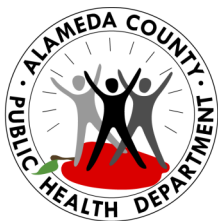


A microscopic view of several viruses, likely influenza, with their characteristic spherical shape and surface spikes. The background is a deep blue with some lighter blue and green highlights, suggesting a fluid environment.

Summary of Acute Communicable Diseases Alameda County 2007-2013

May 2016



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Section 1: Background

Introduction

This report summarizes the incidence and trends of select communicable diseases among Alameda County residents from 2007 to 2013. Per Title 17 of the California Code of Regulations (CCR) (§2500, §2505, §2593, §2641.5-2643.20, §2800-2812)¹, health care providers and laboratories are required to report known or suspected cases of select conditions by notifying the local health departments of their patients' residing jurisdictions. Reports to the Alameda County Public Health Department (ACPHD) are received via telephone, fax or electronic transmission. The list of Title 17 reportable conditions change periodically depending on public health needs and mandates as evaluated by the California Department of Public Health (CDPH) and the California Conference of Local Health Officers (CCLHO); changes from 2007 to 2013 have been documented in this report (Table 1).

Only communicable diseases managed by the Acute Communicable Disease (ACD) Unit of ACPHD are included. The following reportable conditions managed by other ACPHD units are excluded from this report: high-grade cervical precancers; cancers; disorders characterized by lapses in consciousness; human immunodeficiency virus (HIV) and acquired immune deficiency syndrome (AIDS); chancroid; *Chlamydia trachomatis* infections, including lymphogranuloma venereum (LGV); gonococcal infections; chronic hepatitis B and C infections; pelvic inflammatory disease (PID); pesticide-related illness or injury; syphilis; and tuberculosis.

In addition, because the City of Berkeley is a health jurisdiction separate from Alameda County, incidents of diseases in Berkeley residents are not included in this report.

Data Sources

Disease incidents:

Multiple sources of data were used to calculate disease frequency and incidence in this report:

1. **Alameda County Communicable Disease Surveillance System (CDSS):** For all conditions with the exception of select enteric infections (see description below), Creutzfeldt-Jacob Disease (CJD) and other transmissible spongiform encephalopathies (TSE), infant botulism, animal rabies and outbreaks occurring in food-service facilities, data were entered into the Alameda County Communicable Disease Surveillance System database by ACD staff. Case age and year of occurrence were calculated based on date of report to ACPHD.
2. **California Emerging Infections Program (CEIP):** CEIP is one of ten Emerging Infections Program sites funded by the Centers for Disease Control and Prevention (CDC) to perform surveillance on diseases of special interest. CEIP staff actively identify cases of

select conditions by searching laboratory or hospital records within their catchment area, which includes Alameda, Contra Costa and San Francisco Counties, and the City of Berkeley. Because case identification and demographic information are more comprehensive by this method, we elected to use CEIP data to calculate incidence for the following reportable conditions: Creutzfeldt-Jacob Disease (CJD) and other transmissible spongiform encephalopathies (TSE), hemolytic uremic syndrome (HUS), influenza deaths in persons aged 0-64, salmonellosis, shiga toxin-producing *E. coli* infections, and typhoid fever. Case age and year of occurrence were calculated based on different dates for these conditions as defined by CEIP convention: date of death was used for CJD/TSE; date of diagnosis was used for HUS; and date of specimen collection was used for the remaining conditions.

3. **CDPH Infant Botulism Treatment and Prevention Program (IBTPP):** The IBTPP program is a statewide resource that provides healthcare providers with consultation and antitoxin for cases of botulism occurring in infants between 0 and 52 weeks of age. Because IBTPP is the only source of antitoxin available, case reports of infant botulism are complete and were used for this analysis. Case age and year of occurrence were calculated using date of case referral to IBTPP.
4. **Alameda County Public Health Laboratory (ACPHL):** ACPHL performs all testing of potential animal rabies cases in Alameda County. A list of all animals that tested positive for rabies was provided by ACPHL and used for this analysis. Year of disease occurrence was calculated based on test result date.
5. **National Outbreak Reporting System (NORS):** In Alameda County, foodborne outbreaks are investigated by Alameda County Environmental Health Department with assistance from CEIP; final reports are submitted to CDPH. CDPH reports waterborne and foodborne disease outbreaks for all California local health jurisdictions to CDC via NORS. Data on all Alameda County foodborne outbreaks reported to NORS were used for this analysis. Year of outbreak occurrence was calculated based on date of report to Alameda County Environmental Health Department.

Population Estimates²:

The population size of Alameda County were estimated by the California Department of Finance (DOF) and the decennial Censuses. For July 1st estimates from each year from 2007 to 2011, the age and sex distributions were assumed to change linearly with given values from Census 2000 to Census 2010, with the total number of persons taken from DOF estimates. Since data in this report are for 2007 to 2013, the midpoint population estimate is from July 1, 2010. Population estimates for 2012 and 2013 population were from Esri (ArcGIS Desktop: Release 10.4. Redlands, CA: Environmental Systems Research Institute). The 2010 midpoint Alameda County population excluding Berkeley residents was used as the denominator for average annual crude incidence rate (IR) calculations for most disease conditions (see “Rate Calculation and Interpretation” for description).

Comparison Data Sources:

In Section 3: Summary of Select Communicable Diseases, rate comparisons were made between Alameda County and select jurisdictions. Comparison data sources are as follows:

1. **National rates:** For campylobacteriosis, *E. coli* O157, salmonellosis and shigellosis, comparison rates were obtained from the CDC Foodborne Diseases Active Surveillance Network (FoodNet) annual surveillance reports³⁻⁹. For all other nationally notifiable conditions, comparison rates were obtained from the Summary of Notifiable Infectious Diseases and Conditions published by CDC in the Morbidity and Mortality Weekly Report, 2007-2013¹⁰⁻¹⁶.
2. **California and local health jurisdiction rates:** Comparison rates of Title 17 reportable diseases in California, Contra Costa County, the City and County of San Francisco and Santa Clara County were obtained from the Yearly Summaries of Selected General Communicable Diseases in California, 2001-2010¹⁷ and 2011-2014¹⁸.

Rate Calculations and Interpretation

Crude Incidence Rate

This reports presents both the number and crude incidence rates (IR) of reportable disease incidents occurring in Alameda County. Crude IRs describe the incidence of disease in relation to the size of the population at risk for developing disease and the time period observed; standardizing the frequency of disease using this method allows for direct comparisons of disease incidence across two or more populations of different sizes. For this report, the crude IR is defined as the number of new disease incidents occurring in 100,000 people at risk for infection during a specific time period. The types of crude IRs are calculated in this report are as follows:

1. **Average annual crude incidence rate:** This was calculated by first determining the average number of cases occurring annually for each condition from 2007 to 2013, then dividing this seven-year average number of cases by the appropriate midpoint 2010 population of Alameda County. This number is then multiplied by 100,000 to produce the average crude incidence rate of disease per 100,000 residents per year.
2. **Annual crude incidence rate:** For select conditions, annual rates were calculated to examine trends in disease incidence from 2007-2013. The annual crude IR is calculated for each year of interest by dividing the number of disease incidents occurring in that year by the number of residents in Alameda County in the same year, then multiplied by 100,000 to produce the annual crude IR per 100,000 residents per year.
3. **Sex-, Age- and Race/Ethnicity-specific crude incidence rate:** For select conditions, crude IRs were also calculated for select demographic characteristics. For example, in order

to determine the average annual crude IR of a certain disease among women, the calculation is done by dividing the total number of disease incidents occurring in females from 2007 to 2013 by seven to obtain the average annual number of cases in women over the seven-year period of interest, then dividing by the number of women residing in Alameda County in 2010. Crude IRs were not calculated for cases with unknown sex, age or race/ethnicity group because no denominator exists for these groups, and is denoted by “NC” in all tables.

Confidence Intervals and their Interpretation²

In addition to crude IRs, confidence intervals were calculated to estimate the reliability of the rates, which are subject to random variation. A 95% confidence interval (95% CI) represents an estimate of the true underlying rate of disease should a population be repeatedly sampled; that is, if the same population is sampled 100 times, in 95 times a rate would be produced that falls within the 95% confidence interval. For example, in Alameda County the 2009 crude IR for amebiasis is 0.9 cases/100,000 residents, with a 95% CI of 0.5-1.6 (Table 2); this indicates that if the same sample was repeated 100 times in 2009, 95% of the time the IR estimate would have a value between 0.5 cases/100,000 residents and 1.6 cases/100,000 residents.

The width of a 95% CI indicates the precision and variability of the rate estimate, as well as the size of the sample from which the estimate was drawn. The narrower the confidence interval, the larger the sample size and the more precise and less variable the estimate; conversely, large confidence intervals should be interpreted cautiously because they may represent estimates drawn from small samples and are therefore not reliable.

Confidence intervals are also useful for comparing whether multiple rates are significantly different from one another. If the confidence intervals of two rates overlap, there is a chance that with repeated sampling, the rates in these populations may be identical and therefore not statistically significantly different from one another. However, if the intervals do not overlap, we can more confidently interpret the rates to be truly different from one another even with repeated sampling. For example, in the case of annual rates for salmonellosis (Table 2), the 95% CIs of the 2007 (15.6 cases/100,000 residents [95%CI 13.6-17.8]) and 2008 rates (13.8 cases/100,000 residents [95%CI 11.9-15.9]) overlap with one another, indicating that with repeated sampling, it is possible for the rate from 2007 and 2008 to have the same estimate value. In such a case, we do not interpret the rate of disease from either year to be statistically significantly different from one another. However, when comparing the 95% CI from 2008 with 2009 IR estimates (19.5 cases/100,000 residents [95%CI 17.4-22.0]), the confidence intervals do not overlap; in this case, because there is little chance of the value estimates of being identical even with repeated sampling, we interpret the IR of salmonellosis in 2009 to likely be truly higher than the IR in 2008.

Small Numbers and Data Suppression²

Because rates calculated based on a small number of events are subject to a greater degree of variability and are inherently less stable, this report uses a standard set by the Family Health Outcomes Project of the University of California, San Francisco¹⁹ to protect against providing misleading information based on unstable rates. Rates were only calculated for subgroups where 10 or more disease events occurred. Rates for subgroups with fewer than 10 events are not sufficient in providing a stable estimate and thus are not presented in this report; they are indicated in tables with an asterisk (*). Similarly, in maps presented in this report, data for zip codes with fewer than 10 events are not presented.

All frequency, rate and exact confidence interval calculations were performed using SAS version 9.4 (SAS Institute Inc., Cary, NC). Exact confidence intervals were approximated from the gamma distribution.²⁰ Line and bar graphs were produced using Microsoft Excel 2007. Maps were produced using Esri.

Section 2: Overview of Communicable Diseases in Alameda County

Frequencies and average annual crude incidence rates of communicable diseases reported to Alameda County from 2007 to 2013 are presented in Table 1, and annual crude incidence rates for select diseases are presented in Table 2, Figure 1 and Figure 2.

From 2007 to 2013, diseases with the highest incidences in Alameda County were: campylobacteriosis (N=2347, average annual IR=23.9 cases/100,000 residents), acute salmonellosis (N=1578, average annual IR=16.1 cases/100,000 residents), pertussis (N=957, average annual IR=9.8 cases/100,000 residents), giardiasis (N=637, average annual IR=6.5 cases/100,000 residents), and meningitis (all causes; N=600, average annual IR=6.1 cases/100,000 residents).

Figure 1: Annual Incidence Rates of Select Enteric Communicable Diseases, Alameda County, 2007-2013

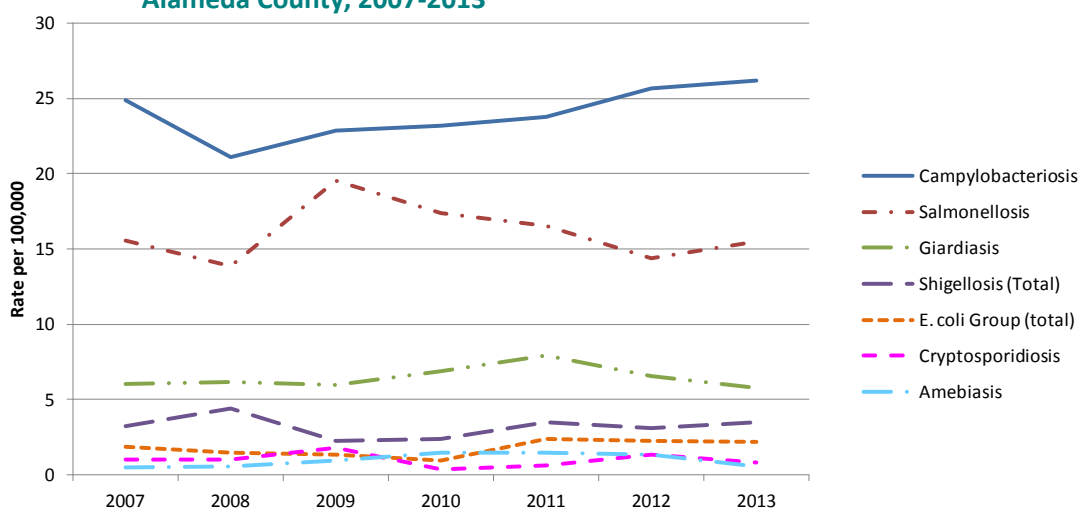


Figure 2: Annual Incidence Rates of Select Non-Enteric Communicable Diseases, Alameda County, 2007-2013

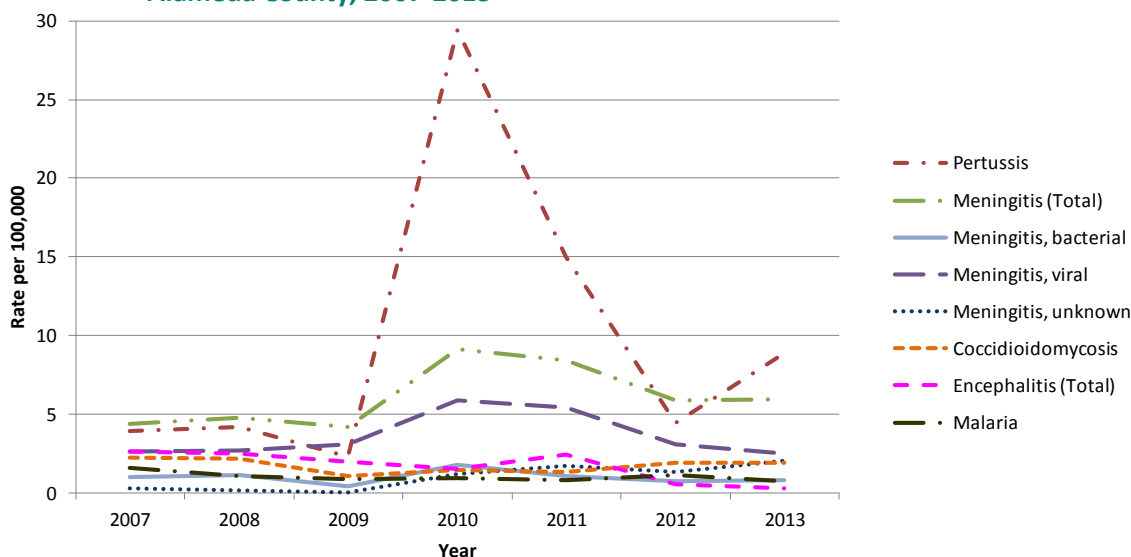


Table 1: Number of Cases and Average Annual Incidence Rates (IR) of Acute Communicable Diseases Alameda County, 2007-2013

Disease	Number of Cases	Average annual IR per 100,000 (95% CI)*	Annual Number of Cases						
			2007	2008	2009	2010	2011	2012	2013
Amebiasis	97	1.0 (0.5-1.7)	7	8	13	21	21	19	8
Anaplasmosis/Ehrlichiosis [1]	2	*	0	0	0	0	0	0	2
Anthrax, human	0	*	0	0	0	0	0	0	0
Anthrax, animal	0	*	NR	NR	NR	NR	0	0	0
Babesiosis	3	*	0	1	1	0	1	0	0
Botulism, foodborne	1	*	0	1	0	0	0	0	0
Botulism, infant ^	7	*	0	1	2	0	1	1	2
Botulism, wound	12	*	1	1	6	2	2	0	0
Botulism, other	0	*	NR	NR	NR	NR	0	0	0
Brucellosis, human	7	*	4	1	1	0	1	0	0
Campylobacteriosis	2347	23.9 (21.5-26.7)	340	291	318	325	335	364	374
Chickenpox (hospitalizations and deaths)	9	*	0	0	0	4	0	2	3
Cholera	1	*	1	0	0	0	0	0	0
Ciguatera fish poisoning	1	*	0	0	1	0	0	0	0
Coccidioidomycosis	169	1.7 (1.1-2.6)	31	30	15	20	19	27	27
Colorado Tick Fever	0	*	0	0	0	0	NR	NR	NR
Creutzfeldt-Jakob Dis. Or Other TSE ^^ [2]	10	*	2	3	1	1	2	1	0
Cryptosporidiosis	98	1.0 (0.5-1.7)	14	14	25	5	9	19	12
Cyclosporiasis	0	*	NR	NR	NR	NR	0	0	0
Cysticercosis (2007-2013) or Taeniasis (2013 only) [3]	3	*	1	1	1	0	0	0	0
Dengue	34	*	3	2	2	0	0	10	17
Diphtheria	0	*	0	0	0	0	0	0	0
Domoic Acid Poisoning	0	*	0	0	0	0	0	0	0
Encephalitis (Total)	166	1.7 (1.1-2.5)	36	35	28	21	34	8	4
Encephalitis, arboviral	0	*	0	0	0	0	0	0	0
Encephalitis, bacterial	3	*	0	1	1	0	1	0	0
Encephalitis, fungal	0	*	0	0	0	0	0	0	0
Encephalitis, parasitic	1	*	0	0	0	0	0	0	1
Encephalitis, viral	35	*	5	5	12	5	6	2	0
Encephalitis, unknown	127	1.3 (0.8-2.0)	31	29	15	16	27	6	3
Shiga Toxin-Producing <i>E. coli</i> Group (Total) ^^ [4]	174	1.8 (1.1-2.6)	25	20	19	13	34	32	31
<i>E. coli</i> O157 ^^ [4]	127	1.3 (0.8-2.0)	23	17	16	10	18	22	21
<i>E. coli</i> non-O157 ^^ [4]	42	*	2	1	2	2	16	10	9
Giardiasis	634	6.5 (5.2-7.9)	82	85	83	96	112	93	83
Glanders (<i>Burkholderia mallei</i>)	0	*	NR	NR	NR	NR	0	0	0
<i>H. influenzae</i> , invasive (aged <15 years)	9	*	0	2	2	0	2	2	1
Hantavirus infection	2	*	0	0	0	0	0	2	0

[1] Anaplasmosis not reportable until 2010 and data not recorded in CDSS until 2013; ehrlichiosis was reportable from 2007-2013

[2] Case year classified by year of death as per CEIP/CDPH/CDC/WHO conventions rather than date of report to ACPHD

[3] Data for taeniasis not recorded in CDSS until 2013

[4] Various categories of *E. coli* were reportable from 2007-2013: Shiga toxin producing *E. coli* (STEC) infection and *E. coli* O157:H7 infection separately from 2007 to 2009, STEC including *E. coli* O157:H7 in 2010 and STEC including *E. coli* O157 from 2011 to 2013.

^ Data from CDPH, Infant Botulism Treatment and Prevention Program

^^ Data from California Emerging Infections Program

* Annual average rates not presented for diseases with fewer than average of 10 total incidents per year from 2007-2013

NR Not Reportable

Table 1: Number of Cases and Average Annual Incidence Rates (IR) of Acute Communicable Diseases Alameda County, 2007-2013 (continued)

Disease	Frequency	Average annual IR per 100,000 (95% CI)*	Annual Frequency						
			2007	2008	2009	2010	2011	2012	2013
Hemolytic Uremic Syndrome (HUS) ^^	20	*	2	1	1	5	5	4	2
Hepatitis A, acute	51	*	7	20	3	7	4	4	6
Hepatitis B, acute	63	*	21	14	7	4	5	7	5
Hepatitis C, acute	5	*	0	1	0	0	1	1	2
Hepatitis D (Delta)	11	*	NR	NR	NR	NR	5	3	3
Hepatitis E, acute	1	*	NR	NR	NR	NR	0	0	1
Influenza A, Avian (H5N1) (Human) ^^	0	*	0	0	0	0	NR	NR	NR
Influenza, Pediatric Deaths ^^	4	*	0	1	2	1	NR	NR	NR
Influenza, deaths in ages 0-64 ^^	17	*	NR	NR	NR	NR	3	7	7
Influenza, novel strains (human) ^^	0	*	NR	NR	NR	NR	0	0	0
Kawasaki Syndrome	33	*	4	4	9	16	NR	NR	NR
Legionellosis	19	*	2	3	2	2	5	3	2
Leprosy (Hansen Disease)	11	*	0	3	2	0	4	2	0
Leptospirosis	1	*	1	0	0	0	0	0	0
Listeriosis	44	*	1	12	7	9	6	6	3
Lyme disease	34	*	6	11	5	4	2	5	1
Malaria	100	1.0 (0.6-1.7)	22	15	12	13	11	16	11
Measles (Rubeola)	1	*	0	0	0	1	0	0	0
Melioidosis (<i>Burkholderia pseudomallei</i>)	3	*	NR	NR	NR	NR	1	2	0
Meningitis (Total)	600	6.1 (4.9-7.6)	60	66	58	128	119	84	85
Meningitis, bacterial	99	1.0 (0.6-1.7)	14	16	6	25	15	11	12
Meningitis, fungal [5]	51	*	6	11	9	4	3	10	8
Meningitis, parasitic	0	*	0	0	0	0	0	0	0
Meningitis, viral	355	3.6 (2.7-4.8)	36	37	43	82	77	44	36
Meningitis, unknown	95	1.0 (0.5-1.6)	4	2	0	17	24	19	29
Meningococcal infection	34	*	9	4	4	2	3	7	5
Mumps	5	*	0	0	1	1	1	0	2
Occurrence of any unusual disease	46	NC	NR	1	0	19	14	4	8
Outbreaks (Foodborne) ^^^	32	NC	4	4	3	8	3	5	5
Outbreaks (Non-foodborne)	285	NC	28	30	30	42	47	48	60
Paralytic Shellfish Poisoning	0	*	0	0	0	0	0	0	0
Pertussis (Whooping Cough)	957	9.8 (8.2-11.5)	54	58	32	412	211	63	127
Plague, animal	0	*	NR	NR	NR	NR	0	0	0
Plague, human	0	*	0	0	0	0	0	0	0
Poliomyelitis / Poliovirus infection [6]	0	*	0	0	0	0	0	0	0
Psittacosis	0	*	0	0	0	0	0	0	0
Q fever	2	*	0	0	0	0	0	0	2
Rabies, animal ^^^	23	*	3	3	3	3	4	3	4

[5] Five cryptococcal infections were reported in 2007. Some of these were potential fungal meningitis cases but could not be verified. Not included in 2007 count.

[6] Poliomyelitis reportable until 2009; poliovirus infection reportable from 2010 to the present.

^^ Data from California Emerging Infections Program

^^^ Data from Alameda County Public Health Laboratory

^^^^ Data from CDC National Outbreak Report System

* Annual average rates not presented for diseases with fewer than average of 10 total incidents per year from 2007-2013

NR Not Reportable

NC Not Calculated (see methods for description)

Table 1: Number of Cases and Average Annual Incidence Rates (IR) of Acute Communicable Diseases Alameda County, 2007-2013 (continued)

Disease	Frequency	Average annual IR per 100,000 (95% CI)*	Annual Frequency						
			2007	2008	2009	2010	2011	2012	2013
Rabies, human	0	*	0	0	0	0	0	0	0
Relapsing fever	3	*	0	0	0	2	1	0	0
Rheumatic Fever (Acute)	0	*	0	0	0	0	NR	NR	NR
Rickettsial diseases (non-RMSF)	1	*	NR	NR	NR	NR	0	0	1
Rocky Mountain Spotted Fever (RMSF)	1	*	0	0	0	0	0	0	1
Rubella (German Measles)	0	*	0	0	0	0	0	0	0
Rubella syndrome (Congenital)	0	*	0	0	0	0	0	0	0
Salmonellosis ^^	1578	16.1 (14.1-18.3)	213	191	272	243	233	204	222
Salmonellosis (carriers) ^^ [7]	41	*	5	4	5	11	2	7	7
Scrombroid fish poisoning	3	*	0	1	0	0	2	0	0
Severe Acute Respiratory Syndrome (SARS)	0	*	0	0	0	0	0	0	0
Severe <i>Staphylococcus aureus</i> infection	11	*	NR	N/A [8]	4	1	3	2	1
Shiga toxin, detected in feces ^^	20	*	NR	NR	0	7	3	4	6
Shigellosis (Total)	312	3.2 (2.3-4.3)	44	61	31	33	49	44	50
<i>Shigella</i> , group A (<i>S. dysenteriae</i>)	2	*	0	0	1	0	0	0	1
<i>Shigella</i> , group B (<i>S. flexneri</i>)	104	1.1 (0.6-1.8)	18	14	11	2	16	13	30
<i>Shigella</i> , group C (<i>S. boydii</i>)	7	*	0	2	0	1	0	2	2
<i>Shigella</i> , group D (<i>S. sonnei</i>)	162	1.7 (1-2.5)	24	37	17	22	25	23	14
<i>Shigella</i> , unknown	37	*	2	8	2	8	8	6	3
Smallpox	0	*	0	0	0	0	0	0	0
Streptococcal infection [9]	0	*	0	0	0	0	0	0	0
Tetanus	1	*	1	0	0	0	0	0	0
Toxic shock syndrome	9	*	0	1	3	3	2	0	0
Toxoplasmosis	4	*	0	2	2	NR	NR	NR	NR
Trichinosis	0	*	0	0	0	0	0	0	0
Tularemia, animal	0	*	NR	NR	NR	NR	0	0	0
Tularemia, human	3	*	1	1	0	0	1	0	0
Typhoid Fever ^^	56	*	8	9	9	7	9	6	8
Typhus Fever	0	*	0	0	0	0	0	0	0
Vibriosis (Non-Cholera)	43	*	2	7	4	8	3	7	12
Viral Hemorrhagic Fevers, human	0	*	0	0	0	0	0	0	0
Viral Hemorrhagic Fevers, animal	0	*	NR	NR	NR	NR	0	0	0
West Nile virus infection	6	*	1	1	0	1	0	2	1
Yellow Fever	0	*	0	0	0	0	0	0	0
Yersiniosis	34	*	9	2	4	4	4	3	8

[7] Cases with multiple positive specimens more than 31 days apart

[8] Not available: severe *S. aureus* infections have been reportable since 2008; records of these infections in Alameda County were not recorded in CDSS until 2009.

[9] Outbreaks and individual cases in food handlers or dairy workers only

^^ Data from California Emerging Infections Program

* Annual average rates not presented for diseases with fewer than average of 10 total incidents per year from 2007-2013

NR Not Reportable

Table 2: Number of Cases and Annual Incidence Rate (IR) of Select Acute Communicable Diseases, Alameda County, 2007-2013

Disease	Number of Cases	Average Annual IR per 100,000 (95% CI)	Annual Incidence Rate per 100,000 (95%CI)						
			2007	2008	2009	2010	2011	2012	2013
Amebiasis	97	1.0 (0.5-1.7)	*	*	0.9 (0.5-1.6)	1.5 (0.9-2.3)	1.5 (0.9-2.3)	1.3 (0.8-2.1)	*
Campylobacteriosis	2347	23.9 (21.5-26.7)	24.9 (22.3-27.7)	21.1 (18.7-23.6)	22.8 (20.4-25.5)	23.2 (20.8-25.9)	23.8 (21.3-26.4)	25.6 (23.1-28.4)	26.1 (23.6-28.9)
Coccidioidomycosis	169	1.7 (1.1-2.6)	2.3 (1.5-3.2)	2.2 (1.5-3.1)	1.1 (0.6-1.8)	1.4 (0.9-2.2)	1.3 (0.8-2.1)	1.9 (1.3-2.8)	1.9 (1.2-2.7)
Cryptosporidiosis	98	1.0 (0.5-1.7)	1.0 (0.6-1.7)	1.0 (0.6-1.7)	1.8 (1.2-2.7)	*	*	1.3 (0.8-2.1)	0.8 (0.4-1.5)
Encephalitis (Total)	166	1.7 (1.1-2.5)	2.6 (1.8-3.6)	2.5 (1.8-3.5)	2.0 (1.3-2.9)	1.5 (0.9-2.3)	2.4 (1.7-3.4)	*	*
Shiga Toxin-Producing <i>E. coli</i> Group (Total) ^{^^}	174	1.8 (1.1-2.6)	1.8 (1.2-2.7)	1.4 (0.9-2.2)	1.4 (0.8-2.1)	0.9 (0.5-1.6)	2.4 (1.7-3.4)	2.3 (1.5-3.2)	2.2 (1.5-3.1)
<i>E. coli</i> O157 ^{^^}	127	1.3 (0.8-2.0)	1.7 (1.1-2.5)	1.2 (0.7-2.0)	1.1 (0.7-1.9)	0.7 (0.3-1.3)	1.3 (0.8-2.0)	1.5 (1.0-2.3)	1.5 (0.9-2.2)
Giardiasis	634	6.5 (5.2-7.9)	6.0 (4.8-7.4)	6.2 (4.9-7.6)	6.0 (4.7-7.4)	6.9 (5.6-8.4)	7.9 (6.5-9.6)	6.5 (5.3-8.0)	5.8 (4.6-7.2)
Malaria	100	1.0 (0.6-1.7)	1.6 (1.0-2.4)	1.1 (0.6-1.8)	0.9 (0.4-1.5)	0.9 (0.5-1.6)	0.8 (0.4-1.4)	1.1 (0.6-1.8)	0.8 (0.4-1.4)
Meningitis (Total)	600	6.1 (4.9-7.6)	4.4 (3.3-5.6)	4.8 (3.7-6.1)	4.2 (3.2-5.4)	9.1 (7.6-10.9)	8.4 (7.0-10.1)	5.9 (4.7-7.3)	5.9 (4.7-7.3)
Meningitis, bacterial	99	1.0 (0.6-1.7)	1.0 (0.6-1.7)	1.2 (0.7-1.9)	*	1.8 (1.2-2.6)	1.1 (0.6-1.8)	0.8 (0.4-1.4)	0.8 (0.4-1.5)
Meningitis, viral	355	3.6 (2.7-4.8)	2.6 (1.8-3.6)	2.7 (1.9-3.7)	3.1 (2.2-4.2)	5.9 (4.7-7.3)	5.5 (4.3-6.8)	3.1 (2.3-4.2)	2.5 (1.8-3.5)
Meningitis, unknown	95	1.0 (0.5-1.6)	*	*	*	1.2 (0.7-1.9)	1.7 (1.1-2.5)	1.3 (0.8-2.1)	2.0 (1.4-2.9)
Pertussis (Whooping Cough)	957	9.8 (8.2-11.5)	3.9 (3.0-5.2)	4.2 (3.2-5.4)	2.3 (1.6-3.2)	29.4 (26.7-32.4)	15.0 (13.0-17.1)	4.4 (3.4-5.7)	8.9 (7.4-10.6)
Salmonellosis ^{^^}	1578	16.1 (14.1-18.3)	15.6 (13.6-17.8)	13.8 (11.9-15.9)	19.5 (17.3-22.0)	17.4 (15.2-19.7)	16.5 (14.5-18.8)	14.4 (12.5-16.5)	15.5 (13.5-17.7)
Shigellosis (Total)	312	3.2 (2.3-4.3)	3.2 (2.3-4.3)	4.4 (3.4-5.7)	2.2 (1.5-3.2)	2.4 (1.6-3.3)	3.5 (2.6-4.6)	3.1 (2.3-4.2)	3.5 (2.6-4.6)
<i>Shigella</i>, group B (<i>S. flexneri</i>)	104	1.1 (0.6-1.8)	1.3 (0.8-2.1)	1.0 (0.6-1.7)	0.8 (0.4-1.4)	*	1.1 (0.6-1.8)	0.9 (0.5-1.6)	2.1 (1.4-3.0)
<i>Shigella</i>, group D (<i>S. sonnei</i>)	162	1.7 (1.0-2.5)	1.8 (1.1-2.6)	2.7 (1.9-3.7)	1.2 (0.7-2)	1.6 (1.0-2.4)	1.8 (1.1-2.6)	1.6 (1.0-2.4)	1.0 (0.5-1.6)

^{^^} Data from California Emerging Infections Program

* Unstable rates; rates are not presented if annual count is fewer than 10 cases

NR Not Reportable

Section 3: Summary of Select Communicable Diseases

Summaries are included on select communicable diseases to highlight conditions with high incidence or unique epidemiology within Alameda County. Where possible, additional analyses of select diseases based on sex, age and race/ethnicity groups were conducted and presented in Tables 3-7b in Section 6 of this report.

A) Amebiasis

The average annual incidence of amebiasis in Alameda County from 2007 to 2013 was 1.0 cases/100,000 residents per year [95%CI 0.5-1.7] (Table 1). Annual rates from 2009 to 2012 ranged from 0.9 cases/100,000 residents to 1.5 cases/100,000 residents and did not differ significantly from year to year (Table 2). Males had significantly higher rates of amebiasis compared to females (1.5 cases/100,000 men [95%CI 1.2-1.9] compared to 0.5 cases/100,000 women [95%CI 0.3-0.7]), and were comparable to state rates (Table 3). No significant differences in disease incidence were found among different age groups, whose distribution was similar to that observed in California.

B) Campylobacteriosis

Campylobacteriosis was the highest incidence reportable acute communicable disease in Alameda County from 2007 to 2013 (average annual rate: 23.9/100,000 residents per year [95%CI 21.5-26.7]). Campylobacteriosis incidence in Alameda County was higher when compared to California and the nation, similar to rates in neighboring Contra Costa County from 2009 to 2013, and significantly lower than rates observed in San Francisco (Figure B1).

Campylobacteriosis rates were significantly higher among males compared to females (26.2 cases/100,000 males [95%CI 24.8-27.7] compared to 21.3 cases/100,000 females [95%CI 20.0-22.6]), a disparity also observed in state and national rates. Within the county, the highest average annual rates were observed in Piedmont and North and Central East Oakland, followed by Emeryville, the central regions of Oakland, Pleasanton and parts of Livermore (Figure B2).

Figure B1: Annual incidence of Campylobacteriosis in Alameda County (in comparison with Contra Costa County, San Francisco County, California and the United States), 2007-2013

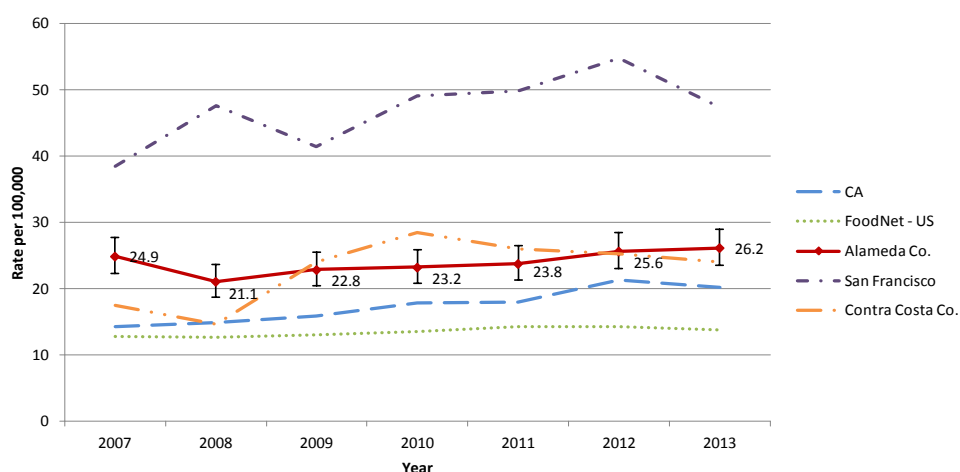
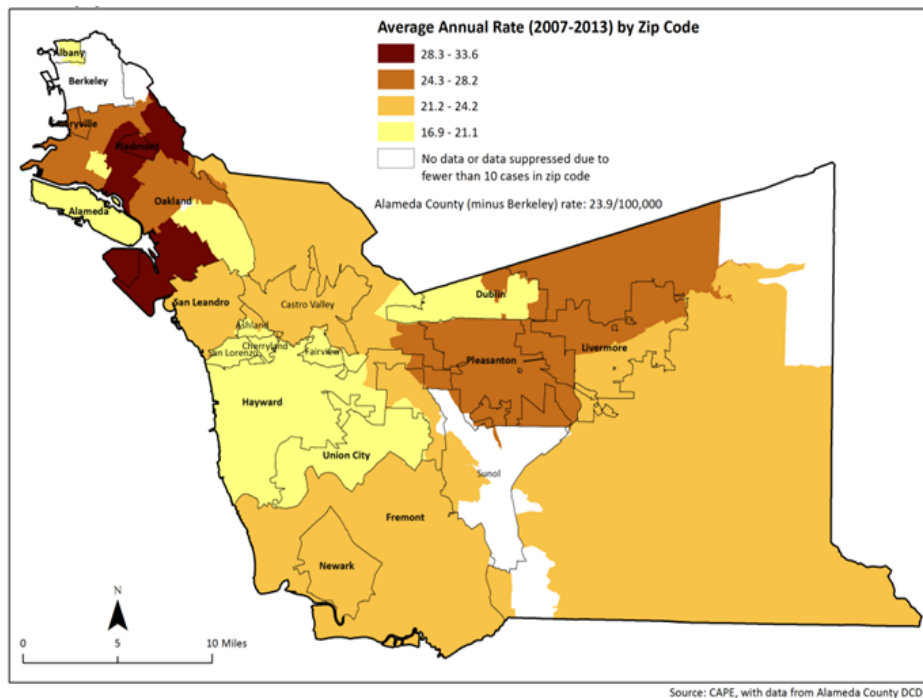
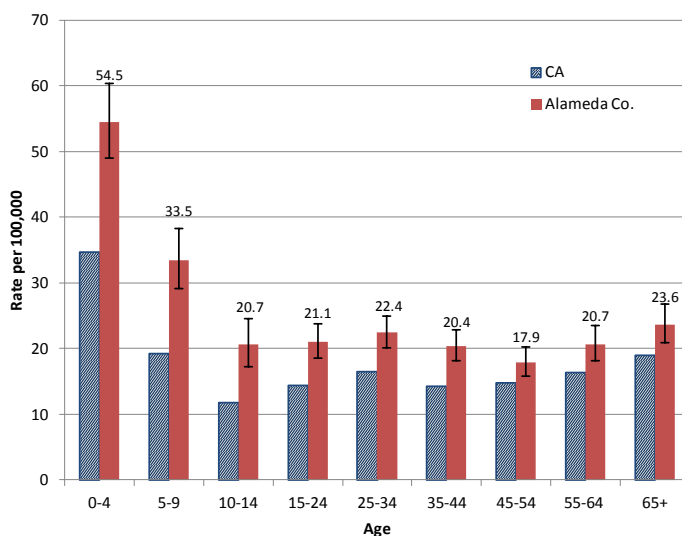


Figure B2: Map of Average Annual Incidence of Campylobacteriosis in Alameda County, by Zip Code, 2007-2013



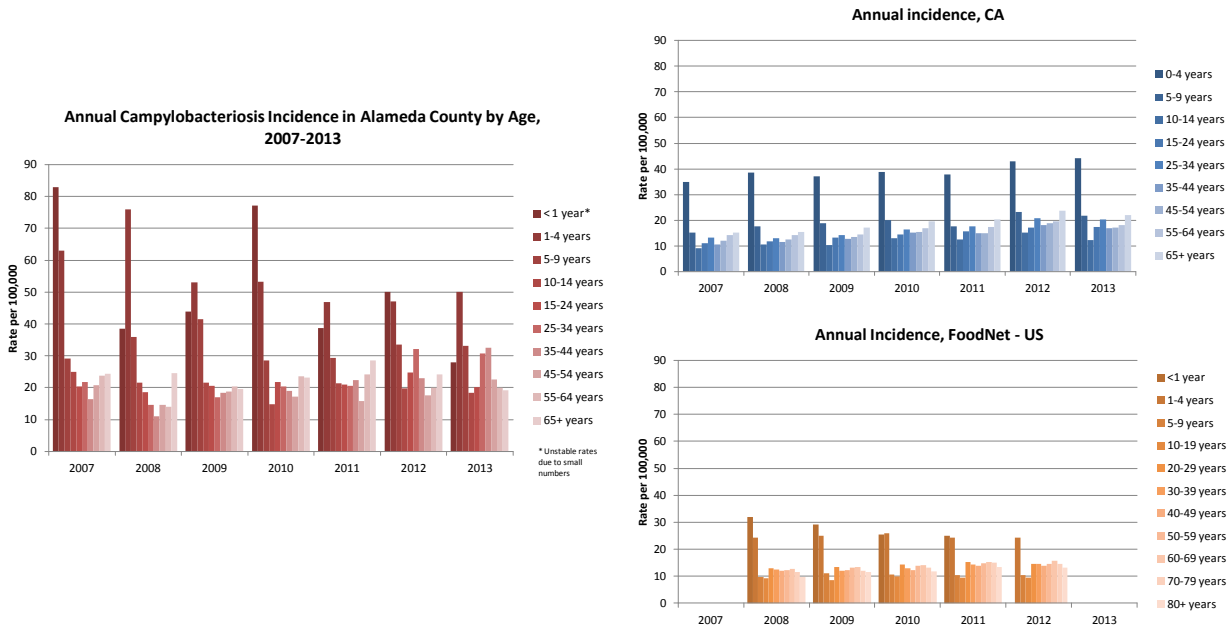
Comparing incidence across age groups, children younger than five years old in Alameda County had significantly higher rates of disease than those five years and older (< 1 year old: 51.1 cases/100,000 residents [95%CI 39.5-65.2] and 1-4 years old 55.3 cases/100,000 residents [95%CI 49.1-62.0], compared to 17.9 cases/ 100,000 residents to 33.5 cases/100,000 residents in other age groups), and those 5-9 years old had significantly higher rates than those 10 years and older (33.5 cases/ 100,000 residents [95%CI 29.1-38.3] compared to 17.9 cases/100,000 residents to 23.6 cases/100,000 residents in other age groups) (Table 4 and Figure B3).

Figure B3: Average Annual Incidence of Campylobacteriosis in Alameda County, by Age, 2007-2013



When examining trends annually from 2007 to 2013, age distributions changed over time (Table 5 and Figure B4). While rates remained highest in children under 10 years old from 2007 to 2013, rates among 35-44 year olds increased significantly when comparing rates in 2007 (16.5 cases/100,000 residents [95%CI 11.6-22.8]) to 2013 (32.5 cases/100,000 residents [95%CI 25.3-41.2]). In contrast, this change in age distribution over time was not observed in California or national rates (Figure B4).

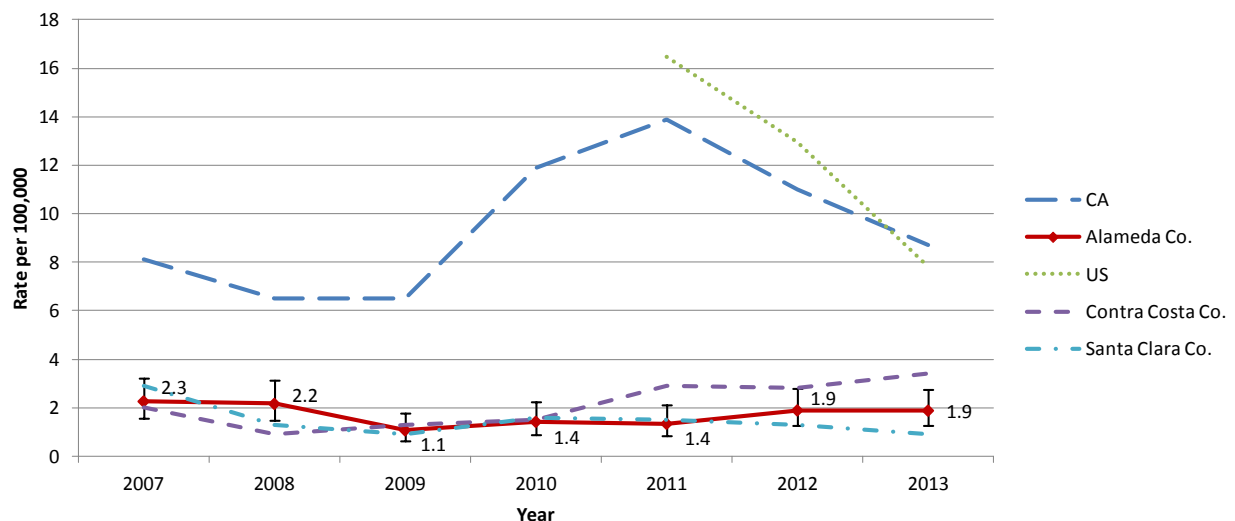
Figure B4: Annual Incidence of Campylobacteriosis in Alameda County (in comparison with California and the United States), by Age, 2007-2013



C) Coccidioidomycosis

Incidence of coccidioidomycosis remained stable from 2007 to 2013, averaging 1.7 cases/100,000 residents per year [95%CI 1.1-2.6] (Table 2 and Figure C1). Alameda County rates were similar to those observed in neighboring Contra Costa and Santa Clara counties, and significantly lower than state and national rates. Locally, incidence rates in men were higher than in women (2.6 cases/100,000 men [95%CI 2.2-3.1] compared to 0.9 cases/100,000 women [95%CI 0.6-1.2]) (Table 3), which was also mirrored in the state and nation. Rates of coccidioidomycosis did not differ significantly among persons aged 15 and older.

Figure C1: Annual incidence of Coccidioidomycosis in Alameda County (in comparison with Contra Costa County, San Francisco County, California and the United States), 2007-2013



D) Dengue

While small numbers preclude incidence rate calculation for dengue cases reported to Alameda County from 2007 to 2013, we observed a notable increase in the number of cases reported in 2012-2013 compared to prior years (10-17 cases annually in 2012-2013 compared to 0-3 cases annually 2007-2011) (Table 1). Similar to the cases occurring elsewhere in the continental U.S., Alameda County cases acquire disease through travel to countries endemic for dengue infection, which typically occur abroad but are not identified until cases returned to Alameda County.²¹ Regions within the U.S. where dengue is endemic are the U.S. Virgin Islands, Samoa, Guam and Puerto Rico, which experienced an islandwide epidemic in 2007. Globally, the World Health Organization (WHO) observed increases in the number of dengue outbreaks starting in 2010.²² In addition to the historically endemic regions of the Caribbean and Latin America, Southeast Asia and Western Pacific, dengue outbreaks were reported in Western Europe in 2012 and Florida in 2013.

E) Encephalitis

Incidence of encephalitis (all causes) in Alameda County averaged 1.7 cases/100,000 residents per year [95%CI 1.1-2.5] (Table 2). While the number and rates of encephalitis did not differ significantly from 2007 to 2011, the number of encephalitis cases reported in 2012-2013 were much lower than previous years (Table 1). This decrease may be attributable to a programmatic change at the California Encephalitis Network (CEN) in 2012. CEN was changed to the Neurologic Surveillance and Testing Program and required preapproval for specimen submission; this change in testing criteria may have resulted in fewer specimens from suspect encephalitis cases qualifying for testing. Most encephalitis cases had unknown etiology.

No differences were observed comparing rates in males and females (Table 3). Incidence among children under 10 years of age was significantly higher compared to incidence in those over 15 years of age (5.5 cases/100,000 children 1-4 years old [95%CI 3.69-7.91] and 4.6 cases/100,000 children 5-9 years old [95%CI 3.1-6.5], compared to rates ranging from 0.8 cases/100,000 residents to 2.1 cases/100,000 residents among persons older than 15 years) (Table 4).

F) Shiga Toxin-Producing *Escherichia coli* (STEC) infections

Trends in total STEC incidence were generally higher in 2011-2013 compared to 2007-2010, with a significant increase between 2010 and 2011 (0.9 cases/100,000 residents [95%CI 0.5-1.6] in 2010 compared to 2.4 cases/100,000 residents [95%CI 1.7-3.4] in 2011) (Table 2 and Figure F1). Notably, the majority of increase in cases starting in 2011 was due to infections by non-O157 serotypes (Figure F2). The CDC Laboratory-based Enteric Disease Surveillance (LEDS) network, comprised of state public health laboratories, has also observed a similar trend: the national incidence of O157 infections has remained stable since 2001 but a steady increase in non-O157 or unknown subtypes has been observed since 2006.²³ In 2012, approximately half of the specimens tested within the LEDS network were either non-O157 or of unknown serotype.

Figure F1: Annual incidence of Shiga toxin-producing *E. coli* in Alameda County (in comparison with the United States), 2007-2013

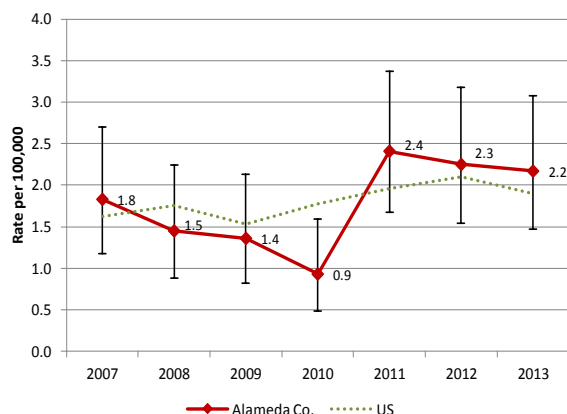
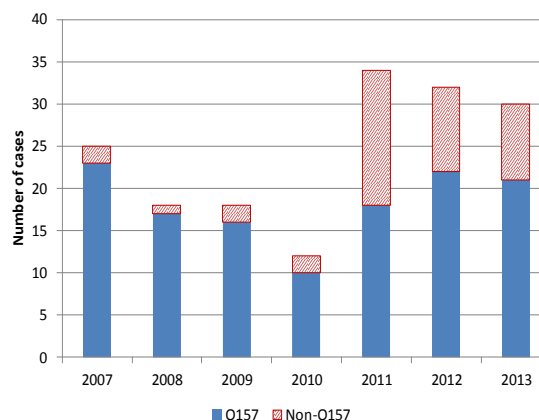


Figure F2: Frequency of Shiga toxin-producing *E. coli* infections by O- antigen status, Alameda County, 2007-2013



This rise in non-O157 incidence may be attributable to the increased use of culture-independent diagnostic tests in the clinical setting, leading to greater case-finding compared to earlier years when this technology was not widely available.²⁴ In Alameda County, the most common non-O157 serotypes isolated from 2007 to 2013 were O26 (N=12), O111 (N=9), and O103 (N=8).

STEC infections were significantly more common among children 1-4 years of age than those five and older (13.1 cases/100,000 1-4 year old residents [95%CI 10.2-16.6], compared to rates ranging from 1.2 cases/100,000 residents to 3.3 cases/100,000 residents among those 5 years and older) (Table 4). Among *E. coli* O157 cases, Alameda county rates for all years, except 2009 and 2010, were significantly higher than those observed in California, which ranged from 0.6 cases/100,000 residents to 0.8 cases/100,000 residents in 2007-2013 (Figure F3). No significant differences were observed when comparing groups by sex or race/ethnicity. *E. coli* O157 infections were significantly more common among persons under 25 years of age in Alameda County compared to rates in California (Figure F4).

Figure F3: Annual incidence of *E. coli* O157 infections in Alameda County (in comparison with California and the United States), 2007-2013

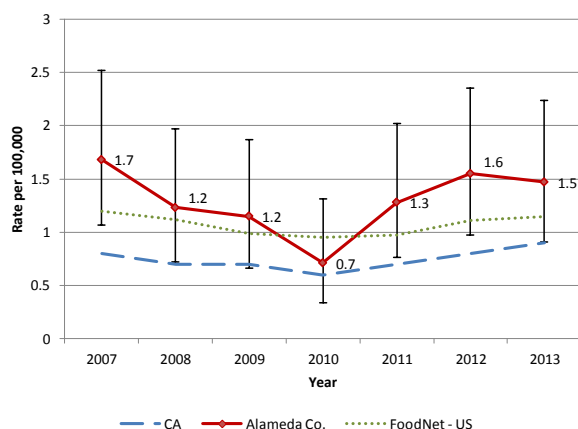
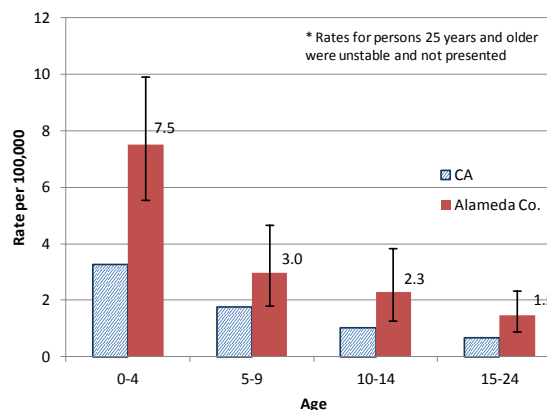


Figure F4: Average Annual incidence of *E. coli* O157 infections in Alameda County among persons 0-24 years old* (in comparison with California), 2007-2013



G) Giardiasis

Giardiasis was the fourth most common communicable disease in Alameda County from 2007 to 2013; rates did not change significantly from year to year (annual average rate 6.5 cases/100,000 residents per year [95%CI 5.2-7.9]) (Table 2). Incidence rates were highest in the northern part of Alameda County: Emeryville, Piedmont and North Oakland (Figure G1). As seen in state and national trends, males had significantly higher rates of infection compared to females (7.7 cases/100,000 male residents [95% CI 6.9-8.5] compared to 5.2 cases/100,000 female residents [95% CI 4.6-5.9]) (Table 3). Incidence rates were higher among children under 10 years old compared to persons 15 and older (Table 4 and Figure G2). Age distribution generally mirrored that observed in California, except rates among persons younger than 25 were significantly higher in Alameda County.

Figure G1: Map of Average Annual Giardiasis Incidence in Alameda County, by Zip Code, 2007-2013

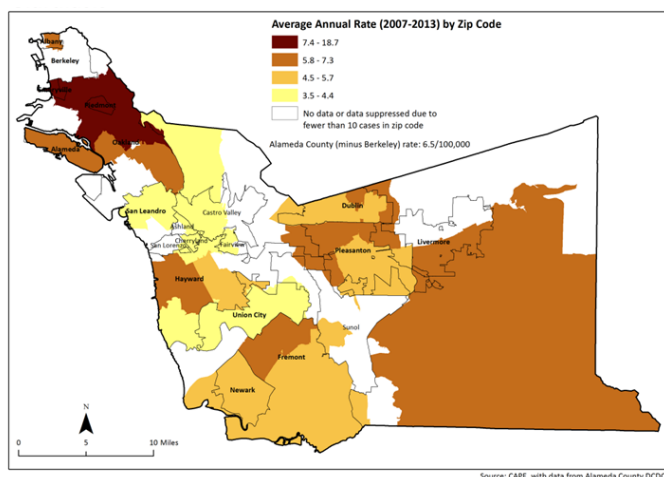
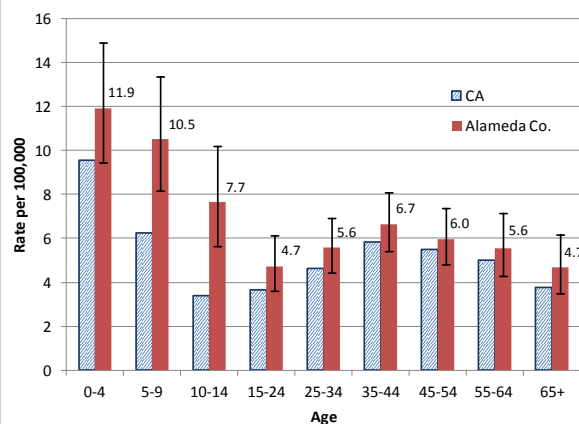


Figure G2: Average Annual Giardiasis Incidence in Alameda County (in comparison with California), by Age, 2007-2013



H) Malaria

Malaria in Alameda County residents is acquired through travel to endemic countries. On average, incidence of malaria is higher in Alameda County compared to California rates (1.0 cases/100,000 residents per year [95%CI 0.6-1.7] compared to 0.3 cases/100,000 California residents), and generally higher than rates in neighboring counties (Table 2 and Figure H1).

Among Alameda County residents, no significant differences were observed when comparing groups by sex or age (Tables 3 and 4). Both sex and age distributions in Alameda County were similar to that observed in California; Alameda County rates were significantly higher than state rates in all persons over the age of 14, with the most pronounced difference in persons 35-44 years old (1.3 cases/100,000 residents [95%CI 0.8-2.0] compared to 0.4 cases/100,000 in California) and those 65 years and older (1.2 cases/100,000 residents [95%CI 0.6-2.0], compared to 0.2 cases/100,000 in California) (Figure H2).

Figure H1: Annual Malaria Incidence in Alameda County (in comparison with San Francisco County, Contra Costa County, California and the United States), 2007-2013

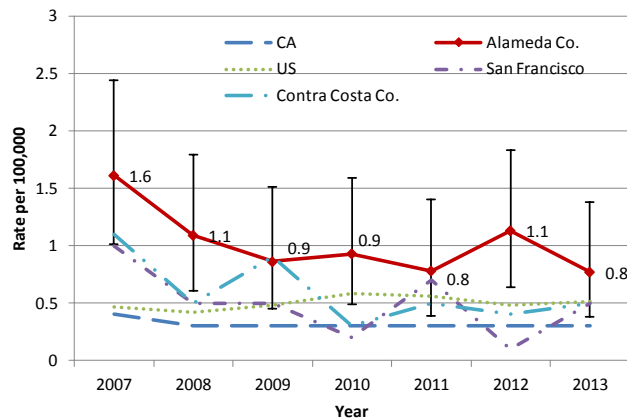
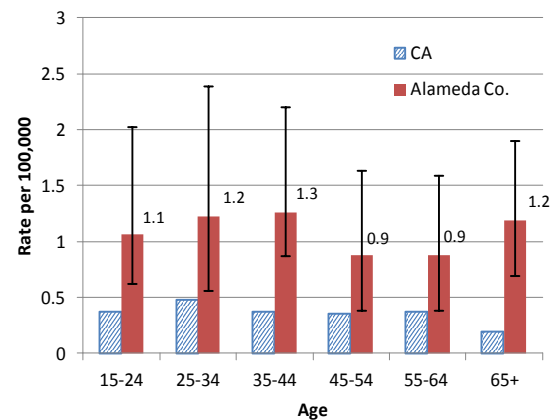


Figure H2: Average Annual Malaria Incidence in Alameda County (in comparison with California), by Age (15 years and older), 2007-2013



I) Meningitis

Annual incidence of all-cause meningitis reported in Alameda County changed significantly from 2007 to 2013: annual rates were lowest from 2007 to 2009 (ranging from 4.2 cases/100,000 residents [95%CI 3.2-5.4] in 2009 to 4.8 cases/100,000 residents [95%CI 3.7-6.1] in 2008), significantly increasing in 2010 and 2011 (to 9.1 cases/100,000 residents [95%CI 7.6-10.9] and 8.4 cases/100,000 residents [95%CI 7.0-10.1], respectively), and again decreasing in 2012 and 2013 (5.9 cases/100,000 [95%CI 4.7-7.3] residents for both years) (Table 2). As seen in Figure I1, this trend was driven by viral meningitis rates, which followed a similar trend; bacterial meningitis rates have remained relatively stable from 2007 to 2013, while rates of meningitis with unknown etiology have been steadily increasing since 2009 (from 1.2 cases/100,000 residents to 2.0 cases/100,000 residents) (Table 2). CDPH reported a statewide increase in viral meningitis outbreaks in 2010 due to concurrent circulation of multiple enteroviruses, coxsackieviruses and West Nile Virus²⁵, which may have been reflected in increased Alameda County incidence during the same time period. Geographically, places with highest incidence of all-cause meningitis were: Emeryville, West Oakland, parts of Central East Oakland, parts of Alameda, and Livermore (Figure I2).

Figure I1: Annual Meningitis Incidence in Alameda County, by Etiology, 2007-2013

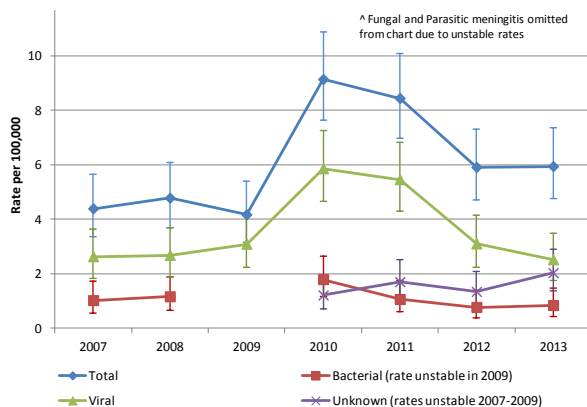
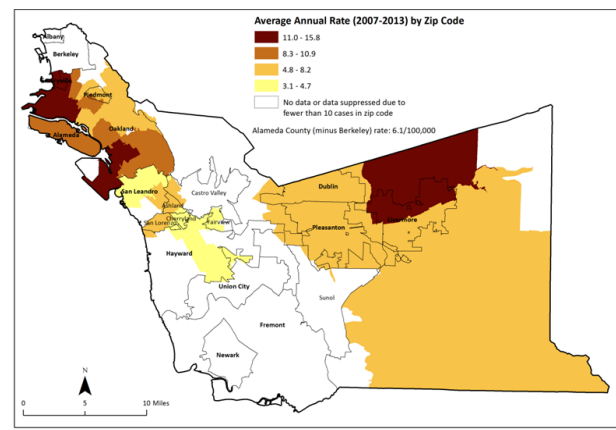


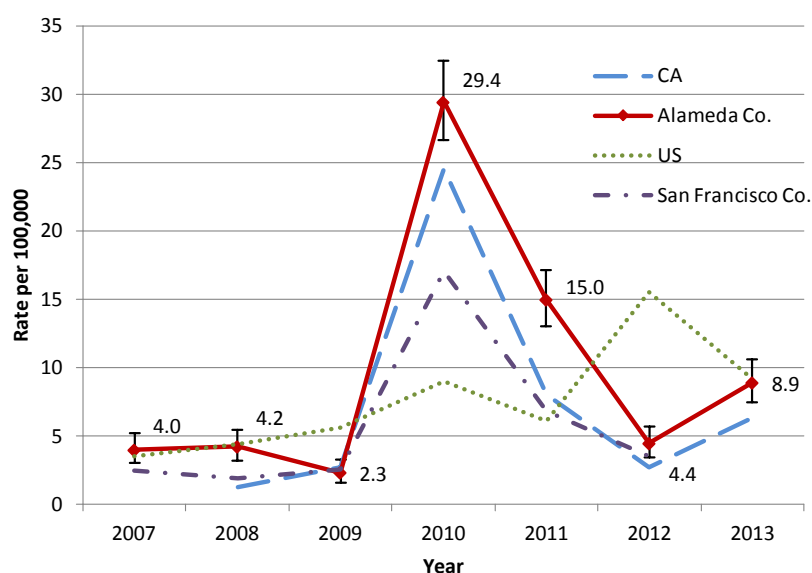
Figure I2: Map of Average Annual Meningitis Incidence (all causes) in Alameda County, 2007-2013



J) Pertussis

Pertussis incidence in Alameda County differed from 2007 to 2013 and reflected the state and national pertussis outbreak of 2010, during which California observed the highest incidence of pertussis in more than 60 years²⁶ (Table 2 and Figure J1). During this outbreak, Alameda County experienced significantly higher rates of disease compared to California as a whole (2010: 29.4 cases/100,000 residents [95%CI 26.7-32.4] compared to 24.6 cases/100,000 residents in CA; 2011: 15.0 cases/100,000 residents [95%CI 13.0-17.1] compared to 8.0 cases/100,000 residents in CA). General and sex-specific trends from 2007 to 2013 mirror those observed in California and the U.S.; females experienced higher incidence than males (10.3 cases/100,000 female residents [95%CI 9.4-11.2] compared to 9.1 cases/100,000 male residents [95%CI 8.2-10.0]) (Table 3).

Figure J1: Annual Pertussis Incidence in Alameda County (in comparison with San Francisco County, California and the United States), 2007-2013



Geographic areas experiencing the highest pertussis incidence were in Alameda and the Lower Hills and Central East parts of Oakland (Figure J2). Regions with the next highest average annual rates were: Ashland, Cherryland, East Oakland, eastern area of Hayward, Fairview, northern parts of Pleasanton, San Leandro and San Lorenzo (Figure J2).

When examining differences among race/ethnicity groups, average incidence was significantly higher in Hispanic residents compared to all other groups (13.2 cases/100,000 Hispanic residents [95%CI 11.8-14.8] compared to rates ranging from 4.5 cases/ 100,000 residents to 10.1 cases/ 100,000 residents in other groups) (Table 6a and Figure J3). Incidence in Asian/Pacific Islander (API) (4.5 cases/ 100,000 residents [95%CI 3.7-5.4]) and Black residents (6.4 cases/100,000 residents [95%CI 5.0-7.9]) were significantly lower than in Hispanic and White residents (13.2 cases/100,000 residents [95%CI 11.8-14.8] and 10.1 cases/100,000 residents [95%CI 9.0-11.2], respectively).

Average Annual Rate (2007-2013) by Zip Code

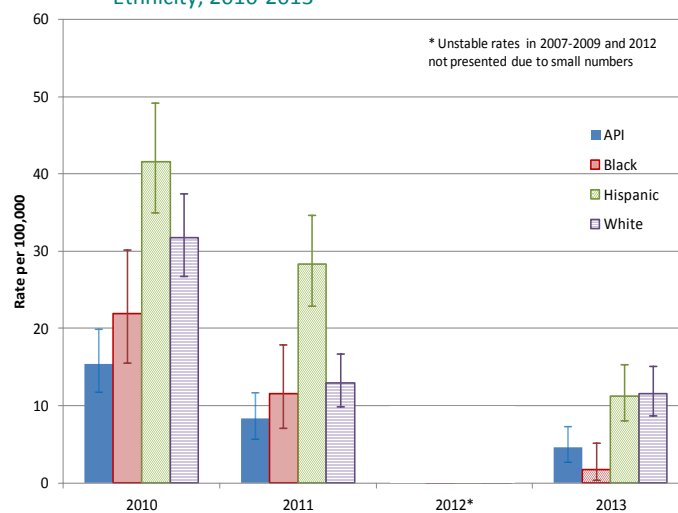
- 14.2 - 20.7
- 9.9 - 14.1
- 7.4 - 9.8
- 5.0 - 7.3
- No data or data suppressed due to fewer than 10 cases in zip code

Alameda County (minus Berkeley) rate: 9.8/100,000

0 5 10 Miles

Source: CAPE, with data from Alameda County DCD

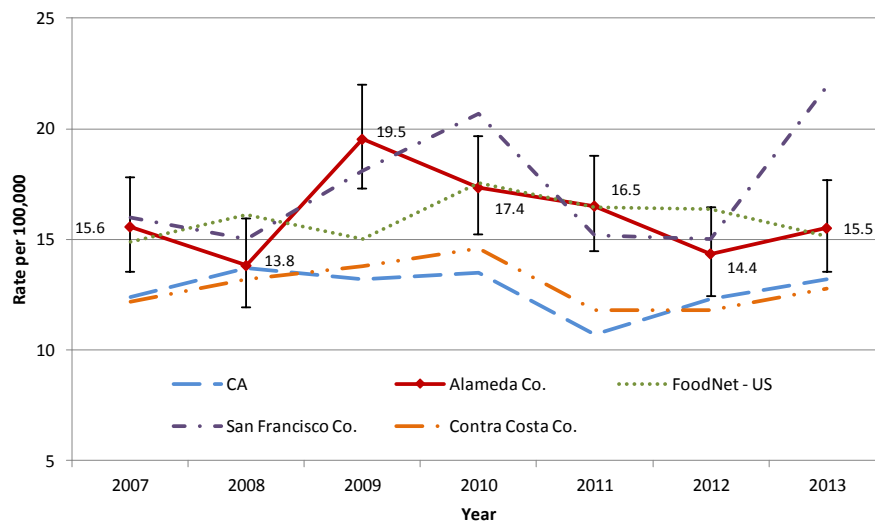
Figure J3: Annual Pertussis Incidence in Alameda County, by Race/Ethnicity, 2010-2013



K) Salmonellosis (non-Typhoidal)

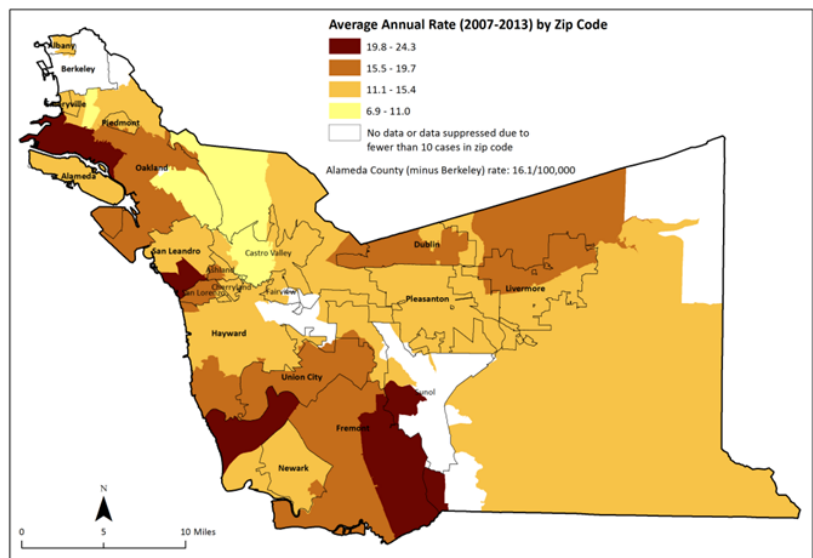
Salmonellosis is the second-highest incidence disease in Alameda County (average annual rate: 16.1 cases/100,000 residents per year [95%CI 14.1-18.3]) (Table 2). Rates were stable from 2007 to 2013 (ranging from 13.8 cases/100,000 residents to 19.5 cases/100,000 residents), with the exception of 2008-2009, when 2009 incidence was significantly higher than 2008 incidence (19.5 cases/100,000 residents [95%CI 17.3-22.0] in 2009 compared to 13.8 cases/100,000 residents [95%CI 11.9-15.9] in 2008). In most years, Alameda County rates were significantly higher than that observed in California and neighboring Contra Costa County, and comparable to rates observed in the U.S. and San Francisco (Figure K1).

Figure K1: Annual Salmonellosis (non-Typhoid) Incidence in Alameda County (in comparison with Contra Costa County, San Francisco County, California and the United States), 2007-2013



The most common serotypes identified in all cases from 2007 to 2013 were: Enteritidis (18.8%), Typhimurium (9.8%), Heidelberg (8.2%), Newport (5.5%), and S. I 4,[5],12:i- (5.3%). No significant differences in incidence were found when comparing female and male cases. Geographically, disease incidence was highest in West and Downtown Oakland, the San Leandro/San Lorenzo border, northern part of Fremont and Fremont Hills (Figure K2).

Figure K2: Map of Average Annual Salmonellosis (non-Typhoidal) Incidence in Alameda County, 2007-2013



When examining differences among race/ethnicity groups, incidence among API (19.2 cases/100,000 residents [95%CI 17.5-20.9]) and Hispanic (16.5 cases/100,000 residents [95%CI 14.9-18.2]) residents were significantly higher than incidence among Black (12.1 cases/100,000 [95%CI 10.2-14.2]) and White residents (12.2 cases/100,000 residents [95%CI 11.0-13.5]) (Table 7b and Figure K3). Rates among API and Hispanic residents of Alameda County significantly exceed rates for those groups within California and the nation, with API Alameda County residents experiencing rates nearly twice as high as API groups in California. Annual trends show that while no significant differences were seen among race/ethnicity groups in Alameda County in most years, rates among API residents were significantly higher than those in White and Black residents in 2011 (23.3 cases/100,000 API residents [95%CI 18.8-28.7] compared to 10.8 cases/100,000 White residents [95%CI 8.0-14.2] and 11.6 cases/100,000 Black residents [95%CI 7.1-17.9]) and 2013 (21.1 cases/100,000 API residents [95%CI 16.8-26.1] compared to 8.3 cases/100,000 White residents [95%CI 5.9-11.4] and 10.5 cases/100,000 Black residents [95%CI 6.2-16.5]) (Table 7b).

Figure K3: Average Annual Salmonellosis (non-Typhoid) Incidence in Alameda County, by Race/Ethnicity, 2007-2013

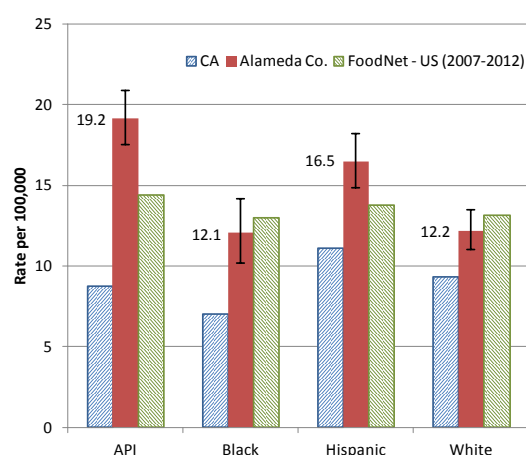
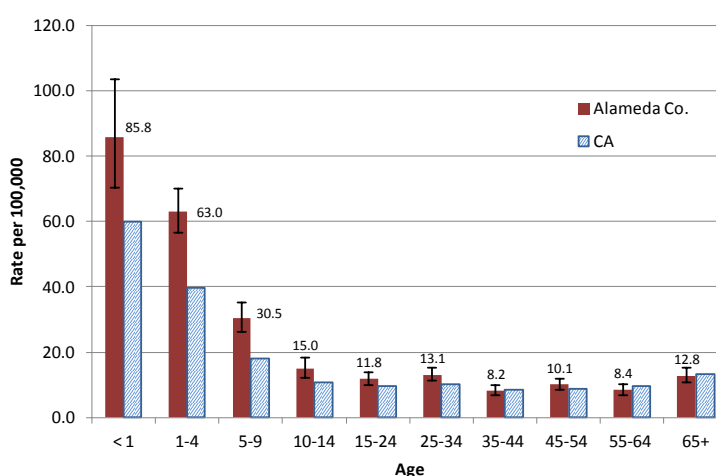


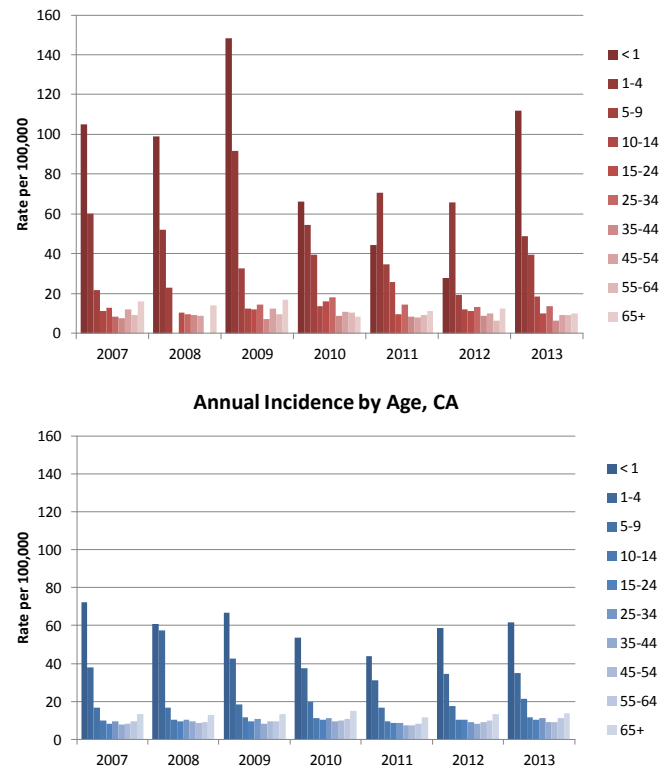
Figure K4: Average Annual Salmonellosis (non-Typhoid) Incidence in Alameda County (in comparison with California), by Age, 2007-2013



Salmonella incidence differed significantly across age groups from 2007 to 2013, with the highest incidence in the youngest residents and progressively decreasing with age. On average, infants under one year of age had the highest rates of disease (85.7 cases/100,000 infants [95%CI 70.4-103.5]), significantly more so than children 1-4 years old (63.0 cases/100,000 residents [95%CI 56.4-70.2]), who in turn had significantly higher rates than children 5-9 years old (30.5 cases/100,000 residents [95%CI 26.3-35.1]) (Table 4 and Figure K4). Rates among those 10 years and older did not significantly differ in each age group. Compared to California as a whole, Alameda County had significantly higher disease incidence in all groups under 35 years of age (Figure K4). Age trends were similar across years, except in 2011 and 2012 when rates in children 1-4 years old were higher than those in infants under one year of age (Table 7a and Figure K5).

High frequency of disease allows for incidence comparison among combined age and race/ethnicity subgroups (Table 7c). Disease incidence was most pronounced in API residents younger than 5 years of age (124.5 cases/100,000 residents [95% CI 84.1-177.6]), significantly higher than in Hispanic residents of the same age group (52.6 cases/100,000 residents [95%CI 30.7-84.1]). There were no significant disparities among other age and race/ethnicity group combinations, though rates were too unstable in Black residents and residents aged 65 and older to include in comparisons.

Figure K5: Annual Salmonellosis (non-Typhoid) Incidence in Alameda County (in comparison with California), by Age, 2007-2013

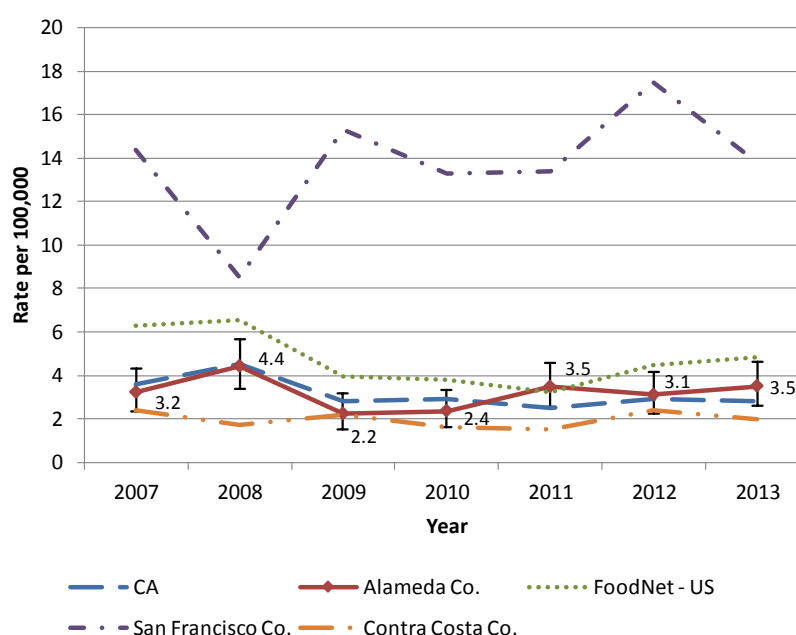


Analysis of Alameda County data indicate that incidence of salmonellosis was disproportionately higher among API and Hispanic children. Recently, CEIP conducted an exploratory analysis examining differences in domestically-acquired salmonellosis incidence from 2008 to 2013 by census-tract poverty level, age, race/ethnicity groups and salmonella serotype in the CA FoodNet catchment area.²⁷ More study is needed to identify the epidemiologic risk factors for higher rates of infections in certain subgroups of Alameda County residents.

L) Shigellosis

Incidence of shigellosis (all subtypes) has remained stable from 2007 to 2013 (average annual rate: 3.2 cases/100,000 residents per year [95%CI 2.3-4.3]), with the exception of 2008 to 2009, when rates significantly decreased in 2009 before stabilizing in subsequent years (4.4 cases/100,000 residents [95%CI 3.4-5.7] in 2008 compared to 2.2 cases/100,000 residents [95%CI 1.5-3.2] in 2009) (Table 2 and Figure L1). Rates in Alameda County were generally similar to those observed in California and Contra Costa County, slightly lower than national rates and significantly lower than rates in San Francisco.

Figure L1: Annual Shigellosis Incidence in Alameda County (in comparison with Contra Costa County, San Francisco County, California and the United States), 2007-2013



Similar to California and U.S. distributions, men had higher disease rates than women (3.7 cases/100,000 men [95%CI 3.1-4.2] compared to 2.6 cases/100,000 women [95%CI 2.2-3.1]) (Table 3), and incidence is significantly highest among children under 10 years of age (11.4 cases/100,000 children 1-4 years old [95%CI 8.7-14.7] and 6.3 cases/100,000 children 5-9 years old [95%CI 4.5-8.6]), decreasing in older age groups, with a small increase in adults aged 25-34 (3.7 cases/100,000 residents [95%CI 2.8-4.8]) (Table 4).

Notable trends emerge when examining incidence by *Shigella* subgroups (Table 2, Figure L2 and Figure L3). Rates of group B shigellosis in Alameda County were consistently lower than national rates, while group D shigellosis rates were higher. Incidence of group D shigellosis has decreased from 2.7 cases/100,000 residents [95%CI 1.9-3.7] in 2008 to 1.0 cases/100,000 residents [95%CI 0.5-1.6] in 2013, while Group B shigellosis incidence increased from 2007 to 2013, from its lowest in 2010 (unstable rate not presented) to 2.1 cases/100,000 residents [95%CI 1.4-3.0] in 2013.

Figure L2: Annual Shigellosis (Group B) Incidence in Alameda County (in comparison with the United States), 2007-2013

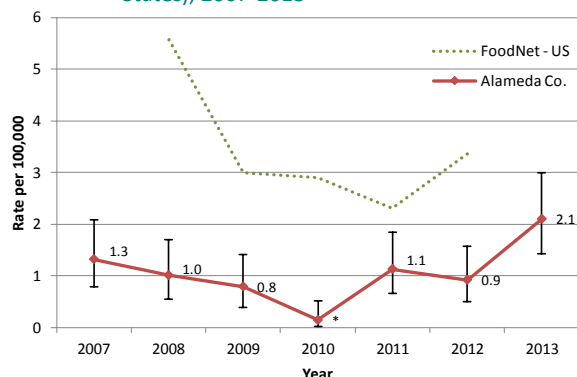
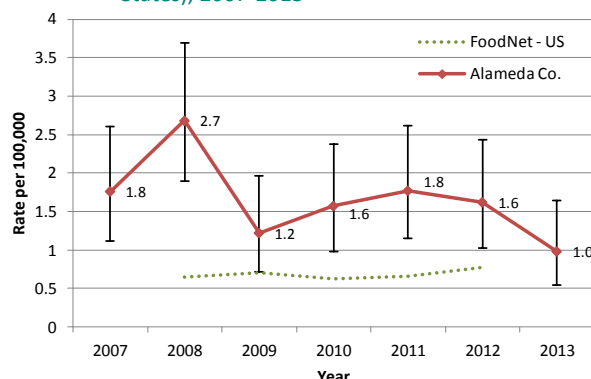


Figure L3: Annual Shigellosis (Group D) Incidence in Alameda County (in comparison with the United States), 2007-2013



Incidence of group B shigellosis was significantly higher in men than women (1.4 cases/100,000 men [95%CI 1.1-1.8] compared to 0.7 cases/100,000 women [0.5-1.0]), while no differences were seen in rates by sex for group D shigellosis (Table 3). No significant incidence differences exist across age groups for group B shigellosis; however, incidence of group D shigellosis was highest in young children compared to older age groups (7.4 cases/100,000 1-4 year olds [95%CI 5.3-10.1] compared to 0.8 cases/100,000 to 3.8 cases/100,000 in other age groups) (Table 4).

M) Unusual Diseases

Occurrences of select unusual diseases were reported from 2010 to 2013. None were recorded from 2007 to 2009.

- 2010: 15 cases of paraptussis and 1 case of *Bordetella holmesii* infection
- 2011: 13 cases of paraptussis and 1 case of visceral leishmaniasis
- 2012: 3 cases of paraptussis and 1 case of *Bordetella holmesii* infection
- 2013: 1 case of balamuthia and 4 cases of carbapenem-resistant enterobacteriaceae (outbreak at a single hospital)

N) Vibriosis

While incidence rates were not calculated due to low frequency, a notable increase in the number of vibriosis cases was observed in 2013, from a range of two to eight cases in previous years to 12 in 2013. We did not identify any epidemiological link or outbreak of vibriosis in Alameda County; however, an increase in vibriosis infections was observed at both the state and national level. In the summer of 2013, California noted a multijurisdictional outbreak²⁸, while a 43% increase in 2013 national incidence (to 0.41 cases/100,000 residents) was observed compared to 2006-2008 national data⁹.

Section 4: Outbreaks

All outbreak-related data are found in Tables 8 to 10 of Section 6: Additional Tables.

Outbreaks in Food Service Facilities

Outbreaks in food service facilities are investigated by the Alameda County Department of Environmental Health with coordinated effort and assistance from CEIP. From 2007 to 2013, 32 outbreaks were determined to be foodborne and reported to the National Outbreak Reporting System (NORS) at CDC. Thirteen (40.6%) outbreaks were suspect or confirmed norovirus; the next most common etiologic agents were *Salmonella spp.* (N=3) and scrombroid toxin (N=3) (Table 8). During this time period, the majority of investigations took place in restaurants (20/32) and twelve took place in other facilities such as banquet facilities, offices, schools and outdoor fairs. Annually, the number of outbreaks reported ranged from three to eight, with a median of four outbreaks per year. A median of eight cases were identified per outbreak, with a range of two to 76 cases (Table 8).

Outbreaks in Non-Food Service Facilities

Outbreaks in non-food service facilities are investigated by ACD. The most common type of outbreak investigated from 2007 to 2013 was gastrointestinal (GI) (70.5%), followed by scabies (not reportable to CDPH, 13.7%) and influenza-like illness (ILI) (13.3%) (Table 9). Overall, the number of outbreaks investigated increased almost two-fold from 28 in 2007 to 61 in 2013. Among 201 GI outbreaks, almost all (96.5%) were attributed to norovirus; 21.6% of all GI outbreaks were lab-confirmed. The most common outbreak settings were skilled nursing facilities (41.3%) and assisted living facilities (39.3%); few were reported from schools, daycares, camps or other group living settings. The median number of cases was 23.5 per outbreak and median outbreak duration was 8 days.

Among 38 ILI outbreaks, 25 (65.8%) were attributable to Influenza A; 36.8% of all ILI outbreaks were lab-confirmed. ILI outbreaks occurred most commonly in skilled nursing facilities (50.0%), followed by assisted living facilities (23.7%). The median number of cases per outbreak was 19 cases, with a median outbreak duration of 14 days. Limited data were available for scabies outbreaks; most took place in hospital, acute care, post-acute care settings (43.6%), followed by skilled nursing facilities (25.6%). Lastly, one notable non-GI, non-ILI outbreak occurred in 2013; this outbreak involved 4 carbapenem-resistant enterobacteriaceae cases occurring in a hospital setting.

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Section 6: Additional Tables

Table 3: Number of Cases and Average Annual Incidence Rates (IR) of Select Acute Communicable Diseases Reported to Alameda County, by Sex, 2007-2013

Sex	Cases	%	Average Annual IR per 100,000 (95% CI)	Cases	%	Average Annual IR per 100,000 (95% CI)	Cases	%	Average Annual IR per 100,000 (95% CI)	Cases	%	Average Annual IR per 100,000 (95% CI)	Cases	%	Average Annual IR per 100,000 (95% CI)
	Amebiasis			Campylobacteriosis			Coccidioidomycosis			Cryptosporidiosis			Encephalitis (Total)		
Female	23	23.7	0.5 (0.3-0.7)	1062	45.2	21.3 (20-22.6)	44	26.0	0.9 (0.6-1.2)	48	49.0	1.0 (0.7-1.3)	84	50.6	1.7 (1.3-2.1)
Male	73	75.3	1.5 (1.2-1.9) [†]	1262	53.8	26.2 (24.8-27.7) [†]	124	73.4	2.6 (2.1-3.1) [†]	50	51.0	1.0 (0.8-1.4)	78	47.0	1.6 (1.3-2.0)
Unknown	1	1.0	NC	23	1.0	NC	1	0.6	NC	0	0.0	NC	4	2.4	NC
	Encephalitis, unknown			STEC Group (Total) ^{^^}			E. coli O157 ^{^^}			Giardiasis			Malaria		
Female	67	52.8	1.3 (1.0-1.7)	101	58.0	2.0 (1.6-2.5)	72	56.7	1.4 (1.1-1.8)	260	41.0	5.2 (4.6-5.9)	39	39.0	0.8 (0.6-1.1)
Male	56	44.1	1.2 (0.9-1.5)	73	42.0	1.5 (1.2-1.9)	55	43.3	1.1 (0.9-1.5)	369	58.2	7.7 (6.9-8.5) [†]	59	59.0	1.2 (0.9-1.6)
Unknown	4	3.1	NC	0	0.0	NC	0	0.0	NC	5	0.8	NC	2	2	NC
	Meningitis (Total)			Meningitis, bacterial			Meningitis, viral			Meningitis, unknown			Pertussis (Whooping Cough)		
Female	308	51.3	6.2 (5.5-6.9)	41	41.4	0.8 (0.6-1.1)	199	56.1	4.0 (3.5-4.6)	57	60.0	1.1 (0.9-1.5)	514	53.7	10.3 (9.4-11.2)
Male	282	47.0	5.9 (5.2-6.6)	56	56.6	1.2 (0.9-1.5)	150	42.3	3.1 (2.6-3.7)	36	37.9	0.7 (0.5-1.0)	436	45.6	9.1 (8.2-10.0)
Unknown	10	1.7	NC	2	2.0	NC	6	1.7	NC	2	2.1	NC	7	0.7	NC
	Salmonellosis ^{^^}			Shigellosis (Total)			Shigella, group B (<i>S. flexneri</i>)			Shigella, group D (<i>S. sonnei</i>)					
Female	787	49.9	15.8 (14.7-16.9)	132	42.3	2.6 (2.2-3.1)	35	33.7	0.7 (0.5-1.0)	72	44.4	1.4 (1.1-1.8)			
Male	791	50.1	16.5 (15.3-17.6)	176	56.4	3.7 (3.1-4.2)	68	65.4	1.4 (1.1-1.8) [†]	88	54.3	1.8 (1.5-2.3)			
Unknown	0	0.0	NC	4	1.3	NC	1	1.0	NC	2	1.2	NC			

+ Rate statistically higher than rate in other sex group based on 95% CI comparison

^^ Data from California Emerging Infections Program

NC Rates not calculated for unknown sex category

Table 4: Number of Cases and Average Annual Incidence Rates (IR) of Select Acute Communicable Diseases Reported to Alameda County, by Age, 2007-2013

Age Group	Amebiasis			Campylobacteriosis			Coccidioidomycosis			Cryptosporidiosis			Encephalitis (Total)		
	Cases	%	Average Annual IR per 100,000 (95% CI)	Cases	%	Average Annual IR per 100,000 (95% CI)	Cases	%	Average Annual IR per 100,000 (95% CI)	Cases	%	Average Annual IR per 100,000 (95% CI)	Cases	%	Average Annual IR per 100,000 (95% CI)
< 1 year	0	0	*	65	2.8	51.1 (39.5-65.2)	0	0	*	1	1.0	*	8	4.8	*
1-4 years	4	4.1	*	291	12.4	55.3 (49.1-62.0)	1	0.6	*	7	7.1	*	29	17.5	5.5 (3.7-7.9)
5-9 years	7	7.2	*	213	9.1	33.5 (29.1-38.3)	0	0	*	6	6.1	*	29	17.5	4.6 (3.1-6.5)
10-14 years	6	6.2	*	127	5.4	20.7 (17.2-24.6)	1	0.6	*	2	2.0	*	13	7.8	2.1 (1.1-3.6)
15-24 years	10	10.3	0.8 (0.4-1.5)	258	11	21.0 (18.6-23.8)	19	11.2	1.6 (0.9-2.4)	17	17.3	1.4 (0.8-2.2)	17	10.2	1.4 (0.8-2.2)
25-34 years	17	17.5	1.2 (0.7-1.8)	330	14.1	22.4 (20.1-25.0)	28	16.6	1.9 (1.3-2.7)	13	13.3	0.9 (0.5-1.5)	11	6.6	0.7 (0.4-1.3)
35-44 years	21	21.6	1.4 (0.9-2.1)	307	13.1	20.4 (18.2-22.8)	27	16.0	1.8 (1.2-2.6)	20	20.4	1.3 (0.8-2.1)	16	9.6	1.1 (0.6-1.7)
45-54 years	23	23.7	1.6 (1.0-2.3)	264	11.2	17.9 (15.8-20.2)	35	20.7	2.4 (1.7-3.3)	16	16.3	1.1 (0.6-1.8)	16	9.6	1.1 (0.6-1.8)
55-64 years	5	5.2	*	234	10.0	20.7 (18.1-23.5)	27	16.0	2.4 (1.6-3.5)	8	8.2	*	11	6.6	1.0 (0.5-1.7)
65+ years	4	4.1	*	258	11.0	23.6 (20.9-26.7)	31	18.3	2.8 (1.9-4.0)	8	8.2	*	16	9.6	1.5 (0.8-2.4)
Unknown	0	0	NC	0	0	NC	0	0	NC	0	0	NC	0	0	NC
	Encephalitis, unknown			STEC Group (Total) ^{^^}			E. coli O157 ^{^^}			Giardiasis			Malaria		
	Cases	%	Average Annual IR per 100,000 (95% CI)	Cases	%	Average Annual IR per 100,000 (95% CI)	Cases	%	Average Annual IR per 100,000 (95% CI)	Cases	%	Average Annual IR per 100,000 (95% CI)	Cases	%	Average Annual IR per 100,000 (95% CI)
< 1 year	3	2.4	*	3	1.7	*	2	1.6	*	9	1.4	*	0	0	*
1-4 years	24	18.9	4.6 (2.9-6.8)	69	39.7	13.1 (10.2-16.6)	47	37.0	8.9 (6.6-11.9)	69	10.9	13.1 (10.2-16.6)	4	4.0	*
5-9 years	26	20.5	4.1 (2.7-6.0)	21	12.1	3.3 (2.0-5.0)	19	15.0	3.0 (1.8-4.7)	67	10.6	10.5 (8.2-13.4)	7	7.0	*
10-14 years	10	7.9	1.6 (0.8-3.0)	16	9.2	2.6 (1.5-4.2)	14	11.0	2.3 (1.2-3.8)	47	7.4	7.6 (5.6-10.2)	3	3.0	*
15-24 years	16	12.6	1.3 (0.7-2.1)	23	13.2	1.9 (1.2-2.8)	18	14.2	1.5 (0.9-2.3)	58	9.1	4.7 (3.6-6.1)	13	13.0	1.1 (0.6-1.8)
25-34 years	4	3.1	*	6	3.4	*	3	2.4	*	82	12.9	5.6 (4.4-6.9)	18	18.0	1.2 (0.7-1.9)
35-44 years	13	10.2	0.9 (0.5-1.5)	6	3.4	*	6	4.7	*	100	15.8	6.7 (5.4-8.1)	19	19.0	1.3 (0.8-2.0)
45-54 years	12	9.4	0.8 (0.4-1.4)	9	5.2	*	6	4.7	*	88	13.9	6.0 (4.8-7.4)	13	13.0	0.9 (0.5-1.5)
55-64 years	7	5.5	*	13	7.5	1.1 (0.6-2.0)	7	5.5	*	63	9.9	5.6 (4.3-7.1)	10	10.0	0.9 (0.4-1.6)
65+ years	12	9.4	1.1 (0.6-1.9)	8	4.6	*	5	3.9	*	51	8.0	4.7 (3.5-6.1)	13	13.0	1.2 (0.6-2.0)
Unknown	0	0	NC	0	0	NC	0	0	NC	0	0	NC	0	0	NC

^{^^} Data from California Emerging Infections Program

NC Rates not calculated for unknown age category

* Rates are not presented if total Cases for an age category is fewer than 10 cases

Table 4: Number of Cases and Average Annual Incidence Rates (IR) of Select Acute Communicable Diseases Reported to Alameda County, by Age, 2007-2013—cont'd

Age Group	Meningitis (Total)			Meningitis, bacterial			Meningitis, viral			Meningitis, unknown			Pertussis (Whooping Cough)		
	Cases	%	Average Annual IR per 100,000 (95% CI)	Cases	%	Average Annual IR per 100,000 (95% CI)	Cases	%	Average Annual IR per 100,000 (95% CI)	Cases	%	Average Annual IR per 100,000 (95% CI)	Cases	%	Average Annual IR per 100,000 (95% CI)
< 1 year	40	6.7	31.5 (22.5-42.9)	16	16.2	12.6 (7.2-20.4)	23	6.5	18.1 (11.5-27.2)	1	1.1	*	136	14.2	107.0 (89.8-126.6)
1-4 years	18	3.0	3.4 (2.0-5.4)	3	3.0	*	14	3.9	2.7 (1.5-4.5)	1	1.1	*	147	15.4	27.9 (23.6-32.8)
5-9 years	24	4.0	3.8 (2.4-5.6)	4	4.0	*	19	5.4	3.0 (1.8-4.7)	1	1.1	*	179	18.7	28.1 (24.1-32.5)
10-14 years	23	3.8	3.7 (2.4-5.6)	2	2.0	*	19	5.4	3.1 (1.9-4.8)	2	2.1	*	194	20.3	31.6 (27.3-36.3)
15-24 years	88	14.7	7.2 (5.8-8.8)	5	5.1	*	69	19.4	5.6 (4.4-7.1)	13	13.7	1.1 (0.6-1.8)	117	12.2	9.5 (7.9-11.4)
25-34 years	95	15.8	6.5 (5.2-7.9)	7	7.1	*	67	18.9	4.6 (3.5-5.8)	16	16.8	1.1 (0.6-1.8)	54	5.6	3.7 (2.8-4.8)
35-44 years	109	18.2	7.3 (6.0-8.7)	12	12.1	0.8 (0.4-1.4)	61	17.2	4.1 (3.1-5.2)	17	17.9	1.1 (0.7-1.8)	66	6.9	4.4 (3.4-5.6)
45-54 years	89	14.8	6.0 (4.9-7.4)	19	19.2	1.3 (0.8-2.0)	39	11.0	2.6 (1.9-3.6)	20	21.1	1.4 (0.8-2.1)	30	3.1	2.0 (1.4-2.9)
55-64 years	62	10.3	5.5 (4.2-7.0)	14	14.1	1.2 (0.7-2.1)	26	7.3	2.3 (1.5-3.4)	14	14.7	1.2 (0.7-2.1)	21	2.2	1.9 (1.1-2.8)
65+ years	52	8.7	4.8 (3.6-6.3)	17	17.2	1.6 (0.9-2.5)	18	5.1	1.6 (1.0-2.6)	10	10.5	0.9 (0.4-1.7)	13	1.4	1.2 (0.6-2.0)
Unknown	0	0	NC	0	0	NC	0	0	NC	0	0	NC	0	0	NC
	Salmonellosis ^{^^}			Shigellosis (Total)			Shigella, group B (<i>S. flexneri</i>)			Shigella, group D (<i>S. sonnei</i>)					
	Cases	%	Average Annual IR per 100,000 (95% CI)	Cases	%	Average Annual IR per 100,000 (95% CI)	Cases	%	Average Annual IR per 100,000 (95% CI)	Cases	%	Average Annual IR per 100,000 (95% CI)	Cases	%	Average Annual IR per 100,000 (95% CI)
< 1 year	109	6.9	85.8 (70.4-103.4)	2	0.6	*	1	1.0	*	1	0.6	*			
1-4 years	332	21.0	63.0 (56.4-70.2)	60	19.2	11.4 (8.7-14.7)	12	11.5	2.3 (1.2-4.0)	39	24.1	7.4 (5.3-10.1)			
5-9 years	194	12.3	30.5 (26.3-35.1)	40	12.8	6.3 (4.5-8.6)	14	13.5	2.2 (1.2-3.7)	24	14.8	3.8 (2.4-5.6)			
10-14 years	92	5.8	15.0 (12.1-18.4)	16	5.1	2.6 (1.5-4.2)	3	2.9	*	8	4.9	*			
15-24 years	144	9.1	11.7 (9.9-13.8)	21	6.7	1.7 (1.1-2.6)	9	8.7	*	10	6.2	0.8 (0.4-1.5)			
25-34 years	193	12.2	13.1 (11.3-15.1)	54	17.3	3.7 (2.8-4.8)	17	16.3	1.2 (0.7-1.8)	31	19.1	2.1 (1.4-3.0)			
35-44 years	123	7.8	8.2 (6.8-9.8)	46	14.7	3.1 (2.2-4.1)	18	17.3	1.2 (0.7-1.9)	18	11.1	1.2 (0.7-1.9)			
45-54 years	148	9.4	10.1 (8.5-11.8)	35	11.2	2.4 (1.7-3.3)	15	14.4	1.0 (0.6-1.7)	15	9.3	1.0 (0.6-1.7)			
55-64 years	95	6.0	8.4 (6.8-10.3)	19	6.1	1.7 (1.0-2.6)	9	8.7	*	8	4.9	*			
65+ years	140	8.9	12.8 (10.8-15.1)	19	6.1	1.7 (1.0-2.7)	6	5.8	*	8	4.9	*			
Unknown	8	0.5	NC	0	0	NC	0	0	NC	0	0	NC			

^{^^} Data from California Emerging Infections Program

N/A Cannot calculate rates for unknown race/ethnicity category

U Rates are not presented if total cases for race/ethnicity category is fewer than 10 cases

Table 5: Average Annual and Annual Incidence Rates (IR) of Campylobacteriosis in Alameda County, by Age, 2007-2013

Age Group	Annual Incidence Rate per 100,000 (95% CI)									
	Average Annual IR (2007-2013)	2007	2008	2009	2010	2011	2012	2013		
< 1 year	51.1 (39.5-65.2)	82.9 (46.4-136.7)	*	*	77.1 (42.2-129.4)	*	*	*		
1-4 years	55.3 (49.1-62.0)	62.9 (46.2-83.7)	75.9 (57.5-98.4)	53.1 (37.9-72.3)	53.2 (38.0-72.4)	46.8 (32.6-65.1)	47.0 (32.8-65.4)	50.0 (35.2-68.9)		
5-9 years	33.5 (29.1-38.3)	29.2 (19.2-42.4)	35.8 (24.7-50.3)	41.6 (29.4-57.0)	28.6 (18.7-41.9)	29.4 (19.4-42.8)	33.5 (22.8-47.5)	33.2 (22.6-47.1)		
10-14 years	20.7 (17.2-24.6)	25.0 (15.7-37.8)	21.6 (13.0-33.7)	21.6 (13.0-33.8)	14.8 (7.9-25.3)	21.3 (12.8-33.3)	19.9 (11.8-31.4)	18.5 (10.8-29.6)		
15-24 years	21.0 (18.6-23.8)	20.4 (14.2-28.4)	18.5 (12.7-26.1)	20.7 (14.5-28.6)	21.7 (15.4-29.8)	21.0 (14.8-28.9)	24.8 (18.0-33.3)	20.2 (14.1-27.9)		
25-34 years	22.4 (20.1-25.0)	21.7 (15.9-29.0)	14.6 (9.9-20.8)	17.0 (11.9-23.6)	20.4 (14.8-27.5)	20.5 (14.9-27.7)	32.1 (24.9-40.8)	30.8 (23.7-39.4)		
35-44 years	20.4 (18.2-22.8)	16.5 (11.6-22.8)	11.0 (7.1-16.4)	18.5 (13.2-25.2)	19.1 (13.7-25.9)	22.4 (16.6-29.8)	23.0 (17.0-30.4)	32.5 (25.3-41.2)		
45-54 years	17.9 (15.8-20.2)	20.9 (15.0-28.2)	14.6 (9.9-20.9)	18.7 (13.3-25.6)	17.1 (12.0-23.7)	15.7 (10.8-22.1)	17.7 (12.4-24.4)	22.5 (16.5-29.9)		
55-64 years	20.7 (18.1-23.5)	23.7 (16.4-33.2)	14.0 (8.7-21.4)	20.5 (14.0-28.9)	23.5 (16.6-32.2)	24.1 (17.2-32.8)	19.9 (13.8-27.9)	20.0 (13.9-27.9)		
65+ years	23.6 (20.9-26.7)	24.3 (17.0-33.7)	24.5 (17.3-33.8)	19.6 (13.2-28.0)	23.1 (16.2-32.0)	28.6 (20.9-38.1)	24.1 (17.2-32.8)	19.3 (13.3-27.1)		

* Rates are not presented if total count for an age category is fewer than 10 cases

Table 6a: Average Annual and Annual Incidence Rates (IR) of Pertussis in Alameda County, by Race/Ethnicity Group, 2007-2013

Race/Ethnicity	Rate per 100,000 (95% CI)							
	Average Annual IR (2007-2013)	2007	2008	2009	2010	2011	2012	2013
American Indian/Alaskan Native	*	*	*	*	*	*	*	*
Asian/Pacific Islander	4.5 (3.8-5.4)	*	*	*	15.5 (11.8-19.9)	8.3 (5.7-11.7)	*	4.6 (2.7-7.2)
Black	6.3 (5.0-7.9)	*	*	*	21.9 (15.5-30.1)	11.6 (7.1-17.9)	*	*
Hispanic	13.2 (11.8-14.8)	*	*	*	41.6 (34.9-49.2)	28.3 (22.9-34.6)	5.9 (3.6-9.0)	11.2 (8.0-15.3)
White	10.1 (9.0-11.2)	2.3 (1.2-4.2)	3.4 (2.0-5.6)	*	31.8 (26.8-37.4)	13.0 (9.9-16.7)	6.8 (4.6-9.6)	11.6 (8.7-15.1)
Other Races	7.2 (4.9-10.3)	*	*	*	25.3 (14.2-41.7)	*	*	*

* Rates are not presented if total count for a race/ethnicity category is fewer than 10 cases

Table 6b: Average Annual and Annual Incidence Rates (IR) of Pertussis in Alameda County, by Age, 2007-2013

Age Group	Rate per 100,000 (95% CI)							
	Average Annual IR (2007-2013)	2007	2008	2009	2010	2011	2012	2013
< 1 year	107.0 (89.8-126.6)	93.9 (54.7-150.4)	*	55.0 (26.4-101.1)	258.8 (190.2-344.2)	160.6 (107.5-230.6)	*	106.4 (64.0-166.1)
1-4 years	27.9 (23.6-32.8)	*	*	*	101.0 (79.6-126.4)	37.4 (24.9-54.1)	*	27.0 (16.5-41.7)
5-9 years	28.1 (24.1-32.5)	*	13.0 (6.7-22.7)	*	84.7 (66.8-105.8)	47.9 (34.8-64.4)	14.0 (7.5-24.0)	30.0 (19.9-43.3)
10-14 years	31.6 (27.3-36.3)	*	*	*	107.1 (86.5-131.0)	58.3 (43.5-76.4)	14.3 (7.6-24.5)	21.7 (13.3-33.6)
15-24 years	9.5 (7.9-11.4)	10.5 (6.2-16.6)	*	*	24.0 (17.3-32.4)	10.8 (6.5-16.8)	*	11.2 (6.8-17.3)
25-34 years	3.7 (2.8-4.8)	*	*	*	9.5 (5.8-14.7)	5.3 (2.6-9.4)	*	*
35-44 years	4.4 (3.4-5.6)	*	*	*	13.0 (8.7-18.8)	8.4 (5.0-13.3)	*	*
45-54 years	2.0 (1.4-2.9)	*	*	*	6.2 (3.3-10.6)	*	*	*
55-64 years	1.9 (1.1-2.8)	*	*	*	*	*	*	*
65+ years	1.2 (0.6-2.0)	*	*	*	*	*	*	*

* Rates are not presented if total count for race/ethnicity category is fewer than 10 cases

Table 7a: Average Annual and Annual Incidence Rates (IR) of Salmonellosis in Alameda County, by Age, 2007-2013

Age Group	Rate per 100,000 (95% CI)									
	Average Annual IR (2007-2013)	2007	2008	2009	2010	2011	2012	2013		
< 1 year	85.8 (70.4-103.4)	105.0 (63.2-163.9)	99.1 (58.7-156.6)	148.4 (97.8-215.9)	66.1 (34.1-115.4)	*	*	112.0 (68.4-172.9)		
1-4 years	63.0 (56.4-70.2)	60.3 (44.0-80.6)	51.9 (36.9-71.0)	91.6 (71.3-116)	54.5 (39.1-73.9)	70.8 (53.1-92.7)	65.8 (48.7-87.1)	48.6 (34.1-67.3)		
5-9 years	30.5 (26.3-35.1)	21.6 (13.2-33.4)	22.8 (14.1-34.8)	32.8 (22.1-46.8)	39.6 (27.7-54.8)	34.9 (23.9-49.2)	19.4 (11.5-30.7)	39.6 (27.9-54.6)		
10-14 years	15 (12.1-18.4)	11.4 (5.4-20.9)	*	12.5 (6.3-22.4)	13.7 (7.1-23.9)	25.8 (16.3-38.7)	12.1 (6.1-21.7)	18.5 (10.8-29.6)		
15-24 years	11.7 (9.9-13.8)	12.8 (8.1-19.5)	10.4 (6.2-16.4)	12.1 (7.5-18.4)	16.0 (10.6-23.1)	9.6 (5.6-15.4)	11.3 (6.9-17.4)	10.1 (6.0-15.9)		
25-34 years	13.1 (11.3-15.1)	8.5 (5.0-13.4)	9.4 (5.8-14.6)	14.7 (10.0-20.8)	18.1 (12.8-24.8)	14.3 (9.7-20.5)	13.4 (8.9-19.4)	13.5 (9.0-19.5)		
35-44 years	8.2 (6.8-9.8)	7.8 (4.5-12.5)	9.2 (5.6-14.2)	7.4 (4.2-12.0)	8.8 (5.3-13.8)	8.4 (5.0-13.3)	8.9 (5.4-13.9)	6.6 (3.6-11.1)		
45-54 years	10.1 (8.5-11.8)	11.9 (7.6-17.7)	8.8 (5.2-13.9)	12.5 (8.2-18.3)	10.9 (6.9-16.4)	8.1 (4.7-13.0)	10.0 (6.2-15.3)	9.1 (5.5-14.2)		
55-64 years	8.4 (6.8-10.3)	9.1 (4.8-15.5)	*	9.6 (5.4-15.8)	10.5 (6.1-16.8)	9.0 (5.1-14.9)	6.5 (3.2-11.5)	9.2 (5.2-14.9)		
65+ years	12.8 (10.8-15.1)	16.2 (10.4-24.1)	13.9 (8.6-21.3)	17.0 (11.1-24.9)	8.3 (4.4-14.3)	11.2 (6.6-17.7)	12.6 (7.8-19.3)	9.9 (5.8-15.9)		

* Rates are not presented if total count for an age category is fewer than 10 cases

Table 7b: Average Annual and Annual Incidence Rates (IR) of Salmonellosis in Alameda County, by Race/Ethnicity Group, 2007-

Race/Ethnicity	Rate per 100,000 (95% CI)									
	Average Annual Rate (2007-2013)	2007	2008	2009	2010	2011	2012	2013		
Asian/Pacific Islander	19.2 (17.5-20.9)	16.9 (12.8-21.8)	14.9 (11.2-19.5)	23.1 (18.4-28.5)	18.9 (14.8-23.7)	23.3 (18.8-28.7)	17.4 (13.5-22.1)	21.1 (16.8-26.1)		
Black	12.1 (10.2-14.2)	12.3 (7.7-18.7)	6.8 (3.5-11.9)	18.9 (13.0-26.5)	11.6 (7.1-17.8)	11.6 (7.1-17.9)	12.2 (7.5-18.6)	10.5 (6.2-16.5)		
Hispanic	16.5 (14.9-18.2)	13.1 (9.3-17.8)	14.0 (10.2-18.8)	22.0 (17.2-27.8)	17.9 (13.6-23.1)	18.8 (14.4-24.0)	14.4 (10.6-19.0)	15.5 (11.7-20.3)		
White	12.2 (11.0-13.5)	14.0 (10.8-17.8)	12.5 (9.5-16.1)	13.5 (10.4-17.3)	14.8 (11.5-18.8)	10.8 (8.0-14.2)	10.3 (7.6-13.7)	8.3 (5.9-11.4)		

* Rates are not presented if total count for a race/ethnicity category is fewer than 10 cases

Table 7c: Average Annual Incidence Rates of Salmonellosis in Alameda County, by Age and Race/Ethnicity Groups, 2007-2013

Age Group	Annual average rate per 100,000 (95% CI)			
	Black	Asian / Pacific Islander	Hispanic	White
0-4 years	*	124.5 (84.1-177.6)	52.6 (30.7-84.0)	*
5-14 years	*	28.2 (15.1-48.0)	21.5 (11.3-37.2)	*
15-34 years	*	*	10.7 (5.6-18.6)	16.8 (9.7-26.9)
35-64 years	*	8.7 (4.8-14.4)	*	7.9 (4.6-12.6)
65+ years	*	*	*	*

* Rates are not presented if total count for a combined race/ethnicity and age category is fewer than 10 cases

Table 8: Number and Size of Outbreaks in Food Service Facilities Reported by Alameda County, by Etiologic Agent (Suspect and Laboratory-confirmed), 2007-2013

Etiologic agent	Outbreaks N (%)	Median number of cases (min, max)
<i>Clostridium perfringens</i>	1 (3.1%)	14 (14, 14)
<i>E. coli</i>	1 (3.1%)	76 (76, 76)
Fish-related toxin	1 (3.1%)	6 (6, 6)
Norovirus	13 (40.6%)	10 (2, 68)
<i>Salmonella</i>	3 (9.4%)	7 (6, 23)
Scombroid toxin	3 (9.4%)	7.5 (7, 8)
<i>Shigella flexneri</i>	1 (3.1%)	19 (19, 19)
<i>Vibrio parahaemolyticus</i>	1 (3.1%)	3 (3, 3)
Unknown	8 (25.0%)	3.5 (2, 10)
Total	32	8 (2, 76)

Table 9: Number of Outbreaks in Non-Food Service Facilities by Disease, Alameda County, 2007-2013

Disease	Number of outbreaks							
	2007	2008	2009	2010	2011	2012	2013	Total
Gastrointestinal Illness	28 100.0%	18 60.0%	21 72.4%	32 76.2%	26 55.3%	34 70.8%	42 68.9%	201 70.5%
<i>Clostridium difficile</i>	0	1	0	0	1	0	0	2
Norovirus	27	16	21	30	23	30	42	189
Norovirus and <i>Clostridium difficile</i>	0	0	0	0	1	4	0	5
Shigatoxin-producing <i>E. coli</i>	1	0	0	0	0	0	0	1
<i>Shigella sonnei</i>	0	1	0	0	1	0	0	2
Unknown GI pathogen	0	0	0	2	0	0	0	2
Influenza-like illness	0	8 26.7%	5 17.2%	3 7.1%	6 12.8%	5 10.4%	11 18.0%	38 13.3%
Influenza A	0	7	4	0	2	1	9	23
Influenza A and RSV	0	0	0	0	0	1	0	1
Influenza B	0	0	0	0	1	1	0	2
Influenza A, B and RSV	0	0	0	0	0	1	0	1
Other - Unknown Respiratory	0	1	1	3	3	1	2	11
Carbapenem-resistant Enterobacteriaceae	0	0	0	0	0	0	1 1.6%	1 0.4%
Hand Foot and Mouth Disease	0	0	0	0	0	1 2.1%	0	1 0.4%
Parapertussis	0	0	1 3.4%	0	0	0	0	1 0.4%
Pertussis	0	0	0	0	0	0	1 1.6%	1 0.4%
Scabies	0	2 6.7%	2 6.9%	7 16.7%	14 29.8%	8 16.7%	6 9.8%	39 13.7%
Varicella	0	0	0	0	1 2.1%	0	0	1 0.4%
Other	0	2 6.7%	0	0	0	0	0	2 0.7%
Total	28	30	29	42	47	48	61	285

Table 10: Characteristics of Select Outbreak Types in Non-Food Service Facilities, Alameda County, 2007-2013

Characteristic	Gastrointestinal	Influenza-like illness	Scabies
Outbreak size and Severity	Median (Min, Max)		
Total ill Number ill Attack rate (%)	23.5 (2, 109)	19 (1, 58)	Not Calculated
	17.5 (1.2, 58.6)	11.0 (1.1, 48.7)	
Ill residents/students Number ill Attack rate (%)	17.5 (0, 88)	14 (1, 54)	
	24.1 (0, 100)	14.7 (1.1, 86.7)	
Ill staff Number ill Attack rate (%)	5 (0, 32)	3 (0, 23)	
	7.6 (0, 100)	4 (0, 66.7)	
Duration Number of days	8 (1, 43)	14 (5, 27)	
Facility Type	Number of Outbreaks (%)		
Assisted Living	79 (39.3%)	9 (23.7%)	7 (17.9%)
Community Care/Group Living Situation	3 (1.5%)	1 (2.6%)	5 (12.8%)
Hospital/Acute Care/Post Acute Care	16 (8.0%)	5 (13.2%)	17 (43.6%)
Skilled Nursing Facility	83 (41.3%)	19 (50.0%)	10 (25.6%)
School/Daycare/Camp	13 (6.5%)	2 (5.3%)	0
Other	4 (2.0%)	1 (2.6%)	0
Unknown	3 (1.5%)	1 (2.6%)	0
Total	201	38	39

Table 11: Alameda County Population Estimates by Age, Sex and Race/Ethnicity Groups, 2007-2013 (Excludes Berkeley)

Type	Description	2007	2008	2009	2010	2011	2012	2013
Total	Total	1367230.04	1381347.36	1392132.67	1400202.28	1410274.99	1420375.29	1430448.00
Sex	Male	670911.76	677724.71	682901.56	686847.66	692084.66	697336.00	702573.00
	Female	696318.28	703622.65	709231.11	713354.62	718190.33	723039.29	727875.00
Race / Ethnicity	Hispanic	306406.86	314744.51	322432.76	329195.11	335272.19	341365.92	347443.00
	White	471106.48	465729.50	459018.18	453407.40	454961.25	456519.36	458073.22
	Black	178210.58	176823.33	174966.93	173136.16	172759.77	172382.36	172005.97
	Amer Indian	4215.40	4133.40	4039.71	3975.56	4033.98	4092.56	4150.98
	API	349743.68	361706.51	372944.06	381799.99	385867.11	389945.38	394012.50
	Other Races	57547.04	58210.11	58731.04	59258.58	60239.59	61223.28	62204.29
Age Group	< 1 year	18098.90	18169.43	18195.72	18157.35	18058.49	17959.36	17860.49
	1-4 years	74669.47	75075.99	75301.80	75231.92	74822.49	74411.94	74002.51
	5-9 years	92595.68	92139.91	91447.86	90955.47	91767.57	92581.90	93394.00
	10-14 years	88061.05	88041.75	87803.30	87807.75	89202.56	90601.19	91996.00
	15-24 years	171238.64	172954.92	174212.85	175107.55	176280.96	177457.59	178631.00
	25-34 years	211729.63	211779.16	211283.66	210288.66	209412.91	208534.75	207659.00
	35-44 years	218185.61	217518.21	216291.88	214730.99	213824.49	212915.50	212009.00
	45-54 years	201364.32	205058.72	208293.56	210244.63	209765.86	209285.77	208807.00
	55-64 years	143221.62	149859.94	156216.06	161824.36	166137.64	170462.73	174776.00
	65+ years	148065.12	150749.34	153085.96	155853.58	161002.02	166164.56	171313.00

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