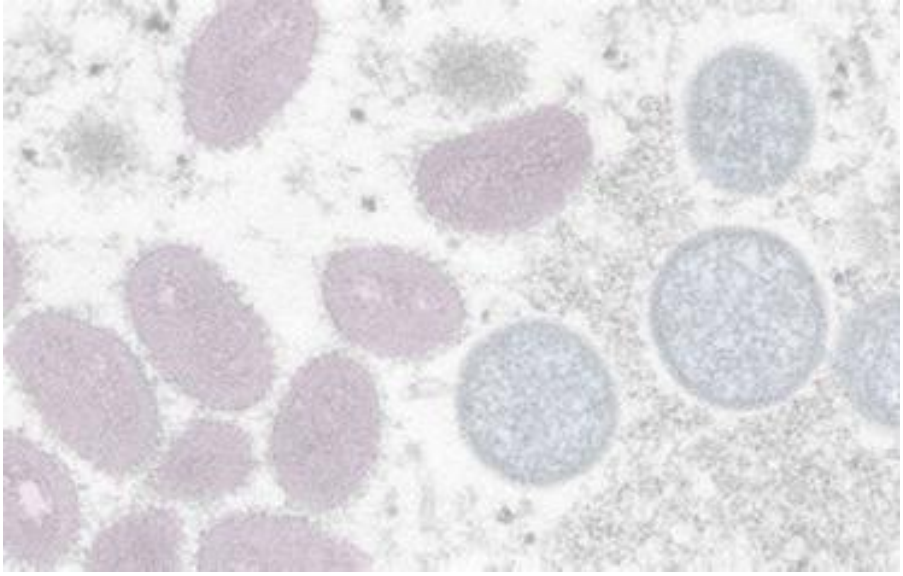


SAN DIEGO COUNTY

Annual Communicable Disease Report 2021

County of San Diego, Health and Human Services Agency
Epidemiology and Immunization Services Branch

SAN DIEGO COUNTY ANNUAL COMMUNICABLE DISEASE REPORT 2021

County of San Diego
Health and Human Services Agency
Public Health Services

For more information:
Epidemiology and Immunization Services Branch
3255 Camino Del Rio South, MS P577
San Diego, CA 92108
619-692-8499
www.sdepi.org

June 2023

ACKNOWLEDGMENTS

Communicable disease surveillance in San Diego County is a collaborative effort among Public Health Services, a department of the County of San Diego Health and Human Services Agency, hospitals, medical providers, laboratories, schools, and the San Diego Health Connect Health Information Exchange. We would like to thank all involved for their contributions to disease reporting.

This report was prepared by Marjorie A. Richardson, MPH, Kimberly A. Morgan, MPH, Whitney Webber, MS, Jacquelyn Ho, MPH, Alana McGrath, MPH, Erin South, MPH, Maci Guzman, MPH, Fatema Sakha, MPH, and Lauren Kearney, MPH.

We would also like to thank the subject matter experts and all other Epidemiology and Immunization Program staff who made contributions to this report.

Asma Al Sabag

Kristen Angel, MPH

Ernie Q. Awa

Carlie Catolico, MPH

Jori Cedillo, MPH

Maria Djuric, BSN, RN, PHN

Torrey Henry, BSN, RN, PHN

Jackie Hopkins, MPH

Fadumo Ismail, BSN, RN, PHN

Jeffrey Johnson, MPH, Chief

Rachel Jonas, BSN, RN, PHN

Annie Kao, PhD, MPH, MS

Mraf Kidane-Mariam, BSN, RN, PHN

Azarnoush Maroufi, MPH

Jennifer A. Nelson, MPH

Seema Shah, MD, MPH, Medical Director

Sarah Stous, MPH

S. Samantha Tweeten, PhD, MPH

Lisa M. Yee, MPH

Live Well San Diego is a regional vision adopted by the San Diego County Board of Supervisors in 2010 that aligns the efforts of County government, community partners and individuals to help all San Diego County residents be healthy, safe, and thriving. The vision includes three components. *Building Better Health,* adopted on July 13, 2010, focuses on improving the health of residents and supporting healthy choices; *Living Safely,* adopted on October 9, 2012, focuses on protecting residents from crime and abuse, making neighborhoods safe, and supporting resilient communities; and, *Thriving,* adopted on October 21, 2014, focuses on cultivating opportunities for all people to grow, connect and enjoy the highest quality of life.

Cover photos: Top left: Centers for Disease Control and Prevention Public Health Image Library. Top right: County of San Diego. All other photos from Canva.com.

TABLE OF CONTENTS

Introduction **1**

Data Sources 1

Communicable Disease Data *1*

Surveillance Case Definitions *2*

Population Data *3*

Disease Information *3*

Methods 3

Organization and Content 4

Number of Cases by Year *5*

Incidence, San Diego County, California, and United States *5*

Cases by Month of Onset *5*

Cases and Rates by Age *5*

Map of Rates by Zip Code *6*

Clinical, Risk, and Laboratory Data *6*

Special Sections *6*

A Special Note on COVID-19 ..... *6*

San Diego County Population **7**

Communicable Disease Summaries **8**

Campylobacteriosis 9

Coccidioidomycosis 11

Cryptosporidiosis 13

Dengue Virus Infection 15

Encephalitis 16

Giardiasis 18

Hepatitis A 21

Hepatitis B 23

Hepatitis B, Acute *24*

Perinatal Hepatitis B Infections *24*

Hepatitis B, Chronic *25*

Hepatitis C, Chronic 26

TABLE OF CONTENTS

Legionellosis 28
Listeriosis 30
Lyme Disease 32
Malaria 34
Measles (Rubeola) 36
Meningitis 37
Meningococcal Disease 39
Mumps 40
Pertussis 41
Salmonellosis 43
Shiga toxin-Producing *E. coli* 46
Shigellosis 48
Typhoid Fever 51
Vibriosis 52

Influenza Season Summary, 2021-22 54
Outbreaks, 2021 57
Norovirus Outbreaks, 2021-22 58
Demographics by Disease 60
Zip Codes by HHSA Service Region 64
Resources 65

INTRODUCTION

The purpose of this report is to provide an overview of select communicable diseases in San Diego County in 2021. It is intended to serve as a resource for the medical community and to inform the general public.

The Epidemiology and Immunization Services Branch (EISB) in Public Health Services (PHS), a department of the County of San Diego Health and Human Services Agency (HHSA), is responsible for registering, investigating, and monitoring reports of numerous communicable diseases, with the goals of preventing morbidity and mortality and protecting the health of the community. Important components of meeting these goals are interviewing case-patients and taking direct public health action as a result. Equally important, however, is using the data collected via the reports and interviews to describe the characteristics of cases and review trends over time. This type of analysis may help detect outbreaks and suggest additional, population-based public health prevention and control measures.

This report includes descriptive summaries highlighting 23 diseases that are commonly reported or are of particular public health interest. Also included are an influenza season summary and an outbreak investigation summary. Diseases investigated by other PHS branches or programs are not covered in this report. HIV disease reports are managed by the HIV Epidemiology Unit; sexually transmitted disease (chlamydia, gonorrhea, syphilis, chancroid, pelvic inflammatory disease) reports are managed by the HIV, STD, and Hepatitis Branch; and tuberculosis reports are managed by the Tuberculosis Control and Refugee Health Branch. Data related to these diseases can be found on their respective websites. Case counts for all diseases monitored by PHS are available in a Five-Year Table of Reportable Diseases and Conditions on the Epidemiology Program Statistics and Reports website.

Data Sources

Communicable Disease Data

Title 17, California Code of Regulations (CCR), requires that health care providers (Sections 2500, 2593, 2641.5-2643.20, 2800-2812, and 2593) report over 80 diseases and conditions, as well as the occurrence of any unusual disease, and outbreaks of any disease, to the local health department. Health care providers, as defined by Section 2500, can include physicians, surgeons, veterinarians, podiatrists, nurse practitioners, physician assistants, registered nurses, nurse midwives, school nurses, infection control practitioners, medical examiners, coroners, and dentists. Laboratories are also required to report certain communicable diseases (Section 2505). Local health departments may make additional diseases locally reportable. Not all diseases and conditions reportable at the state or local level are nationally notifiable. For a current list of

locally reportable diseases and conditions, refer to pages 2-4 of the Confidential Morbidity Report. The list of reportable diseases and conditions is subject to change.

EISB enters the information from these reports, as well as information gathered during public health follow-up, into a local surveillance system. The San Diego County disease data presented in this report come from this local surveillance system.

Communicable disease data collected by EISB are reported to the California Department of Public Health (CDPH), and CDPH, in turn, reports cases to the Centers for Disease Control and Prevention (CDC). CDPH produces annual disease summaries, aggregating data from the 61 local health departments in the state. National data are made available each week and in annual summaries through the CDC Wonder website. State and national disease data for this report were obtained from these sources. Final California and United States data for select diseases in 2021 were not available at the time of publication of this report; preliminary data were used when available. See *Resources* at the end of this document.

Communicable disease data are subject to some limitations. The number of cases reported to the local health department is likely an underestimate of the true burden of disease in the community. This can be due to several factors. Diseases that are asymptomatic or have less severe symptoms may be underreported as individuals may not present to a provider for care. Additionally, providers who are unaware of legal requirements may fail to report cases to the health department. This effect may be mitigated by dual-reporting laws in California, which also require reporting by laboratories. Many laboratories have automated reporting systems in place. However, providers may not order diagnostic tests, and for some diseases, diagnosis is based on clinical findings rather than laboratory tests.

Completeness of demographic data, such as race and ethnicity, may also vary by disease. While all diseases in this report are monitored by the health department, some require additional follow-up and investigation. Diseases that are investigated have more complete demographic information because interviews with case-patients provide opportunities to obtain additional information that may not have been provided in the original reports.

The data presented in this report are provisional as changes may occur due to late reporting or updated case information.

Surveillance Case Definitions

Except where otherwise noted in the disease-specific sections of this report, cases are classified based on the CDC/Council of State and Territorial Epidemiologists (CDC/CSTE) surveillance

case definitions. Case criteria are national standards that allow for comparisons across jurisdictions. Cases can be defined based on a combination of clinical criteria and laboratory criteria. Case definitions are reviewed regularly and are subject to change, which can affect case counts. Links to case definitions are listed in the "For more information" box of each disease-specific section as applicable.

Population Data

Population estimates of San Diego County residents, used in the calculation of rates of disease incidence, were obtained from annual population estimates provided by the San Diego Association of Governments (SANDAG). SANDAG's methodology is described on their website. The 2021 SANDAG estimates were used for calculating rates for demographic and geographic groups (e.g., age, zip code).

When sources for national and statewide data provided case counts but not incidence rates, rates were calculated using United States and California population estimates obtained from the United States Census Bureau American Community Survey website. Information on the Census Bureau population estimate methodology is available on their website.

Disease Information

Each disease-specific section includes information on the infectious agent, incubation period, mode of transmission, and symptoms. Most of this disease information was obtained from the Diseases and Conditions pages of the CDC website and the *Control of Communicable Diseases Manual*. The CDC *Epidemiology and Prevention of Vaccine-Preventable Diseases*, also known as the "Pink Book," was used as an additional source of information. Links to the CDC website corresponding to the disease of interest, as well as links to relevant chapters of the "Pink Book," are included in the "For more information" box of the disease-specific pages in this report.

Methods

The analyses presented in this report are descriptive and include counts, proportions, and rates. These measures are presented for several different groups: for San Diego County overall, by time period (year, month), by age group, and by zip code of residence.

Most rates presented are incidence rates. Incidence is a measure of the number of new cases of disease in a population within a given time period (in this report, a year). For a few chronic conditions (e.g., chronic hepatitis B, chronic hepatitis C, coccidioidomycosis), where it may not be known when the infection was acquired, the rates could more realistically be described as report rates. All rates are calculated per 100,000 population for ease of comparison. None of the rates are age-adjusted. Rates are generally not calculated for counts below five, and rates should be

interpreted with caution when counts are below 20. When counts are small, even small changes in the count can cause large changes in the rate, producing unstable rates. The San Diego County rates tend to vary more from year to year than the California and United States rates, which are based on larger overall numbers.

Most of the data included in this report are presented by CDC disease year, rather than calendar year. CDC uses disease years, with numbered weeks, for ease of comparing data from year to year. These weeks run from Sunday to Saturday. The disease year may differ by a few days from the calendar year. For example, disease year 2021 began on 1/3/2021 and ended on 1/1/2022.

San Diego County groups cases on the basis of the "episode date," which is the earliest available of onset, laboratory specimen collection, diagnosis, death, and report received dates. California also uses "episode date" to group cases. When reporting to CDC, states can choose which of several dates to use for grouping cases into weeks. This may vary from state to state and condition to condition. The only national data presented in this report are annual data, so these differences are less likely to be noticeable. Unless otherwise noted, the San Diego County data in this report are presented by disease year based on episode date.

Analysis was done using SAS software, Version 9.4. Copyright © 2002-2012 SAS Institute Inc. SAS and all other SAS registered trademarks of SAS Institute Inc., Cary, NC, USA. Maps were created using ArcPro 2.8. Copyright © 2021 Environmental Systems Research Institute, Inc.

Organization and Content

The report begins with a section giving an overview of the San Diego County population. This section presents SANDAG population estimates grouped into the same demographic categories used throughout the report; it provides context for the data presented in the disease sections. The individual disease sections follow, with one-to-three page summaries of 23 diseases, listed in alphabetical order. These are followed by an influenza season summary and an outbreak summary. Near the end of the report are demographic tables including counts by gender, age group, race/ethnicity, and HHSA service region for each disease highlighted in this report. The counts are included in these tables regardless of whether the subgroup counts were sufficient to display graphically in the disease sections. Finally, additional information, including zip codes by HHSA service region, reportable diseases and conditions, and resources are included at the end of the document.

The content and layout of the disease sections vary somewhat based on disease characteristics and case volume. However,

there are some common components. All sections begin with some basic "Disease Info": infectious agent, incubation, mode of transmission, and symptoms. Other common components include a "Key Points" box, which includes summary bullets of the data presented, and a "For more information" box, which includes links to websites (usually CDC, CDPH, and, when available, San Diego County) where readers can find more in-depth information about the disease, as well as the CDC/CSTE case criteria. These websites are also the primary sources for the disease information presented. Each section also contains "Notes" with additional details about case criteria, how long the disease has been reportable, caveats, and any other information necessary to understand the data presented.

Below are descriptions of the graphs and tables that may appear in the disease sections.

Number of Cases by Year

Each disease section features a bar graph with case count trends over time. The number of years included depends on when the disease became reportable and the number of years of reliable data in the San Diego County disease registry.

Incidence, San Diego County, California, and United States

Incidence rates per 100,000 population for 2017-2021 are presented in line graphs, which are included in most disease sections. These graphs compare incidence in San Diego County to incidence in California and the United States. National data may be omitted if the disease is not nationally notifiable. The graph may not be included at all if five years of data are not available or if neither California nor United States data are available. Incidence rates are calculated for San Diego County even if case counts are low. However, when case counts are low, rates should be considered unstable and interpreted with caution; they may vary considerably from year to year.

Cases by Month of Onset

This graph, included in most disease sections, displays case counts by month for 2021 as bars, compared to a line showing the average count by month over the previous three years. While all other data in this report are presented by CDC disease year, this graph presents the data by calendar year, grouped by "episode date" (see *Methods* for a definition of "episode date"). Usually, this will be the onset date, but in cases where onset date is unavailable (e.g., no interview with the case-patient was completed) or where the case is asymptomatic, another date is used. Which date is used most frequently may vary by disease. This graph may not be included if there are insufficient cases.

Cases and Rates by Age

Counts and rates by age group are presented using a bar and line graph. Case counts for six age groups (0-4 years, 5-14 years, 15-24 years, 45-64 years, and 65+

years) are displayed as bars, compared to a line showing the rates per 100,000 population by age group. When case counts are very low, this graph is not included. If counts are less than five across all age groups, rates are not calculated and only counts by age group are presented. When some of the age group counts are five or above, but others are below five, rates are presented for all groups. However, the rates for groups with low counts should be considered unstable and interpreted with caution.

Map of Rates by Zip Code

Choropleth maps display the rate per 100,000 population by zip code of residence at the time of report. The zip code of residence may not be the location where a person was exposed. In the case of chronic conditions, it also may not be the residence at time of diagnosis. Rates are calculated for each zip code with at least five cases. These are displayed using a color scheme where darker colors represent higher rates. Maps are only included when enough zip codes have case counts of at least five. A limited number of maps are presented. Whenever possible, maps include only 2021 data, but in some instances, multiple years of data are aggregated in order to allow for a geographic display.

Clinical, Risk, and Laboratory Data

Whenever possible, clinical and risk data are presented. Generally, this requires sufficient case counts to make a summary of clinical or risk data possible and meaningful. Data must also be available, which may not be the case for diseases where an interview of case-patients is not conducted. In some cases, laboratory data are also included (e.g., etiology of meningitis cases). The specific variables summarized, as well as how the data are presented, depend on the characteristics of the disease and what information is available. Clinical, risk, and laboratory data are variously presented using tables, graphs, and infographics. When case counts are low and graphic representation is not possible, some clinical or risk data may be summarized in the "Key Points."

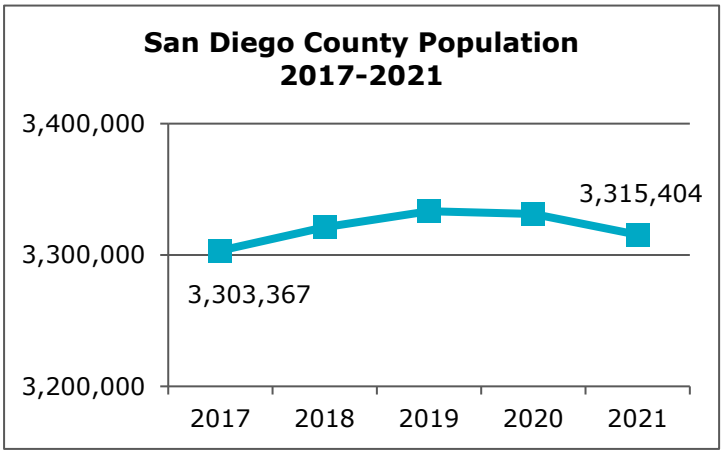
Special Sections

The influenza season summary and the outbreak summaries are organized differently. The influenza season summary and norovirus and influenza outbreak summaries present data by fiscal year, focusing on fiscal year 2021-22. This convention better illustrates the seasonal nature of influenza and norovirus, both of which peak during the winter months. An overall outbreak summary covering all outbreaks investigated by EISB in 2021 is also included.

A Special Note on COVID-19

Information on COVID-19 is excluded from this report but can be found on the County dashboard. Case counts for other diseases in 2020 likely decreased due to the COVID-19 pandemic.

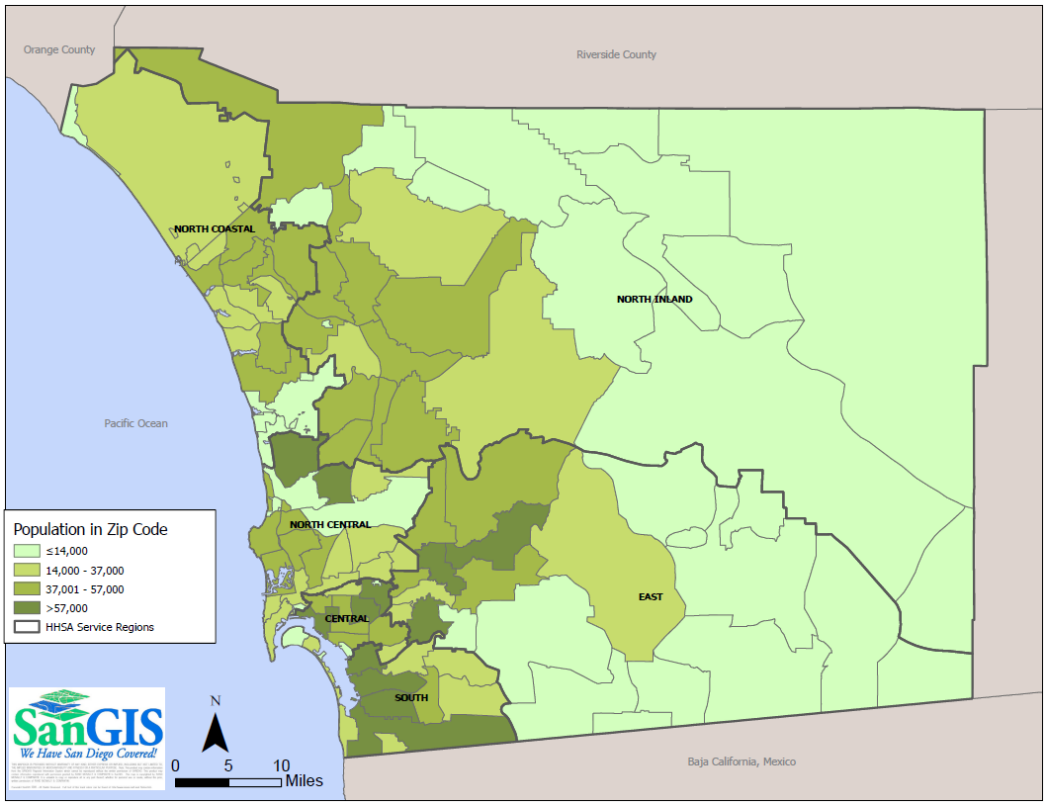
SAN DIEGO COUNTY POPULATION



HHSA Regions, 2021	Population	Percent
Central	662,645	20.0
East	472,916	14.3
North Central	662,645	20.0
North Coastal	557,393	16.8
North Inland	602,627	18.2
South	502,911	15.2
Total County Population	3,315,404	100.0

Demographics, 2021	Population	Percent
Gender		
Female	1,643,889	49.6
Male	1,671,515	50.4
Age		
0-4 years	197,646	6.0
5-14 years	454,515	13.7
15-24 years	492,305	14.9
25-44 years	843,948	25.5
45-64 years	797,924	24.1
65+ years	529,066	16.0
Race/Ethnicity		
American Indian or Alaska Native	15,000	0.5
Asian	350,737	10.6
Black	158,351	4.8
Hispanic	1,137,461	34.3
Native Hawaiian/Pacific Islander	14,424	0.4
White	1,518,497	45.8
Other	7,517	0.2
Two or More Races	113,417	3.4

San Diego County Population by Zip Code, 2021



Source:

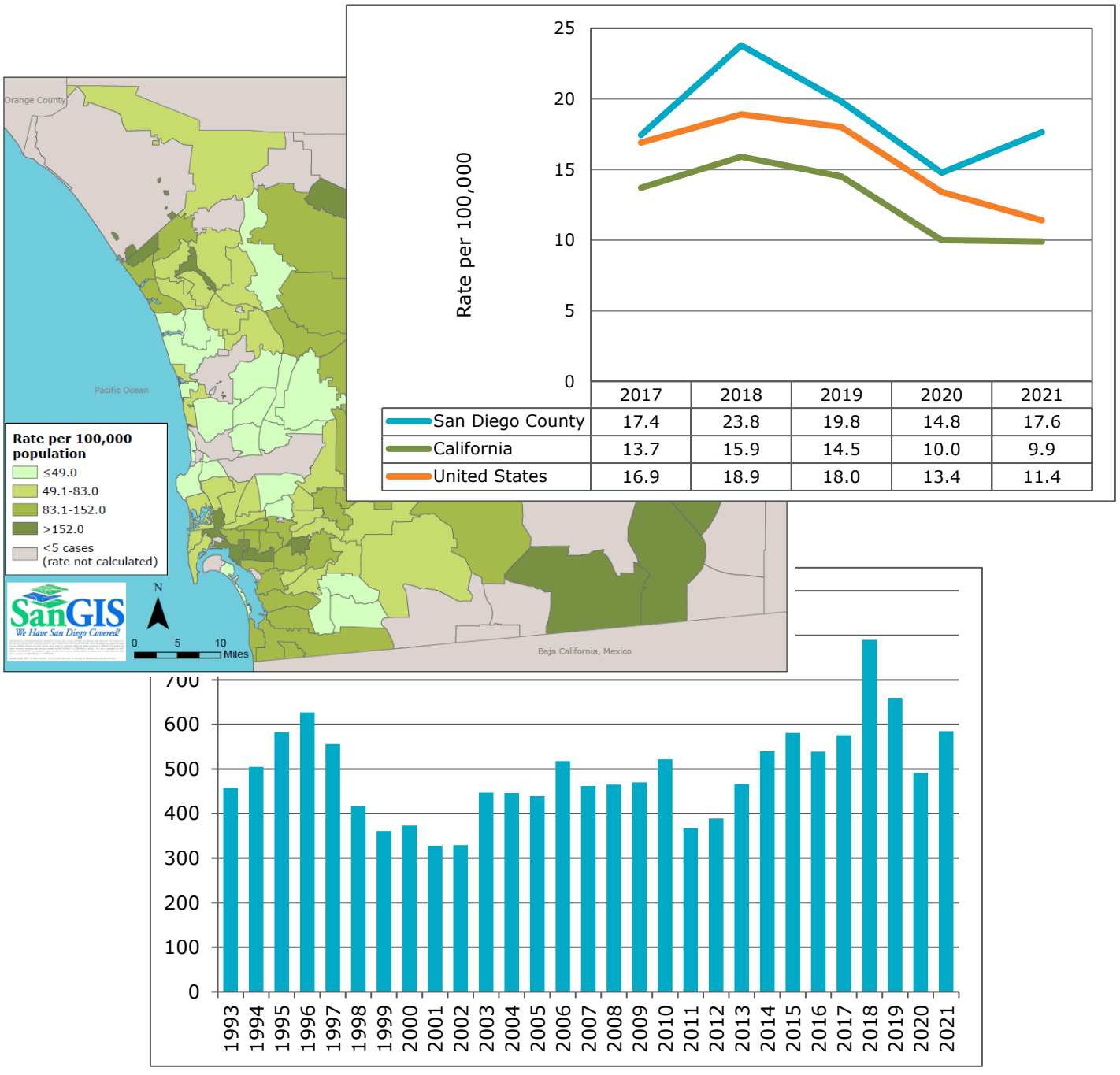
SANDAG population estimates, prepared July 2021. For more information on population estimates, including methodology, see www.sandag.org.

Notes:

1. Race/ethnicity combines two variables collected separately, race and ethnicity. Persons of any race with Hispanic ethnicity are included in the Hispanic category. The other categories are non-Hispanic.
2. Population estimates by Health and Human Services Agency (HHSA) service regions are based on zip code of residence. See *Zip Codes by HHSA Service Region* at the end of the document.

COMMUNICABLE DISEASE SUMMARIES

The following individual disease sections, listed alphabetically, are one-to-three page summaries that provide information and data about each disease using text, tables, and graphs. These descriptive summaries highlight 23 diseases that are commonly reported or are of particular public health interest.

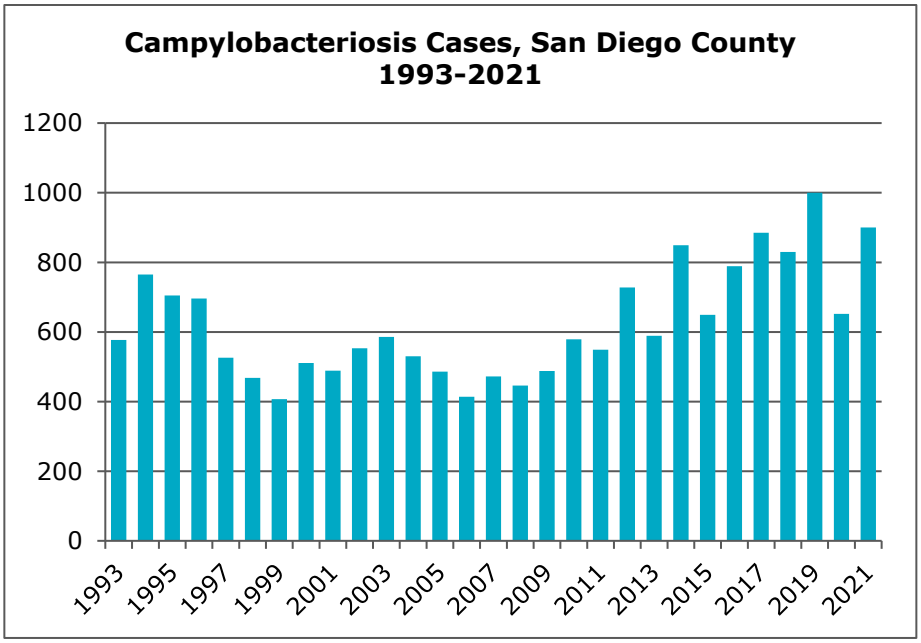


CAMPYLOBACTERIOSIS

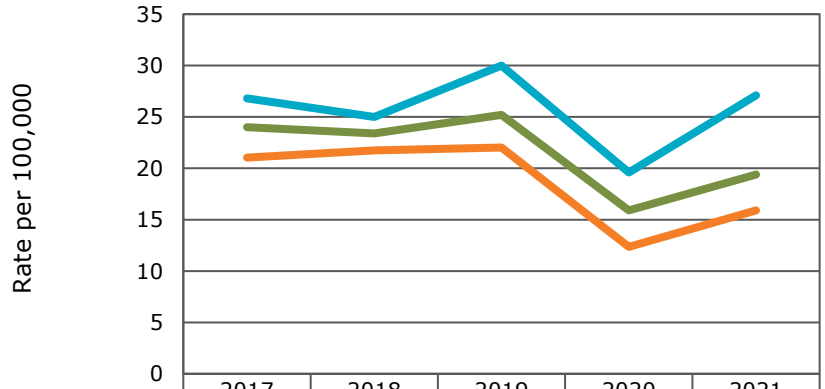
Disease Info

Infectious agent: *Campylobacter* bacteria, most often *C. jejuni*
Incubation: Usually 2-5 days, range 1-10 days
Mode of transmission: Ingestion of raw or undercooked poultry, unpasteurized milk products, or other contaminated food/beverages; contact with an infected animal; rarely person-to-person via fecal-oral route
Symptoms: Diarrhea, sometimes bloody; abdominal cramps; fever; nausea; vomiting; may be asymptomatic

Campylobacteriosis Cases, San Diego County 1993-2021



Campylobacteriosis Incidence, San Diego County, California, and United States, 2014-2021



	2017	2018	2019	2020	2021
San Diego County	26.8	25.0	30.0	19.6	27.1
California	24.0	23.4	25.2	15.9	19.4
United States	21.0	21.7	22.0	12.4	15.9

Key Points

- There were 900 campylobacteriosis cases reported among San Diego County residents in 2021. Counts have been higher in recent years, possibly related to increased use of culture-independent diagnostic testing (CIDT) methods.
- After a likely pandemic-related decrease in 2020, the San Diego County incidence rate rebounded to 27.1 per 100,000 population in 2021. California incidence was lower at 19.4. Since campylobacteriosis became nationally notifiable in 2015, county and state incidence rates have been consistently higher than national rates.
- Although campylobacteriosis cases are most common during the summer and early fall in San Diego County, cases peaked in May in 2021.
- Although the highest case counts are among adults aged 25-64 years, the rate of infection is highest among young children under 5 years of age (39.0 per 100,000 population).
- Zip codes with higher incidence of campylobacteriosis can be found in many areas of the county.

For more information:

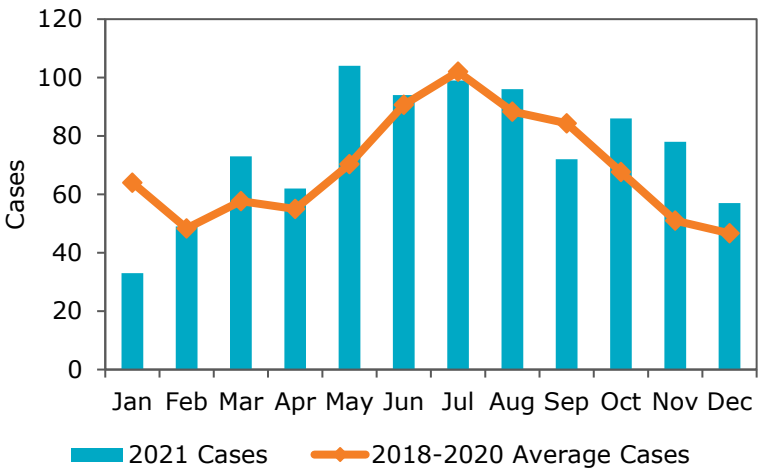
- Centers for Disease Control and Prevention (CDC) *Campylobacter* website
- CDC/CSTE Campylobacteriosis Case Definition
- California Department of Public Health (CDPH) Campylobacteriosis website
- CDPH Food and Drug Branch Food Safety Program website

Notes:

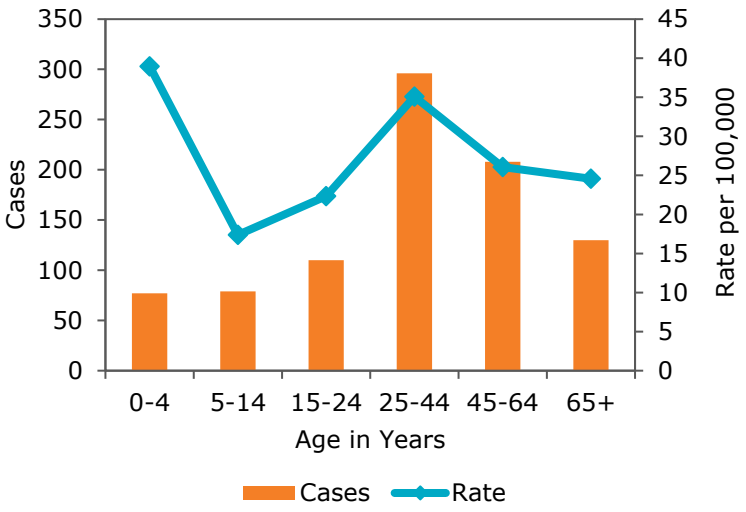
1. Counts include confirmed and probable cases following the CDC/CSTE case criteria.
2. Campylobacteriosis has been nationally notifiable since 2015.
3. The Epidemiology Program tracks but does not investigate most campylobacteriosis cases; clinical and epidemiological information is not available for San Diego County cases.

CAMPYLOBACTERIOSIS

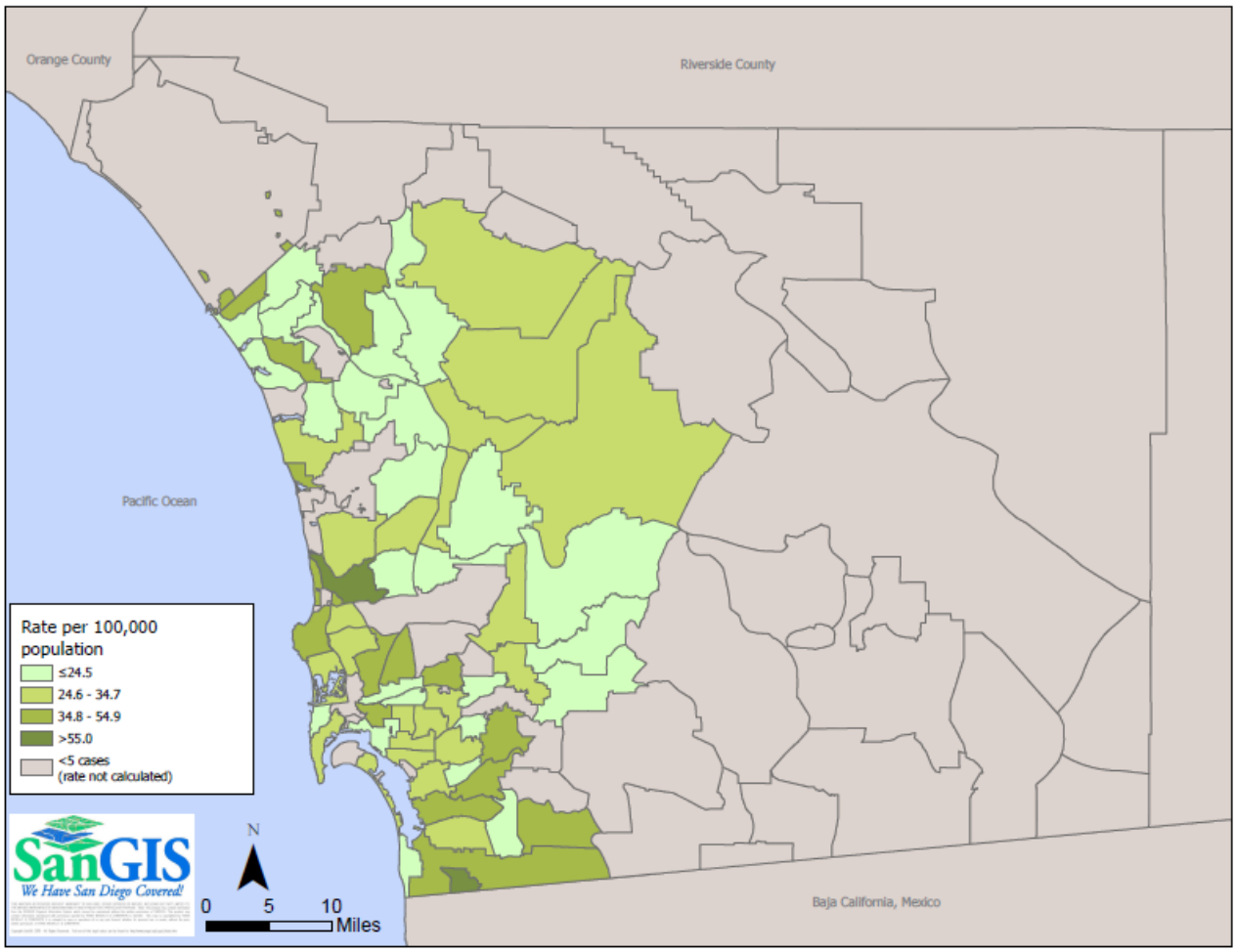
Campylobacteriosis Cases by Month of Onset, San Diego County, 2021



Campylobacteriosis Cases and Rates by Age, San Diego County, 2021



Campylobacteriosis Rates by Zip Code, San Diego County, 2021

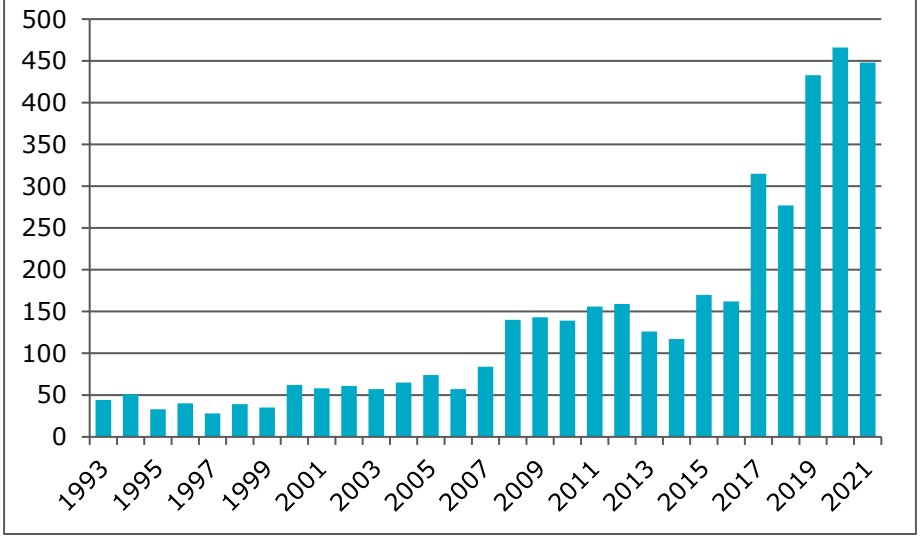


COCCIDIOIDOMYCOSIS

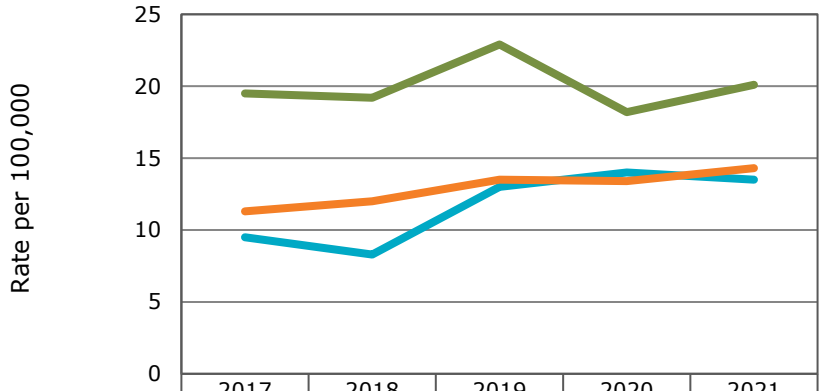
Disease Info

Infectious agent: *Coccidioides immitis* and *Coccidioides posadasii*, fungi
Incubation: Range 1-3 weeks
Mode of transmission: Inhalation of fungal spores from soil or airborne dust
Symptoms: Fatigue, cough, fever, shortness of breath, headache, night sweats, muscle aches or joint pain, rash; in rare instances, disseminated disease involves skin and soft tissues, bones, joints, or central nervous system. Disease can be acute or chronic. Approximately 60% of infections are asymptomatic.

Coccidioidomycosis Cases, San Diego County 1993-2021



Coccidioidomycosis Incidence, San Diego County, California, and United States, 2017-2021



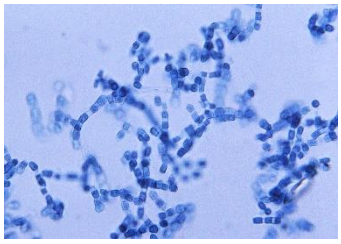
	2017	2018	2019	2020	2021
San Diego County	9.5	8.3	13.0	14.0	13.5
California	19.5	19.2	22.9	18.2	20.1
United States	11.3	12.0	13.5	13.4	14.3

Key Points

- A total of 448 coccidioidomycosis cases were reported among San Diego County residents in 2021. Case counts increased sharply starting in 2017 and continued to increase and remain high through 2021. This increase may be attributed to changes in a combination of factors related to the environment, human activity, and diagnostics. Starting in 2019, there was a case definition change that confirmed cases based on laboratory criteria only.
- In 2021, the incidence rate was lower in San Diego County (13.5 per 100,000) compared to California (20.1 per 100,000) and the United States (14.3 per 100,000).
- In 2021, the onset of disease for over half (55.3%) of acute coccidioidomycosis cases occurred during the months of January, February, November, and December.
- Incidence rates were highest among older age groups. The incidence rate among 45-64 year olds was 23.3 per 100,000 population; the incidence rate among persons ages 65 years and over was 31.4 per 100,000 population.
- Incidence rates of coccidioidomycosis are highest in the southern part of the county.

For more information:

- Centers for Disease Control and Prevention (CDC) Coccidioidomycosis website
- California Department of Public Health (CDPH) Coccidioidomycosis website
- CDC/CSTE Coccidioidomycosis Case Definition
- CDPH Guidance for Management of Coccidioidomycosis

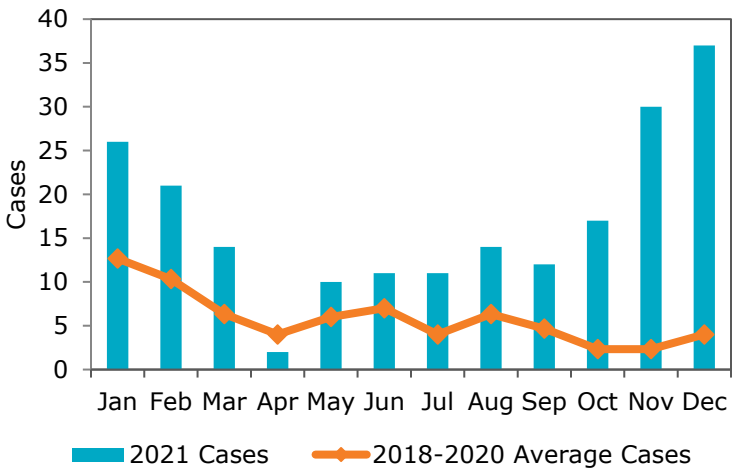


Photomicrograph of *Coccidioides* (environmental form).

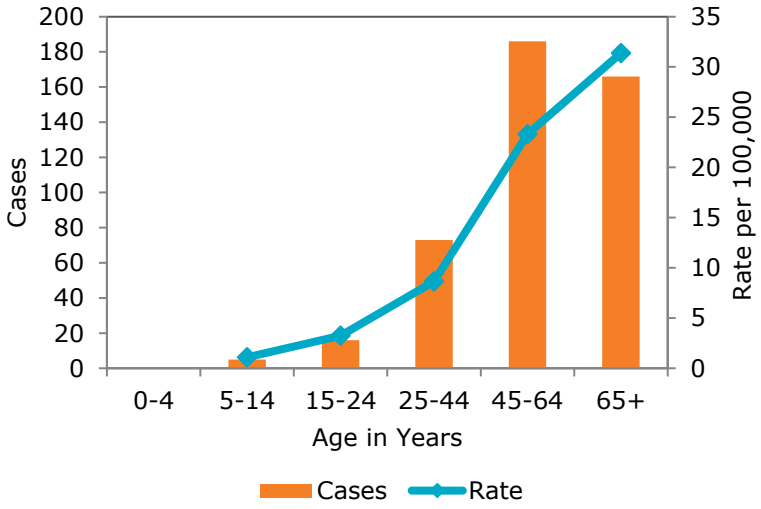
Content from: CDC/Dr. Lucille K. Georg, CDC Public Health Image Library

COCCIDIOIDOMYCOSIS

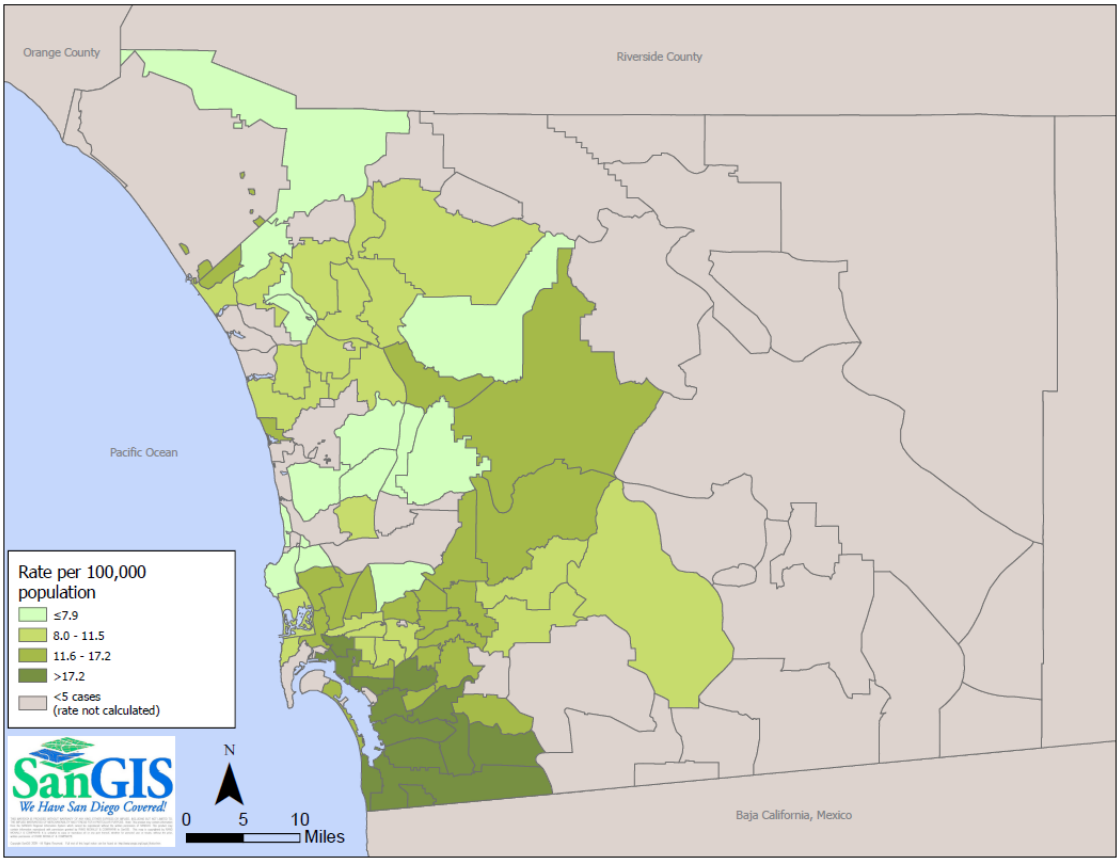
Acute Coccidioidomycosis Cases by Month of Onset, San Diego County, 2021



Coccidioidomycosis Cases and Rates by Age, San Diego County, 2021



Coccidioidomycosis Rates by Zip Code of Residence, San Diego County, 2019-2021



Cases indicating a detention facility as the address of residence are excluded from the calculation of rates by zip code.

Notes:

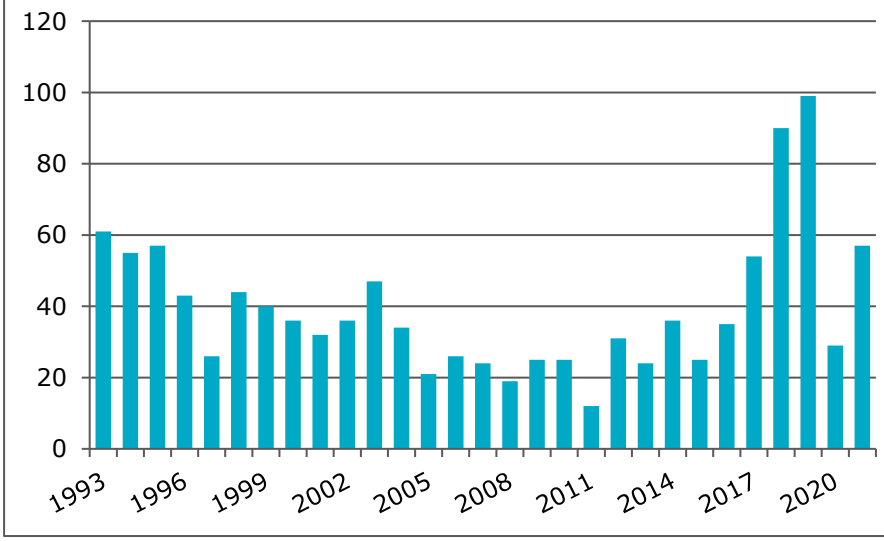
1. Counts include confirmed cases (acute and chronic) following the CDC/CSTE case criteria. Coccidioidomycosis became nationally reportable in 1995.
2. Case criteria were revised in 2008, removing the requirement for a rising titer for coccidioidal immunoglobulin G results. Starting in January 2019, confirmed cases were classified according to the California Department of Public Health case definition requiring laboratory confirmation only with no clinical criteria. Nationally, clinical criteria are still required.
3. Date of symptom onset is available for acute cases (n=206) in 2021.
4. San Diego County reports case counts to CDPH. CDPH deduplicates reported cases from across the state. San Diego County works with CDPH to align case counts by removing cases previously reported in another jurisdiction. Differences may still exist between CDPH and county counts at any point in time.

CRYPTOSPORIDIOSIS

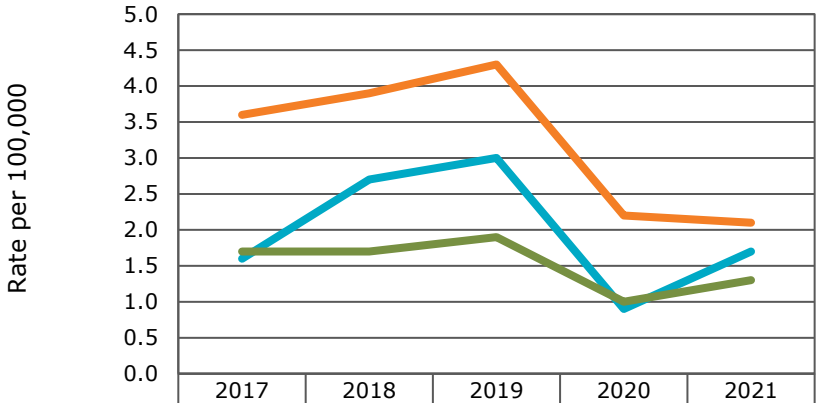
Disease Info

Infectious agent: *Cryptosporidium* parasites, most frequently *C. parvum* or *C. hominis*
Incubation: Usually about 7 days, range 1-12 days
Mode of transmission: Fecal-oral route; person-to-person, food or water contaminated by feces, exposure to recreational water
Symptoms: Watery diarrhea, abdominal cramps, nausea, vomiting, dehydration, fever; people with compromised immune systems may experience more serious illness

Cryptosporidiosis Cases, San Diego County 1993-2021



Cryptosporidiosis Incidence, San Diego County, California, and United States, 2017-2021



	2017	2018	2019	2020	2021
San Diego County	1.6	2.7	3.0	0.9	1.7
California	1.7	1.7	1.9	1.0	1.3
United States	3.6	3.9	4.3	2.2	2.1

Key Points

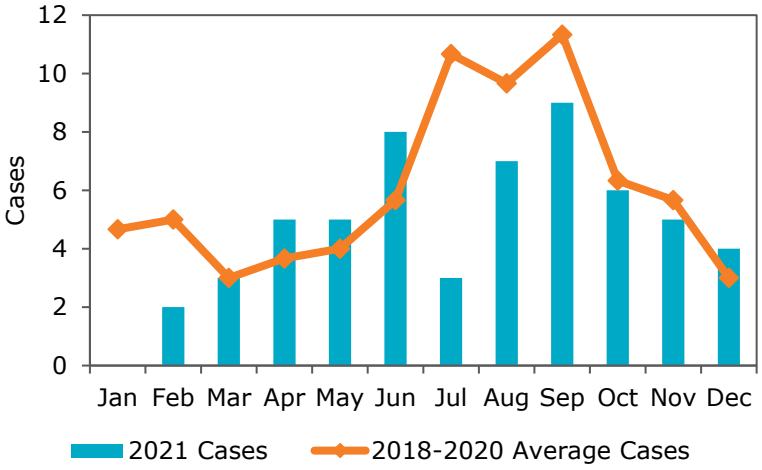
- There were 57 reported cases of cryptosporidiosis among San Diego County residents in 2021, about twice as many cases as in 2020.
- The national incidence rate of cryptosporidiosis dropped to 2.2 per 100,000 population in 2020 and remained steady at 2.1 in 2021. California incidence rates dropped in 2020, and also held steady at 1.3 per 100,000 population in 2021, while San Diego County initially dropped to 0.9 in 2020 and rebounded to 1.7 per 100,000 in 2021.
- San Diego County cases peaked during September 2021. Cryptosporidiosis cases are most commonly seen during the summer months.
- The highest cryptosporidiosis case count and rate in 2021 were among 25-44 year olds (2.7 per 100,000).
- All San Diego County residents infected with cryptosporidiosis in 2021 had diarrhea. Other common symptoms, reported by more than 50% of case-patients, were abdominal pain and nausea.
- Approximately 26% of cases were immune compromised and approximately 26% were hospitalized. Those who were immune compromised were more likely to be hospitalized—64% compared to 13% of the immunocompetent.

For more information:

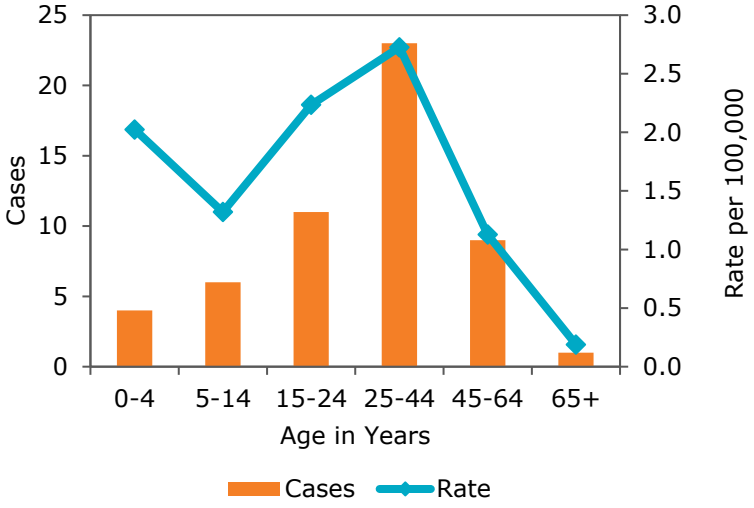
- Centers for Disease Control and Prevention (CDC) Cryptosporidiosis website
- CDC Healthy Water website
- CDC Health Information for International Travel (the Yellow Book) – Cryptosporidiosis
- CDC/CSTE Cryptosporidiosis Case Definition
- California Department of Public Health (CDPH) Cryptosporidiosis website

CRYPTOSPORIDIOSIS

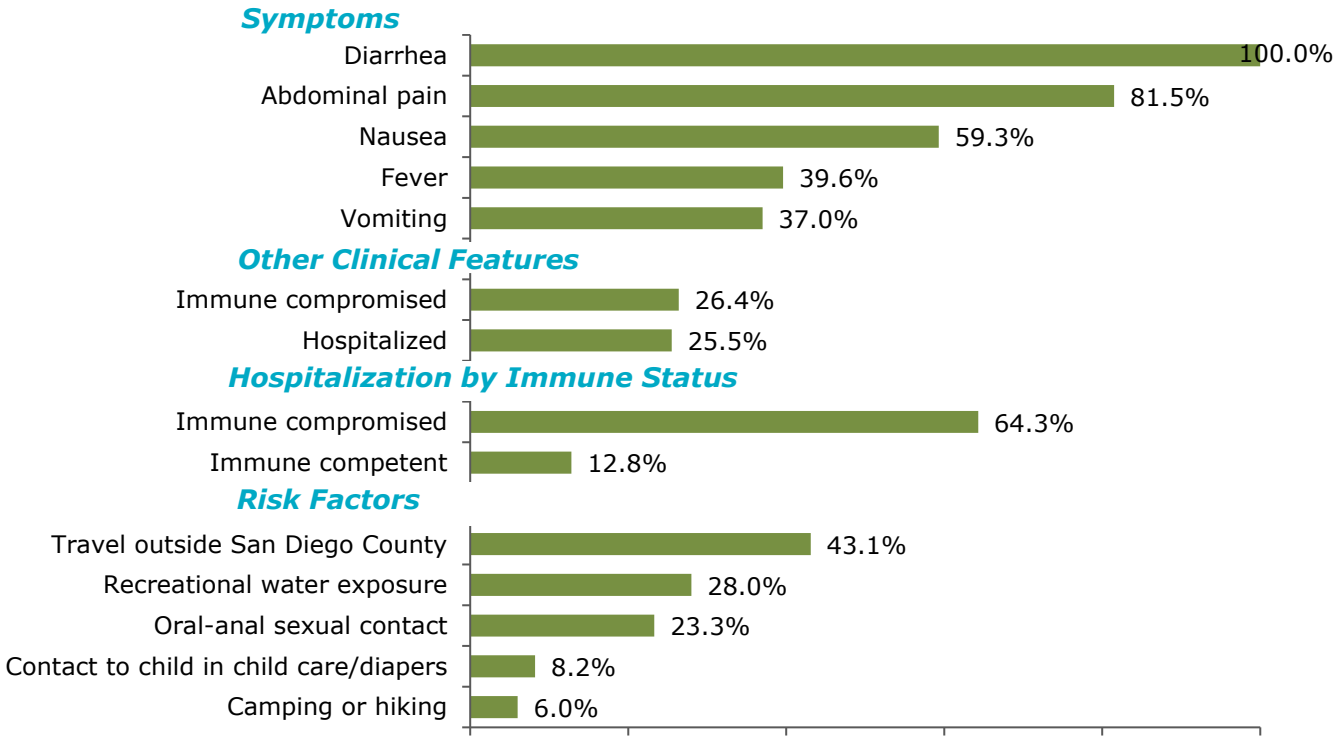
Cryptosporidiosis Cases by Month of Onset, San Diego County, 2021



Cryptosporidiosis Cases and Rates by Age, San Diego County, 2021



Clinical and Risk Characteristics Reported by Cryptosporidiosis Case-Patients, San Diego County, 2021



Notes:

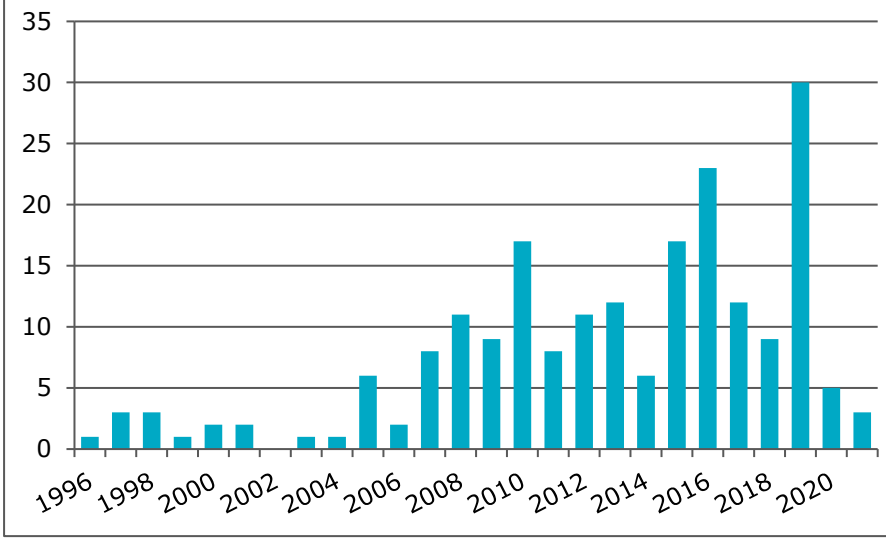
1. Counts include confirmed and probable cases following the CDC/CSTE case criteria.
2. Cryptosporidiosis has been nationally notifiable since 1995.
3. Denominators for clinical and risk characteristics calculations are cases with available information, ranging from 43-54 of 57 total cases. Fifty-three cases had complete information for both hospitalization and immune status; different denominators are used for calculation of these percentages. Risk factors are potential exposures mentioned by case-patients, not confirmed sources of infection.

DENGUE VIRUS INFECTION

Disease Info

Infectious agent: Four closely related dengue virus serotypes (DENV1-4), flaviviruses
Incubation: Usually 4-7 days, range 3-14 days
Mode of transmission: Bite of an infected *Aedes* mosquito, primarily *Aedes aegypti* and *Aedes albopictus*
Symptoms: Fever, headaches, eye pain, joint pain, muscle pain, rash, minor bleeding, nausea and vomiting; the more severe, hemorrhagic form of disease may result in shock, fluid accumulation, and respiratory distress

Dengue Cases, San Diego County 1996-2021



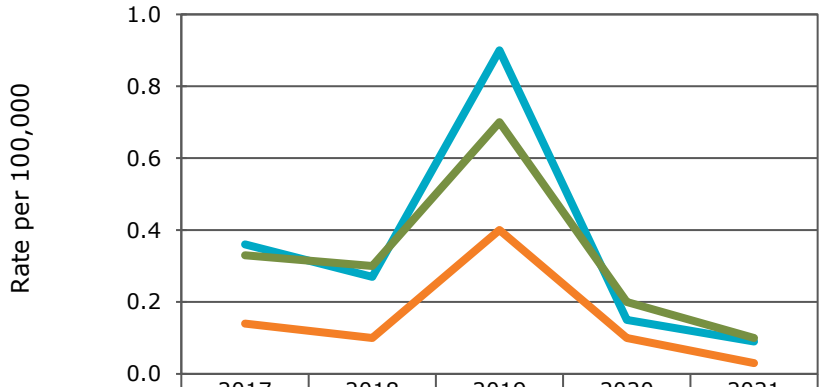
Key Points

- There were 3 cases of dengue virus infection among San Diego County residents in 2021.
- Dengue is not endemic in San Diego County. Although invasive *Aedes* mosquitos have been detected in the county, all 3 cases in 2021 were acquired during travel to Mexico and India.
- In 2021, dengue case-patients ranged in age from 18 to 39 years.
- The most common symptoms were fever and chills, reported by 100% of San Diego County case-patients.

Notes:

1. Counts include confirmed and probable cases following the CDC/CSTE case criteria.
2. Dengue has been nationally notifiable since 2010.
3. Due to the COVID-19 pandemic, decreased travel may have contributed to smaller case numbers in 2020 and 2021.

Dengue Incidence, San Diego County, California, and United States, 2017-2021



	2017	2018	2019	2020	2021
San Diego County	0.4	0.3	0.9	0.2	0.1
California	0.3	0.3	0.7	0.2	0.1
United States	0.1	0.1	0.4	0.1	0.03

For more information:

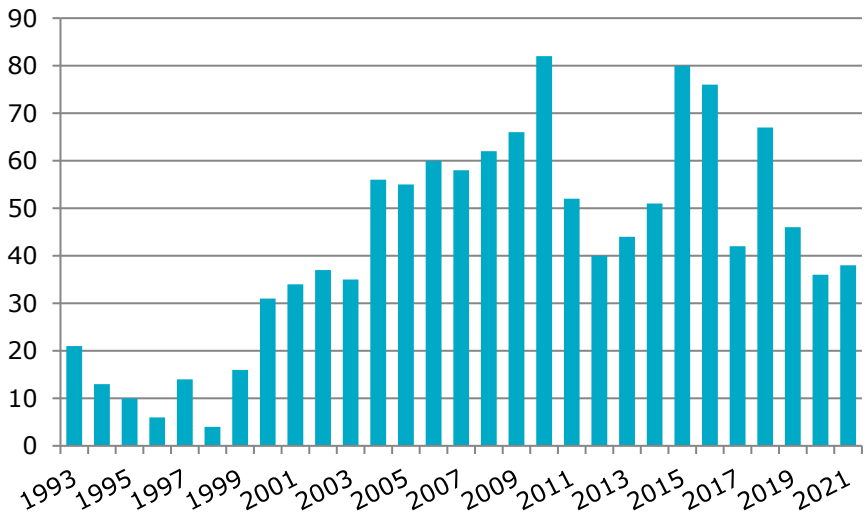
- Centers for Disease Control and Prevention (CDC) Dengue website
- CDC Health Information for International Travel (the Yellow Book) – Dengue
- CDC/CSTE Dengue Case Definition
- California Department of Public Health (CDPH) Dengue website
- CDPH Aedes Aegypti and Aedes Albopictus Mosquitos website
- County of San Diego Department of Environmental Health Invasive Aedes Mosquitoes website
- World Health Organization Dengue website

ENCEPHALITIS

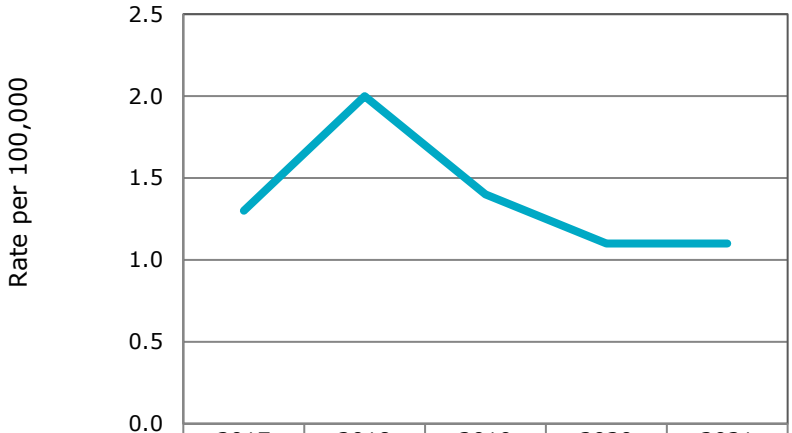
Disease Info

Infectious agent: Causes of encephalitis include viruses, bacteria, fungus, and parasites; the etiology is often not identified
Incubation: Depends on the agent
Mode of transmission: Depends on the agent
Symptoms: Sudden onset of fever, headache, vomiting, sensitivity to light, stiff neck and back; more severe cases can develop problems with speech or hearing, vision problems, and hallucinations; can progress to loss of consciousness, seizures, muscle weakness, or sudden severe dementia

Encephalitis Cases, San Diego County 1993-2021



Encephalitis Incidence, San Diego County, 2017-2021

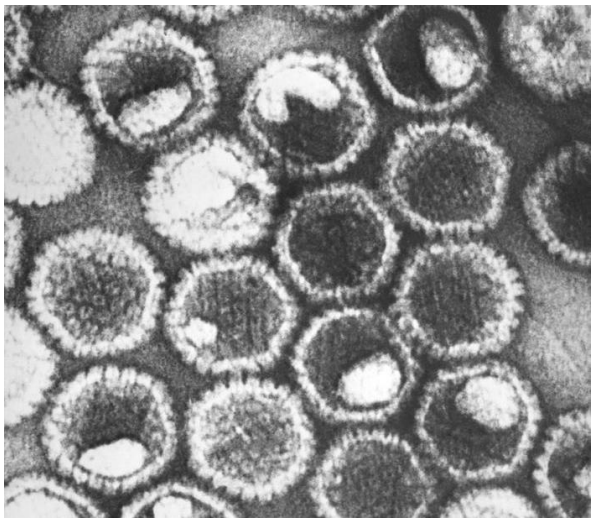


	2017	2018	2019	2020	2021
San Diego County	1.3	2.0	1.4	1.1	1.1

US and CA incidence data are not available. Encephalitis is not nationally reportable.

Key Points

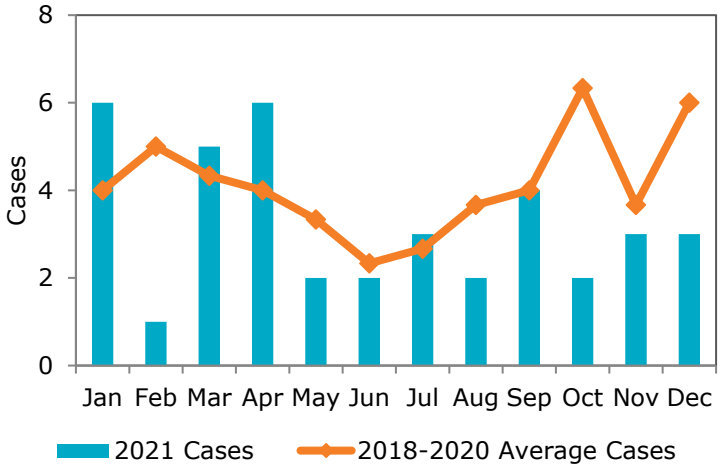
- In 2021, 38 cases of encephalitis were reported among residents of San Diego County.
- The incidence rate of encephalitis in San Diego County in 2021 was 1.1 per 100,000 population.
- A seasonal trend for encephalitis cases was not observed in 2021. Case counts were highest in January (6 cases), March (5 cases), and April (6 cases).
- Half of case-patients (50%) in 2021 were aged 65 years and older. Incidence rates were also highest among those aged 65 years and older (3.6 per 100,000).
- Forty-five percent of cases in 2021 did not have a causative agent identified.
- Viral/aseptic infections accounted for 45% of cases, eight of which had herpes simplex virus identified as a causative agent. Viral/aseptic infections include non-bacterial and non-fungal infections; not all have a specific virus identified.
- There were no cases with non-infectious/other causative agents.



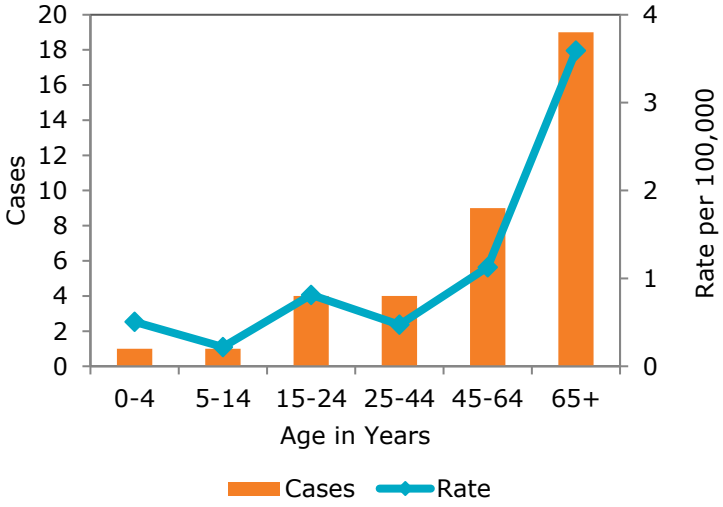
Negative-stained transmission electron microscopic (TEM) image of numerous herpes simplex virons, members of the Herpesviridae virus family.
Photo credit: CDC/ Dr. Fred Murphy; Sylvia Whitfield, Public Health Image Library

ENCEPHALITIS

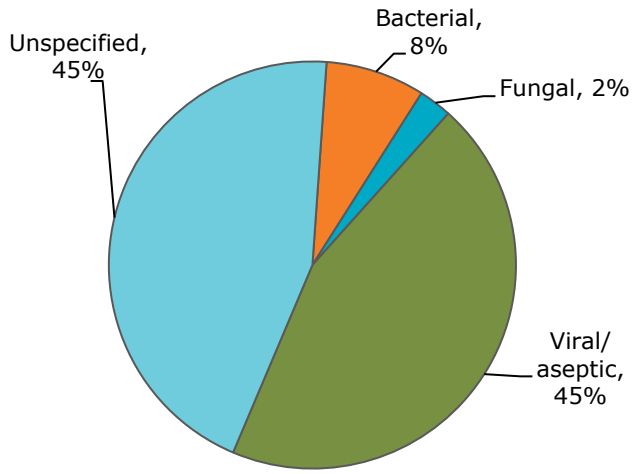
Encephalitis Cases by Month of Onset, San Diego County, 2021



Encephalitis Cases and Rates by Age, San Diego County, 2021



Encephalitis Cases by Type, San Diego County, 2021



Notes:

1. Counts include confirmed cases of encephalitis of specific arboviral etiology following the CDC/CSTE case criteria and confirmed cases of aseptic/viral, bacterial, fungal, parasitic, non-infectious/other, and unknown etiologies following local case criteria.
2. Data presented for encephalitis do not include cases of encephalitis due to other infectious reportable diseases. For example, these data do not include cases of West Nile virus. Information on West Nile virus encephalitis is provided in a separate section of this report.
3. Encephalitis, of all types, was removed from the list of nationally notifiable diseases and conditions in 1995, though encephalitis caused by arboviruses remains notifiable.

For more information:

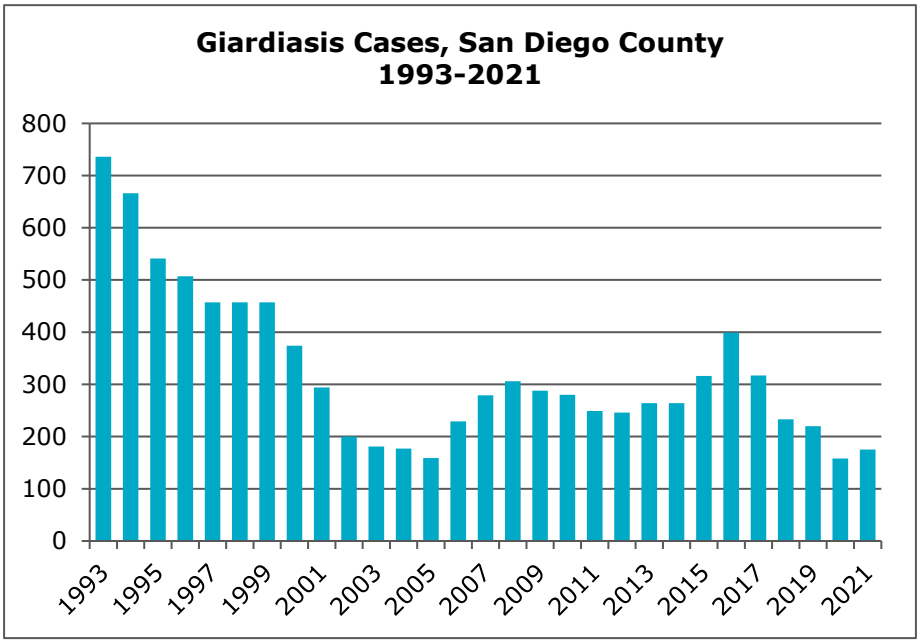
- Centers for Disease Control and Prevention (CDC) Tick-borne Encephalitis website
- CDC Eastern Equine Encephalitis website
- CDC Japanese Encephalitis website
- CDC La Crosse Encephalitis website
- CDC Saint Louis Encephalitis website
- California Department of Public Health (CDPH) Saint Louis Encephalitis website
- CDC/CSTE Arboviral Encephalitis Case Definition
- National Institute of Neurological Disorders and Stroke Meningitis and Encephalitis Information Page

GIARDIASIS

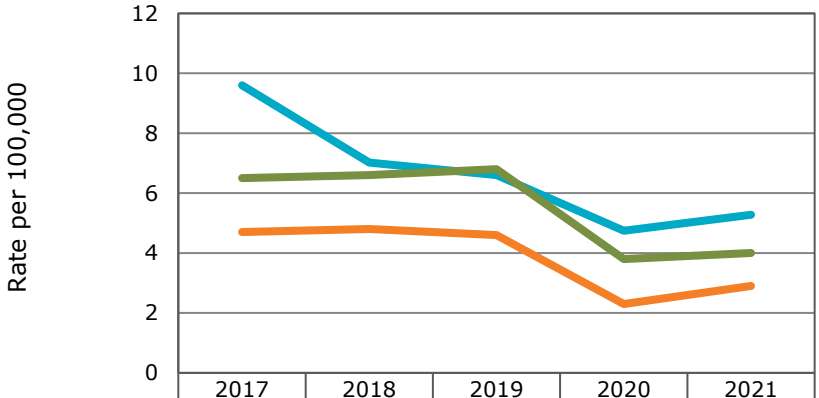
Disease Info

Infectious agent: *Giardia lamblia,* also known as *Giardia intestinalis* and *Giardia duodenalis*, a parasite
Incubation: Usually 3-25 days
Mode of transmission: Fecal-oral; ingestion of contaminated food or water, including untreated drinking water or recreational water sources; person-to-person (e.g., day care/diapers, sexual activity)
Symptoms: Diarrhea, abdominal cramps, nausea, gas, fatigue, weight loss, dehydration; can be asymptomatic

Giardiasis Cases, San Diego County 1993-2021



Giardiasis Incidence, San Diego County, California, and United States, 2014-2018



	2017	2018	2019	2020	2021
San Diego County	9.6	7.0	6.6	4.7	5.3
California	6.5	6.6	6.8	3.8	4.0
United States	4.7	4.8	4.6	2.3	2.9

Key Points

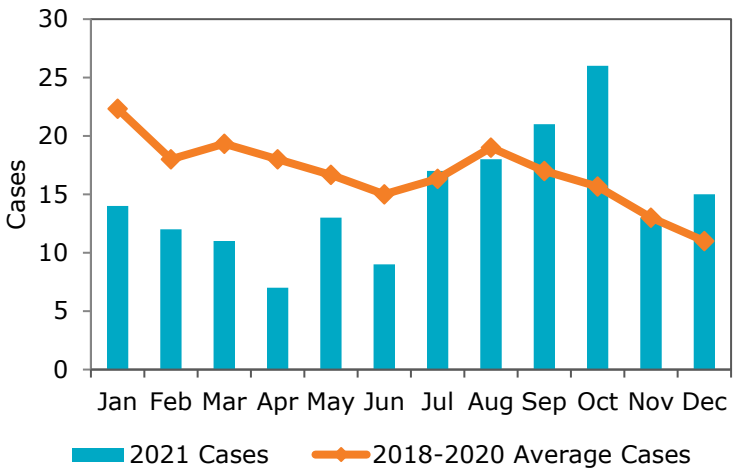
- In 2021, there were 175 cases of giardiasis reported in San Diego County.
- The incidence rate of giardiasis in San Diego County increased slightly in 2021 (5.3 per 100,000) after decreasing in 2020, and was higher than the state and national rate.
- In recent years, there has been no consistent seasonal pattern in giardiasis cases in San Diego County, though in 2021, the most cases were seen July – October.
- In San Diego County, case counts (58 cases) and rates (6.9 per 100,000) were highest among 25-44 year olds.
- In 2021, 6.3% of cases reported in San Diego County were among refugees.
- Risk factors reported by case-patients included eating out (61%), eating fresh fruits (66%) and raw vegetables (54%), exposure to animals (50%), and travel (46%). Another group at risk are men who have sex with men (22%).
- Rates of giardiasis were highest among residents of the East and Central HHSA Regions of San Diego County.

Notes:

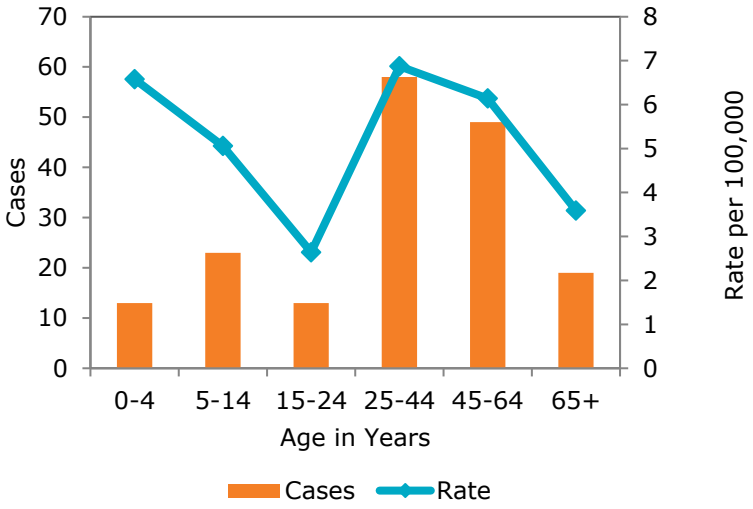
1. Counts include confirmed and probable cases following the CDC/CSTE case criteria.
2. Giardiasis became nationally notifiable in 2002.
3. Denominators for risk factor calculations are cases with available information, ranging from 75-175 of 175 total cases.
4. Risk factors are potential sources as reported by case-patients, not confirmed sources of infection.

GIARDIASIS

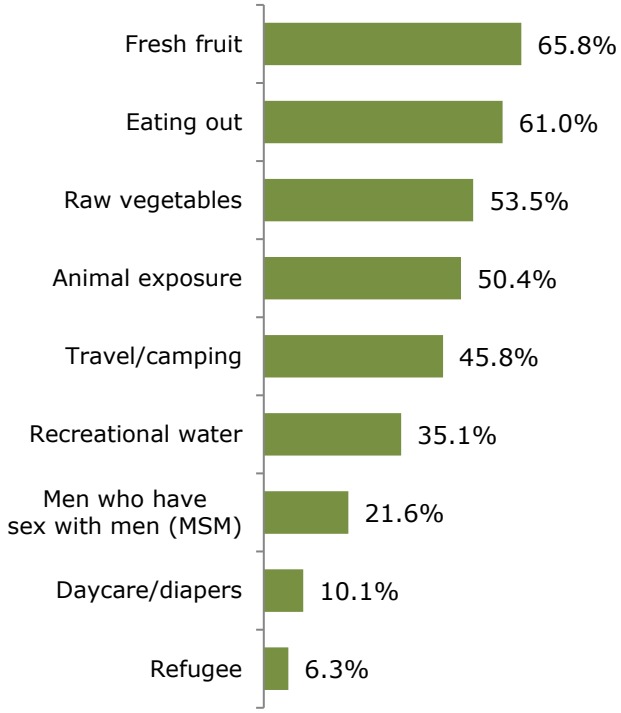
Giardiasis Cases by Month of Onset, San Diego County, 2021

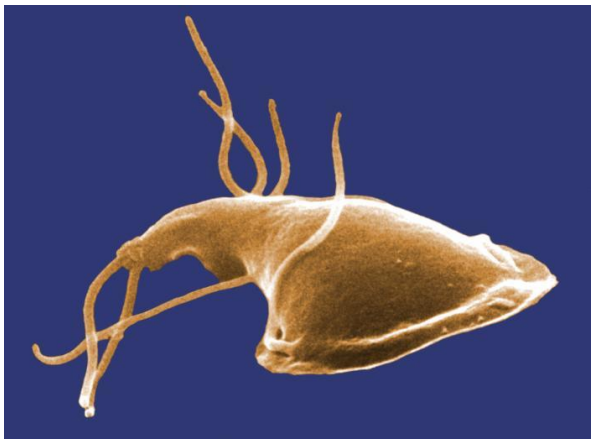


Giardiasis Cases and Rates by Age, San Diego County, 2021



Risk Factors Reported by Giardiasis Case-Patients, San Diego County, 2021





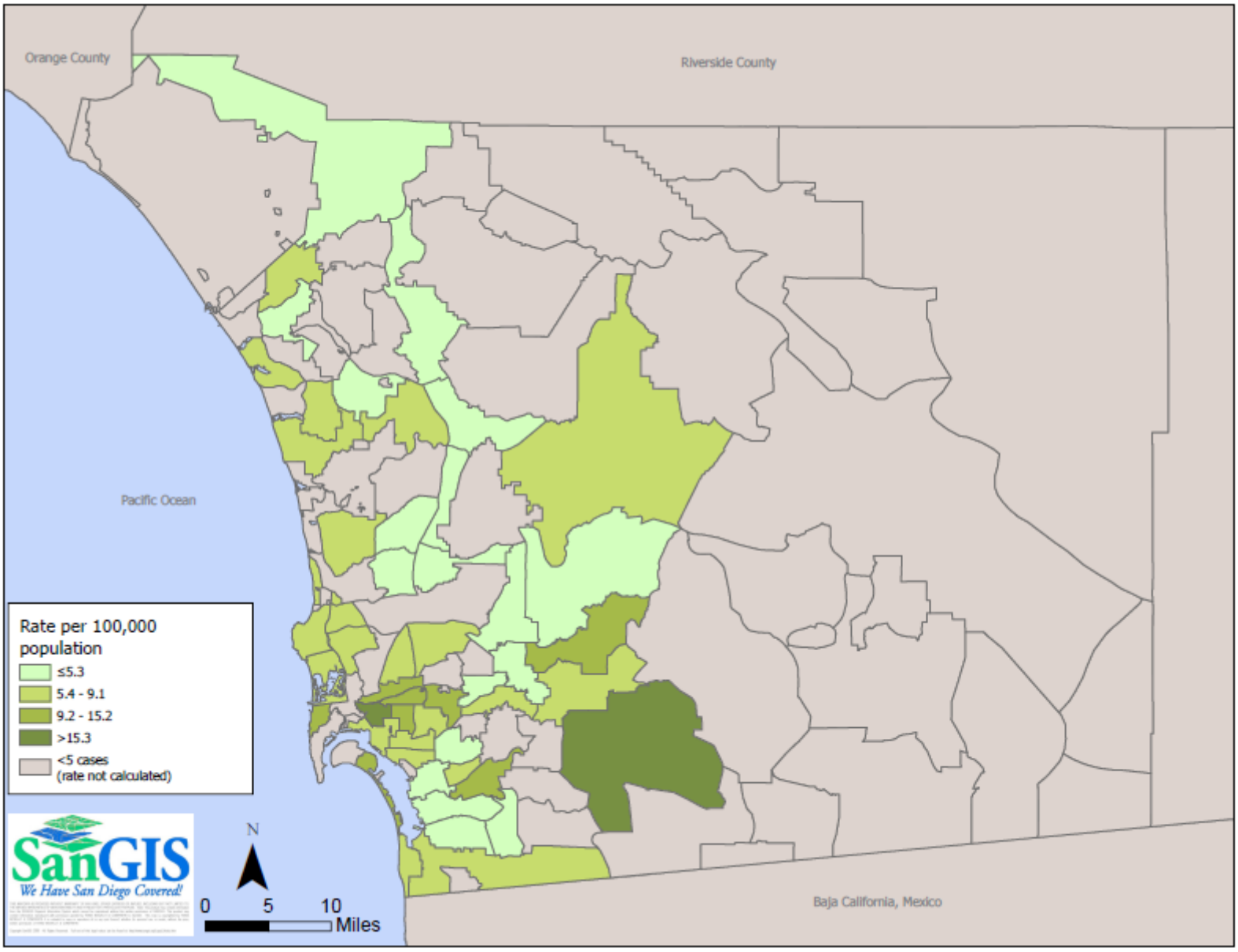
Scanning electron microscopic (SEM) image depicting the dorsal (upper) surface of a *Giardia* protozoan.
Photo credit: Dr. Stan Erlandsen, Dr. Dennis Feely, Public Health Image Library

For more information:

- Centers for Disease Control and Prevention (CDC) *Giardia* website
- CDC Health Information for International Travel (the Yellow Book) – Giardiasis
- California Department of Public Health (CDPH) Giardiasis website
- CDC/CSTE Giardiasis Case Definition

GIARDIASIS

Giardiasis Rates by Zip Code of Residence, San Diego County, 2019-2021

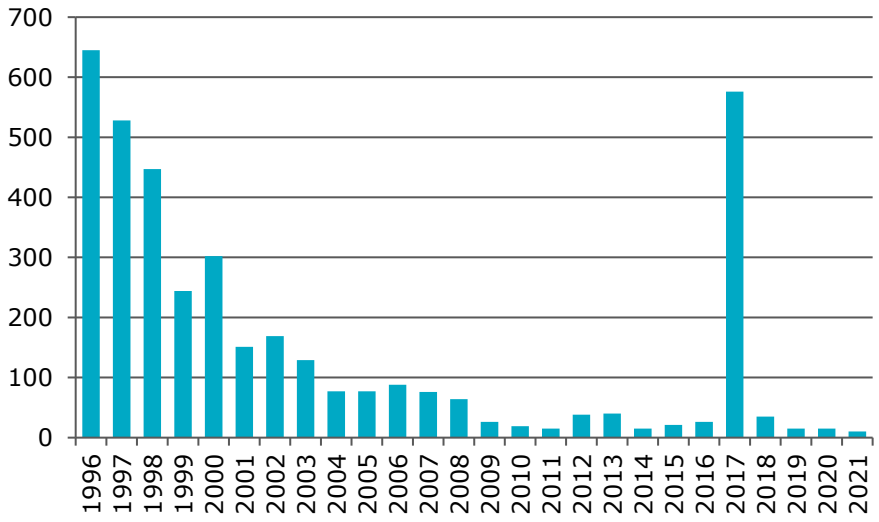


HEPATITIS A

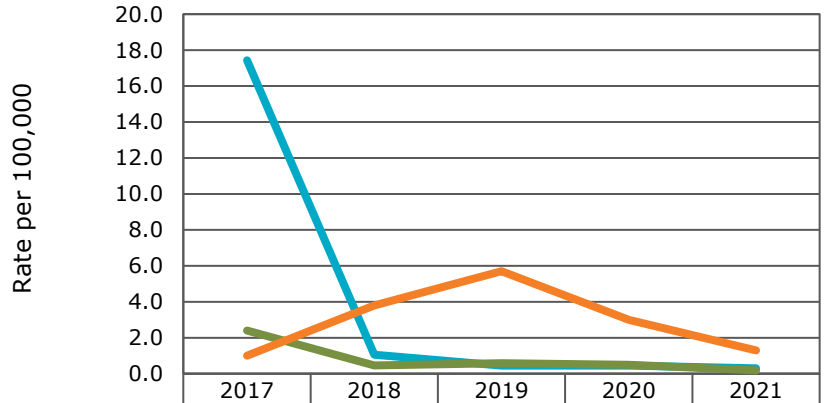
Disease Info

Infectious agent: Hepatitis A virus, a picornavirus
Incubation: Usually 28-30 days, range 15-50 days
Mode of transmission: Person-to-person via the fecal-oral route; food or water contaminated by feces
Symptoms: Jaundice, fever, fatigue, loss of appetite, nausea, vomiting, abdominal pain, dark urine, clay-colored stool; may be asymptomatic, particularly in young children

Hepatitis A Cases, San Diego County 1996-2021



Hepatitis A Incidence, San Diego County, California, and United States, 2017-2021



	2017	2018	2019	2020	2021
San Diego County	17.4	1.1	0.5	0.5	0.3
California	2.4	0.5	0.6	0.5	0.2
United States	1.0	3.8	5.7	3.0	1.3

Key Points

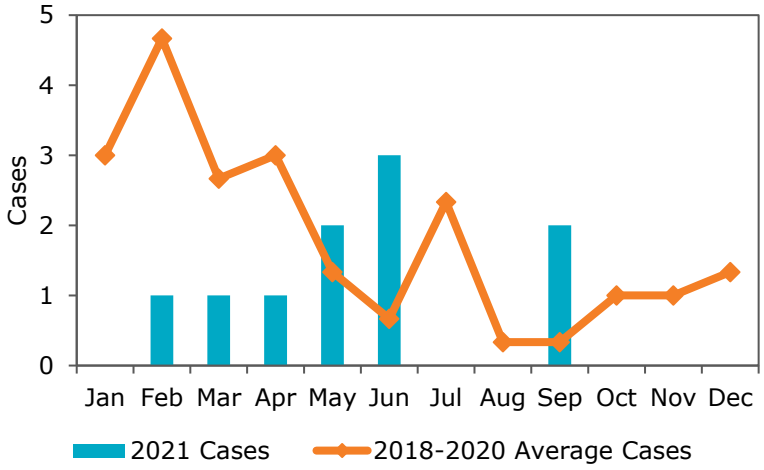
- There were 10 cases among San Diego County residents in 2021. Introduction of the hepatitis A vaccine in 1995 and adoption of routine vaccination of children in California in 1999 resulted in a reduction of case counts until 2017. A large outbreak associated primarily with persons experiencing homelessness and persons using illicit drugs started in November 2016 and ended in October 2018.
- San Diego County incidence decreased to 0.3 per 100,000 in 2021, while national incidence decreased to 1.3 per 100,000 population.
- In 2021, case counts peaked in June.
- Since children are routinely vaccinated against hepatitis A, most cases are now in adults; in 2021, the highest case rate was among adults aged 65 and older.
- Symptoms were reported by all San Diego County case-patients in 2021. The most common symptoms included fatigue, dark urine, jaundice, and clay-colored stool. Hospitalization is common.
- Travel continues to be leading known risk factors for cases identified in San Diego County. Fifty percent of all cases in 2021 reported travel outside of the county.

For more information:

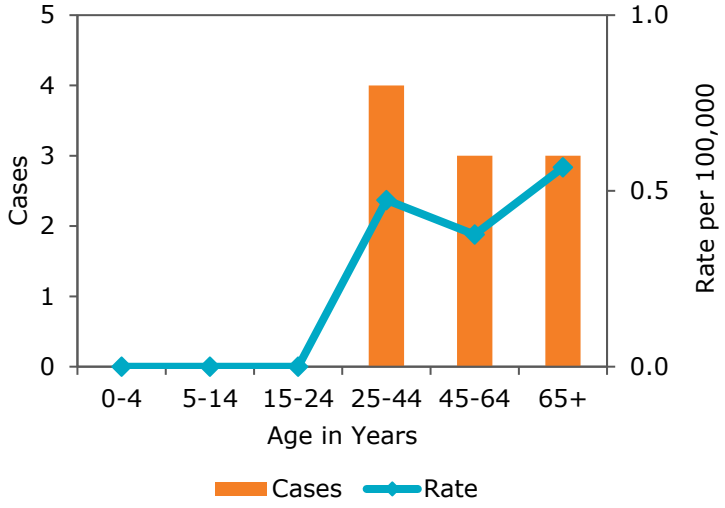
- Centers for Disease Control and Prevention (CDC) Hepatitis A website
- Epidemiology and Prevention of Vaccine-Preventable Diseases (the Pink Book) – Hepatitis A
- CDC Health Information for International Travel (the Yellow Book) – Hepatitis A
- CDC/CSTE Hepatitis A Case Definition
- California Department of Public Health (CDPH) Hepatitis A website
- County of San Diego Hepatitis A website

HEPATITIS A

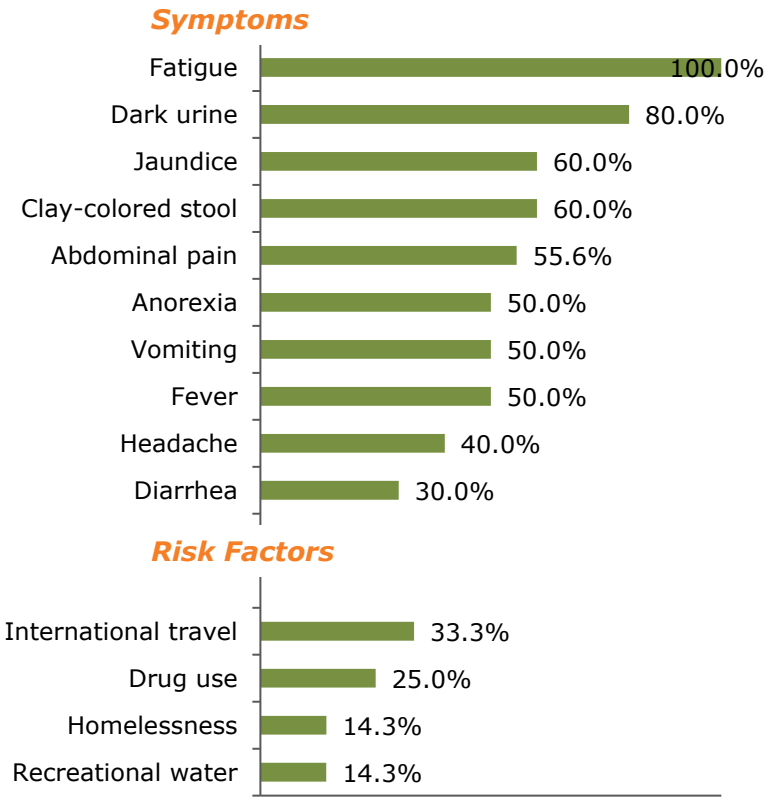
Hepatitis A Cases by Month of Onset, San Diego County, 2021



Hepatitis A Cases and Rates by Age, San Diego County, 2021



Select Characteristics Reported by Hepatitis A Case-Patients, San Diego County, 2021



80% HOSPITALIZED 2021

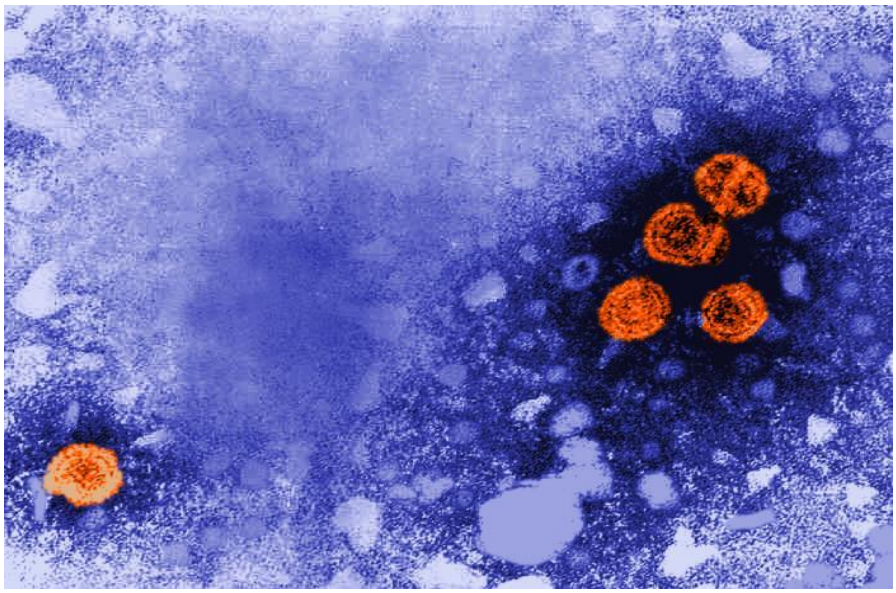
Notes:

1. Counts include confirmed cases following the CDC/CSTE case criteria. Hepatitis A has been nationally notifiable since 1966.
2. Hepatitis A is vaccine-preventable. The vaccine became available in the United States in 1995, was recommended as a routine vaccination for children in high-incidence states (including California) starting in 1999, and was recommended as a routine vaccination for all children beginning in 2006.
3. Denominators for symptom and risk factor calculations are cases with available information.
4. Risk factors are potential sources as reported by case-patients, not confirmed sources of infection. Categories are not mutually exclusive. Recreational water refers to participation in aquatic activities such as surfing or swimming in the ocean, water parks, etc.

HEPATITIS B

Disease Info

Infectious agent: Hepatitis B virus, a member of the family Hepadnaviridae
Incubation: 60 to 150 days (avg. 90 days) from exposure to symptom onset
Mode of transmission: Person-to-person through percutaneous or mucosal contact with infected blood, semen, or other body fluid. This includes activities such as sex with an infected partner, sharing of drug-injection equipment (needles, syringes, etc.), birth to an infected mother (perinatal), direct contact with blood or open sores of an infected person, needle sticks, sharing of items such as razors or toothbrushes with an infected person.
Symptoms: Acute symptoms include fever, fatigue, loss of appetite, nausea, vomiting, abdominal pain, dark urine, light or gray stools, joint pain, jaundice; 1-2% of infected persons develop fulminant hepatitis; approximately 50% of acute infections are asymptomatic. Can lead to chronic infection, which is often asymptomatic. Complications can include cirrhosis, liver failure, and hepatocellular carcinoma.



Digitally-colorized transmission electron microscopic (TEM) image showing the presence of hepatitis B virions. The large round orange-colored virions are known as Dane particles. Photo credit: CDC/Dr. Erskine Palmer, Public Health Image Library

Key Points

Vaccination Recommendations

Over the years, the Advisory Committee on Immunization Practices (ACIP) has made several recommendations in an effort to eliminate hepatitis B transmission in the United States, including:

- 1991: All infants are recommended to receive 3 doses of Hepatitis B Vaccine
- 2022: Hepatitis B vaccination is recommended to all adults 19-59 years of age and adults ≥ 60 years of age with certain risk factors

Acute Hepatitis B

- There were 16 cases of acute hepatitis B infection in San Diego County in 2021, a decrease of 52% from 37 cases in 1996.
- In recent years, the incidence rate of acute hepatitis B in San Diego County has remained low, 0.5 per 100,000 population in 2021.
- All 16 cases of acute hepatitis B in 2021 were among adults aged 25 years and older.

Chronic Hepatitis B

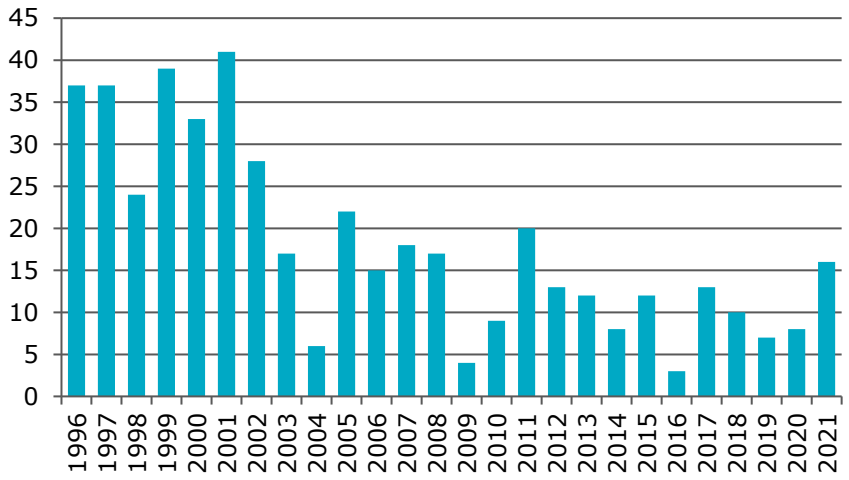
- In 2021, there were 798 cases of chronic hepatitis B reported among residents of San Diego County.
- The greatest number of newly reported cases in 2021 was in persons between the ages of 45-64 years (333 cases).
- Rates of newly reported cases were highest in the Central and North Central HHSA Regions of San Diego County.

For more information:

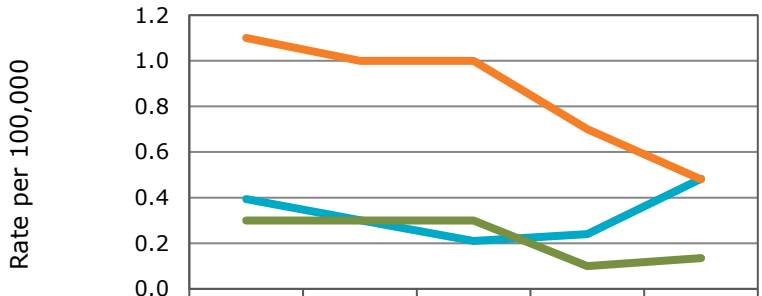
- Centers for Disease Control and Prevention (CDC) Hepatitis B website
- California Department of Public Health (CDPH) Hepatitis B website
- CDC Hepatitis B Perinatal Transmission webpage
- CDC/CSTE Acute Hepatitis B Case Definition
- CDC/CSTE Chronic Hepatitis B Case Definition
- CDC/CSTE Perinatal Hepatitis B Virus Infection Case Definition
- Epidemiology and Prevention of Vaccine-Preventable Diseases (the Pink Book) – Hepatitis B Virus
- CDC Hepatitis B Vaccination webpage

HEPATITIS B, ACUTE

Acute Hepatitis B Cases, San Diego County, 1996-2021



Acute Hepatitis B Incidence, San Diego County, California, and United States, 2017-2021



	2017	2018	2019	2020	2021
San Diego County	0.4	0.3	0.2	0.2	0.5
California	0.3	0.3	0.3	0.1	0.1
United States	1.1	1.0	1.0	0.7	0.5

Perinatal Hepatitis B Infections

Pregnant women infected with the hepatitis B virus (HBV) can transmit the infection to their infant at birth, through a vaginal delivery or cesarean section. To prevent perinatal transmission, national guidelines in the United States include the following recommendations:

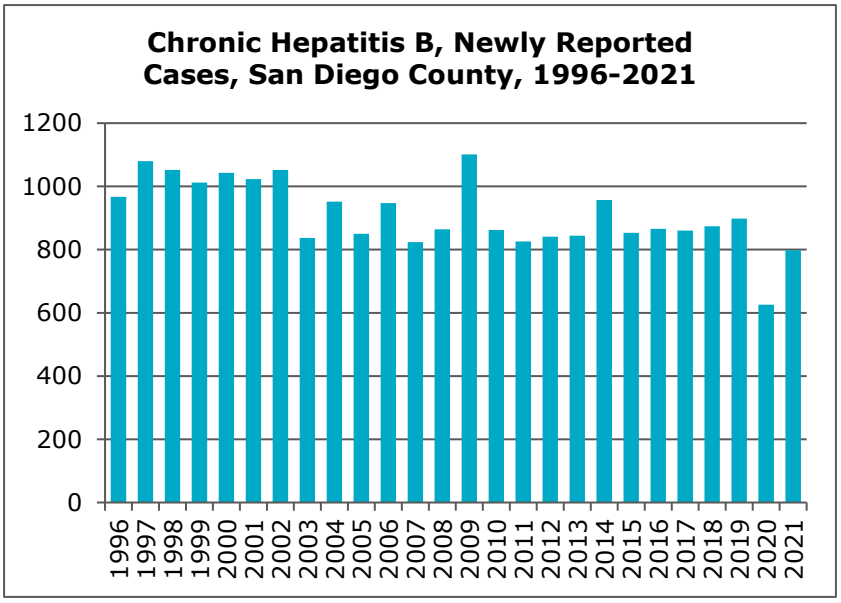
1. Universal screening of pregnant persons for HBsAg during each pregnancy
2. HBV DNA testing for HBsAg-positive pregnant persons at 26-28 weeks to guide the use of maternal antiviral therapy during pregnancy
3. Case management of HBsAg-positive mothers and their infants
4. Immunoprophylaxis for infants born to infected mothers, including hepatitis B vaccine and hepatitis b immune globulin within 12 hours of birth
5. Routine vaccination of all infants with the hepatitis B vaccine series, starting with the first dose administered within 24 hours of birth
6. HBsAg and anti-HBs testing should be performed one to two months after completion of the vaccine series, between 9-12 months of age for infants born to hepatitis B positive mothers

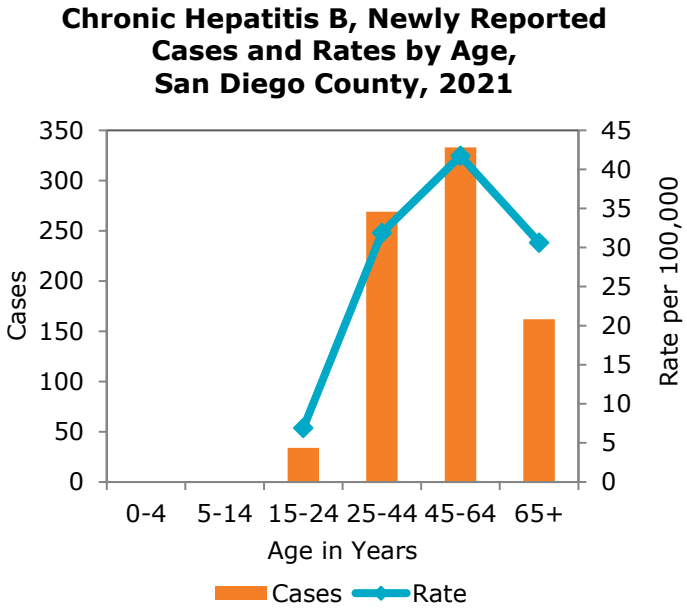
In 2021, there were no cases of perinatal HBV infection in San Diego County. Nationally, 15 cases of perinatal infection were reported.

Notes:

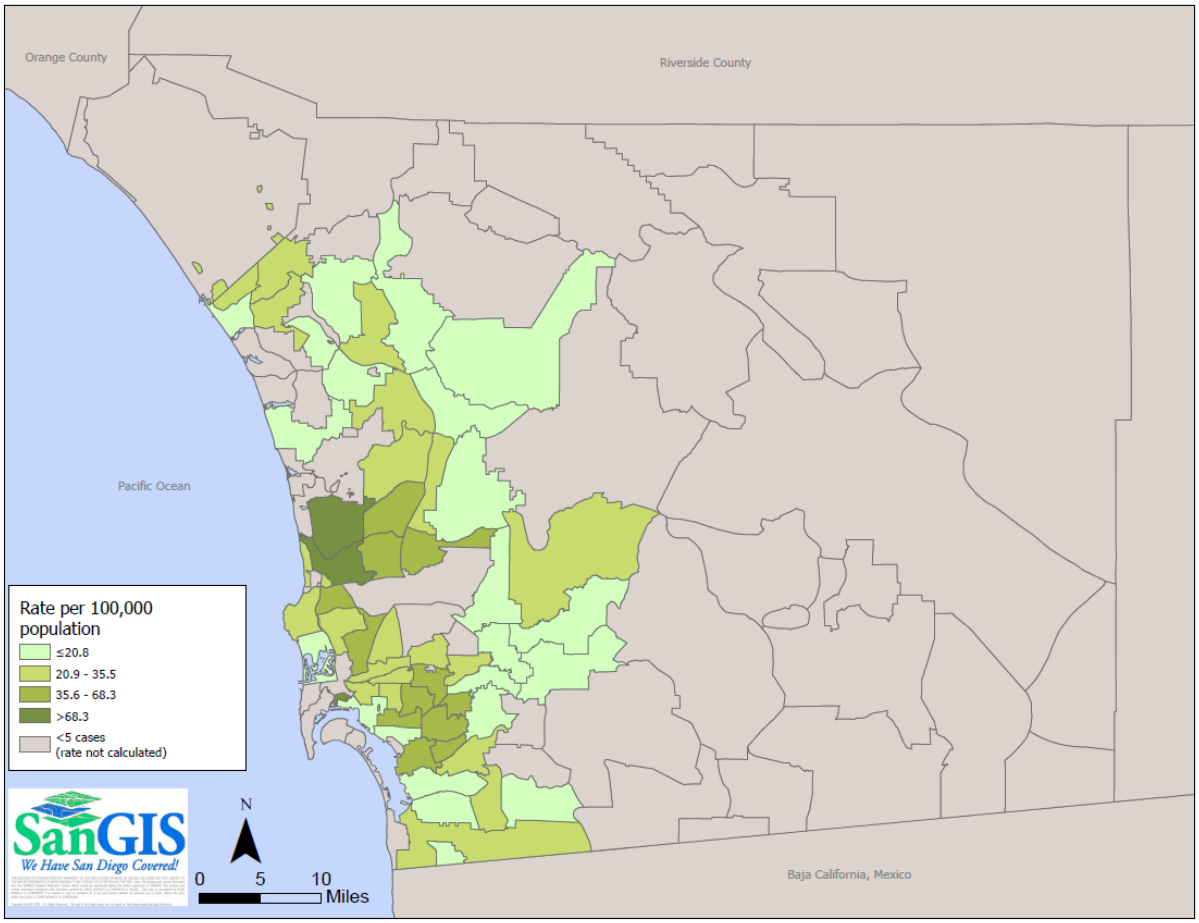
1. Acute hepatitis B case counts include confirmed cases following the CDC/CSTE case criteria. In 2012, the case definition was changed, eliminating the requirement of acute clinical presentation for patients with a negative hepatitis B surface antigen laboratory test within six months prior to a positive hepatitis B virus test.
2. Acute hepatitis B infections became nationally notifiable in 1966.
3. Chronic hepatitis B case counts include confirmed and probable cases following the CDC/CSTE case criteria. Changes have been made to the case definition as additional laboratory testing became available.
4. Chronic hepatitis B virus infection became nationally notifiable in 2003.
5. San Diego County chronic hepatitis B case counts include the first report of a diagnosis of chronic hepatitis B infection for a unique individual to the health department. National case counts for chronic hepatitis B may include duplicate case reports.
6. Counts and rates for acute and chronic hepatitis B infections include perinatal hepatitis B virus infections that meet case criteria.
7. In 2017, the case definition for perinatal HBV infections was changed to include HBeAg and HBV DNA laboratory tests.
8. Hepatitis B infection is vaccine preventable. Recombinant hepatitis B vaccines, the type of vaccine in use in the United States today, have been in use in the U.S. since 1986.

HEPATITIS B, CHRONIC





Chronic Hepatitis B, Rates of Newly Reported Cases by Zip Code of Residence, San Diego County, 2021



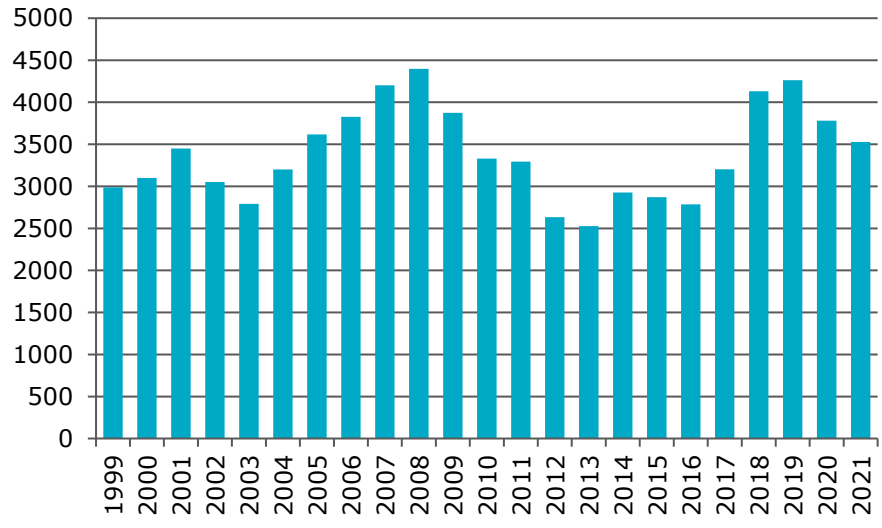
Cases indicating a detention facility as the address of residence are excluded from the calculation of rates by zip code.

HEPATITIS C, CHRONIC

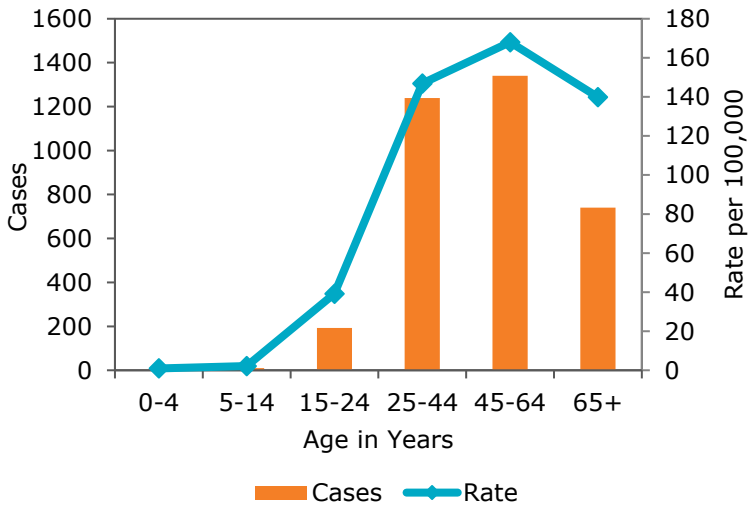
Disease Info

Infectious agent: Hepatitis C virus, an enveloped RNA virus
Incubation: 2 weeks to 6 months, average 4-12 weeks
Mode of transmission: Exposure to infected blood, frequently via injection drug use (shared equipment); infrequently, via sex, shared personal items (e.g., razors, toothbrushes), or health care procedures (e.g., injections)
Symptoms: Most chronic hepatitis C infections are asymptomatic until there is clinically apparent liver disease such as cirrhosis or cancer. Only 20-30% of acute infections will cause symptoms of hepatitis including jaundice, abdominal pain, fatigue, or poor appetite, but 75-85% of acute cases will become chronic.

Chronic Hepatitis C, Newly Reported Cases, San Diego County, 1999-2021



Chronic Hepatitis C, Newly Reported Cases and Rates by Age, San Diego County, 2021



Key Points

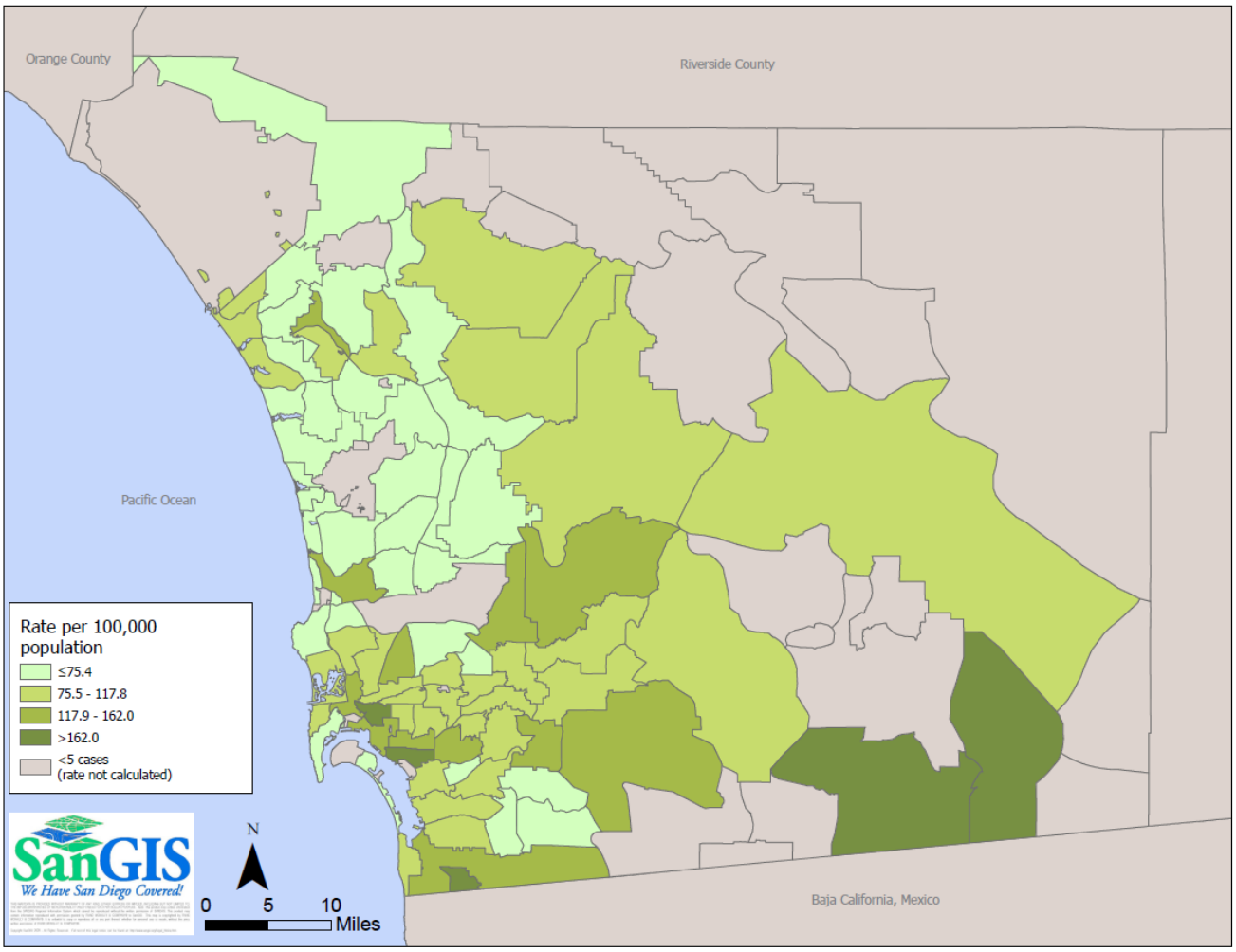
- There were 3,528 newly reported cases of chronic hepatitis C in San Diego County in 2021, slightly lower than the average of 3,632 cases over the previous five years and below the peak of 4,398 cases in 2008.
- The rate of newly reported cases of chronic hepatitis C among San Diego County residents has ranged from 97.0-127.9 per 100,000 population between 2017 and 2021.
- In 2021, both the number of cases (1,340) of chronic hepatitis C and the rate of newly reported cases (167.9 per 100,000 population) were higher among those aged 45-64 years than in any other age group. There were very few cases in children.
- Higher rates of newly reported chronic hepatitis C were distributed in South and East County. However, the high rates in some rural areas of the county with low populations should be interpreted with caution due to small case counts.
- There were 76 acute hepatitis C cases in San Diego County in 2021 (2.3 per 100,000 population).
- Most of the acute hepatitis C cases were among those aged 25-44 years (44 cases, rate of 5.2 per 100,000 population).

For more information:

- Centers for Disease Control and Prevention (CDC) Hepatitis C website
- CDC Viral Hepatitis Surveillance and Statistics website
- Know More Hepatitis Campaign website
- CDC/CSTE Hepatitis C, Chronic Case Definition
- California Department of Public Health (CDPH) Office of Viral Hepatitis Prevention website

HEPATITIS C, CHRONIC

Chronic Hepatitis C, Rates of Newly Reported Cases by Zip Code of Residence, San Diego County, 2021



Reports where a state or federal detention facility is indicated as the address of residence are excluded from the calculation of rates by zip code.

Notes:

1. Counts include confirmed and probable cases following the CDC/CSTE case criteria.
2. Chronic hepatitis C became nationally notifiable in 2003. Over the past 15 years, it has alternately been referred to as Hepatitis C, Past or Present and Hepatitis C, Chronic, with varying case definitions. The term chronic hepatitis C is used here for all years.
3. Available tests and testing criteria have changed over the years.
4. Chronic hepatitis C reports are not investigated and are minimally evaluated; numbers should be interpreted with caution.
5. Cases are grouped into the year of first report to the San Diego County Epidemiology Program; this may not represent the year of infection or diagnosis and case-patients may not have been infected in San Diego County. Cases should be considered neither incident nor prevalent.
6. San Diego County counts include reports from Robert J. Donovan Correctional Facility (state facility), Western Region Detention Facility (federal facility), and Metropolitan Correctional Center (federal facility), although inmates may have originally come from other jurisdictions. These cases are excluded from the zip code map, but included in other counts.
7. Numbers differ from counts published by the California Department of Public Health (CDPH). CDPH obtains data from other sources, including the correctional system, and de-duplicates cases across local health jurisdictions.
8. Case counts in some rural areas with small populations are five or above, but still small; rates may be unstable and should be interpreted with caution.

LEGIONELLOSIS

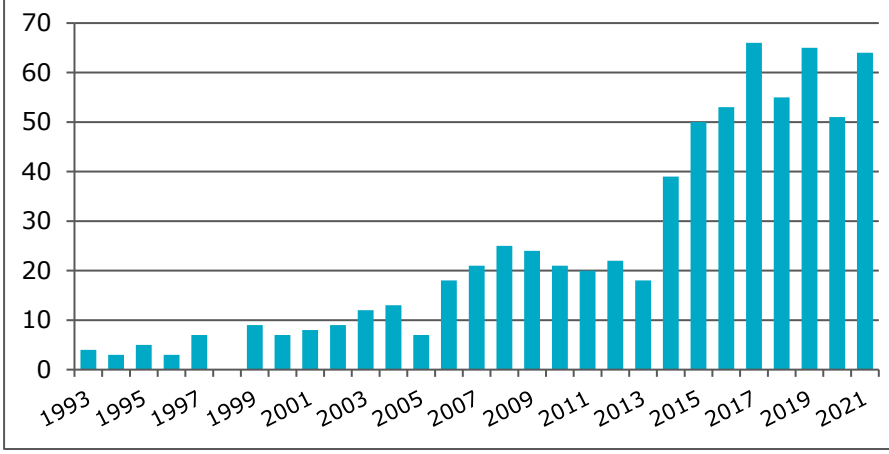
Disease Info

Infectious agent: *Legionella* bacteria, most commonly in North America *L. pneumophila, serogroup 1*
Incubation: Legionnaires' Disease average 5-6 days, range 2-10 days; Pontiac Fever average 24-48 hours, range 5-66 hours
Mode of transmission: Inhalation of small droplets of water in the air that contain the bacteria; less commonly by aspiration of drinking water or inhalation of potting soil. No person-to-person transmission has been documented.
Symptoms: Three distinct syndromes: Legionnaires' Disease with symptoms of pneumonia, including cough, shortness of breath, fever, muscle aches, and headaches; Pontiac Fever, a milder infection without pneumonia, with symptoms of fever and muscle aches; and Extrapulmonary Legionellosis, an infection of Legionella bacteria in a body site outside the lungs

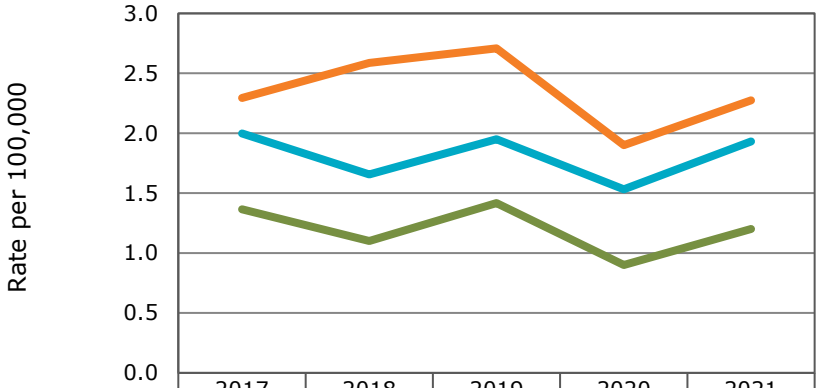
Key Points

- In 2021, there were 64 cases of legionellosis in San Diego County. This is an increase of 256% compared to 2013 (18 cases). An increase in cases was seen starting in 2014 and cases have remained higher since then.
- The 2021 incidence rate of legionellosis in San Diego County (1.9 per 100,000) was higher than the California rate but lower than that for the United States.
- In 2021, the majority of legionellosis case-patients were diagnosed with Legionnaires' Disease (98%). Pontiac Fever is infrequently diagnosed due to mild symptoms.
- There was no seasonal trend for case counts in 2021. The greatest number of cases occurred in December (10).
- Nearly half of cases, and the highest rates, were seen among older adults. A total of 31 cases were among persons aged 65 years and older (incidence rate of 5.9 per 100,000).
- Most cases (75%) were community-acquired. Nineteen percent of cases were possibly travel-associated.
- In 2021, the case-fatality rate among legionellosis cases in San Diego County was 14.1%.

Legionellosis Cases, San Diego County 1993-2021

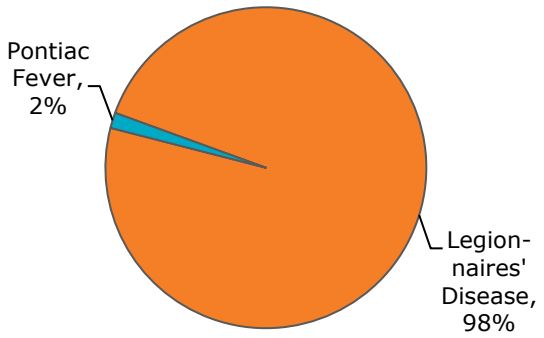


Legionellosis Incidence, San Diego County, California, and United States, 2017-2021



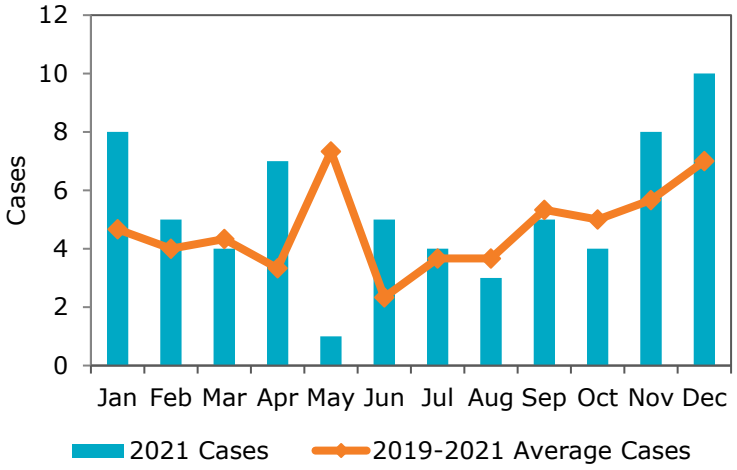
	2017	2018	2019	2020	2021
San Diego County	2.0	1.7	2.0	1.5	1.9
California	1.4	1.1	1.4	0.9	1.2
United States	2.3	2.6	2.7	1.9	2.3

Legionellosis Cases by Disease Classification, San Diego County, 2021

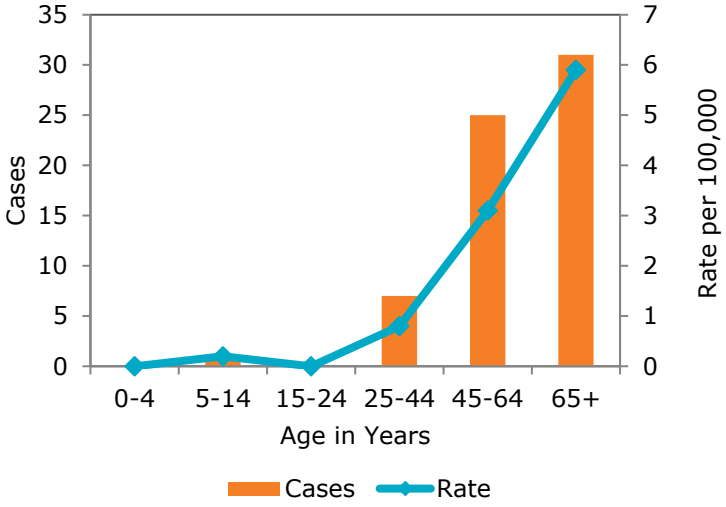


LEGIONELLOSIS

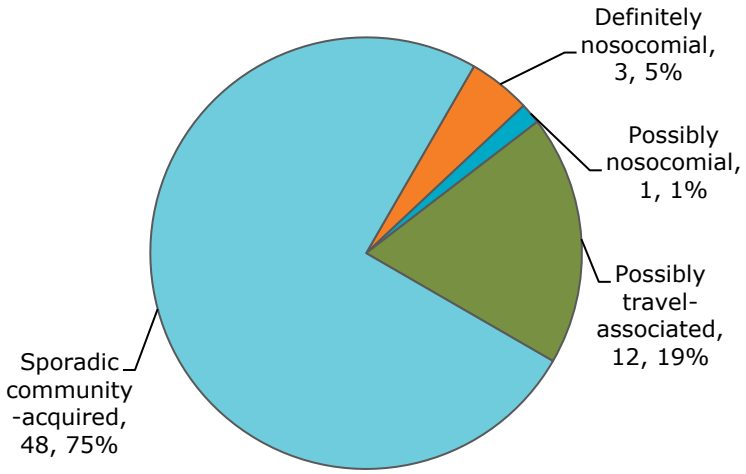
Legionellosis Cases by Month of Onset, San Diego County, 2021



Legionellosis Cases and Rates by Age, San Diego County, 2021



Legionellosis Cases by Transmission Type, San Diego County, 2021



Notes:

1. Counts include confirmed cases following the CDC/CSTE case criteria.
2. Legionellosis became nationally notifiable in 1976.
3. In 2005, the CDC/CSTE case criteria were revised to include classification criteria for travel-associated cases of legionellosis. A case that has a history of spending at least one night away from home, either in the country of residence or abroad, in the ten days before onset of illness is classified as "travel-associated".
4. Nosocomial transmissions are defined as follows: A case is classified as "definitely nosocomial" if the patient was hospitalized continuously for ≥10 days before the onset of *Legionella* infection. A case is classified as "possibly nosocomial" if the patient was hospitalized 2-9 days before the onset of *Legionella* infection. Cases with no inpatient or outpatient hospital visits in the 10 days prior to onset of symptoms are not nosocomial.
5. The denominator for case classification and case-fatality rate calculations is 64 total cases.

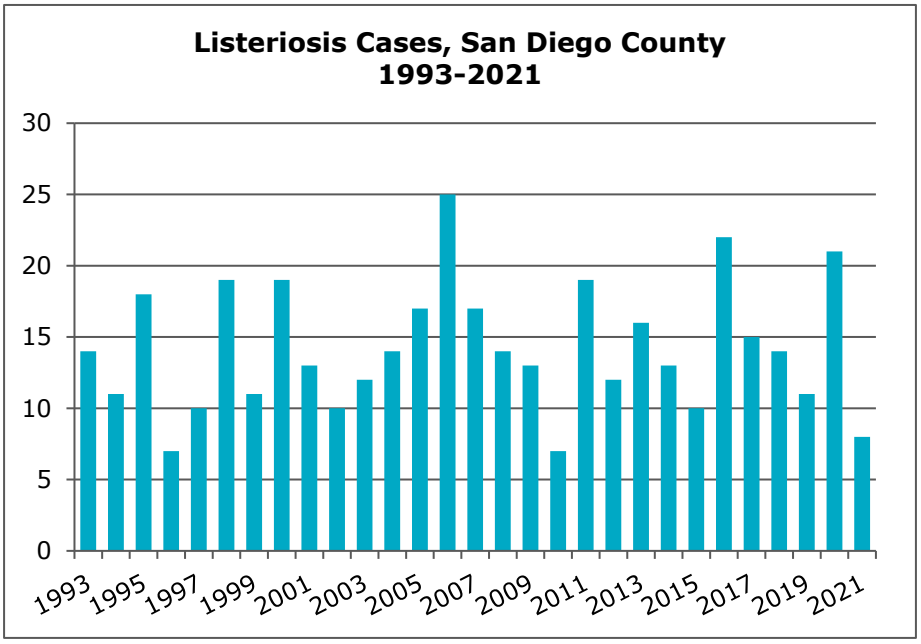
For more information:

- Centers for Disease Control and Prevention (CDC) *Legionella* website
- California Department of Public Health (CDPH) Legionellosis website
- CDC/CSTE Legionellosis Case Definition

LISTERIOSIS

Disease Info

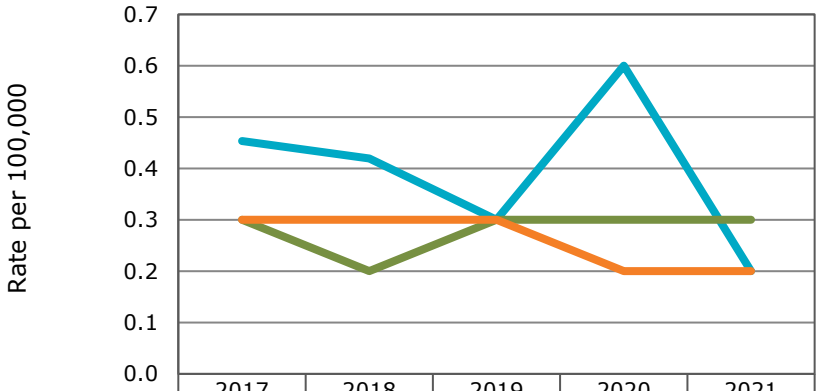
Infectious agent: *Listeria monocytogenes*, a bacterium
Incubation: Usually 1-4 weeks, range 3-70 days
Mode of transmission: Consumption of contaminated foods such as raw sprouts; deli meats and hot dogs; raw milk; soft cheeses; and ready-to-eat cold, smoked, or raw seafood
Symptoms: High fever, headache, neck stiffness, confusion, sometimes diarrhea; infections during pregnancy can lead to miscarriage, stillbirth, premature delivery, or infection of the newborn



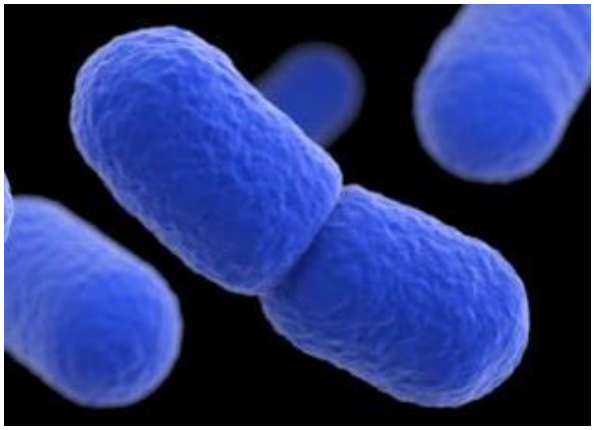
Key Points

- In 2021, there were 8 cases of listeriosis in San Diego County, almost half of the average annual case count over the last ten years (15.3).
- The incidence rate of listeriosis in 2021 in San Diego County (0.2 per 100,000) was comparable to the rate in California (0.3 per 100,000) and the United States (0.2 per 100,000).
- As in previous years, on average, case counts in 2021 were highest during the summer months.
- All of the cases in San Diego County in 2021 were among persons aged 25 years and older, with most among 65 or older.
- The most common risk group among case-patients was a weakened immune system (100%).
- One listeriosis case-patient in San Diego County in 2021 was a pregnant woman. The pregnancy did not result in fetal death.
- In 2021, there were no case-patients that died due to listeriosis in San Diego County.

Listeriosis Incidence, San Diego County, California, and United States, 2017-2021



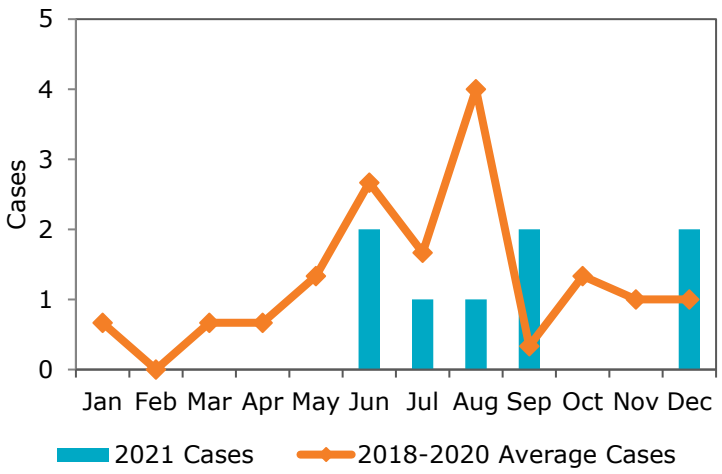
	2017	2018	2019	2020	2021
San Diego County	0.5	0.4	0.3	0.6	0.2
California	0.3	0.2	0.3	0.3	0.3
United States	0.3	0.3	0.3	0.2	0.2



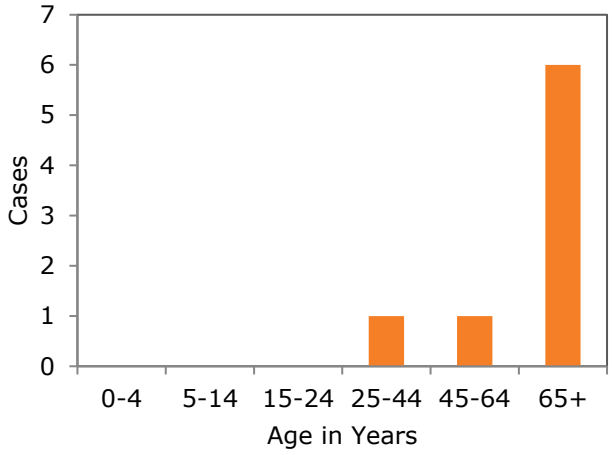
3D computer-generated image of a grouping of *Listeria monocytogenes* bacteria.
Photo credit: CDC/ James Archer, Public Health Image Library

LISTERIOSIS

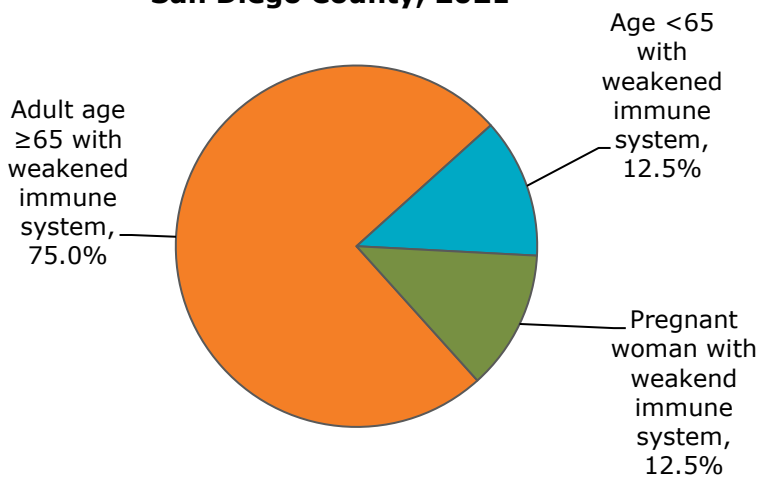
Listeriosis Cases by Month of Onset, San Diego County, 2021



Listeriosis Cases by Age, San Diego County, 2021



Listeriosis Risk Groups, San Diego County, 2021



Notes:

1. Counts include confirmed cases following the CDC/CSTE case criteria.
2. Listeriosis became nationally notifiable in 2000.
3. CDC indicates that groups at higher risk for listeriosis are pregnant women and their newborns, adults aged 65 or over, and adults with weakened immune systems. People can be in multiple categories; nonoverlapping categories were created to reflect that.

For more information:

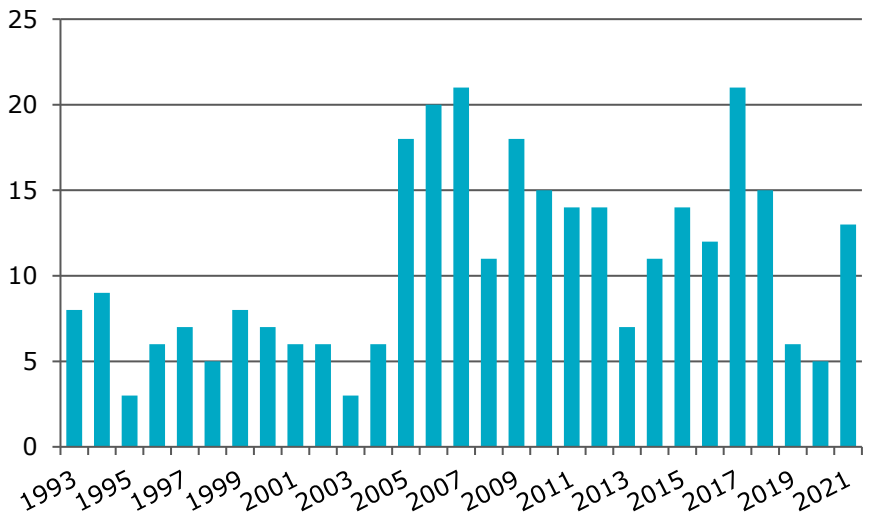
- Centers for Disease Control and Prevention (CDC) Listeriosis website
- California Department of Public Health (CDPH) Listeriosis website
- CDC/CSTE Listeriosis Case Definition

LYME DISEASE

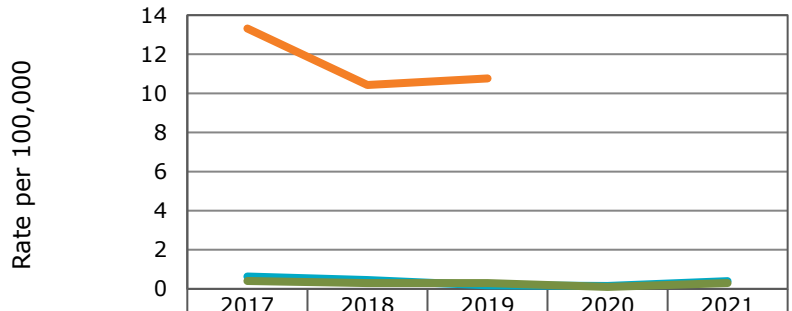
Disease Info

Infectious agent: *Borrelia burgdorferi*, a bacterium of the spirochete class
Incubation: Usually 7-10 days, range 3-30 days
Mode of transmission: Vectorborne, through the bite of infected ticks: *Ixodes scapularis* (the blacklegged tick, or deer tick) in the northeastern, mid-Atlantic, and north-central US; *Ixodes pacificus* (the Western blacklegged tick) on the Pacific coast
Symptoms: Early stage (3-30 days after tick bite) symptoms include fever, chills, headache, fatigue, muscle and joint aches, swollen lymph nodes, and a red, expanding skin rash (erythema migrans). Later stage symptoms include arthritis with joint swelling, particularly of the knees and other large joints, and nervous system signs, such as numbness, tingling, or pain in the arms and legs, or difficulties with memory and concentration.

Lyme Disease Cases, San Diego County 1993-2021



Lyme Disease Incidence, San Diego County, California, and United States, 2017-2021



	2017	2018	2019	2020	2021
San Diego County	0.6	0.5	0.2	0.2	0.4
California	0.4	0.3	0.3	0.1	0.3
United States	13.3	10.4	10.8	*	*

*United States data for 2020 and 2021 were not available at publication.

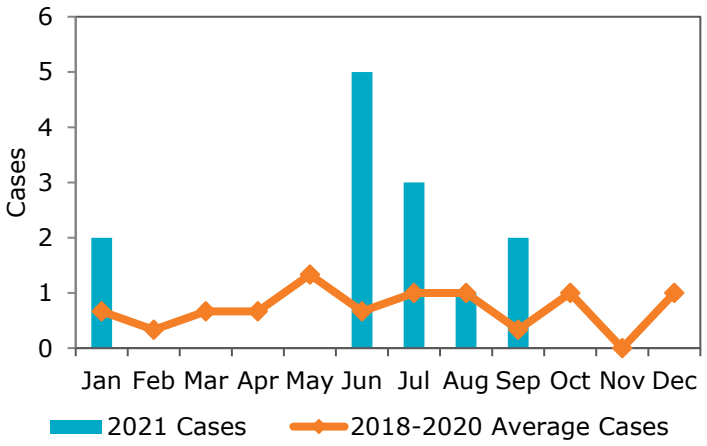
Key Points

- In 2021, 13 cases of Lyme disease were reported among residents of San Diego County. This is a 160% increase from the prior year (5 cases).
- The incidence rate of Lyme disease among San Diego County residents has remained low between 2017 and 2021 (range 0.2-0.6 per 100,000).
- In 2021, the incidence of Lyme disease in San Diego County (0.4 per 100,000) was similar to California incidence (0.3 per 100,000). Lyme disease is more common in other areas in the U.S.
- The majority of case-patients had an onset of illness during the summer months in 2021. Human infections occur most often in the late spring to summer months when ticks are in the nymph stage of their life cycle and are difficult to detect due to their small size (less than 2mm).
- Eight case-patients (62%) reported engaging in outdoor activities outside of San Diego County. The most commonly reported location was in the New England states (23%), followed by the Middle Atlantic and Midwestern states (15%). No case-patients reported outdoor activity in San Diego County.
- Signs and symptoms among case-patients varied. Ten case-patients (91%) reported having symptoms. The most commonly reported symptom was fever, reported by six case-patients.

The Western blacklegged tick, *Ixodes pacificus*, (shown here) is a known vector for the spirochetal bacteria *Borrelia burgdorferi*, which is the pathogen responsible for Lyme disease. Photo credit: CDC/ James Gathany, Public Health Image Library

LYME DISEASE

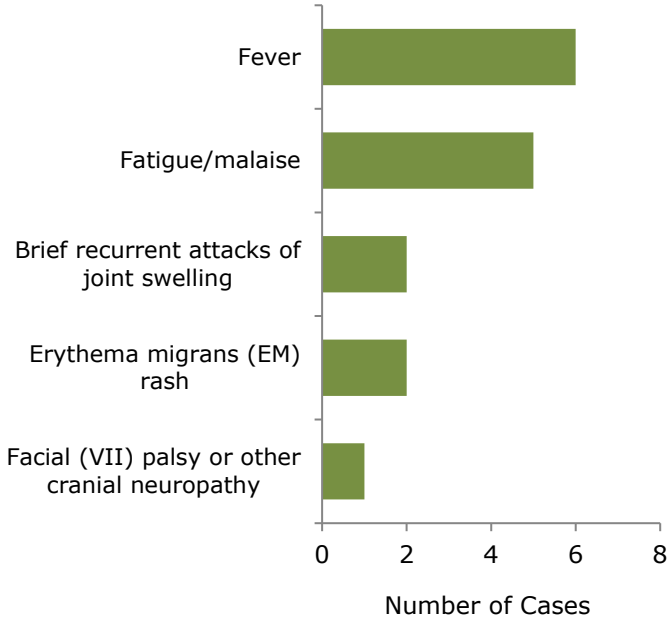
Lyme Disease Cases by Month of Onset, San Diego County, 2021



Outdoor Activity Locations Reported by Lyme Disease Cases, San Diego County, 2021

Location of Outdoor Activity	Cases	Percent
New England States	3	23.1
Middle Atlantic States	2	15.4
Midwestern States	2	15.4
South Atlantic States	1	7.7
Western Mountain States	1	7.7
Unknown	5	38.5

Signs and Symptoms Reported by Lyme Disease Case-Patients, San Diego County, 2021



Notes:

1. Counts include confirmed and probable cases following the CDC/CSTE case criteria.
2. Lyme disease became nationally notifiable in 1991.
3. Prior to 2008, the case definition included criteria for confirmed cases only. In 2008, the definition was expanded to include criteria for suspected and probable classifications. Laboratory criteria for diagnosis have changed over time.
4. A specific onset date could not be determined for 1 out of the 13 cases. In this instance, the date of laboratory specimen collection was used as a surrogate.
5. Outdoor activity locations total more than 100% due to one person who reported two locations.
6. Data on signs/symptoms is presented for patients for whom information could be obtained, ranging from 7-10 of 13 total cases by sign/symptom type. One patient was asymptomatic.

For more information:

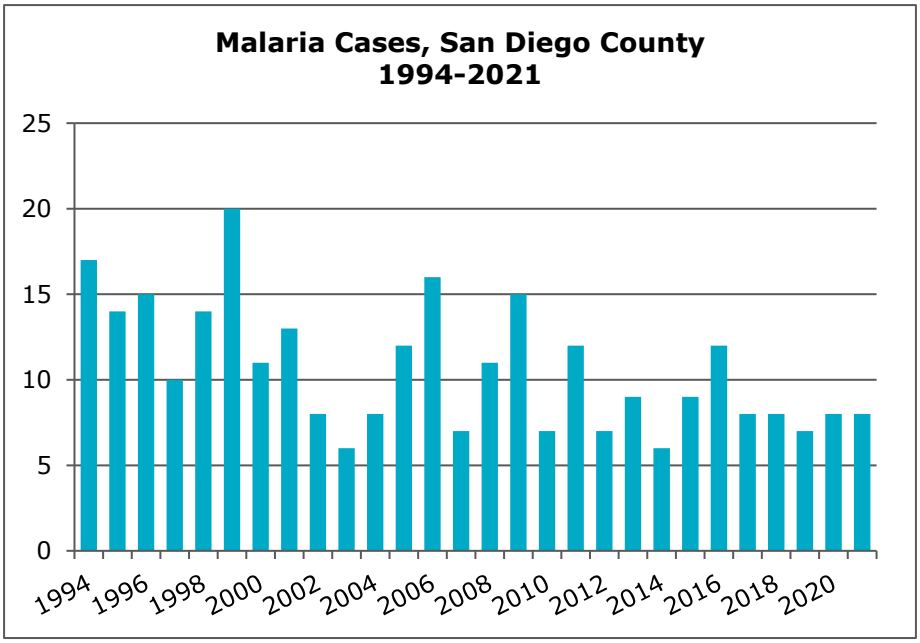
- Centers for Disease Control and Prevention (CDC) Lyme Disease website
- California Department of Public Health (CDPH) Lyme Disease website
- CDC/CSTE Lyme Disease Case Definition
- County of San Diego Department of Environmental Health Lyme Disease website

MALARIA

Disease Info

Infectious agent: *Plasmodium* species, protozoan parasites: *P. falciparum, P. vivax, P. ovale, P. malariae, P. knowlesi*
Incubation: Usually 7-30 days, depending on *Plasmodium* species (approximately 7-14 days for *P. falciparum*, 12-18 days for *P. vivax* and *P. ovale*, and 18-40 days for *P. malariae*)
Mode of transmission: Bite of an *Anopheles* mosquito
Symptoms: Fever, chills, sweats, headaches, body aches, general malaise, nausea and vomiting

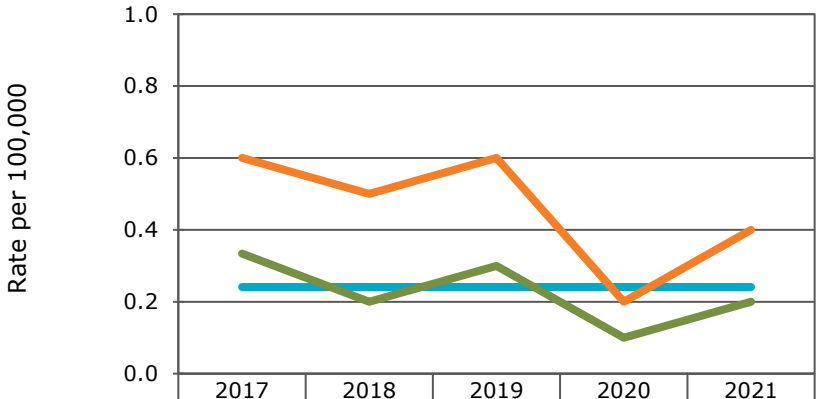
Malaria Cases, San Diego County 1994-2021



Key Points

- There were eight cases of malaria among San Diego County residents in 2021, just below the average of 8.6 cases over the previous ten years.
- The incidence of malaria among San Diego County residents has been stable between 2017 and 2021, remaining at 0.2 cases per 100,000 population.
- Malaria incidence in California was similar to San Diego, but United States incidence was generally higher.
- Malaria is not endemic to the United States; seven of the San Diego County cases in 2021 were imported from either Africa, Afghanistan, India, or Kuwait. One case was s potential reinfection from a past malaria infection.
- There is no clear seasonal distribution and most cases were in adults.
- Five of the eight cases were caused by *P. falciparum*, two by *P. vivax, and* one by *P. ovale.*

Malaria Incidence, San Diego County, California, and United States, 2017-2021

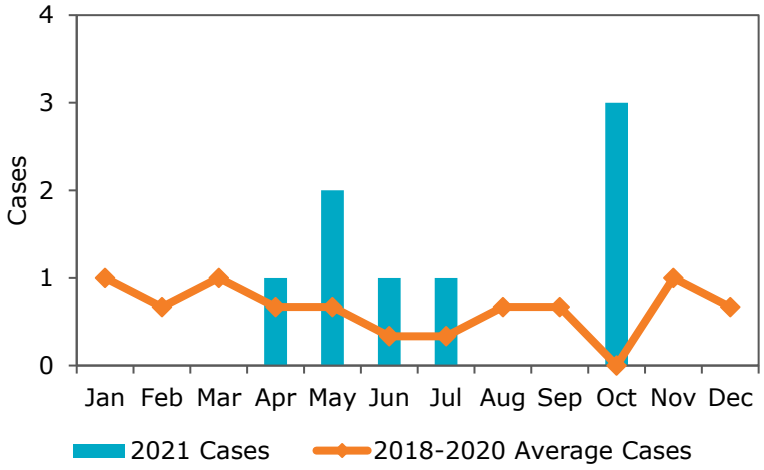


	2017	2018	2019	2020	2021
San Diego County	0.2	0.2	0.2	0.2	0.2
California	0.3	0.2	0.3	0.1	0.2
United States	0.6	0.5	0.6	0.2	0.4

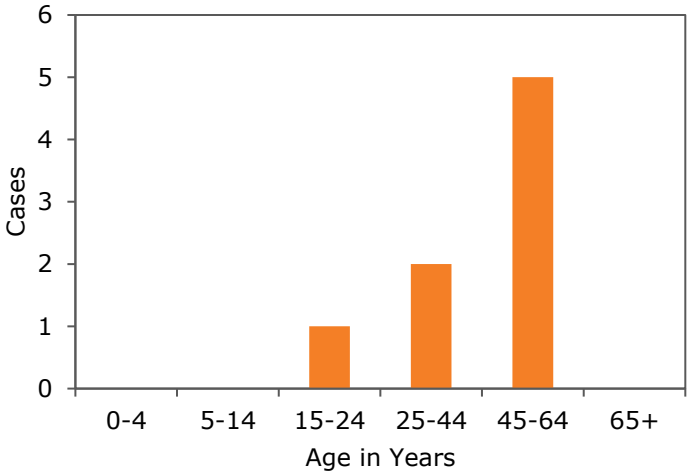
Anopheles quadriannulatus mosquito
Photo credit: CDC/ James Gathany, Public Health Image Library

MALARIA

Malaria Cases by Month of Onset, San Diego County, 2021



Malaria Cases by Age, San Diego County, 2021



Select Characteristics of Malaria Cases, San Diego County, 2021

Characteristic	Cases	Percent
Plasmodium species		
P. falciparum	5	62.5
P.vivax	2	25.0
P. ovale	1	12.5
Symptomatic	8	100.0
Hospitalized	8	100.0
Took chemoprophylaxis		
Yes	0	0.0
No	5	100.0
Travel location		
Africa	4	57.1
Afghanistan	1	14.3
India	1	14.3
Kuwait	1	14.3
Reason for travel		
Visiting friends/relatives	2	33.3
Work	2	33.3
Refugee/immigrant to U.S.	1	16.7
Military	1	16.7

Notes:

1. Counts include confirmed cases following the CDC/CSTE case criteria.
2. Malaria has been nationally notifiable since 1944.
3. Rates not calculated by age group due to counts <5.
4. Laboratory information was available for all eight cases. Clinical information was available for eight cases, except for chemoprophylaxis information, which was available for five cases. Travel location was available for seven cases and travel reason was available for six cases. One case did not have travel information and was indicated as a possible reinfection. Denominators for these calculations will vary based on availability of information as described above.

For more information:

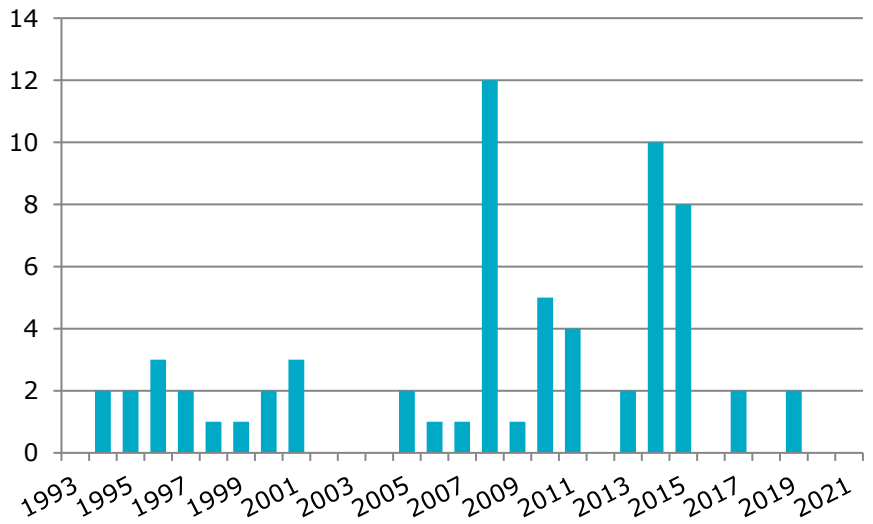
- Centers for Disease Control and Prevention (CDC) Malaria website
- CDC Health Information for International Travel (the Yellow Book) – Malaria
- CDC/CSTE Malaria Case Definition
- California Department of Public Health (CDPH) Malaria website
- World Health Organization Malaria website

MEASLES (RUBEOLA)

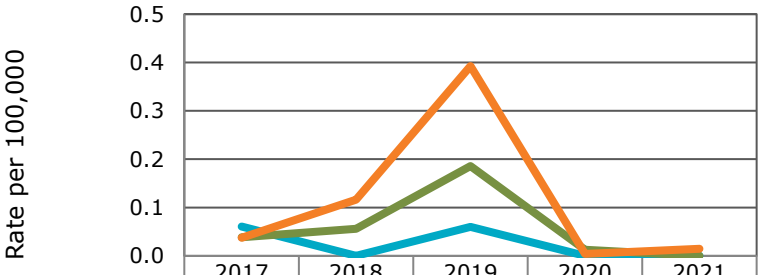
Disease Info

Infectious agent: Measles virus, an enveloped RNA virus of the genus *Morbillivirus* and the family Paramyxoviridae
Incubation: Usually 10 days, range 8-12 days
Mode of transmission: Primarily person-to-person by respiratory transmission, highly infectious
Symptoms: High fever (≥104°F), runny nose, cough, red eyes, and sore throat; followed by rash that begins as flat red spots appearing on the face at the hairline and spreading downward to the neck, trunk, arms, legs, and feet

Measles Cases, San Diego County 1993-2021



Measles Incidence, San Diego County, California, and United States, 2017-2021



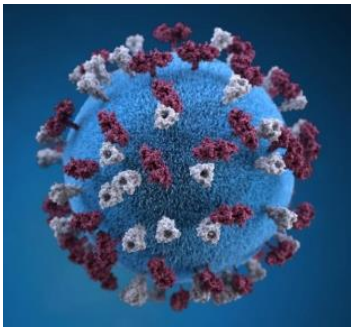
	2017	2018	2019	2020	2021
San Diego County	0.06	0.00	0.06	0.00	0.00
California	0.04	0.06	0.19	0.01	0.00
United States	0.04	0.12	0.39	0.00	0.01

Notes:

1. Counts include confirmed cases following the CDC/CSTE case criteria.
2. Measles became nationally notifiable in 1944.
3. Measles is vaccine-preventable; a measles vaccine first became available in the U.S. in 1963.

Key Points

- In 2021, there were no cases of measles in San Diego County.
- In 2008, 12 cases were reported in San Diego County, all of which were associated with a single outbreak. Case-patients ranged in age from zero to nine years (median six years). All but one of the case-patients (92%) were unimmunized.
- Eighteen cases were reported in 2014-2015, 14 of which were part of a multi-jurisdictional outbreak that originated at the Disneyland amusement park in Orange County, California. San Diego County case-patients associated with this outbreak ranged in age from 0-49 years (median 9.5 years). The majority of the case-patients (86%) were unvaccinated. This outbreak, which occurred from December 2014 to April 2015, included at least 131 cases in California as well as residents of six other states, Mexico, and Canada.



3D graphical representation of a measles virus particle studded with glycoprotein tubercles.
Photo credit: CDC/ Allison M. Maiuri, MPH, CHES, Public Health Image Library

For more information:

- Centers for Disease Control and Prevention (CDC) Measles website
- California Department of Public Health (CDPH) Measles website
- CDC/CSTE Measles Case Definition
- Epidemiology and Prevention of Vaccine-Preventable Diseases (the Pink Book) – Measles
- CDC Health Information for International Travel (the Yellow Book) – Measles

MENINGITIS

Disease Info

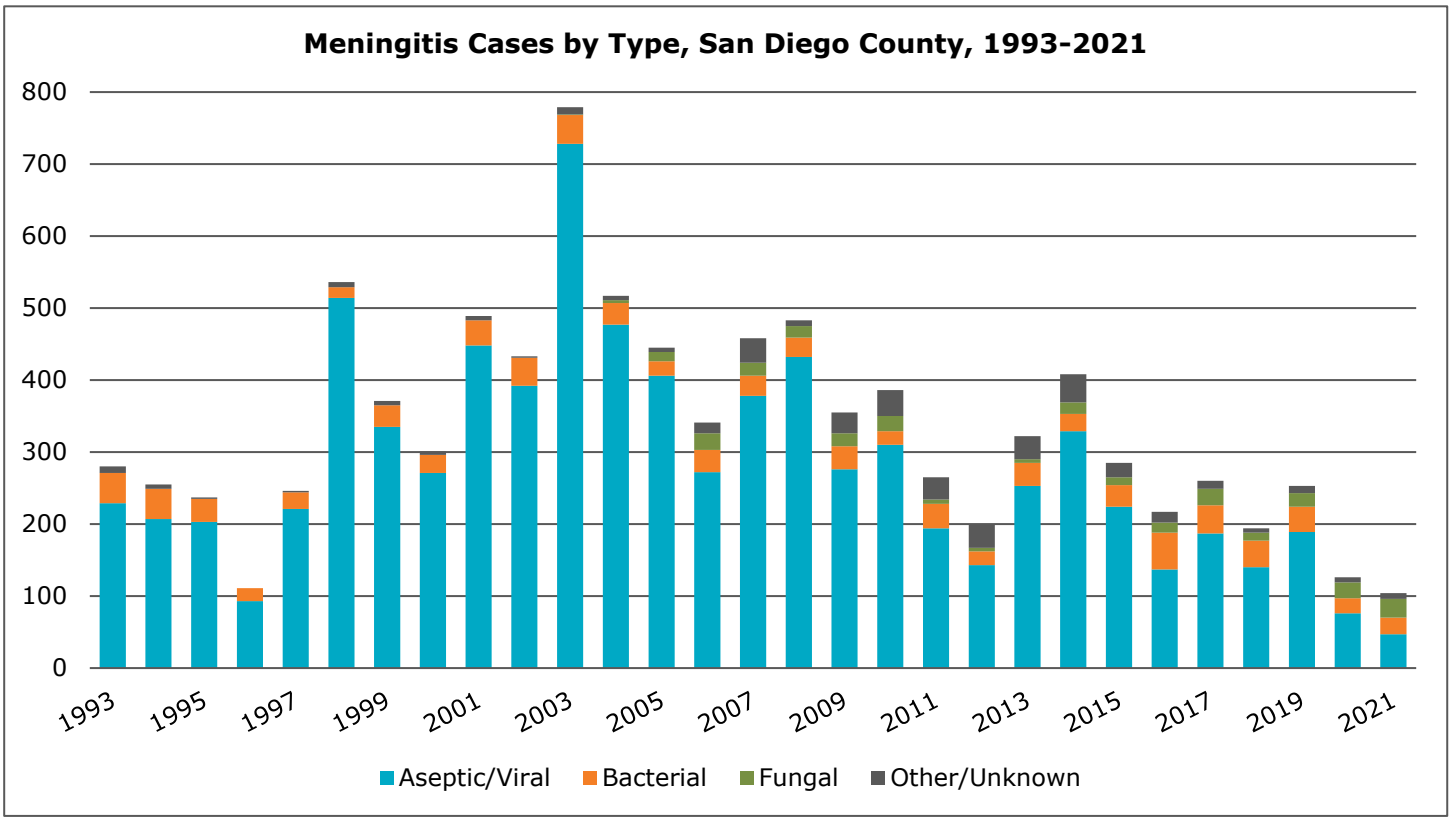
Infectious agent: Various viruses (e.g., non-polio enteroviruses and herpesviruses), bacteria (e.g., *Streptococcus pneumoniae*), fungus (e.g., *Cryptococcus*), and parasites, as well as some non-infectious causes; the etiology cannot always be identified
Incubation: Depends on the agent; for bacterial meningitis, usually 3-7 days
Mode of transmission: Bacteria and viruses are usually transmitted person-to-person (the specific mode varies by infectious agent), but most people infected with these bacteria and viruses will not develop meningitis
Symptoms: Meningitis is inflammation of the protective membranes around the brain and spinal cord; symptoms include fever, headache, stiff neck, photophobia, nausea, vomiting, altered mental status

For more information:

- Centers for Disease Control and Prevention (CDC) Meningitis website
- California Department of Public Health Viral Meningitis fact sheet

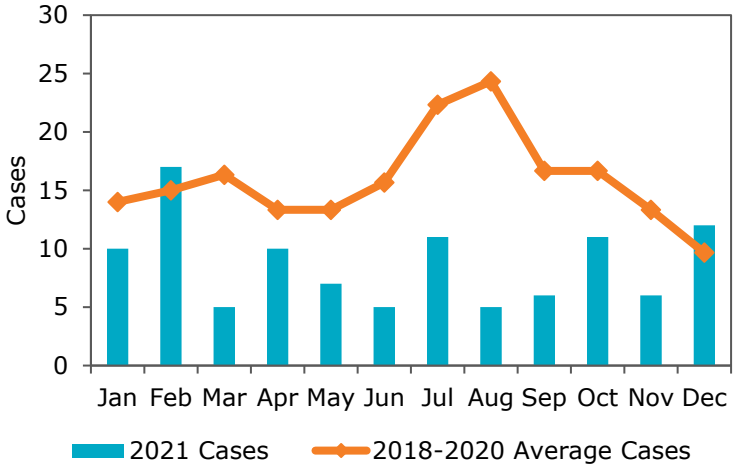
Key Points

- In 2021, there were 104 cases of meningitis reported in San Diego County: 47 (45%) viral/aseptic, 23 (22%) bacterial, 26 (25%) fungal, and 8 (8%) other or unknown cause.
- Herpes simplex virus was the most common cause of viral meningitis in 2021. The most common etiology of bacterial meningitis was Group B *Streptococcus*. Most fungal meningitides were caused by *Cryptococcus*, particularly *C. neoformans*.
- San Diego County experienced peak meningitis cases during the summer in 2021.
- While the largest number of cases was among adults ages 45-64 years, the highest rates (4.0, 4.1, and 4.2 per 100,000 population) were in children under five years old, adults ages 45-64 and 65 and older.

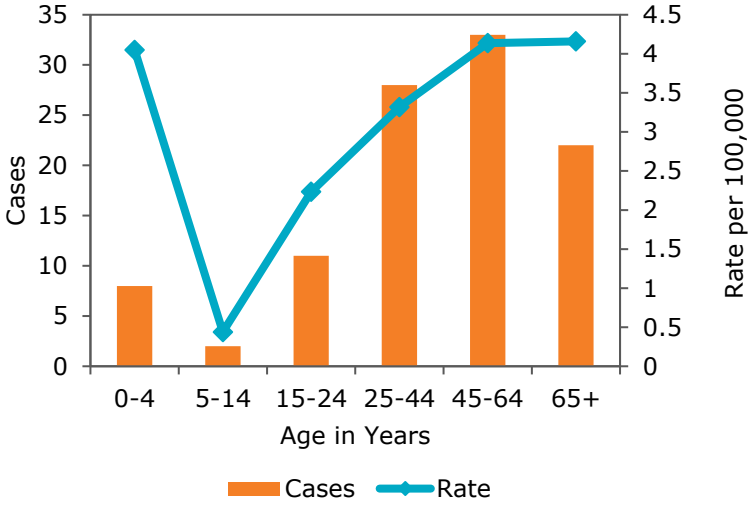


MENINGITIS

Meningitis Cases by Month of Onset, San Diego County, 2021



Meningitis Cases and Rates by Age, San Diego County, 2021



Etiology of Meningitis Cases, San Diego County, 2021

Etiology	Cases
Viral (n=47)	
Herpes Simplex Virus	17
Varicella Zoster Virus	6
Unknown etiology	24
Fungal (n=26)	
Cryptococcus	25
Other fungus	1
Bacterial (n=23)	
Group B *Streptococcus*	5
Escherichia coli	3
Haemophilus influenzae	3
Streptococcus pneumonaie	3
Staphylococcus aureus	1
Other bacteria	6
Unknown etiology	2
Other/Unknown (n=8)	

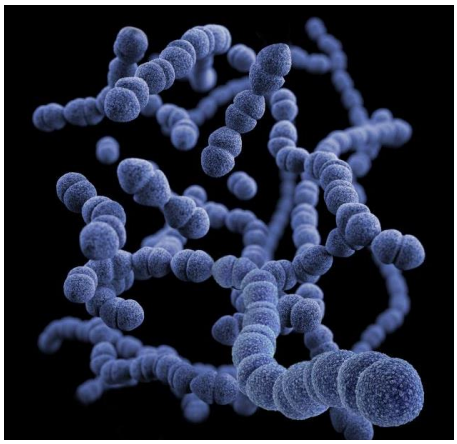


Illustration based upon scanning electron microscopic imagery of *Streptococcus pneumoniae* bacteria.

Content from: CDC/Sarah Bailey Cutchin/Illustrator Dan Higgins, CDC Public Health Image Library

Notes:

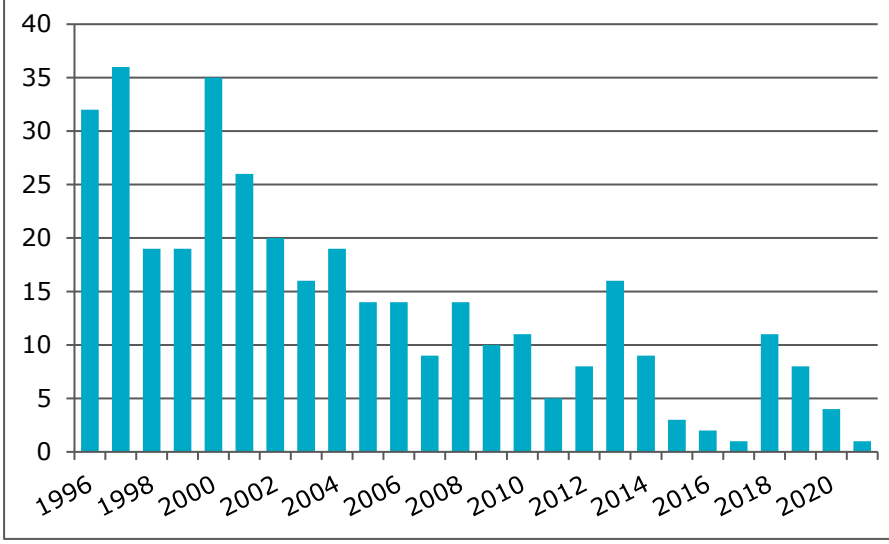
1. Counts include confirmed, probable, and suspect cases based on California Department of Public Health recommendations for reporting viral and bacterial meningitis, which consider clinical findings, cerebral spinal fluid (CSF) cell counts, CSF glucose, and CSF protein, in addition to confirmed etiology.
2. Meningitis is not nationally notifiable. Specific causes of meningitis, such as arboviruses and meningococcus, are reportable at the national level. Meningitis of any etiology is reportable in California.
3. Counts do not include meningitis cases caused by infections that are separately reportable (e.g., West Nile virus, *Neisseria meningiditis*, *Listeria monocytogenes*, *Haemophilus influenzae* in children, tuberculosis, mumps).

MENINGOCOCCAL DISEASE

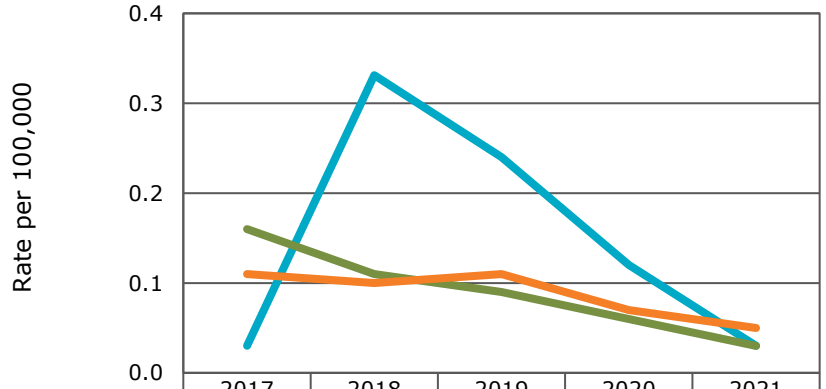
Disease Info

Infectious agent: *Neisseria meningitidis*, a gram-negative bacterium; 3 serogroups—B, C, and Y—cause most illness in the U.S.
Incubation: Usually 3-4 days, range 2-10 days
Mode of transmission: Shared respiratory and throat secretions, generally via close contact such as coughing or kissing
Symptoms: There are two common clinical syndromes: meningitis symptoms which often include fever, headache, stiff neck; septicemia (meningococcemia) symptoms which may include fever and chills, fatigue, vomiting, cold hands/feet, body aches, dark purple rash

Meningococcal Disease Cases, San Diego County, 1996-2021



Meningococcal Disease Incidence, San Diego County, California, and United States, 2017-2021



	2017	2018	2019	2020	2021
San Diego County	0.03	0.33	0.24	0.12	0.03
California	0.16	0.11	0.09	0.06	0.03
United States	0.11	0.10	0.11	0.07	0.05

Key Points

- There was one case of meningococcal disease reported among San Diego County residents in 2021, a decrease from the previous three years.
- Incidence of meningococcal disease remains low in San Diego County, California, and the U.S.
- Local, state, and national rates of meningococcal disease decreased substantially during the height of the COVID-19 pandemic, likely due to factors such as social distancing.
- The 2021 case in San Diego County was caused by serogroup Y.
- The case was in a female over 45 years old who survived the illness, which is often severe and can be deadly.

Notes:

1. Counts include confirmed and probable cases following the CDC/CSTE case criteria.
2. Meningococcal disease has been nationally notifiable since 1944.
3. A quadrivalent vaccine protective against serogroups A,C,W,Y was licensed in the U.S. in 2005. It is recommended for all 11 to 12 year-olds, with a booster dose at 16 years old, as well as children and adults at increased risk for the disease. Serogroup B meningococcal vaccine was licensed in the U.S. in 2014. It is recommended for people 10 years or older who are at increased risk for meningococcal disease.

For more information:

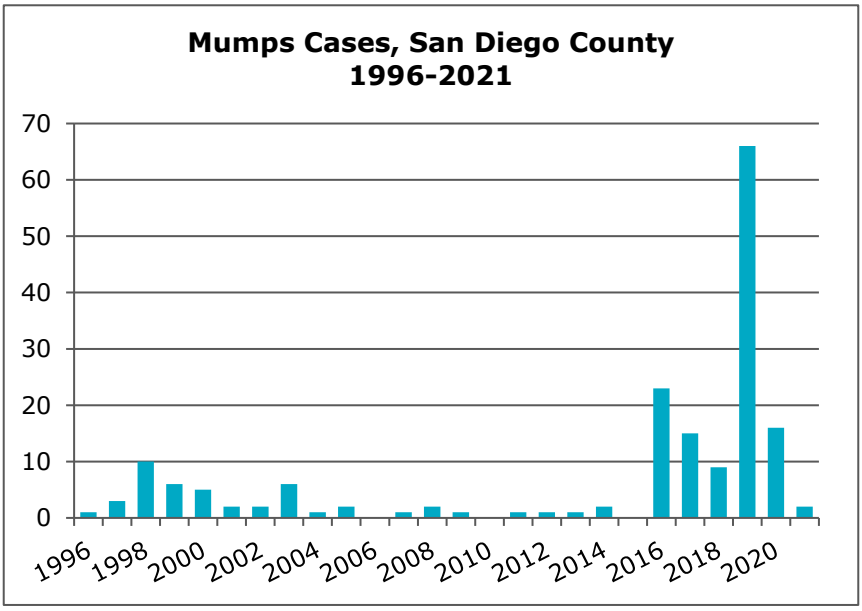
- Centers for Disease Control and Prevention (CDC) Meningococcal Disease website
- Epidemiology and Prevention of Vaccine-Preventable Diseases (the Pink Book) – Meningococcal Disease
- CDC/CSTE Meningococcal Disease Case Definition
- California Department of Public Health (CDPH) Meningococcal Disease website
- County of San Diego Meningococcal Disease Fact Sheet

MUMPS

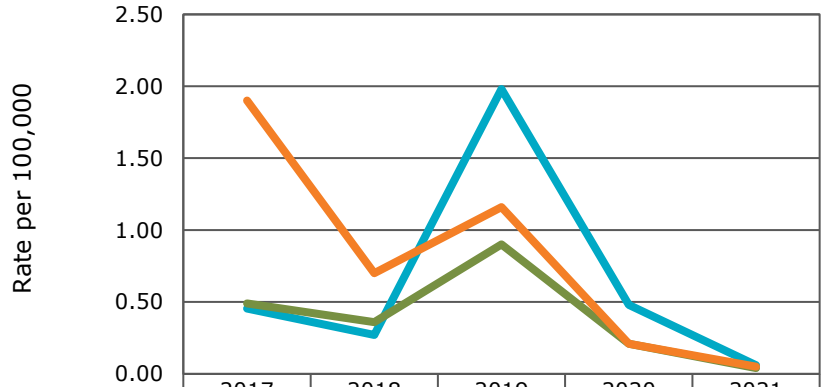
Disease Info

Infectious agent: Mumps virus, an RNA virus and member of the family Paramyxoviridae
Incubation: Usually 16-18 days, range 12-25 days
Mode of transmission: Respiratory droplets or secretions (e.g., being coughed or sneezed on, kissing, sharing utensils/water bottles with the infected person)
Symptoms: Individuals can be symptomatic or asymptomatic
Non-specific symptoms can include fever, headache, fatigue, and muscle pain
Most common symptom is unilateral or bilateral swelling of salivary glands (typically the parotid glands – parotitis)
Complications can include: orchitis, hearing impairment, encephalitis, meningitis, oophoritis, nephritis

Mumps Cases, San Diego County 1996-2021



Mumps Incidence, San Diego County, California, and United States, 2017-2021



	2017	2018	2019	2020	2021
San Diego County	0.45	0.27	1.98	0.48	0.06
California	0.49	0.36	0.90	0.21	0.04
United States	1.90	0.70	1.16	0.21	0.05

Key Points

- There were two cases of mumps among San Diego County residents in 2021, a decrease from the previous five years.
- Mumps incidence in the United States, California, and San Diego County all rose sharply in 2019 and dropped just as sharply in 2020 and 2021.
- One case was in a child under 10 and the other was in an adult over 65.
- One of the two mumps case-patients was hospitalized.

Notes:

1. Counts include confirmed and probable cases following the CDC/CSTE case criteria.
2. Mumps has been nationally notifiable since 1968.
3. Mumps is a vaccine-preventable disease; the MMR vaccine became available in the United States in 1967.

For more information:

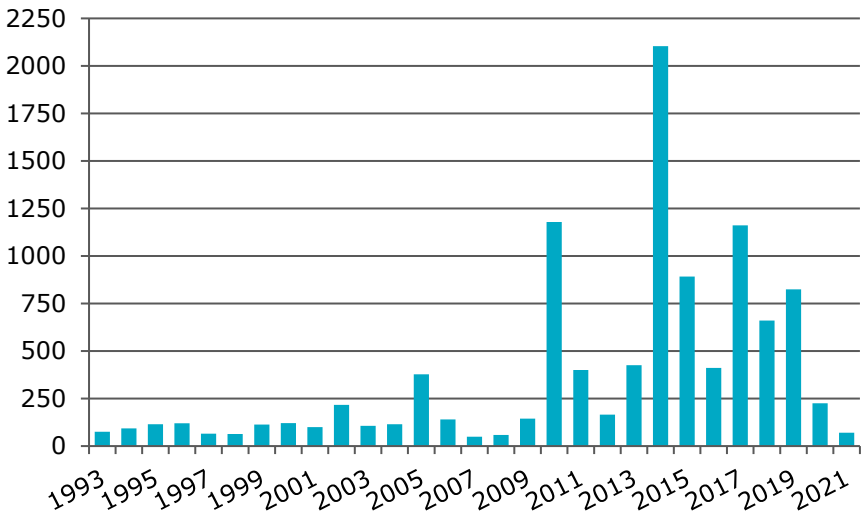
- Centers for Disease Control and Prevention (CDC) Mumps website
- Epidemiology and Prevention of Vaccine-Preventable Diseases (the Pink Book) – Mumps
- CDC Mumps Case Definition
- California Department of Public Health (CDPH) Mumps website
- County of San Diego Immunization Unit website

PERTUSSIS

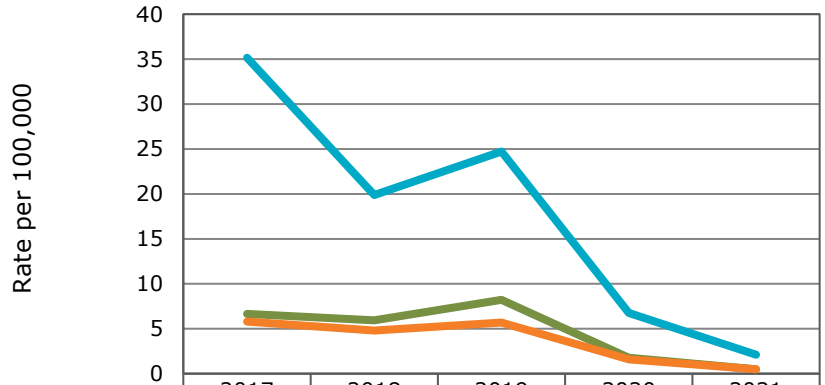
Disease Info

Infectious agent: *Bordetella pertussis*, a bacterium
Incubation: Usually 7-10 days, range 4-21 days
Mode of transmission: Person-to-person by the respiratory route, commonly by coughing or sneezing
Symptoms: Early symptoms include runny nose, low-grade fever, mild, occasional cough, apnea; later-stage symptoms include bursts of numerous, rapid coughs, after which the patient may produce a characteristic high-pitched inspiratory "whoop." Vomiting or exhaustion can occur after coughing. Symptoms can last 6-10 weeks, duration of cough may extend longer for some.

Pertussis Cases, San Diego County 1993-2021



Pertussis Incidence, San Diego County, California, and United States, 2017-2021



	2017	2018	2019	2020	2021
San Diego County	35.1	19.9	24.7	6.8	2.1
California	6.6	5.9	8.2	1.8	0.5
United States	5.8	4.8	5.7	1.6	0.5

Key Points

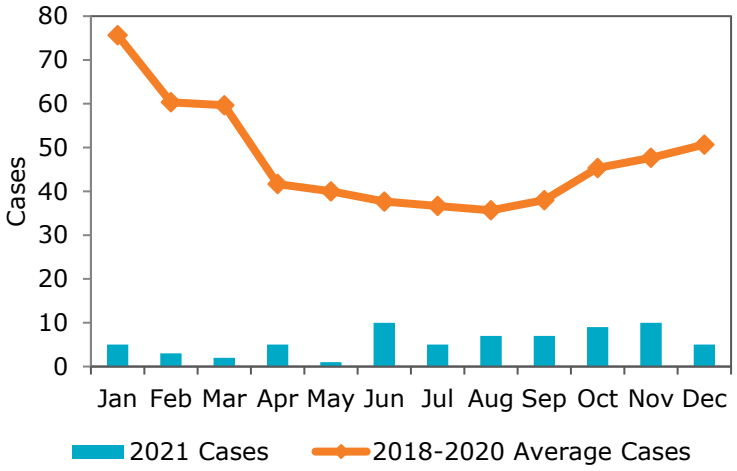
- In 2021, there were 70 cases of pertussis in San Diego County. Peaks in incidence occur every three to five years.
- The incidence rate of pertussis in 2021 was higher in San Diego County (2.1 per 100,000) than in California and the United States (0.5 per 100,000).
- After the introduction of a whole-cell vaccine in the United States in the 1940s, the incidence rate of pertussis decreased from 150 cases per 100,000 in the early 1940s to eight per 100,000 population in 1960. In recent years, the incidence of pertussis has increased. More cases have been reported among children 7-10 and 13-14 years of age, and increases have been noted among children and adolescents who were fully-vaccinated. These increases are likely due to the transition to acellular vaccine use in the 1990s.
- In late 2013-2014, a national media outreach campaign, along with local press releases, raised awareness about pertussis. This may have led to increased pertussis case identification and treatment by providers in 2014.
- In 2021, the majority of case-patients were under the age of 25 years.
- From 2019-2021, incidence rates of pertussis were highest among residents of the East HHSA Region of the county.

For more information:

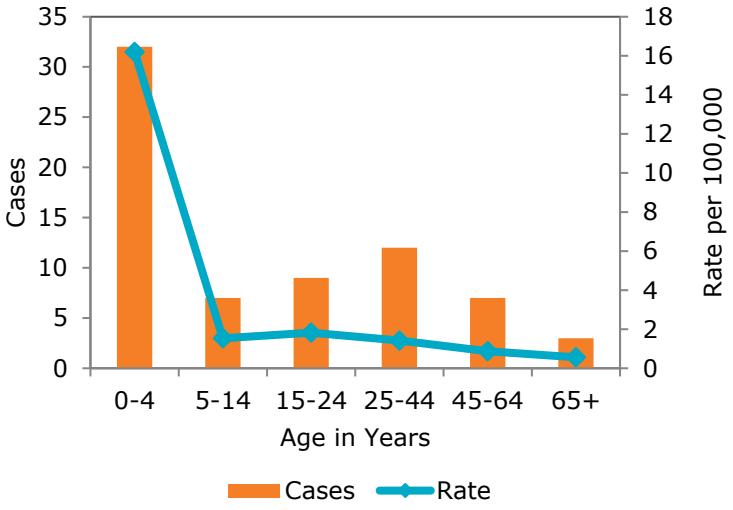
- Centers for Disease Control and Prevention (CDC) Pertussis website
- Epidemiology and Prevention of Vaccine-Preventable Diseases (the Pink Book) – Pertussis
- California Department of Public Health (CDPH) Pertussis website
- CDC/CSTE Pertussis Case Definition
- CDPH Pertussis Case Definition
- CDC Immunization Schedules

PERTUSSIS

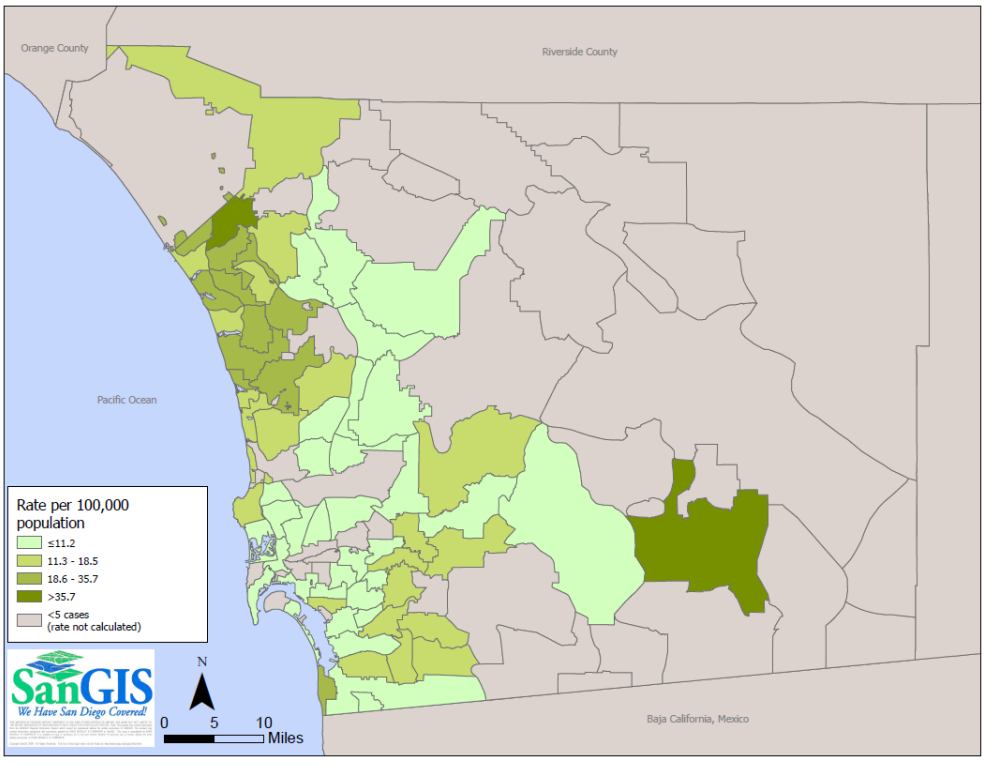
Pertussis Cases by Month of Onset, San Diego County, 2021



Pertussis Cases and Rates by Age, San Diego County, 2021



Pertussis Rates by Zip Code of Residence, San Diego County, 2019-2021



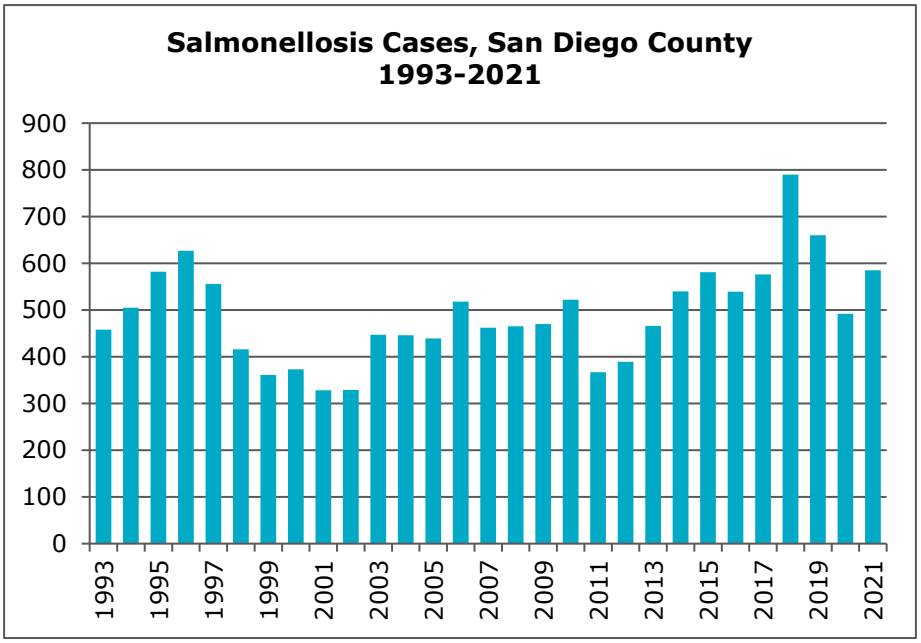
Notes:

1. US counts include confirmed and probable cases following the CDC/CSTE case criteria. San Diego County and California counts through 2019 include confirmed, probable, and suspect cases following the former California Department of Public Health case definition. Beginning in 2020, San Diego County and California counts include confirmed and probable cases following the California Department of Public Health case definition.
2. Pertussis became nationally notifiable in 1973.
3. Pertussis is vaccine-preventable. In the United States, whole-cell pertussis vaccines were first licensed in 1914 and became available in 1948 as the combined DTP vaccine, which provides protection against diphtheria, tetanus, and pertussis. Acellular pertussis vaccines are currently available in combination with tetanus and diphtheria toxoids as DTaP (pediatric formulation) or Tdap (adolescent and adult formulation).
4. CDC recommends vaccination of infants, children, adolescents, and adults. It is recommended that pregnant women receive the Tdap vaccine during each pregnancy between 27-36 weeks of gestation.

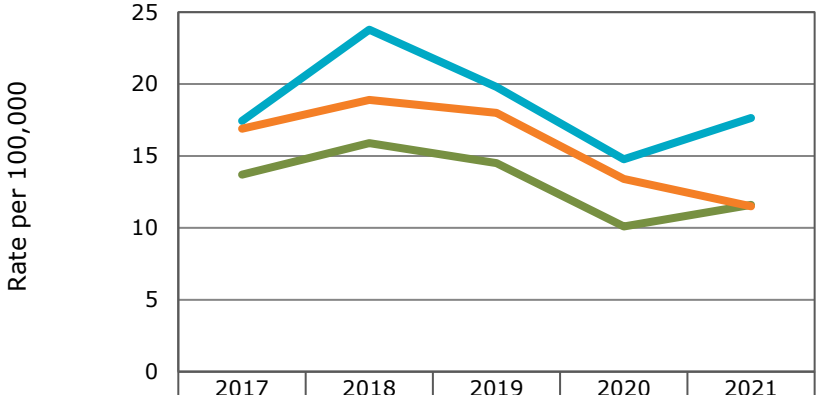
SALMONELLOSIS

Disease Info

Infectious agent: *Salmonella*, non-typhi bacteria
Incubation: Usually 12-36 hours, range 6 hours-7 days
Mode of transmission: Fecal-oral; raw or undercooked eggs; contaminated poultry; cross-contamination; contact with animals, reptiles, or birds; person-to-person (e.g., day care/diapered children/sexual activity)
Symptoms: Acute diarrhea, abdominal cramps, fever, sometimes vomiting



Salmonellosis Incidence, San Diego County, California, and United States, 2017-2021



	2017	2018	2019	2020	2021
San Diego County	17.4	23.8	19.8	14.8	17.6
California	13.7	15.9	14.5	10.1	11.6
United States	16.9	18.9	18.0	13.4	11.5

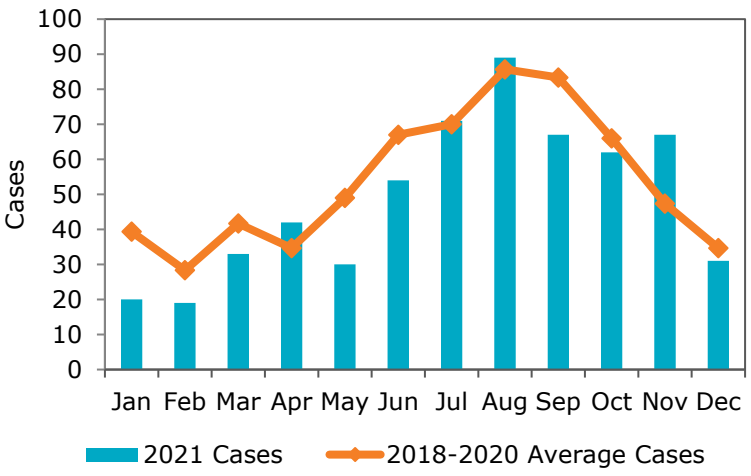
Key Points

- In 2021, there were 585 cases of salmonellosis in San Diego County.
- The incidence rate of salmonellosis in 2021 was higher in San Diego County (17.6 per 100,000) than in California and the United States.
- In 2021, 25% of salmonellosis case-patients in San Diego County were hospitalized for their infections.
- Onsets of illness peaked during the summer months in 2021. This is consistent with trends seen in previous years.
- The greatest number of cases in 2021 were in persons between the ages of 25-44 years (134 cases). The highest rate, however, was among children under five years of age (51.1 per 100,000).
- *Salmonella* Enteritidis (90 cases) was the most frequently reported serotype among San Diego County cases in 2021 followed by *Salmonella* Newport (58 cases).
- Commonly reported risk factors included eating food prepared outside of the home (68%) and consuming poultry (62%), fresh fruit (58%) and eggs (57%). Travel was reported by 24% of case-patients.

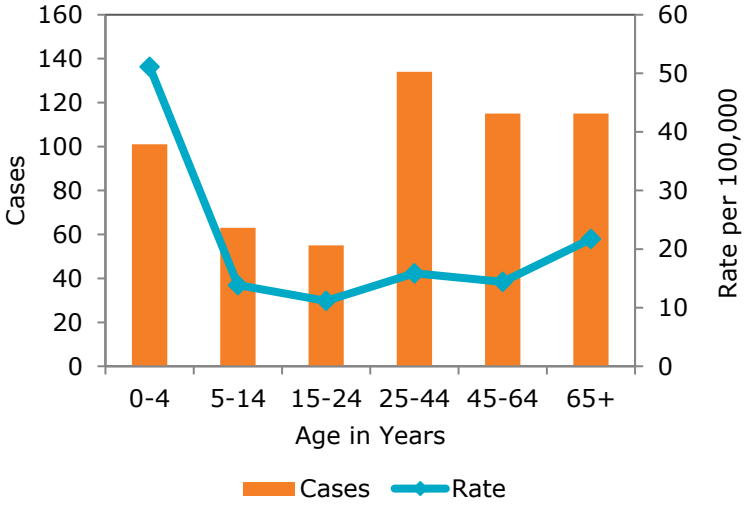
25% HOSPITALIZED 2021

SALMONELLOSIS

Salmonellosis Cases by Month of Onset, San Diego County, 2021



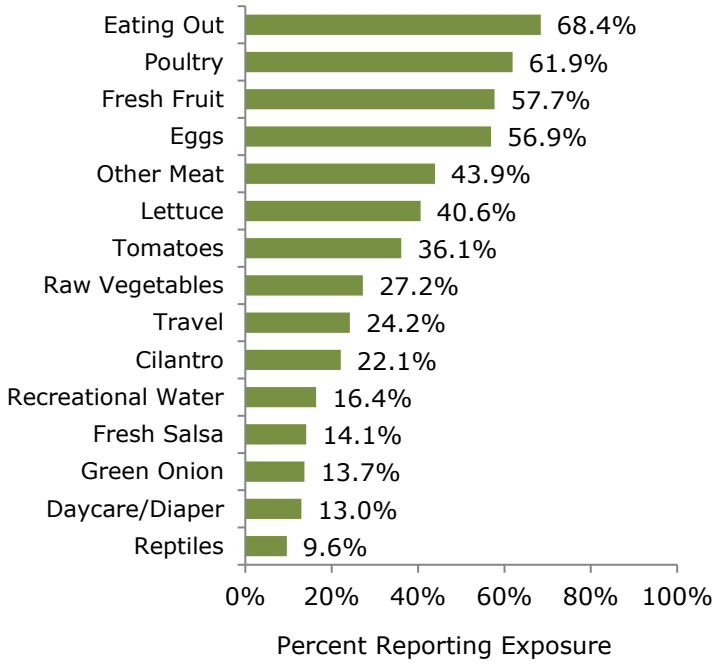
Salmonellosis Cases and Rates by Age, San Diego County, 2021



Reported Salmonella Serotypes, San Diego County, 2021

Serotype	Cases	Percent
Enteritidis	90	15.4
Newport	58	9.9
Montevideo	38	6.5
Manhattan	24	4.1
Muenchen	21	3.6
Typhimurium	19	3.3
Oranienburg	18	3.1
Javiana	12	2.1
Thompson	11	1.9
All other serotypes	117	20.0
Unknown serotype	177	30.3
Total	585	100.0

Risk Factors Reported by Salmonellosis Case-Patients, San Diego County, 2021

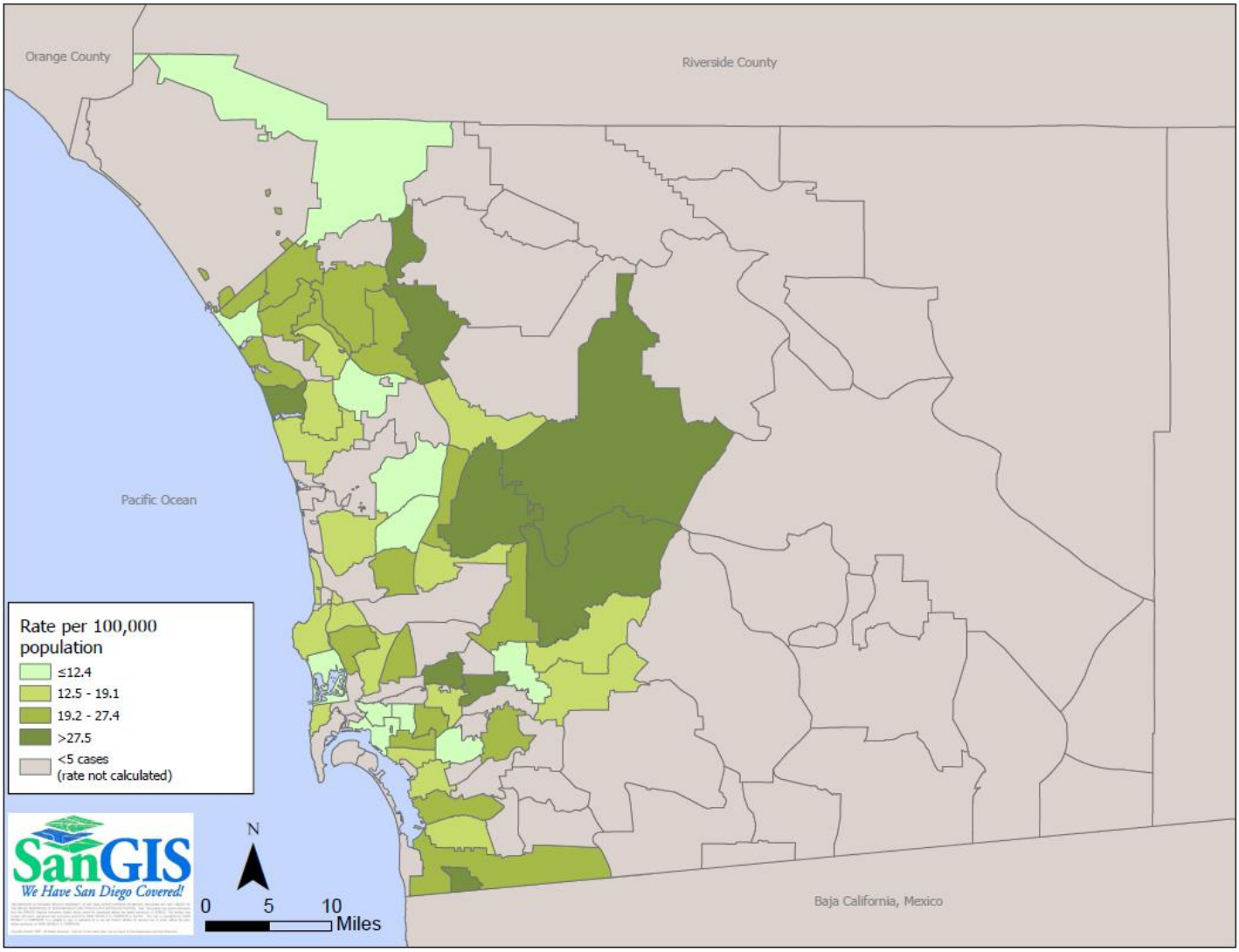


Notes:

1. Counts include confirmed and probable cases following the CDC/CSTE case criteria. In 2017, the case definition was changed to include cases detected by culture-independent diagnostic testing (CIDT) as probable cases. Use of CIDT detection methods is increasing.
2. Salmonellosis became nationally notifiable in 1944.
3. Denominators for hospitalization and risk factor calculations are cases with available information, ranging from 411-535 of 585 total cases.
4. Risk factors are potential sources as reported by case-patients, not confirmed sources of infection.

SALMONELLOSIS

Salmonellosis Rates by Zip Code of Residence, San Diego County, 2021



For more information:

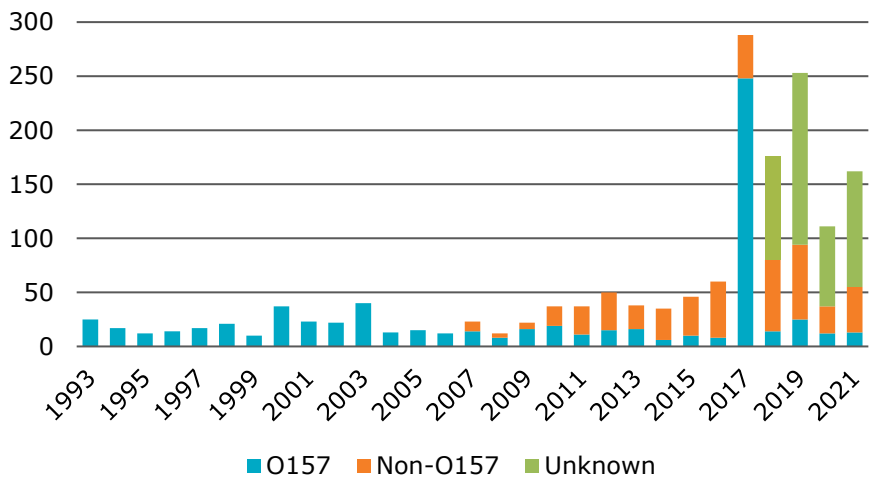
- Centers for Disease Control and Prevention (CDC) Salmonellosis website
- California Department of Public Health (CDPH) Salmonellosis website
- CDC/CSTE Salmonellosis Case Definition
- Salmonella Outbreak Investigations CDC webpage
- Salmonellosis Health Pets CDC webpage
- PulseNet

SHIGA TOXIN-PRODUCING *E. COLI*

Disease Info

Infectious agent: Strains of *Escherichia coli* (*E. coli*) bacteria that produce Shiga toxin; *E. coli* O157 is the best known, but many other serogroups (referred to as non-O157 *E. coli*) cause disease
Incubation: Average 3-4 days, range 1-10 days
Mode of transmission: Fecal-oral; food/beverage/water contaminated by ruminant feces (often ground beef, sprouts, leafy greens, unpasteurized milk products); contact with ruminants; person-to-person in households, child care settings
Symptoms: Acute diarrhea, often bloody; abdominal cramps; sometimes vomiting and low-grade fever

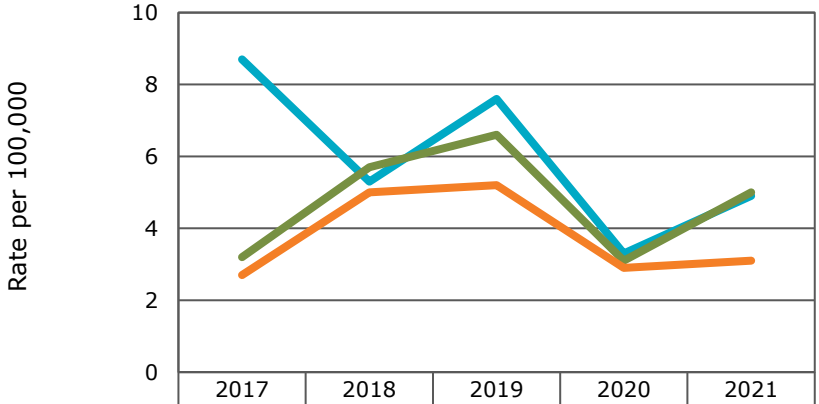
Shiga Toxin-Producing *E. coli* Cases by Serogroup, San Diego County, 1993-2021



Key Points

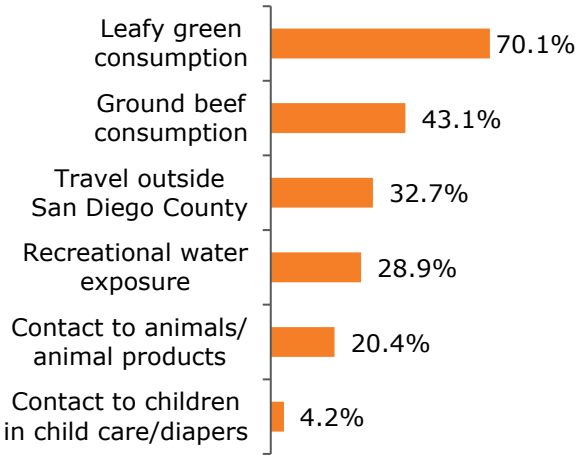
- In 2021, there were 162 cases of Shiga toxin-producing *E. coli* (STEC) reported in San Diego County.
- There were two cases of post-STEC hemolytic uremic syndrome.
- Among STEC cases in 2021, 13 cases (8%) were serogroup O157. Other common serogroups were O103 and O26. Due to the increase in culture-independent diagnostic testing methods for STEC, 66% of cases had an unknown serogroup.
- Due to an outbreak in the military population in 2017, the incidence of STEC in San Diego County increased dramatically compared to the national and state rates. From 2018 through 2020, San Diego County was again more similar to California in incidence, with the rate slightly increasing in San Diego County in 2021.
- The rates of STEC in San Diego County were highest among children under five years old, with the next highest rate among adults over 65 years old.
- Consumption of leafy greens (70%) and ground beef (43%) were the most commonly reported exposures in 2021.

Shiga Toxin-Producing *E. coli* Incidence, San Diego County, California, and United States, 2017-2021



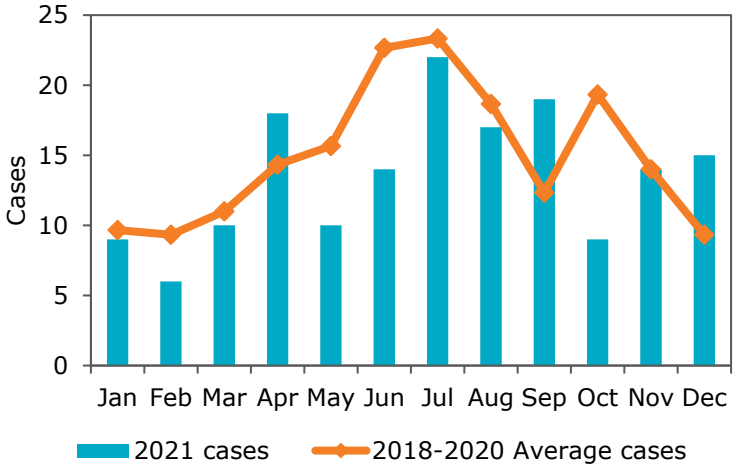
	2017	2018	2019	2020	2021
San Diego County	8.7	5.3	7.6	3.3	4.9
California	3.2	5.7	6.6	3.1	5.0
United States	2.7	5.0	5.2	2.9	3.1

Risk Factors Reported by Case-patients, Shiga Toxin-Producing *E. coli*, San Diego County, 2021

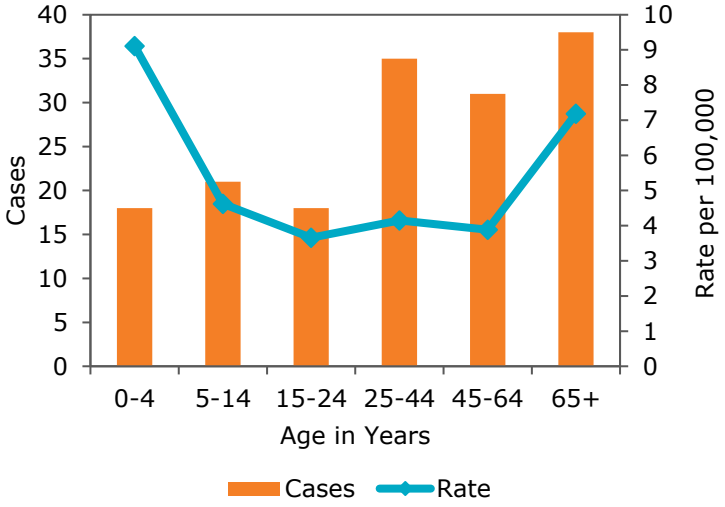


SHIGA TOXIN-PRODUCING *E. COLI*

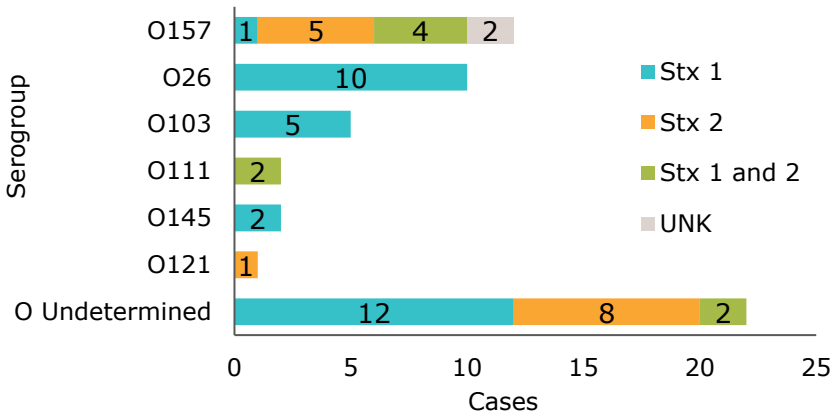
Shiga Toxin-Producing *E. coli* Cases by Month of Onset, San Diego County, 2021



Shiga Toxin-Producing *E. coli* Cases and Rates by Age, San Diego County, 2021



Serogroups of Culture-Confirmed Shiga Toxin-Producing *E. coli* Cases by Shiga Toxin (Stx) Type, San Diego County, 2021



39%
EMERGENCY DEPARTMENT VISIT

24%
HOSPITALIZED

2021

2
CASES OF HEMOLYTIC UREMIC SYNDROME

For more information:

- Centers for Disease Control and Prevention (CDC) *E. coli* website
- CDC/CSTE Shiga toxin-Producing *E. coli* Case Definition
- California Department of Public Health (CDPH) *E. coli* O157 website
- U. S. Department of Agriculture Food Safety and Inspection Service *E. coli* website

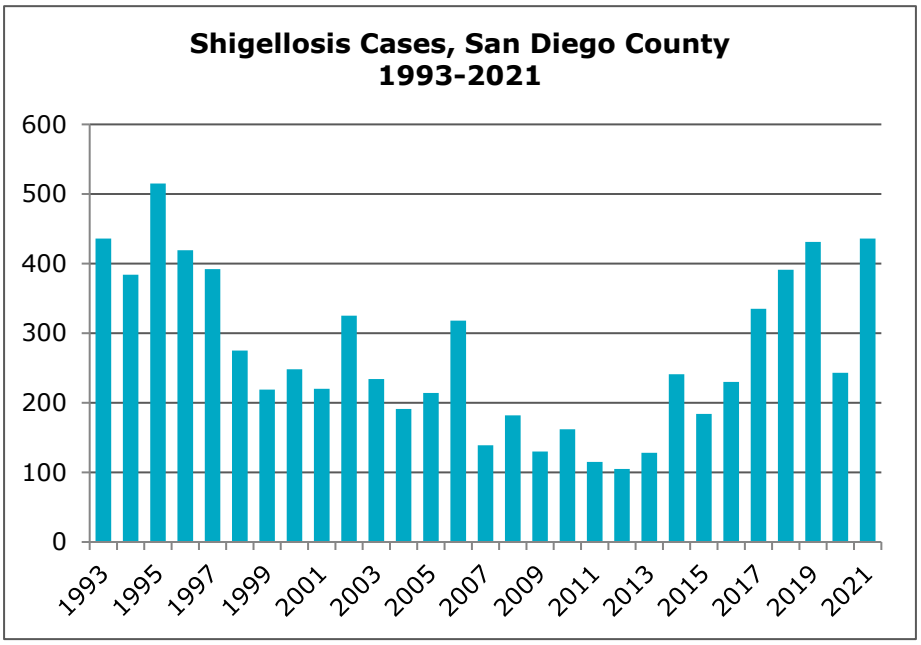
Notes:

1. Counts include confirmed and probable cases following the CDC/CSTE case criteria. In 2018, the case definition was changed to include cases detected by culture-independent diagnostic testing (CIDT) as probable cases. In these cases, serogroup information is not available.
2. *E. coli* O157 has been nationally notifiable since 1995. Non-O157 Shiga toxin-producing *E. coli* became reportable as Enterohemorrhagic *E. coli* (EHEC) in 2001 and as Shiga toxin-producing *E. coli* (STEC) in 2006.
3. Denominators for clinical/risk factor calculations are cases with available information, ranging from 130-162 of 176 cases.
4. Risk factors are potential exposures mentioned by case-patients, not confirmed sources of infection.
5. There was a large outbreak of *E. coli* O157 among recruits at the Marine Corp Recruit Depot San Diego in late 2017, including 242 cases of STEC and 14 cases of hemolytic uremic syndrome.

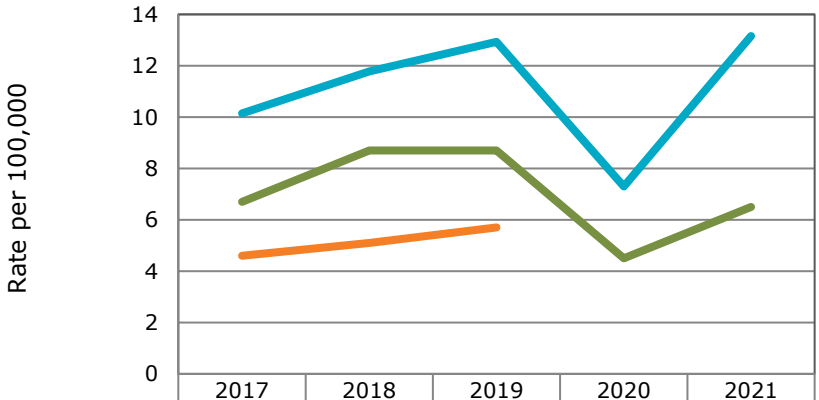
SHIGELLOSIS

Disease Info

Infectious agent: Four species, or serogroups, of *Shigella* bacteria: *S. dysenteriae* (Group A), *S. flexneri* (Group B), *S. boydii* (Group C), and *S. sonnei* (Group D)
Incubation: Usually 1-3 days, range 12 hours-4 days
Mode of transmission: Fecal-oral; ingestion of contaminated food or water; person-to-person (e.g., day care/diapered children/sexual activity)
Symptoms: Diarrhea (often bloody), abdominal cramps, and fever



Shigellosis Incidence, San Diego County, California, and United States, 2017-2021



	2017	2018	2019	2020	2021
San Diego County	10.1	11.8	12.9	7.3	13.2
California	6.7	8.7	8.7	4.5	6.5
United States	4.6	5.1	5.7		

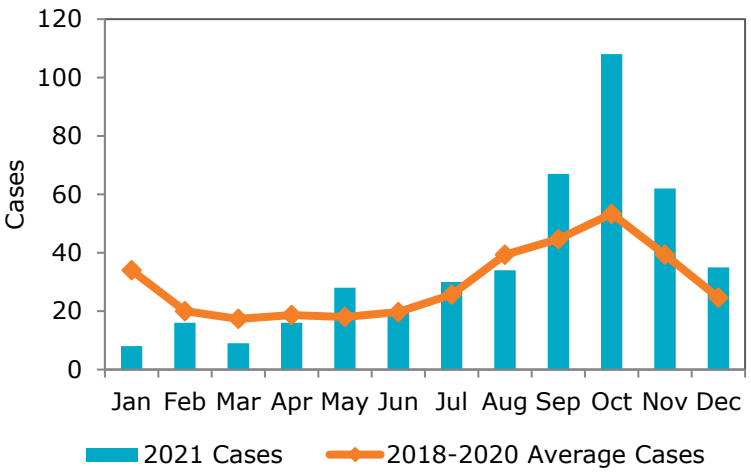
Key Points

- In 2021, there were 436 cases of shigellosis in San Diego County. This is an increase of 79% compared to the previous year (243 cases), but comparable to the number of cases in 2019 (431). In 2017, the case definition was changed to include cases detected by culture-independent diagnostic testing (CIDT) as probable cases.
- The incidence rate of shigellosis in 2021 was higher in San Diego County (13.2 per 100,000) than in California (6.5 per 100,000).
- In 2021, cases of shigellosis were highest during September to November.
- The greatest number of cases and the highest incidence rates were among persons 25-64 years of age.
- Commonly reported risk factors included eating food prepared outside of the home (74%), and consuming fresh fruit (60%), raw vegetables (45%), and cheese (43%). Travel was reported by 32% of case-patients.
- In San Diego County, the most frequently reported species were *S. sonnei* (38%) and *S. flexneri* (19%).
- Incidence rates were highest among residents of the Central and South HHSA Regions of San Diego County.

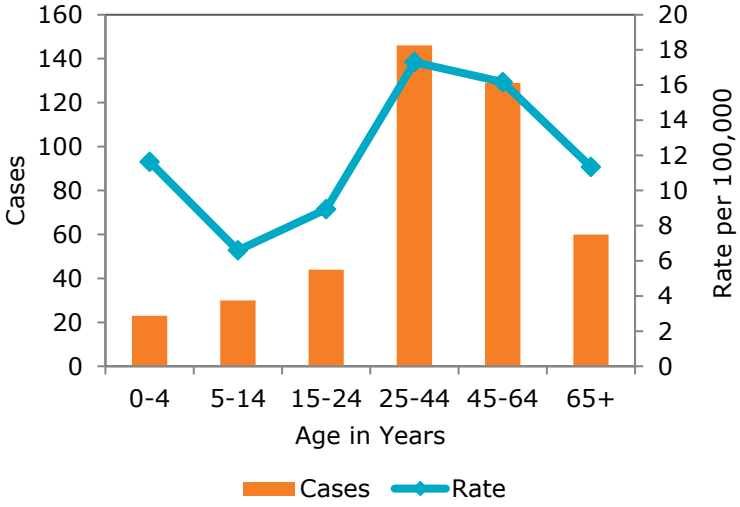
3D computer-generated image of a number of rod-shaped, drug-resistant *Shigella* bacteria.
Photo credit: CDC/ James Archer, Public Health Image Library

SHIGELLOSIS

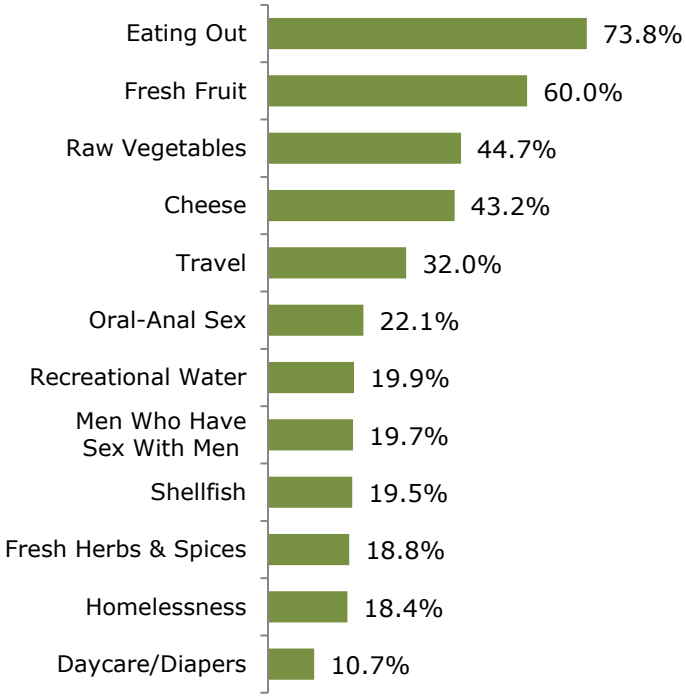
Shigellosis Cases by Month of Onset, San Diego County, 2021



Shigellosis Cases and Rates by Age, San Diego County, 2021



Risk Factors Reported by Shigellosis Cases, San Diego County, 2021



Reported Shigella Species (Serogroups), San Diego County, 2021

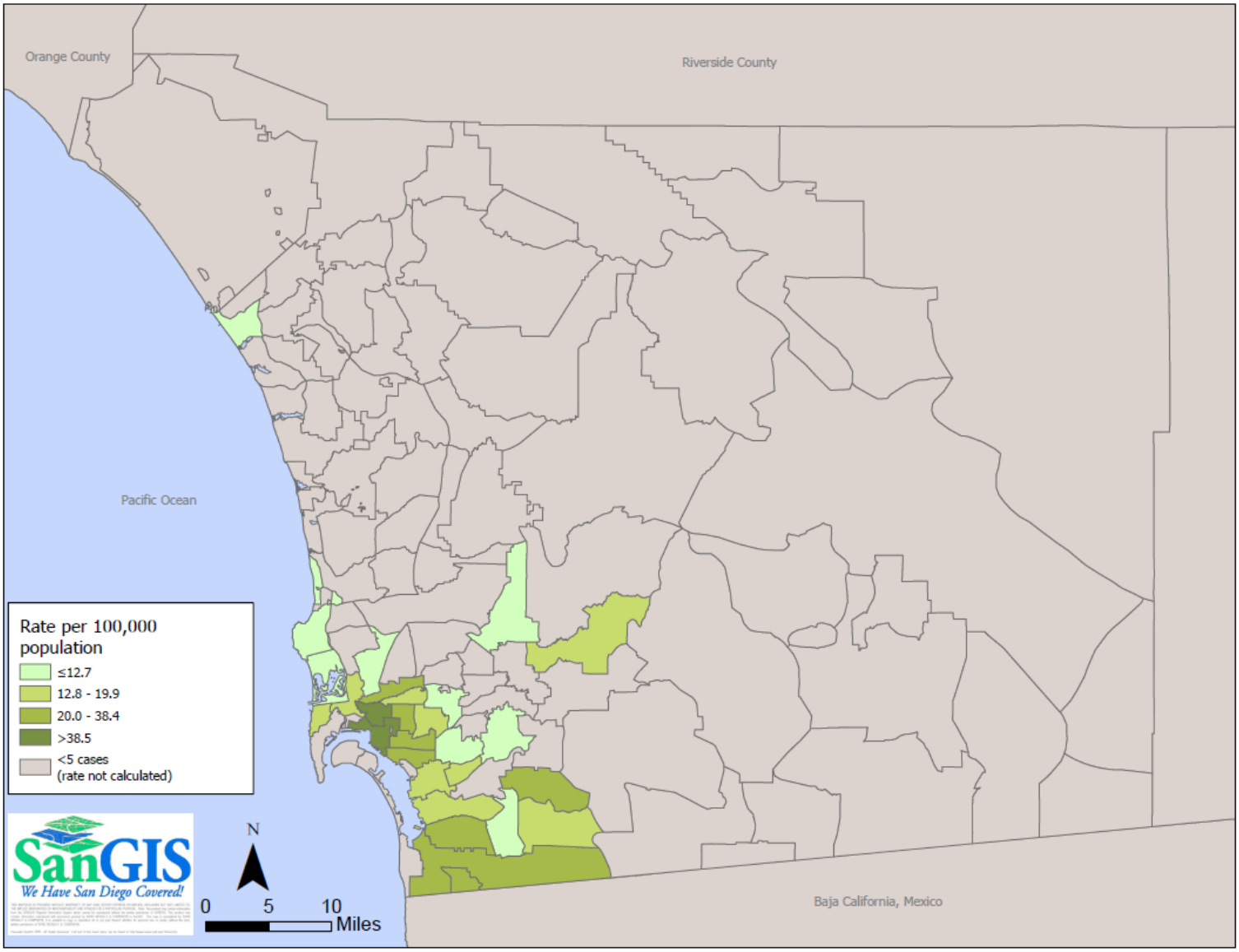
Species	Cases	Percent
S. sonnei (D)	165	37.8
S. flexneri (B)	81	18.6
S. dysenteriae (A)	3	0.7
S. boydii (C)	2	0.5
Unspecified	185	42.4
Total	436	100.0

Notes:

1. Counts include confirmed and probable cases following the CDC/CSTE case criteria. In 2017, the case definition was changed to include cases detected by culture-independent diagnostic testing (CIDT) as probable cases. Use of CIDT detection methods is increasing.
2. Shigellosis became nationally reportable in 1944.
3. Denominators for risk factor calculations are cases with available information, ranging from 261-391 of 436 total cases.
4. Risk factors are potential sources as reported by case-patients, not confirmed sources of infection.

SHIGELLOSIS

Shigellosis Rates by Zip Code of Residence, San Diego County, 2021



For more information:

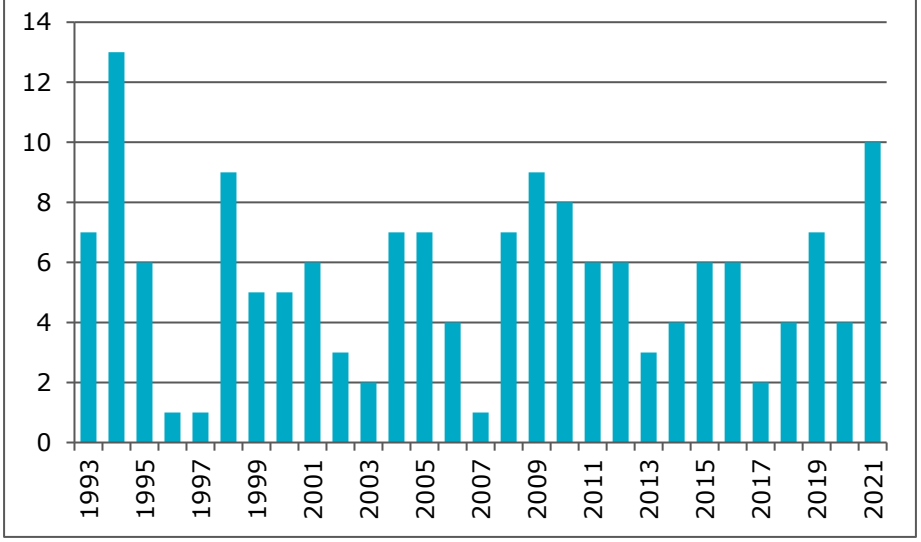
- Centers for Disease Control and Prevention (CDC) Shigellosis website
- California Department of Public Health (CDPH) Shigellosis website
- CDC/CSTE Shigellosis Case Definition

TYPHOID FEVER

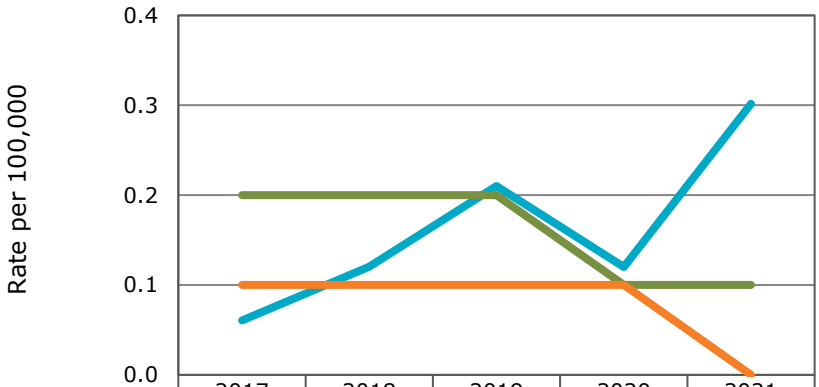
Disease Info

Infectious agent: *Salmonella enterica* serotype Typhi, a bacterium
Incubation: Usually 8-14 days, range 3-30 days
Mode of transmission: Person-to-person through contact with an infected person's feces or urine; contaminated food or drink
Symptoms: High fever (103° or 104° F), stomach pain, headache, fatigue, loss of appetite; sometimes a rash of flat, rose-colored spots

Typhoid Fever Cases, San Diego County 1993-2021



Typhoid Fever Incidence, San Diego County, California, and United States, 2017-2021



	2017	2018	2019	2020	2021
San Diego County	0.1	0.1	0.2	0.1	0.3
California	0.2	0.2	0.2	0.1	0.1
United States	0.1	0.1	0.1	0.1	0.0

Key Points

- In 2021, there were ten cases of typhoid fever in San Diego County.
- The incidence rate of typhoid fever in San Diego County has remained low. In 2021, the rate in San Diego County was 0.3 per 100,000 population, similar to the rate for California (0.0 per 100,000).
- Seven case-patients traveled internationally prior to the onset of their illnesses; the most common location was Mexico.

Notes:

1. Counts include confirmed and probable cases with acute illness following the CDC/CSTE case criteria.
2. There was a case definition change in 2019, requiring only laboratory confirmation for the classification of a confirmed case. Probable cases were expanded to include detection of S. Typhi in a clinical specimen using a culture-independent diagnostic test (CIDT). Epidemiological linkages were also redefined as epidemiological linkages to a confirmed S. Typhi infection case or a probable S. Typhi infection case with laboratory evidence, or being a member of a risk group as defined by public health authorities during an outbreak.
3. Typhoid fever was nationally notifiable beginning in 1944.

For more information:

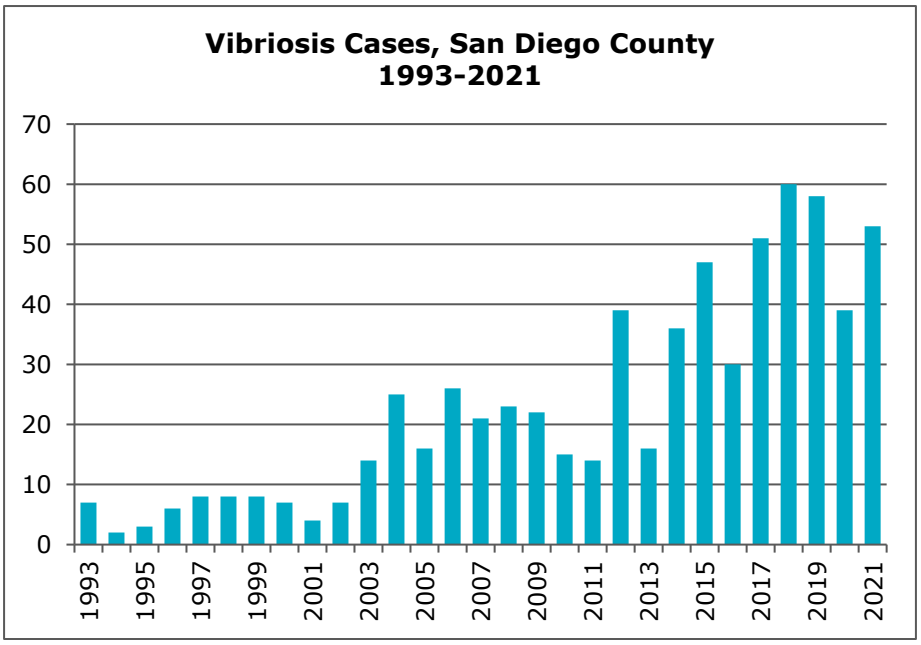
- Centers for Disease Control and Prevention (CDC) Typhoid Fever website
- California Department of Public Health (CDPH) Typhoid Fever website
- CDC/CSTE Typhoid Fever Case Definition
- CDC Health Information for International Travel (the Yellow Book) – Typhoid & Paratyphoid Fever

VIBRIOSIS

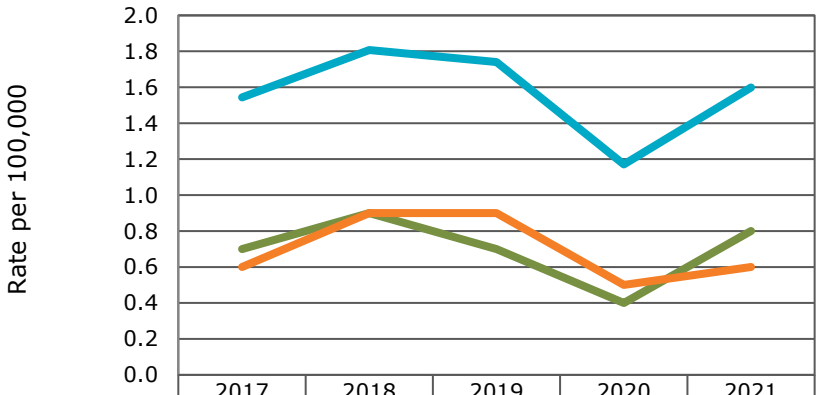
Disease Info

Infectious agent: Numerous bacteria in the *Vibrionaceae* family, including *V. parahaemolyticus, V. alginolyticus,* nontoxigenic *V. cholerae*, *V. vulnificus, Grimontia spp.*, *Photobacterium spp*.
Incubation: Usually 10-72 hours
Mode of transmission: Ingestion of raw or undercooked seafood, especially shellfish; skin infection by exposure of wounds to brackish or salt water
Symptoms: Watery diarrhea, abdominal cramps, nausea, vomiting, fever; septicemia; skin infection; ear infection; can be asymptomatic

Vibriosis Cases, San Diego County 1993-2021



Vibriosis Incidence, San Diego County, California, and United States, 2017-2021



	2017	2018	2019	2020	2021
San Diego County	1.5	1.8	1.7	1.2	1.6
California	0.7	0.9	0.7	0.4	0.8
United States	0.6	0.9	0.9	0.5	0.6

Key Points

- In 2021, there were 53 cases of vibriosis in San Diego County. The case definition was changed in 2017 to include cases detected by culture-independent diagnostic testing (CIDT) as probable cases.
- In San Diego County, the incidence rate of vibriosis in 2021 was 1.6 per 100,000 population. In recent years, the incident rate has been higher in San Diego County than in California and the United States.
- As in previous years, cases of vibriosis peaked in the summer months in 2021.
- The greatest number of cases and the highest incidence rates were among persons 25-64 years of age.
- In San Diego County, the most frequently reported species was *Vibrio parahaemolyticus* (45%).
- The majority of cases were in the non-Hispanic population (87%).

Notes:

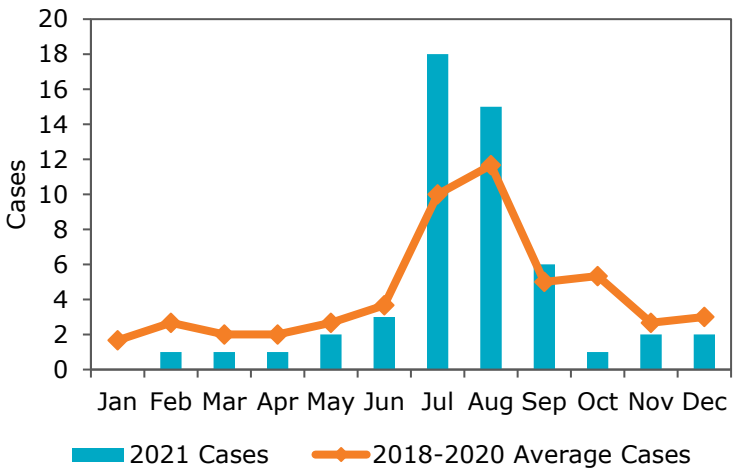
1. Counts include confirmed and probable cases following the CDC/CSTE case criteria. Vibriosis does not include infections with toxigenic *Vibrio cholerae* O1 and O139, which are reportable as cholera.
2. In 2017, the case definition changed to include cases detected by culture-independent diagnostic testing (CIDT) as probable cases.
3. Vibriosis became a nationally notifiable condition in 2007.

For more information:

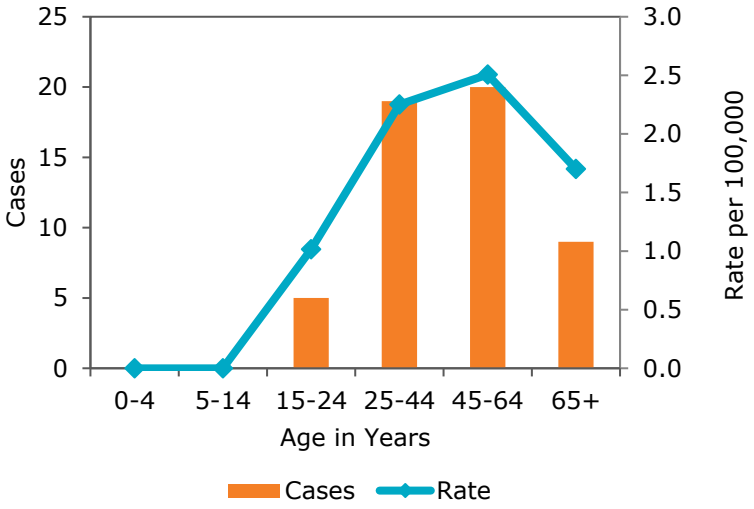
- Centers for Disease Control and Prevention (CDC) Vibriosis website
- California Department of Public Health (CDPH) Vibriosis website
- CDC/CSTE Vibriosis Case Definition

VIBRIOSIS

Vibriosis Cases by Month of Onset, San Diego County, 2021



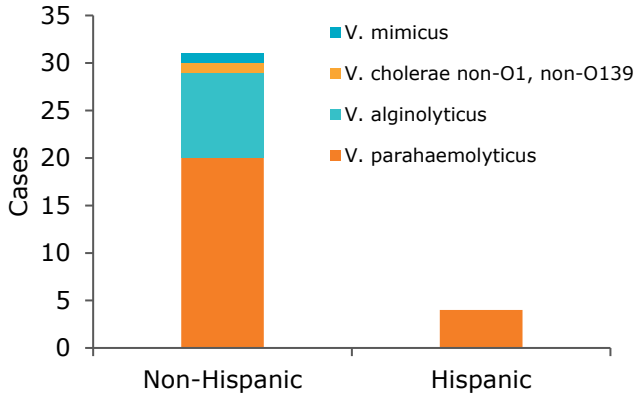
Vibriosis Cases and Rates by Age, San Diego County, 2021



Reported *Vibrio* Species, San Diego County, 2021

Species	Cases	Percent
V. parahaemolyticus	24	45.3
V. alginolyticus	9	17.0
V. cholerae non-O1, non-O139	1	1.9
V. mimicus	1	1.9
Unspecified	18	34.0
Total	53	100.0

Vibriosis Cases by Species and Ethnicity, San Diego County, 2021



Types of Transmission and Presentation Typically Associated with Commonly Reported *Vibrio* Species in San Diego County**

Species	Transmission		Clinical Presentation		
	Ingestion	Wound /Ear	Gastro-enteritis	Wound/Ear Infection	Septicemia
V. parahaemolyticus	●●	○	●●	●	○
V. alginolyticus		●●		●●	
V. vulnificus	●	●	●	●●	●●
V. cholerae non-O1/ non-O139	●●	●	●●	●	●

●● most common ● potential ○ very rare

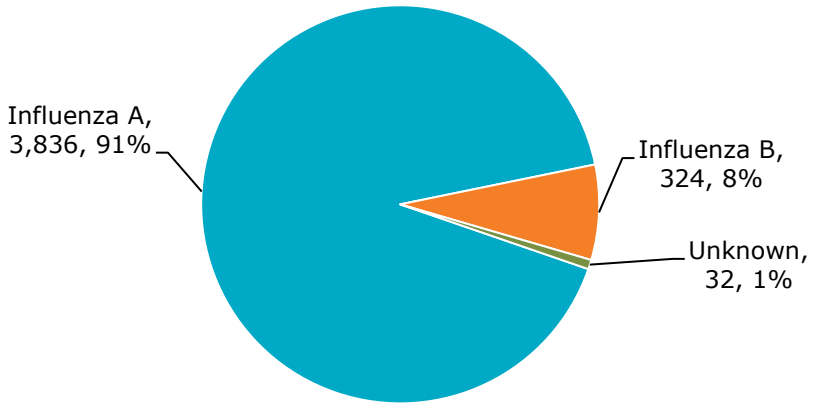
**Adapted from Chapter 5.8 "Noncholera" Vibrio Species, Table 8 Clinical Syndromes Due to Vibrio Species (p. 124) in AS Evans & PS Brachman (Eds.) *Bacterial Infections of Humans: Epidemiology and Control* (3rd edition, 1998); New York: Plenum Medical Book Company.

INFLUENZA SEASON SUMMARY, 2021-22

Disease Info

Infectious agent: Influenza viruses; the two main types causing seasonal epidemics are A and B. Influenza A viruses can be separated into subtypes based on the proteins on the surface of the virus; the influenza A subtypes currently circulating are H1N1 and H3N2. Influenza B viruses are divided into lineages; the lineages currently circulating are Yamagata and Victoria.
Incubation: Typically 1-4 days, with an average of 2 days
Mode of transmission: Large-particle respiratory droplets, spread through close contact or contact with contaminated surfaces
Symptoms: Fever, cough, sore throat, nasal congestion, muscle pain, headache, malaise; young children and the elderly may have atypical presentations (e.g., diarrhea or no fever)

**Influenza Cases by Type,
San Diego County, Fiscal Year 2021-22
N=4,192**



**Subtypes of Influenza Detections,
San Diego County, Fiscal Year 2021-22**

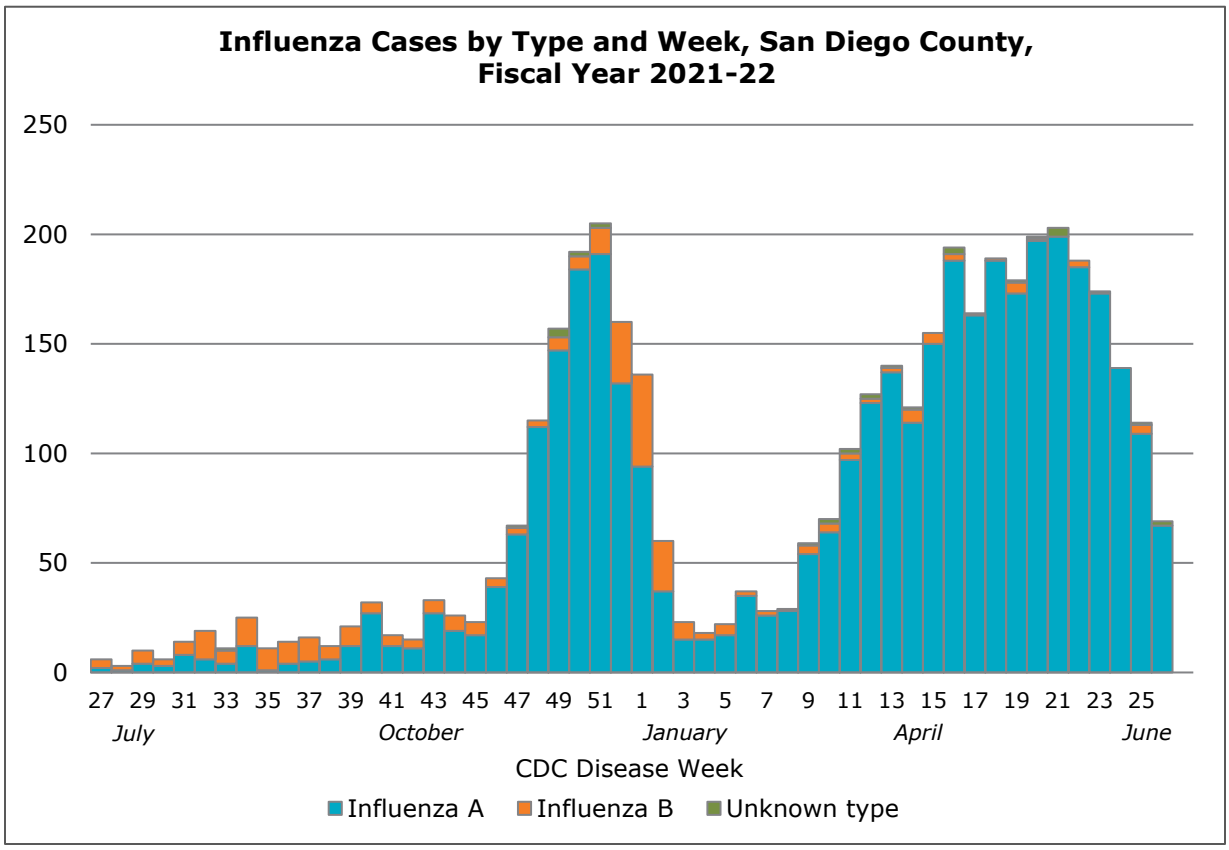
Flu Type	Detections	Percent
Influenza A		
Total Cases	3,836	100.0
Subtyped	353	9.2
Among those subtyped		
H3	352	99.7
H1N1-pdm09	1	0.3
Influenza B		
Total Cases	324	100.0
Subtyped	0	0.0

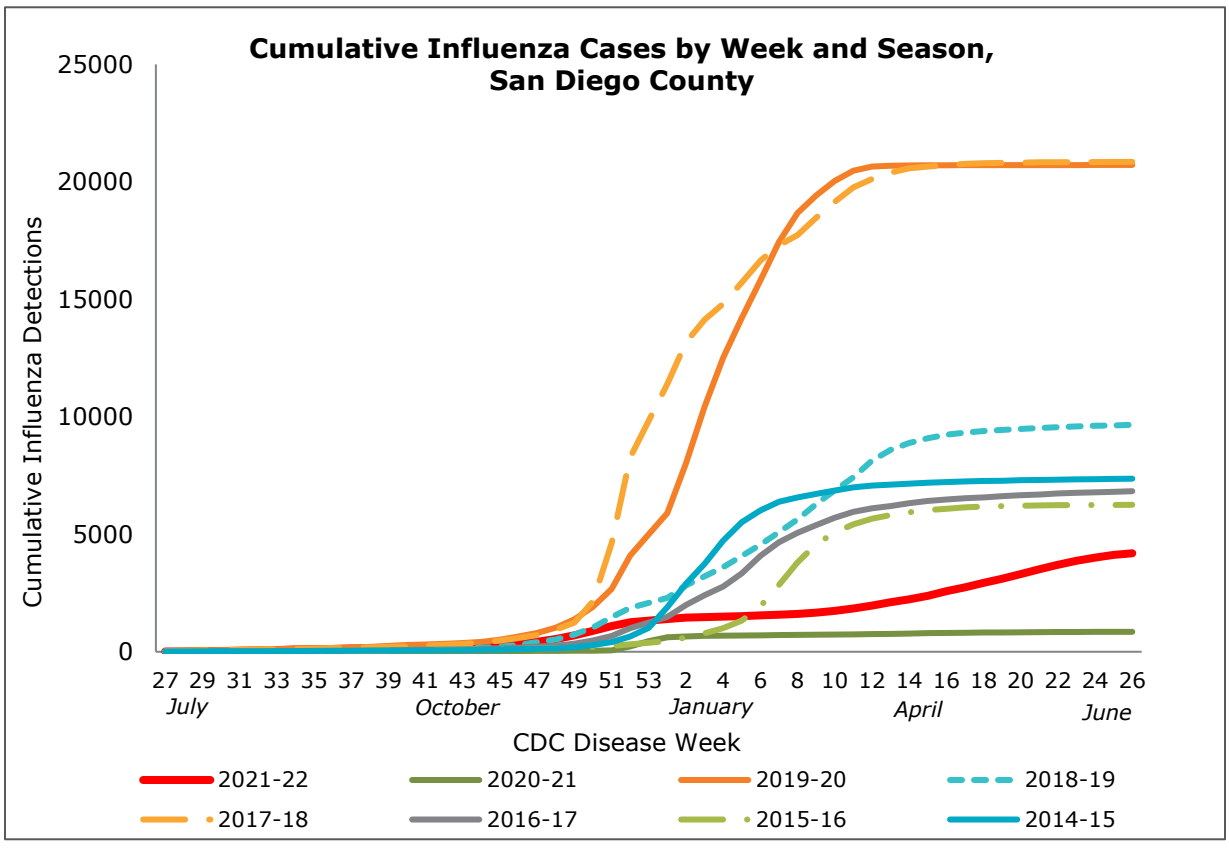
Key Points

- There were 4,192 influenza cases reported in San Diego County during the 2021-22 season (fiscal year 2021-22). San Diego, like the nation, experienced an unusual late-season surge in cases. However, reported cases remained lower in 2021-22 than pre-COVID-19 pandemic years.
- Over 90% of the cases reported were influenza A, while only eight percent were influenza B. A small percentage of influenza cases were not typed.
- Among the influenza A viruses that were subtyped (nine percent), over 99% were H3.
- Of the influenza B virus detections, none were subtyped.
- Influenza cases peaked at 205 cases in week 51 (late December 2021), with a second peak of 203 cases in week 21 (late May 2022).
- The highest proportion of reported cases were in those 18-64 years of age (59%).
- There were 8 influenza-related deaths during the 2021-22 season in San Diego County.
- Persons aged 65 and older are at higher risk for influenza complications; 63% of the influenza deaths in San Diego County in 2021-22 were among persons 65 years old or older.
- One of the persons who died from influenza-related illness had received the seasonal influenza vaccine and all persons had underlying medical conditions.
- A total of 1,255,682 influenza vaccinations were administered in San Diego County in 2021-22*.
- During FY 2021-22 season, there was one influenza A outbreak at a congregate living facility. This outbreak had 4 cases total and one death.

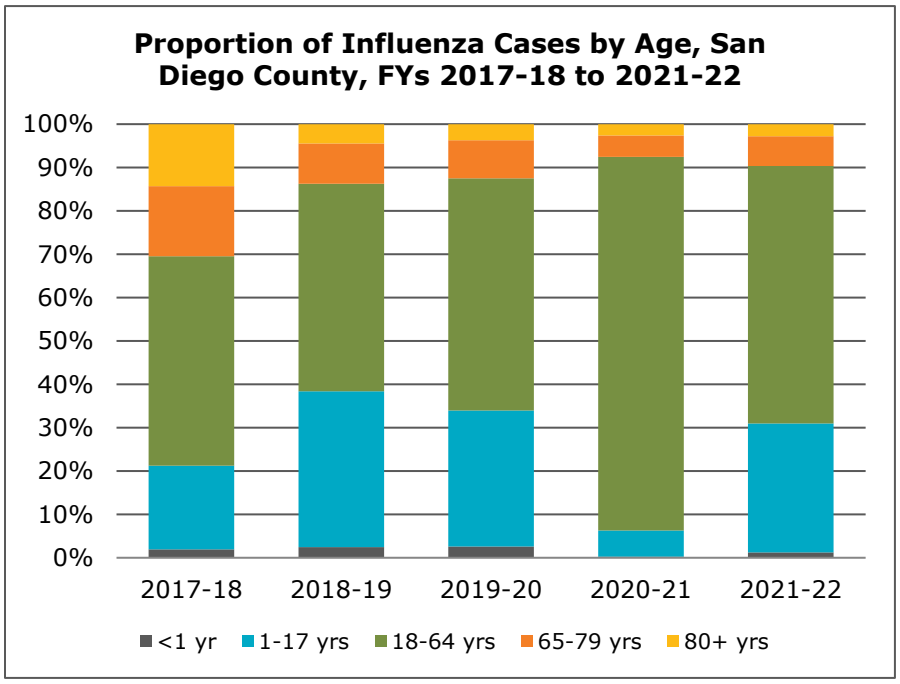
*Influenza vaccinations administered and entered into the California Immunization Registry (CAIR2).

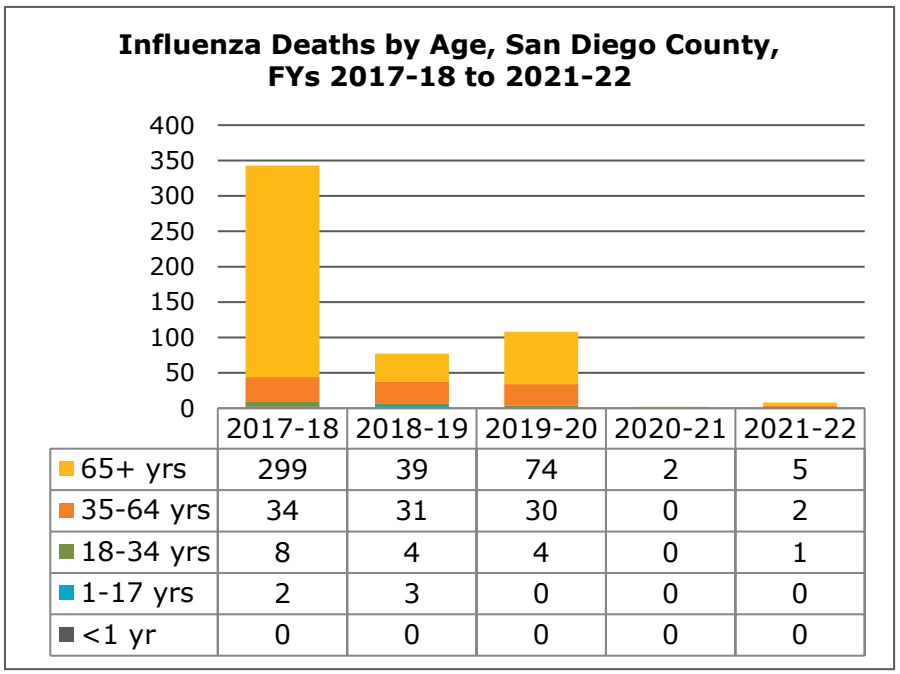
INFLUENZA SEASON SUMMARY, 2021-22





INFLUENZA SEASON SUMMARY, 2021-22

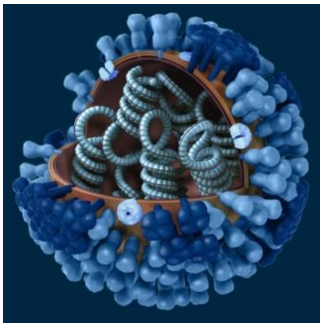




	2017-18	2018-19	2019-20	2020-21	2021-22
65+ yrs	299	39	74	2	5
35-64 yrs	34	31	30	0	2
18-34 yrs	8	4	4	0	1
1-17 yrs	2	3	0	0	0
<1 yr	0	0	0	0	0

For more information:

- Centers for Disease Control and Prevention (CDC) Influenza website
- Epidemiology and Prevention of Vaccine-Preventable Diseases (the Pink Book) – Influenza
- CDC Flu Activity and Surveillance website
- CDC Influenza Vaccination website
- California Department of Public Health (CDPH) Influenza (Flu) website
- County of San Diego Influenza website



3D graphical representation of a generic Influenza virion's ultrastructure, with a portion of the virion's outer protein coat cut away
Illustrator: Dan Higgins, CDC Public Health Image Library

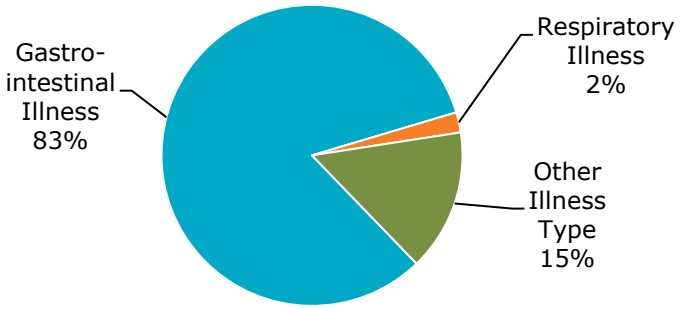
Notes:

1. County of San Diego Public Health Services requests that local providers and laboratories report all laboratory-confirmed cases (using any type of appropriate laboratory test, including rapid diagnostic tests) and all influenza-related deaths, regardless of age. As of September 2019, influenza became a laboratory reportable condition in California. Influenza is reportable by providers in cases of death in persons under age 18, outbreaks, and detections of novel strains of influenza.
2. Cases/detections reported here are incidents of disease, not persons. One person may have more than one type of influenza during a season or multiple infections across seasons; each infection is counted as a separate case.
3. Influenza data are presented using fiscal years (the County fiscal year is July-June) rather than calendar years because this convention better illustrates the seasonal nature of influenza.
4. Influenza is vaccine-preventable. Inactivated vaccines have been available since the 1940s. The vaccine does not provide long-lasting immunity and efficacy varies by season; vaccination is recommended each season for all persons >6 months of age.
5. Influenza outbreaks in institutions (e.g., long term care facilities, prisons, sleepover camps) require at least one case of laboratory-confirmed influenza in the setting of a cluster (at least two cases of influenza-like illness (ILI) with onset within a 72-hour period).

OUTBREAKS, 2021

46 San Diego County Outbreaks, 2021*

Outbreaks by Clinical Syndrome, San Diego County, 2021*



*Excluding outbreaks of COVID-19

Outbreaks by Clinical Syndrome and Etiology, San Diego County, 2021

Outbreak Etiology	Outbreaks
Gastrointestinal Illness (n=38)	
Norovirus	14
Gastroenteritis of undetermined etiology	12
Shigellosis	4
Toxin-producing bacteria of undetermined etiology	3
Vibrio infections (non-cholera)	3
Salmonellosis	2
Respiratory Illness (n=1)	
Respiratory syncytial virus (RSV)	1
Other Illness Type (n=7)	
Carbapenem-resistant *aceinetobacter*	5
Burkholderia cepacia	1
Candida auris	1

For more information:

- Centers for Disease Control and Prevention (CDC) Current Outbreak List
- CDC Foodborne Outbreaks website
- California Department of Public Health (CDPH) Foodborne Diseases and Outbreaks website
- California Department of Public Health (CDPH) Healthcare-Associated Infections Program website

Key Points

- The Epidemiology and Immunization Services Branch investigated 46 outbreaks in 2021, excluding outbreaks of COVID-19.
- In the majority (83%) of outbreaks, the ill experienced gastrointestinal (GI) symptoms. Over one third (37%) of these outbreaks were attributed to norovirus. Other etiologies include shigellosis (11%), toxin-producing bacteria of undetermined etiology (8%), vibriosis (8%), and salmonellosis (5%). Etiology was undetermined for 32% of GI outbreaks.
- Of the 38 gastrointestinal illness outbreaks, 58% were attributed to foodborne transmission. Foodborne etiologies included norovirus (5), toxin-producing bacteria of unknown etiology (3), vibriosis (3), salmonellosis (2), and shigellosis (1). In 8 outbreaks, the etiology was unknown.
- One outbreak was associated with respiratory symptoms and was caused by respiratory syncytial virus (RSV).
- The seven remaining outbreaks were due to healthcare-associated infections and, due to continued transmission, remain under investigation. Of these, five were caused by carbapenem-resistant *aceinetobacter*, one was caused by *Burkholderia cepacia*, and one was caused by *Candida auris*.

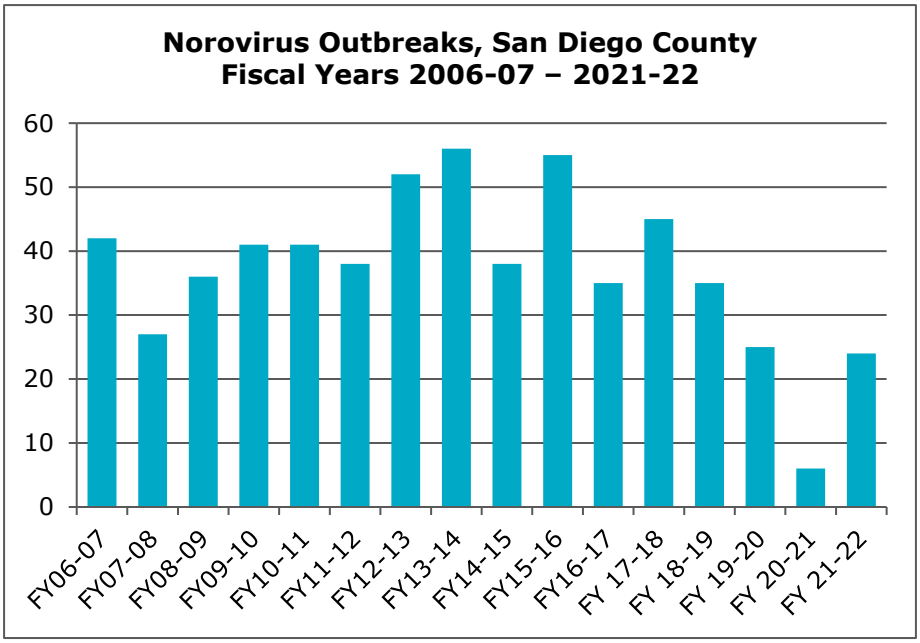
Notes:

1. Outbreak counts include those investigated and classified as confirmed, probable, or suspect by the Epidemiology and Immunization Services Branch and do not represent all outbreaks in San Diego County.
2. Criteria for determining the occurrence of an outbreak and for confirming outbreak etiology vary by disease.
3. Outbreaks of any disease are reportable by law to the local public health department.
4. Outbreaks are grouped into calendar year on the basis of earliest onset date.

NOROVIRUS OUTBREAKS, 2021-22

Disease Info

Infectious agent: Norovirus, a non-enveloped, single-stranded RNA virus in the family *Caliciviridae*; 3 genogroups (GI, GII, GIV) cause disease in humans
Incubation: Typically 12-48 hours, median in outbreaks is 33-36 hours
Mode of transmission: Fecal-oral route: either direct person-to-person contact, ingestion of food or water contaminated by feces, contact with contaminated environmental surfaces or objects, or ingestion of aerosolized vomitus
Symptoms: Vomiting, non-bloody diarrhea, nausea, abdominal pain, low-grade fever



Notes:

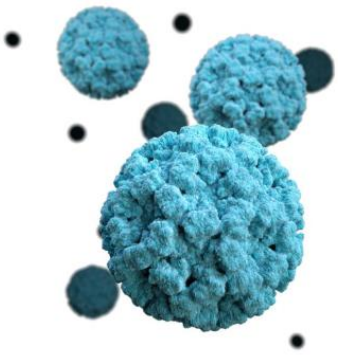
1. A confirmed norovirus outbreak requires that at least two cases are laboratory-confirmed; a probable norovirus outbreak requires one laboratory-confirmed case; in a suspect norovirus outbreak, at least 50% of cases report vomiting, average incubation is 24-48 hours, and average duration of illness is 12-60 hours.
2. Norovirus outbreak data are presented using fiscal years (the County fiscal year is July-June) rather than calendar years because this convention better illustrates the seasonal nature of norovirus outbreaks.

For more information:

- Centers for Disease Control and Prevention (CDC) Norovirus website
- CDC Norovirus U.S. Trends and Outbreaks website
- California Department of Public Health (CDPH) Norovirus website
- County of San Diego Norovirus website

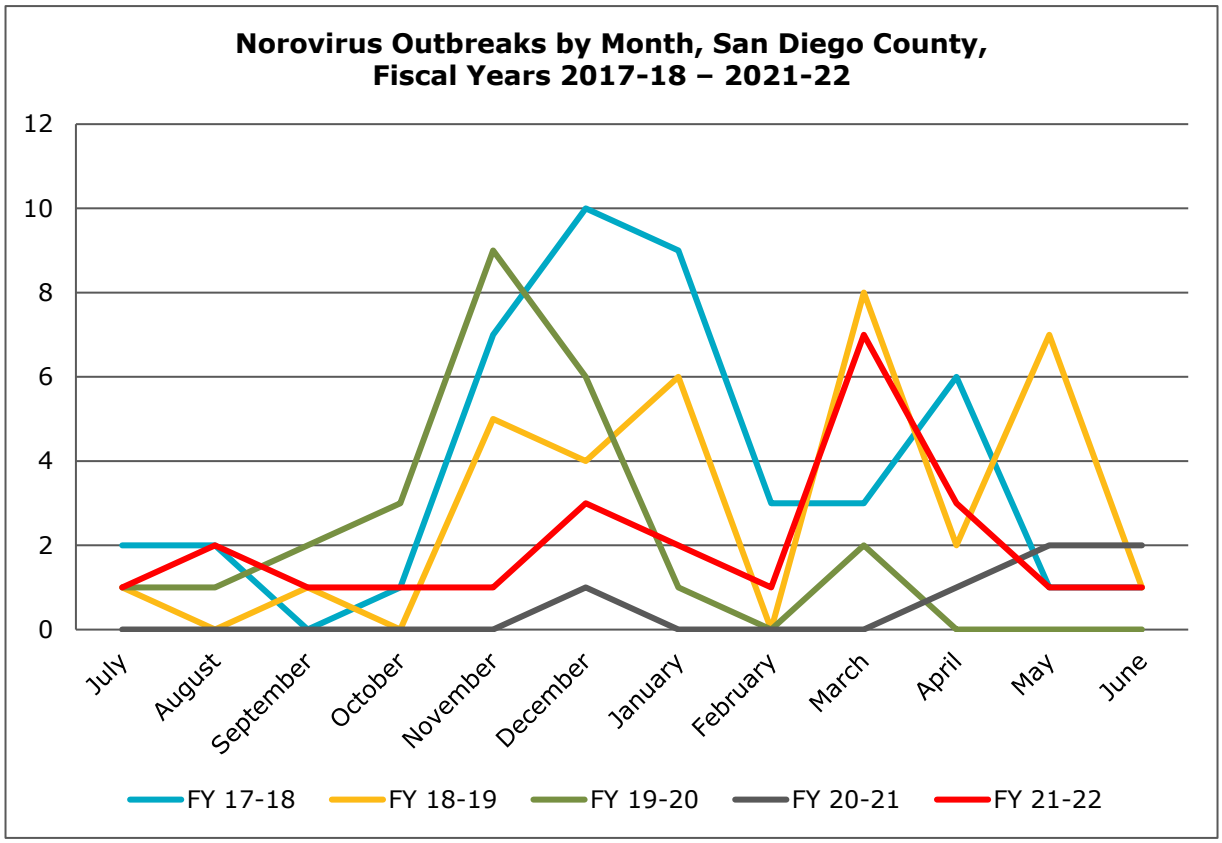
Key Points

- There were 24 norovirus outbreaks investigated by the Epidemiology Program in Fiscal Year (FY) 2021-22, slightly below the average of 29 outbreaks over the previous five seasons.
- In 42% of the outbreaks, at least one human specimen tested positive for norovirus. The remaining outbreaks were classified as suspect norovirus based on clinical characteristics.
- Although norovirus infections and norovirus outbreaks occur year-round, outbreaks are most common from November to April. In FY 2021-22, the peak number of outbreaks investigated was in March of 2022.
- In FY 2021-22, 33% of norovirus outbreaks were attributed to foodborne transmission; the rest were likely person-to-person, although contaminated surfaces and fomites may have also played a role.
- Of the suspect person-to-person norovirus outbreaks, 75% were in congregate living facilities, such as long-term care or assisted living facilities and 25% involved settings such as a school, childcare facility, or indoor playground.
- The median number of cases per norovirus outbreak in FY 2021-22 was 13.5, with a range of 3-68 cases.



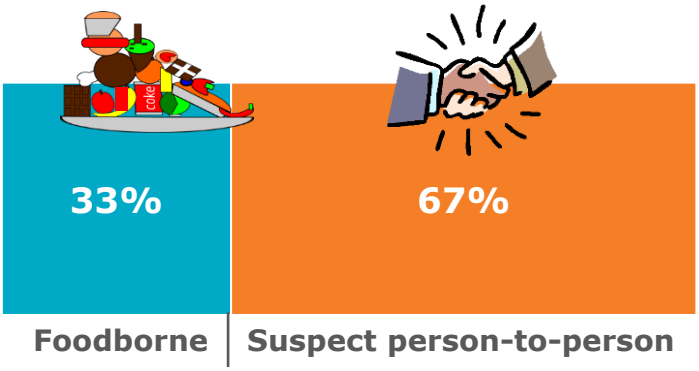
3D representation of norovirus virions based on electron microscopic imagery.
Illustrator: Alissa Eckert, MS, CDC Public Health Image Library

NOROVIRUS OUTBREAKS, 2021-22

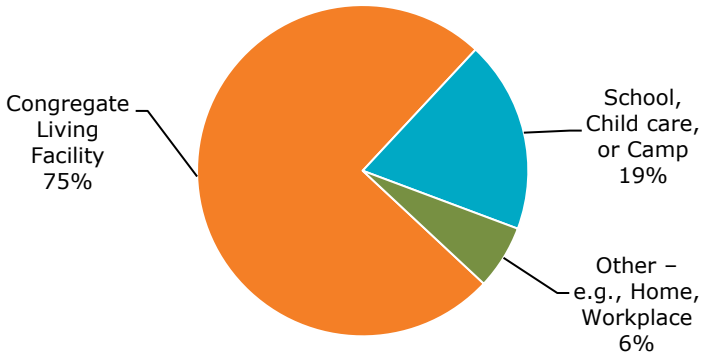


Norovirus Outbreaks, San Diego County, Fiscal Year 2021-22

Mode of Transmission



Location of Suspect Person-to-Person Norovirus Outbreaks



Congregate Living Facilities include long-term care facilities, assisted living facilities, and independent living facilities for seniors.

Number of cases per outbreak

Median: 13.5
Range: 3-68

DEMOGRAPHICS BY DISEASE

	Campylobacteriosis C,P	Coccidioidomycosis C	Cryptosporidiosis C,P	Dengue Virus Infection C,P	Encephalitis C	Giardiasis C,P	Hepatitis A, Acute C
Total	900	448	57	3	38	175	10
Gender							
Female	454	179	18	1	20	67	3
Male	441	267	37	2	18	106	6
Transgender/Other	0	0	1	0	0	1	1
Unknown/Missing	5	2	1	0	0	1	0
Age in Years							
0-4	77	0	4	0	1	13	0
5-14	79	5	6	0	1	23	0
15-24	110	16	11	1	4	13	0
25-44	296	73	23	2	4	58	4
45-64	208	186	9	0	9	49	3
65+	130	166	1	0	19	19	3
Unknown/Missing	0	2	3	0	0	0	0
Race/Ethnicity							
American Indian/Alaska Native	1	0	0	0	0	1	0
Asian	45	31	3	1	1	5	0
Black/African-American	16	24	4	0	4	6	0
Hispanic/Latino	277	100	23	1	7	42	1
Native Hawaiian/Other Pacific Islander	4	2	0	0	0	0	0
White	296	164	23	1	19	81	8
Other	124	38	1	0	1	16	1
Two or More Races	8	1	0	0	1	5	0
Unknown/Missing	129	88	3	0	5	19	0
HHSA Service Region							
Central	142	70	15	0	3	43	1
East	112	61	7	0	4	32	1
North Central	183	65	15	2	7	32	4
North Coastal	118	36	2	0	11	22	1
North Inland	138	65	10	0	8	18	2
South	182	113	6	1	4	26	1
Unknown/Missing	25	38	2	0	1	2	0

Notes:

1. Inclusion criteria are based on CDC/CSTE surveillance case criteria (C,P,S = Confirmed, Probable, Suspect). See individual sections for further details.
2. Cases grouped into CDC disease years based on earliest date of onset, lab specimen collection, diagnosis, death, report received dates.
3. Race/ethnicity combines two variables collected separately, race and ethnicity. Persons of any race with Hispanic ethnicity are included in the Hispanic category. The other categories are non-Hispanic.
4. Health and Human Services Agency (HHSA) service regions are based on zip code of residence.

DEMOGRAPHICS BY DISEASE

	Hepatitis B, Acute [C]	Hepatitis B, Chronic [C,P]	Hepatitis C, Chronic [C,P]	Legionellosis [C]	Listeriosis [C,P]	Lyme Disease [C,P]	Malaria [C]
Total	16	797	3,538	64	8	13	8
Gender							
Female	5	368	1,384	20	4	5	0
Male	11	429	2,114	44	4	8	8
Transgender/Other	0	0	3	0	0	0	0
Unknown/Missing	0	0	37	0	0	0	0
Age in Years							
0-4	0	0	2	0	0	0	0
5-14	0	0	10	1	0	2	0
15-24	0	34	194	0	0	2	1
25-44	7	268	1,243	7	1	3	2
45-64	7	333	1,343	25	1	2	5
65+	2	162	723	31	6	4	0
Unknown/Missing	0	0	23	0	0	0	0
Race/Ethnicity							
American Indian/Alaska Native	0	1	12	0	0	0	0
Asian	0	361	155	5	0	1	1
Black/African-American	2	63	193	6	1	0	2
Hispanic/Latino	6	81	570	11	2	0	0
Native Hawaiian/Other Pacific Islander	0	10	17	0	0	0	0
White	5	93	1,101	35	5	9	2
Other	1	65	326	5	0	0	0
Two or More Races	1	20	6	0	0	0	0
Unknown/Missing	1	103	1,158	2	0	3	3
HHSA Service Region							
Central	5	174	774	17	3	0	2
East	0	86	502	9	1	3	3
North Central	3	226	495	15	1	3	1
North Coastal	2	79	394	12	1	5	2
North Inland	1	123	392	5	1	1	0
South	4	102	674	6	1	1	0
Unknown/Missing	1	7	307	0	0	0	0

Notes:

1. Inclusion criteria are based on CDC/CSTE surveillance case criteria (C,P,S = Confirmed, Probable, Suspect). See individual sections for further details.
2. Cases grouped into CDC disease years based on earliest date of onset, lab specimen collection, diagnosis, death, report received dates.
3. Race/ethnicity combines two variables collected separately, race and ethnicity. Persons of any race with Hispanic ethnicity are included in the Hispanic category. The other categories are non-Hispanic.
4. Health and Human Services Agency (HHSA) service regions are based on zip code of residence.

DEMOGRAPHICS BY DISEASE

	Measles (Rubeola) [C]	Meningitis [C,P,S]	Meningococcal Disease [C,P]	Mumps [C,P]	Pertussis [C,P]	Salmonellosis [C,P]	Shiga toxin-Producing *E. coli* [C,P]
Total	0	104	1	2	70	585	162
Gender							
Female	0	45	1	0	34	312	92
Male	0	58	0	2	36	269	70
Transgender/Other	0	0	0	0	0	0	0
Unknown/Missing	0	1	0	0	0	4	0
Age in Years							
0-4	0	8	0	0	32	101	18
5-14	0	2	0	1	7	63	21
15-24	0	11	0	0	9	55	18
25-44	0	28	0	0	12	134	35
45-64	0	33	1	0	7	115	31
65+	0	22	0	1	3	115	38
Unknown/Missing	0	0	0	0	0	2	1
Race/Ethnicity							
American Indian/Alaska Native	0	0	0	0	0	2	0
Asian	0	9	0	0	4	43	5
Black/African-American	0	4	0	0	1	14	8
Hispanic/Latino	0	28	1	1	15	227	56
Native Hawaiian/Other Pacific Islander	0	1	0	0	0	3	0
White	0	49	0	1	42	242	67
Other	0	3	0	0	5	17	17
Two or More Races	0	0	0	0	1	7	4
Unknown/Missing	0	10	0	0	2	30	5
HHSA Service Region							
Central	0	19	0	0	9	74	27
East	0	10	0	0	5	96	19
North Central	0	19	0	2	14	112	30
North Coastal	0	18	0	0	21	105	32
North Inland	0	19	0	0	14	105	28
South	0	15	1	0	7	79	26
Unknown/Missing	0	4	0	0	0	14	0

Notes:

1. Inclusion criteria are based on CDC/CSTE surveillance case criteria (C,P,S = Confirmed, Probable, Suspect). See individual sections for further details.
2. Cases grouped into CDC disease years based on earliest date of onset, lab specimen collection, diagnosis, death, report received dates.
3. Race/ethnicity combines two variables collected separately, race and ethnicity. Persons of any race with Hispanic ethnicity are included in the Hispanic category. The other categories are non-Hispanic.
4. Health and Human Services Agency (HHSA) service regions are based on zip code of residence.

DEMOGRAPHICS BY DISEASE

	Shigellosis C,P	Typhoid Fever C,P	Vibriosis C,P
Total	436	10	53
Gender			
Female	170	3	21
Male	260	7	32
Transgender/Other	4	0	0
Unknown/Missing	2	0	0
Age in Years			
0-4	23	0	0
5-14	30	0	0
15-24	44	3	5
25-44	146	4	19
45-64	129	2	20
65+	60	1	9
Unknown/Missing	4	0	0
Race/Ethnicity			
American Indian/Alaska Native	2	0	0
Asian	10	1	6
Black/African-American	38	1	0
Hispanic/Latino	182	6	7
Native Hawaiian/Other Pacific Islander	2	0	0
White	156	2	28
Other	19	0	3
Two or More Races	7	0	3
Unknown/Missing	20	0	6
HHSA Service Region			
Central	143	1	7
East	42	1	7
North Central	55	2	11
North Coastal	33	2	17
North Inland	31	1	4
South	95	1	6
Unknown/Missing	37	2	1

Notes:

1. Inclusion criteria are based on CDC/CSTE surveillance case criteria (C,P,S = Confirmed, Probable, Suspect). See individual sections for further details.
2. Cases grouped into CDC disease years based on earliest date of onset, lab specimen collection, diagnosis, death, report received dates.
3. Race/ethnicity combines two variables collected separately, race and ethnicity. Persons of any race with Hispanic ethnicity are included in the Hispanic category. The other categories are non-Hispanic.
4. Health and Human Services Agency (HHSA) service regions are based on zip code of residence.

ZIP CODES BY HHSA SERVICE REGION

San Diego County is divided into six Health and Human Services Agency (HHSA) service regions, which were created by grouping contiguous zip codes. The zip codes that make up each region are listed below. The list only includes current geographic zip codes, not P.O. boxes or historic zip codes; however, case-patients with these zip codes in their address are included in the counts for the enclosing zip code and region.

Central Region
92101, 92102, 92103, 92104, 92105, 92113, 92114, 92115, 92116, 92134, 92136, 92139, 92182

East Region
91901, 91905, 91906, 91916, 91917, 91931, 91934, 91935, 91941, 91942, 91945, 91948, 91962, 91963, 91977, 91978, 91980, 92019, 92020, 92021, 92040, 92071

North Central Region
92037, 92093, 92106, 92107, 92108, 92109, 92110, 92111, 92117, 92119, 92120, 92121, 92122, 92123, 92124, 92126, 92130, 92131, 92140, 92145, 92161

North Coastal Region
92007, 92008, 92009, 92010, 92011, 92014, 92024, 92054, 92055, 92056, 92057, 92058, 92067, 92075, 92081, 92083, 92084, 92091, 92672

North Inland Region
92003, 92004, 92025, 92026, 92027, 92028, 92029, 92036, 92059, 92060, 92061, 92064, 92065, 92066, 92069, 92070, 92078, 92082, 92086, 92096, 92127, 92128, 92129, 92259, 92536

South Region
91902, 91910, 91911, 91913, 91914, 91915, 91932, 91950, 92118, 92135, 92154, 92155, 92173

RESOURCES

United States Disease Data

Centers for Disease Control and Prevention. National Notifiable Diseases Surveillance System, 2017-2019 Annual Tables of Infectious Disease Data. Atlanta, GA. CDC Division of Health Informatics and Surveillance. Available at: https://www.cdc.gov/nndss/data-statistics/infectious-tables/index.html.

Centers for Disease Control and Prevention. National Notifiable Diseases Surveillance System, Weekly Tables of Infectious Disease Data. Atlanta, GA. CDC Division of Health Informatics and Surveillance. Available at: https://www.cdc.gov/nndss/data-statistics/index.html.

Centers for Disease Control and Prevention. Viral Hepatitis Surveillance Report –United States, 2020.https://www.cdc.gov/hepatitis/statistics/2020surveillance/index.htm.Published September 2022.

California Disease Data

Yearly Summaries of Selected General Communicable Diseases in California, 2013-2021. Surveillance and Statistics Section, Infectious Diseases Branch, Division of Communicable Disease Control, Center for Infectious Diseases, California Department of Public Health. February 2023.
https://www.cdph.ca.gov/Programs/CID/DCDC/Pages/YearlySummSelectedGeneralCommDisinCA.aspx

Vaccine Preventable Diseases Annual Report, 2020. Vaccine-Preventable Diseases Epidemiology Section, Immunization Branch, Division of Communicable Disease Control, Center for Infectious Diseases, California Department of Public Health.
https://www.cdph.ca.gov/Programs/CID/DCDC/CDPH%20Document%20Library/Immunization/VPD-AnnualReport2017.pdf

Population Data

Table B01001, Sex by Age. 2017-2021 ACS 5-Year Estimates Detailed Tables.
Source: U.S. Census Bureau, Population Division.

United States Census Bureau, American Community Survey
https://www.census.gov/programs-surveys/acs

SANDAG vintage 2021 yearly population and housing estimates. Prepared by: Michael Ma, September 2022.

San Diego Association of Governments
http://www.sandag.org/

RESOURCES

Disease Information

Centers for Disease Control and Prevention. Diseases and Conditions website. https://www.cdc.gov/health-topics.html

Heymann DL, editor. Control of Communicable Diseases Manual. 20th ed. Washington, DC: American Public Health Association;2015.

Centers for Disease Control and Prevention. Epidemiology and Prevention of Vaccine-Preventable Diseases. Hamborsky J, Kroger A, Wolfe S, eds. 14th ed. Washington DC: Public Health Foundation;2021. [The Pink Book] https://www.cdc.gov/vaccines/pubs/pinkbook/index.html

Centers for Disease Control and Prevention. CDC Yellow Book 2020: Health Information for International Travel. New York: Oxford University Press;2019. [The Yellow Book] https://wwwnc.cdc.gov/travel/page/yellowbook-home

Centers for Disease Control and Prevention and Council of State and Territorial Epidemiologists. National Notifiable Diseases Surveillance System (NNDSS) Surveillance Case Definitions. https://ndc.services.cdc.gov

County of San Diego Board of Supervisors

District 1
Nora Vargas
Chair

District 2
Joel Anderson

District 3
Terra Lawson-Remer
Vice Chair

District 4

District 5
Jim Desmond

Chief Administrative Officer
Helen N. Robbins-Meyer

Director, Health and Human Services Agency
Nick Macchione, MS, MPH, FACHE

Public Health Officer, Public Health Services
Wilma J. Wooten, MD, MPH

Director, Public Health Services
Elizabeth A. Hernandez, Ph.D.

County of San Diego
Health and Human Services Agency
Public Health Services
P.O. Box 85222, MS P578
San Diego, CA 92186-5222