
INFECTIOUS DISEASE

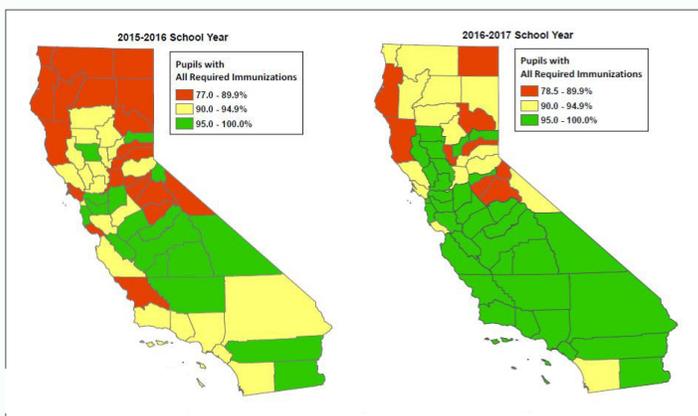


photo credit: Tara Kennon

Good News Spotlight

Immunization Rates: Laws Can Make a Difference

In 2016, a state law (SB277) eliminated the personal belief exemption from vaccine requirements for children enrolling in public or private school in California. The effect was immediately clear in San Luis Obispo County vaccination rates. In one year, the number of students starting child care with all required immunizations increased from 87.9 percent to 93 percent. The number of students starting kindergarten with all required immunizations increased from 89.7% to 95.6%. Most of the students who didn't yet have all required immunizations were in the process of completing a vaccine series.



INFECTIOUS DISEASE

Infectious, or communicable, diseases have a significant influence on illness and death in a community and are largely preventable or treatable. Examples of communicable diseases include those transmitted from human to human, from vectors (e.g., infected ticks or mosquitoes) to humans, and from contaminated food or water to humans.

Sexually Transmitted Diseases (STDs)

Why this Matters

The term STD refers to more than 25 infectious organisms that are transmitted primarily through sexual activity. Some are bacterial, such as chlamydia, syphilis, and gonorrhea; others are viral, such as hepatitis B, herpes, human immunodeficiency virus (HIV), and human papillomavirus (HPV); and still others are parasitic, such as trichomoniasis. Their health implications can range from mild to severe, with some causing only mild discomfort and others, if left untreated, causing infertility, pregnancy complications or life-threatening illness.

National and State Context

The CDC estimates that there are approximately 20 million new STD infections each year—almost half of them among people ages 15 to 24.¹¹⁷ Nationally, the most common STDs are chlamydia, gonorrhea, genital herpes, HPV and syphilis. California was ranked highest among all states in 2016 for the total number of cases for chlamydia, gonorrhea, syphilis, and congenital syphilis.¹¹⁸ Bacterial STDs in California (chlamydia, gonorrhea, and syphilis) significantly increased in 2016. Important disparities persisted, with the highest rates found among young people, African-Americans, and men who have sex with men. Chlamydia remains the most frequently reported disease in California. In 2017, the rate of chlamydia was 552.1 cases per 100,000 Californians, a 9 percent increase over 2016. Gonorrhea cases increased 16 percent in 2017 to the rate of 190.5 per 100,000 Californians.¹¹⁹

117 Centers for Disease Control and Prevention. Sexually Transmitted Disease Surveillance 2016. Atlanta: U.S. Department of Health and Human Services; 2017. <https://www.cdc.gov/std/stats16/default.htm>.

118 Centers for Disease Control and Prevention. Sexually Transmitted Disease Surveillance 2016. Atlanta: U.S. Department of Health and Human Services; 2017. <http://www.cdc.gov/std/stats>.

119 California Dept of Public Health. Sexually Transmitted Diseases in California: 2017 Snapshot. <https://www.cdph.ca.gov/Programs/CID/DCDC/CDPH%20Document%20Library/STDs-CA-2017Snapshot.pdf>

In San Luis Obispo County

Chlamydia was the most commonly diagnosed STD in San Luis Obispo County in 2017, with a rate of 445.9 cases per 100,000 population, up from 410.9 cases per 100,000 in 2016. This rate, while significantly lower than the state average of 552.1 cases per 100,000 population, has been steadily climbing over the past decade, nearly tripling compared to the 2004 rate of 176.9 cases per 100,000 population.¹²⁰ Gonorrhea was the county's second most common STD (after chlamydia), with a rate of 63.31 cases per 100,000 population in 2017, up from 11.3 cases per 100,000 population in 2010.¹²¹

HIV/AIDS

Why this Matters

The human immunodeficiency virus (HIV) damages the immune system, eventually leading infected individuals to develop acquired immunodeficiency syndrome (AIDS), a chronic and potentially life-threatening condition. No effective cure exists for HIV, but increasingly effective treatments are allowing people with HIV to live longer, healthier, and more productive lives.

National and State Context

The total number of people living with HIV in the U.S. is increasing, but the number of new HIV infections has remained stable in recent years. The CDC estimates that there are approximately 1.1 million adults and adolescents living with HIV in the U.S.¹²² Of those, they believe roughly 15 percent do not know they are infected. While new infections have continued to occur, with an estimated 37,600 new HIV infections reported annually, the estimated number of annual new infections has declined 10 percent from 2010 (41,900) to 2014 (37,600). California is experiencing a slower rate of decline at 2.9 percent from 2011 to 2015, while the rate of new diagnoses per 100,000 population declined by 6.1 percent, from 13.5 to 12.7 during the same time period.¹²³

In San Luis Obispo County

HIV patterns in the county are similar to those at the national level, with newly acquired HIV infections hovering around a rate of 6.4 cases per 100,000 population from 2010-2015 (compared to a rate of 13.2 cases per 100,000 population at the state).¹²⁴ In January 2018, the total number of individuals living with HIV in San Luis Obispo County was 269.¹²⁵

120 State of California, Department of Health Service; Sexually Transmitted Disease Control Branch. <http://www.cdph.ca.gov/data/statistics/Pages/STDDData.aspx>

121 State of California, Department of Health Service; Sexually Transmitted Disease Control Branch. <http://www.cdph.ca.gov/data/statistics/Pages/STDDData.aspx>

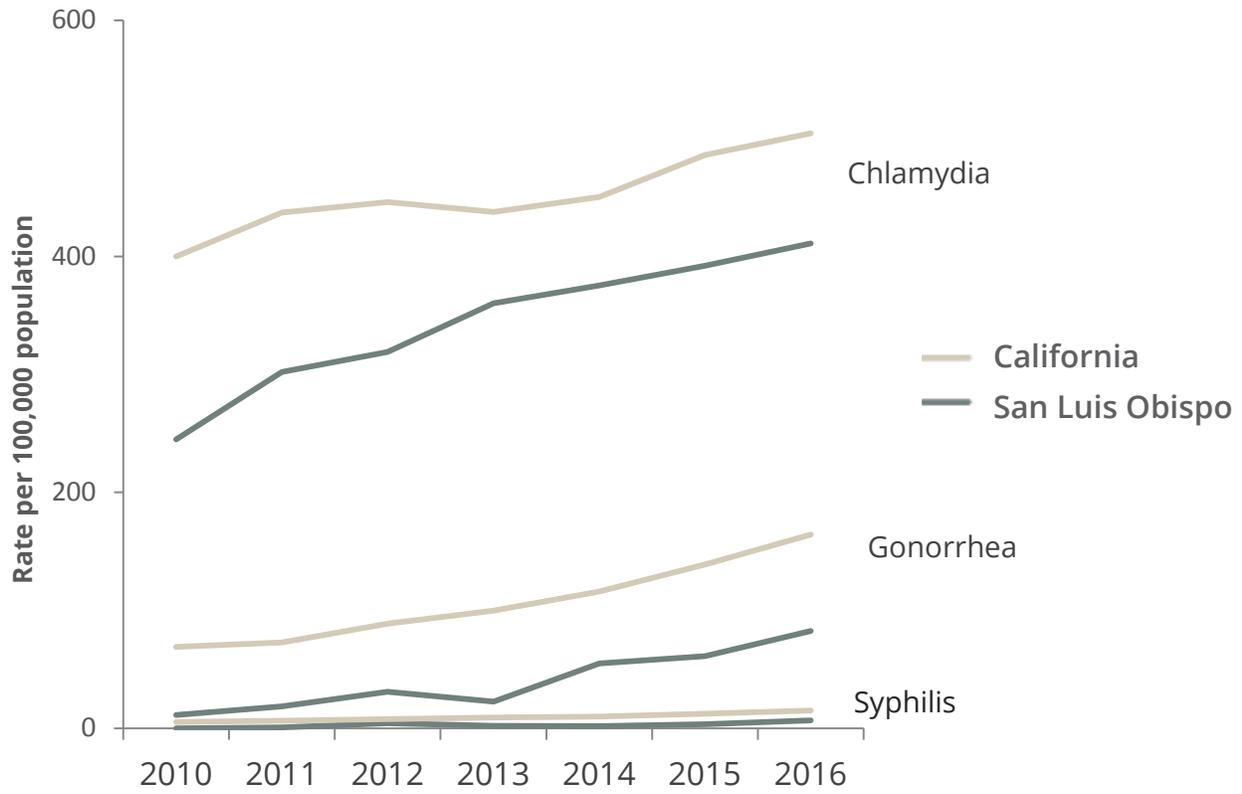
122 Centers for Disease Control and Prevention. (2016) HIV in the United States: *At A Glance*. <https://www.cdc.gov/hiv/statistics/overview/ata glance.html>

123 California Department of Public Health, Office of AIDS, California HIV Surveillance Report — 2015.

124 California Department of Public Health. (2017). Infectious Disease Cases by County, Year, and Sex. <https://data.chhs.ca.gov/dataset/infectious-disease-cases-by-county-year-and-sex/resource/741f25e1-db50-436a-a6a9-7b840176edbf>

125 County of San Luis Obispo Public Health Department, 2018.

Sexually Transmitted Diseases, San Luis Obispo County and California, 2010-2016



Source: California Department of Public Health, STD Control Branch.

Hepatitis

Why this Matters

Hepatitis is inflammation of the liver, a vital organ that processes nutrients, filters the blood, and fights infections. When the liver is inflamed or damaged, its function can be affected. Hepatitis is most often caused by a virus, which can be spread in a variety of ways. Hepatitis A is typically caused by ingestion of contaminated food or water. Hepatitis B and C usually occur as a result of contact with infected body fluids. Hepatitis C is most commonly transmitted through injection drug use while, unlike hepatitis B, sexual transmission is rare. About 75-85 percent of persons infected with hepatitis C will develop chronic infection, and 1-5 percent of these individuals will die from cirrhosis or liver cancer.

National Context

In the U.S., the most common types of viral hepatitis are hepatitis A, B and C.¹²⁶ About 75 percent of all hepatitis C cases are among persons born 1945-1965 and about half of these individuals do not know that they are infected.

In San Luis Obispo County

The majority of hepatitis cases in the county are hepatitis C, with 358 cases reported in 2017. Hepatitis C cases occur across all age groups, with the risk highest for those who have multiple sexual partners or unprotected sex, inject illicit drugs, have been incarcerated, or have sexual contact with other men. While still a concern in the county, the virus has been steadily declining, with newly reported cases down from 692 cases in 2012.¹²⁷ Of note is that acute cases are inching up, with six cases of acute hepatitis C reported in 2017 compared with 0-2 cases each year 2012-2015. Acute hepatitis C refers to the first several months after someone is infected. Severity of acute infection can range from very mild illness to a serious condition requiring hospitalization. The increase in acute hepatitis C will need to be followed and may be related to increased transmission through injection drug use as a result of the opioid epidemic.

Pneumonia and Influenza

Why this Matters

Pneumonia and influenza together are the eighth leading cause of death in the U.S. The two diseases are traditionally reported together because the symptoms and physiology that leads to death are similar and pneumonia is frequently a complication of influenza. Influenza is a contagious disease caused by a virus, while pneumonia is a serious bacterial infection of the lungs that develops when the immune system is weakened. The flu vaccine is recommended for all individuals six months and older; flu and pneumonia vaccines are especially recommended for persons most at risk from serious complications from influenza, including the very young, the elderly, and people with certain chronic medical conditions.

126 Centers for Disease Control and Prevention. Division of Viral Hepatitis and National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention. What is Viral Hepatitis? <https://www.cdc.gov/hepatitis/abc/index.htm>

127 County of San Luis Obispo Public Health Department. (2017). www.slopublichealth.org.

Annual Disease Counts, San Luis Obispo County, 2010-2017

Disease	2010	2011	2012	2013	2014	2015	2016	2017
HIV	18	20	11	12	7	12	16	7
AIDS	6	4	3	3	3	4	3	1
Campylobacteriosis	101	88	78	77	74	74	50	72
Chlamydia	673	815	862	963	1030	1072	1142	1249
Valley Fever	102	225	135	82	33	55	257	368
Cryptosporidiosis	24	13	7	5	9	5	9	8
E. Coli	13	4	8	13	14	12	16	16
Giardiasis	9	16	13	10	10	15	12	9
Gonorrhea	31	50	84	56	150	163	231	176
Hepatitis A	1	3	4	2	0	0	2	1
Hepatitis B (Chronic)	36	40	34	27	27	25	26	38
Hepatitis C (Community)	-	-	355	263	281	219	251	260
Hepatitis C (Correctional)	-	-	337	272	227	148	138	98
Lyme Disease	0	1	1	2	1	3	3	3
Measles (Rubeola)	0	0	0	0	0	0	0	2
Meningitis (Bacterial)	4	2	3	0	0	4	4	8
Meningitis (Viral)	35	12	3	17	12	21	13	12
MRSA	0	0	1	0	2	1	0	0
Pertussis	382	12	13	13	37	19	27	16
Rubella	0	0	0	0	0	0	0	0
Salmonella	33	20	43	39	37	46	42	29
Shigellosis	5	3	1	4	6	9	2	8
Syphilis (Primary/Secondary)	0	2	5	5	5	10	18	14
Tuberculosis	4	6	3	4	0	0	0	0

Source: County of San Luis Obispo Public Health Department.

National Context

It is estimated that during most influenza seasons, approximately 5 percent to 20 percent of the population is infected with influenza, although rates of infection vary among age groups and from one season to another depending on the strength of that year's circulating strain and vaccine effectiveness. Nationally, an estimated 200,000+ people are hospitalized each year due to influenza-related complications, with more deaths attributed to pneumonia than influenza.

In San Luis Obispo County

In San Luis Obispo County, from 2014-2016, less than half (41.0 percent) of people received their annual flu shot - lower than the state overall during the same period (44.6 percent).¹²⁸ Those under age 18 were more likely to get their flu shot (44.7 percent) compared to adults ages 18 and older (40.5 percent).¹²⁹ During 2000-2010, an average of 43 deaths per year occurred in San Luis Obispo County with a primary cause of influenza or pneumonia.¹³⁰

Vector-Borne Disease

Why this Matters

Vector-borne diseases account for 17 percent of all infectious diseases worldwide, causing over 1 million deaths annually.¹³¹ They include dengue, malaria, Zika, West Nile virus, yellow fever, Lyme and others. They are spread through vectors, like mosquitoes, ticks, flies, sandflies, fleas, and others, which may transmit infectious diseases between humans or from animals to humans.

Distribution of these diseases is determined by a complex dynamic of environmental and social factors. The increasingly globally-connected world and environmental challenges such as climate change have had a significant impact on disease transmission in recent years, allowing diseases to emerge in countries where they were previously unknown.

Global, National and State Context

The Zika virus has been a particular concern in recent years, following an explosion of the virus in Latin America and the Caribbean. The disease, spread through the bite of an *Aedes* species mosquito (*Ae. aegypti* and *Ae. albopictus*), can cause certain birth defects, such as microcephaly, and Guillain-Barré Syndrome in adults.¹³² Local transmission has been detected in some parts of Texas and Florida, but has not yet been detected in California.¹³³

Lyme disease has also been a concern nationally and is the most commonly reported vector-borne illness in the U.S. The disease, spread through the bite of an infected black-legged tick, can cause fever, headache, fatigue, skin rash, and, if left untreated, can spread to joints, the heart, and

128 UCLA Center for Health Policy Research. AskCHIS. 2014-2016 Pooled average. Vaccinated for flu in past 12 months: Child, Teen, Adult. (San Luis Obispo County). <http://ask.chis.ucla.edu>.

129 Ibid.

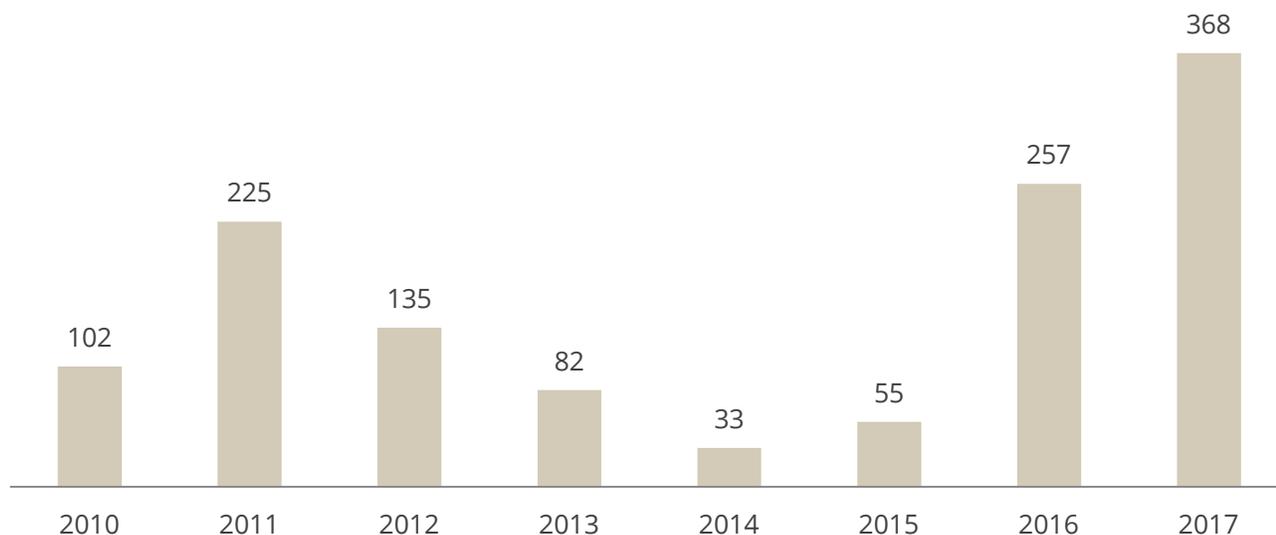
130 County of San Luis Obispo Public Health Department. (2017). <http://www.slocounty.ca.gov/Departments/Health-Agency/Public-Health/All-Public-Health-Services/Epidemiology-Data-Reports.aspx>.

131 World Health Organization. (2017). Vector-borne diseases overview. <http://www.who.int/mediacentre/factsheets/fs387/en>

132 Centers for Disease Control and Prevention.. About Zika: What we know. <https://www.cdc.gov/zika/about/index.html>.

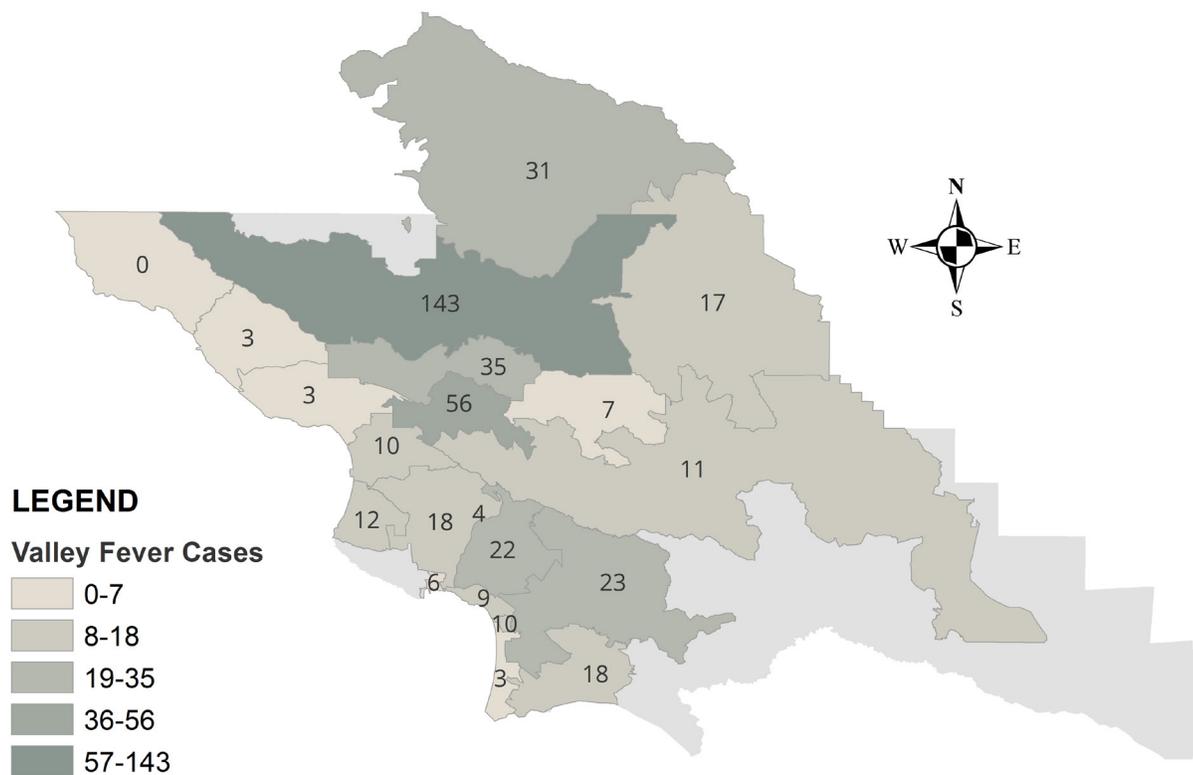
133 Centers for Disease Control and Prevention.. World Map of Areas with Risk of Zika. <https://wwwnc.cdc.gov/travel/page/world-map-areas-with-zika>.

Valley Fever Cases, San Luis Obispo County, 2010-2017



Source: County of San Luis Obispo Public Health Department

Valley Fever Cases by ZIP Code, San Luis Obispo County, 2012-2016



Note: Map reflects home address of residents with reported cases of Valley Fever, not necessarily the location where residents contracted Valley Fever.

Source: County of San Luis Obispo Public Health Department

the nervous system. In 2015, 95 percent of confirmed Lyme disease cases were reported from 14 states (Connecticut, Delaware, Maine, Maryland, Massachusetts, Minnesota, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, Virginia, and Wisconsin).¹³⁴

Statewide cases of West Nile virus rose to 516 in 2017 from 442 in 2016.¹³⁵

In San Luis Obispo County

The last reported case of human West Nile virus in San Luis Obispo County was confirmed in 2016, and West Nile virus continues to be present in the county, as testing of dead birds recently confirmed.¹³⁶

The *Aedes* species mosquito has not yet been detected in San Luis Obispo, Santa Barbara or Monterey Counties, although it is present in 12 other California counties, including Kern County. One case of travel-related Zika reported in San Luis Obispo County in 2016.

The western black-legged tick, which transmits Lyme disease in California, has been found in 56 of 58 California counties. It is most commonly seen in Northern California along the coast and on the western slope of the Sierra Nevada range, and much less commonly in San Luis Obispo County.¹³⁷ From 2006 to 2015, there were 11 cases of confirmed Lyme disease among San Luis Obispo County residents, or an incidence rate of 0.40 per 100,000 population.¹³⁸ Statewide during the same period, there were 778 cases, or an incidence rate of 0.20 per 100,000 population.¹³⁹ Among the statewide 2015 total, 30 percent of patients with confirmed cases reported travel history with exposure outside of California, most commonly in the northeastern U.S.¹⁴⁰

Foodborne Illness

Why this Matters

Foodborne illness, or food poisoning, is a common public health problem. Each year, one in six Americans gets sick by consuming contaminated foods or beverages.¹⁴¹ While most recover within days, some illnesses are severe and can even be deadly. Many different disease-causing microbes, or pathogens, can contaminate foods, including *Campylobacter*, *E. coli*, *Listeria*, *Norovirus*, *Salmonella*, *Shigella* and others.

In San Luis Obispo County

In San Luis Obispo County in 2017, reported cases of foodborne illness included 72 cases of *Campylobacter*, 16 cases of *E. coli*, no cases of *Listeria*, 29 cases of *Salmonella*, and 8 cases of

134 Centers for Disease Control and Prevention. (2017). Lyme Disease Data and Statistics. <https://www.cdc.gov/lyme/stats/index.html>

135 California Department of Public Health, UC Davis Arbovirus Research and Training, and Mosquito and Vector Control Association of California. (2017). Fight the Bite California West Nile Virus Website. <http://www.westnile.ca.gov>.

136 County of San Luis Obispo Public Health Department. (2017). www.slopublichealth.org.

137 California Department of Public Health. (2017). Lyme Disease Homepage. <https://www.cdph.ca.gov/Programs/CID/DCDC/Pages/LymeDisease.aspx>.

138 California Department of Public Health. (2015). Vector-Borne Disease Section Annual Report 2015. <https://www.cdph.ca.gov/Programs/CID/DCDC/CDPH%20Document%20Library/VBDSAnnualReport15.pdf>.

139 Ibid.

140 Ibid.

141 Centers for Disease Control and Prevention. (2017). Food Safety Homepage. <https://www.cdc.gov/foodsafety/foodborne-germs.html>.

Shigella.¹⁴² Data is not available on Norovirus, perhaps the most common cause of gastrointestinal (GI) disease and GI outbreak, because health care providers are not required to report it to the Public Health Department.

Valley Fever

Why this Matters

Valley Fever (coccidioidomycosis) is an illness caused by breathing in a fungus which lives naturally in the soil in some areas of the Southwestern U.S., Mexico and South America. In California, the fungus is found in the Central Valley and San Luis Obispo County. When soil containing the fungus is disturbed, dust containing fungal spores may be inhaled into a person's lungs and the person may become infected. Anyone who lives, visits, or travels through the areas where the fungus is in the soil (endemic areas) may become infected with Valley Fever.

Seasonal rain during late winter and early spring causes the fungus to grow in the region's soil. When temperatures rise during the summer and that soil dries out, it can be picked up and lifted into the air by naturally occurring winds, dust storms, earthquakes, and man-made activities, such as construction, digging and cycling. Once airborne, and given the right conditions, the spores can travel miles, infecting those in its path.

Sixty percent of those infected have no symptoms or symptoms so mild that they do not seek medical attention. The remaining 40 percent develop an illness severe enough to prompt the person to seek medical care. Symptoms typically develop between seven and 20 days after coming in contact with the fungus and include flu-like symptoms such as cough, fever, headache, chills, sweats, chest pain and exhaustion. Of those diagnosed with Valley Fever, 1-5 percent experience a much more serious form of the disease in which the infection spreads to other parts of the body.

National and State Context

Valley Fever lives in the soils of San Luis Obispo County, the Central Valley region, and other areas within parts of Arizona, California, Nevada, New Mexico, Utah and South America. Two-thirds of all U.S. Valley Fever infections are contracted in Arizona. Nationally, Valley Fever is uncommon and is considered an "orphan disease."

The number of Valley Fever cases in California rose to a record level in 2016, with 5,372 reported (a rate of 13.7 cases per 100,000 population). This figure is a jump of 71 percent from the previous year and surpassed the previous peak in 2011, which had been the highest number of cases since Valley Fever was made reportable in 1995.¹⁴³ Historically, about three-quarters of cases have been in the state's heavily agricultural San Joaquin Valley.¹⁴⁴

142 County of San Luis Obispo Public Health Department. (2017). www.slopublichealth.org.

143 California Department of Public Health. (2017). Valley Fever Cases Increase in California in 2016. <https://www.cdph.ca.gov/Programs/OPA/Pages/NR17-058.aspx>

144 California Department of Public Health. (2016). Valley Fever Fact Sheet. [https://www.cdph.ca.gov/Programs/CID/DCDC/CDPH percent20Document percent20Library/ValleyFeverFactSheet.pdf](https://www.cdph.ca.gov/Programs/CID/DCDC/CDPH%20Document%20Library/ValleyFeverFactSheet.pdf)

In San Luis Obispo County

San Luis Obispo County noted similar trends as the state, with a record high 368 cases reported in 2017.

Vaccines and Immunizations

Why this Matters

Immunizations are a successful and cost-effective measure to protect children and adults from numerous infectious diseases such as measles, mumps, and whooping cough. These diseases can result in extended work or school absences, hospitalizations, and even death.

Sufficient vaccination rates are necessary to achieve community immunity (also known as herd immunity). Community immunity is the idea that if a certain percentage of people are vaccinated from a disease, everyone in the community will be safe from the illness. Community immunity protects children too young to have received a vaccine, those with compromised immune systems, or others who have medical conditions that prevent them from receiving a vaccine. For some highly contagious infectious diseases, like measles, the CDC estimates that between 96 to 99 percent of people need to be immunized to establish community immunity.

In San Luis Obispo County

Eighty-eight percent of children in public and private child care centers in San Luis Obispo County in 2015–16 had up-to-date immunizations. The percent of kindergarteners with all required immunizations (DTaP, OPV, MMR, Hib, HepB, VZV and PCV) in San Luis Obispo County was 95.6 percent for the 2016-2017 year, up from 89.7 percent in 2015-2016.¹⁴⁵ This is higher than the Healthy People 2020 goal of 80 percent, and the same as the California average of 95.6 percent.

Key to immunizations:

- DTaP: Diphtheria, tetanus, and pertussis (whooping cough)
- OPV: Oral polio vaccine
- MMR: Measles, mumps, rubella (German measles)
- Hib: Haemophilus influenzae, type B
- HepB: Hepatitis B
- VZV: Varicella zoster vaccine (chicken pox)
- PCV: Pneumococcal conjugate vaccine

¹⁴⁵ California Department of Health Services, Immunization Branch. https://archive.cdph.ca.gov/programs/immunize/Documents/2016-17_CA_KindergartenSummaryReport.pdf. Accessed Sept 2017.