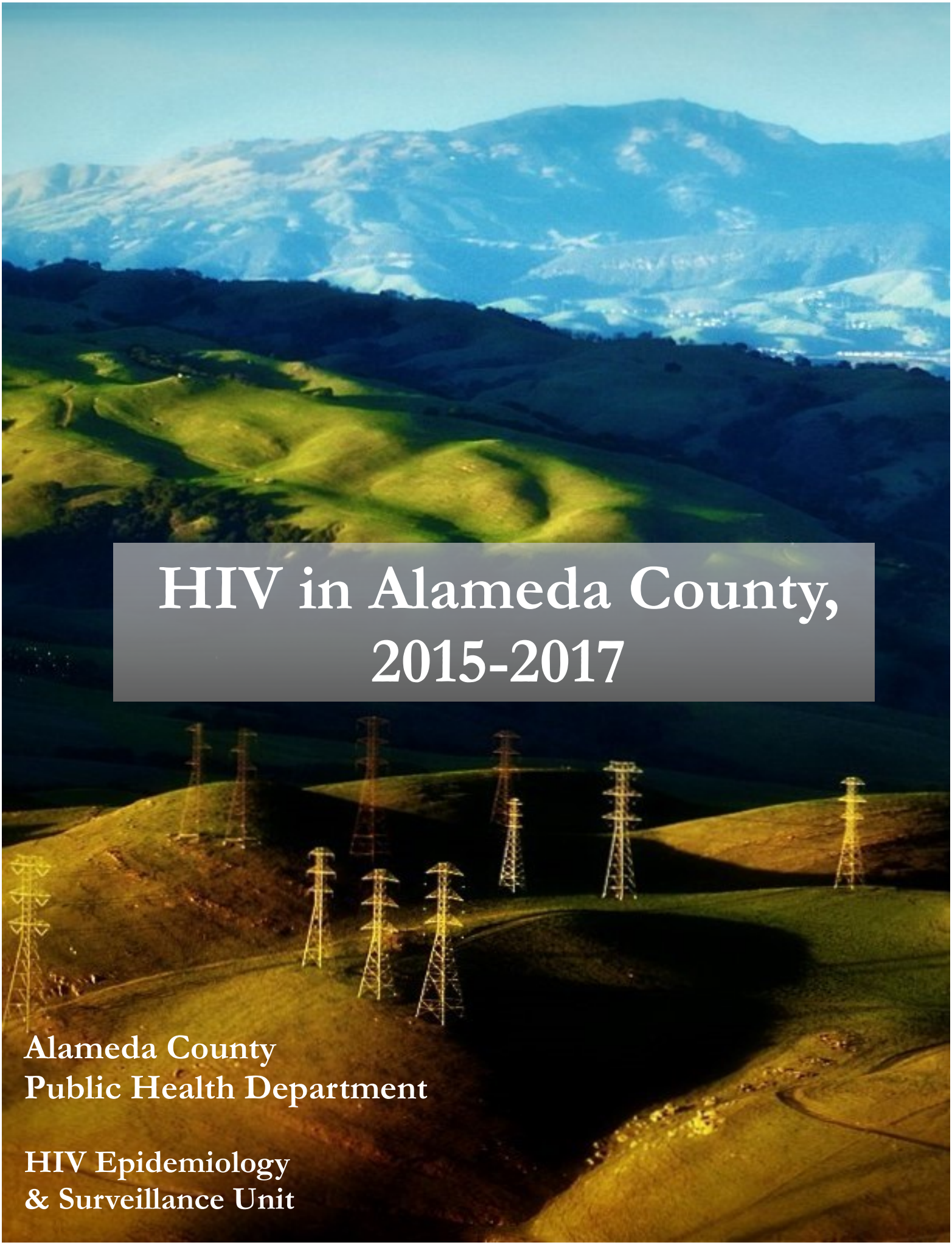

HIV in Alameda County, 2015-2017

Alameda County
Public Health Department

HIV Epidemiology
& Surveillance Unit

HIV in Alameda County, 2015-2017

December 2018

HIV Epidemiology and Surveillance Unit

HIV STD Section

Division of Communicable Disease Control and Prevention

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Acknowledgements

This report was produced by the HIV Epidemiology and Surveillance Unit. Daniel Allgeier, MPH; Elisabeth Gebreegziabher, MPH; and Joyce Ycasas, MPH conducted data analysis. Overall guidance on analysis and content as well as editorial review were provided by Neena Murgai, PhD, MPH. Robert Brown, MPH, Nicholas Moss, MD, MPH and all authors reviewed and provided valuable input for this report. Case investigation, data collection, and data management were conducted by the HIV Surveillance Team: Jesus Altamirano, George Banks, Oliver Heitkamp, and Maria Hernandez.

This report is available online at `http://www.acphd.org/data-reports/reports-by-topic/communicable-disease.aspx#HIV`.

Suggested citation for this report:
Alameda County Public Health Department. HIV in Alameda County, 2015-2017. http://www.acphd.org/data-reports/reports-by-topic/hivaids.aspx. Published December 2018. Accessed [date].

Contents

List of Figures

List of Tables

1 Background

Overview of this Report

This report is based on human immunodeficiency virus (HIV) case surveillance in Alameda County. It summarizes data on HIV in five chapters as described below.

1. New Diagnoses: This chapter describes patterns of HIV diagnosis in Alameda County, characterizing those who were recently diagnosed according to demographic factors, risk factors and stage of disease.
2. People Living with HIV: This chapter describes the characteristics of all people known to be living with HIV disease (PLHIV) in Alameda County. This chapter describes the total burden of HIV disease in the county and how it varies by demographic factors as well as by geography. It also describes changes in mortality rates (deaths) over time among those ever diagnosed with Acquired Immune Deficiency Syndrome (AIDS).
3. The Continuum of HIV Care: This chapter presents the continuum of HIV care in Alameda County. Modern medical treatments for HIV can halt the progression of the disease and prevent its spread, but not all persons living with HIV receive effective treatment. The continuum of HIV care (also known as the "HIV care cascade") is a framework that presents different indicators of engagement in HIV care among PLHIV, including linkage to care, retention in care, and viral suppression.
4. HIV Among Foreign-born Persons: This chapter describes a profile of HIV - new diagnoses, people living with HIV, and the HIV care continuum among foreign-born persons.
5. Persons Co-infected with HIV and Sexually Transmitted Diseases: This chapter describes selected characteristics of PLHIV in Alameda County who were co-infected with chlamydia, gonorrhea, or early syphilis.

HIV/AIDS

HIV attacks the immune system, weakening it over time such that people living with HIV become increasingly susceptible to opportunistic infections and other medical conditions. The most advanced stage of infection, when the immune system is weakest, is called AIDS. Medical treatments can inhibit HIV's ability to replicate and greatly temper its effect, but the human body cannot clear HIV. HIV is typically transmitted through sex, contaminated needles, or spread from mother to fetus during pregnancy.

Definitions Used in this Report

Stages of HIV Infection

For surveillance purposes, HIV disease progression is classified into 4 stages from acute infection (Stage 0) to AIDS (Stage 3). In this report, we use "HIV" to refer to HIV disease at any stage (including Stage 3/AIDS) and AIDS to refer specifically to Stage 3 HIV disease. We use the acronym "PLHIV" to refer to all people living with HIV disease, regardless of stage.

Case Definition

All reported HIV cases must meet the Centers for Disease Control and Prevention (CDC) case definition based on laboratory or clinical criteria[6]. Clinical criteria include a medical provider diagnosis and evidence of HIV treatment, unexplained low CD4 count, or opportunistic infection. The full criteria may be found at `http://www.cdc.gov/mmwr/preview/mmwrhtml/rr6303a1.htm`.

Transmission Category

For surveillance purposes, each reported HIV case must be classified according to their risk factors for acquiring HIV. Cases with multiple risk factors are assigned a transmission category, the risk factor most likely to have resulted in HIV transmission according to a hierarchy developed by the CDC. In this context, "heterosexual contact" refers to sexual contact with a partner of the opposite sex with a known risk factor for HIV. In some cases, partners' risk factors are unknown, leaving some heterosexual cases without known HIV risk factors. Such cases are assigned to the "unknown" transmission category. The only exception is when a case's sex at birth is female and she reported sex with males, in which case she is presumed to have been infected through heterosexual contact in accordance with CDC-accepted guidance set by the Council of State and Territorial Epidemiologists[16].

Demographics

Demographic data in this report are based on investigations of medical records. Although the transgender community is highly impacted by HIV, data on current gender identity are not consistently or reliably captured in medical records. For this reason, all analyses are presented by sex assigned at birth, for which we use "sex" as shorthand.

Data from racial/ethnic groups in which there were very small numbers were combined for these analyses. Asians and Pacific Islanders are combined into a single category. American Indians, Alaskan Natives, and those identifying with multiple races are combined along with those of unknown race into another group ("Other/Unk"). In tables and charts, the category "Asians and Pacific Islanders" is abbreviated "API" and "African American" is abbreviated "AfrAmer".

In the chapter titled "HIV among Foreign-born Persons" the category labelled "African American" represents Blacks for the US-born and persons from Africa for the foreign-born. In addition, the terms "foreign-born" and "immigrant" are used interchangeably.

Geographic Area

Residential addresses are geocoded to census tract and city/census-designated place. Region and neighborhood boundaries established by the Alameda County Community Assessment, Planning, and Evaluation (CAPE) unit based on census tract aggregates are used. These geographic areas are shown in Figures 1.1 and 1.2.

Figure 1.1: Regions of Alameda County

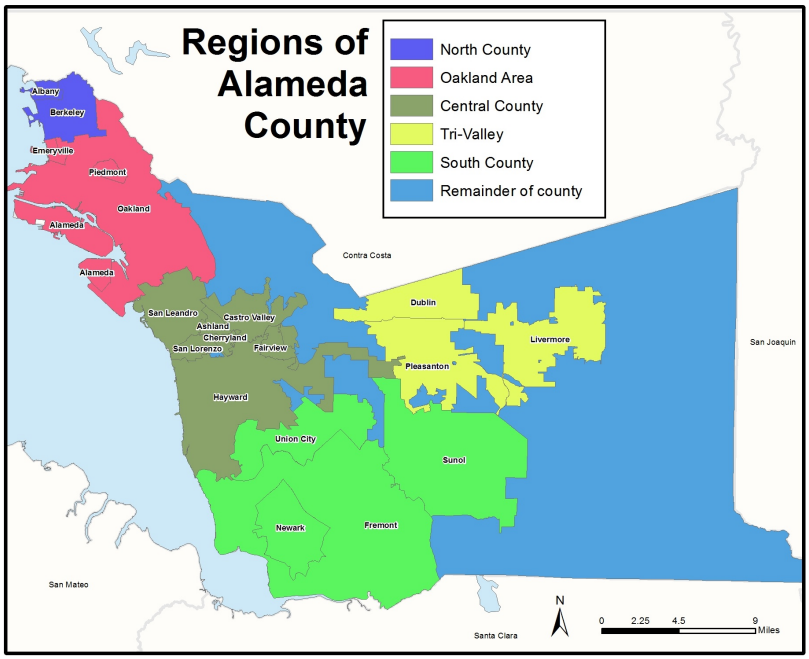
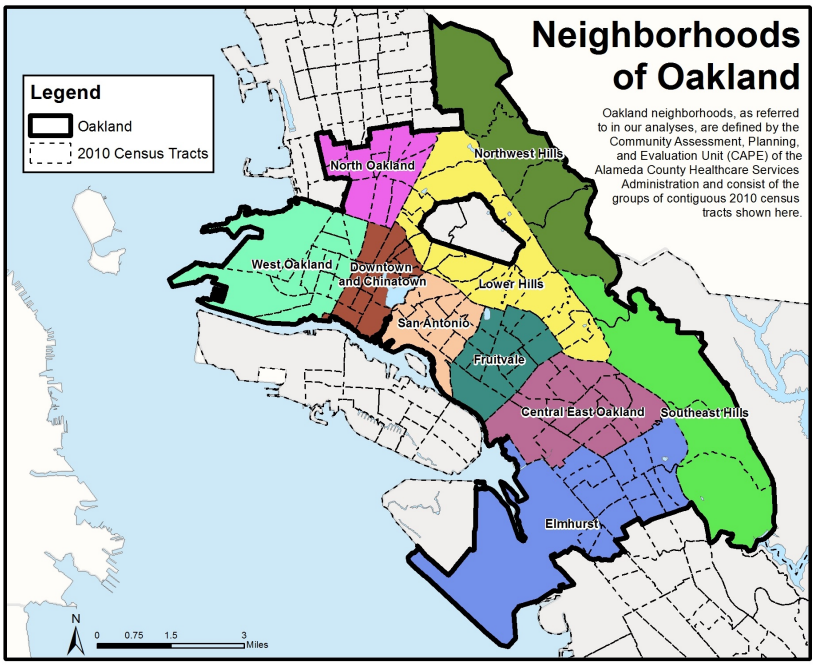


Figure 1.2: Neighborhoods in the City of Oakland



Other Conventions Used

Analyses that are broken out by subgroup (e.g., race/ethnicity) are presented along with the overall group total (e.g., all races) for comparison.

Where rates are presented, in most cases they are accompanied by error bars to convey their degree of statistical variability. These error bars depict 95% confidence intervals (a "margin of error") for the estimates. (In the case of trends, error bands formed by connecting the ends of these margins of error are shown.) Confidence intervals are also displayed in select subgroup analyses of indicators. Confidence intervals that do not overlap are considered "statistically significant" and generally represent true differences that are not attributed to chance alone, though it is still possible. Details regarding how these confidence intervals are calculated can be found in the technical notes (see "Calculation of Confidence Intervals" on page 80).

Tables showing detailed breakdowns of populations (e.g., new diagnoses, people living with HIV) for indicators (e.g., diagnosis rates, viral suppression) by demographic or other subgroup are included at the end of each chapter. Note that in each table the length of the green bar is proportional to the fraction of the total population in that subgroup. Additionally, estimates of each indicator and lines depicting 95% confidence intervals for the estimate are also shown for absolute comparisons between subgroups. Relative comparisons of subgroups (e.g., "Late diagnosis is three times as common in group A as it is in group B") may be made by comparing estimates, when shown. Unreliable estimates are not shown in tables, although their confidence intervals may be. Details on data suppression conventions used in this report can be found in the technical notes (see "Data Suppression Rules" on page 81).

Lastly, in order to protect privacy, case counts less than five are not presented in this report.

2 New Diagnoses

The Alameda County Public Health Department monitors the HIV epidemic through required reports of new diagnoses. Estimating the true incidence rate of new HIV transmissions is complex due to the variable time interval between when a person becomes infected and when their infection is diagnosed. However, surveillance data reliably describe all new HIV diagnoses and diagnosis rates. In 2017, there were an estimated 38,281 new diagnoses of HIV infection in the US for an overall diagnosis rate of 11.8 per 100,000 persons. Nationally rates were highest among males as compared to females (23.1 vs. 5.2 diagnoses per 100,000, respectively), those aged 20-24 or 25-29 (28.7 and 32.9 per 100,000, respectively), African Americans and Latinos (41.1 and 16.1 per 100,000), and in the South and Northeast (16.1 and 10.6 per 100,000). Men who have sex with men (MSM), including those that inject drugs, accounted for 69.9% of all infections, heterosexual contact accounted for 23.5%, and other modes of transmission accounted for the remaining 6.6% [8]. In California, there were an estimated 5,061 new diagnoses for an overall statewide rate of 12.9 diagnoses per 100,000 in 2016. The epidemiology of HIV in Alameda County largely mirrored that of the nation, with the exception that heterosexual contact is estimated to account for only 18% of all new diagnoses among Alameda County residents [4]. In Alameda County the average annual diagnosis rate calculated over the 3-year period of 2015-2017 was 15.2 diagnoses per 100,000.

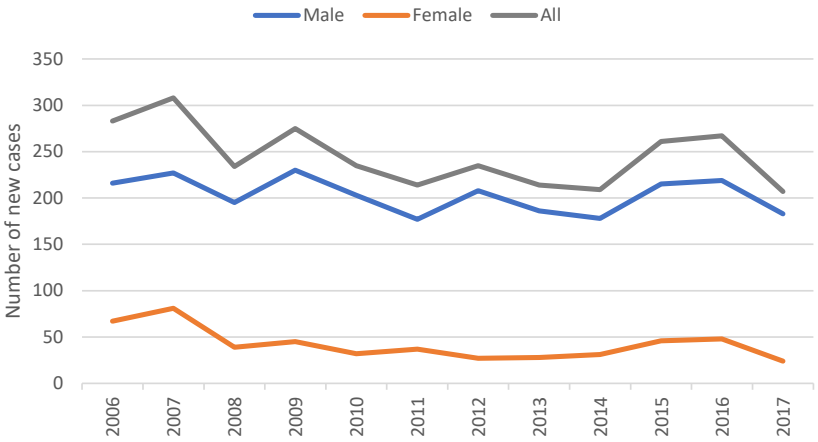
This chapter describes HIV in Alameda County by examining characteristics of new diagnoses, new diagnosis rates, and the timeliness of diagnoses by demographic characteristics. Data presented in this chapter are also summarized in Table 2.1. Detailed stratification of newly diagnosed cases from 2015 to 2017 by sex, age and race/ethnicity are provided in Tables 2.2 - 2.7 at the end of this chapter.

Characteristics of New Diagnoses

Since HIV became reportable by name in California in 2006, between 200 and 300 new cases of HIV disease have been reported each year among Alameda County residents. In 2017, there were 206 new diagnoses of HIV in the county.

In Alameda County, those newly diagnosed with HIV disease were overwhelmingly male. The proportion of new diagnoses that were among males increased steadily from 76.3% in 2006 to 88.5% in 2012, before decreasing over the subsequent four years to 82.9% in 2016. In 2017 the proportion increased to 88.4%.

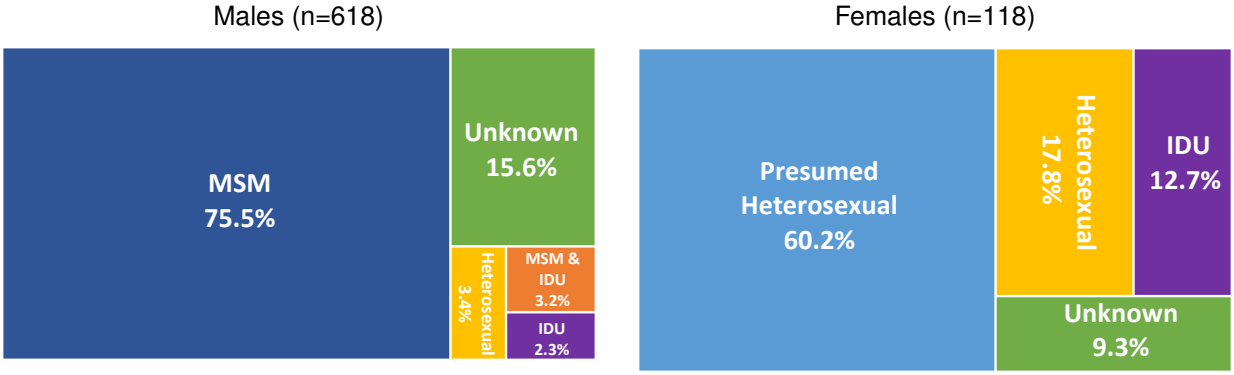
Figure 2.1: New Diagnoses by Sex, Alameda County, 2006-2017



NOTE: "Sex" here refers to sex assigned at birth.

Among the 618 men diagnosed with HIV from 2015 to 2017, the overwhelming majority were MSM. Nearly eight in ten (78%) newly diagnosed women were reported to or presumed to have acquired HIV by a heterosexual sex partner who had a documented HIV risk factor; most of the remaining women were infected through injection drug use (IDU).

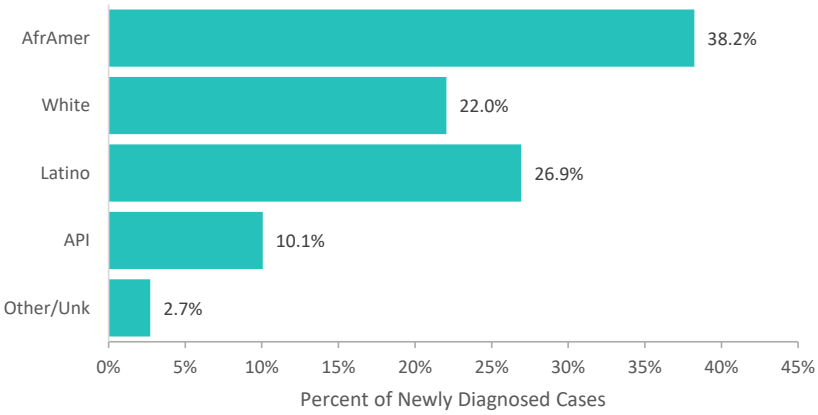
Figure 2.2: New Diagnoses by Sex and Mode of Transmission, Alameda County, 2015-2017



NOTE: "Sex" here refers to sex assigned at birth.

From 2015 to 2017, African Americans comprised the largest proportion (38.2%) of all new HIV diagnoses among all racial/ethnic groups. Whites and Latinos each comprised over a quarter and API 10.1% of new diagnoses.

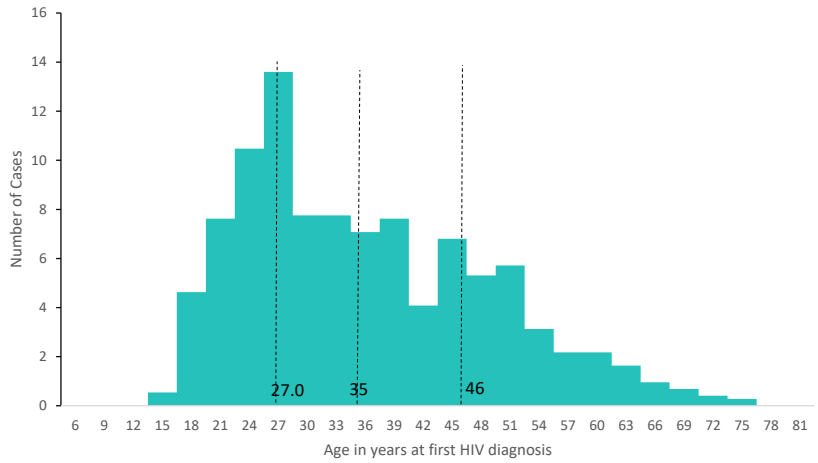
Figure 2.3: New Diagnoses by Race/Ethnicity, Alameda County, 2015-2017



NOTE: "Other/Unk" includes American Indians, Alaskan Natives, and those identifying with multiple racial categories as well as those for whom race/ethnicity could not be identified.

The median age among Alameda County residents diagnosed with HIV disease from 2015 to 2017 was 35 years and the mean age was 37 years. Most diagnoses were among those in their twenties to forties.

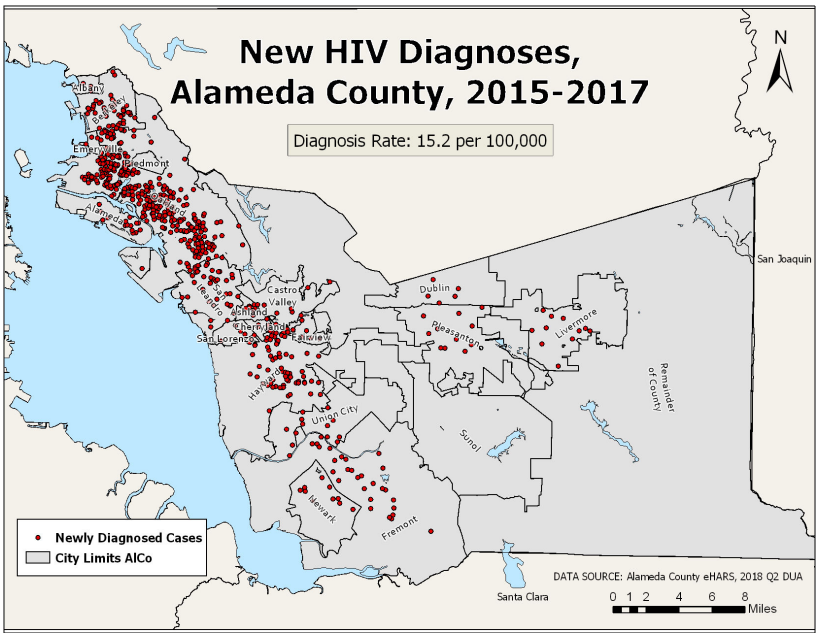
Figure 2.4: Age of New Diagnoses, Alameda County, 2015-2017



NOTE: The dashed lines indicate the 25th, 50th, and 75th percentile values for age among the new diagnoses.

New diagnoses of HIV were most concentrated in the Oakland area and central county regions (as defined in Figure 1.1 on page 3).

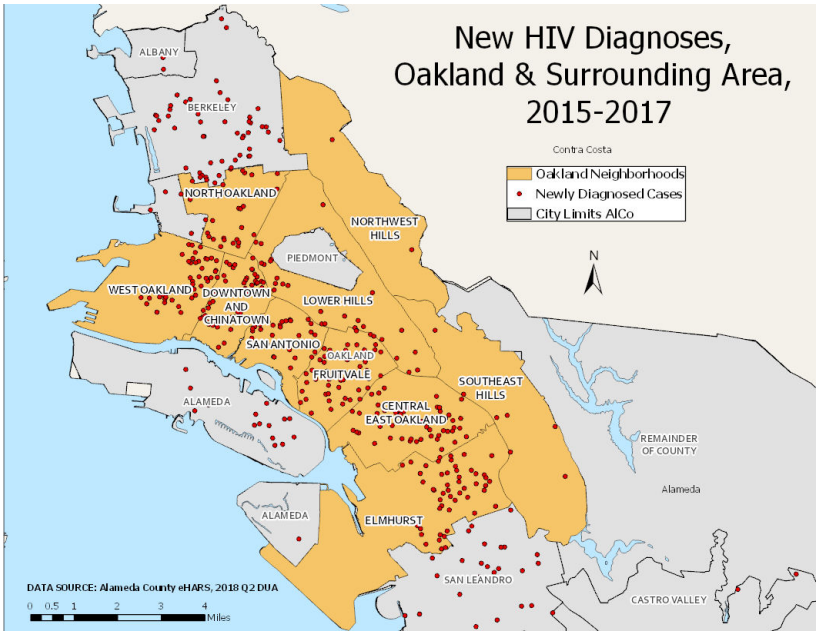
Figure 2.5: Geographic Distribution of New HIV Cases by Residence at HIV Diagnosis, Alameda County, 2015-2017



NOTE: N=690; an additional 45 diagnoses (6.12% of all) are not represented due to incomplete street address.

Within the Oakland area, new diagnoses were less concentrated in the Oakland hills (Northwest Hills, Southeast Hills, and Lower Hills neighborhoods) than in the rest of the region.

Figure 2.6: Residence at HIV Diagnosis, Oakland and Surrounding Area, 2015-2017



Diagnosis Rates

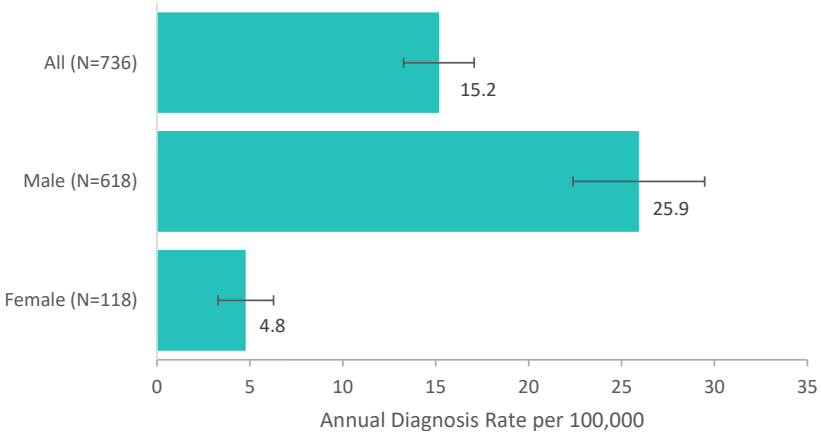
This section examines trends in HIV diagnosis rates. Diagnosis rates are not equivalent to true HIV incidence rates. Trends in diagnosis rates *may* reflect changes in HIV incidence over time, but may also reflect changes in HIV testing practices. For example, HIV incidence could decrease while HIV diagnosis rates increase if more HIV-unaware persons are tested and diagnosed.

Due to the relatively small numbers of diagnoses occurring in Alameda County in any given year, annual diagnosis rates are statistically unstable. We performed statistical analyses to identify trends that are least likely to reflect *random* year-to-year variability. *Apparent* trends do not indicate statistical significance unless specified in the caption.

From 2015 to 2017, there were 736 new HIV diagnoses in Alameda County for an average annual rate of 15.2 per 100,000 residents.

New diagnosis rates were over five times as high among males than among females between 2015 and 2017.

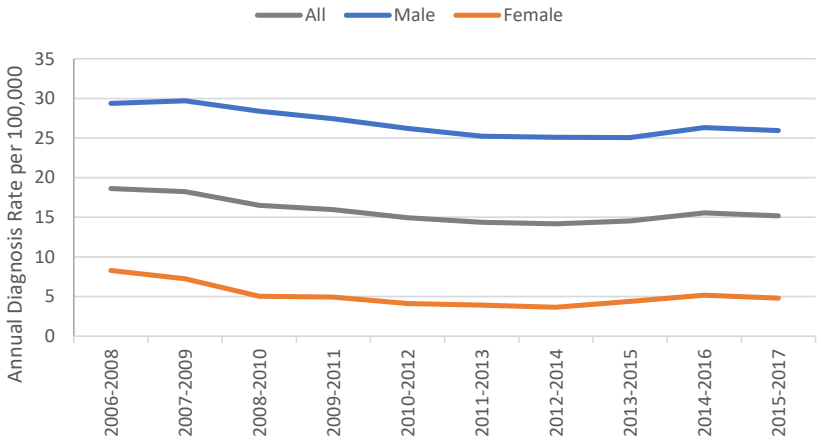
Figure 2.7: Rates of New Diagnoses by Sex, Alameda County, 2015-2017



NOTE: "Sex" here refers to sex assigned at birth.

HIV diagnosis rates declined steadily and significantly between 2006 and 2017, decreasing by an average of 2.9% annually overall and 2.0% annually among males. During the same period, rates among females dropped significantly by 7.3% annually. Rates were consistently higher in men between 2006 and 2017.

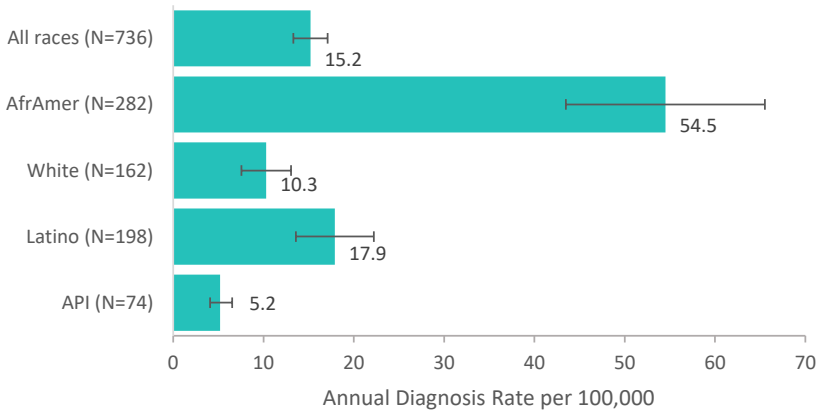
Figure 2.8: Trends in Rates of New Diagnoses by Sex, Alameda County, 2006-2017



NOTE: "Sex" here refers to sex assigned at birth.

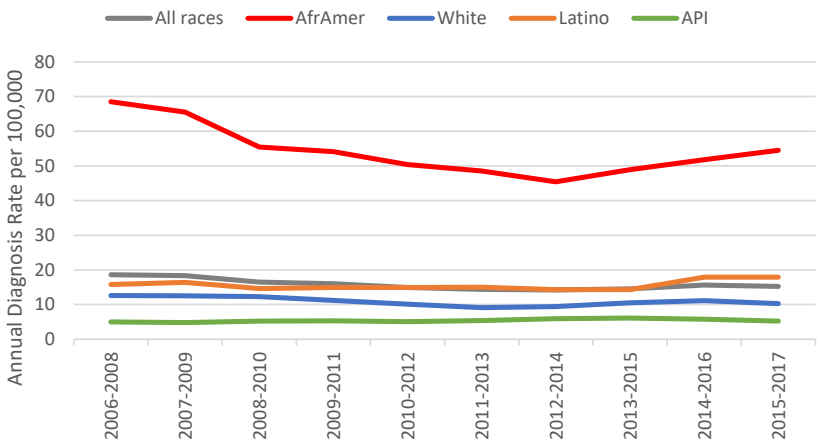
From 2015 to 2017, the highest diagnosis rate was among African Americans, which was almost three times as high as the second most impacted group, Latinos. The lowest diagnosis rate was seen among API.

Figure 2.9: Rates of New Diagnoses by Race/Ethnicity, Alameda County, 2015-2017



Diagnosis rates were relatively constant since 2006 in most racial/ethnic groups. However, the average annual decline in diagnosis rate of 3.4% among African Americans was statistically significant.

Figure 2.10: Trends in Rates of New Diagnoses by Race/Ethnicity, Alameda County, 2006-2017



The overall decline in the county-wide diagnosis rate since 2006 was driven largely by decreases in diagnoses among African Americans, and in particular, African American women, amongst whom rates decreased by 7.2% per year on average. Whereas there were 42.8 new diagnoses per 100,000 African American women in 2006-2008, that rate was 25.8 new diagnoses per 100,000 from 2015 to 2017. Rates also declined among Latino women, by an average 5.3% per year. Figure 2.11 shows the change in 3-year average diagnosis rate from the previous year among females. The years indicated along the X-axis represent the middle years of the 3-year periods for which diagnosis rate was calculated. For example, the average annual diagnosis rate among African American women between 2008 and 2010 (as indicated by the middle year 2009 on the X-axis) was 38% lower than the average annual diagnosis rate between 2007 and 2009. The 3-year periods centered on 2014 and 2015 show large increases in diagnosis rates for all females regardless of race/ethnicity, but the average annual rates centered on 2016 show decreases for all racial/ethnic groups save API.

Figure 2.11: Percent Change in 3-Year Average Annual Diagnosis Rate, Among Females, Alameda County, 2007-2016

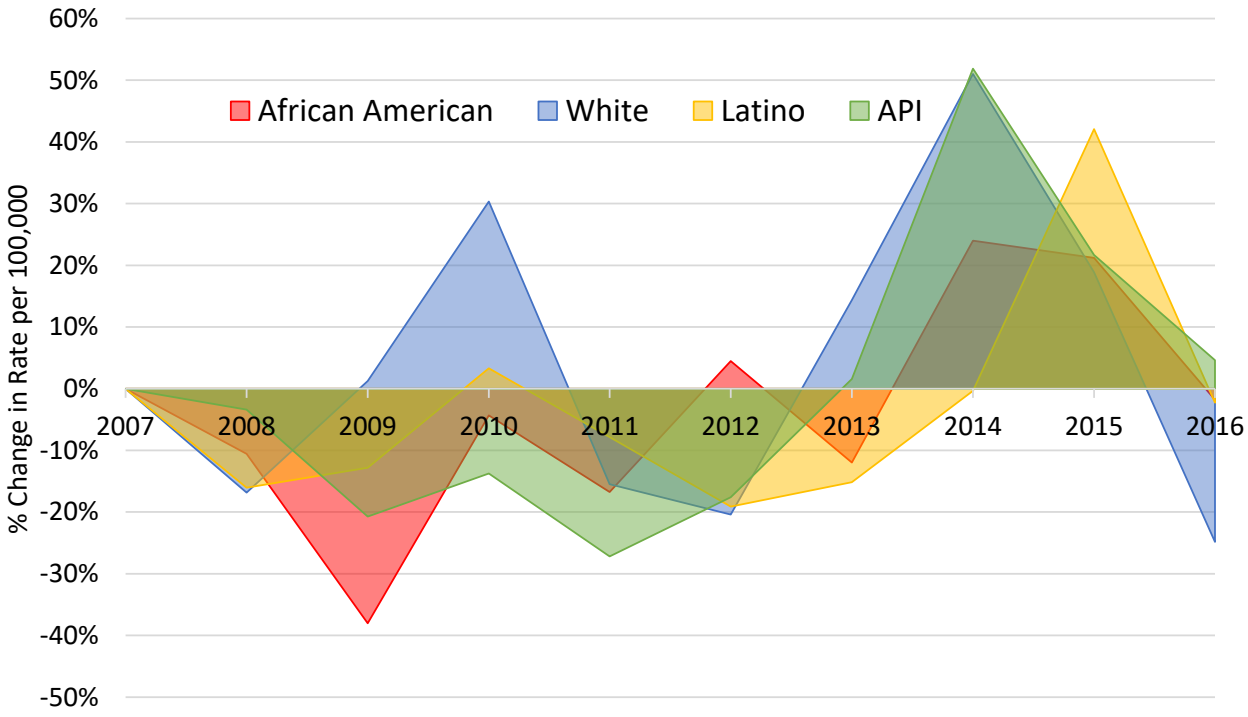
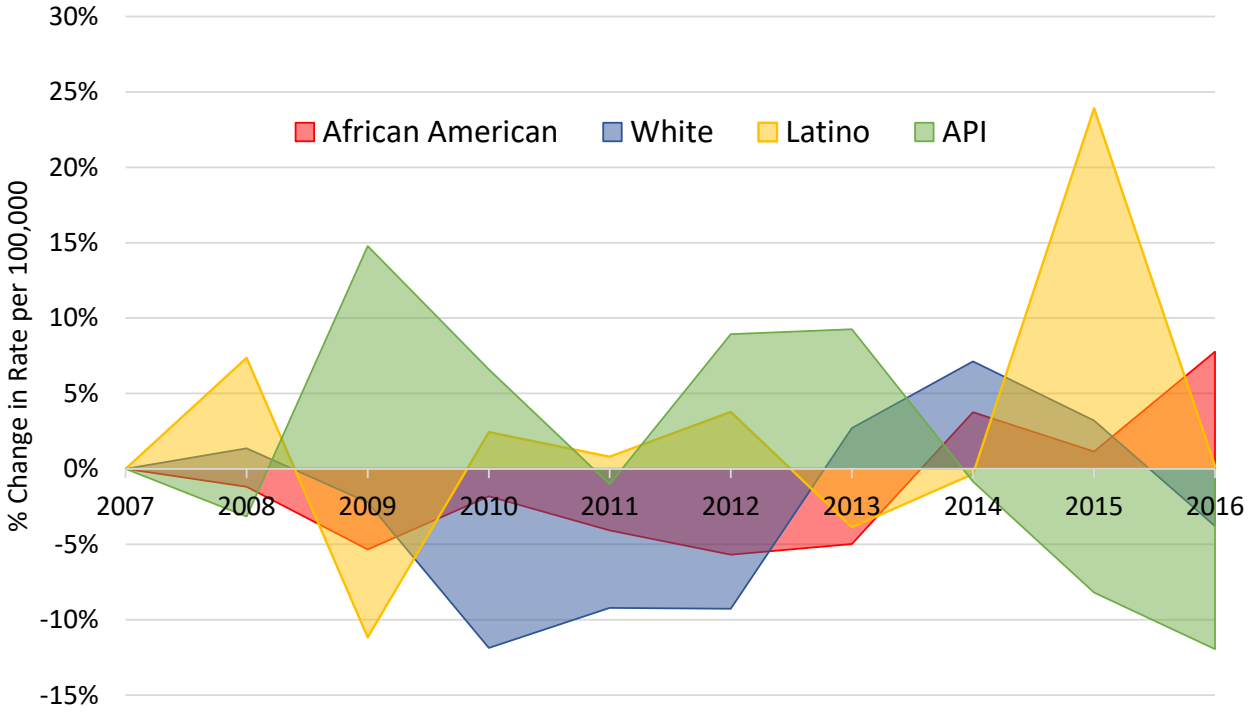


Figure 2.12: Percent Change in 3-Year Average Annual Diagnosis Rate, Among Males, Alameda County, 2007-2016



Among all males, the only significant trends were declines among African Americans of 2.0% per year and among whites of 3.6% on average. There was an increase in diagnosis rates in 2014-2016, especially among African American males, but it was not statistically significant. Of interest is the relative decline in diagnosis rates among male API from 2014 to 2016, a time period coinciding with large increases in diagnosis rates among female API (Figure 2.11).

From 2015 to 2017, new HIV diagnoses were most common among those in their twenties, thirties, and forties, with 36.4, 25.7, and 21.6 diagnoses per 100,000, respectively. New HIV diagnoses were somewhat less common among those in their fifties and least common among those at the extremes of the age spectrum (i.e., teens and those aged 60 & over).

Figure 2.13: Rates of New Diagnoses by Age, Alameda County, 2015-2017

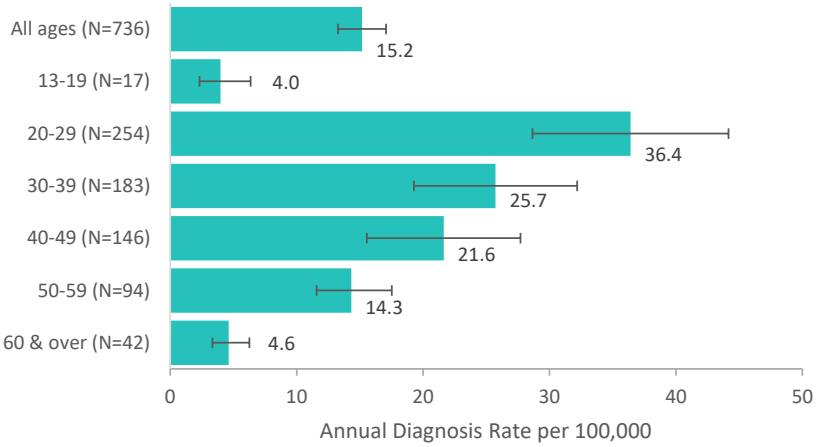
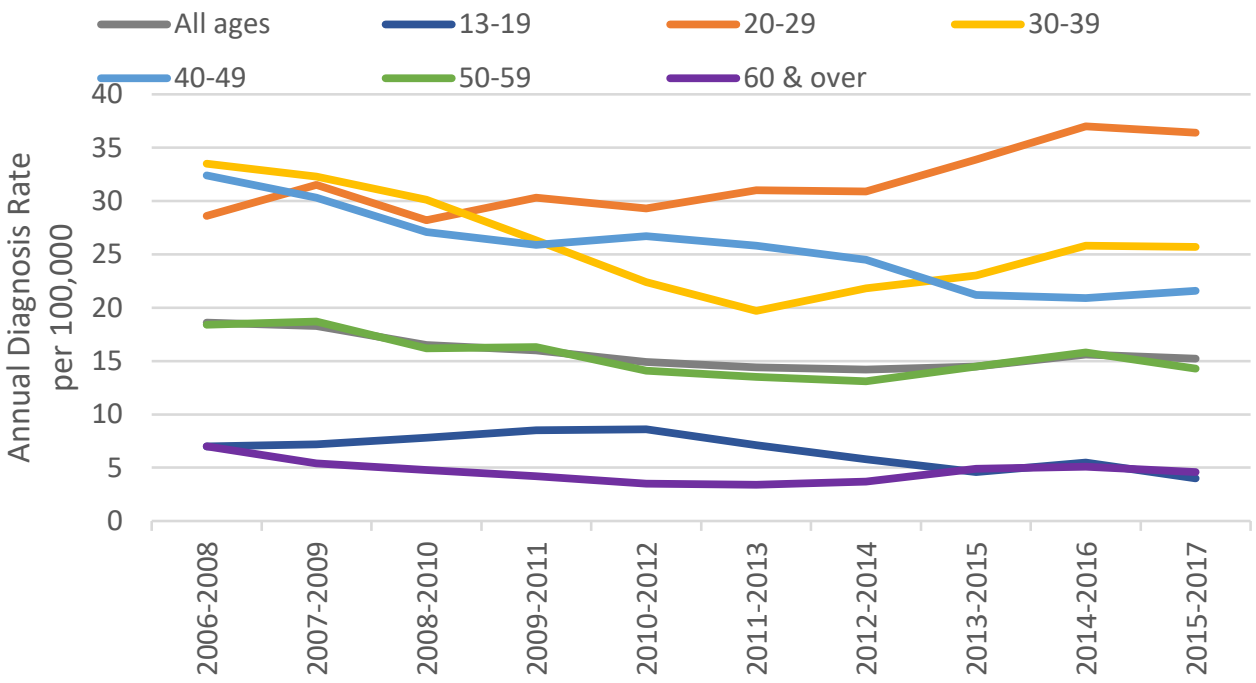


Figure 2.14: Trends in Rates of New Diagnoses by Age, Alameda County, 2006-2017



By age, diagnosis rates have decreased significantly at an average rate of 3.8% per year among those 30-39, 5.0% per year among those 40-49 and 3.8% per year among those 50 and older through 2017. While the rate among those 20-29 has increased since 2006, it was not a statistically significant trend.

Among African Americans, there were significant declines in diagnosis rates between 2006 and 2017 in several age groups. There was an average annual decline of 6.3% among those aged 30-39 years of age, 7.5% among 40-49 years of age, and 4.8% for those 50 and older. Whites 40-49 years of age saw an average annual decline of 5.9% while those 60 and older saw a decline of 7.0%. Among Latinos and API there were no statistically significant trends.

Stratified diagnosis rates by sex, age and race/ethnicity are provided in tables at the end of this chapter (Table 2.1 on page 18). The disparity in diagnosis rates between African Americans and whites was more pronounced among females than males. African American males had 4.8 times the diagnosis rates compared to white males diagnosed from 2015 to 2017. African American females had 10.2 times the diagnosis rates of white females (Table 2.2 on page 20).

Timeliness of Diagnosis

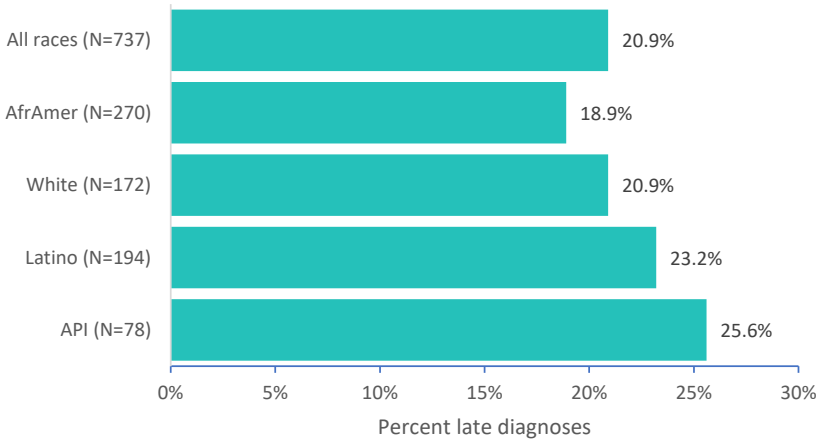
Diagnosis of HIV early in the course of infection is an important component of effective HIV prevention and treatment as early treatment generally reduces both the risk of transmission to others and the impact of HIV infection on a person's health.

Late Diagnosis

A commonly-used indicator of late HIV diagnosis is the time to progression to AIDS (stage 3 infection). A diagnosis is considered to be late if AIDS is diagnosed at the same time as a person's initial HIV diagnosis or if the person progresses to AIDS within one year of the initial HIV diagnosis. The analyses presented in this section are for between 2014 and 2016 to allow a full year of follow-up from initial HIV diagnosis. Stratified analyses of late diagnosis by sex, age, and race/ethnicity is provided in tables at the end of this chapter. Apparent differences should be interpreted with caution due to the small numbers of diagnoses seen in some subgroups, resulting in statistical instability.

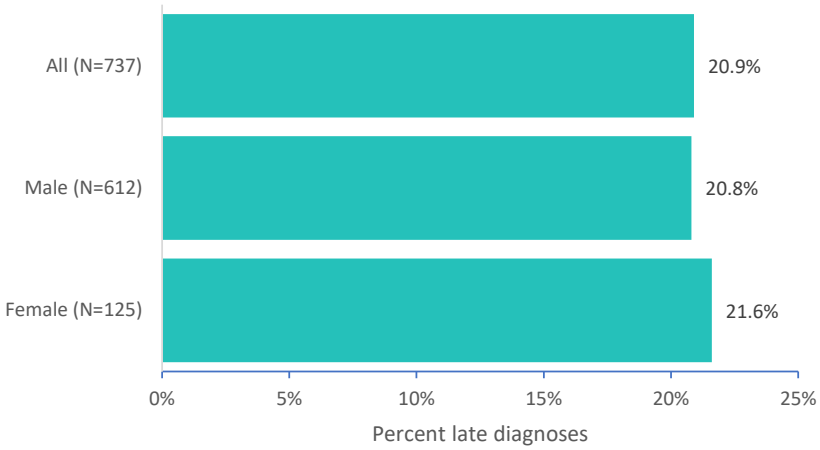
In Alameda County, 20.9% of new diagnoses between 2014 and 2016 were late. Although whites and African Americans appear to have the lowest rate and Latinos and API the highest, differences by race/ethnicity were not statistically significant.

Figure 2.15: Late Diagnosis by Race/Ethnicity, Alameda County, 2014-2016



There was no difference in late diagnosis by sex.

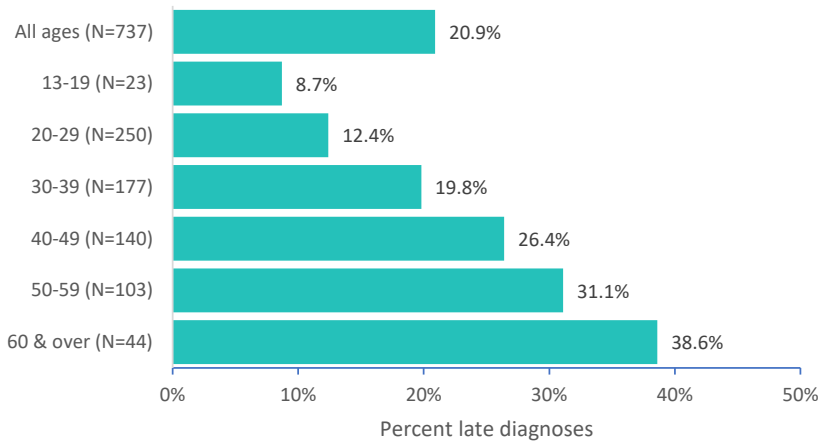
Figure 2.16: Late Diagnosis by Sex, Alameda County, 2014-2016



NOTE: "Sex" refers to sex assigned at birth.

The proportion of late diagnoses generally increased with age: over a third of HIV diagnoses among those aged 60 and over were late. Late diagnosis was less common among those aged 20 to 29—fewer than 1 in 8 were diagnosed late in this age group. The increase in rate of late diagnosis with increasing age was statistically significant.

Figure 2.17: Late Diagnosis by Age, Alameda County, 2014-2016

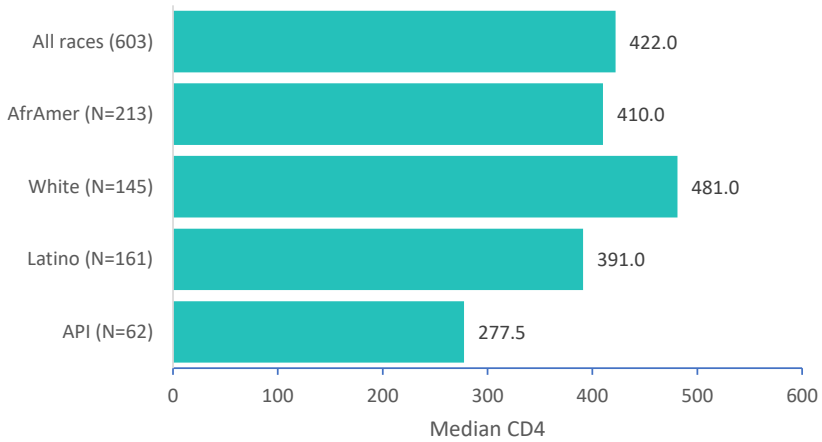


First CD4 Count

CD4 cell count at the time of diagnosis is another indicator of the timeliness of HIV diagnosis. CD4+ T-cells, an important component of the human immune system, are infected and killed by HIV. Anti-retroviral therapy (ART) allows the body to preserve or increase the CD4 count. However, the longer a person goes without taking ART, which controls the level of HIV in their body, the lower their CD4 count will be and the more susceptible the person will be to opportunistic infections and other health problems. Once a person's CD4 count falls below 200 cells/mm^3, the person is considered to have AIDS[1].

Among those diagnosed with HIV disease between 2014 and 2016 and for whom a CD4 count was conducted within 90 days, the median CD4 count at the time of diagnosis was 422 cells/mm^3. Whites had the highest median CD4 count at diagnosis among all racial/ethnic groups and API had the lowest, though the differences were not significant.

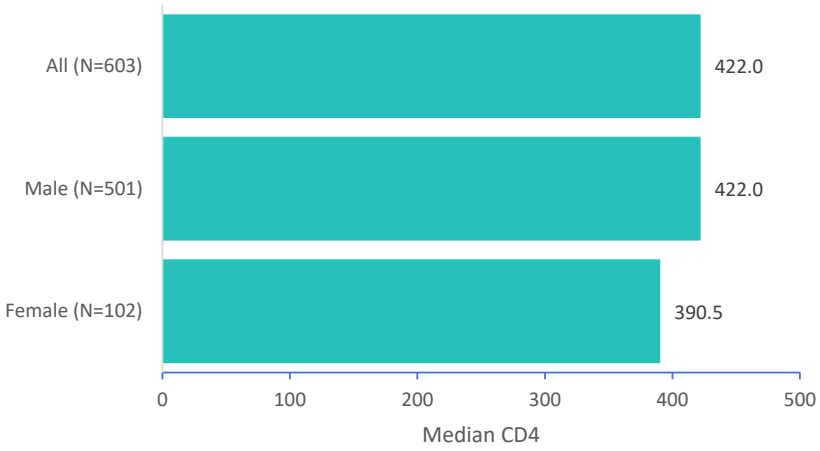
Figure 2.18: First CD4 Count at Diagnosis by Race/Ethnicity, Alameda County, 2014-2016



[1]These analyses exclude 132 cases (17.9% of all diagnoses) with a first CD4 count more than 90 days after diagnosis.

Median CD4 within 90 days of diagnosis was higher among males than females.

Figure 2.19: First CD4 Count at Diagnosis by Sex, Alameda County, 2014-2016



NOTE: "Sex" refers to sex assigned at birth.

Those aged 20-29 had a substantially higher median CD4 count at diagnosis than any other age group. Median CD4 count was generally lower in successively older age groups. Those 60 and older had the lowest median CD4 count at diagnosis. However, data for this group and those aged 13-19 should be interpreted with caution due to small numbers.

Figure 2.20: First CD4 Count at Diagnosis by Age, Alameda County, 2014-2016

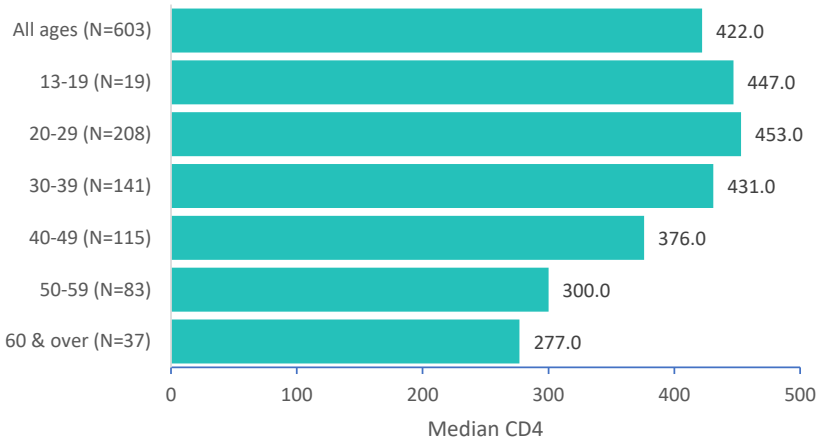


Table 2.1: New HIV Diagnoses, Alameda County, 2015-2017

NOTE: This table spans multiple pages

Characteristic	Category	Average Annual Count	Percent	Average Annual Diagnosis Rate per 100,000	95% Confidence Interval
All Diagnosis	--	245.3	100.0%	15.2	13.3 - 17.1
Sex[a]	Male	206.0	84.0%	25.9	22.4 - 29.5
	Female	39.3	16.0%	4.8	3.3 - 6.3
Race/Ethnicity[b]	AfrAmer	94.0	38.3%	54.5	43.5 - 65.5
	White	54.0	22.0%	10.3	7.6 - 13.1
	Latino	66.0	26.9%	17.9	13.6 - 22.2
	API	24.7	10.1%	5.2	4.1 - 6.5
	Other/Unk	6.7	2.7%	--	--
Age (years)[c]	0-12	0.0	0.0%	**	**
	13-19	5.7	2.3%	4.0	2.3 - 6.4
	20-29	84.7	34.5%	36.4	28.7 - 44.2
	30-39	61.0	24.9%	25.7	19.3 - 32.2
	40-49	48.7	19.8%	21.6	15.6 - 27.7
	50-59	31.3	12.8%	14.3	11.6 - 17.5
	60 & over	14.0	5.7%	4.6	3.3 - 6.3

Table 2.1: New HIV Diagnoses, Alameda County, 2015-2017 (continued)

NOTE: This table spans multiple pages

Characteristic	Category	Average Annual Count	Percent	Average Annual Diagnosis Rate per 100,000	95% Confidence Interval
Residence	North County	21	8.6%	15.3	11.7 - 19.5
	Oakland Area	141.7	57.7%	27.4	22.9 - 31.9
	Central County	51.7	21.1%	13.4	9.8 - 17.1
	South County	19.7	8.0%	5.7	4.3 - 7.3
	Tri-Valley	10.7	4.3%	4.8	3.3 - 6.8
	Remainder of county	*	*	*	*
	Unknown	*	*	--	--

Source: Alameda County eHARS, 2018 Q2

a Refers to sex assigned at birth

b 'Other/Unk' = American Indians and Alaskan Natives, multiple race, unknown race

c Age at diagnosis

* Some cells suppressed to protect confidentiality

** Unstable estimates not shown

-- Rate not calculable for lack of a denominator

Table 2.2: HIV Diagnosis Rates by Sex and Age, Alameda County, 2015-2017

Sex[a]	Age	Average Annual Count	Percent	Average Annual Diagnosis Rate per 100,000	95% Confidence Interval
All	All ages	245.3	100.0%	15.2	13.3 - 17.1
	0-4	0.0	0.0%	**	**
	5-12	0.0	0.0%	**	**
	13-19	5.7	2.3%	4.0	2.3 - 6.4
	20-24	33.0	13.5%	28.6	23.2 - 34.8
	25-29	51.7	21.1%	44.1	32.1 - 56.1
	30-39	61.0	24.9%	25.7	19.3 - 32.2
	40-49	48.7	19.8%	21.6	15.6 - 27.7
	50 & over	45.3	18.5%	8.7	6.2 - 11.2
Male	All ages	206.0	84.0%	25.9	22.4 - 29.5
	0-4	0.0	0.0%	**	**
	5-12	0.0	0.0%	**	**
	13-19	5.3	2.2%	7.3	4.2 - 11.9
	20-24	28.0	11.4%	48.0	38.3 - 59.5
	25-29	46.7	19.0%	79.3	56.5 - 102.0
	30-39	53.0	21.6%	45.2	33.0 - 57.4
	40-49	38.7	15.8%	34.8	23.8 - 45.8
	50 & over	34.3	14.0%	14.1	9.4 - 18.8
Female	All ages	39.3	16.0%	4.8	3.3 - 6.3
	0-4	*	*	*	*
	5-12	0.0	0.0%	**	**
	13-19	*	*	*	*
	20-24	5.0	2.0%	8.7	4.9 - 14.4
	25-29	5.0	2.0%	7.6	4.8 - 14.2
	30-39	8.0	3.3%	6.7	4.3 - 9.9
	40-49	10.0	4.1%	8.8	5.9 - 12.5
	50 & over	11.0	4.5%	4.0	2.7 - 5.6

Source: Alameda County eHARS 2018 Q2

[a] Refers to sex assigned at birth

[*] Some cells suppressed to protect confidentiality

[**] Unstable estimates not shown

Table 2.3: HIV Diagnosis Rates by Sex and Race/Ethnicity, Alameda County, 2015-2017

Sex[a]	Race/Ethnicity[b]	Average Annual Count	Percent	Average Annual Diagnosis Rate per 100,000	95% Confidence Interval
All	All races	245.3	100.0%	15.2	13.3 - 17.1
	AfrAmer	94.0	38.3%	54.5	43.5 - 65.5
	White	54.0	22.0%	10.3	7.6 - 13.1
	Latino	66.0	26.9%	17.9	13.6 - 22.2
	API	24.7	10.1%	5.2	4.1 - 6.5
	Other/Unk	6.7	2.7%	--	--
Male	All races	206.0	84.0%	25.9	22.4 - 29.5
	AfrAmer	70.3	28.7%	87.0	66.7 - 107.3
	White	47.7	19.4%	18.3	13.1 - 23.5
	Latino	60.3	24.6%	32.1	24.0 - 40.2
	API	21.0	8.6%	9.2	7.1 - 11.8
	Other/Unk	6.7	2.7%	--	--
Female	All races	39.3	16.0%	4.8	3.3 - 6.3
	AfrAmer	23.7	9.6%	25.8	20.2 - 32.6
	White	6.3	2.6%	2.4	1.4 - 3.8
	Latino	5.7	2.3%	3.1	1.8 - 5.0
	API	3.7	1.5%	**	**
	Other/Unk	0.0	0.0%	--	--

Source: Alameda County eHARS 2018 Q2

[a] Refers to sex assigned at birth

[b] 'Other/Unk' = American Indians and Alaskan Natives, multiple race, unknown race

[**] Unstable estimates not shown

[--] Rate not calculable for lack of a denominator

Table 2.4: HIV Diagnosis Rates by Race/Ethnicity and Age, Alameda County, 2015-2017

NOTE: This table spans multiple pages

Race/Ethnicity[a]	Age	Average Annual Count	Percent	Average Annual Diagnosis Rate per 100,000	95% Confidence Interval
All races	All ages	245.3	100.0%	15.2	13.3 - 17.1
	0-4	0.0	0.0%	**	**
	5-12	0.0	0.0%	**	**
	13-19	5.7	2.3%	4.0	2.3 - 6.4
	20-24	33.0	13.5%	28.6	23.2 - 34.8
	25-29	51.7	21.1%	44.1	32.1 - 56.1
	30-39	61.0	24.9%	25.7	19.3 - 32.2
	40-49	48.7	19.8%	21.6	15.6 - 27.7
	50 & over	45.3	18.5%	8.7	6.2 - 11.2
AfrAmer	All ages	94.0	38.3%	54.5	43.5 - 65.5
	0-4	0.0	0.0%	**	**
	5-12	0.0	0.0%	**	**
	13-19	3.7	1.5%	**	**
	20-24	17.0	6.9%	143.3	106.7 - 188.5
	25-29	19.3	7.9%	173.0	131.3 - 223.6
	30-39	17.7	7.2%	78.2	58.6 - 102.3
	40-49	13.7	5.6%	55.9	40.7 - 75.8
	50 & over	22.7	9.2%	37.8	29.3 - 47.9
White	All ages	54.0	22.0%	10.3	7.6 - 13.1
	0-4	0.0	0.0%	**	**
	5-12	0.0	0.0%	**	**
	13-19	0.0	0.0%	**	**
	20-24	4.7	1.9%	15.1	8.3 - 25.3
	25-29	10.0	4.1%	30.3	20.4 - 43.2
	30-39	16.3	6.7%	25.3	18.7 - 33.4
	40-49	12.0	4.9%	15.9	11.1 - 22.0
	50 & over	11.0	4.5%	4.7	3.2 - 6.6

Table 2.4: HIV Diagnosis Rates by Race/Ethnicity and Age, Alameda County, 2015-2017 (continued)

NOTE: This table spans multiple pages

Race/Ethnicity[a]	Age	Average Annual Count	Percent	Average Annual Diagnosis Rate per 100,000	95% Confidence Interval
Latino	All ages	66.0	26.9%	15.2	13.3 - 17.1
	0-4	*	*	**	**
	5-12	0.0	0.0%	**	**
	13-19	*	*	4.0	2.3 - 6.4
	20-24	8.0	3.3%	28.6	23.2 - 34.8
	25-29	16.3	6.7%	44.1	32.1 - 56.1
	30-39	18.3	7.5%	25.7	19.3 - 32.2
	40-49	16.0	6.5%	21.6	15.6 - 27.7
	50 & over	6.0	2.4%	8.7	6.2 - 11.2
API	All ages	24.7	10.1%	54.5	43.5 - 65.5
	0-4	0.0	0.0%	**	**
	5-12	0.0	0.0%	**	**
	13-19	*	*	**	**
	20-24	*	*	143.3	106.7 - 188.5
	25-29	4.0	1.6%	173.0	131.3 - 223.6
	30-39	7.0	2.9%	78.2	58.6 - 102.3
	40-49	*	*	55.9	40.7 - 75.8
	50 & over	*	*	37.8	29.3 - 47.9
Other/Unk	All ages	6.7	2.7%	--	--
	0-4	*	*	--	--
	5-12	0.0	0.0%	--	--
	13-19	0.0	0.0%	--	--
	20-24	*	*	--	--
	25-29	2.0	0.8%	--	--
	30-39	1.7	0.7%	--	--
	40-49	*	*	--	--
	50 & over	*	*	--	--

Source: Alameda County eHARS 2018 Q2

[a] 'Other/Unk' = American Indians and Alaskan Natives, multiple race, unknown race

[*] Some cells suppressed to protect confidentiality

[**] Unstable estimates not shown

[-] Rate not calculable for lack of a denominator

Table 2.5: Late Diagnosis by Sex and Age, Alameda County, 2014-2016

Sex[a]	Age at Diagnosis	All Diagnoses		Late Diagnosis	
		Average Annual Count	Column Percent	Average Annual Count	Row Percent
All	All ages	245.7	100.0%	51.3	20.9%
	13-19	7.7	3.1%	0.7	**
	20-24	36.3	14.8%	1.7	**
	25-29	47.0	19.1%	8.7	18.5%
	30-39	59.0	24.0%	11.7	19.8%
	40-49	46.7	19.0%	12.3	26.3%
	50 & over	49.0	19.9%	16.3	33.3%
Male	All ages	204.0	83.0%	42.3	20.7%
	13-19	*	*	*	*
	20-24	*	*	*	*
	25-29	42.3	17.2%	7.7	18.2%
	30-39	49.7	20.2%	9.0	18.1%
	40-49	37.7	15.3%	10.0	26.5%
	50 & over	36.0	14.7%	13.7	38.1%
Female	All ages	41.7	17.0%	9.0	21.6%
	13-19	*	*	*	*
	20-24	*	*	*	*
	25-29	4.7	1.9%	1.0	**
	30-39	9.3	3.8%	2.7	**
	40-49	9.0	3.7%	2.3	**
	50 & over	13.0	5.3%	2.7	**

Source: Alameda County eHARS 2018 Q2

[a] Refers to sex assigned at birth

[b] 'Other/Unk' = American Indians and Alaskan Natives, multiple race, unknown rate

[**] Unstable estimates not shown

Table 2.6: Late Diagnosis by Sex and Race/Ethnicity, Alameda County, 2014-2016

Sex[a]	Race/Ethnicity[b]	All Diagnoses		Late Diagnosis	
		Average Annual Count	Column Percent	Average Annual Count	Row Percent
All	All races	245.7	100.0%	51.3	20.9%
	AfrAmer	90.0	36.6%	17.0	18.9%
	White	57.3	23.3%	12.0	20.9%
	Latino	64.7	26.3%	15.0	23.2%
	API	26.0	10.6%	6.7	25.8%
	Other/Unk	7.7	3.1%	0.7	**
Male	All races	204.0	83.0%	42.3	20.7%
	AfrAmer	65.7	26.7%	12.3	18.7%
	White	49.0	19.9%	10.7	21.8%
	Latino	59.0	24.0%	13.3	22.5%
	API	22.7	9.2%	5.3	**
	Other/Unk	7.7	3.1%	0.7	**
Female	All races	41.7	17.0%	9.0	21.6%
	AfrAmer	24.3	9.9%	4.7	19.3%
	White	8.3	3.4%	1.3	**
	Latino	5.7	2.3%	1.7	**
	API	3.3	1.4%	1.3	**
	Other/Unk	0.0	0.0%	0.0	**

Source: Alameda County eHARS 2018 Q2

[a] Refers to sex assigned at birth

[*] Some cells suppressed to protect confidentiality

[**] Unstable estimates not shown

Table 2.7: Late Diagnosis by Race/Ethnicity and Age, Alameda County, 2014-2016

NOTE: This table spans multiple pages

Race/Ethnicity[a]	Age at Diagnosis	All Diagnoses		Late Diagnosis	
		Average Annual Count	Column Percent	Average Annual Count	Row Percent
All races	All ages	245.7	100.0%	51.3	20.9%
	13-19	7.7	3.1%	0.7	**
	20-24	36.3	14.8%	1.7	**
	25-29	47.0	19.1%	8.7	18.5%
	30-39	59.0	24.0%	11.7	19.8%
	40-49	46.7	19.0%	12.3	26.3%
	50 & over	49.0	19.9%	16.3	33.3%
AfrAmer	All ages	90.0	36.6%	17.0	18.9%
	13-19	5.0	2.0%	0.7	**
	20-24	18.3	7.5%	1.0	**
	25-29	15.7	6.4%	3.0	**
	30-39	17.7	7.2%	3.7	**
	40-49	13.3	5.4%	3.0	**
	50 & over	20.0	8.1%	5.7	**
White	All ages	57.3	23.3%	12.0	20.9%
	13-19	0.0	0.0%	0.0	**
	20-24	5.3	2.2%	0.0	0.0%
	25-29	10.3	4.2%	1.3	**
	30-39	14.7	6.0%	3.0	**
	40-49	12.7	5.2%	2.3	**
	50 & over	14.3	5.8%	5.3	**

Table 2.7: Late Diagnosis by Race/Ethnicity and Age, Alameda County, 2014-2016 (continued)

NOTE: This table spans multiple pages

Race/Ethnicity[a]	Age at Diagnosis	All Diagnoses		Late Diagnosis	
		Average Annual Count	Column Percent	Average Annual Count	Row Percent
Latino	All ages	64.7	26.3%	15.0	23.2%
	13-19	1.7	0.7%	0.0	0.0%
	20-24	8.0	3.3%	0.3	**
	25-29	15.7	6.4%	3.3	**
	30-39	17.0	6.9%	2.7	**
	40-49	14.7	6.0%	5.3	**
	50 & over	7.7	3.1%	3.3	**
API	All ages	26.0	10.6%	6.7	25.8%
	13-19	*	*	0.0	*
	20-24	*	*	0.3	*
	25-29	3.3	1.4%	1.0	**
	30-39	8.0	3.3%	2.0	**
	40-49	*	*	1.3	*
	50 & over	5.3	2.2%	2.0	**
Other/Unk	All ages	7.7	3.1%	0.7	**
	13-19	*	*	0.0	*
	20-24	*	*	0.0	*
	25-29	2.0	0.8%	0.0	0.0%
	30-39	1.7	0.7%	0.3	**
	40-49	*	*	0.3	*
	50 & over	1.7	0.7%	0.0	0.0%

Source: Alameda County eHARS 2018 Q2

[a] 'Other/Unk' = American Indians and Alaskan Natives, multiple race, unknown rate

[*] Some cells suppressed to protect confidentiality

[**] Unstable estimates not shown

3 People Living with HIV

In the United States, there were an estimated 991,447 PLHIV diagnosed at the end of 2016. Prevalence was highest among men (570.1 men vs. 169.9 women per 100,000 population), those aged 45-49 and 50-54 (661.6 and 777.6 per 100,000 respectively), African Americans and Latinos (1,026.6 and 372.1 per 100,000 respectively), and in the Northeast and South (418.8 and 361.6 per 100,000 respectively). At year-end 2016, California had an estimated 132,405 PLHIV for an overall prevalence of 336.4 per 100,000 population. HIV prevalence in women in California (78.5 per 100,000) was half that of women nationally [8]. At year-end 2017 in Alameda County, the prevalence of HIV was 393.3 per 100,000 residents.

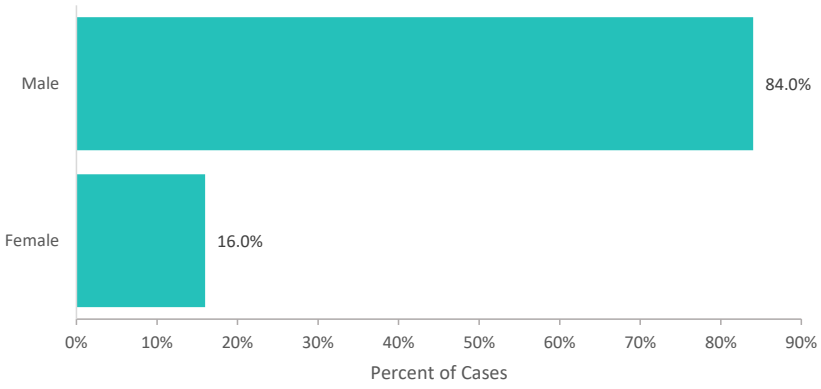
This chapter examines prevalence, or the proportion of people in Alameda County with HIV infection, reflecting the overall burden of HIV in the population. Data presented do not include PLHIV with undiagnosed infection but include all those with diagnosed HIV (including the newly diagnosed), regardless of the stage of HIV infection. First, characteristics of PLHIV in the county are presented. Then the prevalence of HIV disease in different subpopulations is described. Finally, mortality (deaths) among PLHIV ever diagnosed with AIDS is described. Table 3.1 summarizes data presented in this chapter. Stratified prevalence rates by sex, age and race/ethnicity are provided in Tables 3.2-3.4 at the end of this chapter.

Characteristics of PLHIV

At the end of 2017, there were an estimated 6,427 PLHIV in Alameda County[1].

Similar to the distribution by sex among new diagnoses of HIV, people living with HIV in Alameda County at year-end 2017 were predominantly male (84.0%).

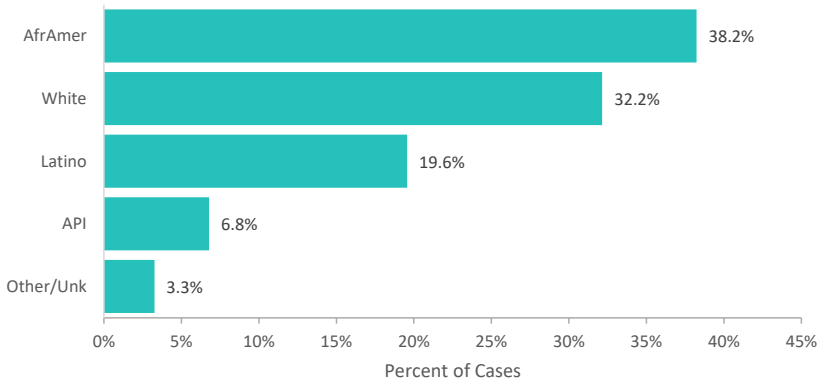
Figure 3.1: PLHIV by Sex, Alameda County, year-end 2017



NOTE: "Sex" refers to sex assigned at birth.

Approximately 38.2% of PLHIV in Alameda County were African American and 32.2% were white. Latinos and API each comprised a smaller proportion of PLHIV.

Figure 3.2: PLHIV by Race/Ethnicity, Alameda County, year-end 2017



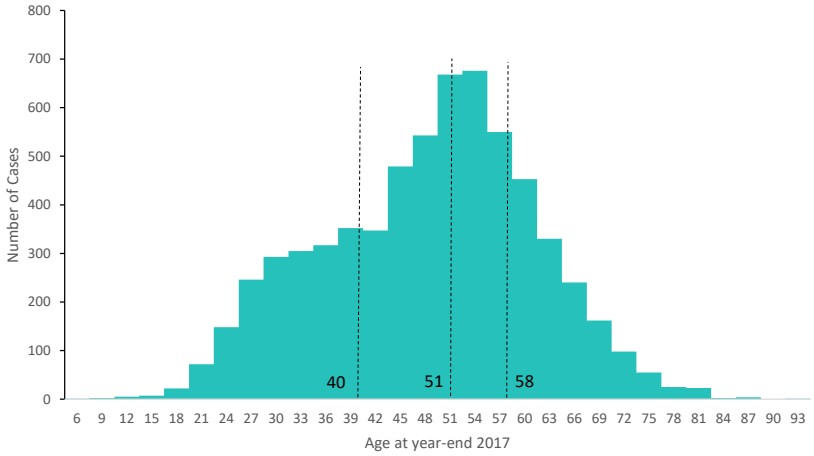
NOTE: "Other/Unk" includes American Indians, Alaskan Natives, multiracial, and unknown categories.

Racial/ethnic disparities in numbers of PLHIV were more apparent among women compared to men—while there was an approximately equal number of cases of African Americans and whites among males, there were nearly four times as many African American women compared to white women (Table 3.3).

[1] PLHIV counts presented in this report include those that moved to Alameda County after their diagnosis and have never seen an HIV healthcare provider in Alameda County. This is in contrast to previous years where such cases would not have been available to the local health jurisdiction for analysis. In addition to these cases, PLHIV also include all cases currently residing or diagnosed in Alameda County.

Half of PLHIV were in their fifties or older. Only about a quarter were in their thirties or younger at year-end 2017.

Figure 3.3: Age of PLHIV, Alameda County, year-end 2017



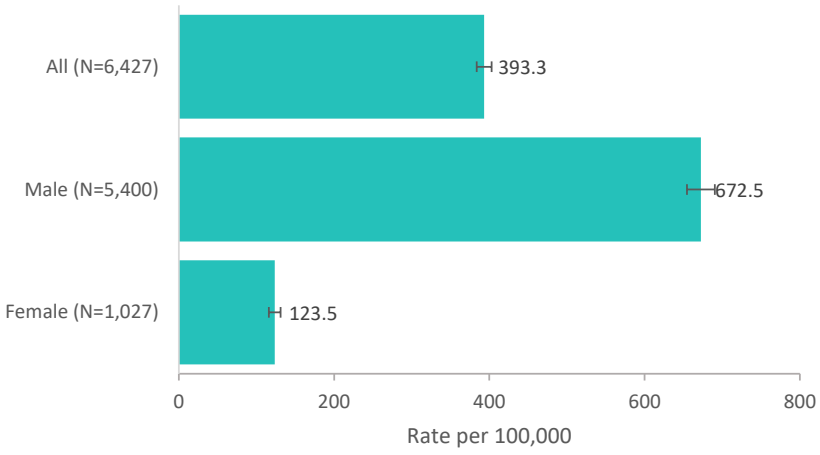
NOTE: The dashed lines indicate the 25th, 50th, and 75th percentile values for age among PLHIV.

Prevalence Rates

At the end of 2017 there were 6,427 people living with HIV in Alameda County for a prevalence rate of 393.3 per 100,000 or 0.4% of residents.

HIV prevalence was about five times higher among males than females at year-end 2017.

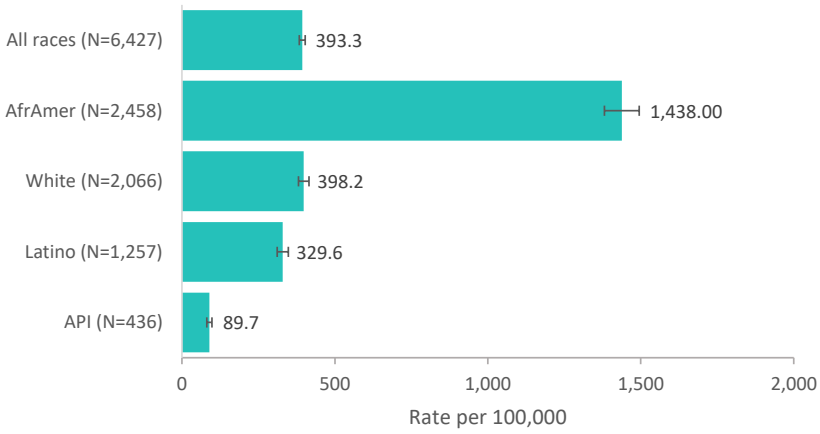
Figure 3.4: Prevalence of HIV by Sex, Alameda County, year-end 2017



NOTE: "Sex" refers to sex assigned at birth.

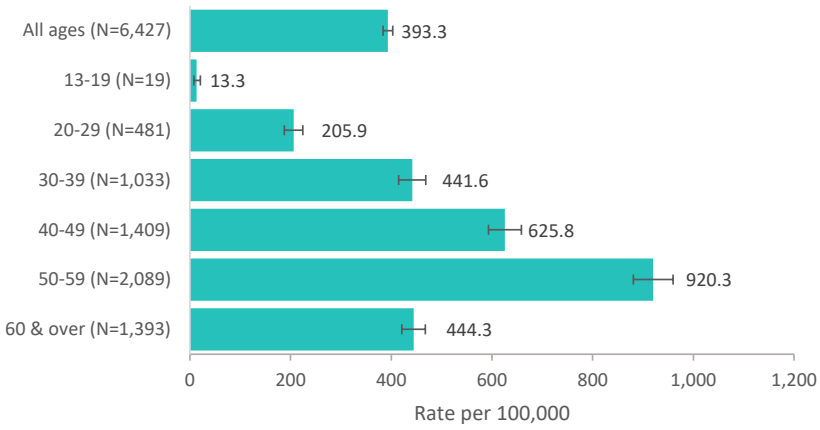
African Americans carried over 3.6 times the burden of HIV compared to the next most impacted group in Alameda County—whites. The burden of HIV was lowest among API.

Figure 3.5: Prevalence of HIV by Race/Ethnicity, Alameda County, year-end 2017



HIV prevalence was higher in each successive age group ranging from 13.3 per 100,000 youth aged 13-19 to a high of 920.3 per 100,000 people ages 50-59 years. The number of children aged 0-12 living with HIV was too low to estimate a statistically reliable prevalence rate. Prevalence among those aged 60 and over differed only slightly from those in their thirties. Increasing prevalence of HIV with age is consistent with the greatly improved survival of PLHIV in the ART era.

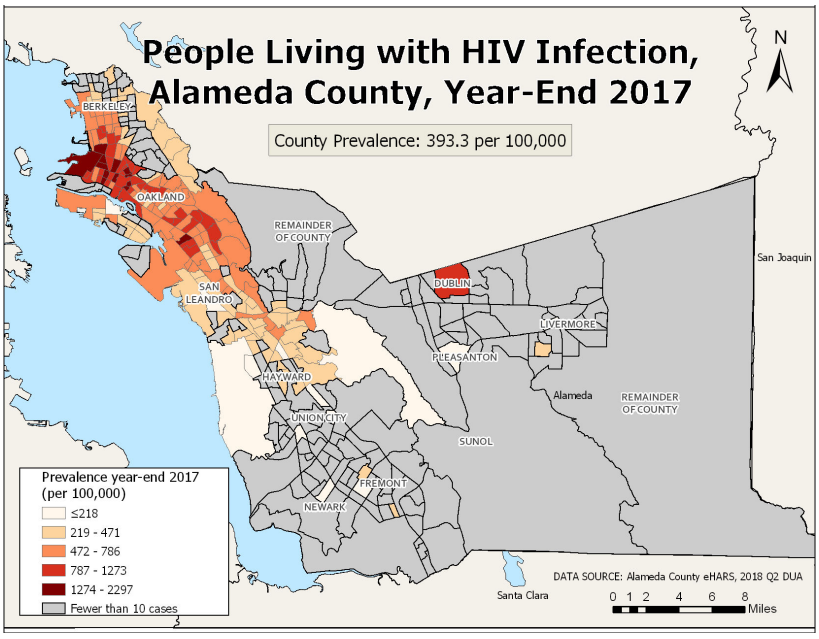
Figure 3.6: Prevalence of HIV by Age, Alameda County, year-end 2017



The disparity in prevalence rates by race was more pronounced among females compared to males. While prevalence was about three times higher among African American males compared to white males, it was more than 10 times higher among African American females compared to white females (Table 3.3). Additionally, although HIV prevalence was higher among white males than Latino males, this was not the case among females.

Oakland had the highest HIV prevalence within Alameda County followed by the central county region.

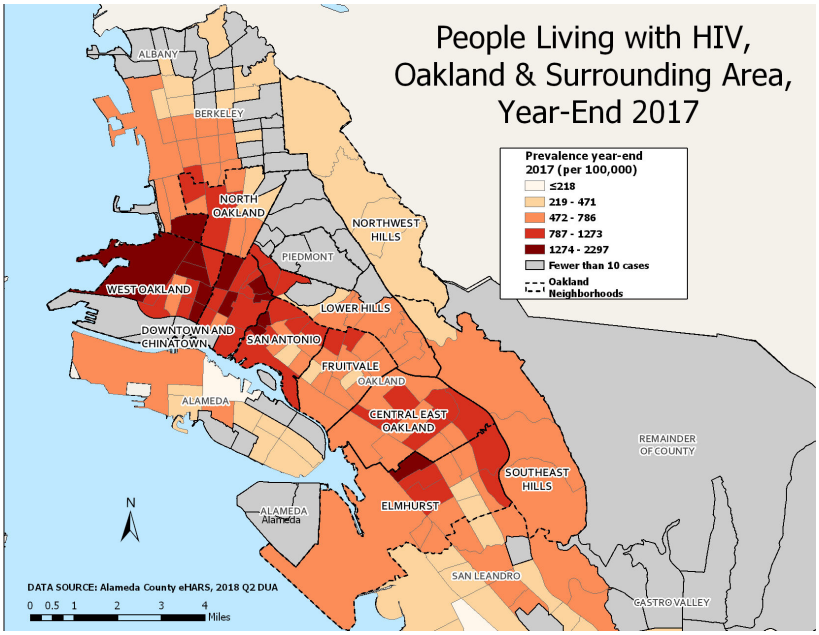
Figure 3.7: Prevalence of HIV by Census Tract of Residence, Alameda County, year-end 2017



NOTE: N=5,927; an additional 499 PLHIV (7.77% of all) are not represented due to incomplete street address.

The North and West Oakland, Downtown, Chinatown, and San Antonio neighborhoods had the highest HIV prevalence rate, ranging between 1-2% of residents.

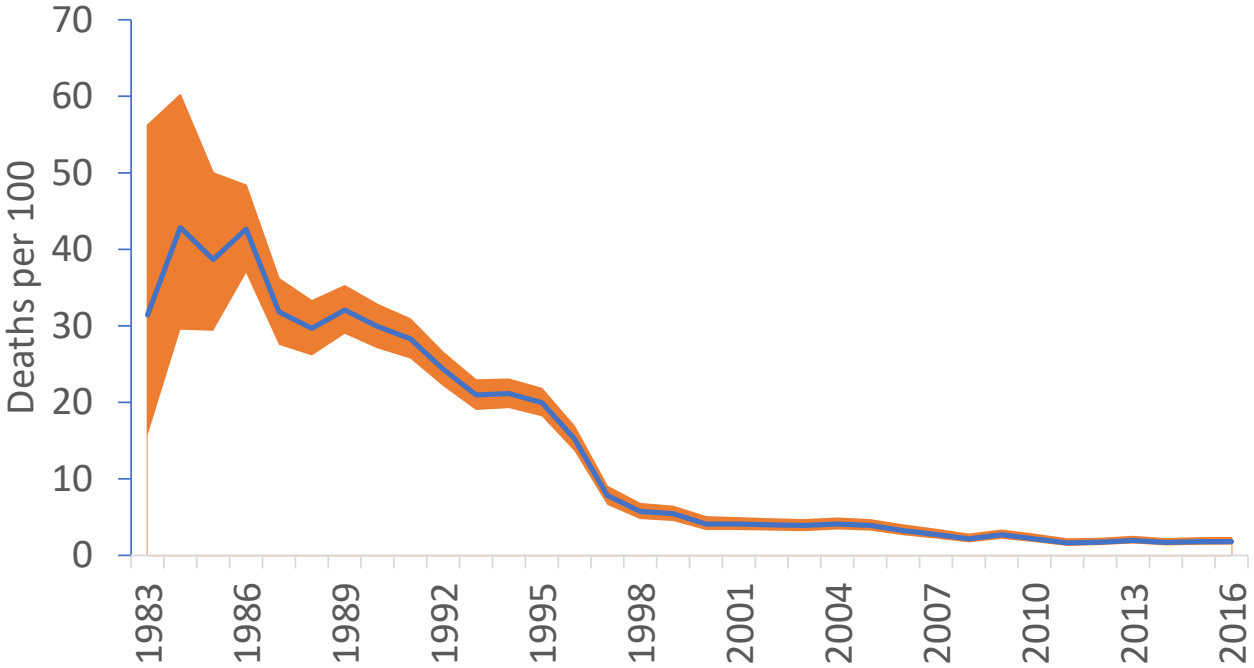
Figure 3.8: Prevalence of HIV by Census Tract of Residence, Oakland and Surrounding Area, year-end 2017



Deaths Among Alameda County Residents Ever Diagnosed with AIDS

Although HIV without AIDS has been reportable by name in California only since 2006, AIDS has been a reportable disease since the early 1980s, allowing examination of long-term trends in death rates among the subset of PLHIV ever diagnosed with AIDS. In 1985, there were 38.7 deaths (from any cause, whether HIV-related or not) per 100 Alameda County residents ever diagnosed with AIDS. This rate dropped to 7.5 deaths per 100 by 1997 and has declined slowly, but steadily since then. In 2015, there were 66 deaths among the 3,820 residents ever diagnosed with AIDS for a rate of 1.73 deaths per 100 residents.

Figure 3.9: Death Rate among Alameda County Residents Ever Diagnosed with AIDS, 1985-2016



NOTE: Death rates calculated among persons ever diagnosed with AIDS while a resident of Alameda County, regardless of county of residence at death. Deaths in PLHIV without AIDS are not reported here.

Table 3.1: People Living with HIV Disease and Prevalence Rates, Alameda County, Year-End 2017

NOTE: This table spans multiple pages

Characteristic	Category	Count	Percent	Prevalence per 100,000	95% Confidence Interval
All PLHIV	--	6,427	100.0%	393.3	383.7 - 402.9
Sex[a]	Male	5,400	84.0%	672.5	654.6 - 690.4
	Female	1,027	16.0%	123.5	116.0 - 131.1
Race/Ethnicity[b]	AfrAmer	2,458	38.2%	1438.0	1,381.2 - 1,494.9
	White	2,066	32.1%	398.2	381.0 - 415.3
	Latino	1,257	19.6%	329.6	311.4 - 347.8
	API	436	6.8%	89.7	81.3 - 98.2
	Other/Unk	210	3.3%	--	--
Age (years)[c]	0-12	*	*	*	*
	13-19	*	*	*	*
	20-29	481	7.5%	205.9	187.5 - 224.3
	30-39	1,033	16.1%	441.6	414.7 - 468.6
	40-49	1,409	21.9%	625.8	593.1 - 658.5
	50-59	2,089	32.5%	920.3	880.8 - 959.8
	60 & over	1,393	21.7%	444.3	421.0 - 467.7

Table 3.1: People Living with HIV Disease and Prevalence Rates, Alameda County, Year-End 2017 (continued)

NOTE: This table spans multiple pages

Characteristic	Category	Count	Percent	Prevalence per 100,000	95% Confidence Interval
Residence	North County	527	8.2%	377	344.8 - 409.2
	Oakland Area	3,937	61.3%	756.8	733.1 - 780.4
	Central County	1,232	19.2%	317	299.3 - 334.7
	South County	381	5.9%	108.6	97.7 - 119.5
	Tri-Valley	329	5.1%	146.3	130.5 - 162.1
	Remainder of county	15	0.2%	179.5	102.6 - 291.4
	Unknown	5	0.1%	**	**

Source: Alameda County eHARS, 2018 Q2

a Refers to sex assigned at birth

b 'Other/Unk' = American Indians and Alaskan Natives, multiple race, unknown race

c Age at diagnosis

* Some cells suppressed to protect confidentiality

** Unstable estimates not shown

-- Rate not calculable for lack of a denominator

Table 3.2: HIV Prevalence by Sex and Age, Alameda County, Year-End 2017

Sex[a]	Age	Count	Percent	Prevalence per 100,000	95% Confidence Interval
All	All ages	6,427	100.0%	393.3	383.7 - 402.9
	0-12	*	*	*	*
	13-19	*	*	*	*
	20-29	481	7.5%	205.9	187.5 - 224.3
	30-39	1,033	16.1%	441.6	414.7 - 468.6
	40-49	1,409	21.9%	625.8	593.1 - 658.5
	50-59	2,089	32.5%	920.3	880.8 - 959.8
	60 & over	1,393	21.7%	444.3	421.0 - 467.7
Male	All ages	5,400	84.0%	672.5	654.6 - 690.4
	0-12	*	*	*	*
	13-19	*	*	*	*
	20-29	430	6.7%	364.2	329.8 - 398.6
	30-39	898	14.0%	779.1	728.2 - 830.1
	40-49	1,140	17.7%	1,023.6	964.1 - 1,083.0
	50-59	1,774	27.6%	1,596.4	1,522.1-1,670.7
	60 & over	1,145	17.8%	807.3	760.5 - 854.0
Female	All ages	1,027	16.0%	123.5	116.0 - 131.1
	0-12	0	0.0%	*	*
	13-19	9	0.1%	*	*
	20-29	51	0.8%	44.1	32.9 - 58.0
	30-39	135	2.1%	113.8	94.6 - 133.0
	40-49	269	4.2%	236.4	208.2 - 264.7
	50-59	315	4.9%	271.9	241.8 - 301.9
	60 & over	248	3.9%	114.5	126.5 - 162.5

Source: Alameda County eHARS 2018 Q2

[a] Refers to sex assigned at birth

[*] Some cells suppressed to protect confidentiality

[**] Unstable estimates not shown

Table 3.3: HIV Prevalence by Sex and Race/Ethnicity, Alameda County, Year-End 2017

Sex[a]	Race/Ethnicity[b]	Count	Percent	Prevalence per 100,000	95% Confidence Interval
All	All races	6,427	100.0%	393.3	383.7 - 402.9
	AfrAmer	2,458	38.2%	1,438.0	1,381.2-1,494.9
	White	2,066	32.1%	398.2	381.0 - 415.3
	Latino	1,257	19.6%	329.6	311.4 - 347.8
	API	436	6.8%	89.7	81.3 - 98.2
	Other/Unk	210	3.3%	--	--
Male	All races	5,400	84.0%	672.5	654.6 - 690.4
	AfrAmer	1,842	28.7%	2,294.3	2,189.5-2399.1
	White	1,897	29.5%	733.8	700.7 - 766.8
	Latino	1,099	17.1%	566.3	532.9 - 599.8
	API	377	5.9%	162.1	145.7 - 178.4
	Other/Unk	185	2.9%	--	--
Female	All races	1,027	16.0%	123.5	116.0 - 131.1
	AfrAmer	616	9.6%	679.6	625.9 - 733.3
	White	169	2.6%	64.9	55.1 - 74.7
	Latino	158	2.5%	84.3	71.2 - 97.5
	API	59	0.9%	23.3	17.7 - 30.1
	Other/Unk	25	0.4%	--	--

Source: Alameda County eHARS 2018 Q2

[a] Refers to sex assigned at birth

[b] 'Other/Unk' = American Indians and Alaskan Natives, multiple race, unknown race

[**] Unstable estimates not shown

[--] Rate not calculable for lack of a denominator

Table 3.4: HIV Prevalence by Race/Ethnicity and Age, Alameda County, Year-End 2017

NOTE: This table spans multiple pages

Race/Ethnicity[a]	Age	Count	Percent	Prevalence per 100,000	95% Confidence Interval
All races	All ages	6,427	100.0%	393.3	383.7 - 402.9
	0-12	*	*	*	*
	13-19	*	*	*	*
	20-29	481	7.5%	205.9	187.5 - 224.3
	30-39	1,033	16.1%	441.6	414.7 - 468.6
	40-49	1,409	21.9%	625.8	593.1 - 658.5
	50-59	2,089	32.5%	920.3	880.8 - 959.8
	60 & over	1,393	21.7%	444.3	421.0 - 467.7
AfrAmer	All ages	2,458	38.2%	1,438.0	1,381.2-1,494.9
	0-12	*	*	*	*
	13-19	*	*	*	*
	20-29	223	3.5%	979.8	851.2 - 1108.4
	30-39	391	6.1%	1,819.7	1,639.3-2,000.1
	40-49	489	7.6%	2,032.6	1,852.4-2,212.7
	50-59	775	12.1%	2,931.1	2,724.7-3,137.5
	60 & over	567	8.8%	1,591.4	1,460.4-1,722.4
White	All ages	2,066	32.1%	398.2	381.0 - 415.3
	0-12	*	*	*	*
	13-19	*	*	*	*
	20-29	78	1.2%	122.8	97.0 - 153.2
	30-39	234	3.6%	387.0	337.4 - 436.6
	40-49	382	5.9%	527.5	474.6 - 580.4
	50-59	807	12.6%	863.9	804.3 - 923.5
	60 & over	562	8.7%	384.4	352.6 - 416.2

Table 3.4: HIV Prevalence by Race/Ethnicity and Age, Alameda County, Year-End 2017 (continued)

NOTE: This table spans multiple pages

Race/Ethnicity[a]	Age	Count	Percent	Prevalence per 100,000	95% Confidence Interval
Latino	All ages	1,257	19.6%	393.3	383.7 - 402.9
	0-12	*	*	*	*
	13-19	*	*	*	*
	20-29	119	1.9%	205.9	187.5 - 224.3
	30-39	276	4.3%	441.6	414.7 - 468.6
	40-49	353	5.5%	625.8	593.1 - 658.5
	50-59	336	5.2%	920.3	880.8 - 959.8
	60 & over	169	2.6%	444.3	421.0 - 467.7
API	All ages	436	6.8%	1,438.0	1,381.2-1,494.9
	0-12	*	*	*	*
	13-19	*	*	*	*
	20-29	41	0.6%	979.8	851.2 - 1108.4
	30-39	92	1.4%	1,819.7	1,639.3-2,000.1
	40-49	129	2.0%	2,032.6	1,852.4-2,212.7
	50-59	109	1.7%	2,931.1	2,724.7-3,137.5
	60 & over	64	1.0%	1,591.4	1,460.4-1,722.4
Other/Unk	All ages	210	3.3%	398.2	381.0 - 415.3
	0-12	*	*	*	*
	13-19	*	*	*	*
	20-29	20	0.3%	122.8	97.0 - 153.2
	30-39	40	0.6%	387.0	337.4 - 436.6
	40-49	56	0.9%	527.5	474.6 - 580.4
	50-59	62	1.0%	863.9	804.3 - 923.5
	60 & over	31	0.5%	384.4	352.6 - 416.2

Source: Alameda County eHARS 2018 Q2

[a] 'Other/Unk' = American Indians and Alaskan Natives, multiple race, unknown race

[*] Some cells suppressed to protect confidentiality

[-] Rate not calculable for lack of a denominator

4 The Continuum of HIV Care

Anti-retroviral therapy (ART), when taken regularly, can suppress HIV, limiting the damage done by the virus to the immune system as well as preventing the transmission of HIV entirely. Thus, ART benefits both PLHIV as well as the larger community. In order to maximize these benefits, it is crucial that PLHIV be diagnosed, linked to and retained in regular HIV care, and be prescribed and take ART. These steps—diagnosis, linkage, retention, and prescription of and adherence to ART—are all pre-requisites for achieving virologic suppression. Together, these steps comprise the continuum of HIV care, also called the HIV care cascade or the stages of HIV care. The continuum has gained enormous popularity as a framework for conceptualizing HIV care and prevention efforts.

In the United States, the CDC estimated that 85.2% of persons diagnosed in 2016 linked to care within 3 months[1]. Additionally, the CDC estimated that, at the end of 2015, 85.0% of all PLHIV had been diagnosed and that, among those still alive and who had been diagnosed by the end of the previous year, 72.5% received any HIV care, 56.9% were retained in continuous care, and 57.9% were virally suppressed.

In California, 82.4% of those diagnosed in 2016 were estimated to have linked to care within 3 months. By the end of 2016, among PLHIV still alive and who had been diagnosed by the end of the previous year, 73.4% were estimated to have received any HIV care in 2015, 57.2% were estimated to have been retained in continuous care, and 59.8% were estimated to have been virally suppressed at last test[2][7].

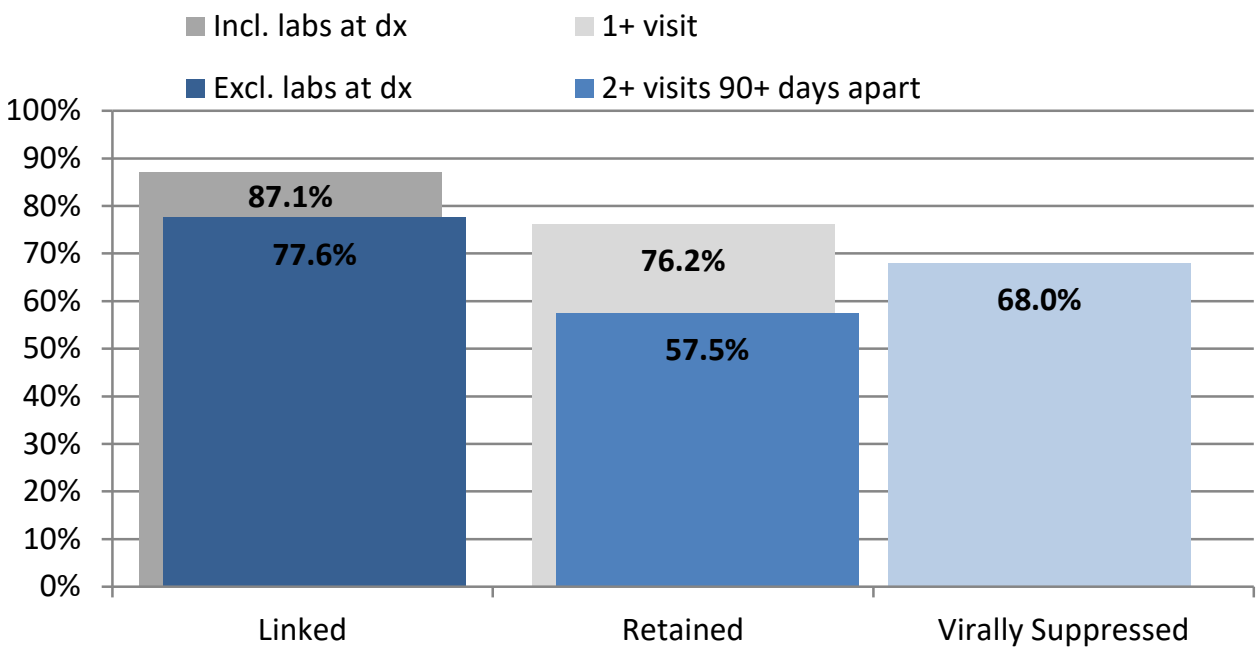
[1] Among those aged 13 or older at diagnosis in the 37 jurisdictions with complete laboratory reporting.

[2] Data on receipt of HIV medical care and viral suppression are based on data for PLHIV aged 13 or older, diagnosed by year-end 2014, alive at year-end 2015, and residing in the 37 jurisdictions with complete laboratory reporting. CD4 or viral load tests ordered in 2015 were used as markers of HIV care. Retention in continuous care is defined 2 or more CD4 or viral load tests at least 3 months apart and viral suppression is defined as last viral load in 2015 <200 copies/mL.

The Overall Continuum of Care

In Alameda County, 77.6% of new diagnoses between 2014 and 2016 were linked to care within 3 months if HIV-related labs ordered on the date of diagnosis were excluded; 87.1% were linked to care if labs done on the date of diagnosis were included. Approximately 57.5% of PLHIV in Alameda County for the entirety of 2016 had 2 or more visits 90 or more days apart that year and so were considered retained in care. Viral suppression was estimated to be 68.0% that same year.

Figure 4.1: The Continuum of HIV Care in Alameda County



Note:1)Of 737 total diagnoses, 10 died within 90 days and were excluded from analysis. 2)Of 6,131 PLHIV at year-end 2015, 76 were known to have died and an additional 614 to have moved out of Alameda County in 2016

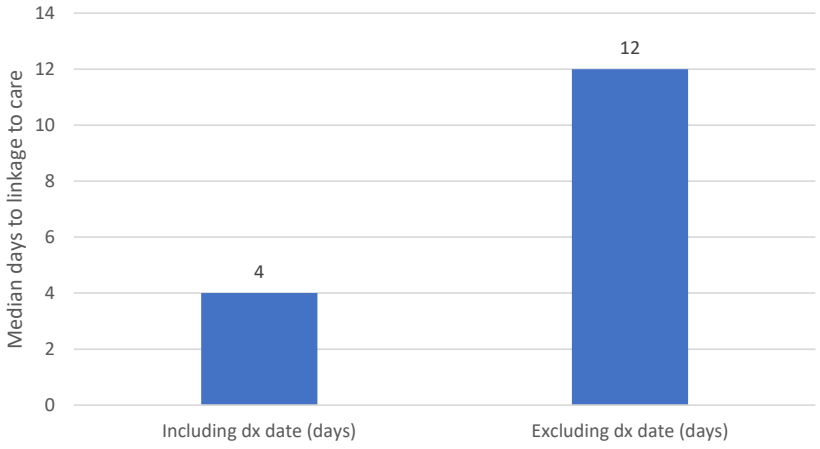
This chapter presents data on select measures along the continuum of HIV care including estimates stratified by demographics. Data on ART use were not available for analysis. Stratified analysis of measures along the continuum (linkage, retention, and virologic status) are presented in Tables 4.1-4.15 at the end of this chapter. Note that apparent differences should be interpreted with caution due to the small numbers in some subgroups and resulting statistical instability.

Linkage to Care

Here we present linkage to care estimates for Alameda County. It should be noted that receipt of a CD4 count or viral load test is not a definitive indicator of linkage to care. For example, a health care provider may order these tests concurrently with a confirmatory HIV test or before a patient even knows the diagnosis. Labs ordered after the date of diagnosis provide an alternative method for estimating linkage to care. We present both estimates of linkage—one that includes labs done on the date of diagnosis and another that excludes them—providing a range of what might be considered linked to care. Patients who died within 90 days of diagnosis were not included (N=10).

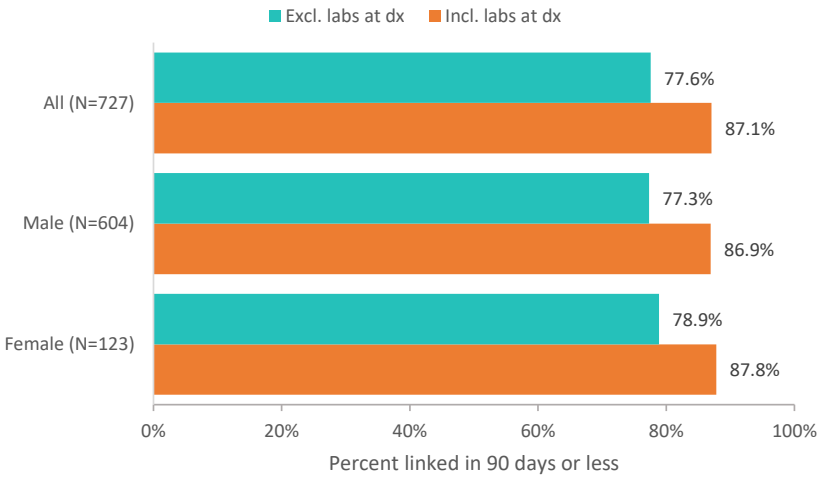
The median time from diagnosis to first CD4 or viral load among Alameda County residents diagnosed from 2014 to 2016 was four days. Excluding labs ordered on the date of diagnosis, the median time from diagnosis was 12 days.

Figure 4.2: Days Between Diagnosis and First CD4 or Viral Load, Alameda County, 2013-2015



Overall, just over 87% of those diagnosed with HIV in Alameda County from 2014 to 2016 were linked to HIV care within 90 days of their diagnosis. Excluding labs ordered on date of diagnosis, about 77.6% of newly diagnosed cases were linked. Differences by sex were not statistically significant.

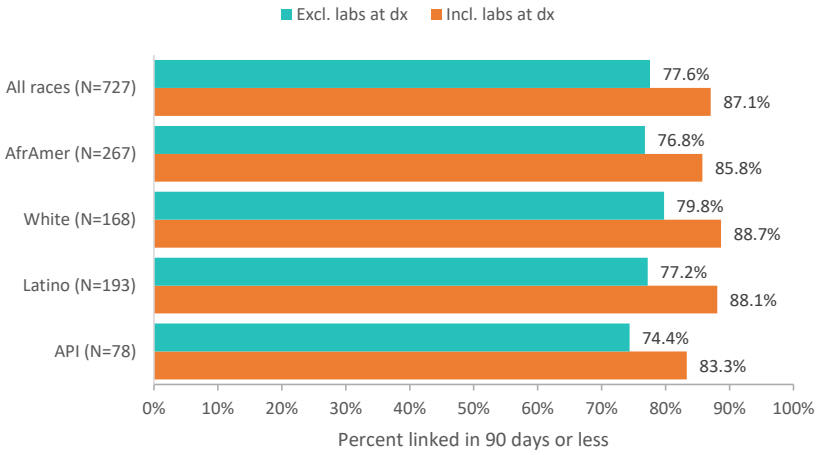
Figure 4.3: Linkage to HIV Care within 90 Days of Diagnosis by Sex, Alameda County, 2014-2016



NOTE: "Sex" refers to sex assigned at birth.

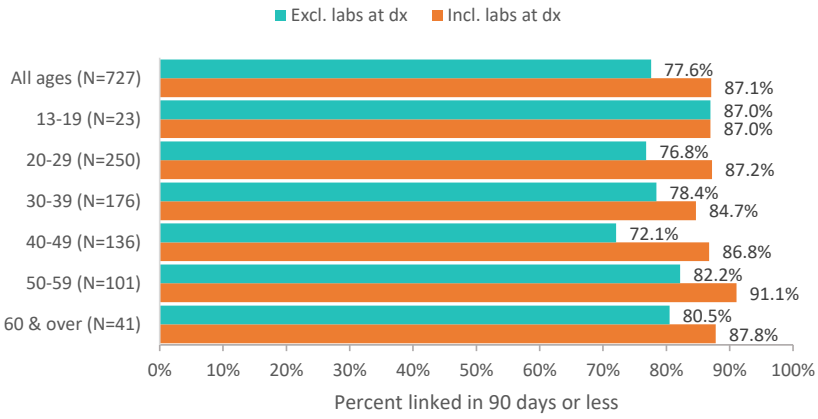
Differences in linkage to care by race/ethnicity were not statistically significant.

Figure 4.4: Linkage to HIV Care within 90 Days of Diagnosis by Race/Ethnicity, Alameda County, 2014-2016



Linkage was generally higher at the extremes of the age spectrum and lower among those in their thirties and forties. Differences by age group were not statistically significant.

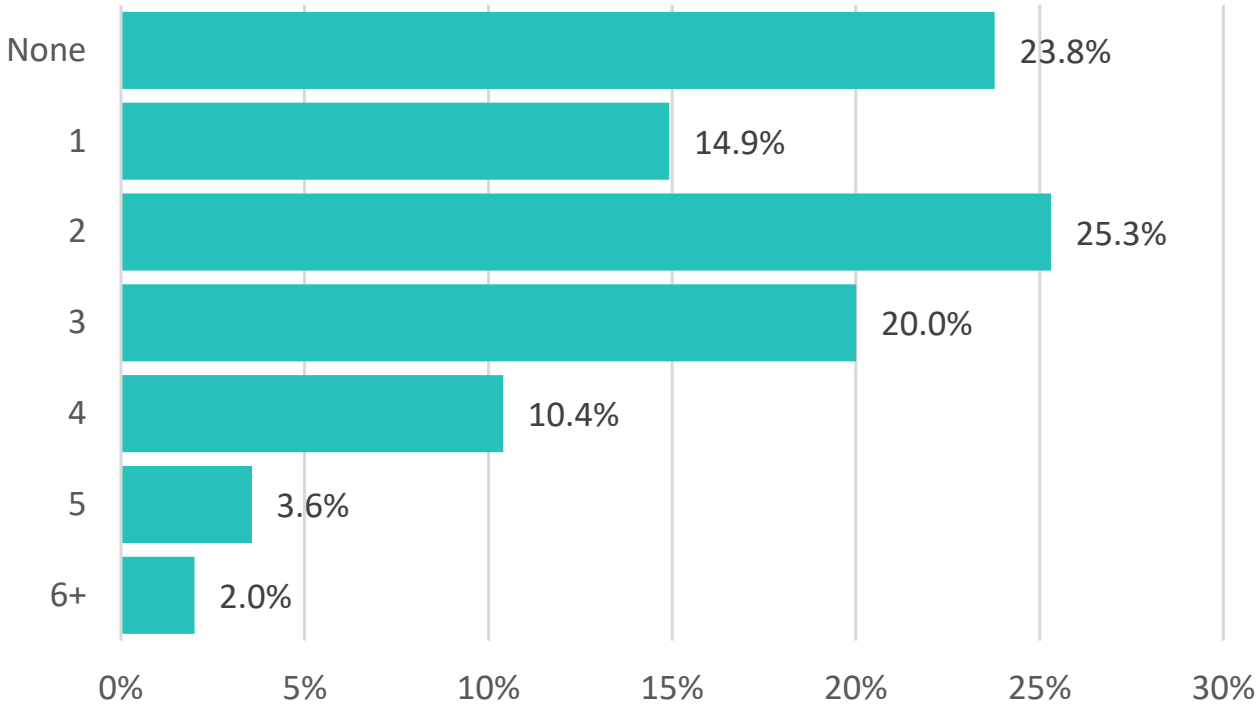
Figure 4.5: Linkage to HIV Care within 90 Days of Diagnosis by Age, Alameda County, 2014-2016



Retention in Care

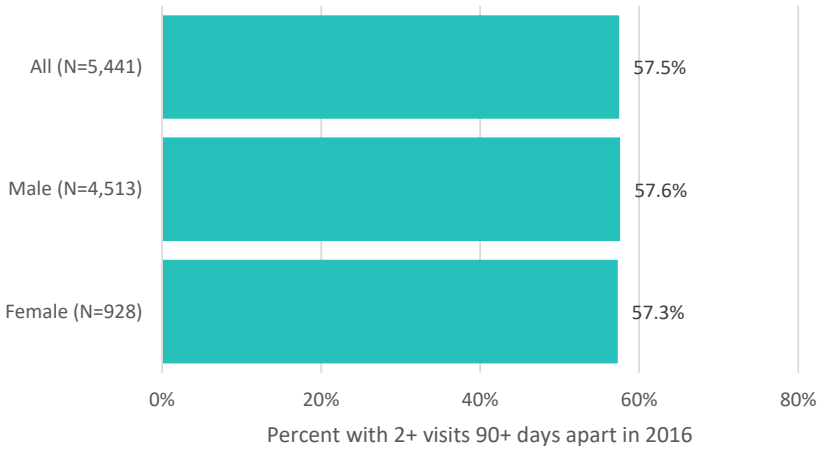
In 2016, 76.2% of PLHIV[1] had one or more visits to an HIV care provider as indicated by a new lab. About 14.9% of all PLHIV had only a single visit; by this measure however, it is possible that some had additional visits in which no lab tests were ordered.

Figure 4.6: Number of HIV Care Visits per PLHIV in 2016, Alameda County



In 2016, 57.5% of PLHIV had two or more visits 90 or more days apart. Differences by sex were not statistically significant.

Figure 4.7: Retention in HIV Care by Sex, Alameda County, 2016

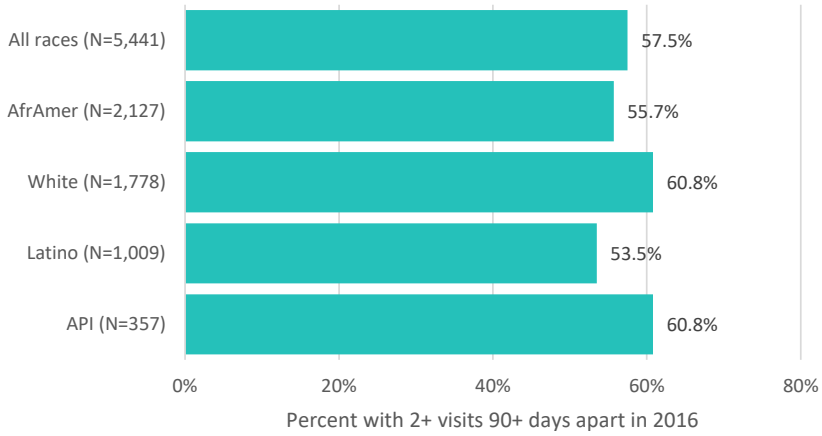


NOTE: "Sex" refers to sex assigned at birth.

[1] PLHIV that died or moved in 2016 were excluded from all analysis of retention in care.

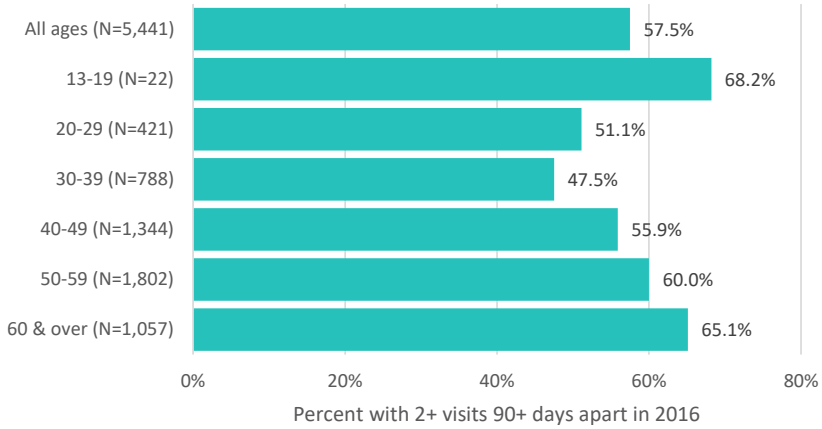
API and white PLHIV had the highest rates of retention in HIV care in 2016. Only 53.5% of Latino PLHIV were retained in care. Differences by race/ethnicity were not statistically significant.

Figure 4.8: Retention in HIV Care by Race/Ethnicity, Alameda County, 2016



PLHIV aged 30-39 at year-end 2016 had the lowest rates of retention in care; younger and successively older age groups had higher rates. Retention was highest among those aged 13-19 and 60 and over; however the number of PLHIV aged 13-19 was small. The general trend of higher retention in older age groups was statistically significant.

Figure 4.9: Retention in HIV Care by Age, Alameda County, 2016

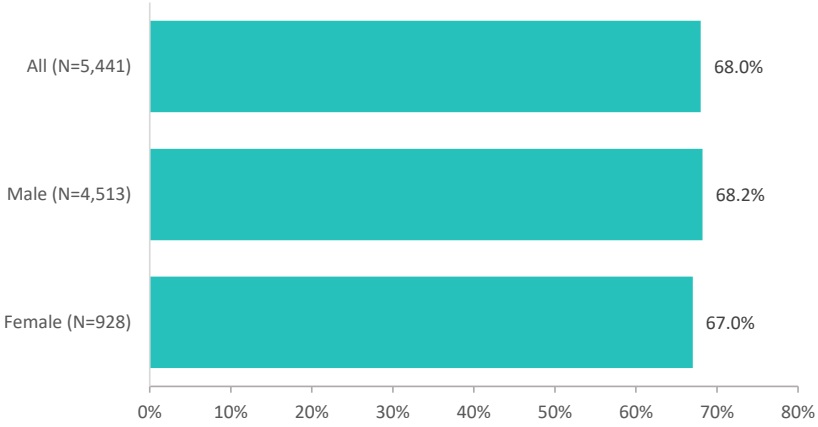


Virologic Status

The final measure along the care continuum is virologic suppression, defined as a viral load under 200 copies per ml. For the purposes of these analyses, an undetectable viral load is defined as 75 copies per ml or less. PLHIV that died or moved in 2016 were excluded. Disparities in virologic suppression among PLHIV in care can suggest possible differences in ART use or access to care.

Approximately 68% of PLHIV were virally suppressed at their most recent test in 2016, with the majority being undetectable. Virologic suppression was not significantly different between male and female PLHIV.

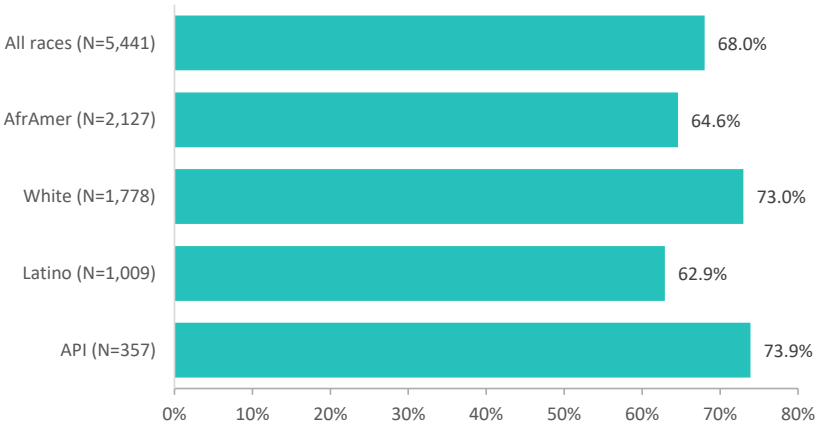
Figure 4.10: Virologic Status by Sex, Alameda County, 2016



NOTE: "Sex" refers to sex assigned at birth.

In 2016, 73% of white and API PLHIV were virally suppressed. Viral suppression was about 6-10% lower in all other racial/ethnic groups. Similar disparities were seen among those in care (Table 4.14).

Figure 4.11: Virologic Status by Race/Ethnicity, Alameda County, 2016



Viral suppression rates generally increased as age increased, ranging from about 59% among those ages 13-19 to 72.9% among those ages 60 and over. A similar pattern was seen among those in care (Table 4.9).

Figure 4.12: Virologic Status by Age, Alameda County, 2016

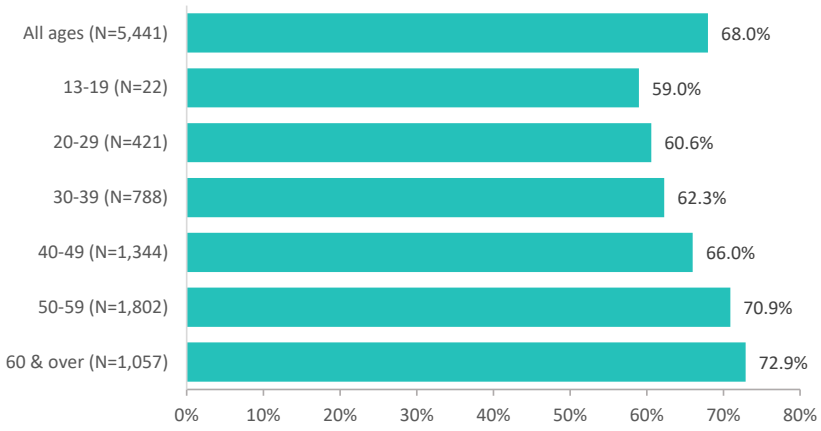


Table 4.1: Timely Linkage to HIV Care Among New Diagnoses by Sex and Age, Alameda County, 2014-2016

Sex[a]	Age at Diagnosis	All Diagnoses		Linked in 90 Days, incl. Date of Diagnosis	
		Average Annual Count	Column Percent	Average Annual Count	Row Percent
All	All ages	242.3	100.0%	211.0	87.1%
	13-19	7.7	3.2%	6.7	**
	20-24	36.3	15.0%	30.7	84.6%
	25-29	47.0	19.4%	42.0	89.4%
	30-39	58.7	24.2%	49.7	84.7%
	40-49	45.3	18.7%	39.3	86.8%
	50 & over	47.3	19.5%	42.7	90.3%
Male	All ages	201.3	83.1%	175.0	86.9%
	13-19	*	*	5.3	*
	20-24	*	*	27.3	*
	25-29	42.3	17.5%	37.3	88.2%
	30-39	49.3	20.4%	42.3	85.8%
	40-49	36.7	15.1%	32.0	87.2%
	50 & over	34.7	14.3%	30.7	88.5%
Female	All ages	41.0	16.9%	36.0	87.8%
	13-19	*	*	1.3	*
	20-24	*	*	3.3	*
	25-29	4.7	1.9%	4.7	100.0%
	30-39	9.3	3.9%	7.3	**
	40-49	8.7	3.6%	7.3	**
	50 & over	12.7	5.2%	12.0	**

Source: Alameda County eHARS 2018 Q2

NOTE: Excludes N=10 persons who died within 90 days of diagnosis

[a] Refers to sex assigned at birth

[*] Some cells suppressed to protect confidentiality

[**] Unstable estimates not shown

Table 4.2: Timely Linkage to HIV Care Among New Diagnoses by Sex and Race/Ethnicity, Alameda County, 2014-2016

Sex[a]	Race/Ethnicity[b]	All Diagnoses		Linked in 90 Days, incl. Date of Diagnosis	
		Average Annual Count	Column Percent	Average Annual Count	Row Percent
All	All races	242.3	100.0%	211.0	87.1%
	AfrAmer	89.0	36.7%	76.3	85.7%
	White	56.0	23.1%	49.7	88.8%
	Latino	64.3	26.5%	56.7	88.2%
	API	26.0	10.7%	21.7	83.5%
	Other/Unk	7.0	2.9%	6.7	**
Male	All races	201.3	83.1%	175.0	86.9%
	AfrAmer	65.0	26.8%	55.3	85.1%
	White	48.0	19.8%	42.3	88.1%
	Latino	58.7	24.2%	51.7	88.1%
	API	22.7	9.4%	19.0	83.7%
	Other/Unk	7.0	2.9%	6.7	**
Female	All races	41.0	16.9%	36.0	87.8%
	AfrAmer	24.0	9.9%	21.0	**
	White	8.0	3.3%	7.3	**
	Latino	5.7	2.3%	5.0	**
	API	3.3	1.4%	2.7	**
	Other/Unk	0.0	0.0%	0.0	**

Source: Alameda County eHARS 2018 Q2

NOTE: Excludes N=10 persons who died within 90 days of diagnosis

[a] Refers to sex assigned at birth

[b] 'Other/Unk' = American Indians and Alaskan Natives, multiple race, unknown race

[**] Unstable estimates not shown

Table 4.3: Timely Linkage to HIV Care Among New Diagnoses by Race/Ethnicity and Age, Alameda County, 2014-2016

NOTE: This table spans multiple pages

Race/Ethnicity[a]	Age at Diagnosis	All Diagnoses		Linked in 90 Days, incl. Date of Diagnosis	
		Average Annual Count	Column Percent	Average Annual Count	Row Percent
All races	All ages	242.3	100.0%	211.0	87.1%
	13-19	7.7	3.2%	6.7	**
	20-24	36.3	15.0%	30.7	84.4%
	25-29	47.0	19.4%	42.0	89.4%
	30-39	58.7	24.2%	49.7	84.7%
	40-49	45.3	18.7%	39.3	86.8%
	50 & over	47.3	19.5%	42.7	90.1%
AfrAmer	All ages	89.0	36.7%	76.3	85.8%
	13-19	5.0	2.1%	4.3	**
	20-24	18.3	7.6%	15.3	**
	25-29	15.7	6.5%	14.0	**
	30-39	17.7	7.3%	14.7	**
	40-49	13.3	5.5%	11.7	**
	50 & over	19.0	7.8%	16.3	**
White	All ages	56.0	23.1%	49.7	88.7%
	13-19	0.0	0.0%	0.0	**
	20-24	5.3	2.2%	4.7	**
	25-29	10.3	4.3%	9.0	**
	30-39	14.7	6.1%	13.0	**
	40-49	11.7	4.8%	9.7	**
	50 & over	14.0	5.8%	13.3	**

Table 4.3: Timely Linkage to HIV Care Among New Diagnoses by Race/Ethnicity and Age, Alameda County, 2014-2016 (continued)

NOTE: This table spans multiple pages

Race/Ethnicity[a]	Age at Diagnosis	All Diagnoses		Linked in 90 Days, incl. Date of Diagnosis	
		Average Annual Count	Column Percent	Average Annual Count	Row Percent
Latino	All ages	64.3	26.5%	56.7	88.7%
	13-19	1.7	0.7%	1.7	100.0%
	20-24	8.0	3.3%	6.7	**
	25-29	15.7	6.5%	13.7	**
	30-39	17.0	7.0%	14.7	**
	40-49	14.3	5.9%	13.0	**
	50 & over	7.7	3.2%	7.0	**
API	All ages	26.0	10.7%	21.7	83.3%
	13-19	*	*	0.7	*
	20-24	*	*	2.7	*
	25-29	3.3	1.4%	3.3	100.0%
	30-39	*	*	6.3	*
	40-49	*	*	4.0	*
	50 & over	*	*	4.7	*
Other/Unk	All ages	7.0	2.9%	6.7	**
	13-19	*	*	0.0	*
	20-24	*	*	1.3	*
	25-29	2.0	0.8%	2.0	100.0%
	30-39	*	*	1.0	*
	40-49	*	*	1.0	*
	50 & over	*	*	1.3	*

Source: Alameda County eHARS 2018 Q2

NOTE: Excludes N=10 who died within 90 days of diagnosis

[a] 'Other/Unk' = American Indians and Alaskan Natives, multiple race, unknown race

[*] Some cells suppressed to protect confidentiality

[**] Unstable estimates not shown

Table 4.4: Engagement in HIV Care in 2016 Among PLHIV at Year-End 2015 by Sex and Age, Alameda County

Sex[a]	Age at Year-End 2015	All PLHIV		Any Visits in 2016	
		Count	Column Percent	Count	Row Percent
All	All ages	5,441	100.0%	4,147	76.2%
	0-12	7	0.1%	6	85.7%
	13-19	22	0.4%	18	81.8%
	20-29	421	7.7%	326	77.4%
	30-39	788	14.5%	582	73.9%
	40-49	1,344	24.7%	988	73.5%
	50-59	1,802	33.1%	1,400	77.7%
	60 & over	1,057	19.4%	827	78.2%
Male	All ages	4,513	82.9%	3,433	76.1%
	0-12	*	*	*	*
	13-19	*	*	*	*
	20-29	371	6.8%	288	77.6%
	30-39	650	11.9%	483	74.3%
	40-49	1,085	19.9%	787	72.5%
	50-59	1,518	27.9%	1,176	77.5%
	60 & over	869	16.0%	683	78.6%
Female	All ages	928	17.1%	714	76.9%
	0-12	*	*	*	*
	13-19	*	*	*	*
	20-29	50	0.9%	38	76.0%
	30-39	138	2.5%	99	71.7%
	40-49	259	4.8%	201	77.6%
	50-59	284	5.2%	224	78.9%
	60 & over	188	3.5%	144	76.6%

Source: Alameda County eHARS 2018 Q2

NOTE: 1) Engagement in care defined as having at least 1 visit. 2) Excludes PLHIV at year-end 2015 who died (N=76) or moved out of the county (N=614) in 2016

[a] Refers to sex assigned at birth

[*] Some cells suppressed to protect confidentiality

[**] Unstable estimates not shown

Table 4.5: Engagement in HIV Care in 2016 Among PLHIV at Year-End 2015 by Sex and Race/Ethnicity, Alameda County

Sex[a]	Race/Ethnicity[b]	All PLHIV		Any Visits	
		Count	Column Percent	Count	Row Percent
All	All races	5,441	100.0%	4,147	76.2%
	AfrAmer	2,127	39.1%	1,614	75.9%
	White	1,778	32.7%	1,387	78.0%
	Latino	1,009	18.5%	717	71.1%
	API	357	6.6%	283	79.3%
	Other/Unk	170	3.1%	146	85.9%
Male	All races	4,513	82.9%	3,433	76.1%
	AfrAmer	1,568	28.8%	1,182	75.4%
	White	1,626	29.9%	1,269	78.0%
	Latino	875	16.1%	620	70.9%
	API	303	5.6%	237	78.2%
	Other/Unk	141	2.6%	125	88.7%
Female	All races	928	17.1%	714	76.9%
	AfrAmer	559	10.3%	432	77.3%
	White	152	2.8%	118	77.6%
	Latino	134	2.5%	97	72.4%
	API	54	1.0%	46	**
	Other/Unk	29	0.5%	21	**

Source: Alameda County eHARS 2018 Q2

NOTE: 1) Engagement in care defined as having at least 1 visit. 2) Excludes PLHIV at year-end 2015 who died (N=76) or moved out of the county (N=614) in 2016

[a] Refers to sex assigned at birth

[b] 'Other/Unk' = American Indians and Alaskan Natives, multiple race, unknown race

[**] Unstable estimates not shown

Table 4.6: Engagement in HIV Care in 2016 Among PLHIV at Year-End 2015 by Race/Ethnicity and Age, Alameda County

NOTE: This table spans multiple pages

Race/Ethnicity[a]	Age at Year-End 2015	All PLHIV		Any Visits in 2016	
		Count	Column Percent	Count	Row Percent
All races	All ages	5,441	100.0%	4,147	76.2%
	0-12	7	0.1%	6	85.7%
	13-19	22	0.4%	18	81.8%
	20-29	421	7.7%	326	77.4%
	30-39	788	14.5%	582	73.9%
	40-49	1,344	24.7%	988	73.5%
	50-59	1,802	33.1%	1,400	77.7%
	60 & over	1,057	19.4%	827	78.2%
AfrAmer	All ages	2,127	39.1%	1,614	75.9%
	0-12	*	*	*	*
	13-19	*	*	*	*
	20-29	194	3.6%	148	76.3%
	30-39	313	5.8%	238	76.0%
	40-49	498	9.2%	366	73.5%
	50-59	682	12.5%	522	76.5%
	60 & over	422	7.8%	323	76.5%
White	All ages	1,778	32.7%	1,387	78.0%
	0-12	*	*	*	*
	13-19	*	*	*	*
	20-29	72	1.3%	57	79.2%
	30-39	163	3.0%	117	71.8%
	40-49	384	7.1%	292	76.0%
	50-59	725	13.3%	583	80.4%
	60 & over	431	7.9%	336	78.0%

Table 4.6: Engagement in HIV Care in 2016 Among PLHIV at Year-End 2015 by Race/Ethnicity and Age, Alameda County (continued)

NOTE: This table spans multiple pages

Race/Ethnicity[a]	Age at Year-End 2015	All PLHIV		Any Visits in 2016	
		Count	Column Percent	Count	Row Percent
Latino	All ages	1,009	18.5%	717	71.1%
	0-12	*	*	*	*
	13-19	*	*	*	*
	20-29	105	1.9%	81	77.1%
	30-39	205	3.8%	142	69.3%
	40-49	301	5.5%	204	67.8%
	50-59	260	4.8%	179	68.8%
	60 & over	132	2.4%	107	81.1%
API	All ages	357	6.6%	283	79.3%
	0-12	*	*	*	*
	13-19	*	*	*	*
	20-29	32	0.6%	25	78.1%
	30-39	77	1.4%	62	80.5%
	40-49	110	2.0%	81	73.6%
	50-59	87	1.6%	76	87.4%
	60 & over	49	0.9%	38	77.6%
Other/Unk	All ages	170	3.1%	146	85.9%
	0-12	*	*	*	*
	13-19	*	*	*	*
	20-29	18	0.3%	15	83.3%
	30-39	30	0.6%	23	76.7%
	40-49	51	0.9%	45	88.2%
	50-59	48	0.9%	40	83.3%
	60 & over	23	0.4%	23	100.0%

Source: Alameda County eHARS 2018 Q2

NOTE: 1) Engagement in care defined as having at least 1 visit. 2) Excludes PLHIV at year-end 2015 who died (N=76) or moved out of the county (N=614) in 2016

[a] Refers to sex assigned at birth

[*] Some cells suppressed to protect confidentiality

[**] Unstable estimates not shown

Table 4.7: Retention in Continuous HIV Care in 2016 Among PLHIV at Year-End 2015 by Sex and Age, Alameda County

Sex[a]	Age at Year-End 2015	All PLHIV		Retained in Care	
		Count	Column Percent	Count	Row Percent
All	All ages	5,441	100.0%	3,131	57.5%
	0-12	*	*	*	*
	13-19	*	*	*	*
	20-29	421	7.7%	215	51.1%
	30-39	788	14.5%	374	47.5%
	40-49	1,344	24.7%	751	55.9%
	50-59	1,802	33.1%	1,082	60.0%
	60 & over	1,057	19.4%	688	65.1%
Male	All ages	4,513	82.9%	2,599	57.6%
	0-12	*	*	*	*
	13-19	*	*	*	*
	20-29	371	6.8%	186	50.1%
	30-39	650	11.9%	310	47.7%
	40-49	1,085	19.9%	609	56.1%
	50-59	1,518	27.9%	905	59.6%
	60 & over	869	16.0%	575	66.2%
Female	All ages	928	17.1%	532	57.3%
	0-12	*	*	*	*
	13-19	*	*	*	*
	20-29	50	0.9%	29	58.0%
	30-39	138	2.5%	64	46.4%
	40-49	259	4.8%	142	54.8%
	50-59	284	5.2%	177	62.3%
	60 & over	188	3.5%	113	60.1%

Source: Alameda County eHARS 2018 Q2

NOTE: 1) Retention in Continuum care refers to 2 visits at least 90 days apart within the year. 2) Excludes PLHIV at year-end 2015 who died (N=76) or moved out of the county (N=614) in 2016

[a] Refers to sex assigned at birth

[*] Some cells suppressed to protect confidentiality

[**] Unstable estimates not shown

Table 4.8: Retention in Continuous HIV Care in 2016 Among PLHIV at Year-End 2015 by Sex and Race/Ethnicity, Alameda County

Sex[a]	Race/Ethnicity[b]	All PLHIV		Retained in Care	
		Count	Column Percent	Count	Row Percent
All	All races	5,441	100.0%	3,131	57.5%
	AfrAmer	2,127	39.1%	1,184	55.7%
	White	1,778	32.7%	1,081	60.8%
	Latino	1,009	18.5%	540	53.5%
	API	357	6.6%	217	60.8%
	Other/Unk	170	3.1%	109	64.1%
Male	All races	4,513	82.9%	2,599	57.6%
	AfrAmer	1,568	28.8%	858	54.7%
	White	1,626	29.9%	996	61.3%
	Latino	875	16.1%	465	53.1%
	API	303	5.6%	187	61.7%
	Other/Unk	141	2.6%	93	66.0%
Female	All races	928	17.1%	532	57.3%
	AfrAmer	559	10.3%	326	58.3%
	White	152	2.8%	85	55.9%
	Latino	134	2.5%	75	56.0%
	API	54	1.0%	30	**
	Other/Unk	29	0.5%	16	**

Source: Alameda County eHARS 2018 Q2

NOTE: 1) Retention in Continuum care refers to 2 visits at least 90 days apart within the year. 2) Excludes PLHIV at year-end 2015 who died (N=76) or moved out of the county (N=614) in 2016

[a] Refers to sex assigned at birth

[b] 'Other/Unk' = American Indians and Alaskan Natives, multiple race, unknown race

[**] Unstable estimates not shown

Table 4.9: Retention in Continuous HIV Care in 2016 Among PLHIV at Year-End 2015 by Race/Ethnicity and Age, Alameda County

NOTE: This table spans multiple pages

		All PLHIV		Retained in Care	
Race[a]	Age at Year-End 2015	Count	Column Percent	Count	Row Percent
All races	All ages	5,441	100.0%	3,131	57.5%
	0-12	*	*	*	*
	13-19	*	*	*	*
	20-29	421	7.7%	215	51.1%
	30-39	788	14.5%	374	47.5%
	40-49	1,344	24.7%	751	55.9%
	50-59	1,802	33.1%	1,082	60.0%
	60 & over	1,057	19.4%	688	65.1%
AfrAmer	All ages	2,127	39.1%	1,184	55.7%
	0-12	*	*	*	*
	13-19	*	*	*	*
	20-29	194	3.6%	95	49.0%
	30-39	313	5.8%	153	48.9%
	40-49	498	9.2%	261	52.4%
	50-59	682	12.5%	399	58.5%
	60 & over	422	7.8%	262	62.1%
White	All ages	1,778	32.7%	1,081	60.8%
	0-12	*	*	*	*
	13-19	*	*	*	*
	20-29	72	1.3%	41	56.9%
	30-39	163	3.0%	72	44.2%
	40-49	384	7.1%	230	59.9%
	50-59	725	13.3%	452	62.3%
	60 & over	431	7.9%	284	65.9%

Table 4.9: Retention in Continuous HIV Care in 2016 Among PLHIV at Year-End 2015 by Race/Ethnicity and Age, Alameda County (continued)

NOTE: This table spans multiple pages

		All PLHIV		Retained in Care	
Race[a]	Age at Year-End 2015	Count	Column Percent	Count	Row Percent
Latino	All ages	1,009	18.5%	540	53.5%
	0-12	*	*	*	*
	13-19	*	*	*	*
	20-29	105	1.9%	56	53.3%
	30-39	205	3.8%	91	44.4%
	40-49	301	5.5%	163	54.2%
	50-59	260	4.8%	135	51.9%
	60 & over	132	2.4%	91	68.9%
API	All ages	357	6.6%	217	60.8%
	0-12	*	*	*	*
	13-19	*	*	*	*
	20-29	32	0.6%	15	46.9%
	30-39	77	1.4%	40	51.9%
	40-49	110	2.0%	63	57.3%
	50-59	87	1.6%	65	74.7%
	60 & over	49	0.9%	33	67.3%
Other/Unk	All ages	170	3.1%	109	64.1%
	0-12	*	*	*	*
	13-19	*	*	*	*
	20-29	18	0.3%	8	44.4%
	30-39	30	0.6%	18	60.0%
	40-49	51	0.9%	34	66.7%
	50-59	48	0.9%	31	64.6%
	60 & over	23	0.4%	18	78.3%

Source: Alameda County eHARS 2018 Q2

NOTE: 1) Retention in Continuum care refers to 2 visits at least 90 days apart within the year. 2) Excludes PLHIV at year-end 2015 who died (N=76) or moved out of the county (N=614) in 2016

[a] Refers to sex assigned at birth

[*] Some cells suppressed to protect confidentiality

[**] Unstable estimates not shown

Table 4.10: Viral Suppression in 2016 Among PLHIV at Year-End 2015 by Sex and Age, Alameda County

Sex[a]	Age at Year-End 2015	All PLHIV		Suppressed at Last Viral Load in 2016	
		Count	Column Percent	Count	Row Percent
All	All ages	5,441	100.0%	3,699	68.0%
	0-12	*	*	*	*
	13-19	*	*	*	*
	20-29	421	7.7%	255	60.6%
	30-39	788	14.5%	491	62.3%
	40-49	1,344	24.7%	887	66.0%
	50-59	1,802	33.1%	1,277	70.9%
	60 & over	1,057	19.4%	770	72.8%
Male	All ages	4,513	82.9%	3,077	68.2%
	0-12	*	*	*	*
	13-19	*	*	*	*
	20-29	371	6.8%	230	62.0%
	30-39	650	11.9%	406	62.5%
	40-49	1,085	19.9%	717	66.1%
	50-59	1,518	27.9%	1,076	70.9%
	60 & over	869	16.0%	636	73.2%
Female	All ages	928	17.1%	622	67.0%
	0-12	*	*	*	*
	13-19	*	*	*	*
	20-29	50	0.9%	25	50.0%
	30-39	138	2.5%	85	61.6%
	40-49	259	4.8%	170	65.6%
	50-59	284	5.2%	201	70.8%
	60 & over	188	3.5%	134	71.3%

Source: Alameda County eHARS 2018 Q2

NOTE: Excludes PLHIV at year-end 2015 who died (N=76) or moved out of the county (N=614) in 2016

[a] Refers to sex assigned at birth

[*] Some cells suppressed to protect confidentiality

[**] Unstable estimates not shown

Table 4.11: Viral Suppression in 2016 Among PLHIV at Year-End 2015 by Sex and Race/Ethnicity, Alameda County

Sex[a]	Race/Ethnicity[b]	All PLHIV		Suppressed at Last Viral Load in 2016	
		Count	Column Percent	Count	Row Percent
All	All races	5,441	100.0%	3,699	68.0%
	AfrAmer	2,127	39.1%	1,374	64.6%
	White	1,778	32.7%	1,297	72.9%
	Latino	1,009	18.5%	634	62.8%
	API	357	6.6%	264	73.9%
	Other/Unk	170	3.1%	130	76.5%
Male	All races	4,513	82.9%	3,077	68.2%
	AfrAmer	1,568	28.8%	1,002	63.9%
	White	1,626	29.9%	1,189	73.1%
	Latino	875	16.1%	549	62.7%
	API	303	5.6%	224	73.9%
	Other/Unk	141	2.6%	113	80.1%
Female	All races	928	17.1%	622	67.0%
	AfrAmer	559	10.3%	372	66.5%
	White	152	2.8%	108	71.1%
	Latino	134	2.5%	85	63.4%
	API	54	1.0%	40	**
	Other/Unk	29	0.5%	17	**

Source: Alameda County eHARS 2018 Q2

NOTE: Excludes PLHIV at year-end 2015 who died (N=76), moved out of the county (N=614) in 2016

[a] Refers to sex assigned at birth

[b] 'Other/Unk' = American Indians and Alaskan Natives, multiple race, unknown race

[**] Unstable estimates not shown

Table 4.12: Viral Suppression in 2016 Among PLHIV at Year-End 2015 by Race/Ethnicity and Age, Alameda County

NOTE: This table spans multiple pages

		All PLHIV		Suppressed at Last Viral Load in 2016	
Race[a]	Age at Year-End 2015	Count	Column Percent	Count	Row Percent
All races	All ages	5,441	100.0%	3,699	68.0%
	0-12	*	*	*	*
	13-19	*	*	*	*
	20-29	421	7.7%	255	60.6%
	30-39	788	14.5%	491	62.3%
	40-49	1,344	24.7%	887	66.0%
	50-59	1,802	33.1%	1,277	70.9%
	60 & over	1,057	19.4%	770	72.8%
AfrAmer	All ages	2,127	39.1%	1,374	64.6%
	0-12	*	*	*	*
	13-19	*	*	*	*
	20-29	194	3.6%	105	54.1%
	30-39	313	5.8%	199	63.6%
	40-49	498	9.2%	311	62.4%
	50-59	682	12.5%	455	66.7%
	60 & over	422	7.8%	291	69.0%
White	All ages	1,778	32.7%	1,297	72.9%
	0-12	*	*	*	*
	13-19	*	*	*	*
	20-29	72	1.3%	47	65.3%
	30-39	163	3.0%	99	60.7%
	40-49	384	7.1%	274	71.4%
	50-59	725	13.3%	553	76.3%
	60 & over	431	7.9%	322	74.7%

Table 4.12: Viral Suppression in 2016 Among PLHIV at Year-End 2015 by Race/Ethnicity and Age, Alameda County (continued)

NOTE: This table spans multiple pages

		All PLHIV		Suppressed at Last Viral Load in 2016	
Race[a]	Age at Year-End 2015	Count	Column Percent	Count	Row Percent
Latino	All ages	1,009	100.0%	634	62.8%
	0-12	*	*	*	*
	13-19	*	*	*	*
	20-29	105	7.7%	69	65.7%
	30-39	205	14.5%	117	57.1%
	40-49	301	24.7%	184	61.1%
	50-59	260	33.1%	162	62.3%
	60 & over	132	19.4%	99	75.0%
API	All ages	357	39.1%	264	73.9%
	0-12	*	*	*	*
	13-19	*	*	*	*
	20-29	32	3.6%	23	71.9%
	30-39	77	5.8%	56	72.7%
	40-49	110	9.2%	76	69.1%
	50-59	87	12.5%	72	82.8%
	60 & over	49	7.8%	36	73.5%
Other/Unk	All ages	170	32.7%	130	76.5%
	0-12	*	*	*	*
	13-19	*	*	*	*
	20-29	18	1.3%	11	61.1%
	30-39	30	3.0%	20	66.7%
	40-49	51	7.1%	42	82.4%
	50-59	48	13.3%	35	72.9%
	60 & over	23	7.9%	22	95.7%

Source: Alameda County eHARS 2018 Q2

NOTE: Excludes PLHIV at year-end 2015 who died (N=76) or moved out of the county (N=614) in 2016

[a] Refers to sex assigned at birth

[*] Some cells suppressed to protect confidentiality

[**] Unstable estimates not shown

Table 4.13: Viral Suppression in 2016 Among PLHIV at Year-End 2015 and in Care in 2016 by Sex, Alameda County

	All PLHIV		Suppressed at Last Viral Load in 2016	
Sex[a]	Count	Column Percent	Count	Row Percent
All	4,147	100.0%	3,699	89.2%
Male	3,433	82.8%	3,077	89.6%
Female	714	17.2%	622	87.1%

Source: Alameda County eHARS 2018 Q2

NOTE: 1) In care defined as having a viral load test in 2016. 2) Excludes PLHIV at year-end 2015 who died (N=76), moved out of the county (N=614), or did not have any HIV labs reported (N=1294) in 2016.

[a] Refers to sex assigned at birth

[**] Unstable estimates not shown

Table 4.14: Viral Suppression in 2016 Among PLHIV at Year-End 2015 and in Care in 2016 by Race/Ethnicity, Alameda County

	All PLHIV		Suppressed at Last Viral Load in 2016	
Race/Ethnicity[a]	Count	Column Percent	Count	Row Percent
All races	4,147	100.0%	3,699	89.2%
AfrAmer	1,614	38.9%	1,374	85.1%
White	1,387	33.4%	1,297	93.5%
Latino	717	17.3%	634	88.4%
API	283	6.8%	264	93.3%
Other/Unk	146	3.5%	130	89.0%

Source: Alameda County eHARS 2018 Q2

NOTE: 1) In care defined as having a viral load test in 2016. 2) Excludes PLHIV at year-end 2015 who died (N=76), moved out of the county (N=614), or did not have any HIV labs reported (N=1294) in 2016.

[a] 'Other/Unk' = American Indians and Alaskan Natives, multiple race, unknown race

[**] Unstable estimates not shown

5 HIV Among Foreign Born Persons

Foreign-born persons are disproportionately affected by HIV [21, 12] and are a population of interest in HIV prevention. Studies comparing foreign-born and US-born persons have found that the epidemiology of HIV among foreign-born persons living in the US is complex and combines risk factors related to immigration, education, health care, and the global HIV epidemic [21, 5]. For example, immigrants face different challenges and risk of HIV depending on their region of origin and their manner of entry into the United States. In particular, immigrants passing through refugee camps and with undocumented status may face a substantially higher risk of acquiring HIV.

In Alameda County there are over 525,000 immigrants which is about one-third of the population [3]. The immigrant population makes up a substantial proportion of new and existing HIV cases in the county. In 2017, over 25% of the HIV diagnoses in Alameda County were among foreign-born persons.

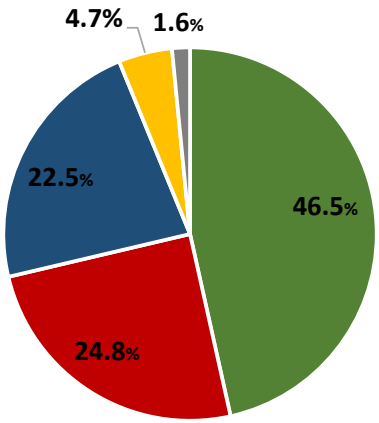
This report describes the profile of HIV among US-born and foreign-born people living with HIV in Alameda County and disparities in the HIV care continuum.

New Diagnoses of HIV

From 2015 to 2017, Alameda County had 478 new HIV diagnoses[1]. Over one-fourth (27.0%) of the cases were among foreign-born individuals. US-born persons comprised 60.0% of new diagnosis and 13.0% had unknown foreign-born status. HIV diagnoses among foreign-born and US-born persons by sex, race/ethnicity, and age group are presented in Table 5.1. Between 2015 and 2017, 43.0 foreign-born and 95.6 US-born persons per year were diagnosed with HIV on average.

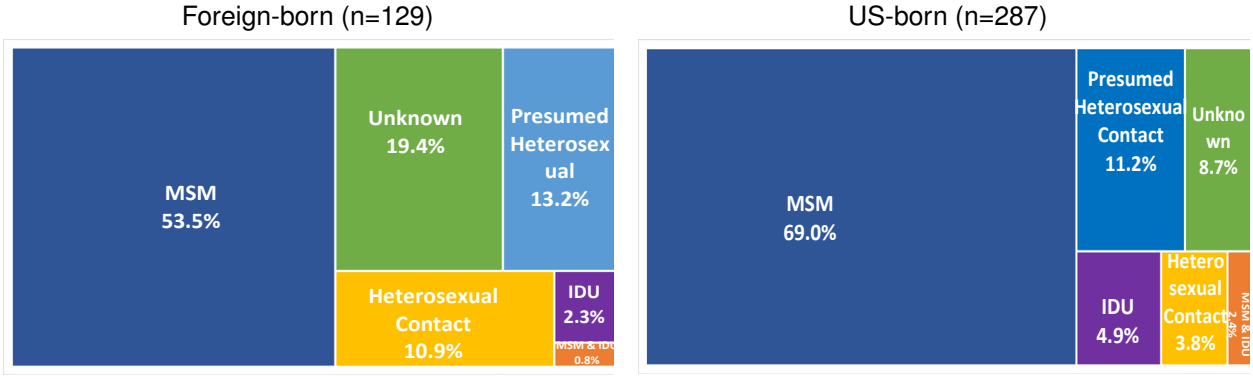
The highest proportion (46.5%) of foreign-born newly diagnosed persons had immigrated from Central and South America (Figure 5.1). The countries of origin with the highest proportion of newly diagnosed persons in Alameda County were Mexico (31.4%), Philippines (7.4%) and Ethiopia (5.7%) (Table 5.4 on page 68).

Figure 5.1: New Diagnoses by Foreign-Born Status and Region of Origin, Alameda County



From 2015 to 2017, the most common mode of transmission for new HIV diagnoses was MSM which made up 53.5% of new diagnoses among foreign-born and 69.0% of new diagnoses among US-born persons. Among both newly diagnosed cases and PLHIV in the county, there was a higher proportion of heterosexual transmission among foreign-born compared to US-born.

Figure 5.2: New Diagnosis by Mode of Transmission and Foreign-Born Status



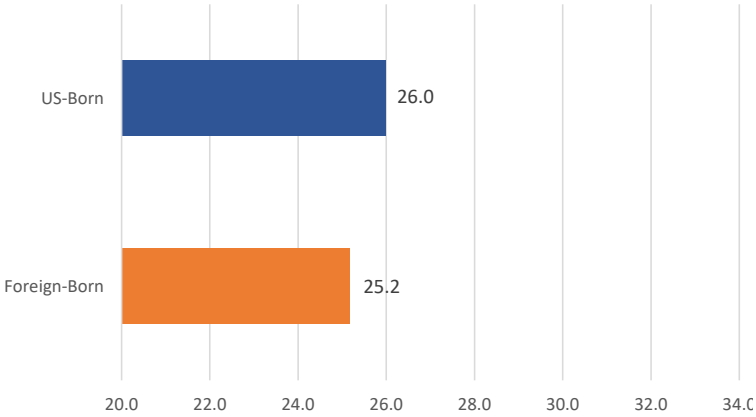
[1] A small number of foreign-born PLHIV may have been initially diagnosed with HIV in another country before arriving in the US, but due to the absence of date of initial diagnosis, their diagnosis date in surveillance data reflects the earliest date of HIV diagnosis in the US. Some foreign-born newly diagnosed cases in this analysis may have a previous diagnosis in another country.

African Americans accounted for 45.6% of new diagnoses among US-born, followed by white who comprised 31.4%. Among foreign-born, the highest proportion (47.3%) were Latino followed by 23.3% who identified as API (Figure 5.1 on the previous page). There was a higher percentage of newly diagnosed females among foreign-born (22.5%) compared to US-born (16.7%). There was a higher proportion of newly diagnosed persons aged 20-29 among US-born (38.3%) compared to foreign-born (24.8%). Persons aged 30 to 59 accounted for the majority of diagnoses among foreign-born.

New Diagnosis Rates

New diagnosis rates were similar for foreign-born and US-born (25.2 and 26.0 per 100,000, respectively).

Figure 5.3: Rates of New Diagnosis by Foreign-Born Status, Alameda County

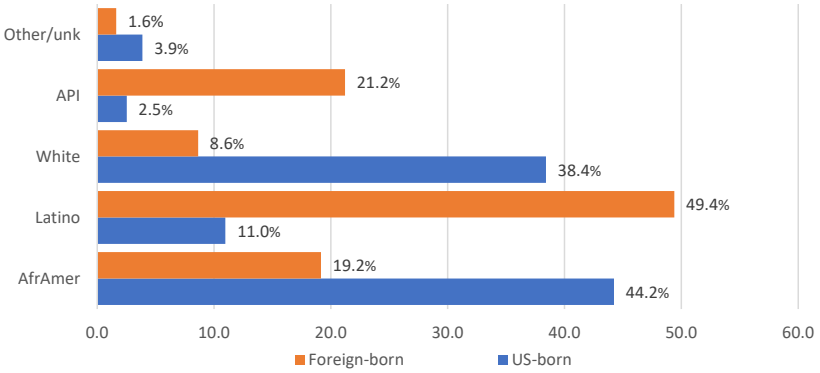


NOTE: American Community Survey (ACS) 2012-2016 population estimates were used for denominators.

People Living with HIV

Between 2015 and 2017, Alameda County had 6,283 people living with HIV. Nineteen percent of the PLHIV were foreign-born. US-born persons comprised 73.3% of PLHIV and 8.1% had unknown foreign-born status. As with newly diagnosed, the majority of the foreign-born PLHIV immigrated from Central or South America (49.9%) (Figure 5.2 on the preceding page). MSM was the most common mode of transmission for both foreign-born and US-born PLHIV. A higher proportion of the female PLHIV were foreign-born compared to that of US-born. The largest proportion of PLHIV among both foreign and US-born were 30-39 years of age (Table 5.2).

Figure 5.4: PLHIV by Foreign-Born Status and Race/Ethnicity, Alameda County

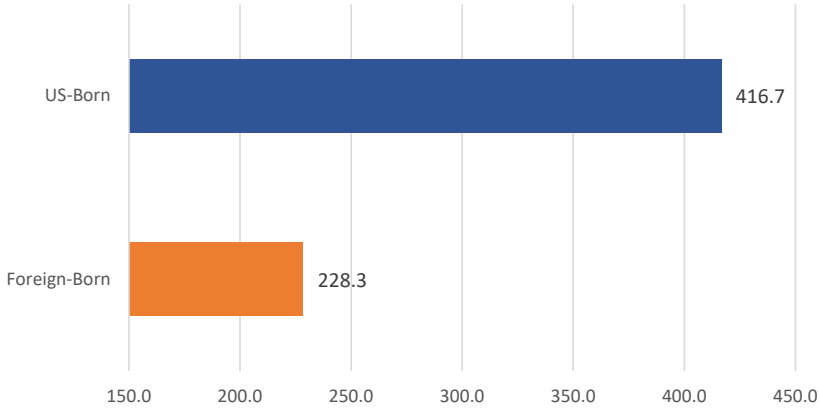


Similar to the finding for newly diagnosed, among foreign-born PLHIV, Latino comprised the the highest proportion (49.4%) and African American comprised the highest proportion of US-born (44.2%).

Prevalence Rates

The prevalence of HIV was lower for foreign-born (416.7 per 100,000) compared to US-born (228.3 per 100,000). The prevalence of HIV in the county overall was 388.5 per 100,000.

Figure 5.5: Prevalence of HIV by Foreign-Born Status, Alameda County



NOTE: American Community Survey (ACS) 2012-2016 population estimates were used for denominators.

Late Diagnosis

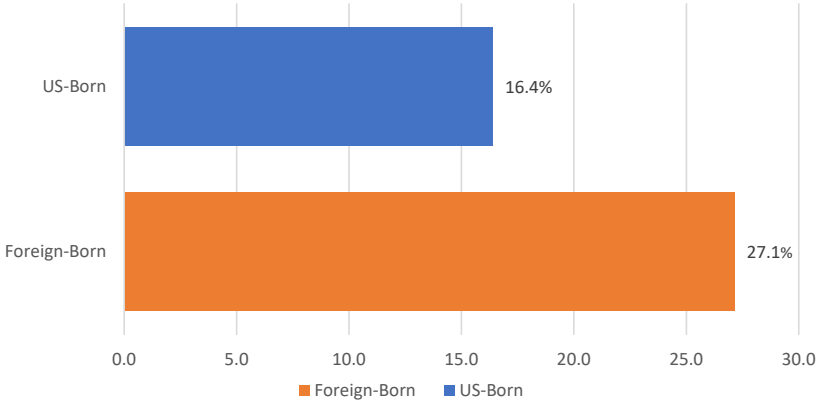
Late diagnosis is diagnosis of stage 3 HIV infection (AIDS) or progression to AIDS within 12 months of the initial diagnosis. A higher proportion of foreign-born persons were diagnosed late compared to US-born.[2] By race/ethnicity, the largest difference between foreign-born and US-born was seen in the category African American. Thirty-three percent of foreign-born persons from Africa were diagnosed late compared to 14.5% of US-born African Americans.

Disparity in late diagnosis between foreign-born and US-born was also seen by sex; among females, where 41.4% of the newly-diagnosed foreign-born females were diagnosed late compared to 10.4% of US-born

[2] A small number of foreign-born PLHIV may have been initially diagnosed with HIV in another country before arriving in the US, but due to the absence of date of initial diagnosis, their diagnosis date in surveillance data reflects the earliest date of HIV diagnosis in the US. As a consequence, late diagnoses maybe overestimated among the foreign-born in our data.

females. Across multiple age groups, a higher proportion of foreign-born persons were diagnosed late compared to US-born. This finding is consistent with previous studies that found that immigrants are likely to be diagnosed with HIV at later stages compared to US-born PLHIV [14, 13]. These findings suggest that immigrants may have additional barriers to HIV testing which potentially include social vulnerability and multiple risk factors related to isolation, acculturation, and access to medical care. Qualitative studies have identified lack of perception about HIV risk, lack of a regular provider, social stigma, and symptom-driven health-seeking behavior among immigrants as factors related to late diagnosis [14, 19, 9]. Additionally, stigmatizing perceptions of HIV in immigrant communities can also lead to increased fear of stigma from HIV and consequently delay testing and diagnosis [15].

Figure 5.6: Late Diagnosis by Foreign-Born Status, Alameda County 2014-2016



Among the Alameda County residents diagnosed between 2014 and 2016, a higher proportion of foreign-born persons were diagnosed late compared to US-born persons. The difference in late diagnosis rates was statistically significant.

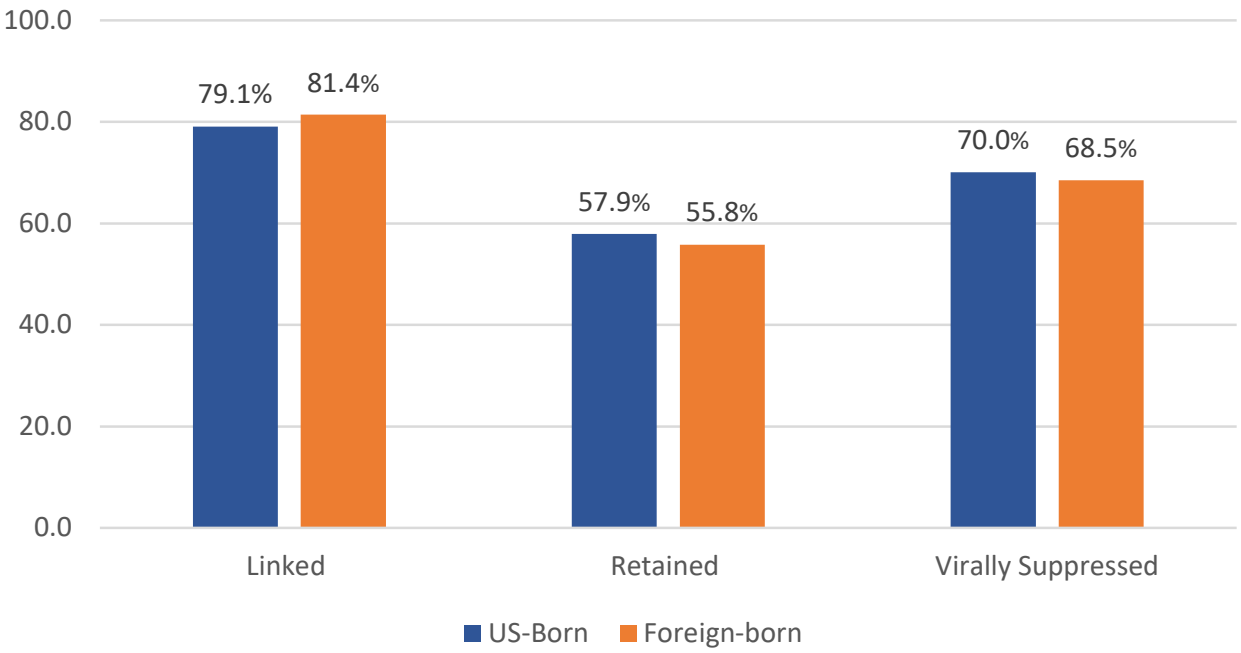
HIV Care Continuum

The HIV care continuum is the sequence of stages of HIV medical care through which people living with HIV progress from diagnosis to viral suppression. Linkage to care, retention in HIV care and viral suppression of foreign-born and US-born persons in Alameda County were analyzed. Among the Alameda County residents newly diagnosed between 2015 and 2017, 81.4% of the foreign-born and 79.1% of US-born individuals were linked to care excluding labs at diagnosis. Among PLHIV in Alameda County at year-end 2016, 55.8% of the foreign-born and 57.9% of US-born had two or more visits that were 90 or more days apart, i.e. were retained in care. At the end of 2016, 68.5% of foreign-born and 70.0% of US-born PLHIV were virally suppressed. There were no major differences in care continuum outcomes by foreign-born status. A comparable proportion of foreign-born and US-born were linked, retained in care and virally suppressed,

This lack of difference in outcomes by foreign-born status may be explained in part by the fact that those who present in care when they are sicker with symptoms may be more likely to be retained in care and virally suppressed [13, 10]. Previous studies found that foreign-born persons could be linked to care and virally suppressed due to more symptomatic disease at diagnosis or shortly thereafter. This phenomenon might be related to the higher perceived need for HIV care among people with symptomatic disease [13, 11]. In addition, access to insurance and development of programs such as the Ryan White HIV/AIDS Program that provides funding to low-income underinsured people living with HIV [2] may close some gaps and minimize barriers in utilization of health care services. Taken together, these data may indicate that

once diagnosed, foreign-born PLHIV engage in other HIV-related services similarly as their US-born counterparts. Overall, there is room for improvement particularly in retention in HIV care, regardless of foreign-born status.

Figure 5.7: The Continuum of HIV Care by Foreign-Born Status, Alameda County



NOTE: Denominators exclude the N=62 new cases and N=509 PLHIV with unknown country of birth.

Table 5.1: New HIV Diagnoses by Foreign-Born Status, Alameda County, 2015-2017

Characteristics	Total (n=416)	Foreign-born (n=129, 27.0%)	US-born (n=287, 60.0%)
Region of Origin			
USA	287 (69.0%)	NA	287
Asia and Pacific Islands	32 (7.7%)	32 (7.7%)	NA
Central & South America	60 (14.4%)	60 (14.4%)	NA
Africa	29 (7.0%)	29 (7.0%)	NA
Europe	6 (1.4%)	6 (1.4%)	NA
Age (years)			
13-19	*	*	*
20-29	142 (34.1%)	32 (24.8%)	110 (38.3%)
30-39	102 (24.5%)	36 (27.9%)	66 (23.0%)
40-49	81 (19.5%)	30 (23.3%)	51 (17.8%)
50-59	58 (13.9%)	20 (15.5%)	38 (13.2%)
60 & over	20 (4.8%)	8 (6.2%)	12 (4.2%)
Race/Ethnicity[a]			
African American	161 (38.7%)	30 (23.3%)	131 (45.6%)
Latino	109 (26.2%)	61 (47.3%)	48 (16.7%)
White	95 (22.8%)	5 (3.9%)	90 (31.4%)
API	38 (9.1%)	30 (23.3%)	8 (2.8%)
Other/unknown	*	*	*
Sex[b]			
Male	339 (81.5%)	100 (77.5%)	239 (83.3%)
Female	77 (18.5%)	29 (22.5%)	48 (16.7%)
Transmission Mode			
MSM	267 (64.2%)	69 (53.5%)	198 (69.2%)
IDU	*	*	*
MSM &IDU	*	*	*
Heterosexual contact	25 (6.0%)	14 (10.9%)	11 (3.8%)
Presumed Heterosexual Contact	49 (11.8%)	17 (13.2%)	32 (11.2%)
Unknown	50 (12.0%)	25 (19.4%)	25 (8.7%)

Sources: Alameda County eHARS 2018 Q2, American Community Survey (ACS) 2017
NOTE: 1) IDU = injection drug use; MSM = men who have sex with men; NA = not applicable 2) excludes N=62 persons with unknown country of birth 3) percentages may not add up to 100 due to rounding and missing cells
[a] The race category "African American" includes persons from Africa for foreign-born and blacks for US-born.
[b] Refers to sex assigned at birth
[*] Some cells suppressed to protect confidentiality

Table 5.2: PLHIV by Foreign-Born Status, Alameda County, Year-end 2017

Characteristics	Total (n=5,773)	Foreign-born (n=1,170, 20.3%)	US-born (n=4,603, 79.7%)
Region of Origin			
USA	4,603 (79.7%)	NA	4,603
Asia and Pacific Island	238 (4.9%)	238 (4.9%)	NA
Central & South America	584 (10.1%)	584 (10.1%)	NA
Africa	206 (3.6%)	206 (3.6%)	NA
Europe	73 (1.3%)	73 (1.3%)	NA
Age(years)			
13-19	160 (2.8%)	29 (2.5%)	131 (2.9%)
20-29	1,647 (29.0%)	332 (28.7%)	1,315 (29.1%)
30-39	2,007 (35.4%)	446 (38.6%)	1,561 (34.6%)
40-49	1,268 (22.4%)	233 (20.2%)	1,035 (22.9%)
50-59	476 (8.4%)	86 (7.5%)	390 (8.6%)
60 & over	115 (2.0%)	29 (2.5%)	86 (1.9%)
Race/Ethnicity[a]			
African American	2,260 (39.1%)	224 (19.2%)	2,036 (44.2%)
Latino	1,083 (18.8%)	578 (49.4%)	505 (11.0%)
White	1,869 (32.4%)	101 (8.6%)	1,768 (38.4%)
API	364 (6.3%)	248 (21.2%)	116 (2.5%)
Other/unknown	197 (3.4%)	19 (1.6%)	178 (3.9%)
Sex[b]			
Male	4,807 (83.3%)	916 (78.3%)	3,891 (84.5%)
Female	966 (16.7%)	254 (21.7%)	712 (15.5%)
Transmission Mode			
MSM	3,636 (63.0%)	645 (55.1%)	2,991 (65.0%)
IDU	409 (7.1%)	39 (3.3%)	370 (8.0%)
MSM &IDU	346 (6.0%)	35 (3.0%)	311 (6.8%)
Heterosexual contact	865 (15.0%)	284 (24.3%)	581 (12.6%)
Presumed Heterosexual Contact	186 (3.2%)	57 (4.9%)	129 (2.8%)
Unknown	330 (5.7%)	110 (9.4%)	220 (4.8%)

Sources: Alameda County eHARS 2018 Q2, American Community Survey (ACS) 2017
NOTE: 1) IDU = injection drug use; MSM = men who have sex with men; NA = not applicable 2) excludes N=62 persons with unknown country of birth 3) percentages may not add up to 100 due to rounding and missing cells
[a] The race category "African American" includes persons from Africa for foreign-born and blacks for US-born.
[b] Refers to sex assigned at birth
[*] Some cells suppressed to protect confidentiality

Table 5.3: HIV Care Continuum by Foreign-Born Status, Alameda County

	Total (n=416 newly dx, n=5773 PLHIV)	Foreign-Born (n=129,1170)	US-Born (n=287,4603)	P-value
Diagnosed late[a]	82 (19.7%)	35 (27.1%)	47 (16.4%)	0.01
Linked to care[b]	332 (79.8%)	105 (81.4%)	227 (79.1%)	0.63
Retained in care[c]	3319(57.5%)	653 (55.8%)	2666 (57.9%)	0.19
Virally Suppressed[d]	4024 (69.7%)	801 (68.5%)	3223 (70.0%)	0.74

Source: Alameda County eHARS 2018 Q2

NOTE: 1) Denominator for late diagnosis and linkage to care is newly diagnosed between 2015 and 2017 2) Denominator for retention in care and viral suppression is PLHIV in Alameda county at year end 2016 3) Only 5,773 PLHIV with known county of birth were included in the denominators

[a]Proportion of newly diagnosed late by foreign-born status

[b]Proportion of newly diagnosed linked to care (excluding labs at diagnosis) by foreign-born status

[c]Proportion of PLHIV retained in HIV care by foreign-born status

[d]Proportion of PLHIV with suppressed viral load at year end 2017 by foreign-born status

Table 5.4: Top Ten Countries of Origin among Foreign-Born PLHIV, Alameda County, 2017

Country of birth	N	Percent
Mexico	367	31.4
Philippines	87	7.4
Ethiopia	67	5.7
El Salvador	43	3.7
China	36	3.1
Viet Nam	34	2.9
Guatemala	32	2.7
India	25	2.1
Nigeria	24	2.1
Brazil	23	2.0

Source: Alameda County eHARS 2018 Q2

6 Persons Co-infected with HIV and Sexually Transmitted Diseases

Syphilis, gonorrhea and chlamydia are common among sexually active persons living with HIV infection. STD co-infection in persons with HIV can occur before or after their HIV diagnosis. The occurrence of early syphilis (primary and secondary stages, which are infectious), gonorrhea, and chlamydia after HIV diagnosis, particularly in those with unsuppressed viral load, suggests risk for transmission to HIV-uninfected partners. Conversely, STD infection prior to an HIV diagnosis reflects a missed opportunity for HIV prevention. Biologically, STD infection increases risk of HIV transmission and acquisition.

Reported cases of syphilis, gonorrhea and chlamydia have risen in California and in Alameda County in recent years. Between 2013 and 2017, diagnoses of early syphilis, chlamydia, and gonorrhea in California rose a combined 44.8%, while in Alameda County they rose 54.4%, from 8,560 cases to 13,220 cases [18]. Although there are no published national or state STD co-infection rates among PLHIV, several health jurisdictions have estimated incidence rates of HIV in MSM seen at STD clinics for early syphilis. These estimates are under 10% in Los Angeles, over 35% in New York, nearly 40% in Seattle, approximately 50% in San Francisco, and over 50% in Baltimore [17].

This chapter presents selected characteristics of PLHIV in Alameda County diagnosed with HIV in the preceding five years (2013-2017) who were also diagnosed with early syphilis (primary, secondary, or early-latent stage), gonorrhea, or chlamydia within one year prior to their HIV diagnosis or at any time after their HIV diagnosis. Particular focus is given to the characteristics of those who were STD co-infected after diagnosis. This group of PLHIV was selected in order to focus on the more recent epidemiology of STD in PLHIV. The findings related to HIV STD co-infection presented here are based on matches of HIV surveillance data with reported cases of early syphilis, gonorrhea, and chlamydia in the California STD surveillance data. Additional details on methods are provided in the Technical Notes (Appendix A, page 80).

Prevalence of STD Co-infection

At the end of 2017, of the 1,140 PLHIV living in Alameda County who had been diagnosed with HIV in the previous five years, 31.4%(N=358) had been diagnosed with one or more episodes of early syphilis, gonorrhea, or chlamydia, either within the year preceding their HIV diagnosis or at any time after HIV diagnosis (Table 6.1). This excluded 70 persons with STD diagnoses within 30 days of their HIV diagnosis (STD simultaneous with HIV in Table 6.1) and 71 persons with STD infections one year or more before HIV diagnosis. Overall, 56.2% (N=641) never had an STD diagnosis. The 358 PLHIV who had experienced STD co-infection had a total of 890 STD diagnoses, or an average of 2.5 per person.

Table 6.1: Timing of STD Diagnosis in PLHIV, Alameda County

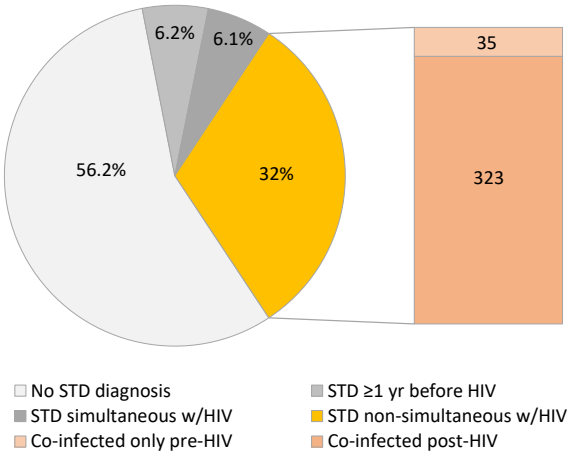
	Count	Percent
All	1,140	100.0%
Never diagnosed with STD	641	56.2%
Had STD ≥1 year before HIV	71	6.2%
STD simultaneous with HIV	70	6.1%
STD non-simultaneous with HIV	358	31.4%

NOTE: Analysis included persons diagnosed with HIV in 2013-2017 who were living in Alameda County at the end of 2017.

Among the 358 co-infected cases, 323 or 90.2% had STD co-infection *after* HIV diagnosis (Figure 6.1). This group is of particular concern, as STD transmission after HIV diagnosis is a sign of risk behaviors that could involve HIV transmission to uninfected partners. Among these 323 were 36 persons who had STD co-infections both before and after HIV diagnosis. Selected comparisons betweeen these 323 PLHIV and the 641 PLHIV never infected with an STD are presented in the next section below.

The remaining 35 or 9.8% of the co-infected cases had STD co-infection *before* HIV diagnosis. These cases reflect a missed opportunity for HIV prevention efforts following STD diagnosis.

Figure 6.1: Timing of STD Diagnosis in PLHIV, Alameda County



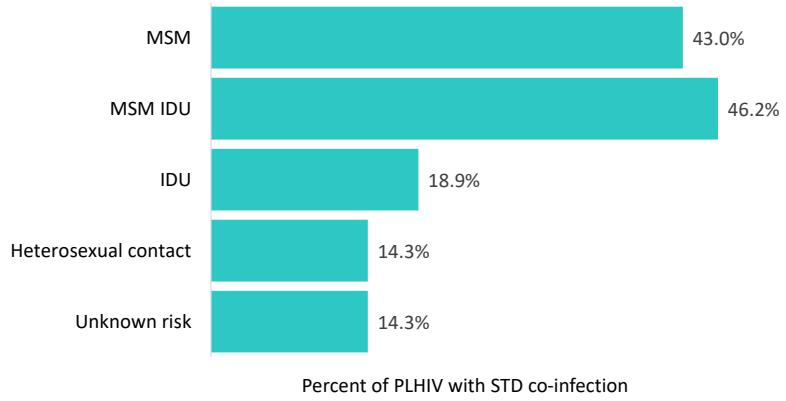
NOTE: Analysis is on persons diagnosed with HIV in 2013-2017 who were living in Alameda County at the end of 2017.

Co-infection Rates by Selected Characteristics

Table 6.3 at the end of this chapter shows selected characteristics of those co-infected after HIV diagnosis. Males, young adults, and MSM were disproportionately impacted by HIV STD co-infection. Males comprised 85.4% of the PLHIV (co-infected and not co-infected) included in the analysis, yet they made up 94.7% of all co-infected cases. Young adults aged 20-29 years comprised 33.6% of the PLHIV in this analysis yet accounted for 50.5% of all co-infected cases. MSM comprised 63.5% of the PLHIV yet accounted for 81.4% of the co-infected persons.

Forty-three percent of all PLHIV who were MSM were co-infected, compared to only 14.3% of PLHIV who had acquired HIV through heterosexual transmission (Figure 6.2). Co-infection rates were similarly high for MSM IDU (46.2%). In contrast, among IDU, a much smaller proportion were co-infected (18.9%).

Figure 6.2: Proportion of Co-infected Among PLHIV by HIV Transmissing Risk, Alameda County

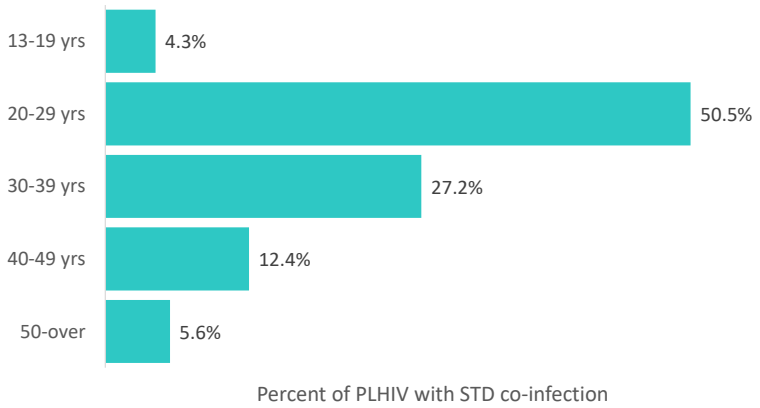


NOTE: Analysis included persons diagnosed with HIV in 2013-2017 who had STD infection after HIV diagnosis, who were living in Alameda County at the end of 2017.

The distribution of co-infected cases by age group is shown in Figure 6.3. Those aged 20-29 years made up over half (50.5%) of the co-infected cases. The next largest age group were those aged 30-39 years, who comprised 27.2% of co-infected cases. The distribution of co-infected cases by age is similar to that for the overall population of newly diagnosed HIV cases.

Males comprised 94.7% of the co-infected persons (306 cases).

Figure 6.3: STD Co-infection by Age at HIV Diagnosis, Alameda County



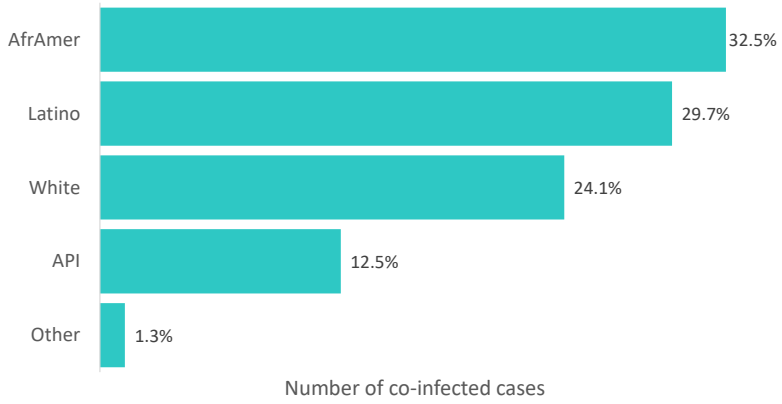
NOTE: Analysis included persons diagnosed with HIV in 2013-2017 who had STD infection after HIV diagnosis, who were living in Alameda County at the end of 2017.

African Americans comprised the largest proportion (32.5%) of co-infected persons, of all racial/ethnic groups.

Latinos made up 29.7%, whites 24.1%, and API 12.5% of co-infected persons (Figure 6.4).

These proportions closely mirror those for persons who were not co-infected.

Figure 6.4: STD Co-infection by Race/Ethnicity, Alameda County



NOTE: Analysis included persons diagnosed with HIV in 2013-2017 who had STD infection after HIV diagnosis, who were living in Alameda County at the end of 2017.

Chlamydia was the most commonly reported STD co-infection, comprising 42.4% of the STD diagnoses among PLHIV. Gonorrhea accounted for 40.6% and early syphilis for 17.0% of the STD diagnoses (Table 6.2).

MSM, including MSM IDU, comprised 83.6% of all co-infectious early syphilis, 80.8% of all co-infectious gonorrhea, and 79.6% of all co-infectious chlamydia cases (data table not shown). The 20-29 year age group made up the highest proportion of co-infected cases for each reported STD: 36.4% of syphilis, 58.4% of gonorrhea, and 48.1% of chlamydia cases.

Table 6.2: STD Co-infection by Disease, Alameda County

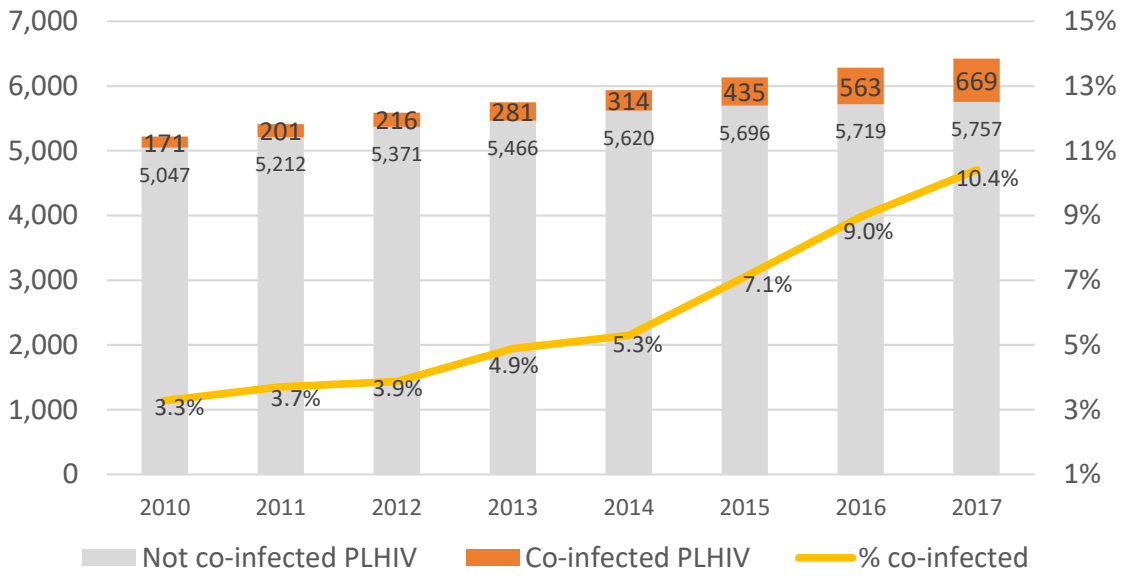
Disease	Count	Percent
Total	323	100.0%
Chlamydia	137	42.4%
Gonorrhea	131	40.6%
Early Syphilis	55	17.0%

NOTE: Analysis included persons diagnosed with HIV in 2013-2017 who had STD infection after HIV diagnosis, who were living in Alameda County at the end of 2017.

Co-infection Rates by Year

For this analysis, PLHIV in Alameda County were identified at year-end 2010-2017 and the percentage of PLHIV who experienced an STD diagnosis in each year was calculated. Figure 6.5 shows that the annual proportion of PLHIV who had an STD co-infection has more than tripled in recent years, from 3.3% in 2010 to 10.4% in 2017. This finding is consistent with the rise in STD occurrence in the general population in this time period.

Figure 6.5: STD Co-infection in PLHIV by Year, Alameda County, 2010-2017



NOTE: Each year's denominator is PLHIV at end of that year. Persons who had only simultaneous HIV and STD infection in each year were considered not co-infected for that year. This figure shows only onset of STD infection within each year. For this reason, it may underestimate the numbers of PLHIV with co-infection as it does not account for ongoing STD co-infection that may have continued from the preceding year.

Table 6.3: Demographics of Co-infected PLHIV, Alameda County

Characteristic	Category	Count	Percent
All Co-infected	--	323	100.0%
Sex[a]	Male	306	94.7%
	Female	17	5.3%
Race/Ethnicity[b]	AfrAmer	104	32.2%
	Latino	95	29.4%
	White	77	23.8%
	API	40	12.4%
	Other/Unk	7	2.2%
Age (years)	13-19	14	4.3%
	20-29	163	50.5%
	30-29	88	27.2%
	40-49	40	12.4%
	50 & over	18	5.6%
HIV Transmission Risk	MSM	263	81.4%
	IDU	7	2.2%
	MSM IDU	12	3.7%
	Heterosexual contact	9	2.8%
	Unknown	32	9.9%

NOTE: 1) Analysis included persons diagnosed with HIV in 2013-2017 who had STD infection after HIV diagnosis, who were living in Alameda County at the end of 2017. 2) MSM = men who have sex with men; IDU = injection drug use.

[a] Refers to sex assigned at birth

[b] 'Other/Unk' = American Indians and Alakan Natives, multiple race, unknown race

Appendix A: Technical Notes

Data Sources

All counts and proportions in this report were calculated using data from the Enhanced HIV/AIDS Reporting System (eHARS). Numerators of rates were also obtained from eHARS; denominators were derived using data from the United States Census (2000 and 2010) and Environmental Systems Research Institute (2012 and later). Mid-year population estimates for intercensal years prior to 2012 as well as all year-end estimates were obtained through linear interpolation.

To calculate prevalence of HIV among foreign-born and US-born individuals, estimates of the proportions of foreign-born and US-born in Alameda County were obtained from American Community Survey (ACS) and applied to the Community Assessment, Planning, and Evaluation (CAPE) mid-year population estimates of all people living in Alameda County.

STD surveillance data was obtained from the CDPH STD Control Branch; PLHIV at the end of 2017 were identified from eHARS. Computerized matching was done using Link King (version 9.0 for SAS, 2018), deterministic and probabilistic methods. Race/ethnicity was derived on the HIV dataset, and when missing, was populated with the race/ethnicity in the STD dataset.

Statistical Analysis

Calculation of Confidence Intervals

All confidence intervals (CI) depicted in the report are at the 95% confidence level. CIs for proportions are calculated on the log odds ("logit") scale and then antilogit-transformed in order to preclude lower limits less than 0% and upper limits greater than 100%. Confidence limits for rates are calculated using a Poisson distribution for counts less than 100 and a binomial distribution for counts of 100 or greater.

Significance Testing and Statistical Modeling

The statistical significance of associations between categorical variables was tested by Pearson's chi square test or Fisher's exact test, as appropriate. Differences in CD4 count at diagnosis were assessed using ANOVA unless Levene's Test for Homogeneity of Variances yielded a significant result (at alpha = 0.05), in which case Welch's ANOVA was used. Trend analyses were performed using Join Point [1] to model crude rates as a log-linear function of year separately for each stratum of the categorical variable(s); errors were assumed to have Poisson variance and to be independent. Grid search and the modified Bayesian Information Criterion were used to select the best fitting model from among those with zero to four join points at least 2 years apart between 2007 and 2016 (the second and second-to-last years examined).

Data Suppression Rules

Proportions

In accordance with draft guidelines released by the National Center for Health Statistics [20], proportions are considered to be statistically unreliable and are not presented if they meet either of the following criteria:

1. The absolute CI width exceeds 20%.
2. The absolute CI width does not exceed 20%, but the relative CI width (the absolute CI width divided by the lesser of the proportion and its complement) exceeds 120%.

Rates

Rates for subpopulations with fewer than 12 cases are considered to be statistically unreliable and were not presented. In these instances, the relative standard error of the rate exceeds 30%.

Death Ascertainment

Alameda County HIV surveillance officials are notified by the local Office of Vital Registration whenever HIV is documented on a death certificate filed in Alameda County. Additionally, the California Office of AIDS periodically matches state HIV registry data to national death databases such as the National Death Index and the Social Security Administration's Death Master File. PLHIV who died outside of Alameda County and were ever associated with Alameda County or whose HIV was not documented on their death certificate are thus generally captured through this process with some delay.

Appendix B: Reporting Requirements

The representativeness and accuracy of HIV surveillance data depend on the reliable, complete, and timely reporting of data by health care providers and laboratories in accordance with California law. The Adult HIV/AIDS Case Report Form, which is used to report data on cases of HIV infection, is available at `https://www.cdph.ca.gov/Programs/CID/DOA/CDPH%20Document%20Library/cdph8641a.pdf`. Help completing it in Alameda County can be obtained by calling (510) 268-2372.

Health Care Providers

Title 17, Section 2643.5, "HIV Reporting by Health Care Providers," requires health care providers to report cases of HIV disease (at any stage) to the local health department in the jurisdiction of their practice:

(a) Each health care provider that orders a laboratory test used to identify HIV, a component of HIV, or antibodies to or antigens of HIV shall submit to the laboratory performing the test a pre-printed laboratory requisition form which includes all documentation as specified in 42 CFR 493.1105 (57 FR 7162, Feb. 28, 1992, as amended at 58 FR 5229, Jan. 19, 1993) and adopted in Business and Professions Code, Section 1220.

(b) The person authorized to order the laboratory test shall include the following when submitting information to the laboratory:

- **(1)** Complete name of patient; and
- **(2)** Patient date of birth (2-digit month, 2-digit day, 4-digit year); and
- **(3)** Patient gender (male, female, transgender male-to-female, or transgender female-to-male); and
- **(4)** Date biological specimen was collected; and
- **(5)** Name, address, telephone number of the health care provider and the facility where services were rendered, if different.

(c) Each health care provider shall, within seven calendar days of receipt from a laboratory of a patient's confirmed HIV test or determination by the health care provider of a patient's confirmed HIV test, report the confirmed HIV test to the local Health Officer for the jurisdiction where the health care provider facility is located. The report shall consist of a completed copy of the HIV/AIDS Case Report form.

(1) All reports containing personal information, including HIV/AIDS Case Reports, shall be sent to the local Health Officer or his or her designee by:

(A) courier service, U.S. Postal Service Express or Registered mail, or other traceable mail; or

(B) person-to-person transfer with the local Health Officer or his or her designee.

(2) The health care provider shall not submit reports containing personal information to the local Health Officer or his or her designee by electronic facsimile transmission or by electronic mail or by non-traceable mail.

(d) HIV reporting by name to the local Health Officer, via submission of the HIV/AIDS Case Report, shall not supplant the reporting requirements in Article 1 of this Subchapter when a patient's medical condition progresses from HIV infection to an Acquired Immunodeficiency Syndrome (AIDS) diagnosis.

(e) A health care provider who receives notification from an out-of-state laboratory of a confirmed HIV test for a California patient shall report the findings to the local Health Officer for the jurisdiction where the health care provider facility is located.

(f) When a health care provider orders multiple HIV-related viral load tests for a patient, or receives multiple laboratory reports of a confirmed HIV test, the health care provider shall be required to submit only one HIV/AIDS Case Report, per patient, to the local Health Officer.

(g) Nothing in this Subchapter shall prohibit the local health department from assisting health care providers to report HIV cases.

(h) Information reported pursuant to this Article is acquired in confidence and shall not be disclosed by the health care provider except as authorized by this Article, other state or federal law, or with the written consent of the individual to whom the information pertains or the legal representative of that individual.

Note: Authority cited: Sections 120125, 120130, 120140, 121022, 131080 and 131200, Health and Safety Code. Reference: Sections 1202.5, 1206, 1206.5, 1220, 1241, 1265 and 1281, Business and Professions Code; and Sections 1603.1, 101160, 120175, 120250, 120775, 120885-120895, 120917, 120975, 120980, 121015, 121022, 121025, 121035, 121085, 131051, 131052, 131056 and 131080, Health and Safety Code.

Laboratories

Title 17, Section 2643.10, "HIV Reporting by Laboratories," requires laboratories to report all HIV-related laboratory tests to the local health department in the jurisdiction of the ordering provider:

(a) The laboratory director or authorized designee shall, within seven calendar days of determining a confirmed HIV test, report the confirmed HIV test to the Health Officer for the local health jurisdiction where the health care provider facility is located. The report shall include the

(1) Complete name of patient; and

(2) Patient date of birth (2-digit month, 2-digit day, 4-digit year); and

(3) Patient gender (male, female, transgender male-to-female, or transgender female-to-male); and

(4) Name, address, and telephone number of the health care provider and the facility that submitted the biological specimen to the laboratory, if different; and

(5) Name, address, and telephone number of the laboratory; and

(6) Laboratory report number as assigned by the laboratory; and

(7) Laboratory results of the test performed; and

(8) Date the biological specimen was tested in the laboratory; and

(9) Laboratory Clinical Laboratory Improvement Amendments (CLIA) number.

(b)

(1) All reports containing personal information, including laboratory reports, shall be sent to the local Health Officer or his or her designee by:

(A)

courier service, U.S. Postal Service Express or Registered mail, or other traceable mail; or

(B) person-to-person transfer with the local Health Officer or his or her designee.

(2) The laboratory shall not submit reports containing personal information to the local Health Officer or his or her designee by electronic facsimile transmission or by electronic mail or by non-traceable mail.

A laboratory that receives incomplete patient data from a health care provider for a biological specimen with a confirmed HIV test, shall contact the submitting health care provider to obtain the information required pursuant to Section 2643.5(b)(1)-(5), prior to reporting the confirmed HIV test to the local Health Officer.

If a laboratory transfers a biological specimen to another laboratory for testing, the laboratory that first receives the biological specimen from the health care provider shall report confirmed HIV tests to the local Health Officer.

Laboratories shall not submit reports to the local health department for confirmed HIV tests for patients of an Alternative Testing Site or other anonymous HIV testing program, a blood bank, a plasma center, or for participants of a blinded and/or unlinked seroprevalence study.

When a California laboratory receives a biological specimen for testing from an out-of-state laboratory or health care provider, the California director of the laboratory shall ensure that a confirmed HIV test is reported to the state health department in the state where the biological specimen originated.

When a California laboratory receives a report from an out of state laboratory that indicates evidence of a confirmed HIV test for a California patient, the California laboratory shall notify the local Health Officer and health care provider in the same manner as if the findings had been made by the California laboratory.

Information reported pursuant to this Article is acquired in confidence and shall not be disclosed by the laboratory except as authorized by this Article, other state or federal law, or with the written consent of the individual to whom the information pertains or the legal representative of the individual.

Note: Authority cited: Section 1224, Business and Professions Code; and Sections 120125, 120130, 120140, 121022, 131080 and 131200, Health and Safety Code. Reference: Sections 1206, 1206.5, 1209, 1220, 1241, 1265, 1281 and 1288, Business and Professions Code; and Sections 101150, 120175, 120775, 120885-120895, 120975, 120980, 121022, 121025, 121035, 131051, 131052, 131056 and 131080, Health and Safety Code.

Appendix C: HIV Surveillance in Alameda County

California Code of Regulations (CCR) Title 17, Section 2643.5 requires all health care providers (HCP) to report all cases of HIV disease they encounter in their clinical practice to the county/local health jurisdiction in which the encounter occurs. Additionally, CCR Title 17, Section 2643.10 requires all commercial laboratories to report all HIV-related laboratory tests they conduct to the local health jurisdiction of the HCP who ordered the test, providing an additional means by which local health departments may learn of a case of HIV disease.

In November 2015, California adopted the Electronic Laboratory Reporting (ELR) system for laboratories performing HIV testing. HIV test results delivered through ELR meet the statutory and regulatory reporting requirements for HIV test results. HIV-related laboratory results are submitted to the California Department of Public Health (CDPH) and routed to Alameda County for investigation. Establishment of ELR resulted in major changes in the local processing and management of laboratory results for HIV surveillance. Figure A.2 illustrates the steps involved in processing lab results, including ELR, for HIV surveillance in Alameda County. As shown in the figure, reported labs are checked against a local database to identify cases not previously reported. Potential new cases are investigated by trained field staff, who visit the office of the HCP that ordered the laboratory tests(s) or submitted the report and complete a standardized case report form (available at `https://www.cdph.ca.gov/Programs/CID/DOA/CDPH%20Document%20Library/cdph8641a.pdf`) using information abstracted from the patient's medical record and obtained from the HCP. Forms are then transmitted to CDPH, which in turn routinely submits de-identified data to CDC. When cases reported by different states appear to be the same person, CDC notifies the appropriate states to contact each other directly and determine whether the cases are duplicates.

Security and Confidentiality of Data

In accordance with the county's data use and disclosure agreement with CDPH, all data collected in the course of conducting HIV surveillance are used solely for public health purposes. Additionally, administrative, technical, and physical safeguards are in place to ensure the security and confidentiality of these data. All paper records are stored in locked file cabinets in an office with restricted access. Electronic data transmissions are encrypted and occur over a secure file transfer network. All electronic data are stored in a restricted access directory on a protected server.

Limitations of Surveillance Data and of County Analysis

A major strength of HIV surveillance data is that it captures and reflects the entire population of HIV diagnosed individuals. HIV surveillance data are not without their limitations however, which limit the analyses that can be done. These limitations include, but are not limited to:

- **Data quality:** Public health investigators extract required information from medical records for HIV reporting. Some information, such as risk factors or identification as transgender may not have been available in the medical record, elicited from the patient by the HCP, or adequately described. STDs are recognized to be widely under-reported, which may affect the figures reported here.
- **Data quantity:** In small subpopulations, the number of new diagnoses or PLHIV was not large enough to allow certain analyses. Statistical analyses based on small numbers may result in unstable estimates which can be misleading.
- **Timeliness of reporting:** Surveillance data are the product of a long process triggered by a visit to a HCP by an HIV-infected individual and culminating in the entry of case data into the statewide HIV surveillance database at the California Department of Public Health. Intermediate steps include, but are not limited to, laboratory testing, submission of case reports and lab results to the local health department, and investigation of each report. Data preparation, analysis and interpretation take additional time. For these reasons, there can be a 6-12 month delay in estimating numbers of diagnoses or PLHIV and in estimating any measures dependent on laboratory test results.
- **History of reporting laws:** The laws mandating the reporting of HIV-related laboratory test results and of cases of HIV disease at its different stages have changed over time, and this impacts our ability to characterize the epidemic at different points in the past. Although AIDS has been reportable since 1983, HIV disease at its earlier stages was not reportable until mid-2002 and even then only by a non-name code. More reliable, name-based data on HIV non-AIDS cases became mandated in 2006, and HIV-related labs became reportable in California in 2009. Consequently, most of analyses are limited to 2006 and later, and analyses relying on laboratory reporting are limited to 2010 and later.
- **Diagnosis date assigned to foreign-born cases:** A small number of foreign-born PLHIV may have been initially diagnosed with HIV in another country before arriving in the US, but due to the absence of verified information on date of initial diagnosis, their diagnosis date in the surveillance data reflects the earliest date of HIV diagnosis in the US. As a consequence new diagnoses and late diagnoses may be overestimated in our data.

Figure A.1: Timeline of Mandated HIV Reporting in California

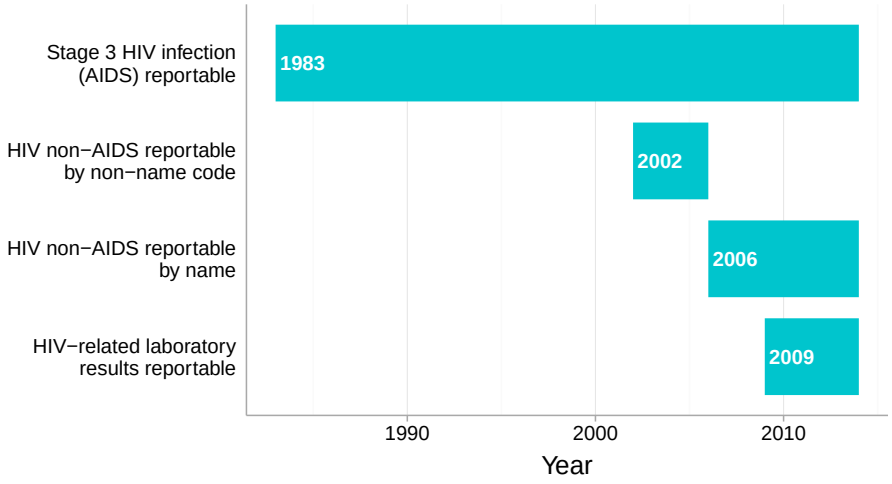
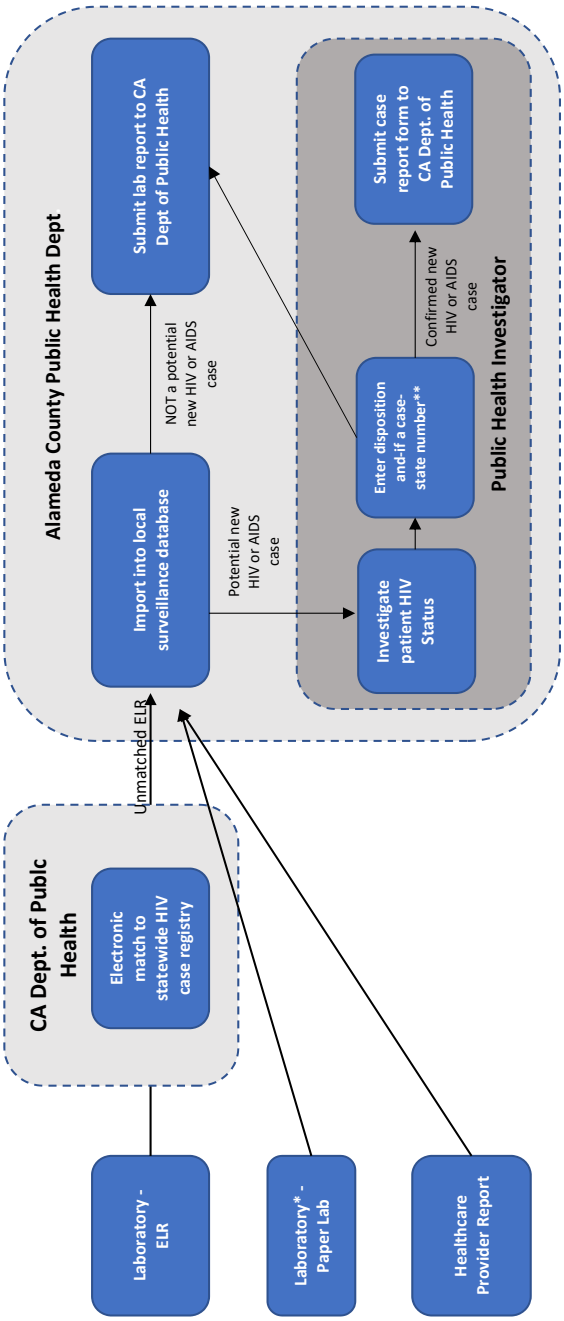


Figure A.2: The HIV Surveillance System in Alameda County



*Not all laboratories submit ELR; some still submit paper test results to the local public health department.
**The state number is used to uniquely identify HIV cases within the state.

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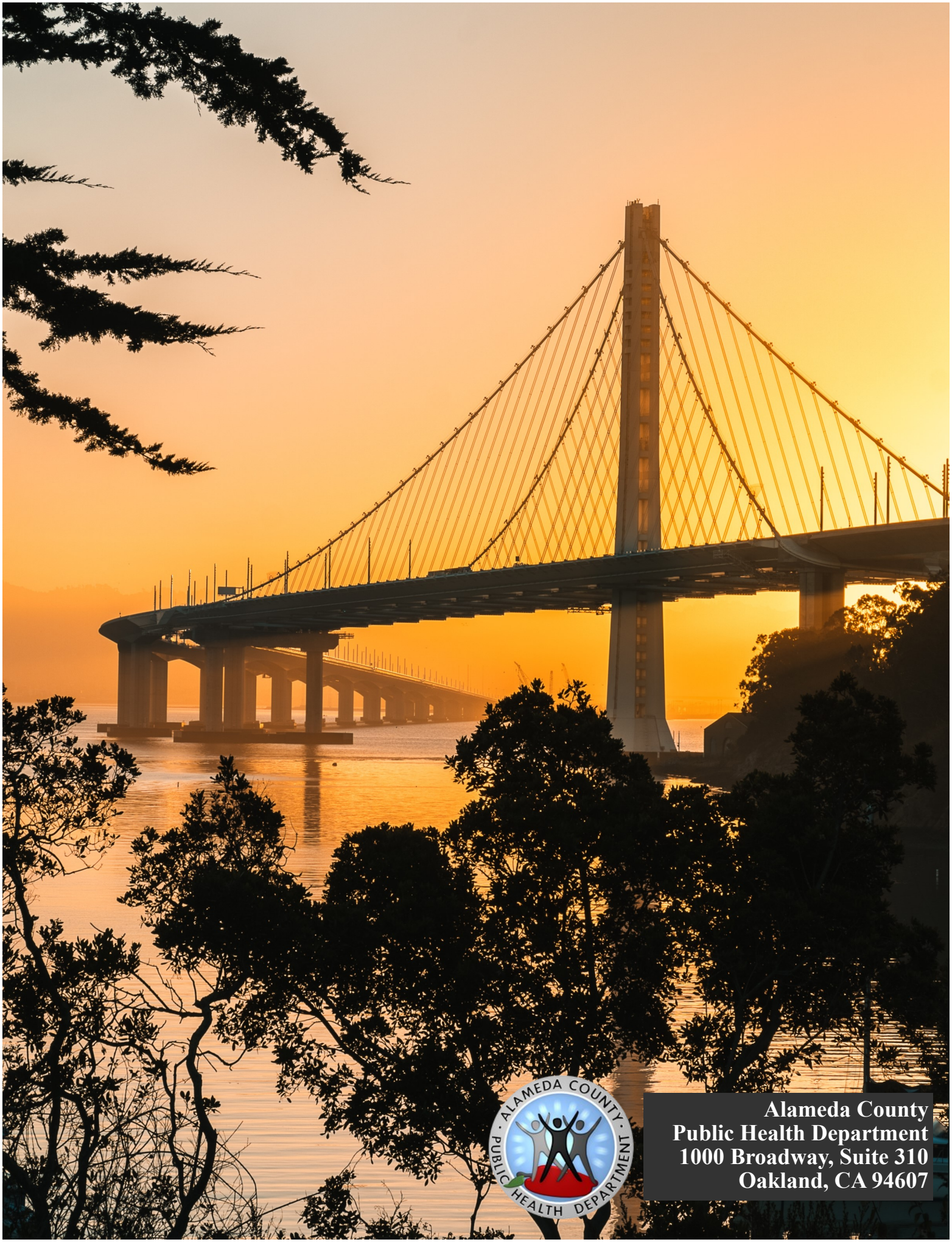

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