San Francisco Department of Public Health

Integrated Surveillance Report for Communicable Diseases

2013

POPULATION HEALTH DIVISION
SAN FRANCISCO DEPARTMENT OF PUBLIC HEALTH
APPLIED RESEARCH, COMMUNITY HEALTH EPIDEMIOLOGY, & SURVEILLANCE

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Cover photo by Frank Schulenburg.

Acknowledgments

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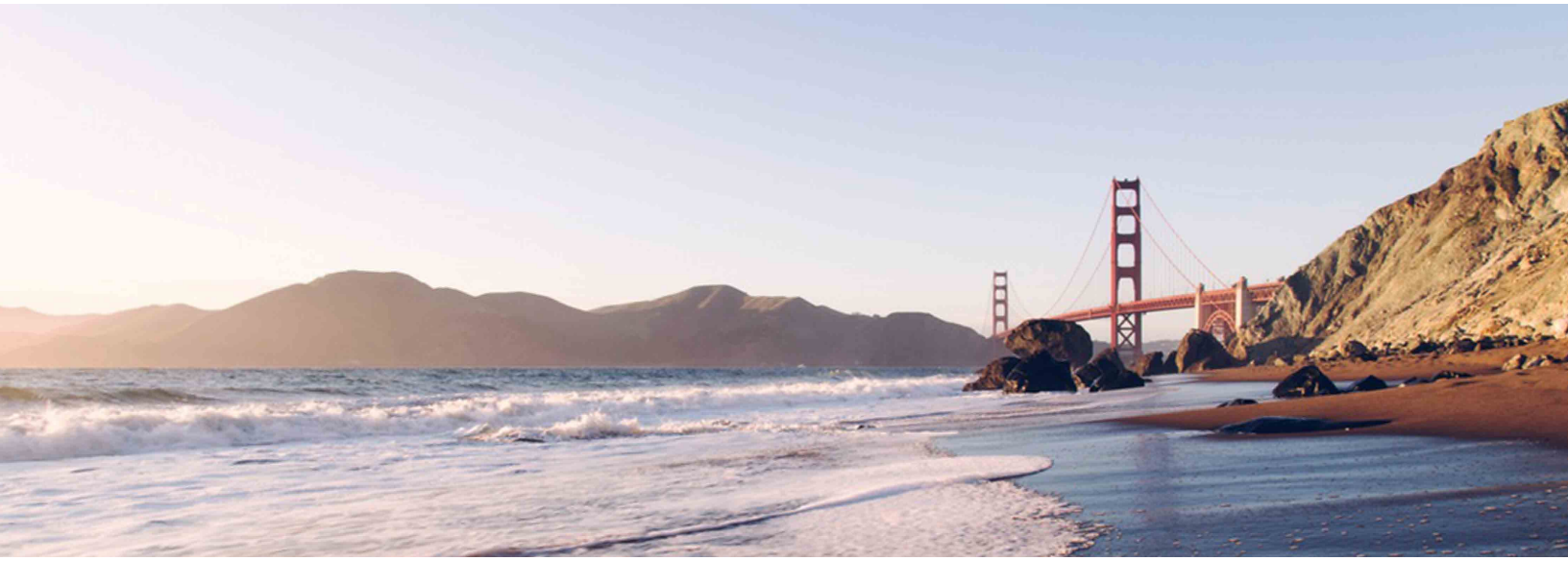

Photograph by Sebastien Gabriel

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Executive Summary

As part of the 2013 reorganization of the San Francisco Department of Public Health's Population Health Division, the Applied Research, Community Health Epidemiology, and Surveillance (ARCHES) Branch was formed. Epidemiologists, analysts, and staff who support the surveillance and epidemiology activities of infectious diseases including HIV, hepatitis B and C, sexually transmitted diseases (STDs), general communicable diseases, and tuberculosis, as well as chronic diseases and environmental health were brought together into ARCHES.

ARCHES coordinates the collection, management, analysis, and interpretation of data related to health and morbidity in San Francisco. Working with private and public medical clinics, community-based organizations, research groups and laboratories, ARCHES maintains data systems and data-sharing protocols to gather, explore, analyze and present data that informs decision-making for public health. Data across reportable diseases, health conditions, and populations are integrated to assess, investigate and address community health problems and to evaluate and monitor the effectiveness and quality of interventions and services.

We are pleased to present the first Integrated Surveillance Report for Communicable Diseases highlighting demographic disease trends for HIV, tuberculosis, hepatitis B and C, STDs, and communicable diseases in San Francisco. While the more detailed, disease-specific surveillance reports will continue to be available (see citations at the end of each section), we hope that this Integrated Surveillance Report provides a useful snapshot across these disease programs. In future reports, we will expand the level of detail and cross-cutting analyses that might be useful to our community and public health partners.

Photo credit: San Francisco Travel Association

1. Human Immunodeficiency Virus (HIV)

15,901

San Francisco residents living with HIV

13%

Proportion of CA's living HIV cases residing in SF at time of diagnosis

2%

Proportion of national living HIV cases residing in SF at time of diagnosis

As of December 31, 2013, there were 15,901 San Francisco residents diagnosed with HIV infection who were alive (Table 1.1). These persons comprised 13% of California's living HIV cases and 2% of persons living with HIV reported nationally. Compared to cases reported in California and the United States, San Francisco living HIV cases were more likely to be male, white, and men who have sex with men (MSM), including MSM who also inject drugs intravenously (MSM-PWID).

Compared to all living HIV cases in San Francisco, newly diagnosed HIV cases in San Francisco had a similar distribution by gender, a greater proportion of Latinos and Asian/Pacific Islanders, and a smaller proportion of MSM-PWID. Compared to newly diagnosed national HIV cases, newly diagnosed HIV cases in San Francisco were more likely to be male, white, and MSM.

Table 1.1 Characteristics of living HIV cases and newly diagnosed HIV cases in San Francisco, California and the United States

	Living HIV Cases			Newly Diagnosed HIV Cases	
	San Francisco[1] (N = 15,901) %	California[2] (N = 120,480) %	United States[3] (N = 898,529) %	San Francisco[1], 2013 (N = 359) %	United States[3], 2011 (N = 42,842) %
Gender					
Male	92%	87%	75%	91%	79%
Female	6%	12%	25%	6%	21%
Transgender[4]	2%	1%	--	3%	--
Race/Ethnicity					
White	61%	43%	33%	46%	28%
African American	13%	18%	43%	12%	46%
Latino	18%	33%	20%	25%	21%
Asian/Pacific Islander	6%	4%	1%	14%	2%
Native American	1%	<1%	<1%	1%	<1%
Other/Unknown	2%	1%	2%	3%	2%
Transmission Category					
MSM	74%	66%	43%	77%	50%
PWID	6%	7%	13%	6%	4%
MSM-PWID	15%	8%	5%	9%	2%
Heterosexual	3%	9%	19%	4%	15%
Other/Unidentified	2%	10%	20%	4%	29%

1 San Francisco data are reported through March 11, 2014 for cases diagnosed through December 31, 2013.
2 California data are reported through December 2013. California data on newly diagnosed HIV cases are not available.
3 U.S. data are reported through June 30, 2012 and reflect cases diagnosed through December 31, 2011. U.S. data reflect unadjusted numbers for 50 states and 6 dependent areas and may be found in the CDC HIV Surveillance Report, 2011; vol.23.
4 Transgender data are not reported by the United States. See Technical Notes "Transgender Status."

2,331

HIGHEST NUMBER OF STAGE 3 HIV CASES DIAGNOSED IN A SINGLE YEAR (1992)

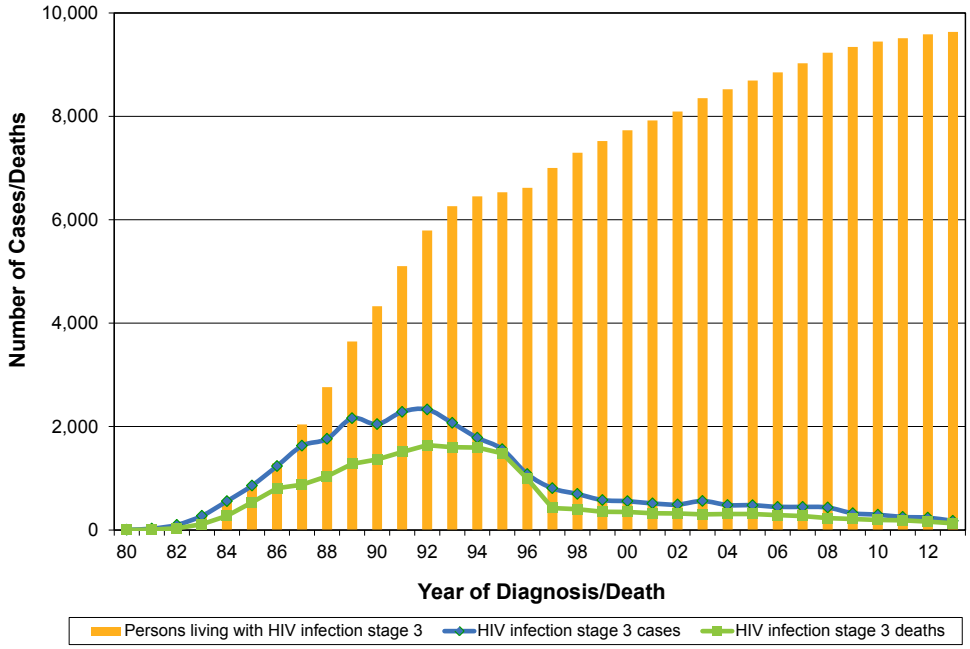
HIV infection stage 3 (AIDS) cases diagnosed each year among San Francisco residents reached a peak of 2,331 cases in 1992 and has declined since then (Figure 1.1). Deaths among HIV infection stage 3 (AIDS) cases decreased dramatically beginning in 1995 due to the impact of combination antiretroviral therapies (ART). From 1999 on, both cases and deaths have shown slight declines.

9,634

SF RESIDENTS LIVING WITH STAGE 3 HIV, 2013

The number of San Franciscans living with HIV infection stage 3 (AIDS) has continued to rise every year since 1980. This is due to effective ART and a lower number of deaths than new cases each year. There were 9,634 San Francisco residents living with HIV infection stage 3 (AIDS) by the end of 2013.

Figure 1.1 HIV infection stage 3 (AIDS) cases, deaths, and prevalence, 1980-2013, San Francisco



Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1990
HIV infection stage 3 cases	3	26	99	274	557	859	1236	1629	1763	2161	2046	2046
HIV infection stage 3 deaths	0	8	32	111	273	534	807	878	1039	1278	1365	1365
Persons living with HIV infection stage 3	3	21	88	251	535	860	1289	2040	2764	3647	4328	4328

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
HIV infection stage 3 cases	2331	2070	1784	1562	1080	807	696	579	557	514	492	561
HIV infection stage 3 deaths	1641	1600	1594	1484	992	424	402	353	350	323	320	303
Persons living with HIV infection stage 3	5793	6263	6453	6531	6619	7002	7296	7522	7729	7920	8092	8350

Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
HIV infection stage 3 cases	483	479	447	447	435	324	296	252	238	176
HIV infection stage 3 deaths	310	311	289	270	230	212	194	186	162	129
Persons living with HIV infection stage 3	8523	8691	8849	9026	9231	9343	9445	9511	9587	9634

359

NEW HIV CASES DIAGNOSED IN SF, 2013

Figure 1.2 illustrates the number of persons newly diagnosed with HIV infection (blue line), number of deaths each year (green line), and number of persons living with HIV infection between 2006 and 2013 (yellow bars). The date of HIV diagnosis for newly diagnosed cases was determined based on the earliest date of any of the following: positive HIV antibody test, viral load or CD4 test, initiation of ART, or patient self-report of a positive HIV test.

The number of new HIV diagnoses declined between 2007 and 2011, stabilized in 2012, and continued to decline in 2013.

The number of deaths was steady from 2006 to 2007 and has declined slightly each year since. For recent years, the number of cases diagnosed and deaths may be underestimated due to reporting delays.

The number of living cases by year includes persons who were diagnosed with HIV during or prior to the year shown and who are not known to have died by the end of that year. Persons living with HIV increased from 14,469 in 2006 to 15,901 in 2013. The increasing number of living cases is a reflection of a steady addition of newly diagnosed cases over time coupled with a decline in deaths in each year. These data only include persons who have been diagnosed and reported to the health department. HIV-infected persons who are unaware of their infection and persons diagnosed with an anonymous HIV test are not included unless they are San Francisco residents who also tested confidentially or entered HIV care in San Francisco. These figures may therefore underestimate the true prevalence and incidence of HIV in the city.

Figure 1.2 New HIV diagnoses, deaths, and prevalence, 2006-2013, San Francisco

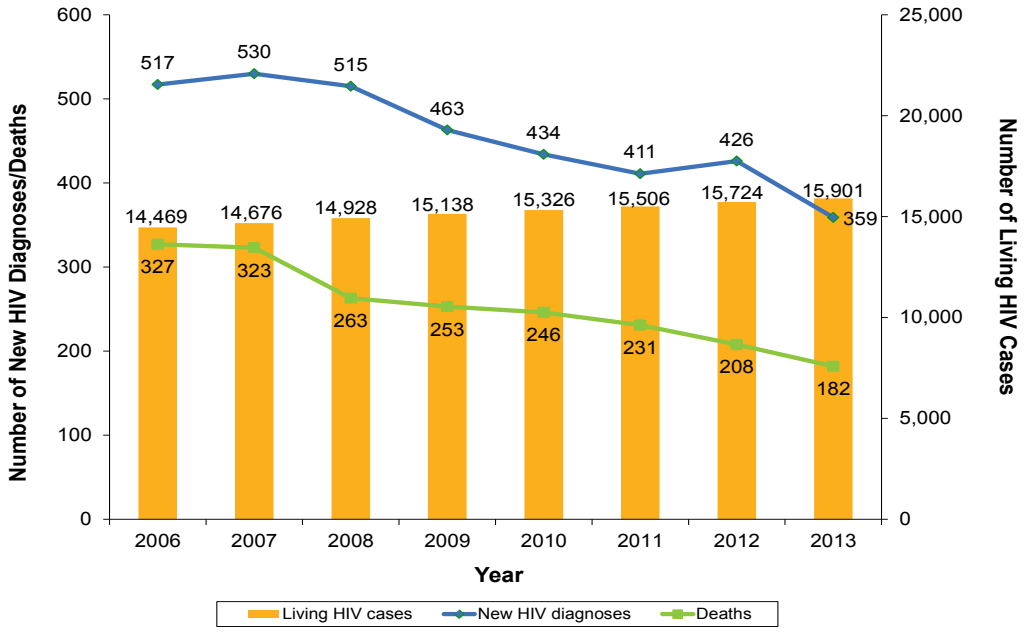


Table 1.2 shows the characteristics of persons diagnosed with HIV between 2009 and 2013. The majority were male, white, age 30-49 years and MSM. Race/ethnicity distributions were fairly similar year to year from 2009 to 2013, but data for recent years suggest small increases in proportions of Latinos and Asian/Pacific Islanders. The proportion of new diagnoses among persons aged 25-29 years also increased in recent years. No children (<13 years) were diagnosed with HIV during these years. Proportions of diagnoses among MSM-PWID, the second largest transmission category, declined from 2009 to 2012 and remained stable in 2013.

Number of HIV cases diagnosed each year

Table 1.2 Trends in persons diagnosed with HIV infection by demographic and risk characteristics, 2009-2013, San Francisco

	Year of Initial HIV Diagnosis[1]				
	2009	**2010**	**2011**	**2012**	**2013**
Total Number	463	434	411	426	359
Gender					
Male	91%	90%	88%	94%	91%
Female	5%	8%	10%	5%	6%
Transfemale[2]	4%	3%	2%	<1%	3%
Race/Ethnicity					
White	52%	48%	52%	49%	46%
African American	15%	14%	16%	11%	12%
Latino	21%	25%	20%	25%	25%
Asian/Pacific Islander	8%	9%	8%	12%	14%
Native American	0%	1%	0%	2%	1%
Other/Unknown	5%	4%	4%	2%	3%
Age at HIV Diagnosis (years)					
0 - 12	0%	0%	0%	0%	0%
13 - 17	<1%	<1%	<1%	0%	0%
18 - 24	12%	12%	10%	13%	12%
25 - 29	13%	13%	15%	16%	22%
30 - 39	31%	31%	27%	31%	29%
40 - 49	27%	28%	31%	29%	25%
50+	17%	15%	17%	12%	12%
Transmission Category					
MSM	72%	65%	71%	79%	77%
PWID	5%	8%	7%	3%	6%
MSM-PWID	15%	14%	11%	9%	9%
Heterosexual	5%	8%	6%	5%	4%
Other/Unidentified	3%	5%	5%	4%	4%

1 Data include persons diagnosed with HIV infection in any stage and reported as of March 11, 2014. Percentages may not add to 100% due to rounding.

2 Transfemale data include all transgender cases. Transmale data are not released separately due to potential small population size. See Technical Notes "Transgender Status."

54%

PROPORTION OF PLWH AGE 50 YEARS AND OLDER, 2013

As of December 31, 2013, 15,901 San Francisco residents were living with HIV (Table 1.3). Demographic and risk characteristics of persons living with HIV (PLWH) remained mostly stable between 2010 and 2013; cases were predominately white, age 50 years and older, and MSM (including MSM-PWID). This table demonstrates aging of persons living with HIV; the proportion of persons aged 50 years and older increased from 45% to 54% between 2010 and 2013, while the proportions of persons aged 30-39 and 40-49 years decreased.

Proportion of PLWH, age 30-49

Proportion of PLWH, age 50+

Table 1.3 Trends in persons living with HIV by demographic and risk characteristics, 2010-2013[1], San Francisco

	2010		2011		2012		2013	
	Number	(%)	Number	(%)	Number	(%)	Number	(%)
Gender								
Male	14,090	(92)	14,244	(92)	14,462	(92)	14,638	(92)
Female	878	(6)	902	(6)	907	(6)	906	(6)
Transfemale[2]	358	(2)	360	(2)	355	(2)	357	(2)
Race/Ethnicity								
White	9,531	(62)	9,617	(62)	9,696	(62)	9,760	(61)
African American	2,014	(13)	2,027	(13)	2,033	(13)	2,038	(13)
Latino	2,607	(17)	2,656	(17)	2,732	(17)	2,795	(18)
Asian/Pacific Islander	772	(5)	799	(5)	847	(5)	894	(6)
Native American	80	(1)	82	(1)	89	(1)	90	(1)
Other/Unknown	322	(2)	325	(2)	327	(2)	324	(2)
Age in Years (at end of each year)								
0 - 12	5	(<1)	4	(<1)	3	(<1)	3	(<1)
13 - 17	13	(<1)	12	(<1)	8	(<1)	4	(<1)
18 - 24	167	(1)	153	(1)	153	(1)	138	(1)
25 - 29	443	(3)	442	(3)	455	(3)	459	(3)
30 - 39	2,135	(14)	1,987	(13)	1,916	(12)	1,869	(12)
40 - 49	5,658	(37)	5,451	(35)	5,133	(33)	4,778	(30)
50+	6,905	(45)	7,457	(48)	8,056	(51)	8,650	(54)
Transmission Category								
MSM	11,153	(73)	11,316	(73)	11,533	(73)	11,708	(74)
PWID	1,025	(7)	1,016	(7)	992	(6)	972	(6)
MSM-PWID	2,396	(16)	2,384	(15)	2,382	(15)	2,380	(15)
Heterosexual	469	(3)	491	(3)	507	(3)	519	(3)
Transfusion/Hemophilia	25	(<1)	25	(<1)	25	(<1)	25	(<1)
Other/Unidentified	258	(2)	274	(2)	285	(2)	297	(2)
Total	**15,326**		**15,506**		**15,724**		**15,901**	

1 Persons living with HIV at the end of each year.
2 Transfemale data include all transgender cases. Transmale data are not released separately due to potential small population size. See Technical Notes "Transgender Status."

HIV incidence estimates

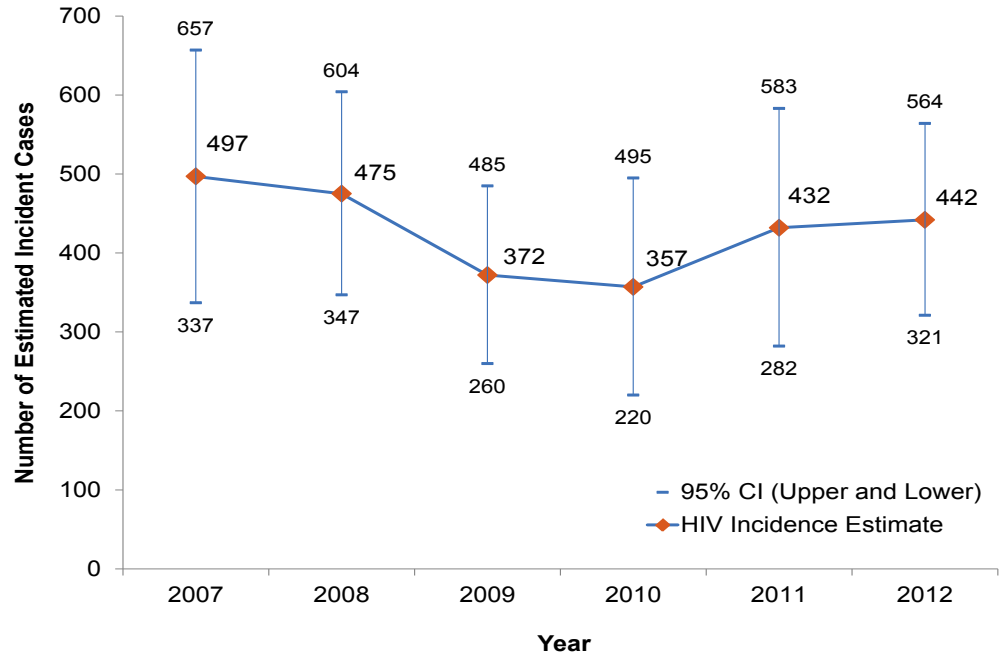
442
ESTIMATED # OF NEW HIV CASES, 2012

The San Francisco Department of Public Health (SFDPH) serves as one of the 25 national HIV incidence surveillance sentinel sites monitoring the number and rates of new HIV infections. Estimates of new infections track the leading edge of the HIV epidemic and are critical for allocating resources and evaluating effectiveness of prevention programs.

To identify incident HIV cases, blood from newly diagnosed HIV individuals is retested using a laboratory assay (called BED) that classifies individuals as having either a recently acquired HIV infection or a long-standing infection. These results are used with a statistical adjustment for HIV testing history to estimate HIV incidence. We applied this method, developed by the Centers for Disease Control and Prevention (CDC), to 2007-2012 data.

Overall, the estimated number of new HIV infections has remained relatively stable since 2007 (Figure 1.3). While there were fluctuations in the estimates, the confidence intervals overlap from year to year indicating there were no large decreases or increases in HIV incidence over the last several years.

Figure 1.3 Estimated number of new HIV infections, 2007-2012, San Francisco



CI: Confidence Interval.

Continuum of HIV care among persons newly diagnosed with HIV

89%

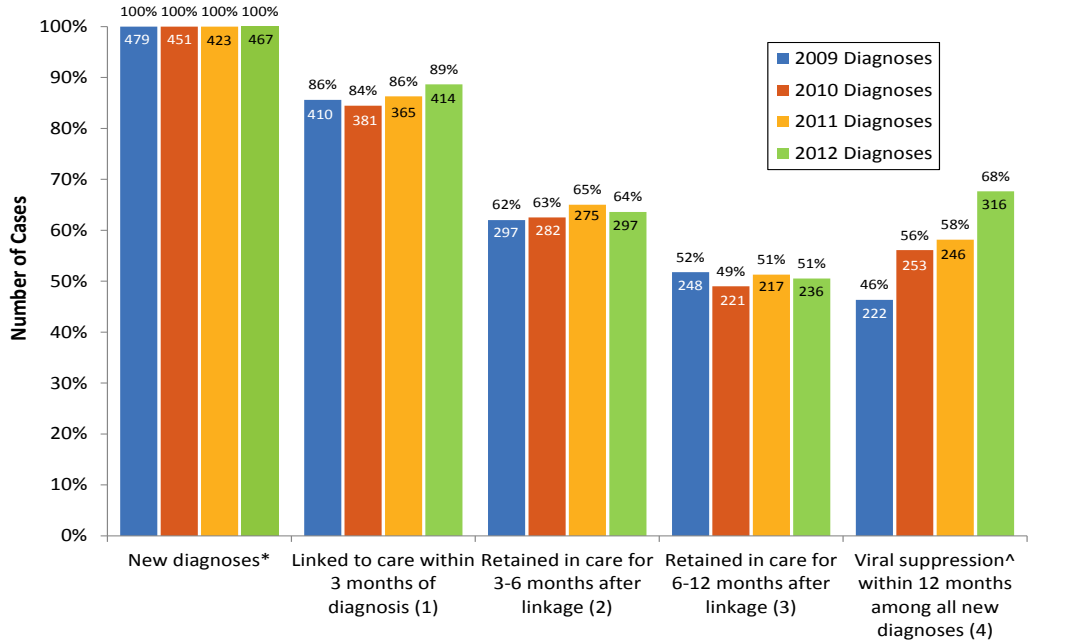
NEWLY-DIAGNOSED INDIVIDUALS LINKED TO CARE WITHIN 3 MONTHS OF DIAGNOSIS, 2012

68%

NEWLY-DIAGNOSED INDIVIDUALS WHO ACHIEVED VIRAL SUPPRESSION WITHIN 12 MONTHS, 2012

To improve health outcomes for HIV-infected persons, rapid entry into care, ongoing engagement in care, and use of ART to achieve viral suppression are required. The SFDPH monitors these outcomes using reports of CD4 and viral load tests. For the four years from 2009 to 2012, the proportion of newly diagnosed persons who entered care within three months of diagnosis has increased to 89% in 2012(1)(Figure 1.4). However, not all persons who entered care continued to receive care; 62%-65% of persons diagnosed in 2009 to 2012 remained in care three to six months after initial linkage to care (i.e., had a second visit after their first medical visit)(2), and 49%-52% retained in care 6-12 months after linkage (i.e., had three visits)(3). Of note, the four-year period has seen a substantial increase, from 46% to 68%, in the proportion of newly diagnosed persons who achieved viral suppression within 12 months(4). Because not all newly diagnosed persons enter or remain in care and others move outside of San Francisco, our ability to measure these outcomes has some limitations.

Figure 1.4 Continuum of HIV care among persons diagnosed with HIV, 2009-2012, San Francisco



* Number of new diagnoses shown each year is based on the evidence of a confirmed HIV test and does not take into account patient self-report of HIV infection.

^ Defined as the latest viral load test during the specified period ≤ 200 copies/mL.

2. Sexually Transmitted Diseases

632.6
CHLAMYDIA RATE IN 2013

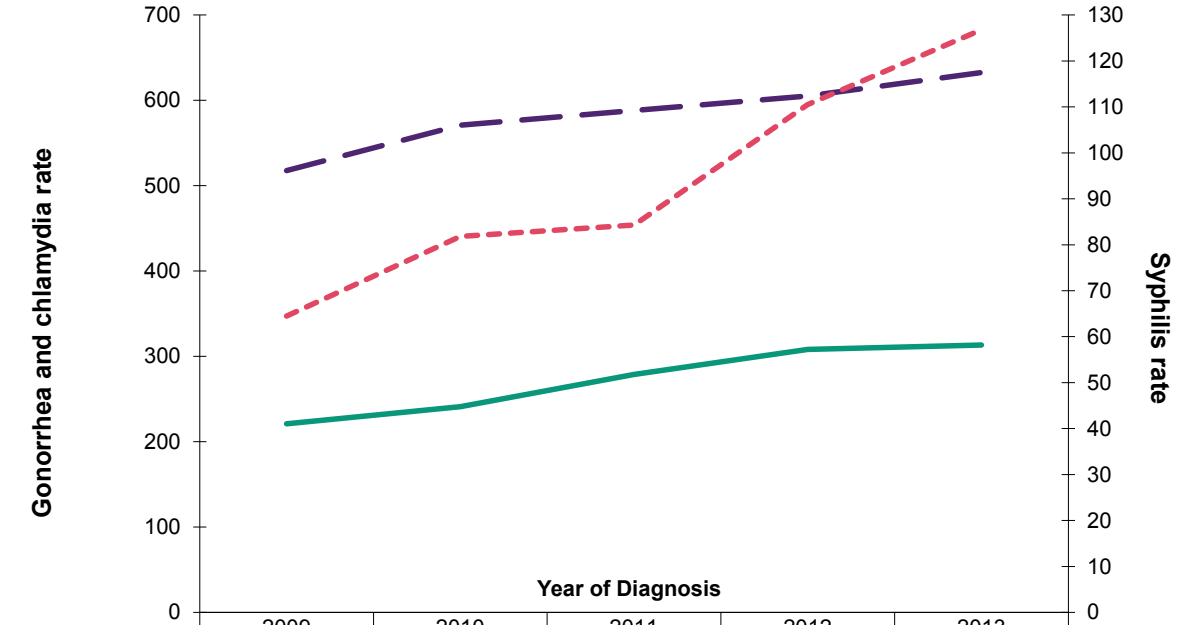
313.4
GONORRHEA RATE IN 2013

126.8
EARLY SYPHILIS RATE IN 2013

The most prevalent of the reportable sexually transmitted diseases (STDs) are chlamydia, gonorrhea, and syphilis. While previous evaluations of the San Francisco STD surveillance system indicate that reporting of all positive test results is nearly complete, the reported morbidity is still an underestimate of the true disease burden in the population. Many STDs among men and women are not diagnosed because people do not always seek care when their infection is asymptomatic or they do not have access to health care.

As reflected in Figure 2.1, STD rates have continued to increase over the past 5 years. The greatest STD burden in San Francisco is among two priority populations: men who have sex with men (MSM) and adolescents/young adults. Inequities by sex and race/ethnicity persist as well.

Figure 2.1 Annual rates of cases diagnosed with major reportable STDs per 100,000 population, 2009-2013, San Francisco



	2009	2010	2011	2012	2013
Chlamydia	517.6	571.0	588.2	605.2	632.6
Gonorrhea	221.1	241.0	278.8	308.1	313.4
Early Syphilis	64.5	81.8	84.3	110.5	126.8

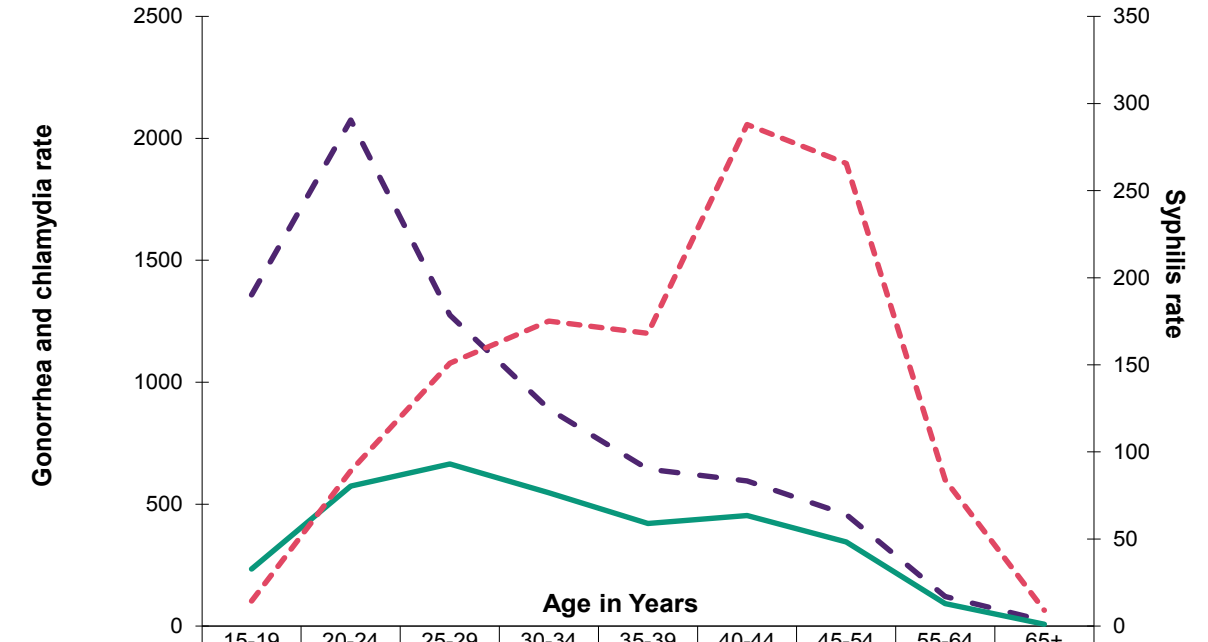
As in previous years, chlamydia rates were highest among adolescents and young adults (ages 15-24) and syphilis rates peaked among the 40-44 year-old age group. Gonorrhea in San Francisco affects both priority populations, as seen in the bimodal distribution in Figure 2.2, with peaks among the 20-29 and 40-44 age groups that are composed primarily of MSM.

2075.3
CHLAMYDIA RATE WAS HIGHEST AMONG PERSONS AGE 20-24, 2013

664.7
GONORRHEA RATE WAS HIGHEST AMONG PERSONS AGE 25-29, 2013

287.9
EARLY SYPHILIS RATE WAS HIGHEST AMONG PERSONS AGE 40-44, 2013

Figure 2.2 Rates of cases diagnosed with major reportable STDs per 100,000 population by age group, 2013, San Francisco



	15-19	20-24	25-29	30-34	35-39	40-44	45-54	55-64	65+
Chlamydia	1358.1	2075.3	1275.0	890.4	643.9	594.9	457.9	121.1	21.8
Gonorrhea	234.1	574.1	664.7	546.5	420.8	453.3	345.2	92.1	7.3
Early Syphilis	14.4	89.1	150.9	175.1	168.0	287.9	265.6	83.9	9.1

Chlamydia

5,094
REPORTED CASES IN 2013

Chlamydia rates in San Francisco mirror the annual trends of, and are relatively similar to, those in the U.S. and other large metropolitan cities, including New York City (NYC) and Los Angeles (LA). For the first time, though, where the U.S. rates decreased by 1.5%, San Francisco's chlamydia rate continued to increase (by 4.5%) in 2013 (Figure 2.3). The 5,094 reported cases in San Francisco in 2013 were part of the steady increase seen in the past 17 of 19 years.

Unlike national rates, chlamydia incidence in San Francisco is greater in males than females (Figure 2.4) because of the prevalence among MSM. The burden of chlamydia has been greater among MSM in San Francisco for many years but the increased availability of testing for pharyngeal and rectal infections has increased the identification and treatment of these infections.

As is also seen nationally, the highest chlamydia rates by race/ethnicity in San Francisco are among Blacks/African Americans (Figure 2.5), though the inequity is improving as rates in this group have decreased since 2010.

Figure 2.3 Chlamydia incidence rates by year, 2009-2013, San Francisco

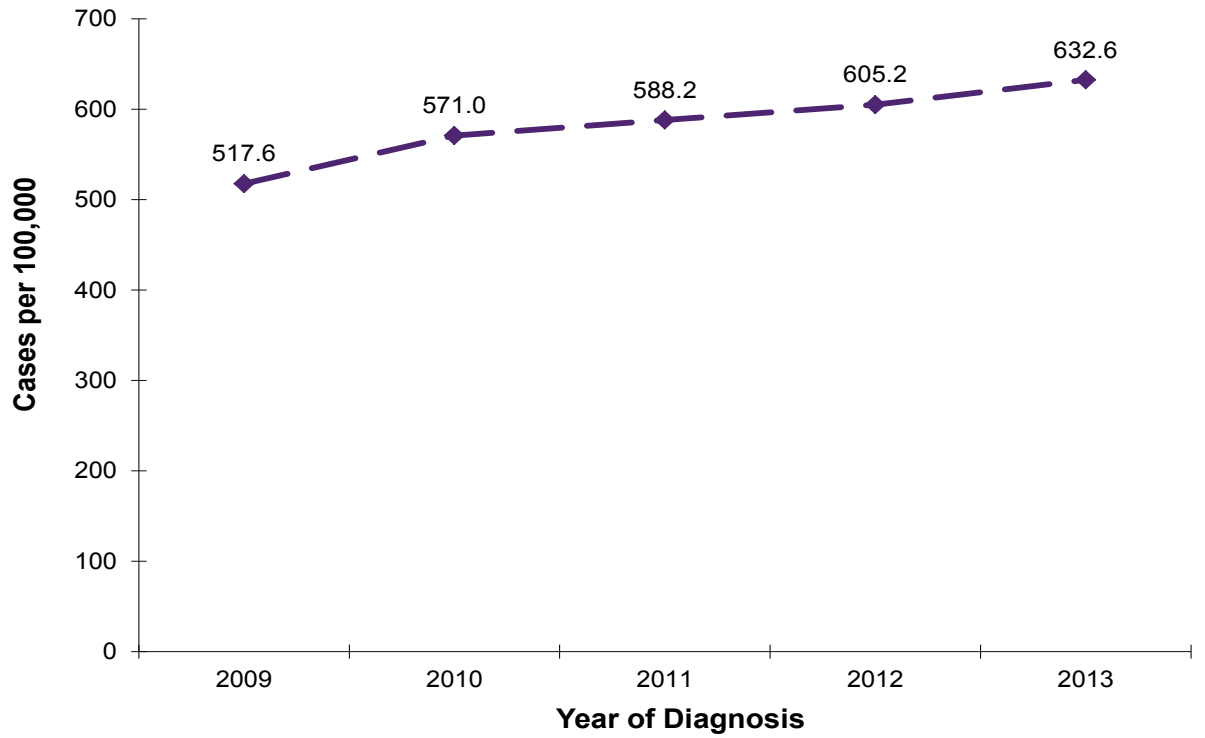


Figure 2.4 Chlamydia incidence rates by gender, 2009-2013, San Francisco

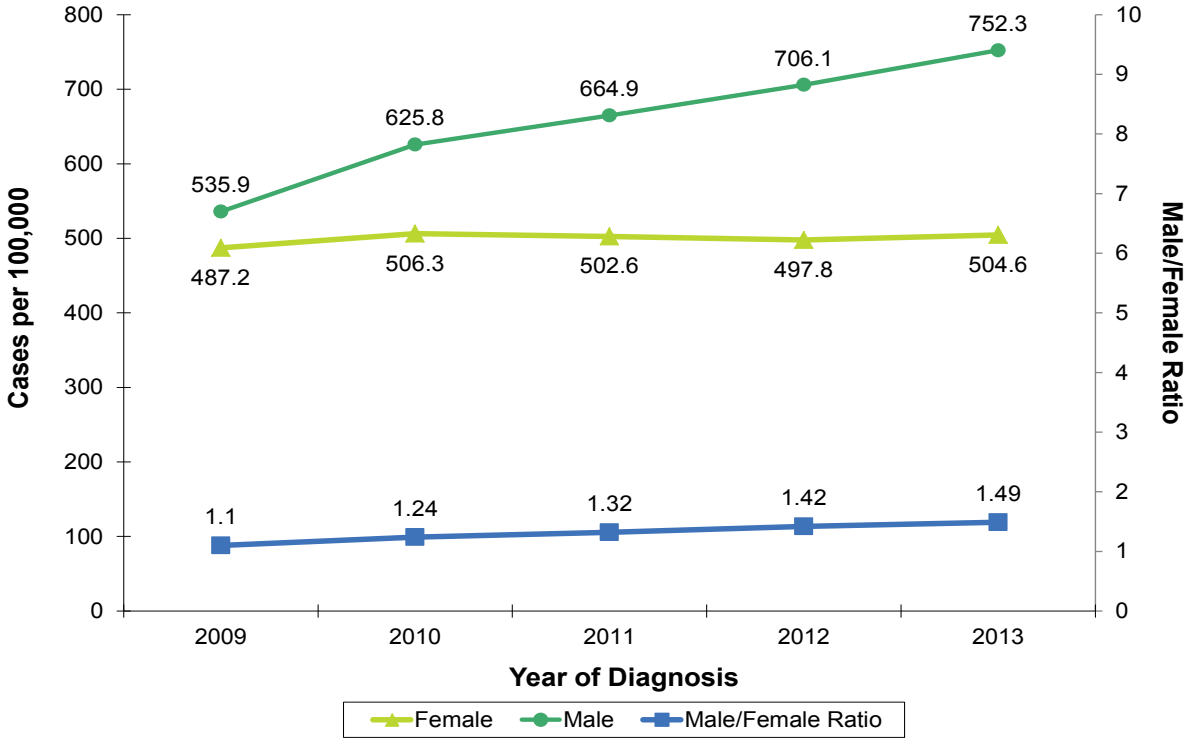
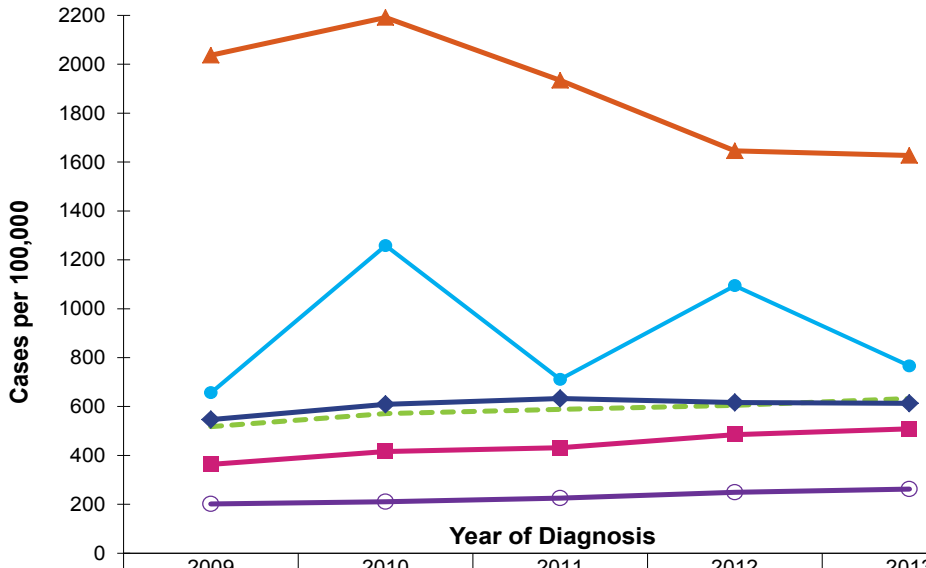


Figure 2.5 Chlamydia incidence rates by race/ethnicity, 2009-2013, San Francisco



	2009	2010	2011	2012	2013
All Races	517.6	571.0	588.2	605.2	632.6
African American	2037.2	2191.1	1934.5	1646.0	1626.7
Native American	656.5	1258.2	711.2	1094.1	765.9
Hispanic	546.1	609.3	633.1	616.7	613.4
White	363.0	415.8	431.2	485.1	508.8
Asian/Pacific Islander	201.4	210.4	225.4	248.8	261.9

Gonorrhea

2,524

REPORTED CASES IN 2013

Although gonorrhea rates in San Francisco have generally followed annual trends seen in the U.S., NYC, and LA, rates in San Francisco have always been higher. In 2013, the 2,524 reported cases were a 1.7% increase from the previous year.

The male/female ratio of gonorrhea incidence is much more striking in San Francisco (Figure 2.7) than in the U.S. The gonorrhea incidence rate has always been much greater among males in San Francisco than females primarily because of the high burden of infections among MSM. The ratio in the U.S. is very similar between males and females. Female gonorrhea rates have been higher in the U.S. than for males since 2000, but males had a higher rate (109.5 cases per 100,000 population) in 2013 than females (102.4 cases per 100,000 population).

Similar to the U.S., African Americans in San Francisco are disproportionately affected by gonorrhea. The inequity with white residents has decreased over the past years as a result of both decreases in gonorrhea rates among African Americans but also an increase in rates among whites. The fluctuation in rates seen among Native Americans is due to their small population size in San Francisco.

Figure 2.6 Gonorrhea incidence rates by year, 2009-2013, San Francisco

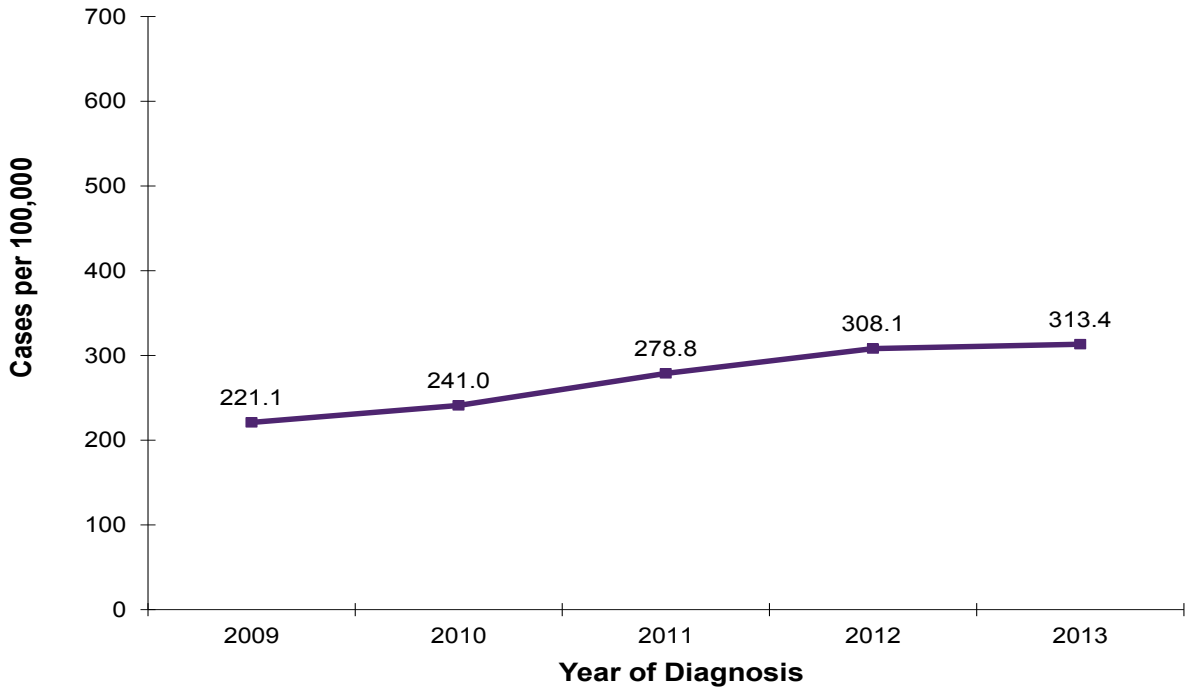


Figure 2.7 Gonorrhea incidence rates by gender, 2009-2013, San Francisco

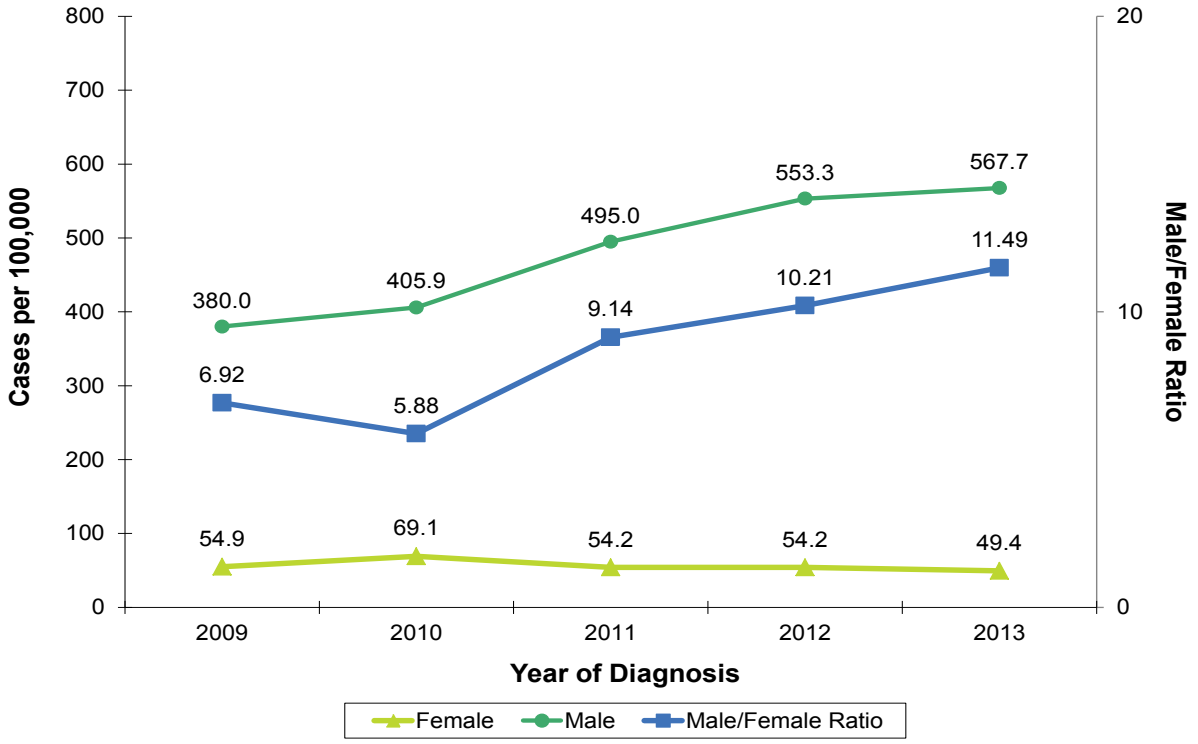
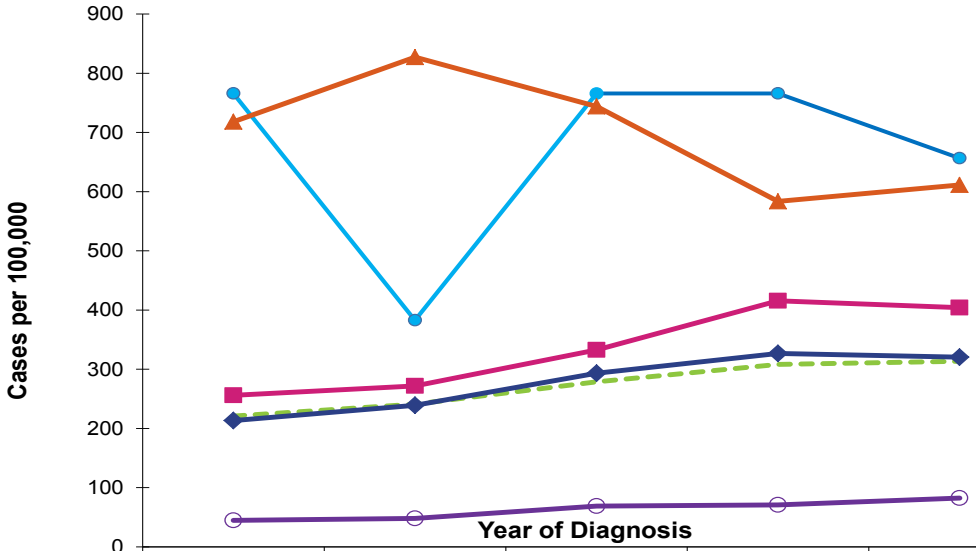


Figure 2.8 Gonorrhea incidence rates by race/ethnicity, 2009-2013, San Francisco



	2009	2010	2011	2012	2013
All Races	221.1	241.0	278.8	308.1	313.4
Native American	765.9	382.9	765.9	765.9	656.5
African American	718.2	827.3	743.9	583.6	611.4
White	256.0	272.0	332.5	415.5	403.9
Hispanic	213.5	239.0	293.2	326.8	320.3
Asian/Pacific Islander	44.8	48.2	68.9	70.8	82.4

Syphilis

1,021

REPORTED CASES IN 2013

The highest number of early syphilis cases since 1984 was reported in 2013; the 1,021 cases were an increase of 14.7 percent over 2012. Syphilis rates in San Francisco continue to exceed the rates seen in the U.S., LA, and NYC.

Only 23 of the 1,021 early syphilis cases were diagnosed in females. Syphilis in San Francisco remains a disease predominantly among men because of the prevalence among MSM (Figure 2.10). No congenital syphilis cases were found in San Francisco in 2013. The last reported congenital syphilis case was in 2009.

The inequity in syphilis rates between African-American residents and white residents decreased in 2013 as a result of both an increase in the rate among whites and a decrease in the rate among African Americans (Figure 2.11).

Figure 2.9 Syphilis incidence rates by year, 2009-2013, San Francisco

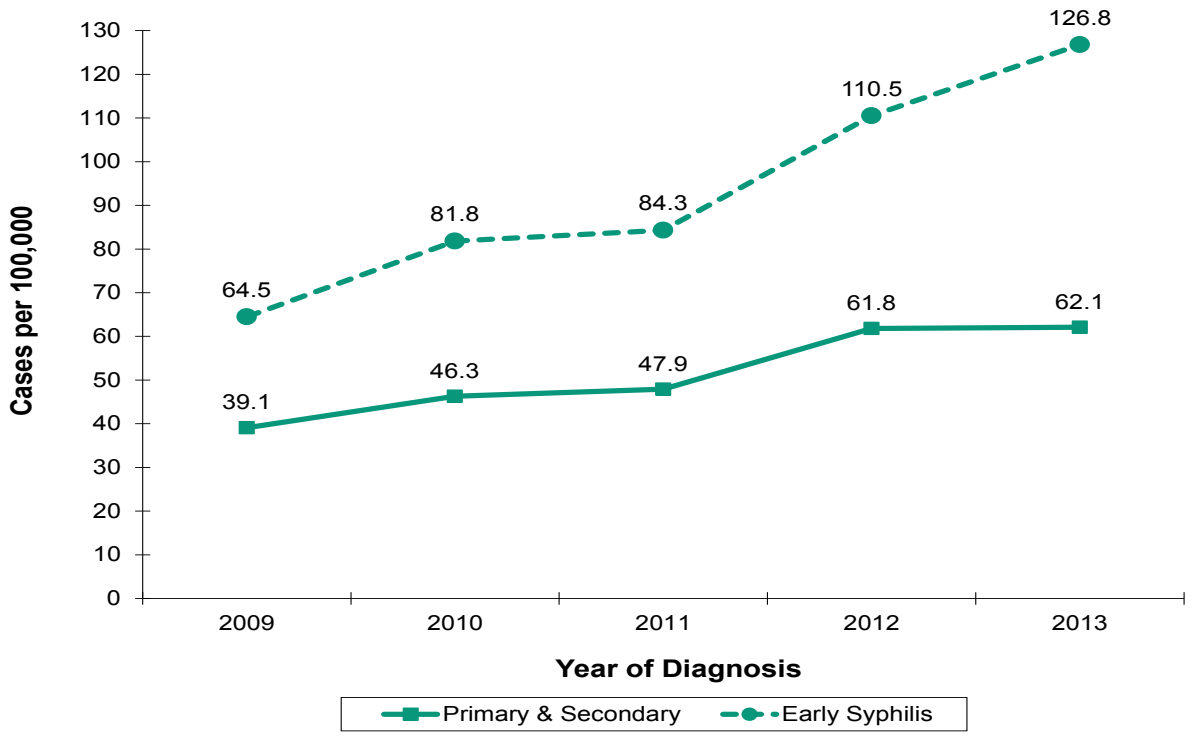


Figure 2.10 Early syphilis incidence rates by gender, 2009-2013, San Francisco

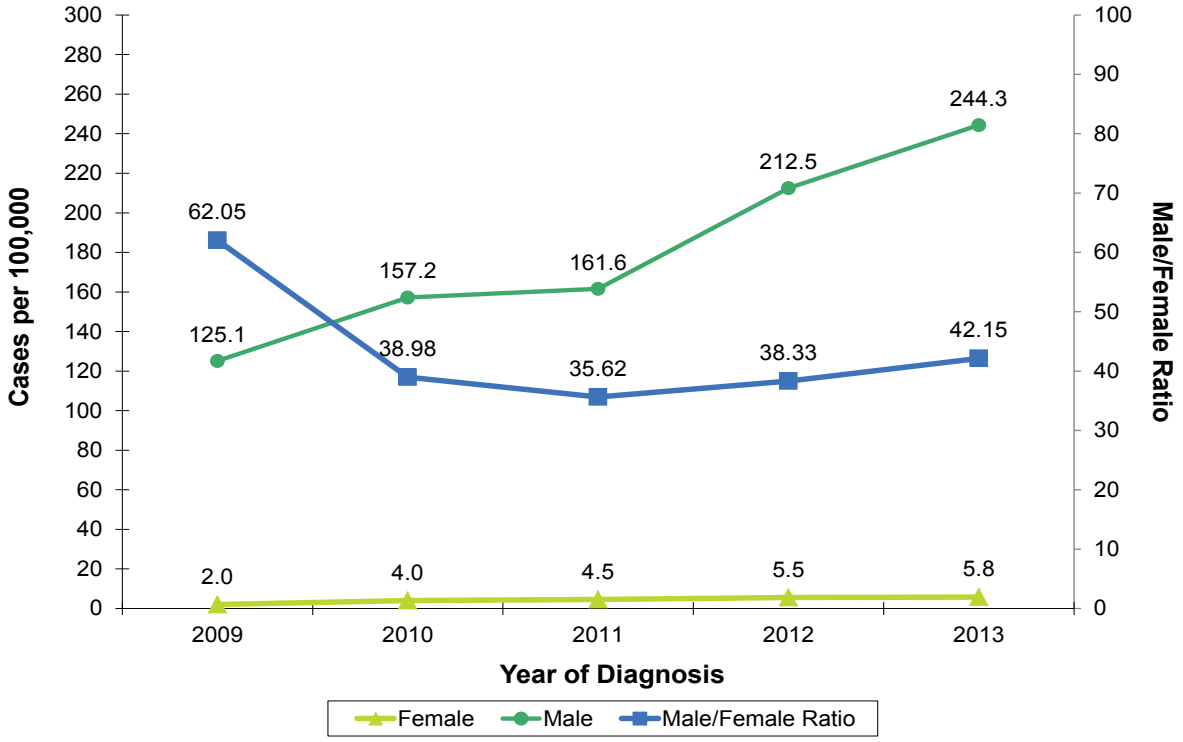
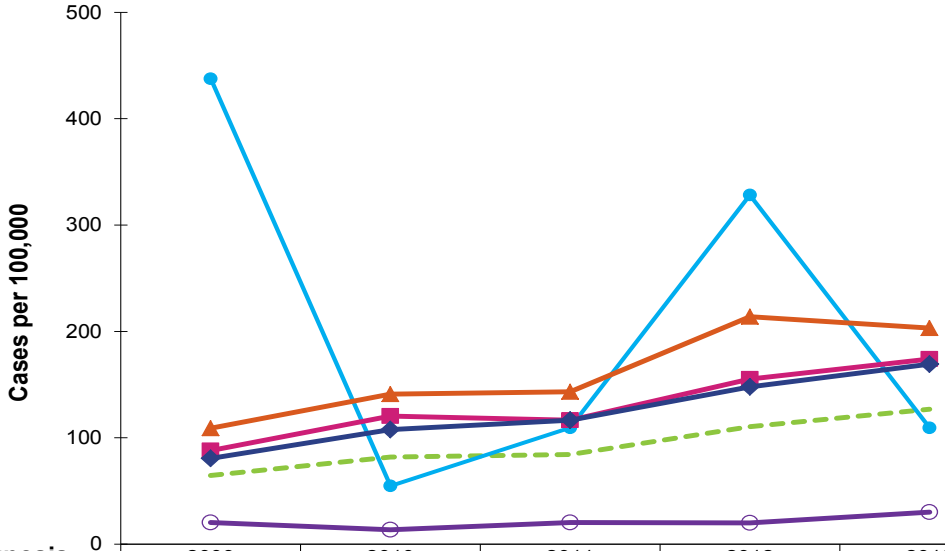


Figure 2.11 Early syphilis incidence rates by race/ethnicity, 2009-2013, San Francisco



Year of Diagnosis	2009	2010	2011	2012	2013
All Races	64.5	81.8	84.3	110.5	126.8
Native American	437.6	54.7	109.4	328.2	109.4
African American	109.0	141.1	143.2	213.8	203.1
White	88.0	120.3	116.5	155.3	174.0
Hispanic	80.5	107.6	116.6	147.8	169.2
Asian/Pacific Islander	20.3	13.5	20.3	19.9	30.1

STDs among priority populations

84.1%

PROPORTION OF EARLY SYPHILIS CASES AMONG GAY/BI MEN, 2013

As noted previously, MSM are one of the priority populations for the prevention and control of STDs because of their disproportionate burden of infections. As reflected in the city's syphilis rates, nearly 100% of cases were among males, of whom 89% were MSM (Figure 2.12).

4.7%

PROPORTION OF EARLY SYPHILIS CASES AMONG OTHER MEN, 2013

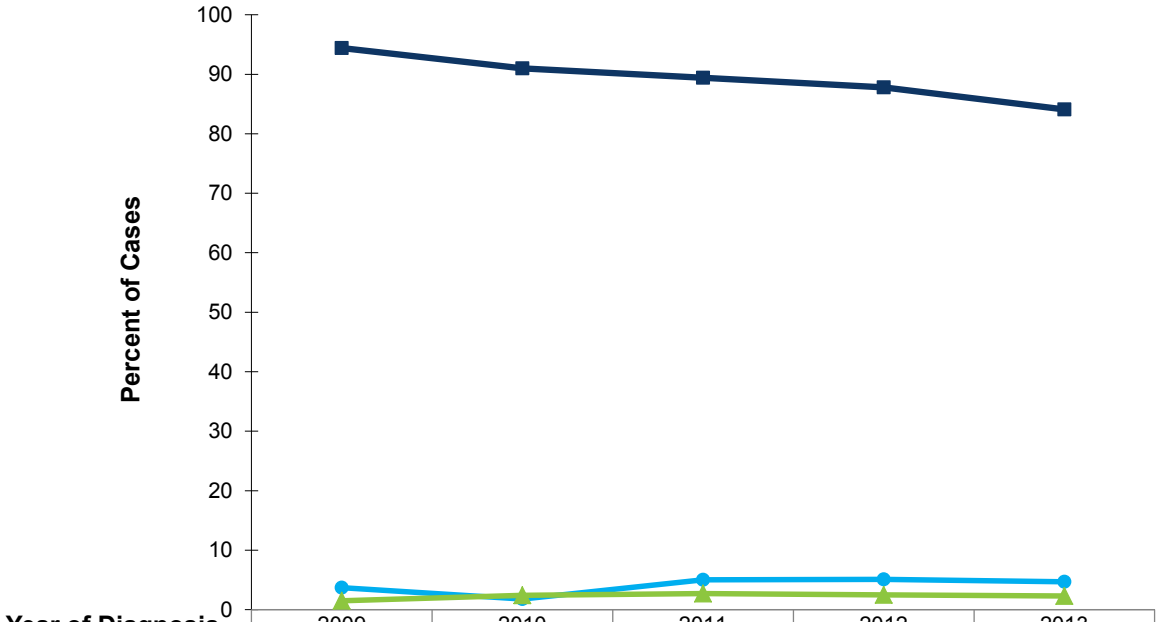
The other priority population in San Francisco for STD prevention and control is adolescents, particularly those who are Black or African American. Adolescents, compared to adults in San Francisco, have high rates of both chlamydia (Figure 2.13) and gonorrhea, which result from the higher prevalence of disease among adolescents that necessitates the targeted screening for sexually active persons ages less than 25.

2.3%

PROPORTION OF EARLY SYPHILIS CASES AMONG WOMEN, 2013

Though there had been recent decreases in rates of gonorrhea among African-American adolescents, the increased rate in 2013 among African Americans coupled with the decreased rate among whites led to a higher inequity (Figure 2.14).

Figure 2.12 Early syphilis cases by sexual orientation, 2009-2013, San Francisco



Year of Diagnosis	2009	2010	2011	2012	2013
Gay/Bi Men	94.4	91.0	89.4	87.8	84.1
Other Men	3.7	1.8	5.0	5.1	4.7
Women	1.5	2.4	2.7	2.5	2.3

Figure 2.13 Chlamydia incidence rates among adults and adolescents by race/ethnicity, 2013, San Francisco

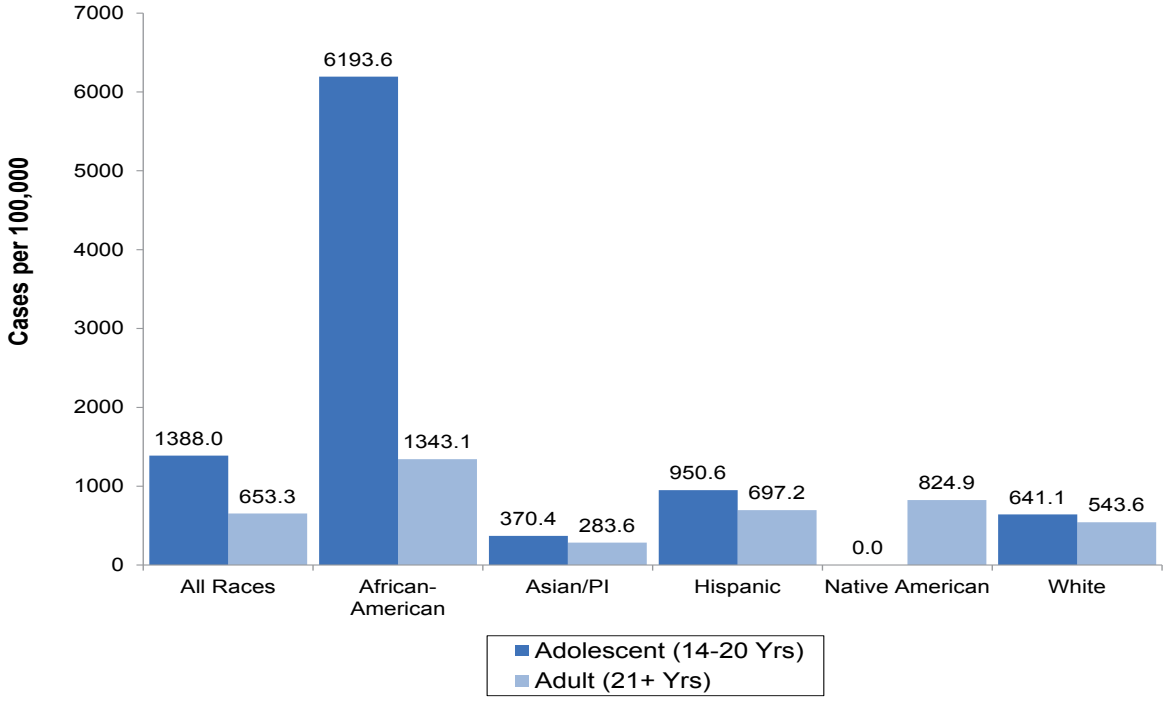
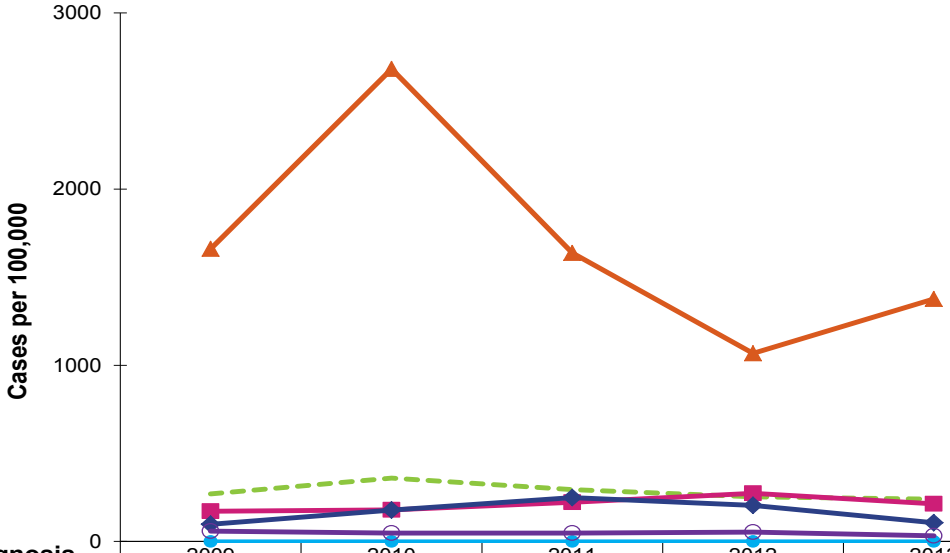


Figure 2.14 Gonorrhea incidence rates among adolescents (14-20 years) by race/ethnicity, 2009-2013, San Francisco



Year of Diagnosis	2009	2010	2011	2012	2013
All Races	269.9	359.2	294.2	253.7	239.5
Native American	0.0	0.0	0.0	0.0	0.0
African American	1661.1	2681.5	1637.4	1067.9	1376.4
White	171.0	179.5	222.2	273.5	213.7
Hispanic	97.7	177.7	248.8	204.3	106.6
Asian/Pacific Islander	58.2	47.6	47.6	52.9	31.7

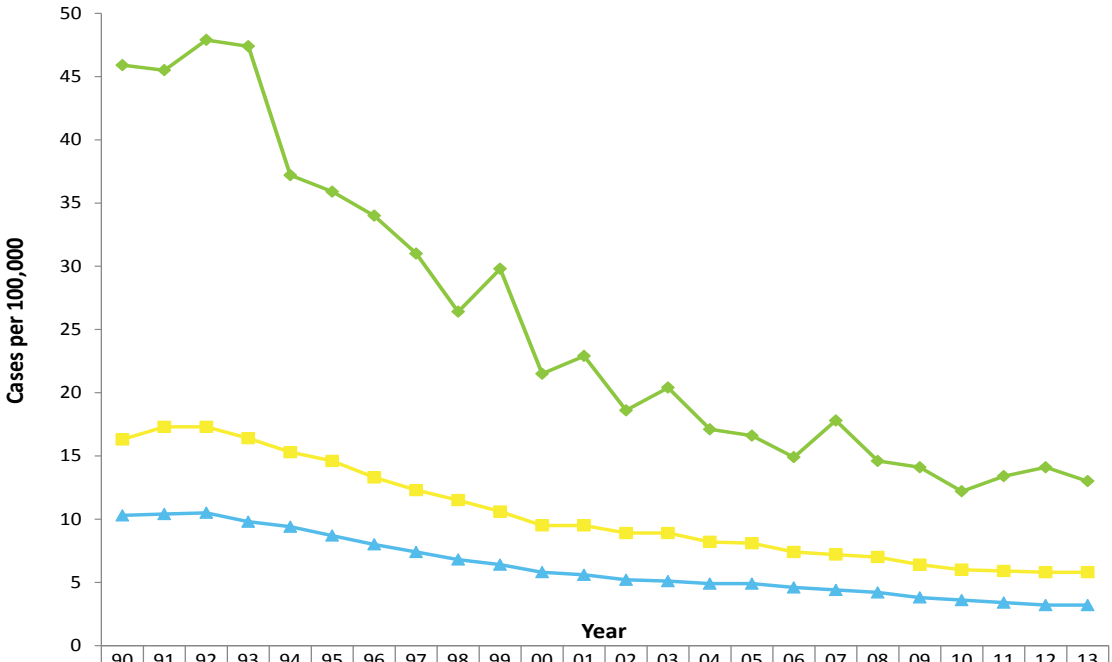
⇨ Please refer to the San Francisco Sexually Transmitted Disease Annual Reports for more details at https://www.sfdph.org/dph/files/reports/default.asp#2S.

3. Tuberculosis

107
NEW TB CASES REPORTED IN 2013

In 2013, 107 new tuberculosis (TB) cases were reported in San Francisco, for an incidence rate of 13.0 cases per 100,000 population (Figure 3.1). This represents a decline of 7.8% from 2012; however, since 2010 when TB cases were at an all time low, the number of new cases each year has remained relatively stable. The rate of TB in San Francisco is more than four times the national average of 3.2 cases per 100,000 and more than twice the California average of 5.8 cases per 100,000.

Figure 3.1 TB incidence rates, 1990-2013, San Francisco



	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13
San Francisco	45.9	45.5	47.9	47.4	37.2	35.9	34.0	31.0	26.4	29.8	21.5	22.9	18.6	20.4	17.1	16.6	14.9	17.8	14.6	14.1	12.2	13.4	14.1	13.0
CA	16.3	17.3	17.3	16.4	15.3	14.6	13.3	12.3	11.5	10.6	9.5	9.5	8.9	8.9	8.2	8.1	7.4	7.2	7.0	6.4	6.0	5.9	5.8	5.8
U.S.	10.3	10.4	10.5	9.8	9.4	8.7	8.0	7.4	6.8	6.4	5.8	5.6	5.2	5.1	4.9	4.9	4.6	4.4	4.2	3.8	3.6	3.4	3.2	3.2

Age, Race/Ethnicity, and Place of Birth

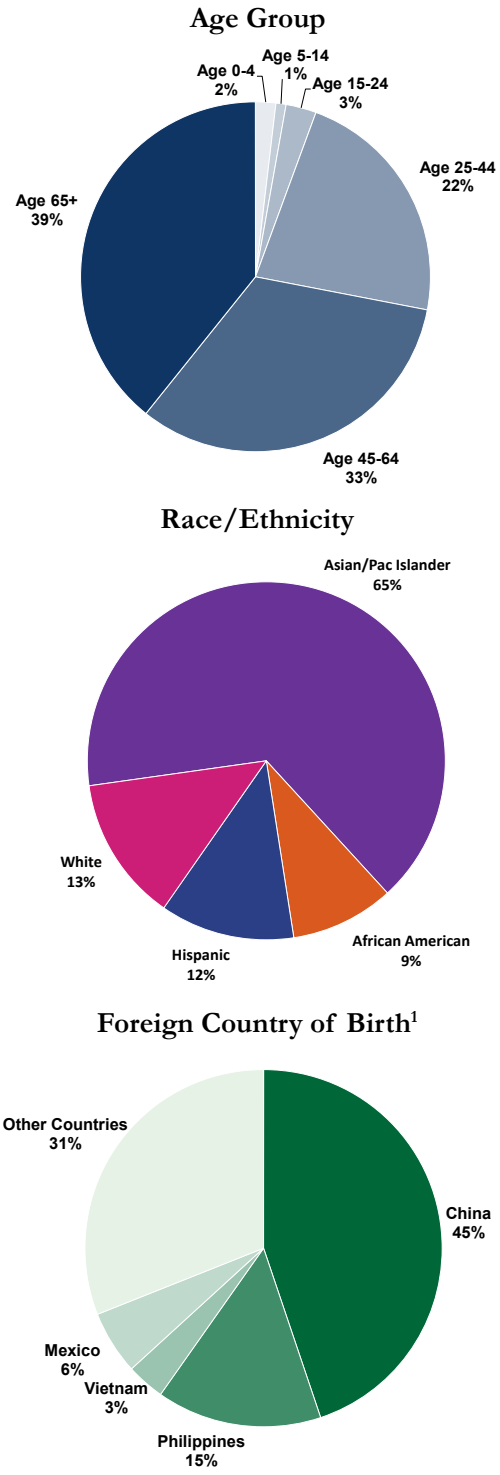
72%
TB CASES REPORTED AMONG PERSONS >45 YEARS OF AGE

The average age of persons with TB in 2013 was 57 years, with 72% of cases occurring in persons over the age of 45 (Figure 3.2). Asian cases are older, with over half of cases in this group greater than 66 years of age, while Hispanic cases tend to be younger with over half less than 36 years of age. Only 3 pediatric cases (0–14 years old) were diagnosed in 2013.

The largest proportion of cases reported annually are Asian (65%). As in prior years, the majority of Asian (97%) and Hispanic cases (87%) were foreign-born.

In 2013, 81% of cases were reported among foreign-born individuals – 45% from China, 15% from the Philippines, 3% from Vietnam, and 6% from Mexico. The median length of residence in the U.S. prior to TB diagnosis was 17 years; however this varies by country of origin. For example, Filipino cases reside in the U.S. a median of 20 years prior to diagnosis, while Mexican cases are in the U.S. for a median of only 10 years.

Figure 3.2 TB cases by age group, race/ethnicity, and country of birth, 2013, San Francisco



1 Excluding U.S. born TB cases (N=20).

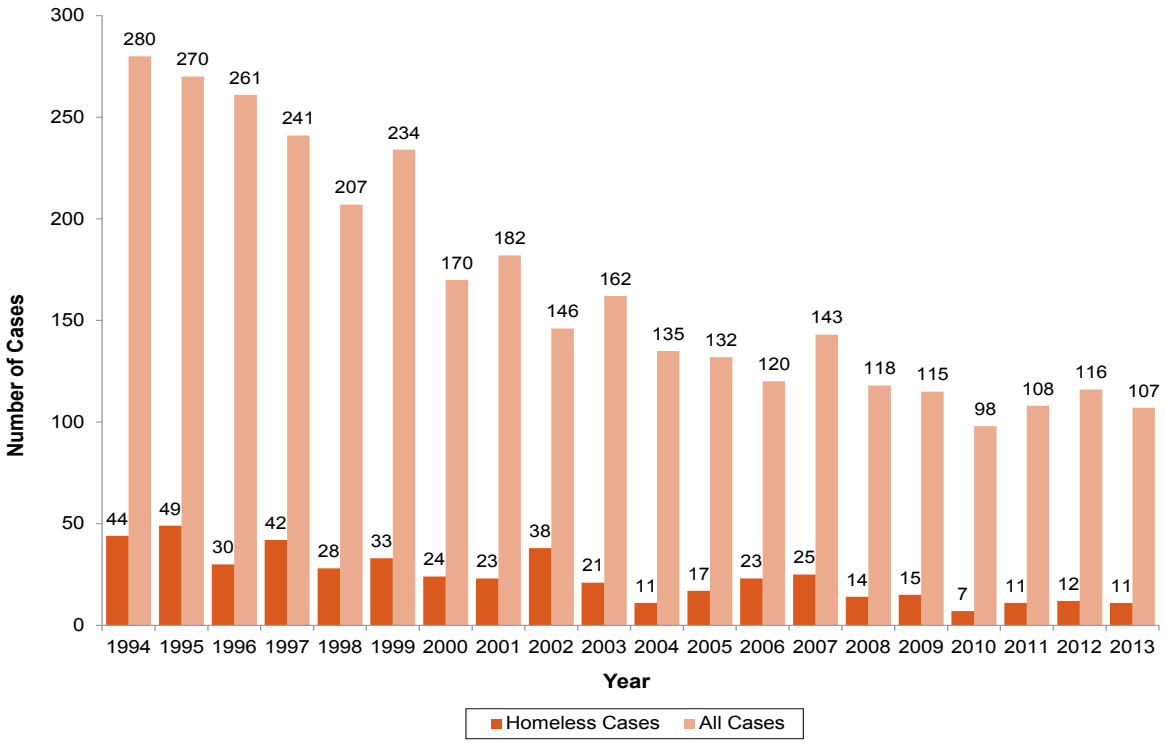
Homelessness

TB in the homeless/marginally housed population remained stable in 2013, with 11 cases reported (Figure 3.3); 18% of these cases were HIV-positive, a significant decline from 41% in 2012. In 2013, two TB cases were diagnosed while staying in shelters and four cases occurred in residents of SRO hotels.

11
HOMELESS TB CASES REPORTED IN 2013

18%
HOMELESS TB CASES WERE HIV+

Figure 3.3 Number of Homeless TB cases, 1993-2013, San Francisco



Co-morbidities and Deaths

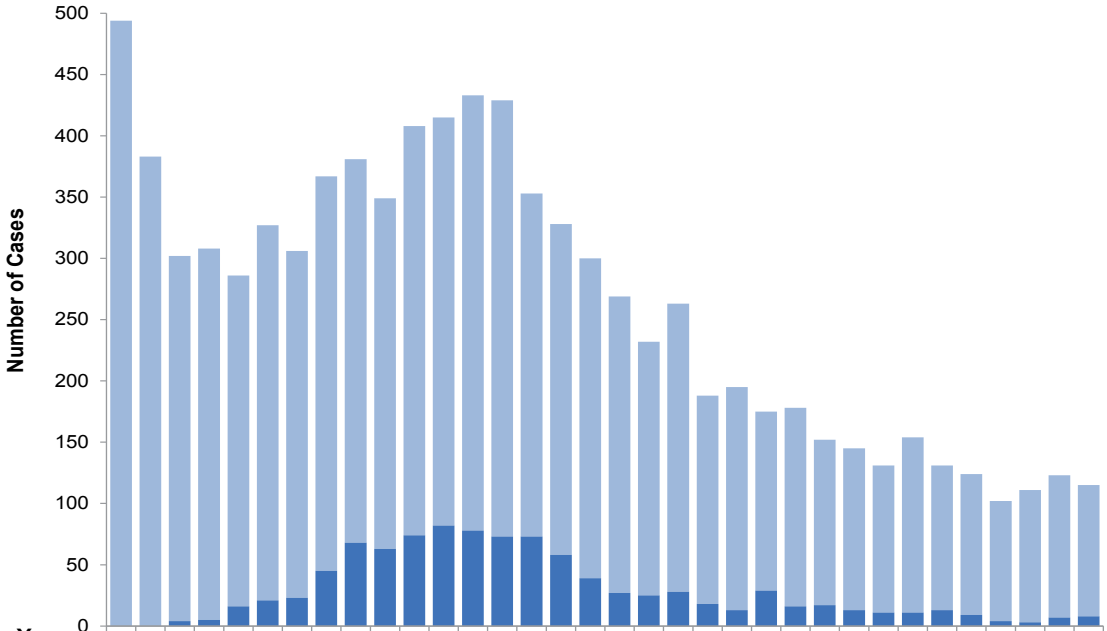
8%

TB CASES CO-INFECTED WITH HIV, 2013

Comorbid conditions such as diabetes and tobacco use are becoming increasingly important risk factors for active TB, much more so than HIV infection. In 2013, 8% of TB cases were co-infected with HIV (Figure 3.4) while 28% of active TB cases reported current or past use of tobacco and 23% had diabetes.

There were 7 deaths among TB cases in 2013 and 6 died due to complications of their TB disease. There were two deaths among HIV-positive cases.

Figure 3.4 Number of TB cases co-infected with HIV, 1993-2013, San Francisco



Year	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13
All Cases	49	38	29	30	27	30	28	32	31	28	33	33	35	35	28	27	26	24	20	23	17	18	14	16	13	13	12	14	11	11	98	10	11	10
HIV co-infected Cases	0	0	4	5	16	21	23	45	68	63	74	82	78	73	73	58	39	27	25	28	18	13	29	16	17	13	11	11	13	9	4	3	7	8

Drug Resistance

11

TB CASES RESISTANT TO AT LEAST ONE ANTI-TB DRUG

Over the past three years, the percent of culture-positive TB cases with any form of drug resistance has ranged from 15-23%. In 2013, 11 cases (15% of culture-positive cases) were resistant to at least one anti-TB drug. The majority of cases were resistant to Isoniazid (INH) alone (7%) or in combination with another non-Rifampin, first-line drug (3%). There were 3 MDR-TB cases reported this year (4%).

⇨ Please refer to the Annual Summary of TB Incidence in San Francisco for more details at http://www.sfcdcp.org/tbcontrol.

4. Vaccine Preventable Diseases

In this section, the epidemiology of the following reportable vaccine preventable diseases (VPDs) in San Francisco are presented: Hospitalization or death due to chickenpox, diphtheria, invasive *Haemophilus influenzae* disease, hepatitis A, acute hepatitis B, measles, invasive meningococcal disease, mumps, pertussis, poliovirus infection, rubella and tetanus (Table 4.1). Other vaccine preventable diseases, such as rotavirus gastroenteritis or human papillomavirus (HPV) infection, are not described because they are not currently reportable under state reporting regulations.

Table 4.1 Number of confirmed and probable cases of vaccine preventable diseases, 2002-2012, San Francisco

Vaccine Preventable Diseases	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Total
Chickenpox, hospitalizations or death[1]	NR	NR	NR	NR	NR	1	0	1	1	3	2	**8**
Diphtheria	0	0	0	0	0	0	0	0	0	0	0	**0**
Haemophilus influenzae, invasive, under 15 years	1	1	1	3	2	0	0	0	0	0	0	**8**
Hepatitis A	38	15	21	11	17	27	11	4	5	6	5	**160**
Acute Hepatitis B	34	44	25	29	22	10	12	16	12	7	3	**214**
Measles	2	0	3	0	0	0	1	5	1	1	0	**13**
Meningococcal disease, invasive	11	9	5	7	9	21	17	4	1	8	4	**96**
Mumps	1	0	0	1	1	2	0	0	0	2	1	**8**
Pertussis	6	10	28	45	35	19	15	20	139	56	29	**402**
Poliovirus[2]	0	0	0	0	0	0	0	0	0	0	0	**0**
Rubella	1	0	1	0	0	0	0	0	1	0	0	**3**
Rubella, congenital	0	0	0	0	0	0	0	0	0	0	0	**0**
Tetanus	0	0	0	0	1	0	0	0	0	0	0	**1**

NR: Not Reportable.
1 Hospitalization or death due to chickenpox became reportable June 2007.
2 Reportable as poliomyelitis until December 2009.

Chickenpox (varicella), hospitalization and death

Before the chickenpox vaccine was introduced in the United States (U.S.) in 1995, chickenpox was a common disease, affecting millions of people within the U.S. every year. In California, chickenpox resulting in hospitalization or death was not reportable until June 2007. From 2007 to 2012, only eight cases resulting in hospitalization or death were reported in San Francisco residents.

Haemophilus influenzae, invasive

0
CASE REPORTED IN 2007-2012

In California, only invasive (e.g., pneumonia, bacteremia, meningitis, epiglottitis, septic arthritis, cellulitis, or purulent pericarditis; less common infections include endocarditis and osteomyelitis) disease in children under 15 years of age is reportable. From 2002 to 2012, only eight cases were reported in San Francisco children and no cases were reported in San Francisco residents from 2007 to 2012.

Hepatitis A

5
CASES REPORTED IN 2012

The hepatitis A vaccine was licensed for use in the U.S. in 1995. After 1997, there was a marked decreased in the number of hepatitis A cases in San Francisco residents, attributed to vaccine usage. In 1997, 593 cases of hepatitis A were reported in San Francisco residents; from 2002 to 2012, only 160 cases in San Francisco residents were reported. In 2012, five cases were reported. Currently, the most important risk factor for contracting disease is a history of foreign travel, although foodborne transmission of hepatitis A, often related to imported food items, has also been documented in the U.S.

Hepatitis B

3
CASES REPORTED IN 2012

The hepatitis B vaccine has been available in the U.S. since 1981 and since 1991, the hepatitis B vaccine has been recommended for all infants. A decrease in the number of acute Hepatitis B cases reported began before this recommendation. The decline is thought to be associated with HIV/AIDS prevention strategies, i.e., reduction of high risk sexual behaviors and injection drug use, both of which are also major risk factors for hepatitis B.

Hepatitis B has decreased in San Francisco residents since the late 1980s. In 2012, only three cases of hepatitis B were reported.

Measles

13
CASES FROM 2002-2012

According to the Centers for Disease Control and Prevention (CDC), widespread use of measles vaccine has led to a greater than 99% reduction in measles cases in the U.S. compared with the pre-vaccine era. In 2000, measles was declared eliminated in the U.S.; however, measles is endemic in other countries and most cases in the U.S. are associated with foreign importation.

0
CASES IN 2012

Between 2002 to 2012, 13 cases of measles were reported in San Francisco residents. In 2009, five cases of measles were reported when an imported measles case caused an outbreak. Because of the quick identification and reporting of measles by a community provider, the rapid response to this outbreak including isolation of the case and quarantine of susceptible contacts, and the limited number of susceptible contacts, only two additional cases occurred. No cases of measles were reported in 2012.

Invasive Meningococcal Disease

4
CASES REPORTED IN 2012

From 2002 to 2012, 96 cases of invasive meningococcal infection were reported in San Francisco residents, ranging from 1-21 cases per year. In 2012, four cases in San Francisco residents were reported.

Pertussis – Whooping cough

29
CASES REPORTED IN 2012

Pertussis is endemic with epidemic cycles every three to five years. People of all ages can get the disease, though death and serious complications are most likely in young infants.

Rates of pertussis have been increasing in the last 30-40 years. Reasons for this increase are unknown but hypotheses include increased recognition and diagnosis, increased access to laboratory tests, introduction of new laboratory tests such as nucleic acid amplification tests, increased surveillance and reporting, and waning immunity following vaccination.

A pertussis outbreak occurred in California in 2010 when over 9,000 cases were reported, the highest number of cases reported in over 60 years. During this outbreak, 139 cases of pertussis were reported among San Francisco residents; no deaths occurred. The number of cases in non-epidemic years has increased in recent years; it is hypothesized this may, in part, be due to waning immunity in individuals vaccinated with the acellular pertussis vaccine introduced in the 1990s, as well as changes in detection, including increased physician awareness and increased testing.

5. Enteric Diseases

In this section of the report, the epidemiology of selected enteric diseases in San Francisco is described (Table 5.1 and Figure 5.1). Enteric diseases can be caused by bacteria, parasites, or viruses. There can be a range of symptoms from none or mild diarrheal symptoms to severe diarrhea and vomiting. They are generally transmitted by eating or drinking contaminated food or water or having direct contact with contaminated feces or vomit.

Amebiasis, Giardiasis, and Shigellosis

7.1
Amebiasis rate per 100,000 residents, 2012

21.6
Giardiasis rate per 100,000 residents, 2012

17.2
Shigellosis rate per 100,000 residents, 2012

Amebiasis, giardiasis, and shigellosis are among the most frequently reported diseases in San Francisco. Rates of these three diseases declined overall from 2002 to 2012. In the last 25 years, amebiasis rates were highest in 1986 (67.3 cases per 100,000 residents, 95% CI: 61.5, 73.4), generally declined until 2003, and were between 10-15 cases per 100,000 residents from 2003 to 2011. The lowest rate observed to date was in 2012 (7.1 cases per 100,000 residents, 95% CI: 5.4, 9.2). Giardiasis rates have been decreasing since 1995 (rate=55.4 cases per 100,000); the rate was 21.6 per 100,000 population (N=178) in 2012. The rates of shigellosis in San Francisco residents decreased overall between 2002 (N=186; rate=23.6; 95% CI: 20.3, 27.2) and 2012 (N=142; rate=17.2; 95% CI: 14.5, 20.3); however, shigellosis rates have been increasing since the nadir in 2008 (N=72; rate=8.9; 95% CI: 7.0, 11.2).

Rates of amebiasis, giardiasis, and shigellosis were significantly higher in males than in females for all years of existing data (1986-2012). For all these diseases, the disparity between the rates of disease in males and females had decreased over time. In 2012, the rate of amebiasis in women was 1.0 (N=4; 95% CI: 0.3, 2.6) and in men was 12.9 (N=55; 95% CI: 9.8, 16.8), the rate of giardiasis in women was 14.0 (N=56; 95% CI: 10.6, 18.2) and in men was 28.7 (N=122; 95% CI: 23.8, 34.3), and the rate of shigellosis in women was 4.5 (N=18; 95% CI: 2.7, 7.1) and in men was 29.2 (N=124; 95% CI: 24.3, 34.8).

Campylobacteriosis

53.8
Campylobacteriosis rate per 100,000 residents, 2012

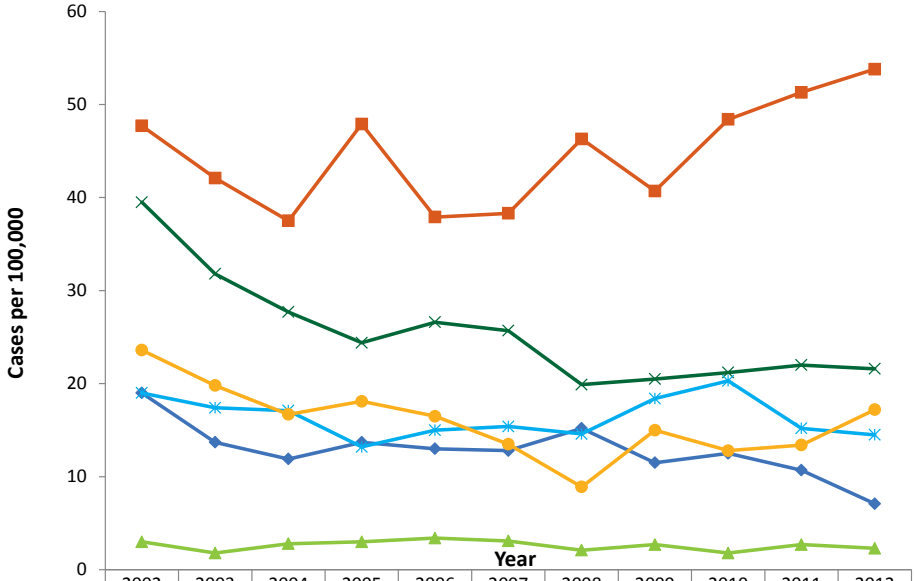
Campylobacteriosis is the most frequently reported enteric disease in San Francisco (2012: N=444, rate=53.8 per 100,000 residents, 95% CI: 48.9, 59.0). The rates of campylobacteriosis in San Francisco have been increasing since 2009. The overall incidence rate of campylobacteriosis in 2012 was slightly higher than it has been in the past four years (2011: N=422, rate=51.3 per 100,000 residents, 95% CI: 46.6, 56.5; 2010: N=396, rate 48.4 cases per 100,000 residents, 95% CI: 43.8, 53.4; 2009: N=331, rate = 40.7 cases per 100,000 residents, 95% CI: 36.4, 45.3; 2008: N=375, rate=46.3 cases per 100,000 residents, 95% CI: 41.7, 51.2); the rate in 2012 was statistically significantly higher than in 2009.

Table 5.1 Number of confirmed and probable cases of selected enteric diseases, 2002-2012, San Francisco

Enteric Diseases	2002 Number	2003 Number	2004 Number	2005 Number	2006 Number	2007 Number	2008 Number	2009 Number	2010 Number	2011 Number	2012 Number
Amebiasis	150	108	94	109	104	103	123	94	102	88	59
Campylobacteriosis	376	333	297	381	303	308	375	331	396	422	444
Cryptosporidiosis	24	14	22	24	27	25	17	22	15	22	19
Giardiasis	311	255	219	194	213	207	161	167	173	181	178
Salmonellosis - non-typhoidal	150	137	135	105	120	124	118	150	166	125	120
Shigellosis	186	156	132	144	132	109	72	122	105	110	142
Shiga toxin-producing *Escherichia coli* (STEC), including *E. coli* O157:H7*						14	7	15	8	15	12
E. coli O157:H7	16	27	6	13	8						
Hemolytic Uremic Syndrome (HUS)	2	0	0	0	1	0	0	0	0	0	0
Shiga toxin in feces*								0	0	0	2

* Shiga toxin-producing *Eschericia coli* (STEC) and Shiga toxin in feces became reportable October 2006.

Figure 5.1 Annual rates per 100,000 population by selected enteric diseases, 2002-2012, San Francisco



	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Amebiasis	19.0	13.7	11.9	13.7	13.0	12.8	15.2	11.5	12.5	10.7	7.1
Campylobacteriosis	47.7	42.1	37.5	47.9	37.9	38.3	46.3	40.7	48.4	51.3	53.8
Cryptosporidiosis*	3.0	1.8	2.8	3.0	3.4	3.1	2.1	2.7	1.8	2.7	2.3
Giardiasis	39.5	31.8	27.7	24.4	26.6	25.7	19.9	20.5	21.2	22.0	21.6
Salmonellosis - non-typhoidal	19.0	17.4	17.1	13.2	15.0	15.4	14.6	18.4	20.3	15.2	14.5
Shigellosis	23.6	19.8	16.7	18.1	16.5	13.5	8.9	15.0	12.8	13.4	17.2

* Unstable rates in 2003, 2008, 2010, and 2012 due to low number of cases (N<20) should not be compared statistically.

Cryptosporidiosis

19

CASES REPORTED IN 2012

Known risk factors for acquiring cryptosporidiosis infection include consumption of recreational water, contaminated food or water, contact with animals, day care attendance or work, health care work, travel to developing countries, sexual contact with another case, and having a compromised immune system.

Historically in San Francisco, the high rates of cryptosporidiosis during the 1990s (highest rate in 1991 of 19.4 per 100,000; 95% CI: 16.3, 22.9) resulted predominantly from disease among people with HIV/AIDS. Rates of cryptosporidiosis decreased during the late 1990s concomitant with the availability of highly active antiretroviral therapy (HAART). From 2002 to 2012, an average of 21 cases of cryptosporidiosis were reported per year (average annual rate 2.6 per 100,000 population). In 2012, 19 cases were reported.

Rates of cryptosporidiosis have been higher in males than in females for all years of existing data (1986-2012); however, this disparity has not been statistically significant each year. In some years, the number of cases was too low for comparison. The disparity is hypothesized to be attributable to sexual activity between men who have sex with men. In San Francisco, in 2012, foreign travel and sexual activity were the two most prevalent risk factors.

The Bay Area Cryptosporidiosis Surveillance Project (CSP) monitors human cryptosporidiosis in Bay Area Counties served by the San Francisco Public Utilities Commission: Alameda, San Francisco, San Mateo, and Santa Clara, and Tuolumne County, where the Hetch Hetchy Reservoir is located. Routine monitoring and ultraviolet water disinfection for *Cryptosporidium* by the San Francisco Public Utilities Commission ensures that the water supply in San Francisco is safe to drink. In the U.S., contaminated recreational water is the most frequently recognized cause of reported water-associated outbreaks. In 2012, no system-wide, drinking water associated or other cryptosporidiosis outbreaks were detected by CSP.

Salmonellosis

14.5

SALMONELLOSIS RATE PER 100,000 RESIDENTS, 2012

In San Francisco, rates of salmonellosis have been modestly increasing since 2005 (13.2 per 100,000 residents (95% CI: 10.6, 16.0)). Between 2011 and 2012, the rate of salmonellosis decreased slightly from 15.2 per 100,000 residents (95% CI: 12.7, 18.1) to 14.5 per 100,000 residents (95% CI: 12.1, 17.4), but this difference was not statistically significant.

The most frequently reported Salmonella serotypes in 2012, which together accounted for 71.7% of the 120 cases with complete serotype information, were as follows: *S. enteriditis* (20.0%), *S. typhimurium* (15.0%), *S. infantis* (5.8%), *S. braenderup* (5.0%), *S. heidelberg* (5.0%), *S. berta* (4.2%), *S. newport* (4.2%), *S. Adelaide* (3.3%), *S. I 4,5,12:i:-* (3.3%), *S. Saint-Paul* (3.3%), and *S. Hadar* (2.5%). The proportion of *S. enteriditis* cases in 2012 (20%) was similar to 2011 (21.8%), but much less than 2010 (45.2%).

Escherichia coli O157:H7, Shiga toxin-producing *Escherichia coli* (STEC), Shiga toxin in feces, and Hemolytic Uremic Syndrome (HUS)

12
STEC CASES REPORTED IN 2012

Reporting requirements for *Escherichia coli* have changed over time as laboratory testing methods and understanding of pathogenesis have evolved. *E. coli* O157:H7 is one of many Shiga toxin-producing *E. coli* serotypes that cause clinically and epidemiologically significant disease, including Hemolytic Uremic Syndrome (HUS). Until 2006, only *E. coli* O157:H7 and/or Hemolytic Uremic Syndrome were reportable. Since October 2006, Shiga toxin-producing *E. coli*, which includes *E. coli* O157:H7, and shiga toxin in feces have been reportable.

From 2007 to 2012, 71 cases of STEC were reported in San Francisco residents. Fifteen or fewer cases annually were reported during this time. Only three cases of HUS were reported since 2002.

6. Chronic Hepatitis

Chronic Hepatitis B

1,049

INDIVIDUALS NEWLY REPORTED IN 2013

From January 1, 2013 through December 31, 2013, the San Francisco Department of Public Health (SFDPH) received over 7,250 positive hepatitis B laboratory reports on 4,476 individuals. Of the 4,476 individuals, 1,049 (23.4%) were newly reported to SFDPH. Of the 4,476 cases reported in 2013, 1,030 (23.0%) met the Centers for Disease Control and Prevention (CDC) laboratory criteria for a probable case of chronic hepatitis B and 3,446 (77.0%) met the CDC laboratory criteria for a confirmed case of chronic hepatitis B.

Data presented in Table 6.1 below are for all probable and confirmed cases of chronic hepatitis B with at least one test reported to SFDPH in 2013 (N=4,476). These data do not represent the number of incident or prevalent infections (see Technical Notes: "Hepatitis Surveillance Data Limitations"). Most cases were male (51.5%) and between the ages of 25-54 years (67.1%) when first reported to SFDPH. Of the 63.2% of cases for whom race was known, 88.0% were Asian/Pacific Islander (API).

Table 6.1 Number of reported cases with chronic hepatitis B by demographic characteristics as of December 31, 2013, San Francisco

	Number	(%)
Gender		
Male	2,302	(51.5)
Female	2,171	(48.5)
Total	4,473	(100.0)
* Gender data mising for 3 (0.07%) of the 4,476 cases.		
Age in Years		
<15	41	(0.9)
15-24	295	(6.6)
25-34	993	(22.2)
35-44	1,025	(22.9)
45-54	983	(22.0)
55-64	743	(16.6)
65+	395	(8.8)
Total	4,475	(100.0)
* Age data missing for 1 (0.02%) of the 4,476 cases.		
Race		
Asian/Pacific Islander	2,490	(88.0)
White	174	(6.2)
African American	93	(3.3)
American Indian/Alaska Native	13	(0.5)
Other	59	(2.1)
Total	2,829	(100.0)
* Race data missing for 1,647 (36.8%) of the 4,476 cases.		

Past or Present Hepatitis C Infection

1,267

INDIVIDUALS NEWLY REPORTED IN 2013

From January 1, 2013 through December 31, 2013, the SFDPH received over 4,950 positive hepatitis C laboratory reports on 3,205 individuals with confirmed past or present hepatitis C infection. Of these 3,205 individuals, 1,267 (39.5%) were newly reported to SFDPH.

Data presented in Table 6.2 below are for all persons who met laboratory criteria for confirmed past or present HCV infection with at least one test reported to SFDPH in 2013 (N=3,205). These data do not represent the number of incident or prevalent infections (see Technical Notes: "Hepatitis Surveillance Data Limitations"). Most infections were reported in males (69.1%) and in persons between the ages of 45-64 years (65.1%) when first reported to SFDPH. Of the 68.0% of persons for whom race was known, 52.8% were White and 32.3% were African American.

Table 6.2 Number of reported cases with past or present hepatitis C infection by demographic characteristics as of December 31, 2013, San Francisco

	Number	(%)
Gender		
Male	2,214	(69.1)
Female	988	(30.9)
Total	3,202	(100.0)
* Gender data missing for 3 (0.09%) of the 3,205 cases.		
Age in Years		
<15	3	(0.1)
15-24	67	(2.1)
25-34	247	(7.7)
35-44	491	(15.3)
45-54	1,039	(32.4)
55-64	1,047	(32.7)
65+	311	(9.7)
Total	3,205	(100.0)
Race		
White	1,151	(52.8)
African American	705	(32.3)
Asian/Pacific Islander	220	(10.1)
American Indian/Alaska Native	30	(1.4)
Other	74	(3.4)
Total	2,180	(100.0)
* Race data missing for 1,025 (32.0%) of the 3,205 cases.		

7. Special Topics

Outbreaks

In 2012, the San Francisco Department of Public Health (SFDPH) identified and investigated a total of 44 communicable disease outbreaks, many more than the 28 outbreaks identified and investigated in 2011. It is unclear what factors contribute to the fluctuation in the number of outbreaks identified and reported, but this increase could be as a result of changes in reporting practices, outbreak definition changes, or a true change in the number of outbreaks.

70%

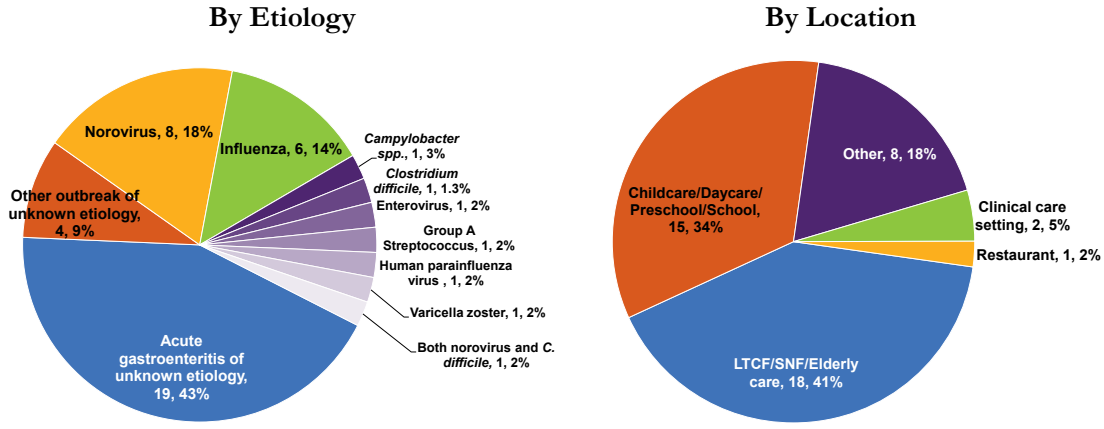
OF OUTBREAKS CAUSED GASTROINTESTINAL ILLNESS

Etiology: Twenty-three (52%) of the 44 outbreaks were of unknown etiology, eight (18%) were caused by norovirus (five confirmed, three suspected), six (14%) by influenza (one H1N1 swine influenza, three influenza A, one influenza B, and one unspecified influenza; all confirmed), and one each by *Campylobacter spp.* (confirmed), *Clostridium difficile* (confirmed), Enterovirus (confirmed), Group A Streptococcus (confirmed), human parainfluenza virus (confirmed), varicella zoster (confirmed), and one other outbreak that was associated with both norovirus and *C. difficile* (Figure 7.1).

Gastrointestinal Illness Outbreaks: Thirty-one (70%) outbreaks caused gastrointestinal illness. Four were suspected to be foodborne.

Location: Eighteen (41%) of outbreaks were associated with a long-term care facility, a skilled nursing facility, or elderly care; 15 (34%) were associated with childcare, daycare, preschool or schools; two (5%) were associated with a clinical care setting; one (2%) was associated with a restaurant, and eight (18%) were associated with other types of settings.

Figure 7.1 Number and percent of reported outbreaks, 2012, San Francisco



Rabies

0

RABIES CASE REPORTED IN HUMANS OR OTHER TERRESTRIAL MAMMALS IN SF FOR OVER 60 YEARS

Bats present a risk of rabies exposure to humans and pets, especially when they are handled or enter homes where they can have contact with people or their pets. Seven rabid bats were detected in San Francisco in 2012. Rabies was not detected in any other animals in 2012, and no cases of rabies have been reported in humans or other terrestrial mammals (e.g. dogs, cats, skunks, raccoons, foxes, coyotes) in San Francisco for over 60 years.

Botulism

18

CASES BETWEEN 2002 - 2012

From 2002 to 2012, 18 cases of botulism occurred in San Francisco residents (Table 7.1): 14 of wound botulism, two of foodborne botulism and two of infant botulism. California began experiencing an epidemic of wound botulism among injecting drug users in the 1990s in conjunction with the use of black tar heroin and skin popping[1,2,3]. In San Francisco in 2004, a cluster of seven cases of wound botulism occurred among injection drug users. Cases of wound botulism continue to occur among injection drug users.

Although botulism is rare, it is considered a public health emergency, requiring coordination between medical providers and local public health to ensure rapid diagnosis of disease, treatment including administration of antitoxin and supportive care, and public health prevention efforts.

Table 7.1 Number of confirmed and probable cases of botulism, 2002-2012, San Francisco

Disease	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Total
Botulism, foodborne	0	0	0	0	1	0	1	0	0	0	0	2
Botulism, infant	0	0	2	0	0	0	0	0	0	0	0	2
Botulism, unspecified	0	0	0	0	0	0	0	0	0	0	0	0
Botulism, wound	0	1	7	2	1	2	0	0	0	1	0	14

1 Werner SB, Passaro D, McGee J, Schechter R, Vugia DJ. Wound botulism in California, 1951-98: Recent Epidemic in Heroin Injectors. Clin Infect Diseases 2000;31:1018-24.

2 Yuan J1, Inami G, Mohle-Boetani J, Vugia DJ: Recurrent wound botulism among injection drug users in California. Clin Infect Dis. 2011 Apr 1;52(7):862-6.

3 Passaro DJ, Werner SB, McGee J, Mac Kenzie WR, Vugia DJ Wound botulism associated with black tar heroin among injecting drug users. JAMA 1998;279:859–63 10.1001/jama.279.11.859.

Technical Notes

HIV Surveillance Methods

San Francisco HIV cases are reported primarily through active surveillance activities in which public health personnel review laboratory and pathology reports and medical records to identify cases and complete the case report forms. HIV cases are also identified through passive reporting, review of death certificates, validation studies using secondary data sources such as hospital billing records or other disease registries, and reports from other health departments. The surveillance system is evaluated regularly for completeness, timeliness, and accuracy.

Completeness of HIV cases reporting in San Francisco was evaluated using capture-recapture methods as recommended by the CDC HIV Incidence and Case Surveillance Branch[1]. In brief, the numbers of cases expected to be diagnosed in San Francisco are estimated using HIV diagnoses reported to the SFDPH by different sources (e.g., laboratories, health-care providers). Log-linear statistical models are used to estimate the number of cases who had been diagnosed but had not been identified by the SFDPH through reporting sources. Completeness of reporting (number of observed cases divided by expected cases) was determined for cases diagnosed during year 2011. The completeness of case reporting of HIV diagnoses in 2011 was found to be 99%.

The HIV data in this report include persons who were residents of San Francisco at the time they were diagnosed with HIV including San Francisco residents who were diagnosed in other jurisdictions. San Francisco started name-based case reporting for HIV cases in April 2006, as mandated by California law. The confidential name-based HIV reporting system in San Francisco is considered mature (6 years have elapsed to allow for stabilization of data collection), and only cases reported confidentially by name are included in this report.

Stage of Disease at Diagnosis of HIV Infection

In 2008, the United States surveillance case definition[2] for HIV infection among adults and adolescents was revised to incorporate an HIV infection classification staging system with stages of HIV infection defined as follows:

- HIV infection, stage 1: No AIDS-defining condition and either CD4 count of ≥500 cells/μL or CD4 percentage of total lymphocytes of ≥29.
- HIV infection, stage 2: No AIDS-defining condition and either CD4 count of 200–499 cells/μL or CD4 percentage of total lymphocytes of 14–28.
- HIV infection, stage 3 (AIDS): CD4 count of <200 cells/μL or CD4 percentage of total lymphocytes of <14 or documentation of an AIDS-defining condition.
  Documentation of an AIDS-defining condition supersedes a CD4 count or percentage that would not, by itself, be the basis for a stage 3 (AIDS) classification.
- HIV infection, stage unknown: No information available on CD4 count or percentage and no reported information on AIDS-defining conditions (every effort should be made to report CD4 counts or percentages at the time of diagnosis to public health authorities).

1 Hall HI, Song R, Gerstle JE. Assessing the completeness of reporting human immunodeficiency virus diagnoses in 2002-2003: Capture recapture methods. American Journal of Epidemiology. 2006;164:391-397.

2 CDC. Revised Surveillance Case Definitions for HIV Infection Among Adults, Adolescents, and Children Aged <18 Months and for HIV Infection and AIDS Among Children Aged 18 Months to <13 Years --- United States, 2008. MMWR 2008;57(No. RR-10).

Data on persons with HIV infection, stage 3 (AIDS) include persons whose infection has ever been classified as stage 3 (AIDS).

HIV Transgender Status

In September 1996, the SFDPH began collecting transgender status when this information is contained in the medical record. Transgender individuals are listed as either male-to-female or female-to-male. The majority of transgender HIV cases are male-to-female (transfemale). Due to the small number of transmale cases and potential small population size, their data are included with transfemale cases to protect confidentiality. Please note that there are several limitations of our transgender data. We believe that our report likely underestimated the number of transgender persons affected by HIV because data collected for HIV reporting are derived from the medical record. Consequently, information that may be discussed with the health care provider but not recorded in the medical record is generally not available for the purposes of HIV case reporting.

Grouping of HIV Data Categories

Data regarding certain racial/ethnic or risk categories are grouped together when the number of persons with HIV in that particular group is small and/or does not present significant trends. For example, “Other” in the Race/Ethnicity breakdown represents Asian/Pacific Islander, Native American and people of mixed race. Whenever possible, this report presents the expanded race/ethnicity categories rather than aggregating into the group “Other.” The label “Other” in the Exposure Category breakdown may include transfusion recipients, hemophiliacs, heterosexuals, persons acquiring AIDS perinatally, or persons of unidentified risk.

Sexually Transmitted Disease Rates

Rates have been listed in most tables along with reporting totals. Rates are equal to the number of STD cases within the specified population per 100,000 San Francisco residents in that population per year. Rates should be used when comparing STD levels among different populations, as differences in disease totals are affected by the size of the population as well as incidence.

Comparison rates for California, the United States and the New York-Newark-Edison, NY-NJ-PA and Los Angeles-Long Beach-Santa Ana, CA metropolitan statistical areas (MSAs) are from Sexually Transmitted Disease Surveillance, 2012, by the Centers for Disease Control and Prevention, U.S. Department of Health and Human Services (November, 2013). In these figures, “San Francisco MSA” represents data for the entire San Francisco-Oakland-Fremont MSA.

Population denominators for disease rates are based on 2010 U.S. Census Data. Data on race or ethnicity of STD patients are typically reported as a single value, with “Hispanic” or “Latino” as a category exclusive of all others. However, in the 2000 and 2010 U.S. Census surveys, race was collected as a multiple-choice item, with Hispanic ethnicity recorded independently of race. In order to make denominators from the census data match totals from case reports, totals for residents reporting more than one race in the census data were divided among totals for residents indicating only one race. Failure to do so would have artificially increased all race-specific rates because there are no patients recorded as “multi-racial” among the STD case reports.

Hepatitis Surveillance Data Limitations

The data presented are not an estimate of the prevalence of chronic hepatitis B or past or present HCV-infection in San Francisco residents. Prevalence cannot be calculated because some persons infected with HBV or HCV are not tested, and others were tested before consistent reporting to SFDPH was established. In addition, some persons who were tested anonymously may not have been reported to SFDPH. Finally, people who were included in these data may not live in San Francisco, either because their address information was not provided or because they have moved.

The data presented are not an estimate of the incidence rate of chronic hepatitis B or past or present HCV infected cases in 2013. The incidence rate is the number of newly infected persons occurring within a defined time in a defined geographical area. While SFDPH does identify the first date the case was reported to them, this date is not necessarily the date the case became infected or was newly diagnosed. For example, some cases may have been infected many years ago but had no symptoms and were not tested when newly infected, but were tested in 2013 because a clinician was following recommended screening practices or because symptoms of chronic hepatitis have developed.

Communicable Disease Methods and Definitions

Data Collection

General communicable disease data is collected through a mix of passive and stimulated passive surveillance. San Francisco health care providers, laboratories and other mandated reporters are required under Title 17, California Code of Regulations (CCR) (§2500, §2505, §2593, §2641-2643, §2800-2812), to notify the local health authority of the diagnosis, detection or suspicion of certain diseases and conditions. Reports are confidentially received by fax, telephone, postal mail, or secure electronic file transfer. Reports by fax and postal mail are generally submitted using the California Confidential Morbidity Report (CMR) form. Limited case demographic and clinical information is provided on the CMR. Depending on the disease or condition, disease control staff attempt to contact the health care provider, laboratory and/or patient for follow-up and implementation of disease control measures. Clinical and risk factor data are subsequently collected according to departmental and state protocols. Data were managed with locally designed databases.

Population Under Surveillance

This report includes confirmed and probable reports of selected CCR Title 17 reportable diseases among San Francisco residents reported to SFDPH from January 1, 2002 through December 31, 2012.

San Francisco population estimates were obtained from the California Department of Finance (DOF) Demographic Research Unit; DOF estimates are based on the U.S. Census counts.

Notifiable Disease Definitions

The diseases required to be reported to public health and disease definitions can change over time. Changes in disease definitions can impact the numbers of cases of disease reported to the SFDPH.

Please see the Annual Report of Communicable Diseases in San Francisco 2012 appendices for a list of notifiable disease definition changes from 2004 to 2011 and definitions for select notifiable diseases. Changes in notifiable disease definitions from 1986 to 2003 are documented in The San Francisco Communicable Disease Report 1986-2003. Both reports are accessible at http://sfcdcp.org/publications.html.

Statistical Calculations

SAS version 9.2 (SAS Institute Inc., Cary, NC) was used to calculate crude incidence rates, age-specific rates, three-year moving averages and confidence intervals. For this report, the crude incidence rate (IR) is defined as the number of new cases of disease per 100,000 residents at risk during a given year. The denominator for all diseases, except infant botulism, congenital rubella, and invasive *H. influenzae*, was the total San Francisco population. The population at risk for infant botulism and congenital rubella was San Francisco residents less than one year of age, while for the invasive *H. influenzae* rat, it was persons less than 15 years of age. Age-adjusted rates were not calculated. Rates and proportions were generally rounded to one decimal place.

Formula 1. $IR = \left(n / p \right) \times 100{,}000$

where n= Number of Cases and p=Population at Risk, and each is identified for a one-year period.

Example: In 2012, there were 178 female cases of campylobacteriosis in San Francisco. The estimated number of female residents in 2012 was 400,483. Accordingly, the incidence among females was:

$$IR_{Campy\,2012_{Females}} = \left(178 / 400{,}483 \right) \times 100{,}000 = 44.4 \text{ cases per 100,000 population.}$$

Reliability of Rates

With rare diseases or with diseases where the number of cases for a particular population group is very small, a minor change in the number of incident cases can result in a relatively large shift in the corresponding rate. Rates and percents based on a small number of events may be unreliable and are generally subject to substantial variability over time. Unstable rates should not be statistically compared for differences with the rates for other populations or for San Francisco over time. Rates with a relative standard error (RSE) of 23% or greater were considered unstable and identified by an asterisk in tables of this report. Equivalently, numerators less than 20 result in unreliable rates.

Formula 2. $$RSE = \left(SE_{rate} / r \right) \times 100 = \left| \frac{r / \sqrt{n}}{r} \right| \times 100 = \left(\sqrt{1 / n} \right) \times 100$$

where r = Rate and SErate = Standard Error of a Rate and n = Number of Cases

Example: In 2012, there were 444 cases of campylobacteriosis cases reported in San Francisco and two cases of acute typhoid fever. Accordingly, the relative standard errors for campylobacteriosis and acute typhoid fever are:

$$RSE_{Campy\,2012} = \left(\sqrt{1/444}\right) \times 100 = 4.7\%$$

The rate derived from the frequency of campylobacteriosis is considered stable (RSE < 23%).

$$RSE_{TyphoidFever\,2012} = \left(\sqrt{1/2}\right) \times 100 = 70.7\%$$

The rate derived from the frequency of acute typhoid fever is not stable and is considered unreliable (RSE > 23%).

Exact Confidence Limits

95% Exact Confidence Intervals (95% CI) for incidence rates were approximated from the gamma distribution. Confidence limits were rounded to one decimal place.

Because the rates presented in this report are estimates of the true incidence of reported communicable diseases in San Francisco, confidence limits are used to describe the uncertainty of an estimate and provide a range in which the true rate occurs. In 2012, the rate of giardiasis in residents 35-44 years of age was 24.8 cases per 100,000 people (95% CI=18.5-32.6). This confidence interval indicates that the true giardiasis rate in residents aged 35-44 years is likely to lie somewhere between 18.5 and 32.6 cases per 100,000 people. The interval therefore provides a useful means for evaluating the precision of a rate calculation. A rate estimate with a wide confidence interval is less precise than a rate with a narrow confidence interval. Using 2012 giardiasis cases as an example, consider the difference between incidence among residents 1-4 years of age (rate=11.7, 95% CI=3.2-30.0) and those aged 35-44 years as described above. The range of possible values among the older age group is approximately half as wide as the range for children 1-4 years. The rate among residents 35-44 years is therefore considered more precise. Rates with very large confidence intervals should be interpreted cautiously. In this report, confidence intervals were not displayed for individual cell counts of zero.

Data Limitations

The surveillance data was reported by laboratorians, clinicians and other mandated reporters to the local health authority in compliance with public health laws. Reports may be incomplete and/or important demographic, clinical or risk information may not be available upon active follow-up. Because not all cases of disease were detected by the health care system and not all detected cases were reported to the public health department, the information presented in this report may underestimate the true incidence of disease.

POPULATION HEALTH DIVISION
SAN FRANCISCO DEPARTMENT OF PUBLIC HEALTH

APPLIED RESEARCH, COMMUNITY HEALTH
EPIDEMIOLOGY, & SURVEILLANCE

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