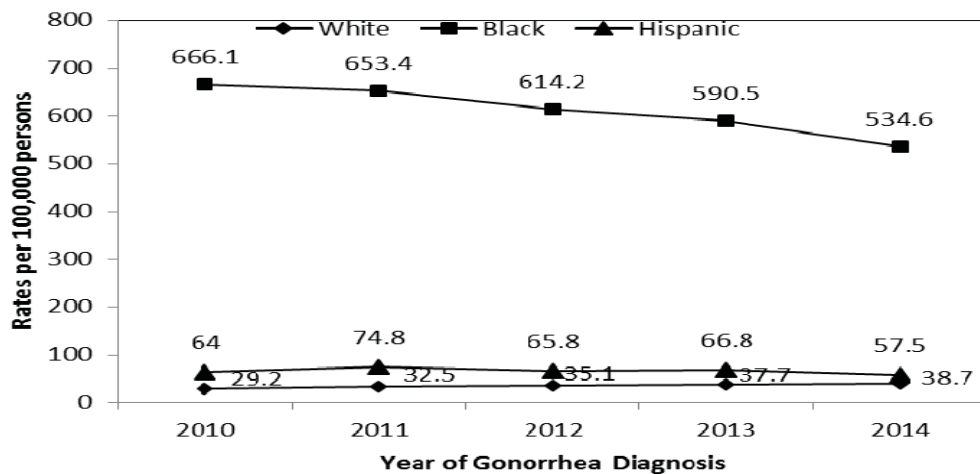
Gonorrhea

Figure 15. Trends in gonorrhea rates, by sex, Ohio, 2010-2014



Source: Ohio Department of Health STD Surveillance. Data reported as of May 17, 2015.

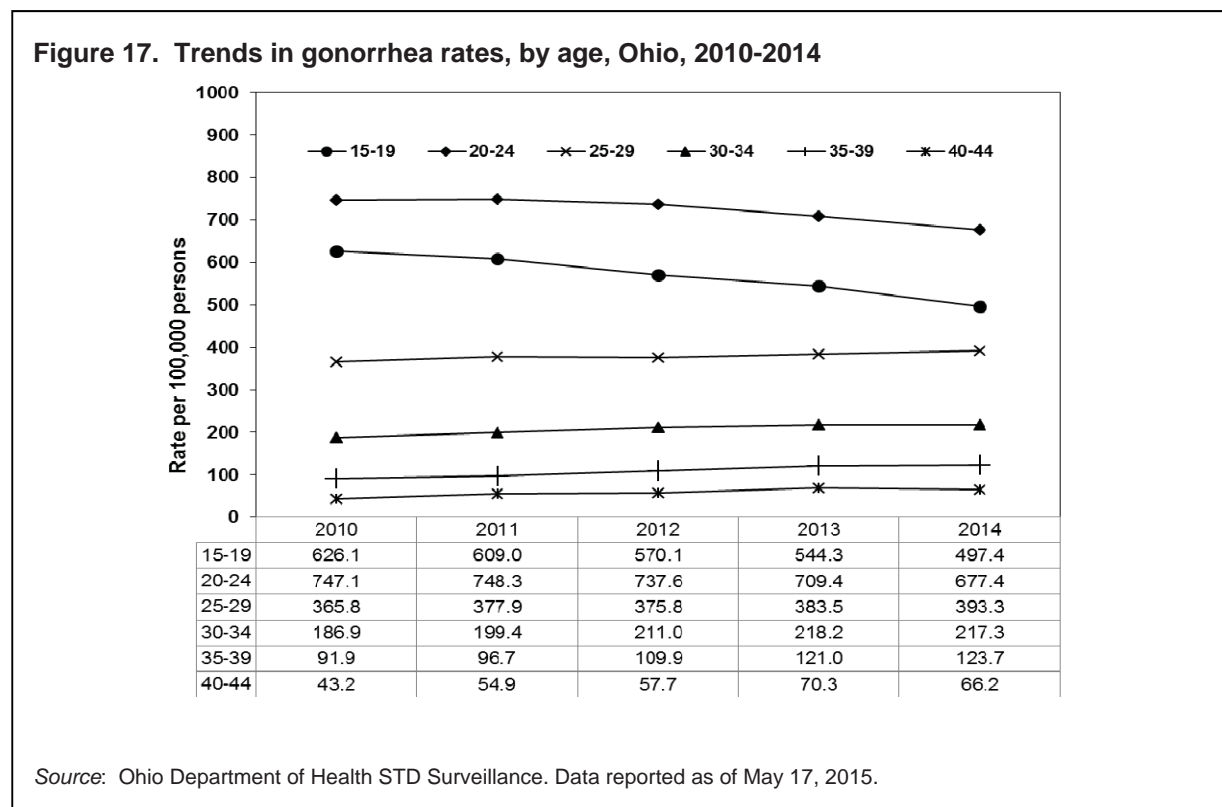
Figure 16. Trends in gonorrhea rates, by race/ethnicity, Ohio, 2010-2014



Source: Ohio Department of Health STD Surveillance. Data reported as of May 17, 2015.

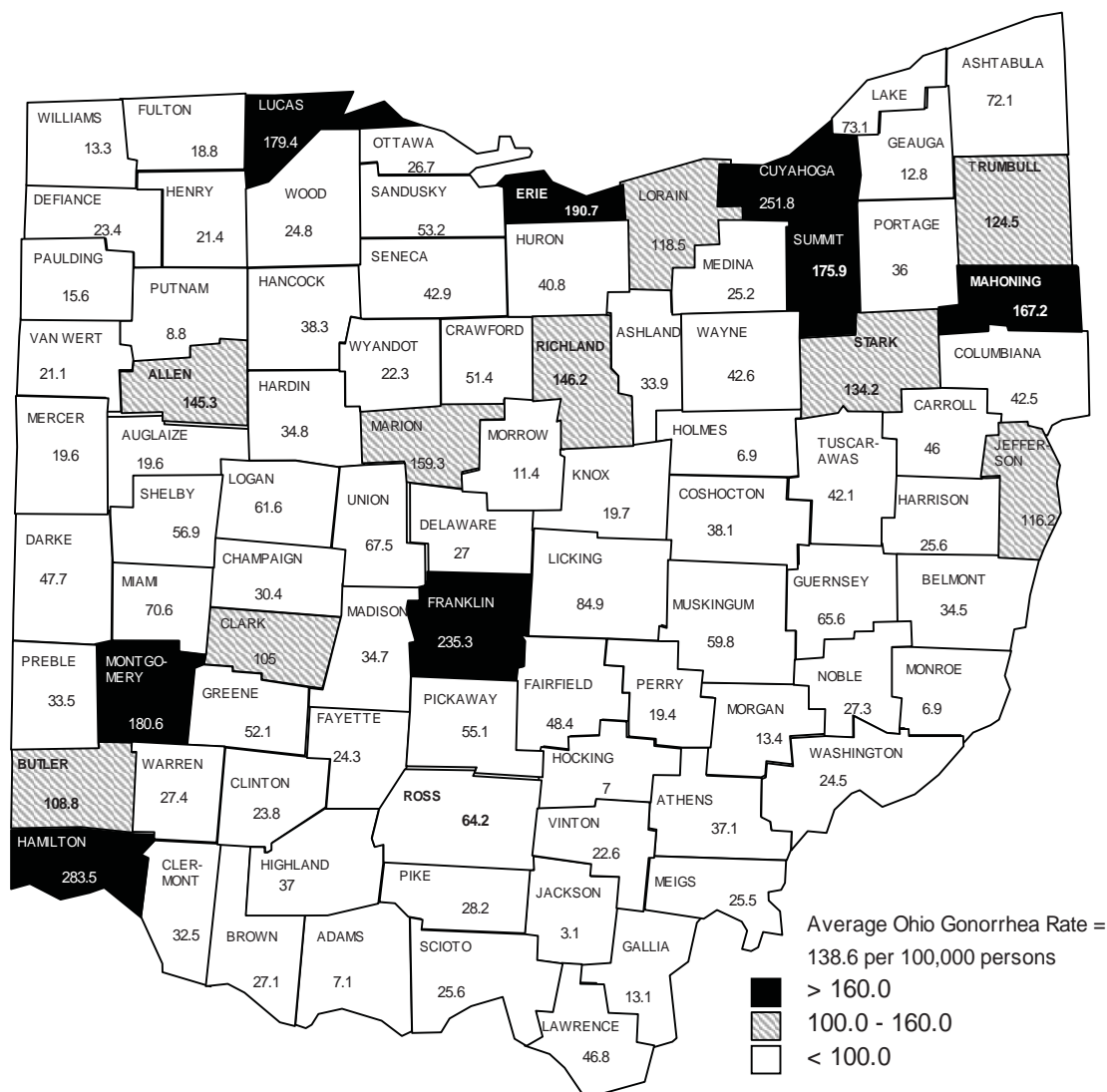
Gonorrhea rates in Ohio were consistently higher among females than males. Male gonorrhea rates decreased from 170.2 per 100,000 in 2010 to 146.3 per 100,000 in 2014. Female gonorrhea rates increased from 114.4 per 100,000 to 130.6 per 100,000 in 2014 (**Figure 15**).

On average gonorrhea rates were 23 times higher among blacks than among whites and two times higher among Hispanics than among whites. Gonorrhea rates decreased among blacks from 666.1 per 100,000 in 2010 to 534.6 per 100,000 in 2014 (a decline of 20%). Among Hispanics, rates for gonorrhea slightly decreased from 64.0 per 100,000 in 2010 to 57.5 per 100,000 in 2014. Among whites, rates steadily increased from 29.2 per 100,000 in 2010 to 38.7 per 100,000 in 2014 (**Figure 16**).



The rates of gonorrhea were consistently highest among persons 15 to 19 years old, followed by persons 20 to 24 years old (**Figure 17**).

Figure 18. Rates of reported cases of gonorrhea, by county, Ohio, 2014

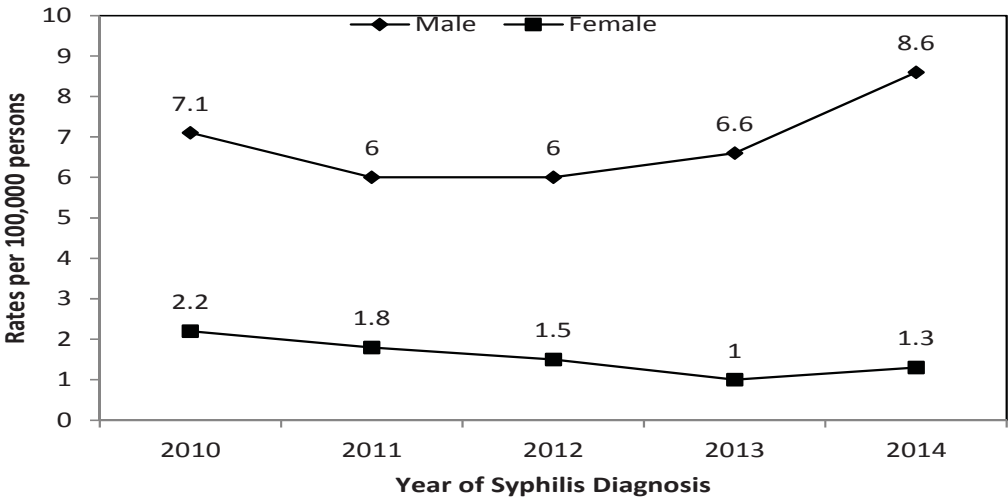


Source: Ohio Department of Health STD Surveillance. Data reported as of May 17, 2015.

In Ohio, the rate of gonorrhea infection was 138.6 per 100,000 persons in 2014. All counties in Ohio had diagnosed and reported cases of gonorrhea. Rates of gonorrhea infection vary by county with the highest rates in the larger urban counties (**Figure 18**).

Syphilis

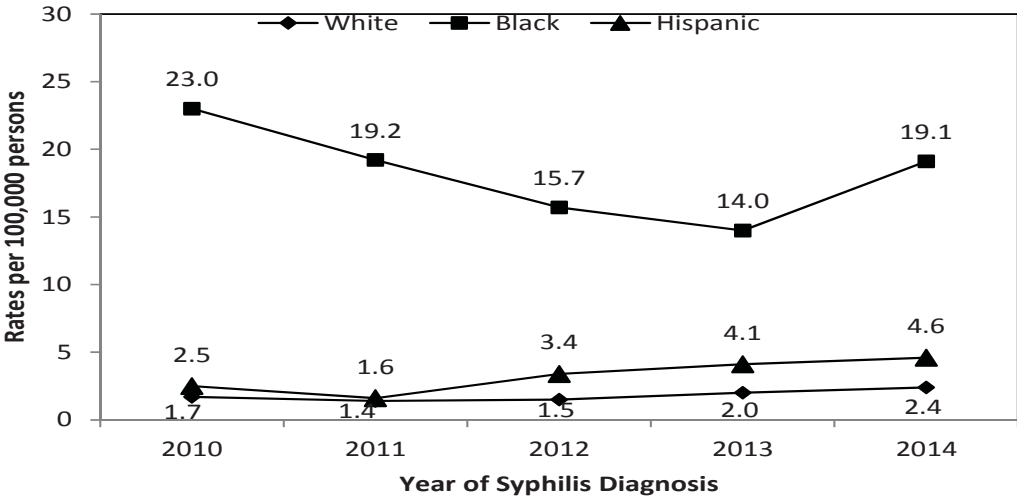
Figure 19. Trends in early syphilis rates, by sex, Ohio, 2010-2014



*Early syphilis includes primary, secondary and early latent syphilis

Source: Ohio Department of Health STD Surveillance. Data reported as of May 17, 2015.

Figure 20. Trends in early syphilis rates, by race, Ohio, 2010-2014

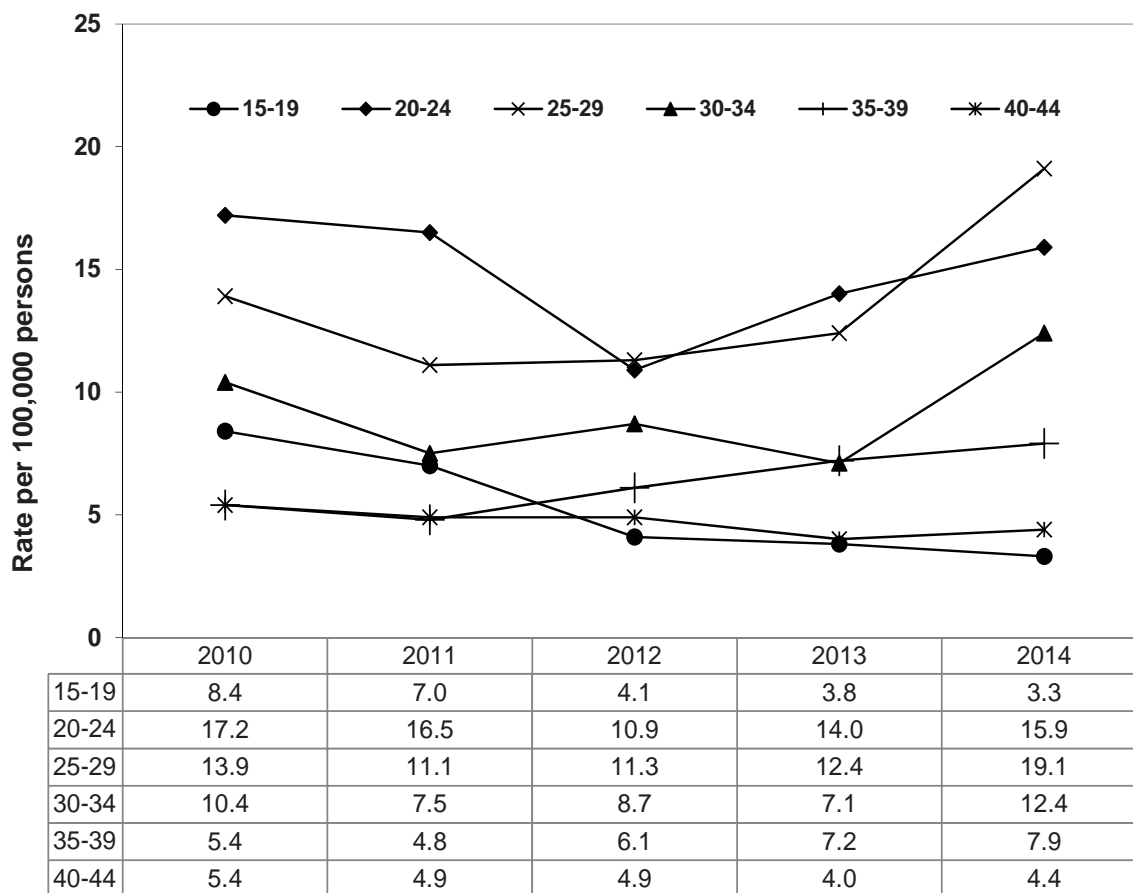


*Early syphilis includes primary, secondary and early latent syphilis

Source: Ohio Department of Health STD Surveillance. Data reported as of May 17, 2015.

Rates for early syphilis among females decreased from 2.2 to 1.3 per 100,000 from 2010 to 2014. However, rates among males increased from 7.1 to 8.6 per 100,000 from 2010 to 2014. The average rate among males was more than five times higher than the average rate among females (**Figure 19**). Overall, early syphilis rates decreased among blacks; but the average rate among blacks was more than ten times higher than the average rate among whites and five times higher than the average rate among Hispanics between 2010 and 2014 (**Figure 20**).

Figure 21. Trends in early syphilis rates, by age, Ohio, 2010-2014



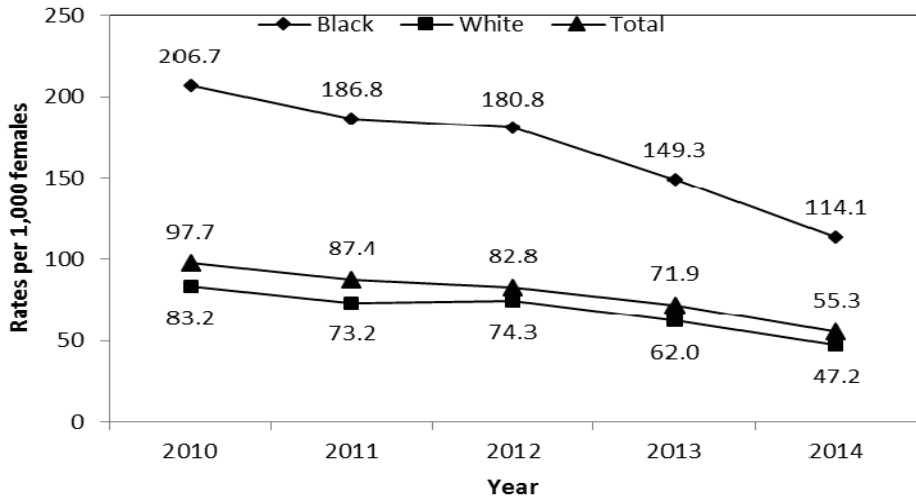
*Early syphilis includes primary, secondary and early latent syphilis

Source: Ohio Department of Health STD Surveillance. Data reported as of May 17, 2015.

Early syphilis rates were highest among persons 20-24 and 25-29 years old between 2010 and 2014. In 2014, early syphilis rates were highest among persons 25-29 years old (19.1 per 100,000), followed by persons 20-24 years old (15.9 per 100,000), persons 30-34 years old (12.4 per 100,000), persons 35-39 years old (7.9 per 100,000). All other age groups, including those not shown, had rates below five per 100,000) (**Figure 21**).

Teen Pregnancy Rates

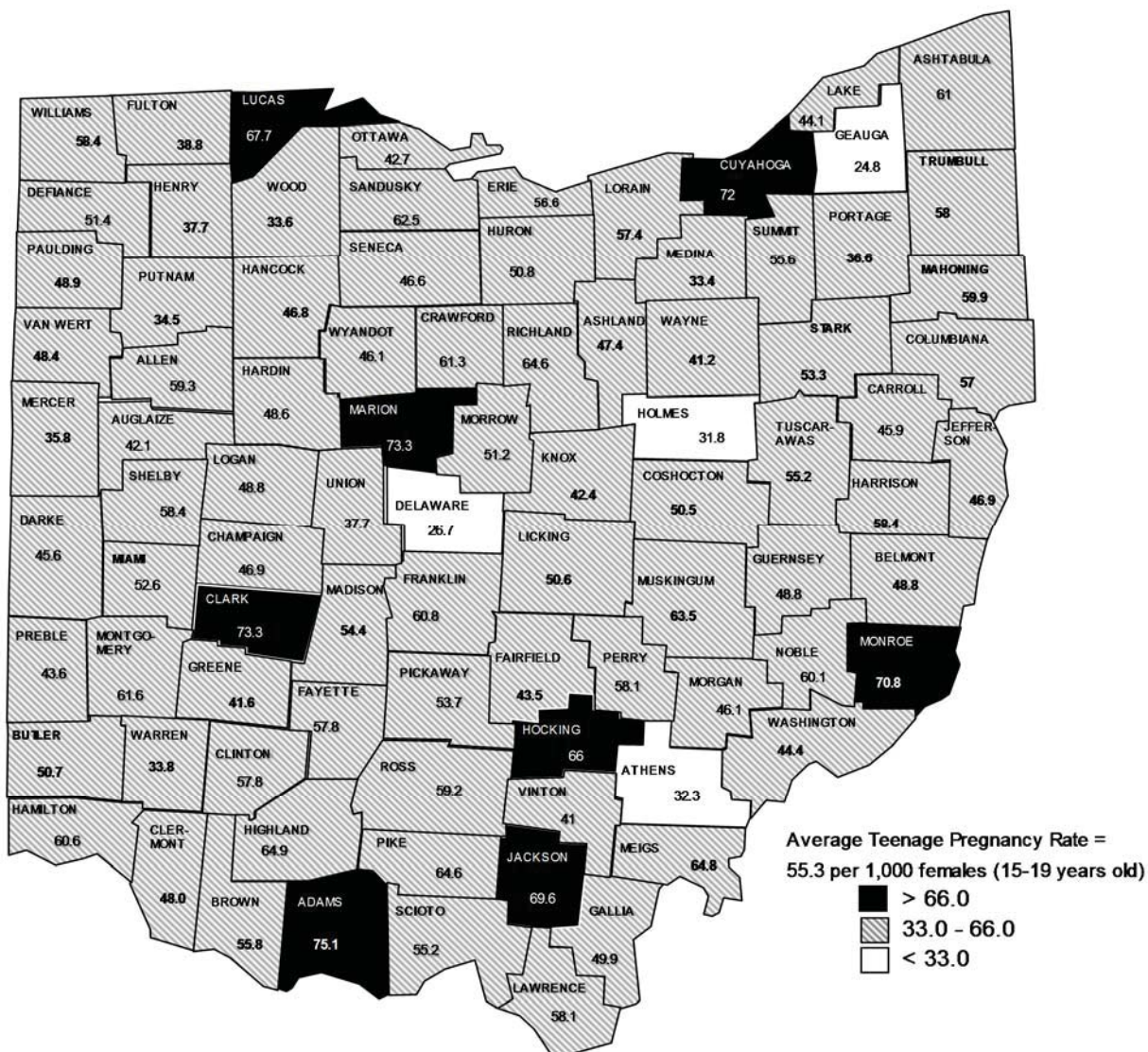
Figure 22. Estimated trends in teen pregnancy rates (15-19 years), Ohio, 2010-2014



Source: Ohio Department of Health Pregnancy Risk Assessment Monitoring System (PRAMS), 2015.

The estimated teen pregnancy rate (15-19 years) in Ohio decreased from 97.7 per 1,000 females (15-19 years) to 55.3 per 1,000 females (15-19 years) from 2010 to 2014. Although the pregnancy rate decreased for both black and white teens in Ohio from 2010 to 2014, the average black teen pregnancy rate was more than two times greater compared to the average white teen rate. In 2014 the black teen pregnancy rate was 114.1 per 1,000 females (15-19 years) compared to 47.2 per 1,000 females (15-19 years) among white teens (**Figure 22**).

Figure 23. Teen pregnancy rates, aged 15-19, by county, Ohio, 2010-2014



Source: Ohio Department of Health Pregnancy Risk Assessment Monitoring System (PRAMS), 2015.

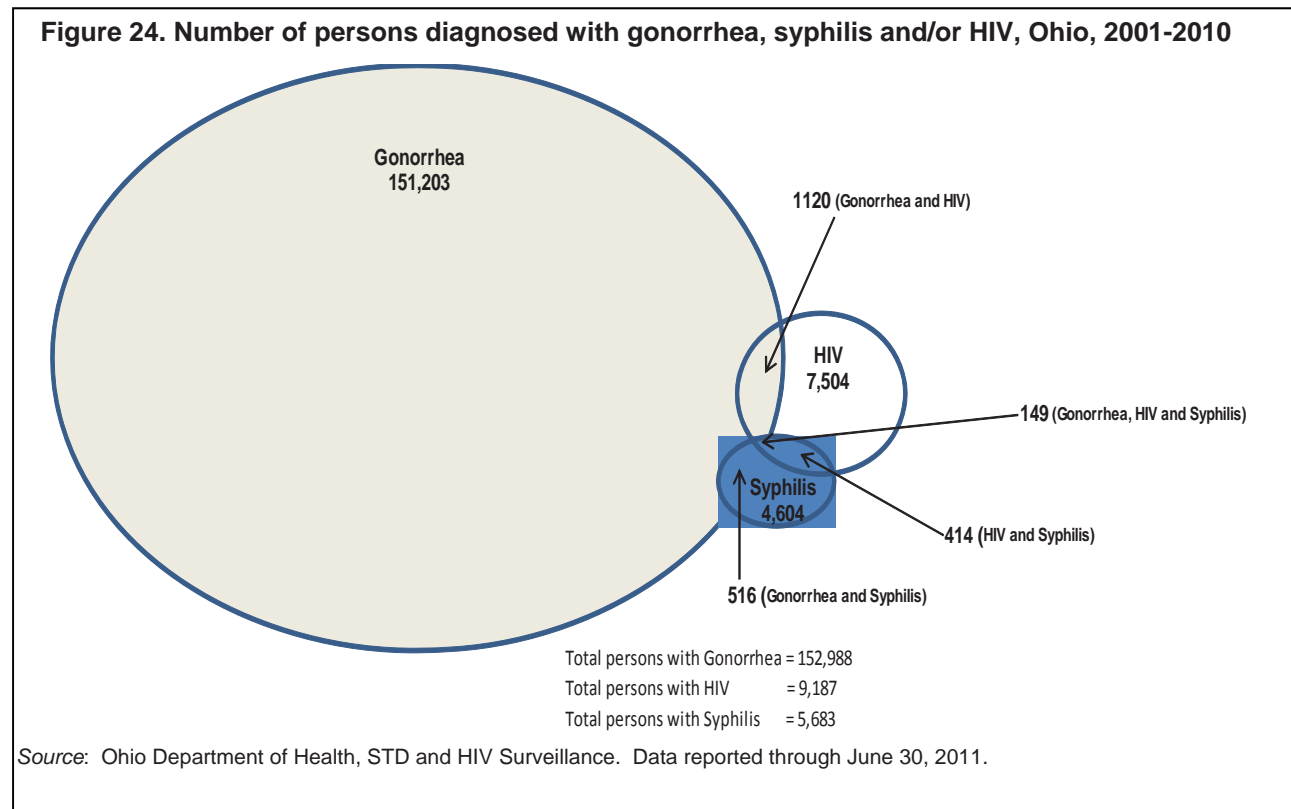
Teen pregnancy rates vary by county. The 2010-2014 average annual estimated teen pregnancy rate in Ohio was 55.3 per 1,000 females between 15 and 19 years old. Teen pregnancy rates ranged from a low of 24.8 in Geauga County to a high of 75.1 in Adams County (Figure 23).

HIV/STD Infections

Direct Measures of Risk Behaviors

An “epidemiological synergy” between diagnoses of HIV infection and other STDs has been observed and studied since the beginning of the HIV/AIDS epidemic. In addition to common modes of transmission, biological mechanisms for this epidemiological synergy have been observed⁷. Substantial evidence indicates that HIV infections with either a previous, concurrent or later ulcerative (e.g. herpes and syphilis) or non-ulcerative STD (e.g. chlamydia and gonorrhea) increases the likelihood of both transmitting and acquiring HIV⁸. Furthermore, HIV/STD infection trends can offer important insights into growing populations with HIV, making the combination of HIV and STD surveillance data helpful in forecasting which populations HIV rates are likely to increase. Syphilis and gonorrhea are the two STDs examined in this section. The following measures of risk behavior are assessed for Ohio to provide information about behaviors associated with acquiring or transmitting HIV infection:

- Persons with HIV and a previous STD diagnosis (history of syphilis or gonorrhea)
- Persons with HIV and a later STD diagnosis (co-infection with syphilis or gonorrhea)

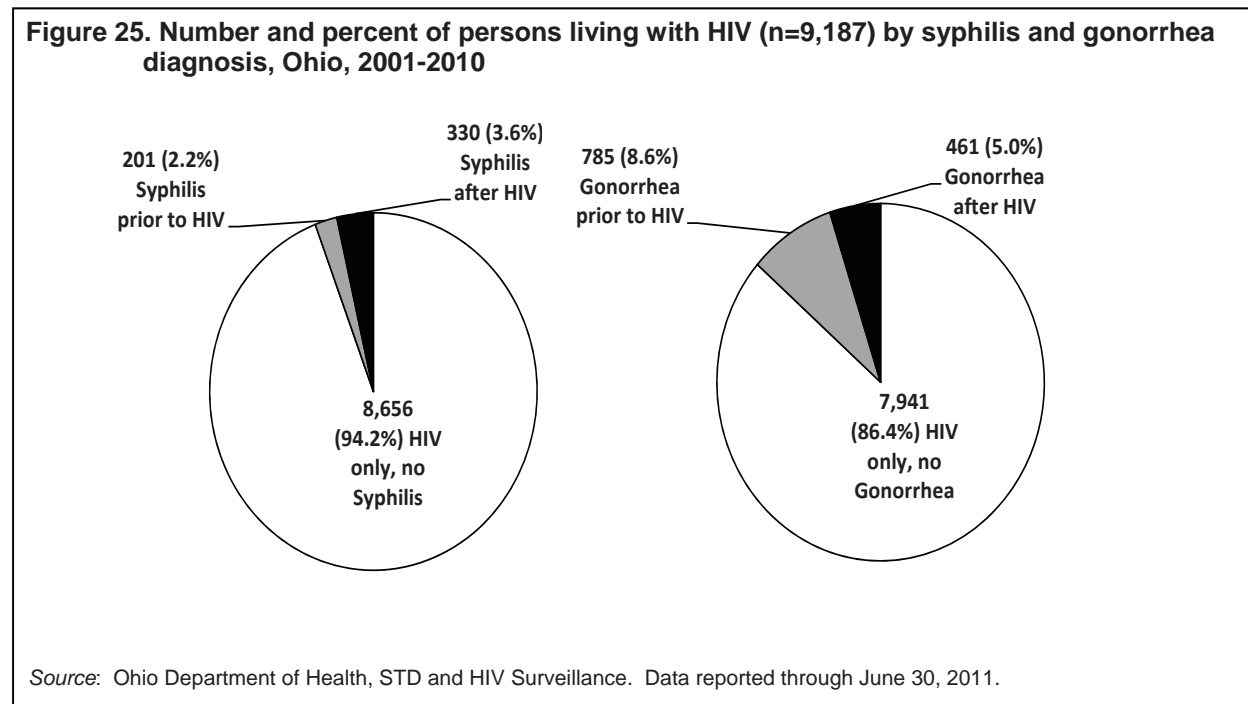


⁷ Centers for Disease Control and Prevention. 2007. The role of STD prevention and treatment in HIV prevention. Fact Sheet: CS115145.

⁸ Ibid.

The ODH HIV/AIDS Surveillance Program retrospectively assessed all Ohio reports of syphilis, gonorrhea and HIV infections reported among persons 13 years of age and older during the 10-years between January 1, 2001 and December 31, 2010. A history of syphilis or gonorrhea in persons living with a diagnosis of HIV infection was determined based on the earliest syphilis or gonorrhea diagnosis, whereas HIV co-infection with syphilis or gonorrhea was determined based on the most recent syphilis or gonorrhea diagnosis. There were 5,683 persons with at least one syphilis diagnosis and 152,988 persons with at least one gonorrhea diagnosis. Approximately 19 percent of persons living with a diagnosis of HIV had a previous, concurrent or later syphilis and/or gonococcal infection reported (**Figure 24**).

HIV and a Previous STD Diagnosis (History of Syphilis or Gonorrhea)



Of the 9,187 persons known to be living with a diagnosis of HIV infection during the 10-year study period, 201 (2.2 percent) reported a previous syphilis infection and 785 (8.6 percent) reported a previous gonococcal infection (Figure 13). Based on this study, a person in Ohio with a reported history of syphilis was 2.2 times more likely to be living with HIV compared to a person living with a diagnosis of HIV infection in Ohio with no reported history of syphilis (Odds ratio [OR]: 2.2; 95 percent confidence interval [CI]: 1.9-2.5). Likewise, a person in Ohio with a reported history of gonorrhea was 4.2 times more likely to be living with HIV compared to a person living with a diagnosis of HIV infection in Ohio with no reported history of gonorrhea (OR: 4.2; 95 percent CI: 3.9-4.5) (**Figure 25**).

HIV and a Later STD (Co-infection with Syphilis or Gonorrhea)

Table 22. Persons living with a diagnosis of HIV infection and persons co-infected with HIV and Syphilis or Gonorrhea, by selected characteristics, Ohio, 2001-2010

Characteristic	Living with a diagnosis of HIV infection		Living with a diagnosis of HIV infection & Syphilis		Living with a diagnosis of HIV infection & Gonorrhea	
	No.	%	No.	%	No.	%
Sex						
Males	7243	79%	367	97%	463	81%
Females	1944	21%	10	3%	108	19%
Age as of 12/10						
<13	52	1%	-	-	-	-
13-14	13	<1%	-	-	1	<1%
15-19	77	1%	13	3%	44	8%
20-24	660	7%	68	18%	104	18%
25-29	1076	12%	55	15%	95	17%
30-34	1152	13%	57	15%	71	12%
35-39	1181	13%	67	18%	89	16%
40-44	1487	16%	60	16%	87	15%
45-49	1437	16%	28	7%	35	6%
50-54	1007	11%	19	5%	31	5%
55-64	868	9%	9	2%	12	2%
65+	177	2%	1	<1%	2	<1%
Race/Sex						
White, not Hispanic Males	3668	40%	218	58%	192	34%
White, not Hispanic Females	561	6%	5	1%	24	4%
Black/African American, not Hispanic Males	3095	34%	130	34%	248	43%
Black/African American, not Hispanic Females	1241	14%	5	1%	77	13%
Hispanic/Latino Males	330	4%	8	2%	20	4%
Hispanic/Latina Females	108	1%	-	-	4	1%
Other/Unknown*	184	1%	11	3%	6	1%
Total	9187		377		571	

Notes: Living with a diagnosis of HIV infection alone, with Syphilis, or with Gonorrhea represents all persons diagnosed and reported in Ohio from January 1, 2001 through December 31, 2010 who have not been reported as having died as of December 31, 2010.

*Other/Unknown includes males and females who are Asian/Pacific Islanders, American Indian/Alaska Natives or persons with missing race/sex information.

Source: Ohio Department of Health HIV/AIDS and STD Surveillance Programs. HIV/AIDS Surveillance data reported through June 30, 2011.

The proportion of co-infections varied for persons living with a diagnosis of HIV infection by sex, age and race/ethnicity during the 10-year study period. Persons living with a diagnosis of HIV infection and syphilis were almost exclusively male (97 percent). Persons co-infected with HIV and syphilis or gonorrhea were younger compared to persons living with a diagnosis of HIV infection alone. The greatest proportion of persons living with only a diagnosis of HIV infection was in the 40-49 year age group (32 percent). The greatest proportions of persons co-infected with HIV and syphilis were in the 35-39 year age group (18 percent) and the 20-24 year old age

group (18 percent). The greatest proportion of persons co-infected with HIV and gonorrhea was in the 20-29 year age group (36 percent).

White and black/African American males make up the greatest proportions of persons living with only a diagnosis of HIV infection (40 percent and 34 percent, respectively) and persons co-infected with HIV and syphilis (58 percent and 34 percent, respectively). The greatest proportion of persons co-infected with HIV and gonorrhea were black/African American males (44 percent), white males (34 percent) and black/African American females (13 percent) (**Table 22**).

Table 23. Persons living with a diagnosis of HIV infection and persons co-infected with HIV and syphilis or gonorrhea, by transmission category, Ohio, 2001-2010

Transmission Category	Living with a diagnosis of HIV infection		Living with a diagnosis of HIV infection & Syphilis		Living with a diagnosis of HIV infection & Gonorrhea	
	No.	%	No.	%	No.	%
Male adult or adolescent						
Male-to-male sexual contact	4696	65%	329	90%	343	74%
Injection drug use (IDU)	210	3%	2	<1%	14	3%
Male-to-male sexual contact and IDU	188	2%	12	3%	10	2%
Heterosexual contact	695	10%	6	2%	36	8%
Missing/Unknown	1454	20%	18	5%	60	13%
Subtotal	7243	100%	367	100%	463	100%
Female adult or adolescent						
Injection drug use	144	7%	2	20%	10	9%
Heterosexual contact	1140	59%	6	60%	72	67%
Missing/Unknown	660	34%	2	20%	26	24%
Subtotal	1944	100%	10	100%	108	100%
Total	9187		377		571	

Notes: Living with a diagnosis of HIV infection alone, with Syphilis, or with Gonorrhea represents all persons diagnosed and reported in Ohio from January 1, 2001 through December 31, 2010 who have not been reported as having died as of December 31, 2010.

Source: Ohio Department of Health HIV/AIDS and STD Surveillance Programs. HIV/AIDS Surveillance data reported through June 30, 2011.

The proportion of co-infections also varied for persons living with a diagnosis of HIV infection by transmission category during the 10-year study period. The majority of males living with a diagnosis of HIV infection were MSM (65 percent). An even greater majority of males co-infected with HIV and syphilis (90 percent) or gonorrhea (74 percent) were MSM. The missing/unknown mode of transmission was a significant proportion of males living with a diagnosis of HIV infection (20 percent) and co-infected with HIV and gonorrhea (13 percent).

The greatest proportion of females living with a diagnosis of HIV infection had heterosexual contact as their mode of transmission (59 percent). Proportions were similar for females co-infected with HIV and syphilis (60 percent) or gonorrhea (67 percent). Females co-infected with HIV and syphilis (20 percent) or gonorrhea (9 percent) had a greater proportion of IDU in comparison to females living with a diagnosis of HIV infection (7 percent). Data for females should be interpreted with caution due to the proportion with missing/unknown mode of transmission and small numbers (**Table 23**).

HIV Testing

HIV testing patterns provide information that is helpful in assessing HIV counseling and testing programs. HIV testing data are available from population-based surveys conducted in the general population via the Behavioral Risk Factor Surveillance System (BRFSS) and from publicly funded HIV counseling and testing sites in Ohio who submit data to the Ohio Department of Health HIV Prevention Program.

Table 24. HIV testing in the general population, Behavioral Risk Factor Surveillance System, Ohio, 2014

(n=13,157)	Ever tested, %	Tested, past 12 months
	Total ^a	Total ^a
Overall	34.5%	7.1%
Sex		
Male	31.5%	6.5%
Female	37.4%	7.7%
Age groups		
18-24	24.7%	9.6%
25-34	46.2%	12.9%
35-44	44.2%	6.6%
45-54	27.3%	4.7%
55-64	19.7%	2.1%
Race/ethnicity		
White, not Hispanic	30.0%	5.0%
Black, not Hispanic	52.6%	16.0%
Hispanic	45.5%	N/A

^aIncludes persons aged 18 to 64 years.

N/A - Reliability for reporting does not meet CDC criteria.

Source: Ohio Department of Health, BRFSS Data, 2014.

More than a third (34.5 percent) of Ohioans surveyed in BRFSS in 2014 reported having ever been tested for HIV. Females (37.4 percent) were more likely to report having ever been tested compared to males (31.5 percent) for HIV. Almost half (46.2 percent) of persons surveyed in the 25 to 34 year-old age group indicated having ever been tested for HIV. Blacks/African American (52.6 percent) and Hispanics (45.5 percent) were more likely to report having ever been tested for HIV when compared to whites (30.0 percent). Only seven percent of the persons surveyed in 2014 reported an HIV test during the past 12 months. The patterns for persons testing for HIV during the past 12 months were similar to the patterns for persons ever tested for HIV. More females (7.7 percent) reported testing during the past 12 months compared to males (6.5 percent). In addition, more persons 25-34 years of age (12.9 percent) reported testing in the past 12 months compared to other age groups and blacks/African Americans (16.0 percent) were more likely to report testing during the past 12 months compared to all other race/ethnicity groups (Table 24).

Survey respondents in the 2014 BRFSS indicated testing most recently at a private physician's office or a health maintenance organization (HMO) (45 percent). The second most common location was a clinic or counseling, testing and referral (CTR) site (23 percent) (data not shown).

HIV Testing at Publicly Funded Counseling, Testing and Referral (CTR) Sites

Table 25. HIV counseling, testing and referral site data by demographics and type of test, Ohio, 2014

Demographic Characteristics and Type of HIV Testing	Total Tests		Positive Tests		Percent Positive
	No.	%	No.	%	
Sex					
Male	36,786	57.5%	407	87%	1.1%
Female	27,061	42.3%	58	12%	0.2%
Transgender/Unknown	102	0.2%	1	0%	1.0%
Age					
<13	761	1.2%	0	0%	0.0%
13-19	8,287	13.0%	30	6%	0.4%
20-24	15,119	23.6%	138	30%	0.9%
25-29	11,848	18.5%	105	23%	0.9%
30-34	8,182	12.8%	50	11%	0.6%
35-44	9,380	14.7%	64	14%	0.7%
45-54	6,306	9.9%	49	11%	0.8%
55-64	3,207	5.0%	23	5%	0.7%
65+	859	1.3%	7	2%	0.8%
Race/Ethnicity					
White	26,456	41.4%	140	30%	0.5%
Black/African American	32,158	50.3%	294	63%	0.9%
Hispanic/Latino	3,647	5.7%	23	5%	0.6%
Other/Unknown	5,240	8.2%	32	7%	0.6%
Exposure Category					
Male/Male Sex & Injection Drug Use (IDU)	217	0.3%	10	2%	4.6%
Male/Male Sex	7,993	12.5%	278	60%	3.5%
IDU	3,497	5.5%	9	2%	0.3%
Heterosexual Contact	38,164	59.7%	91	20%	0.2%
Transgender Sexual Contact	228	0.4%	5	1%	2.2%
Unknown	12,918	20.2%	73	16%	0.6%
Total	63,949	100%	466	100%	0.7%

Source: Ohio Department of Health HIV Prevention Program, 2015.

Ohio has more than 500 publicly funded HIV CTR sites. In 2014, 57.5 percent of HIV tests administered at public CTR sites were provided for males, 42.3 percent for females, 50.3 percent for blacks/African Americans, 41.4 percent for whites and 23.6 percent for persons 20-24 years of age (**Table 25**). CTR records do not contain individual identifying information and records of repeat visits by the same client cannot be linked. Therefore, data from the CTR system represent the number of tests rather than number of persons tested.

Ohio Linkage to Care

Definition

The Centers for Disease Control and Prevention (CDC) defines linkage to care using reported CD4 and viral load (VL) lab results as a proxy measure to assess whether or not a person diagnosed with an HIV infection was linked to care early in their HIV diagnosis. While CDC defines linkage to care as ≥ 1 CD4 and/or VL ≤ 3 months following initial diagnosis, these lab results are examined at specific time intervals (3 months, 6 months, and 12 months) in order to illustrate progress on linkage to care over the first year of a person's diagnosis.

Completeness of Lab Results Reporting

Completeness of CD4 and VL lab results reporting is a key factor impacting the accuracy of linkage to care estimates which rely exclusively on these two lab tests as proxy measures of whether or not a person has received care following their initial HIV diagnosis. While Ohio's HIV disease reporting rules have required the reporting of CD4 and viral load results for persons diagnosed with an HIV infection since 2003, only those result values that met CDC's HIV surveillance case definition were mandated as reportable to public health. A statewide effort to improve the completeness of Ohio's reported CD4 and VL data went into effect July 1, 2014. As of this date, Ohio Administrative Code 3701-3-12 was revised to require laboratories to report all CD4 and viral load values for persons with a diagnosed HIV infection in Ohio. It is essential to understand completeness of reporting not only factors in the reporting of the actual lab result values (e.g. CD4 count/percentage and/or viral load copies per mL) to public health, but also the reporting of the complete specimen collection date the lab were drawn. Completeness of lab reporting varies by laboratory facility.

Calculation

To estimate on a population level the proportion of persons newly diagnosed with an HIV infection linked to care following their HIV diagnosis, two data points are required:

Numerator = All persons newly diagnosed and reported with an HIV infection in Ohio with ≥ 1 CD4 and/or VL ≤ 3 months following initial diagnosis.

Denominator = All persons newly diagnosed and reported with an HIV infection in Ohio in a calendar year.

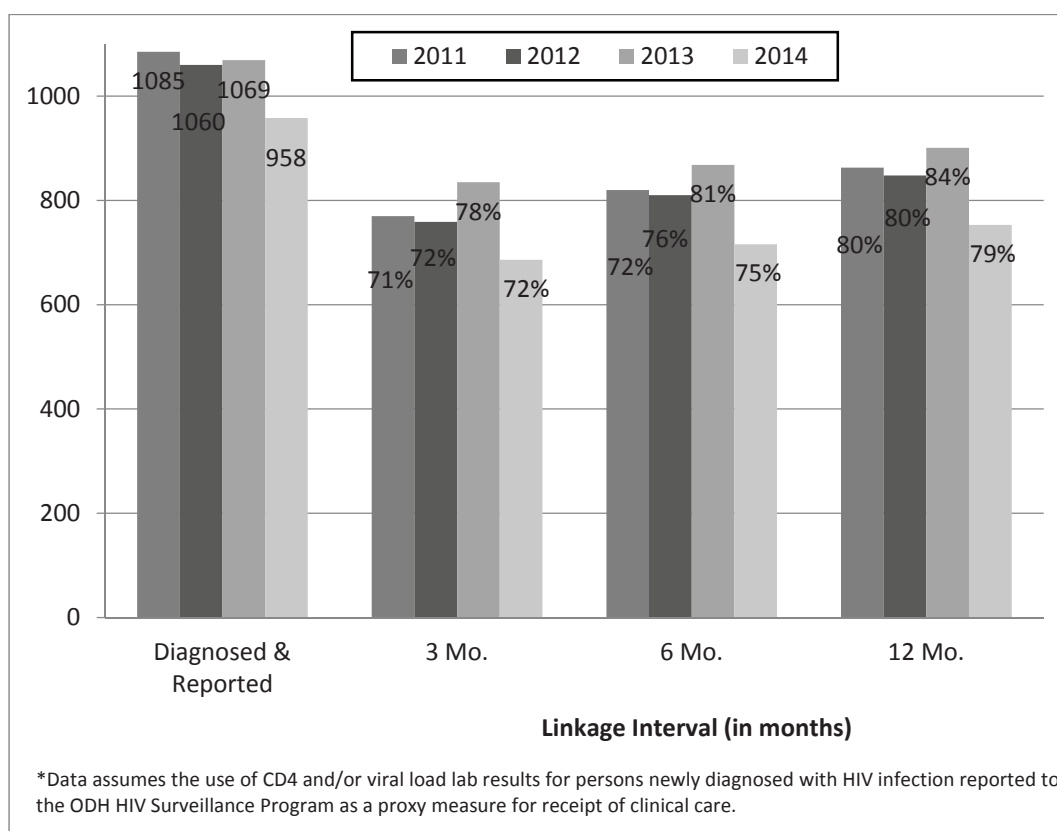
Analysis

CDC provided all funded U.S. state and territorial HIV case surveillance programs with a Statistical Analysis Software (SAS) program to assist in assessing linkage to care estimates using HIV surveillance data. The analytical program provides only state-level estimates of linkage to care. Ohio's estimates were produced using the CDC created analytical program and Ohio's final HIV surveillance datasets for 2011-2014. Analyses performed compare the date of initial HIV diagnosis against the date a blood specimen was drawn to evaluate CD4 and/or viral load status as determined by the laboratory performing the testing.

Results

When using CD4 and VL lab results reported as a proxy for receiving medical care after initial HIV diagnosis, the following estimates of the proportion of the 1,085 persons newly diagnosed and reported with an HIV infection in Ohio linked to care in 2011 reveals: an estimated 71 percent were linked within 3 months following diagnosis; 76 percent were linked within 6 months following diagnosis; and 80 percent were linked within 12 months following diagnosis (Figure 26). These proportions continued to increase at each time interval linkage to care was estimated in 2012-2013. In 2014, there was a decline in the estimated proportion of persons newly diagnosed with an HIV infection in Ohio were linked to care within 3 months of their diagnosis when using CD4 and VL lab results reported as a proxy for being in care.

Figure 26. Linkage to Care Estimates, Ohio, 2011-2014



Limitations

There are several limitations that must be factored in when using HIV surveillance data as a proxy measure of whether or not a person is in care. These include the following:

- Linkage looks only at newly diagnosed persons and not all persons living with an HIV infection (i.e. prevalence).
- Linkage uses reportable laboratory results as a proxy of whether persons newly diagnosed with HIV infection received initial medical care for their HIV infection.
- Results include only persons consenting to confidential (i.e. named) testing and do not include persons newly diagnosed through anonymous testing.

- Results do not factor in persons who may be infected but have not sought testing to learn their HIV diagnostic status (i.e. persons undiagnosed).
- Results do not factor in underreporting of cases by health care providers/facilities.
- Using reportable laboratory results does not account for the variation and/or frequency in which physicians and/or other health care providers routinely monitor their patients' immune status and efficacy of treatment.
- Lack of complete CD4 and/or viral load reporting impacts accuracy of linkage estimates.
- Lags in reporting CD4 and/or viral load reporting impacts accuracy of linkage estimates.
- Results should be interpreted with caution as the estimates of linkage to care in Ohio were based upon CD4 reporting completeness that ranged from 53%-58%, and viral load reporting completeness that ranged from 64%-71%.

Summary

The proportion of persons newly diagnosed with an HIV infection in Ohio who were linked to care from 2011-2013 increased, with a slight decline in 2014. A person was considered linked to care if one or more CD4 or viral load results were reported within three months of initial HIV diagnosis. In addition to treating persons with HIV infection, antiretroviral therapy (ART) medications are used to prevent HIV infection. Linkage to care following a positive HIV test result ensures persons living with HIV infection receive life-saving medical care and treatment, and helps reduce the risk of transmitting HIV (underscoring the importance of HIV testing and linkage to care). While no U.S. state or territory has the capacity or resources to collect ART on all prevalent HIV cases in their population, a study conducted by Cohen et. al. with the National Institutes of Health examined persons living with a diagnosed HIV infection and the time at which ART was initiated after HIV diagnosed. The study found those who began ART before their immune systems are significantly weakened experienced a 96 percent reduction in their risk of transmitting HIV to their sexual partners.⁹

⁹ Cohen MS, Chen YQ, McCakuley M, et al. Prevention of HIV-1 infection with antiretroviral therapy. The HPTN 052 Study Team. *N Engl J Med* 2011. DOI: 10. 1056/nejmoa1105243.